STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

October 18, 2010

U. S. Army Corps of Engineers
Wilmington Regulatory Field Office
69 Darlington Ave.
Wilmington, NC 28403

Attention: Mr. Brad Shaver
NCDOT Coordinator

Subject: **Application for Section 404 Individual Permit, Section 401 Water Quality Certification, and Isolated Wetlands Permit** for the Wilmington Bypass from US 17 in Brunswick County, north of the NC 87 intersection, to US 421 in New Hanover County. Federal Aid Project Nos. NHF-0017 (96) and STM-0017 (97), State Project Nos. 34491.1.3.GV2 and 34491.3.ST1, Division 3, TIP Nos. R-2633AA&AB and R-2633B.

Debit $570.00 from WBS Element 34491.1.3.GV2

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to construct a fully controlled access freeway on new alignment from US 17 in Brunswick County, north of the NC 87 intersection, to US 421 in New Hanover County. This project is the continuation of an urban loop around Wilmington, North Carolina and is approximately 20.2 miles. When completed, the highway will be designated, along with the previously constructed R-2633C and R-2405 projects, as Interstate 140. This project is split into two sections, R-2633AA&AB (formerly Section A and a portion of Section B) and R-2633B. Section AA&AB is approximately 8.0 miles long from US 17 in Brunswick County, north of the NC 87 intersection, to north of US 74/76. Section B is approximately 14 miles long from north of US 74/76 to US 421 in New Hanover County. R-2633AA&AB is a design-build project in final design while R-2633B is a conventional project in the preliminary design stage. This application includes the final design impacts for Section AA&AB and preliminary impacts for Section B. R-2633B impacts are based on the most recent available design provided at the CP 4C meeting in February 2010. Included in this application package are the following: (1) this cover letter, (2) ENG Form 4345, (3) Onsite Mitigation Restoration Plan (4) State Historic Preservation Office concurrence form, (5) Borrow Site Information (6)Hydraulic Design and Permit Drawing Review Meetings (CP 4B and 4C) minutes for Section A, (7) Ecosystem Enhancement Program (EEP) confirmation letter, (8) Stormwater Management Plan, (9) permit drawings, (10) and half-size roadway plans.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT UNIT
1598 MAIL SERVICE CENTER
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TELEPHONE: 919-431-2000
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WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 ATLANTIC AVE.
SUITE 116
RALEIGH NC 27604

Purpose and Need

The purpose and need of the project is to increase traffic capacity and reduce traffic volumes on congested roadway segments of US 17, complete a critical link in the National Highway System and the Intrastate transportation system that will increase mobility, support economic growth and improve military transportation routes within the region, and improve the existing regional transportation system by providing a continuous freeway route for through traffic to bypass downtown Wilmington. The route will also facilitate hurricane evacuation in the growing coastal areas of Brunswick County by providing increased connectivity between US 17 and US 74/76, and eventually, US 421 and I-40 with the construction of R-2633B.

Summary of Impacts

Waters of the U.S.: Construction of R-2633AA&AB and R-2633B will necessitate impacts to Jurisdictional Waters of the U.S. The project lies in the Cape Fear River Basin in HUC 03030005. The construction of R-2633AA&AB will result in permanent impacts to 24.47 acres of wetlands, and 695 linear feet of stream. There will be no temporary impacts to wetlands due to the placement of temporary erosion control devices. Temporary impacts are associated with temporary crossings, utility line relocations and haul roads from the borrow pit sites. Hand clearing is used underneath bridges and where possible to minimize impacts to wetlands.

Preliminary impacts for R-2633B include permanent impacts to 65.15 acres of wetlands, and 276 linear feet of jurisdictional stream.

Table 1. Summary of Jurisdictional Impacts

Section	Riparian Wetlands (ac)	Non-riparian Wetlands (ac)	Streams (ft)
R-2633 AA&AB	8.09	16.38	695
R-2633B (Preliminary)	0.93	64.22	276
Total	9.02	80.60	971

Summary of Mitigation

The proposed construction of R-2633AA&AB will impact 8.09 acres of riparian wetlands, 16.38 acres of non-riparian wetlands and 695 linear feet of stream that will require compensatory mitigation within the Cape Fear River Basin. On-site mitigation opportunities have been fully evaluated and are being pursued as part of this project. NCDOT will restore approximately 0.63 acres of riverine wetland and 66 linear feet of stream as well as preserve 2.97 acres of riverine wetland and 570 feet of stream on Bishop Branch as onsite mitigation. This mitigation site is located within the Section A project right of way located north of -Y1- Sta. 50 along existing NC 87 (Maco Road) and along – Y04- from approximately Sta. 21 to 25+50 on permit drawings 11 and 100 and 108. A specific on-site mitigation plan sheet is included with the attached mitigation plan.

Impacts for Section B are based off preliminary design provided for the 4C concurrence meeting in February 2010. These impacts are 0.93 acres of riparian wetlands, 64.22 acres of non-riparian wetlands and 276 linear feet of stream. No onsite mitigation is proposed on this section at this time.

NCDOT will utilize the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP) for satisfying the remaining federal Clean Water Act compensatory mitigation requirements for the unavoidable impacts to 7.80 acres of riparian wetlands, 80.14 acres of non-riparian wetlands and 723 linear feet of stream for Sections A and B (see attached EEP letter).

PROJECT SCHEDULE

For construction purposes, this project has been divided into two sections. Section AA&AB is being built by a Design Build Team and is scheduled to begin construction upon receipt of all necessary permits and approvals (anticipated January 2011) and completed by July 2013. Section B will be built via NCDOT's conventional design-bid-build process and is scheduled to be let in November 2012. However, the project may be accelerated if additional funds become available. NCDOT will submit permit modification applications for R-2633B when final design is complete.

NEPA DOCUMENT STATUS

The Final Environmental Impact Statement (FEIS) and the Record of Decision (ROD) for the FEIS were approved by the Federal Highway Administration (FHWA) in April 2007 and October 2007 respectively, for R-2633A and B and circulated to the appropriate agencies. A Construction Consultation for Section A was issued in September 2009. Additional copies are available upon request.

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

Wetland and stream determinations, originally verified with an approved Jurisdictional Determination (JD) for Sections A and B in August 2004, expired in August 2009. The wetlands and streams were re-verified for Section AA&AB in 2009 and 2010. NCDOT received a final JD from the USACE on September 16, 2010. Wetlands were re-verified using the field delineation method outlined in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region. 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. Section B is currently being re-verified and NCDOT will obtain a final JD before submitting the permit modification for Section B. Tributaries to Waters of the US are defined as jurisdictional waterbodies that carry flow directly or indirectly into traditional navigable waters and that contain an ordinary high water mark.

Changes made to the jurisdictional sites from what was presented in the FEIS and original JD are included in the section below. The "JD Package ID" column in the tables refer to the final JD package (2010) sent to the USACE for Section AA&AB.

IMPACTS TO WATERS OF THE UNITED STATES

Wetlands

Wetland impacts occur in the Cape Fear River Basin in HUC 03030005. Permanent riparian wetland impacts total 8.09 acres and non-riparian impacts total 16.38 acres for R-2633AA/AB. Permanent riparian wetland impacts total 0.93 acres and non-riparian impacts total 64.22 acres for R-2633B. Tables 2 and 3 list permanent impacts (fill, excavation, and mechanized clearing), temporary impacts and hand clearing. Impacts are based upon final design for R-2633AA&AB presented in the August 2010 4C meeting and preliminary design for R-2633B.

Utility Impacts: There will be 0.43 acres of temporary impacts to riparian wetlands resulting from relocation of a waterline and 0.36 acres of hand clearing in wetlands associated with relocation of over head electric utility lines for R-2633AA&AB (see Sites 3, 4, and 5, Permit Drawing Sheets 21, 24, and 29 of 108). Permanent impacts are associated with the footprint of individual utility poles and temporary impacts are associated with excavation for installation of the water lines and hand clearing for installation of the of the overhead electric lines. The impacts associated with the water line were considered temporary as the lines will be allowed to revegetate and hydrology should not be altered.

- Site 3 includes 0.03 acres of temporary excavation/fill in wetlands from installation of the water line and 0.02 acres of hand clearing associated with the power lines.
- Site 4 includes 0.40 acres of water line impacts and 0.27 acres of hand clearing for the power line.
- Site 5 has 0.07 acres of hand clearing associated with the power line relocation.

Borrow Site: All borrow and waste activities will occur on high ground, except as authorized by permit for construction of temporary haul roads described below. The NCDOT requires its contractors to identify all areas to be used for borrow material, or for disposal of dredged, fill or waste material. Documentation of the location and characteristics of all borrow sites associated with the project is provided. Three borrow locations (IP, Salisbury, and Sustainable Forests) were field reviewed by the USACE and NCDWQ on September 7, 2010. One remaining borrow location (Plum Creek) has not been field reviewed. The IP Borrow Site requires <0.01 acres of temporary impacts to wetlands associated with the haul road. A pipe will be utilized to maintain hydrology and will be removed and the wetland area restored after borrow activities are complete. The Plum Creek Borrow Site requires a temporary 15-foot extension to an existing stream crossing and 0.03 acres of temporary fill in wetlands. The fill and pipe extension will be removed and the area returned to pre-construction grades and replanted after borrow activities are completed at this site.

Table 2. R-2633AA&AB Wetland Impacts (Final)

Permit Site No.	Wetland ID in FEIS	JD package ID	Riparian or Non-riparian	Permanent Impacts (ac)	Temporary Impacts (ac)	Hand Clearing (ac)
1	3, 4	W1, W3	Riparian	0.20	0	0
2	5	W5	Non-riparian	0.18	0	0
3	6	W5	Riparian	0	0.03	0.02
4	7	W7, W12	Riparian	0.49	0.40	0.27
5	8	W8, W9	Riparian	0.17	0	0.07
6 [1]	9	W10	Non-riparian	0.13	0	0
8	-	W15	Riparian	<0.01	0	0.12
9	10	W16	Non-riparian	0.24	0	0
10A	-	WY	Non-riparian	<0.01	0	0
10B	-	W18	Riparian	<0.01	0	0
11	11	W18	Riparian	0.12	0	0
12	12	W18	Riparian	1.05	0	0
13	13	W18	Riparian	0.51	0	0
14	14	W18	Riparian	0.76	0	0
15	15	W18	Riparian	0.38	0	0
16	15	W18	Riparian	0.39	0	0
17	16, 17	W18	Riparian	0.11	0	0.39
18	-	W19	Non-riparian	0.03	0	0
19	19	W20	Non-riparian	0.04	0	0
20	-	W18	Non-riparian	<0.01	0	0
21	21	W20	Non-riparian	0.29	0	0
22	22, 23	W20	Non-riparian	0.11	0.10	0.17
23	-	W21	Non-riparian	0.57	0	0
24	24, 25	W22	Non-riparian	3.46	0	0.12
25	26	W22	Non-riparian	0.65	0	0
27	27	W23	Non-riparian	4.81	0	0
28	28	W24	Riparian	3.76	0	0
29	-	W29	Non-riparian	<0.01	0	0.15
30	29	W30	Non-riparian	0.44	0	0
31	30	W30	Non-riparian	0.59	0	0
32	31	W30	Non-riparian	4.64	0	0
33	1 ,2	W1	Riparian	0.15	0	0.39
34	29	W30	Non-riparian	0.03	0	0
35	32	W30	Non-riparian	0.17	0	0
IP Borrow Site [2]	-	-	Non-riparian	0	<0.01	0
Plum Creek Borrow Site[3]	-	-	Riparian	0	0.03	0
Total				24.46*	0.56	1.70

[1] This site was not considered a total take after field review with USACE on September 7, 2010.
[2] This site requires a temporary haul road and was reviewed by the NCDWQ and USACE on Sept. 7, 2010.
[3] This site requires widening of an existing road. The site has not been field reviewed.
* Due to rounding total permanent impacts are 22.46 ac

Table 3. R-2633B Wetland Impacts (Preliminary) [1]

Permit Site No.	Wetland ID in FEIS.	JD package ID	Riparian or Non-riparian	Permanent Impacts (ac)	Temporary Impacts (ac)	Hand Clearing (ac)
3	33, 34	Will be included with the Permit Modification for R-2633B	Non-riparian	9.49	0	0.68
4	32		Non-riparian	0.07	0	0.01
5	35		Non-riparian	1.04	0	0.11
6	36		Non-riparian	18.79	0	2.05
7	37		Non-riparian	10.62	0	0.85
8	38		Non-riparian	0.06	0	0.01
9	40		Non-riparian	1.10	0	0.10
10	39		Non-riparian	0.02	0	0.10
11	41		Non-riparian	15.37	0	1.61
12	42, 43		Non-riparian	3.31	0	0.37
13	44		Non-riparian	3.89	0	0.44
14	-		Riparian	0.01	<0.01	0.71
15	-		Riparian	0.91	0.11	30.10
16	45		Non-riparian (Isolated)	0.46	0	0
20	-		Riparian	0.01	<0.01	0.60
Total				65.15	0.12	37.74

[1] Sites 1, 2, 17, 18 and a portion of sites 3 and 4 were moved to the R-2633AA&AB Project.

Surface Waters

Surface water impacts occur in the Cape Fear River Basin in HUC 03030005. Permanent stream impacts for R-2633AA&AB and B are 971 linear feet and surface water impacts are 0.41 acres. Tables 4-7 list the site number, reference number, stream name, amount of permanent impacts, amount of mitigation required, DWQ classification, and DWQ index number. Impacts are based upon final design for R-2633AA&AB and preliminary impacts for R-2633B.

The Cape Fear River is listed in the Final 2010 303(d) report from the upstream mouth of Toomers Creek to a line across the river between Lilliput Creek and Snows Cut for copper, low dissolved oxygen, low pH, and turbidity. 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.

Utility Impacts: There will be 30 linear feet (<0.01 acre) of temporary impacts to streams resulting from relocation of waterlines on R-2633AA&AB below the pipe outlet at Site 3 (see permit drawing sheet 21 of 108). The remaining waterline crossing occurs in proposed permanent channel impacts associated with the tie in of the stream to the pipe outlet along US 17 at Site 4 (Permit Drawing Sheet 24 of 108). The open cut trench method will be utilized to construct the waterline at the stream crossings.

Table 4. R-2633AA&AB Streams Impacted and Their Descriptions

Permit Site No.	Stream ID in EIS	JD Package ID	Stream Name	Intermittent/ Perennial/Tributaries to Waters of the US	DWQ Classification	DWQ Index No.
1	S1	S1	Bishop Branch	Perennial	C; Sw	18-81-7-1
3	S4	S4	UT to Morgan Branch	Perennial	C; Sw	18-81-7
4	S7	S7LR	UT to Morgan Branch	Perennial	C; Sw	18-81-7
5	S12	S12LR	Morgan Branch	Perennial	C; Sw	18-81-7
7	S9	S9	UT to Morgan Branch	Intermittent	C; Sw	18-81-7
8	S8	S8	UT to Morgan Branch	Intermittent	C; Sw	18-81-7
14	2TR	-	UT to Morgan Branch	Perennial	C; Sw	18-81-7
17	S7	S7UR	UT to Morgan Branch	Perennial	C; Sw	18-81-7
26	SNO	SNO	UT to Sturgeon Creek	Tributaries to Waters of the US	C; Sw	18-77-1
28	S13	S13	UT to Alligator Branch	Tributaries to Waters of the US	C; Sw	18-66-4
Plum Creek Borrow Site [1]	-	-	Hood Creek	Perennial	C; Sw	18-66

[1] The Borrow Site (Plum Creek) requires widening of an existing road. The site has not been field reviewed.

Table 5. R-2633AA&AB Surface Water Impacts (Final)

Permit Site No.	Permanent Stream Impacts (ft)	Temporary Stream Impacts (ft)	Impacts Requiring Mitigation (ft)	Mitigation Ratio
1	248	0	248	2:1
3	0	30	0	N/A
4	151	0	151	2:1
5	228	0	228	2:1
7	16 [1]	70	0	N/A
8	40 [1]	45	0	N/A
14	12 [1]	0	0	N/A
17	0	0	0	2:1
26	0.01 ac [2]	0	0	N/A
28	0.02 ac [2]	0	0	N/A
Plum Creek Borrow Site [3]	0	12	0	2:1
Total	695	157	627	

[1] Impacts are due to bank stabilization and will not require mitigation.
[2] Sites 26 and 28 are Tributaries to Waters of the US and will not require mitigation.
[3] The Borrow Site (Plum Creek) requires widening of an existing road. The site has not been field reviewed.

Table 6. R-2633B Streams Impacted (Preliminary) and Their Descriptions

Permit Site No.	Stream ID in EIS	JD Package ID	Stream Name	Intermittent/ Perennial/Tributaries to Waters of the US	DWQ Classification	DWQ Index No.
11	S18	Will be included with the Permit Modification for R-2633B	UT to Mill Creek	Tributary to Waters of the US	C; Sw	18-77-1-1
14	S22		UT to Cartwheel Branch	Perennial	SC: Sw	18-72
15	-		Cape Fear River	Perennial	SC	18-(71)
	-		Toomers Creek	Perennial	WS-IV	18-73-(1)
19	S14		Rowell Branch	Perennial	C; Sw	18-77-1-1-1
20	CART		Cartwheel Branch	Perennial	SC; Sw	18-72

Table 7. R-2633B Surface Water Impacts (Preliminary)

Permit Site No.	Permanent Stream Impacts (ft)	Temporary Stream Impacts (ft)	Impacts Requiring Mitigation (ft)	Mitigation Ratio
11	222	0	222	2:1
14	0	<0.01	0	N/A
15	50	0	50	2:1
19	4	147	4	2:1
20	0	<0.01	0	2:1
Total	276	147	276	

PROTECTED SPECIES

The United States Fish and Wildlife Service (USFWS) list fifteen federally protected species for Brunswick County as of January 31, 2008 and New Hanover County as of August 2, 2010 (Table 8).

Table 8. Federally Protected Species in Brunswick[1] and New Hanover[2] Counties

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Acipenser brevirostrum [1,2]	Shortnose sturgeon	E	Yes	MANLTAA*
Alligator mississippiensis [1,2]	American alligator	T(S/A)	N/A	N/A
Amaranthus pumilus [1,2]	Seabeach amaranth	T	No	No Effect
Caretta caretta [1,2]	Loggerhead sea turtle	T	No	No Effect
Carex lutea [2]	Golden sedge	E	Unknown	Unknown
Charadrius melodus [1,2]	Piping plover	T	No	No Effect
Chelonia mydals [1,2]	Green sea turtle	T	No	No Effect
Dermochelys coriacea [1]	Leatherback sea turtle	E	No	No Effect
Haliaeetus leucocephalus [1,2]	Bald eagle	BGPA	Yes	No Effect
Lepidochelys kempii [1]	Atlantic ridley sea turtle	E	No	No Effect
Lysimachia asperulaefolia [1,2]	Rough-leaved loosestrife	E	Yes	MANLTAA*
Mycteria Americana [1]	Wood stork	E	Yes	MANLTAA*
Picoides borealis [1,2]	Red-cockaded woodpecker	E	Yes	No Effect
Puma concolor couguar [1,2]	Eastern cougar	E	Yes	No Effect
Thalictrum cooleyi [1,2]	Cooley's meadowrue	E	Yes	No Effect
Trichechus manatus [1,2]	West Indian Manatee	E	Yes	MANLTAA*

*May Affect, Not Likely To Adversely Affect

A letter from the USFWS dated June 17, 2004 and appended in the FEIS concurred on the Biological Conclusions for these species. Re-surveys were completed in summer of 2009 for Section A and in 2010 for Section B. No individual species were found within the project right of way, except for the red-cockaded woodpecker (RCW). Surveys in spring/summer of 2009 revealed that a RCW cluster identified on Section A was active again. The concurrence letter dated June 17, 2004 was based on the removal of 0.07 acres of foraging habitat. Based on further evaluation, foraging habitat removal will now be 0.21 acres. In an email from USFWS, dated July 13, 2009, they concurred that the 0.21 acres of foraging habitat removal would have "No Effect" on the red-cockaded woodpecker. This is

a change from the FEIS in which the Biological Conclusion was "May Affect, Not Likely to Adversely Affect". All other Biological Conclusions remain valid for the project.

A letter in the FEIS from the National Oceanic and Atmospheric Administration (NOAA), dated August 24, 2006, concurred that this project is not likely to adversely affect the shortnose sturgeon. The NCDOT has committed to no in-water work in the Cape Fear River and Toomers Creek between February 1 and June 15 of any year. In-water is defined for this project and species as the main channel where the vegetation line meets open water and extends 35 meters (115 feet) into adjacent wetlands on both sides of the channel but does not include uplands. The in-water work moratorium prohibits pile installation (both vibratory and impact) and activities associated with the construction of any temporary work bridge. This moratorium applies to Section B only.

The West Indian manatee may occur in the Cape Fear River on Section B of the project. Due to this potential, a commitment was included in the FEIS and ROD to inform all personnel associated with the project that manatees may be present during the months of June through October. The Project Engineer will ensure that the Contractor has a copy of the US Fish and Wildlife Service Guidelines for Avoiding Impacts to the West Indian Manatee - Precautionary Measures for Construction Activities in North Carolina Waters on-site during construction. A copy of the Guidelines can be found at the following website address (http://nc-es.fws.gov/es/publications.html). The contractor will be responsible for complying with the Guidelines and reviewing them with all personnel associated with the project construction. This requirement applies to Section B only.

The wood stork and rough-leaved loosestrife have "May Affect, Not Likely to Adversely Affect" biological conclusions based on suitable habitat present within the project area. Neither species was found within the right of way of Section A or B during the resurveys of 2009 and 2010.

Golden sedge is a recent addition to the USFWS list for New Hanover County (updated 8/2/2010) and has a record status of "probably/potential" for being in the County. This species was not included in the FEIS or in the resurveys completed this year. Surveys for this species will be completed prior to the permit modification for the Section B.

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, both architectural and archaeological sites fall within close proximity to the project right of way.

Archaeology

Archaeological survey and evaluation were done in compliance with Section 106 of the National Historic Preservation Act (1966, as amended) and the guidelines issued by the Advisory Council on Historic Preservation. The location of one (1) previously recorded archaeological site (31NH39**) was reestablished during the course of this survey. Eight (8) previously unrecorded archaeological sites (31BW602-31BW609) were located within the project Area of Potential Effects. Based on the results, Site 31NH39** has the spatial integrity and ability to yield significant information pertaining to North Carolina history in order to be considered eligible for the National Register of Historic Places (NRHP) per Criterion D. In addition, avoidance has been recommended for Site 31BW604**, a small family cemetery. The seven (7) remaining archaeological sites (31BW602, 31BW603, 31BW605-31BW609) represent low-density scatters of prehistoric artifacts, therefore, lacking the

spatial integrity and ability to yield significant information pertaining to prehistory in order to be considered eligible for the NRHP per Criterion D. Based on the current design plans, both archaeological sites (31NH39** and 31BW604**) are either located within or adjacent to the Study Corridor. Even though both archaeological sites will be avoided by the proposed construction, temporary protective fencing will be installed prior to construction to ensure that no inadvertent impacts to Sites 31NH39** and 31BW604** occur. Therefore, no further archaeological work is recommended unless design plans change prior to construction.

Historic Architecture

The Goodman House and Doctor's Office were determined eligible for listing in the NRHP. The ROD states that the right of way will be approximately 120 feet away from the Goodman House and Doctor's Office, and will be separated by a forested area between the right of way and the property. The project necessitates the termination of Goodman Road in a cul-de-sac near the western edge of the NRHP-eligible boundary. The FHWA, NCDOT and State Historic Preservation Office determined (concurrence form dated February 2006, enclosed) that the Selected Alternative alignment would have no effect upon the Goodman House and the Doctor's Office provided that 1) NCDOT shall use best management practices for tree removal to reduce impacts to the woods adjacent to the site, and 2) NCDOT shall plant the edge of the right of way between stations 34+50 and 36+00 (2010 stations 110+00 to 113+75) with native evergreens to further screen the new facility from the Goodman House and Doctor's Office.

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

Due to the growth trends already apparent in the study area without the project and since the project does not provide direct access to major employment centers; the project is not anticipated to substantially affect the urban spatial structure of greater Wilmington. The main effects of the project are expected within interchange catchment areas. These effects include influencing location decisions for future development, accelerating the pace of industrial expansion, and inducing commercial growth. To a lesser extent, the project may induce some residential development by providing new access to low cost, undeveloped, rural land. The project is generally expected to intensify and concentrate development trends already apparent in the study area.

The project, combined with other transportation projects, will cumulatively benefit transportation in the Wilmington region and southeastern North Carolina by reducing congestion on local roadways and enhancing the intrastate transportation system. Cumulative environmental effects will occur from the proposed project and other past, present and reasonably foreseeable development activities. These effects are most notable for natural resources such as biotic communities and wildlife as development replaces natural areas. Cumulative effects to natural resources are difficult to quantify from readily available data. Mitigation for wetland impacts has been or will be provided and coordinated through the Section 404 permitting process. Degradation of water quality is also a possible cumulative effect that may result from development projects. Numerous policies are applicable in the study area that will help protect the quality of surface waters.

An Indirect and Cumulative Effects Assessment (ICI) was completed October 2005 and has already been distributed to the appropriate agencies. Copies are available upon request.

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 R-2633AA/AB. 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 which 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:

- The project was designed to avoid or minimize disturbance to aquatic life movements.
- Wetland and stream impacts were avoided and minimized during the planning process.
- 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 10-year storm event.
- NCDOT has avoided placing erosion control devices in wetlands.
- The use of preformed scour holes where applicable.
- Grass swales are utilized to provide stormwater treatment. These are summarized in the Stormwater Management Plan.
- Special sediment control fence is used at wetlands and low areas along the standard silt fence.
- The use of 3:1 fill slopes in jurisdictional areas where practicable.
- The use of hand clearing in wetlands at bridge locations.
- Reduced mechanized clearing to 5 feet beyond fill slope limits rather than 10 feet throughout the project.
- The use of wetland equalizer pipes to enhance hydraulic conductivity where practicable.
- Lowered the roadway profile to minimize impacts to jurisdictional resources, reduce the amount of off-site borrow required for the job, and reduce guardrail and widening required with the use of guardrail.
- No riprap will be placed in the bed of the channels during stabilization of outlet structures.
- Wetland impacts to the Bishop Branch (R-2633AA/AB) system will be minimized by bridging the adjacent riparian wetlands.
- Bridges will be constructed at three unnamed tributaries to Morgan Branch reducing impacts to streams and wetlands and these bridges have been extended for wildlife use.
- Reinforced concrete pipes (RCP) will be used for the three culvert replacements on US 17, thus reducing the impacts to the channels and construction time required.

- The construction sequence has been developed to avoid temporary impacts at Site 17 by eliminating the need for a temporary work bridge.
- The waterline relocation required along US 17 was placed to avoid additional wetland impacts. The line is located in areas where the channels are permanently impacted by the proposed pipe.

On-Site Mitigation

On-site mitigation opportunities have been fully evaluated and are being pursued as part of this project. NCDOT will perform on-site mitigation within the Section A project right of way located north of -Y1- Sta. 50 on permit drawing 11of 108 along existing NC 87 (Maco Road) and along –Y04- from approximately Sta. 21 to 25+50 on permit drawing 100 and 108. A specific on-site mitigation plan sheet is included with the attached mitigation plan. NCDOT will restore approximately 0.63 acres of riverine wetland and 66 linear feet of stream as well as preserve 2.97 acres of riverine wetland and 570 feet of stream on Bishop Branch at 5:1.

Compensation

As described above, the NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. The wetland at Site 16 in Section B has been determined to be an isolated wetland and since impacts are below an acre, it does not require mitigation. Total riparian and non-riparian wetland impacts requiring mitigation after onsite restoration and preservation are 7.80 and 80.14 acres, respectively. Total stream impacts requiring mitigation are 723 linear feet. These remaining impacts will be offset by the EEP. A copy of the EEP Acceptance Letter is included with this application.

Table 9. Summary of Mitigation Required

Section	Riparian Wetlands (ac)	Non-riparian Wetlands (ac)	Streams (ft)
R-2633 AA/AB	8.09	16.38	627
R-2633B (Preliminary)	0.93	63.76	276
On-site Restoration	0.63	0	66
On-site Preservation	0.59	0	114
Total	7.80	80.14	723

REGULATORY APPROVALS

Section 404

Application is hereby made for a USACE Individual 404 Permit as required for the above-described activities. NCDOT is requesting a phased permit to allow construction activities to commence on Section AA/AB of R-2633 as per attached plans. NCDOT will apply for a permit modification when designs are finalized and before construction commences on Section B.

Section 401

Application is hereby made for a Section 401 Water Quality Certification from the N. C. Division of Water Quality. NCDOT is requesting a phased certification to allow construction activities to commence on Section AA/AB of R-2633 as per attached plans. NCDOT will apply for a certification modification when designs are finalized and before construction commences on Section B.

Isolated Wetlands Permit

Application is hereby made for an Isolated Wetlands Permit from the N. C. Division of Water Quality. This wetland is located in Section B which is being applied for under preliminary design. NCDOT will apply for a permit modification when designs are finalized and before construction commences on Section B.

CAMA Permit

Under separate cover, NCDOT is submitting a request for a CAMA Federal Consistency Review from the N.C. Division of Coastal Management for R-2633AA/AB and B. When final design has been completed and before construction commences on R-2633B, a CAMA Major Permit Application will be submitted.

U.S. Coast Guard Permit

We are not requesting a U.S. Coast Guard Permit at this time. This permit will be required before construction of the Cape Fear River bridge on Section B can begin. NCDOT will apply for this permit when the final design information for the bridge is completed.

A copy of this permit application will be posted on the DOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Rachelle Beauregard at rbeauregard@ncdot.gov or (919) 431-6764.

Sincerely,

E. L. Fuhr

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

w/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)
Ms. Jennifer Derby, USEPA

W/o attachment (see website for attachments)

Mr. Steve Sollod, NCDCM
Dr. David Chang, P.E., Hydraulics
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Ms. Anne Deaton, NCDMF
Mr. Vince Rhea, PDEA Project Planning Engineer
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Dewayne Sykes, P.E., Utilities Unit
Mr. Victor Barbour, P.E., Project Services Unit
Mr. H. Allen Pope, P.E., Division 3 Engineer
Mr. Stoney Mathis, Division 3 Environmental Officer
Ms. Beth Harmon, EEP
Mr. Phillip Ayscue, NCDOT External Audit Branch
Mr. Drew Joyner, PE, Human Environment Unit Head
Mr. Clarence W. Coleman, P.E., FHWA
Ms. Leilani Paugh, NEU
Mr. Randy Griffin, NEU

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:
First - Middle - Last –
Company – North Carolina Department of Transportation
E-mail Address – Project Development and Environmental Analysis

8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
First - Middle - Last –
Company –
E-mail Address –

6. APPLICANT'S ADDRESS.
Address - 1598 Mail Service Center
City – Raleigh State – NC Zip – 27699-1598 Country – US

9. AGENT'S ADDRESS
Address -
City – State – Zip – Country –

7. APPLICANT'S PHONE NOs. W/AREA CODE.
a. Residence b. Business c. Fax
919-431-6764

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)
R-2633AA &AB, R-2633 B(Wilmington Bypass)

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Bishop Branch, Morgan Branch, UTs to Morgan Branch, UT to Sturgeon Creek, UT to Alligator Branch, UT to Mill Creek, UTs to Cartwheel Branch, Cartwheel Branch, Rowell Branch, Cape Fear River, Toomers Creek

14. PROJECT STREET ADDRESS (if applicable)
Address
City - State – Zip -

15. LOCATION OF PROJECT
Latitude: °N
Longitude: °W

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

R-2633 AA/AB Proposed Wilmington Bypass from north of NC 87 to US 74/76 and R-2633 B from US 74/76 to US 421. Approximately 8 mile fulled controlled access freeway on new location.

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

Increase traffic capacity and reduce traffic volumes on congested roadway segments of US 17, complete a critical link in the National Highway System and the Intrastate transportation system that will increase mobility, support economic growth and improve military transportation routes within the region, and improve the existing regional transportation system by providing a continuous freeway route for through traffic to bypass downtown Wilmington. The route will also facilitate hurricane evacuation in the growing coastal areas of Brunswick County by providing increased connectivity between US 17 and US 74/76, and eventually, US 421 and I-40 with the construction of R-2633B.

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

20. Reason(s) for Discharge

Construction of roadway and bridges

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 9.02 acres riparian wetlands, 80.60 acres non-riparian wetlands, 0.68 ac. temporary impacts to wetlands

Or

Liner Feet 971 permanent stream impacts

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 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. Luck — SIGNATURE OF APPLICANT

10·18·10 — 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.

Stream and Wetland Restoration Plan
Bishop Branch at
NC 87/Maco Road
Brunswick County

TIP R-2633 AA
Federal Aid Project No. NHF-0017 (96) and STM-0017 (97)
WBS No. 34491.3.GVI and 34449.3.STM

September 9, 2010

The North Carolina Department of Transportation (NCDOT) will perform on-site mitigation for stream and wetland impacts associated with Transportation Improvement Program (TIP) R-2633AA. This site occurs within the project Right-of-Way located west of -Y1- between Sta. 50 and 55 on plan sheet 07 along existing NC 87 Maco Road to the north side of -Y4- from approximately Sta. 22 to 25+50 on plan sheet 35. NCDOT will restore approximately 0.63 acres of riverine wetland and 66 feet of stream as well as preserve 2.97 acres of riverine wetland and 570 feet of stream on Bishop Branch as on-site mitigation.

EXISTING CONDITIONS

The project is located in Brunswick County, approximately 7 miles southwest of Leland in Bishop, NC on NC 87 (Maco Rd NE) where it departs from US 17 (Ocean Highway E). The adjacent land use is primarily comprised of agricultural and forested land with some low and medium-density housing interspersed throughout.

The mitigation area contains both Bishop Branch and an unnamed tributary to Bishop Branch which flows in an easterly direction through a Small Stream Swamp/Bottomland Hardwood wetland complex. Dominate canopy species include sweet gum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), and several oak species including willow oak (*Quercus phellos*), water oak (*Q.* nigra), and laurel oak (*Q. laurifolia*). Understory species include red maple (*Acer rubrum*), swamp red bay (*Persea palustris*), sweet pepper bush (*Clethera alnifolia*), and titi (*Cyrilla recemiflora*). The dominate species in the herbaceous layer include greenbriar (*Smilax spp*) and poison ivy (*Taxicodendron radicans*). This wetland system is transected by Maco Road under which Bishop Branch currently flows through a 72" by 96" CMA. Bishop Branch is approximately four feet wide with average bank heights of two feet. Up and downstream of this crossing, Bishop Branch has a well developed canopy and wooded buffer providing for a stable channel.

The R-2633 A/B Natural Systems Technical Memorandum dated November 1996 and the Addendum to Natural Resources Technical Memorandum dated February 2004 both provide further details concerning existing roadway and project study area conditions.

PROPOSED CONDITIONS

The proposed mitigation consists of the preservation of 2.97 acres of riverine wetlands and 570 feet of stream as well as the restoration of 0.63 acres of riverine wetland and 66 feet of stream. The restoration activities will involve removal of the existing pavement and roadway fill of NC 87 Maco Road as well as the existing 72" by 96" CMA and associated headwall. This area will be graded to match the existing adjacent reference wetland elevation. Representative spot elevations were surveyed and ranged from 8.77 to 9.91 ft above sea level. Excavated areas will be ripped and disked prior to planting of the site if necessary. The stream channel and banks will be re-established to match both upstream and downstream geomorphology. The stream banks will be stabilized using coir fiber matting and planted.

The Natural Environment Unit shall be contacted to provide construction assistance to ensure that the mitigation area is constructed appropriately.

VEGETATION PLANTING

Following the successful completion of site grading and stabilization, the restoration areas will be planted with bottomland hardwood species including at least three of the following: water oak (*Quercus nigra*), tulip poplar (*Liriodendron tulipifera*), willow oak (*Quercus phellos*), swamp tupelo (*Nyssa biflora*), and swamp chestnut oak (*Quercus michauxii*) depending on availability.

Native grass seeding and mulching will be performed on all disturbed areas within the wetland restoration area for stabilization purposes according to guidance and standard procedures of NCDOT's Roadside Environmental Unit.

MONITORING

Upon successful completion of construction, the following monitoring strategy is proposed for the mitigation site. NCDOT will document monitoring activities on the site in an annual report distributed to the regulatory agencies.

HYDROLOGIC MONITORING

No specific hydrological monitoring is proposed for the wetland restoration area. The target elevation will be based on the reference wetland areas and verified during construction. Constructing the site at the adjacent wetland elevation will ensure the hydrology in the restored area is similar to the hydrology in the reference area.

VEGETATION SUCCESS CRITERIA

NCDOT shall monitor the restoration site by visual observation and photo points for survival and aerial cover of vegetation. NCDOT shall monitor the site for a minimum of three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.

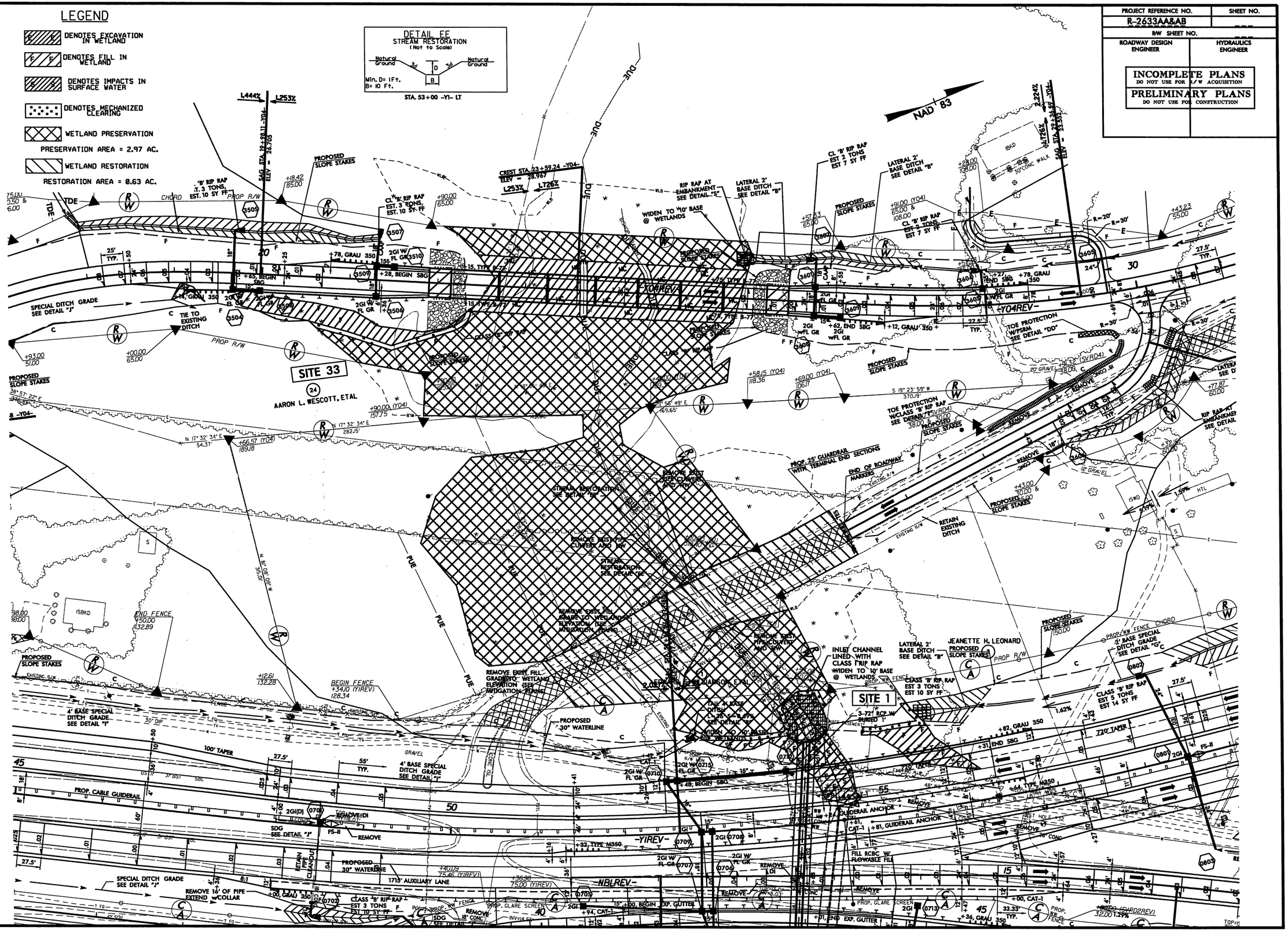
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	---
R/W SHEET NO.	---
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- WETLAND PRESERVATION
  PRESERVATION AREA = 2.97 AC.
- WETLAND RESTORATION
  RESTORATION AREA = 0.63 AC.



REVISIONS

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Federal Aid # **STPNHF-17(1)** *TIP* # **R-2633AB** *County*: **Brunswick/NewHanover**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: Wilmington Bypass

On 1/27/2006, representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [x] Federal Highway Administration (FHWA)
- [x] North Carolina State Historic Preservation Office (HPO)
- [ ] Other

Reviewed the subject project and agreed

- [ ] There are no effects on the National Register-listed property/properties located within the project's area of potential effect and listed on the reverse.
- [ ] There are no effects on the National Register-eligible property/properties located within the project's area of potential effect and listed on the reverse.
- [ ] There is an effect on the National Register-listed property/properties located within the project's area of potential effect. The property/properties and the effect(s) are listed on the reverse.
- [x] There is an effect on the National Register-eligible property/properties located within the project's area of potential effect. The property/properties and effect(s) are listed on the reverse.

Signed:

Mary Pope Furr — 1/31/2006
Representative, NCDOT — Date

1.31.06
FHWA, for the Division Administrator, or other Federal Agency — Date

Renee Gledhill-Earley — 1-31-06
Representative, HPO — Date

Peter B. Sandbeck PHE — 2-1-06
State Historic Preservation Officer — Date

Federal Aid # **STPNHF-17(1)** *TIP* # **R-2633AB** *County*: **Brunswick/NewHanover**

Properties within the area of potential effect for which there is no effect. Indicate if property is National Register-listed (NR) or determined eligible (DE).

Properties within the area of potential effect for which there is an effect. Indicate property status (NR or DE) and describe the effect.

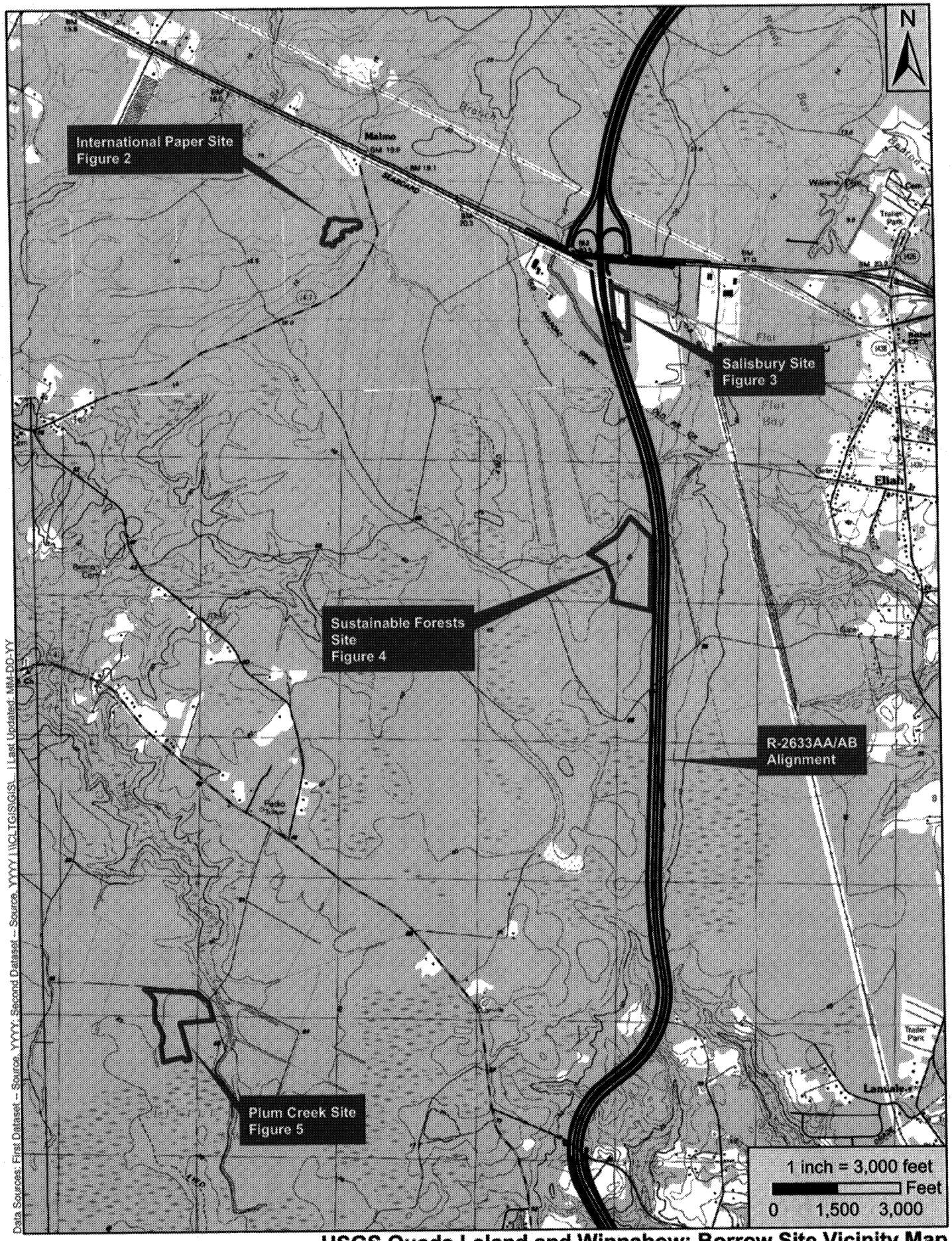
Goodman House and Doctor's Office (DE) – No Adverse Effect for the Pink Alignment with the following conditions:

1. NCDOT shall use best planning practices for tree removal to reduce impacts to the woods adjacent to the Goodman House and Doctor's Office; and
2. NCDOT shall plant the edge of the right of way between stations 34+50 and 36+00 with native evergreens to further screen the new facility from the Goodman House and Doctor's Office.

Reason(s) why the effect is not adverse (if applicable).

Goodman House and Doctor's Office (DE) – No Adverse Effect for the Pink Alignment because the project will not require property from the historic boundaries of the property and the existing woods provide a visual barrier between the property and the new facility.

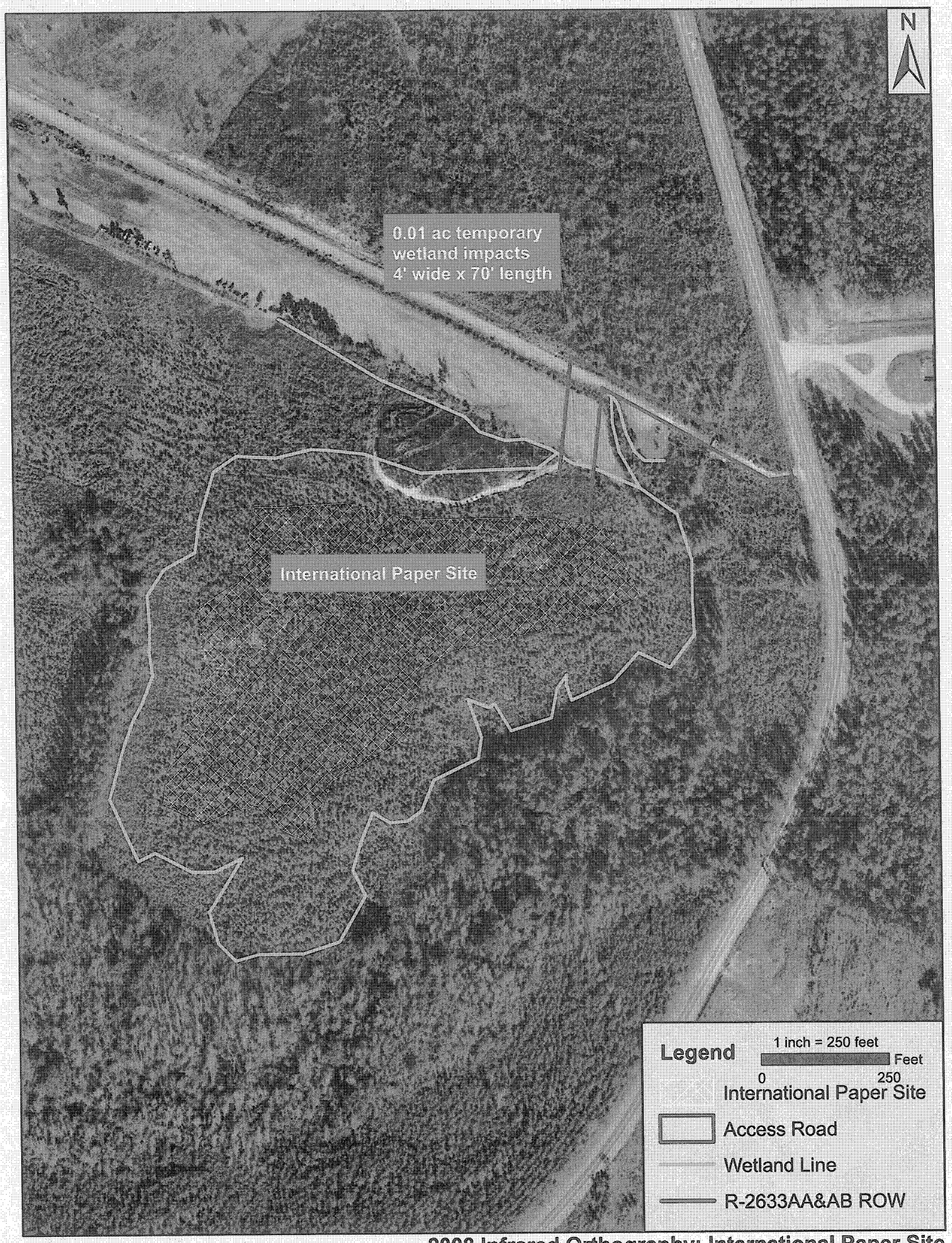
Initialed: NCDOT MPJ FHWA RHA HPO RSE



Data Sources: First Dataset -- Source, YYYY; Second Dataset -- Source, YYYY | \\CLTGIS\GIS\... | Last Updated: MM-DD-YY

USGS Quads Leland and Winnabow: Borrow Site Vicinity Map
Figure 1

HDR
ONE COMPANY | *Many Solutions*™



2008 Infrared Orthography: International Paper Site
Figure 2

HDR
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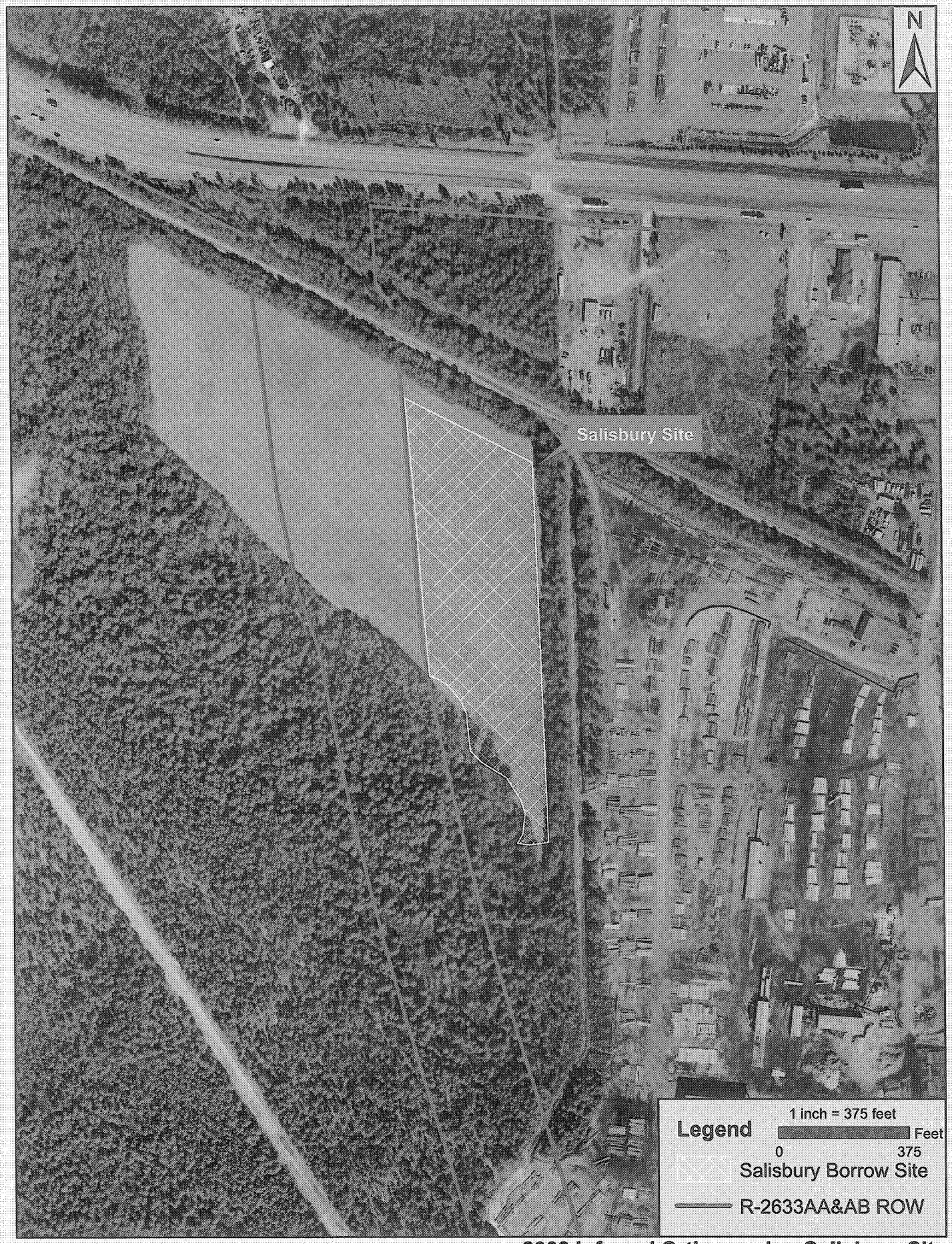

2008 Infrared Orthography: Salisbury Site
Figure 3

HDR
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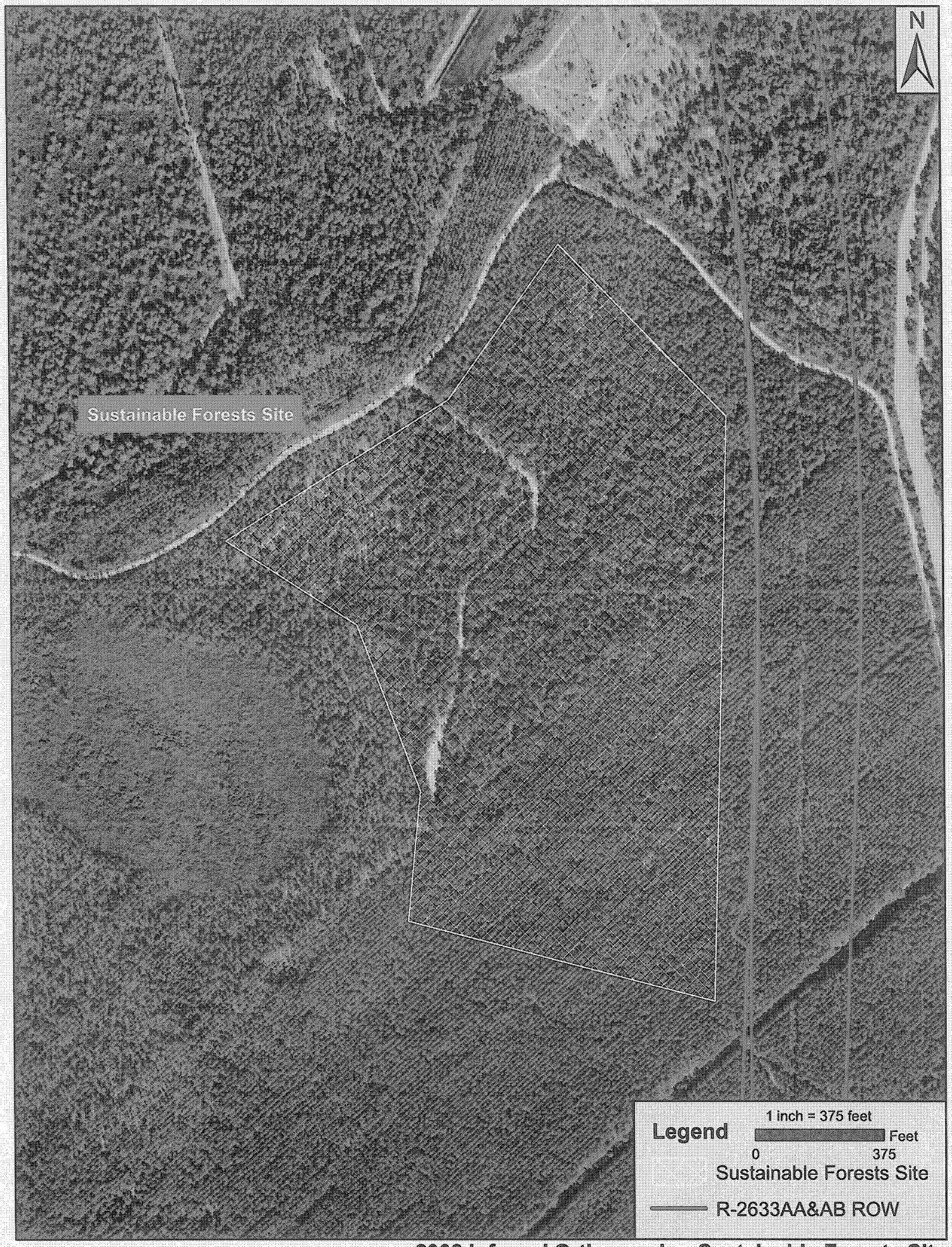

2008 Infrared Orthography: Sustainable Forests Site
Figure 4

HDR
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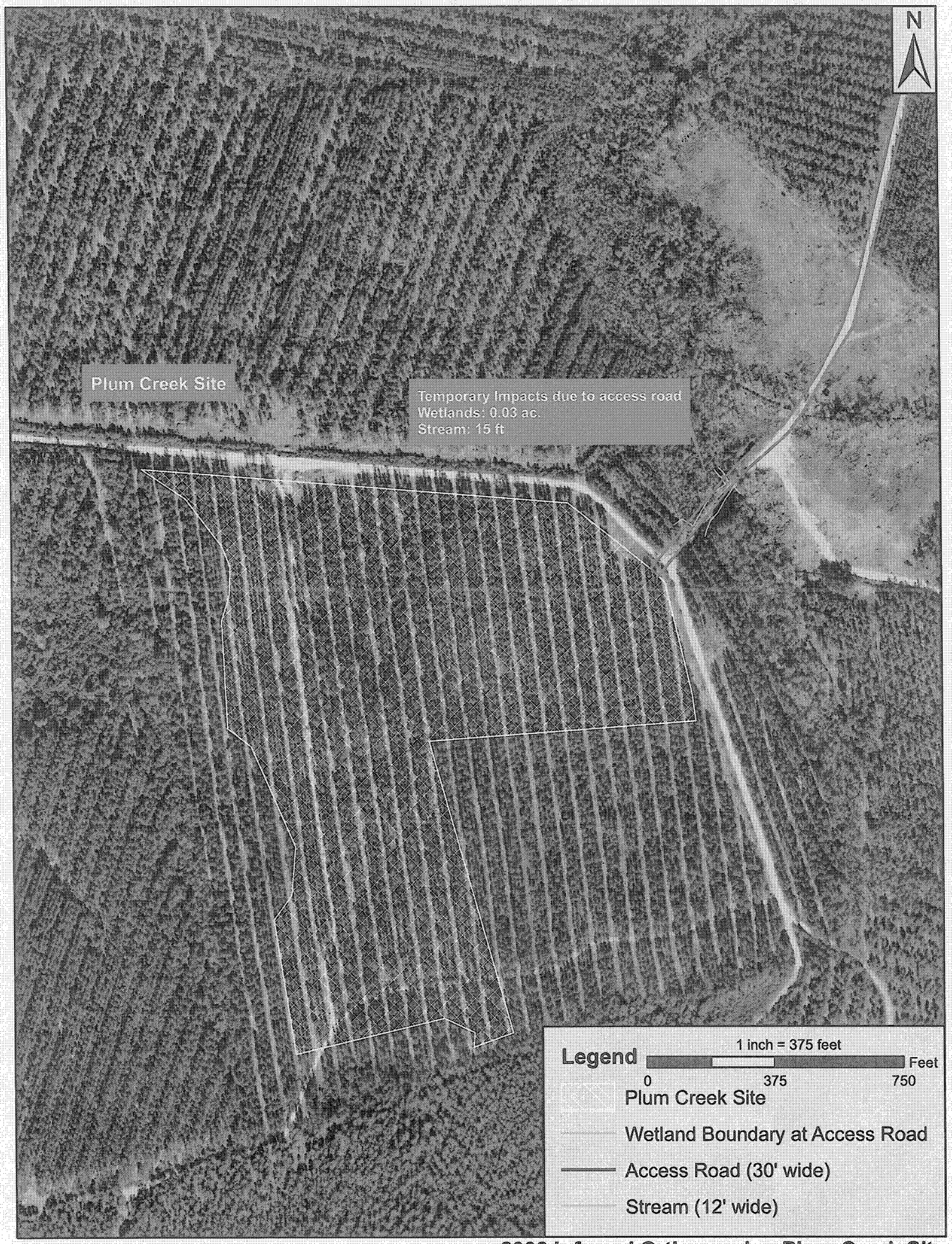

2008 Infrared Orthography: Plum Creek Site
Figure 5

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3

Subject: Minutes from Interagency 4B Hydraulic Design Review Meeting On August 22, 2007 for R-2633A in Brunswick County

Team Members:

Jennifer Frye-USACOE	(not present)
David Wainwright-NCDWQ	(present)
Steve Sollod- DEM	(present)
Stephen Lane-DEM	(present)
Travis Wilson-NCWRC	(present)
Gary Jordan-USFWS	(present)
Kathy Matthews-EPA	(present)
Vince Rhea-PDEA	(present)

Participants:

Marshall Clawson, NCDOT Hydraulics
Dan Duffield, NCDOT Hydraulics
Dan Robinson, Kimley-Horn and Associates
David Fuh., Ko & Associates
Herbert Turner, Ko & Associates
Joe Blair, NCDOT Div 3 Construction
Mason Herndon, NCDOT Div 3 DEO
David Scheffel, NCDOT Roadway
Pamela Porter, NCDOT Roadway
Mark Staley, NCDOT Roadside Env.
Lonnie I. Brooks, NCDOT Structures
Rachelle Beauregard-NCDOT NEU
Chris Rivenbark-NCDOT NEU
Marissa Rodman-NCDOT NEU
Donnie Brew-FHWA

General Comments:

Marshall Clawson began the meeting with introductions and turned the meeting over the Herb Turner.

All discharges into wetlands will be at a non-erosive velocity. Within wetlands, riprap outlet pads are have specified at culvert to dissipate outlet velocities, as required. For jurisdictional stream crossings, the inverts of all proposed box and pipe culverts are buried one foot below the channel bed.

The Division has requested a copy of the draft culvert survey reports and construction sequences for a constructability review. The culvert construction sequences should be incorporated into the project traffic control phasing plans.

Gary Jordan had a question about the wildlife crossings. He requested that the wildlife crossings and the drainage structures lengthened for to accommodate wildlife passage be identified during the plan sheet review.

There are project commitments on planning document green sheets that would affect hydraulics design:

1. Allowing for animal crossing, these were decided in the field and are shown on the plans
2. Span the wetland on the new alignment of NC87 (Plan Sheet 33)

General note: All culverts and pipes on Jurisdictional Streams will be buried

Plan Sheet Comments:

Plan Sheet 7:

- Existing NC 87 will dead-end prior to US 17. We discussed whether existing NC 87 could be terminated prior to crossing Bishop Branch to allow for removal of existing culvert and possible on-site mitigation. Roadway will determine termination of NC 87 and NEU will coordinate on-site mitigation based where NC87 is terminated.

- The existing culvert under US 17 over Bishop Branch is deficient and is being replaced with a larger culvert, (2) @ 10' X 7' RCBC

Plan Sheets 8:

- A small wetland impact is continued from the previous plan sheet at the match line.

Plan Sheets 9:

- Interchange sheet, some wetland impact, small amount, also there are some wetlands that are outside the construction limits.

- There are two jurisdictional streams in the vicinity of existing US 17. The JD stream begins approximately 430' Lt of –NBL- 28+00. Stream impacts occur upstream of the existing 42" concrete pipe that will be extended. No impacts anticipated to the second JD stream that parallels existing US 17 along the RT side.

Plan Sheet 10:

- Impacts occur at wetlands and the JD stream at the culvert which is Trib to Morgan Creek. The culvert is being replaced with a larger culvert, (2) @ 8' X 7' RCBC

Plan Sheet 11:

- Impacts occur at wetlands and the JD stream at the culvert, which is Morgan Creek. The culvert is being replaced with a larger culvert, (2) @ 10' X 8' RCBC.
- Wetland impacts occur at the crossing for the service road.

Plan Sheet 13:

- JD stream and wetland associated with stream, bridging the wetlands. Bridge, 150 ft in length, has been lengthened for wildlife crossing with a clearance of 16 feet.

- Division recommends Shoulder Berm Gutter at all guardrail areas for maintenance reasons and "washes" even need to look at the high side of super. This item will be reviewed and discussed further at the project field inspection.

Plan Sheet 14:

- JD stream and wetland associated with stream, bridging the wetlands. Bridge, 235 ft in length has been lengthened for wildlife crossing with a clearance of approximately 12 feet.

Plan Sheet 15:

- Near –L- 110+00 Lt, total take was discussed for wetland impact at the inlet of the pipe (36" pipe with rock dissipater because of the slope). Hydraulics will provide area of wetland at 4C meeting for total take determination.
- To the bottom of the plan sheet, a very small impact to another wetland.

Plan Sheet 16:

- Two Large Wetland and JD stream with a 72" pipe being buried for the JD stream and a 36" floodplain pipe

Plan Sheet 17:

- Three wetlands sites are impacted. Pipe culverts are proposed at each wetland site:

    1. A 42" with rock dissipater pad
    2. A 48" buried for the JD stream even though the JD stream starts at the outlet of the proposed pipe.
    3. (1) wetland equalizer pipe (Total take was discussed for wetland impact at the inlet of the pipe to the left of –L-. Hydraulics will provide area of wetland at 4C meeting for total take determination.)

Plan Sheet 18:

- JD stream and associated wetlands – bridge crossing. Bridge, 240 ft in length, has been lengthened for wildlife crossing with a clearance of approximately 16 feet.

- Comment from US Fish and Wildlife – 10' high fence should be added for safety – not asking for it but it should be considered and needs to be shown. Plans are preliminary and fencing will be added through out the project to match hearing map.

Plan Sheet 19:

- Large wetlands - small impacts to these wetlands

Plan Sheet 20:

- Large wetlands - small impacts to these wetlands

Plan Sheet 21:

- Wetlands – 150' bridge crossing – wildlife crossing with approximately 10' clearance.
- Channel close to match line is non JD per NEU

Plan Sheet 24:

- JD stream crossing –culvert, (1) 8' x 7' RCBC
- Per NEU stray lines at the top of the page – non JD

Plan Sheet 25:

- JD stream crossing – 60" pipe buried

Plan Sheet 27:

- 100' bridge crossing –wild life crossing – 8' clearance.
- Large wetland impact – (2) wetland equalizer pipes are provided.
- Again comment from US Fishing and Wildlife about fencing, per Roadway plans are preliminary and fencing will be added through out to match hearing map

Plan Sheet 28:

- JD stream crossing – 54" pipe buried
- Large wetland with (3) wetland equalizer pipes provided

Plan Sheet 29:

- Wetlands impacts at both ends of the plan sheet
- Channel in the middle of the plan sheet is non JD

Plan Sheet 30:

- Large wetland area with (3) wetland equalizer pipes provided

- The other channel at the end of the sheet is non JD per NEU.

Plan Sheet 33:

- Wetlands and JD stream crossing – Bridge, 450 in length, has been lengthened to span wetlands and not for wildlife crossing.

End of Meeting

Subject: Minutes from the **Interagency 4C Concurrence Meeting** for Hydraulic Design & Permit Drawings Review on August 18, 2010 for **R-2633AA&AB in Brunswick County**

Team Members:
Brad Shaver –USACE
Gary Jordan – USFWS
Travis Wilson – NCWRC
Steve Sollod – NCDCM
David Wainwright - NCDWQ
Chris Militscher – EPA
Nilesh Surti – Roadway
Rachelle Beauregard – NEU
Mason Herndon–NCDWQ (Previous DEO)
Stephen Lane - NCDCM (absent)
Ron Lucas– FHWA (absent)
Tim Mcfadden – Roadway (absent)
Derrick G. Weaver - PDEA (absent)
Jackson Provost– Division 3 (absent)

Other Participants:
Marshall Clawson - Hydraulics
Dan Duffield - Hydraulics
Vince Rhea - PDEA
Nilesh Surti – ADU
Khaled Al-Akhdar – ADU
Mark Staley - REU
Chris Rivenbark – NEU
Pete Allen – NEU
Jason Elliott – NEU
Elizabeth Lusk – NEU
Wayne Currie – NCDOT Construction
Jonathan Henderson, HDR
James Rice, HDR
Vickie Miller, HDR
Paul Meehan, HDR
Wyatt Yelverton, HDR
Josh Massrock, HDR
Phil May, Carolina Ecosystems
Drew Johnson, Barnhill
David Weir, Barnhill
Randall Gattis, Sanford

General introduction of the project was initiated by Marshall Clawson. Introductions were made by all in attendance. Jonathan Henderson, hydraulic design engineer for the Barnhill/HDR Design-Build (DB) Team, initiated the review by describing the overall project and new project limits with the US74/76 Interchange now included in the Section designated as AA & AB. Concurrence Point 4B was held prior to the DB award and the project retains the intent of the 4B hydraulic design with minimal changes. The B Section has already been through 4C and would not be discussed at this time. The B Section will be included in the permit with preliminary drawings only. Jonathan stated the contractors were in the room and available to answer construction questions and discussed several avoidance and minimization efforts that have taken place since 4B including lowering the roadway (fill slopes), providing 5 feet of mechanized clearing rather than 10 feet (Method III) across the project, hand clearing at bridge locations, and top down construction as well as sequencing bridge construction to avoid additional temporary impacts associated with work bridges. Two handouts (Meeting Agenda and Site Photos) were passed out to those in attendance.

Each plan sheet was then reviewed and the mitigation site was discussed.

Sheet 7 (Site 1) Existing US 17 / Mitigation Site on NC 87:

Jonathan discussed the triple 72" pipes vs. previously proposed culverts and the benefits of using pipes during construction and maintaining traffic at Site 1. Benefits include increased traffic safety and shorter construction time.

Noted that onsite mitigation is located on this sheet as well as continuing to Sheets 35 and 36. Directed attendees to the Mitigation overview sheet on the table for discussion.

Brad Shaver asked where the preservation ends and stated that restoration should follow natural flood plain boundary.
Jason Elliott stated that they tied the boundary to the existing wetland boundaries.

Brad Shaver asked why the mitigation didn't take in the area closer to US 17 and the existing 87 tie-in.
Vickie Miller and Jason Elliott both stated utility issues and right-of-way restrictions were noted in this area.

Brad Shaver asked about removal of the old road bed that wasn't included in the mitigation preservation area.
Vickie Miller stated there would be more damage in the area by pulling the fill out due to the large trees and other wetland vegetation in the roadbed
Jason Elliott concurred with this assessment.

Note a match line is needed at the mitigation site on this sheet.

Sheet 9 (Sites 2 and 3) Existing US 17 interchange and Service Road:

Rachelle Beauregard noted that Site 3 needs a label on the blow-up view.

Sheet 10 (Site 4) Existing US 17:

Rachelle Beauregard stated that Sites 1, 3, and 4 currently do not have a JD. Boundaries may change at these areas based on site verification with Brad Shaver on 9/2/2010 (follow up email on 8/20 moves this meeting to 9/7/2010).

Brad Shaver asked if pipes are located in the thalweg of the channel and if it is usually flooded.
Jonathan Henderson stated that they are tying into the survey data and will be field adjusted if needed.

Chris Militscher asked if the fill on the inlet side is located in open water or wetland.
Jonathan Henderson and Vickie Miller responded that it is below the beaver dam and referred to the photos provided.
Rachelle Beauregard said the area was called wetland in the JD mapping and therefore is shown as such on the impact sheets.
Brad Shaver said to include a stream channel and assume surface water impacts.

Mason Herndon suggested using aerial photography to determine location of the channel.
Rachelle Beauregard stated providing the location of the channel would be the responsibility of Locations & Surveys.
Jonathan Henderson responded that HDR will resolve stream location and include surface water on the final permit impact drawings.

Sheet 11 (Sites 5 and 6) Existing US 17, Service Road, and Waterline:

Brad Shaver requested more legible blow-ups as they are very busy and difficult to differentiate impacts.
Marshall Clawson said to remove the rip rap symbols to clarify.
David Wainwright responded by suggesting that the blowup be on a separate sheet and stated the permit review would possibly stop if the plans were not legible.

Discussion about the total take of Site 6 ensued.
Brad Shaver remarked that the numbers for total take don't look correct.
Chris Rivenbark stated that previous total take decisions were based on acreage and that if the remainder of the wetland were greater than ¼ acre it is not automatically considered a total take.
Brad Shaver responded that the area has temporary impacts from water line it should still be a total take.
Gary Jordan stated that the location of the impacts is also a factor besides acreage and that habitat loss should be considered.
Elizabeth Lusk asked if the temporary impact would be restored and stated that NCDOT should not have to restore an area that is a total take.
Brad Shaver responded that if mitigation is included then no restoration required.
A discussion on how to show the total take areas on the plans began. Everyone agreed to explain with a note rather than showing fill or other hatching and to include with a note the acreage of impact and acreage of total take in the summary impact table.
Brad Shaver noted that the area is probably a mowed shoulder due to the location and plans to check it during JD visit.
Chris Militscher stated that the area is already impacted and a 1:1 mitigation ratio is acceptable. Others concurred.

Sheet 13 (Site 7) NBL – Bridge:

Travis Wilson noted this Bridge was lengthened for wildlife passage.

Vickie Miller started a discussion about the work bridge proposed at this location noting that the site has been logged and referred to the photos of the area on Sheets 13 and 14.
Brad Shaver said that he didn't have an issue with using a temporary pipe if the channel is restored.
David Wainwright stated that the pipe should be hydraulically sized and be a temporary impact only. Pull the pipe out when complete.

Brad Shaver noted that the bank stabilization shown for the stream should not be considered surface water impacts and asked if there is any fill below the ordinary high water mark (OHWM).
Rachelle Beauregard responded that rip-rap will be below OHWM but not in bed of stream.
Brad Shaver said he would clarify with Rachelle Beauregard on how the impacts should be calculated.

Sheet 14 (Site 8) L-line – Bridge:

Chris Militscher asked if Site 8 is jurisdictional.
Jonathan Henderson and Vickie Miller agreed that it is jurisdictional.

Vickie Miller asked if a temporary pipe crossing would be acceptable at the location which has been logged.
Drew Johnson stated that a temporary pipe would be helpful in this location to allow hauling of borrow material to other parts of the project.
David Wainwright asked how long the temporary pipes would be in place.
Drew Johnson responded with 5 to 6 months maximum.
All agencies concurred this would be acceptable.
David Wainwright added that the pipe must be placed outside of wetland area and kept to minimum width necessary for hauling traffic (two directions). Approximately 60-foot crossing was mentioned but the exact width will be determined by the distance required to pass two hauling vehicles safely.

Sheet 15 (Sites 9 and 10) L-line:

Rachelle Beauregard asked for the acreage calculation of the total take at Site 9 be verified.
Chris Rivenbark asked if Site 9 should be a total take since the hydrology will be retained.
Chris Militscher responded that if hydrology is maintained, it should not be a total take since the wetland would still function.
All concurred that Site 9 will not be a total take.

Mason Herndon asked if the pipe outlet could be aligned better with the wetland.
David Wainwright suggested adjusting the pipe in the field to match existing conditions.

Chris Militscher asked about the vegetative screening at Site 10 being located in the wetland.
Vickie Miller stated that the vegetative screening was a commitment for historic property.
Paul Meehan noted that this was to be contracted separately by NCDOT and is not part of the DB Project.
Everyone agreed to pull the vegetated screening note outside out of wetland since the alignment has already been logged.

David Wainwright said that the double line in lower right wetland boundary needs to be fixed prior to permit submittal.

Sheet 16 (Sites 11, 12, 13) L-line:

Chris Militscher asked if this area has been logged.
Vickie Miller responded that it has been.

A general discussion of Site 11 being a total take ensued and the calculation of the total takes were questioned.
Chris Militscher, Travis Wilson and Brad Shaver all agreed Site 11 would not be a total take.

Travis Wilson noted that on Sheets 13/14 wildlife fencing was mentioned in discussion but not intended to be placed there. The wildlife fencing (10' chain link) is show in the correct location on the plans. He suggested that the line style be changed to differentiate the C/A fence by placing R/W line style only in the area with 10' wildlife fencing.

Sheet 17 (Sites 13, 14, 15, 16) L-line:

Site 15 was considered a total take due to ditching and draining. The impacts were included in the summary table.

Rachelle Beauregard asked for Site 14 to have bank stabilization as a separate line on the summary impact table to differentiate that area from fill in the surface water and a note that the jurisdictional stream starts at outlet of pipe on the plans.

Chris Militscher commented that rip-rap needed to be included as fill in calculations and show on the plans at Site 13 and 15 and other locations on the plans where this is missing.

Sheet 18 (Site 17) L-line – Bridge:

Travis Wilson stated the wildlife fence needs to connect under the bridge to prevent wildlife from being funneled toward the roadway.
Mason Herndon suggested tying fencing to the bridge structure.
Travis Wilson responded that the fence should be at the base of toe protection.
Everyone agreed.

General discussion was held on the need for gates to be provided at the bridge locations for bridge maintenance access and possible animal removal.
Drew Johnson said that they would work with the Division to determine location of the needed gates.

David Wainwright asked for profiles at the bridge locations to be provided.

Rachelle Beauregard stated hand clearing is shown in a small upland area and should be removed.

Sheet 19 (Site 18) L-line:

No comments.

Sheet 20 (Sites 19, 20, 21) L-line:

No comments.

Sheet 21 (Site 22) L-line – Bridge:

Vickie Miller stated that the team took a conservative approach with the temporary work bridge shown at this location but that the area doesn't have a tributary only wetland and asked if everyone would accept a temporary crossing at this location.
Chris Militscher and Brad Shaver agreed to the temporary crossing in this location.

Note that the wildlife fencing should follow the toe of slope at the bridge.

Sheet 22 / 23 (Site 23) L-line:

Chris Militscher stated that the Q10/V10 at the outlet in the ditch is high and asked if it was a ditch or if there are any jurisdictional areas off the page. Also, asked if a pre-formed scour hole (PSH) would work.
Rachelle Beauregard responded that there aren't any jurisdictional areas to the east of the ditch outlet.
Steve Sollod asked if there was anything in place to attenuate flow.
Jonathan Henderson stated that rip-rap was provided to attenuate flow in ditch. The velocity is too great for a PSH.

Sheet 27 (Site 24) L-line – Bridge:

Wildlife fencing should wrap around the toe of slope at the bridge.

Sheet 28 (Sites 24, 25, 26, 27) L-line:

No comments.

Sheet 29 (Site 27) L-line:

No comments.

Sheet 30 (Site 28) L-line:

Chris Militscher noted that the rip-rap in the wetland should be shown as impact.

Sheet 31 (Site 28) L-line:

No comments.

Sheet 32 (Sites 29, 30, 31, and 32) US 74/76 Interchange – Railroad Bridge:

Rachelle Beauregard stated that the wetland boundaries at Site 30 may be altered as she is dealing with a landowner with an existing JD showing less wetlands at this location. She is currently trying to acquire this information for use in the permit.

Marshall Clawson asked if the impacts will extend to the B Section.
Jonathan Henderson stated that the Team used the line provided in the B-Section drawings to avoid the impacts being taken into account twice.
Elizabeth Lusk stated to move the section break line to include all impacts from this project.

General discussion about the wetlands internal to the loops of the interchange developed. Site 32 internal to the interchange was not considered a total take due to the equalizer pipes and a "Do Not Disturb" note being provided. The total take of the wetland to the east of Ramp D will be coordinated with NEU when the size is determined.

Chris Rivenbark suggested shifting the equalizer pipe to middle of this wetland to retain hydrology. The proposed equalizer pipes line up with an existing low area created by the proposed gore.

Steve Sollod commented that there is fill in wetlands on B section beyond break line.
This area will be incorporated into the AA/AB Section with the new Section break line.

Discussion about the permits for AA/AB and B:
Brad Shaver agreed that the permit numbering used in 4C for the B section should remain consistent. Also, the revised wetland boundary from the Trask property should be included in the permit if possible.

Sheet 35 (Site 33 and Mitigation Site Continued) –Y04- NC 87 relocation:

Marshall Clawson stated to add a match line at the mitigation site to show the tie to Sheet 7.
Steve Sollod requested that a profile be provided for the bridge.
Brad Shaver asked about credit for preservation under the bridge and stated that the hatch lines were confusing.
Rachelle Beauregard stated that the overlap in hatching makes the distinction of preservation from hand clearing difficult.
Jonathan Henderson responded that this will be clarified in the final impact drawings.

Sheet 36 (Mitigation Site Continued)

No comments.

Sheet 37 (Site 34) –Y5-

No comments

Borrow Pits & Haul Roads:

Vickie Miller discussed the four proposed borrow sites. Two are located adjacent to the alignment and two are off the alignment (near Malmo Loop Road and off of Old Town Creek). There will be no impacts to any jurisdictional areas due to borrow activities and buffers have been set based on the Skaggs method. This information will be submitted through the standard reclamation plan approval process. There could be one haul road impact on a recently reviewed property which has an existing 30' road with ditches on either side. The road needs to be at least 40 feet wide to safely pass two hauling trucks. There would be a temporary wetland impact associated with the road widening and ditch relocation.
Chris Militscher asked how much of an impact would occur.
Vickie Miller stated that was not determined at this time due to just learning of these sites earlier in the week and deferred to David Weir for an estimate.
David Weir stated there are probably two areas approximately 300 feet each and 10 feet wide.
Concern was raised over the impacts and who would be responsible for mitigation would occur.
Vickie Miller stated that the impacts would be temporary and after hauling was completed that the fill could be removed and the ditch moved back to its original location and restored.
Rachelle Beauregard said to include these areas at the end of the impact summary table.

Gary Jordan asked if T&E reviews were completed for the borrow areas.
Vickie Miller responded that they have been completed for the two adjacent to the alignment and no RCW habitat or cavity trees exist. The site off the alignment to the north doesn't have suitable habitat for RCWs. The site to the south may have suitable habitat and will be reviewed.
Gary Jordan stated that RCW surveys should extend to ½ mile from borrow areas.

Steve Sollod stated to include borrow review information in application.

General Discussions:

Brad Shaver asked if there will be any waste from undercutting expected and if so where it would be placed.
Drew Johnson responded that they will use that material to stabilize slopes and grow vegetation on the slopes. No waste areas are proposed.

Meeting Adjourned

Ecosystem Enhancement PROGRAM

October 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:

R-2633A and B, US 17 (Wilmington Bypass) from NC 87 South of Bishop to West of US 421 North of Wilmington, Brunswick and New Hanover Counties

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream, riparian, and non-riparian wetland mitigation for the subject project. Based on the information supplied by you on October 12, 2010, the impacts are located in CU 03030005 of the Cape Fear River Basin in the Southern Outer Coastal Plain (SOCP) Eco-Region, and are as follows:

Cape Fear 03030005 SOCP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	723	7.80	80.14	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	1,446	15.60	160.28	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letters issued on October 20, 2009 for Sections A and B. EEP commits to implementing sufficient compensatory stream, riparian, and non-riparian wetland mitigation credits to offset the impacts associated with this project in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Brad Shaver, USACE – Wilmington Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
Files: R-2633 A and B

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1

General Project Information

Project No.:	R-2633AA&AB	Date:	7/13/2010
City/Town:	Leland (US 74/76) and Bishop (US 17)	Designer:	James Rice, PE
County(ies):		Project Manager:	Jonathan Henderson, PE
River Basin(s):	Cape Fear	CAMA County?	yes / TVA County? no
Primary Receiving Water:	Morgan Creek / Bishop Branch	NCDWQ Stream Index:	
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:	Class C	
	Supplemental:	Swamp Waters (Sw)	
Other Stream Classification:			
303(d) Stream?:	no	Type(s) of Impairment:	
State Stormwater Permit Required?	yes	If yes, why?:	Project requires an Erosion and Sediment Control Plan and is in a coastal county
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 existing travel route is along US 17 through an actively developing area with commercial and residential uses occurring to the east and west of the highway.
Average Daily Traffic:	L line 21,615 for Present Day
Existing Cross Section:	New Alignment
Surrounding Land Use:	Forested, commercial and residential development
General Comments:	

Project Project

Description of Proposed Project:	The proposed action is to construct a fully controlled access freeway on new location from US 17 to US 74/76 in this phase and to complete the urban loop around Wilmington with the next phase from US 74/76 to the tie in with US 421. The new roadway will be designated as I-140.		
Average Daily Traffic:	L line 46,800 for 2035		
Proposed Cross-Section:	4 lane divided		
Interchange Modification:	no	Median Type:	46 ft Grass
North Terminus:	US 74/76		
South Terminus:	US 17		
Project Length (lin. miles/feet):	7.977 miles	Added Impervious Area (ac.):	81
General Comments:	Land use along the new roadway route consists of mainly mananged forest; some industrial at US 74/76; and minimal areas of commercial or residential at the intersections with the existing roadways.		

Environmental Summary

Riparian Buffer and Jurisdictional Stream Impacts and Associated BMPs

Station	Stream Name	Stream Type	Jurisdict. Stream	Buffer?	Classific-ation?	Proposed Structure	BMP Type	Checklist Complete?	DA (ac.)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	WQv^c (ft^3/s)
54+00 -Y1-	Bishop Branch	Perennial	RPW	No	Class C	Triple 72" RCP						
101+46 -Y1-	Trib to Morgan Creek	Perennial	RPW	No	Class C	Triple 66" RCP						
115+18 -Y1-	Morgan Creek	Perennial	RPW	No	Class C	Triple 72" RCP						
59+85 -NBL-	Trib to Morgan Creek	Perennial	RPW	No	Class C	Bridge / Wildlife Crossing						
97+50 -L-	Swale to Trib to Morgan Crk	Perennial	RPW	No	Class C	Bridge / Wildlife Crossing						
125+61 -L-	Trib to Morgan Creek	Intermittent	RPW	No	Class C	48" RCP						
135+53 -L-	Trib to Morgan Creek	Perennial	RPW	No	Class C	36" RCP						
280+43 -L-	Trib to Sturgeon Branch	Perennial	RPW	No	Class C	36" RCP						
24+00 -Y04-	Bishop Branch	Perennial	RPW	No	Class C	Bridge						

General Comments:

Jurisdictional Wetlands

Station	Type of Impact	Minimization of Impact
54+00 -Y1-	Triple 72" RCP	Lowered the roadway profile.
55+00 -Y1- LT	Roadway Fill	Lowered the roadway profile.
77+70 -Y1-	24" RCP	Lowered the roadway profile.
28+00 -NBL- RT	Exist 42" RCP	Lowered the roadway profile.
101+46 -Y1-	Triple 66" RCP	Lowered the roadway profile.
115+18 -Y1-	Triple 72" RCP	Lowered profile
103+61 -SRVD2-	24" RCP	Lowered profile
97+50 -L-	Bridge	Lowered the roadway profile.
110+11 -L-	24" RCP	Lowered the roadway profile.
113+92 -L-	30" RCP	Lowered the roadway profile.
120+66 -L-	30" RCP	Lowered the roadway profile.
125+61 -L-	48" RCP	Lowered the roadway profile.
131+50 -L-	24" RCP	Lowered the roadway profile.
135+53 -L-	36" RCP	Lowered the roadway profile.
140+25 -L-	18" RCP	Lowered the roadway profile.
142+50 -L-	Roadway Fill	Lowered the roadway profile.
143+81 -L-	Bridge	Lowered the roadway profile.

General Comments:

Additional Comments

Please see attached sheets for Grass Swale and Preformed Scour Hole information and backup.

Jurisdictional Wetlands

Station	Type of Impact	Minimization of Impact
164+50 -L- LT	Roadway Fill	Lowered the roadway profile.
171+75 -L- RT	Roadway Fill	Lowered the roadway profile.
173+59 -L- LT	24" RCP	Lowered the roadway profile.
180+00 -L- RT	Roadway Fill	Lowered the roadway profile.
181+59 -L-	36" Equalizer Pipe	Lowered the roadway profile.
185+58 -L-	Bridge	Lowered the roadway profile.
208+00 -L-	30" RCP	Lowered the roadway profile.
266+28/274+26 -L-	36" Equalizer Pipe	Lowered the roadway profile.
277+00 -L-	Roadway Fill	Lowered the roadway profile.
280+70/293+82 -L-	Roadway Fill	Lowered the roadway profile.
304+53/316+77 -L-	Roadway Fill	Lowered the roadway profile.
19+65/26+00 -Y04-	Bridge	Lowered the roadway profile.
329+22/330+20 -L-	Bridge	Lowered the roadway profile.
24+68/28+63 -RPA1-	Roadway Fill	Lowered the roadway profile.
22+10/23+50 -RPA1-	Roadway Fill	Lowered the roadway profile.
5+28/7+16 -LPA1-	36" Equalizer Pipe	Lowered the roadway profile.
332+18/339+79 -L-	Roadway Fill	Lowered the roadway profile.

General Comments:

North Carolina Department of Transportation

Highway Stormwater Program

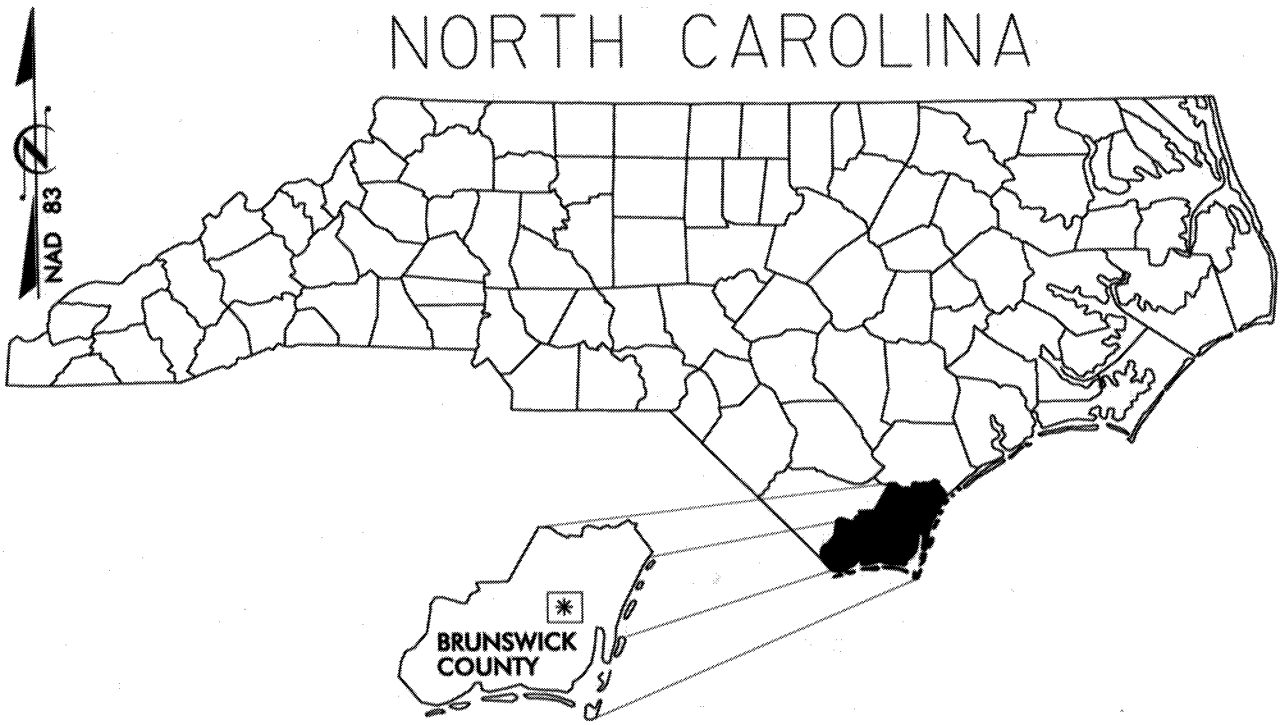
STORMWATER MANAGEMENT PLAN

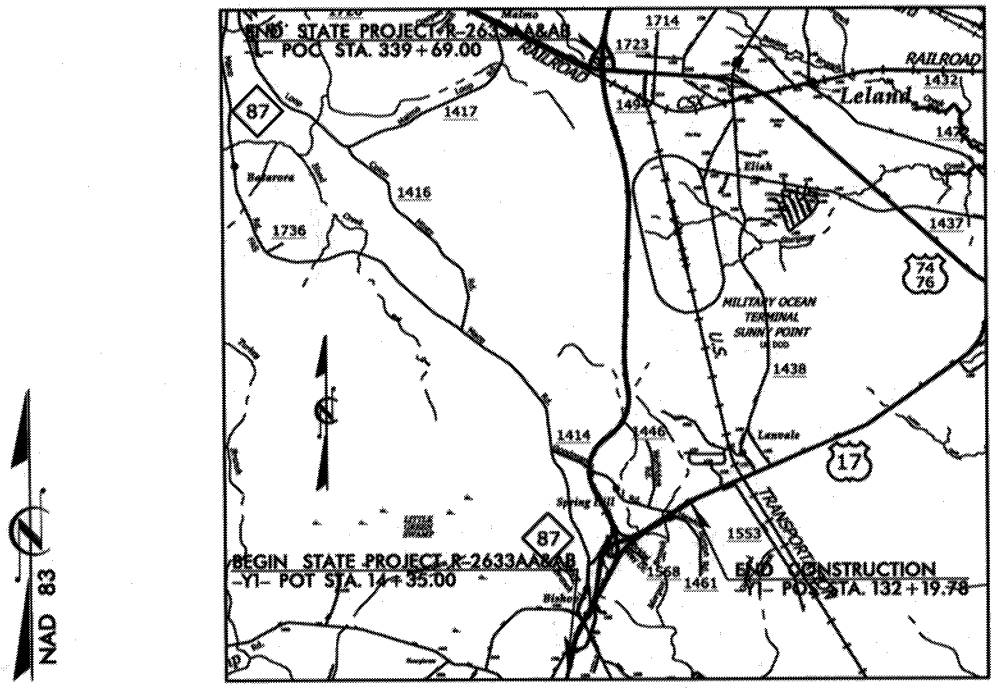
Version 1

Jurisdictional Wetlands

Station	Type of Impact	Minimization of Impact
19+25/20+47 -Y5-	24" RCP	Lowered the roadway profile.

General Comments:





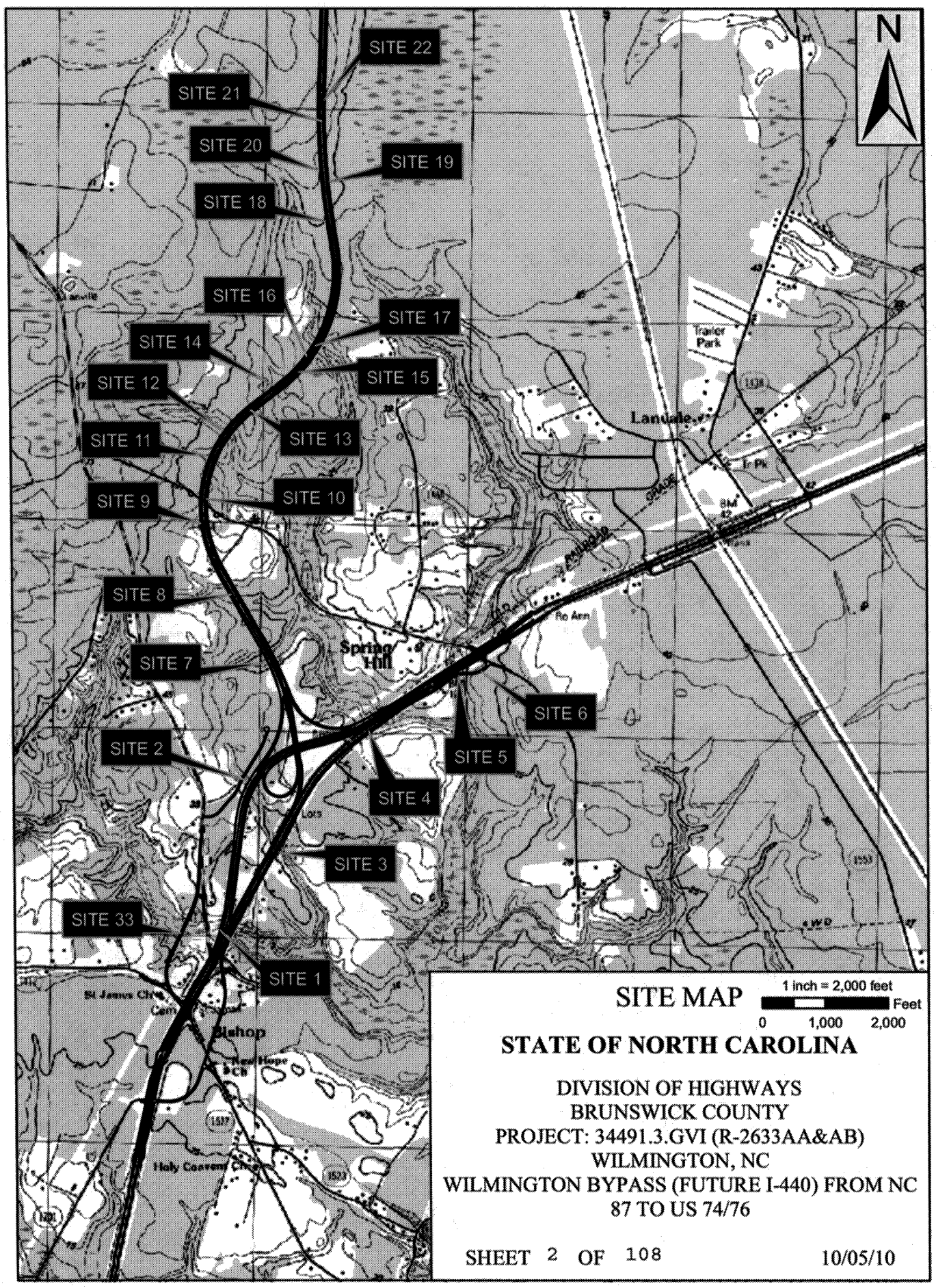
VICINITY MAPS

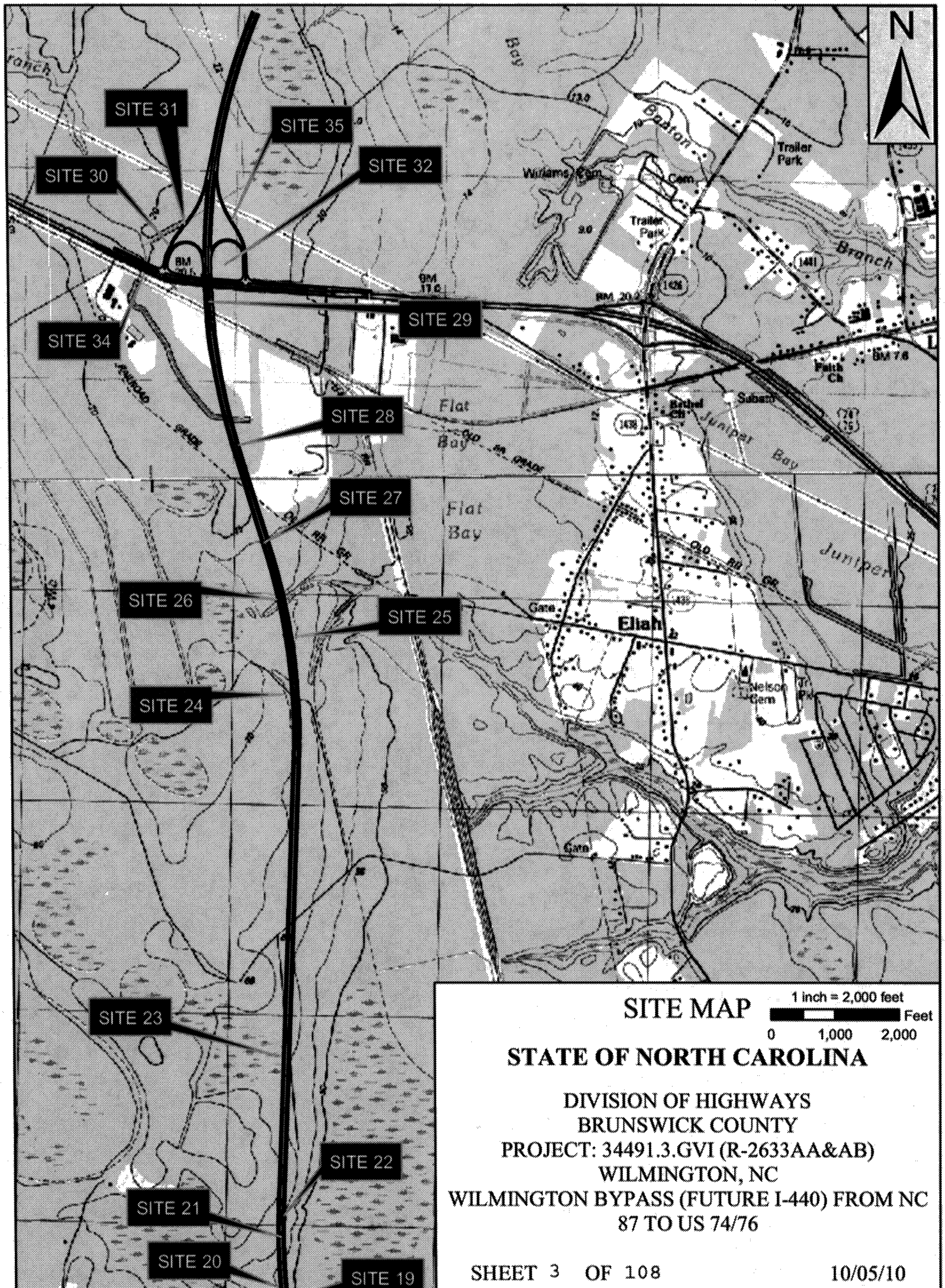
NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY

PROJECT: 34491.3.GV2 / 34491.3.STI
(R-2633AA&AB)

WILMINGTON BYPASS (FUTURE I-140)
FROM NC 87 TO US 74/76


N
SITE 22
SITE 21
SITE 20
SITE 19
SITE 18
SITE 16
SITE 17
SITE 14
SITE 15
SITE 12
SITE 13
SITE 11
SITE 10
SITE 9
SITE 8
SITE 7
SITE 6
SITE 2
SITE 5
SITE 4
SITE 3
SITE 33
SITE 1
Trailer Park
Lanvale
Spring Hill
Bishop
SITE MAP
1 inch = 2,000 feet
Feet
0
1,000
2,000
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 34491.3.GVI (R-2633AA&AB)
WILMINGTON, NC
WILMINGTON BYPASS (FUTURE I-440) FROM NC 87 TO US 74/76
SHEET 2 OF 108
10/05/10



SITE MAP

1 inch = 2,000 feet

0 1,000 2,000 Feet

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 34491.3.GVI (R-2633AA&AB)
WILMINGTON, NC
WILMINGTON BYPASS (FUTURE I-440) FROM NC 87 TO US 74/76

SHEET 3 OF 108 10/05/10

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
1	EDWARD S. WILLIAMSON	807 COLONIAL DRIVE WILMINGTON,NC 28403	1,2
2	CHRISTINE SMITH, ET VIR	7282 OCEAN HWY E LELAND, NC 28451	1
3	JEANETTE H. LEONARD	1460 TPWNCREEK RD NE LELNAD, NC 28451	1
4	KATHY R. SUMERLIN, ET VIR	7353 OCEAN HWY E LELAND, NC 28451	2
5	WILBUR S. MCKEITHAN	2217 CAMELLIA DR WILMINGTON, NC 28403	2
6	LAWERENCE B. HARRLESON, ET UX	118 MACO RD LELAND, NC 28451	2
7	MARILYN K. SELLERS	7315 OCEAN HWY E LELAND, NC 28451	4
8	EUNICE KING	131 GOODMAN RD LELAND, NC 28451	4
9	WINFRED OLIVERA, HEIRS	UNKNOWN	4
10	A. DARRELL HARRIS, ET UX	PO BOX 1550 JAMESTOWN, NC 27282	4

NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY

PROJECT: 34491.3.GV2 / 34491.3.STI
(R-2633AA&AB)

WILMINGTON BYPASS (FUTURE I-140)
FROM NC 87 TO US 74/76

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
11	HENRY JAMES, HEIRS	2019 MONROE ST WILMINGTON, NC 28401	5
12	MARY C. BRUNETTA ARES	1004 WEDGEWOOD ST. CHARLES, MO 63303	5
13	BAK PROPERTIES/ WILMINGTON, LLC	PO BOX 51965 DURHAM, NC 27717	5,6
14	E.G GOODMAN, HEIRS	340 GOODMAN RD LELAND, NC 28451	7-17
15	JAMES R. SMALL	501 GOVERNOR'S RD WINNABOW, NC 28479	18,19,20, 21,22
16	SUSTAINABLE FOREST, LLC	15 GUM AVE. BOLTON, NC 28423	22,23,24
17	D+H INVESTORS, INC	1400 VILLAGE RD NE LELAND, NC 28451	24,25,26
18	E.G. DALE, ET UX	PO BOX 157 LELAND, NC 28451	27
19	HUGH M. MORTON, TRUSTEE	PO BOX 129 LINVILLE, NC 28646	27
20	SALISBURY PARTNERS, LLC	PO BOX 129 LINVILLE, NC 28646	28

NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY

PROJECT: 34491.3.GV2/34491.3.STI
(R-2633AA&AB)

WILMINGTON BYPASS (FUTURE I-140)
FROM NC 87 TO US 74/76

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
21	T.F. HOLDINGS LIMITED PARTNERSHIP	1202 EASTWOOD RD WILMINGTON, NC 28403	29,30, 31,34
22	JOHN M. HEWITT, ET UX	PO BOX 632 LELAND, NC 28451	31
23	VA CREECH, JR.	PO BOX 66 LELAND, NC 28451	32,35
24	AARON L. WESTCOTT, ET AL	170 OLD TOWN CREEK RD N LELAND, NC 28451	33

NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY

PROJECT: 34491.3.GV2 / 34491.3.STI
(R-2633AA&AB)

WILMINGTON BYPASS (FUTURE I-140)
FROM NC 87 TO US 74/76

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	54+00 -Y1-	Triple 72" RCP	0.14		0.03	0.03		0.11		248		
1 & 33	54+00 -Y1-/24+00 -Y04-	Wetland Mitigation										66
2	77+70 -Y1-	24" RCP	0.17			0.01						
*3**	58+30 -SR2- RT	Waterline/Powerline		0.03			0.02		<0.01		30	
*4**	101+46 -Y1-	Triple 66" RCP	0.31	0.40	0.09	0.09	0.27	0.07		151		
5**	115+18 -Y1-	Triple 72" RCP	0.03		0.11	0.03	0.07	0.10		228		
6	103+61 -SRVD2-	24" RCP	0.13			<0.01						
7	60+15 -NBL- RT	Bank Stabilization						<0.01		16		
7	60+15 -NBL-M	Temp. Crossing							<0.01		70	
8	98+00 -L- LT	Temp. Crossing							<0.01		45	
8	97+27 / 98+26 -L-	Bridge	<0.01				0.12					
8	97+27 / 98+26 -L-	Bank Stabilization						<0.01		40		
9	110+00 -L-	24" RCP	0.23			0.01						
10A	113+92 -L- LT	30" RCP	<0.01			<0.01						
10B	113+92 -L- RT	30" RCP	<0.01			<0.01						
11	120+66 -L-	30" RCP	0.11			0.01						
12	124+84 / 127+20-L-	42" RCP	1.00			0.05						
13	129+52 / 132+63 -L-	24" RCP	0.49			0.02						
14	134+27 / 138+13 -L-	36" RCP	0.73			0.03						
14	134+27 / 138+13 -L-	Bank Stabilization						<0.01		12		
15	140+25 -L-	18" RCP	0.33		0.04	0.01						
16	142+50 -L-	Roadway Fill	0.37			0.02						
17	143+81 -L-	Bridge	0.10			0.01	0.39					
18	164+50 -L- LT	Roadway Fill	0.02			0.01						
19	171+75 -L- RT	Roadway Fill	0.03			0.01						
20	173+59 -L- LT	24" RCP			<0.01	<0.01						
21	181+45 -L-	36" RCP	0.27			0.02						
TOTALS:			4.46	0.43	0.27	0.34	0.87	0.27	<0.01	695	145	66

- Wetland Mitigation includes 0.63 acres of restoration and 2.97 acres of preservation

* Contains impacts due to 30" waterline relocation
** Hand clearing impacts due to powerline.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
34491.3.GV2 (R-2633AA&AB)

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)
22	184+08 / 186+27 -L-	Bridge	0.09			0.02	0.17					
22	184+08 / 186+27 -L-	Temp. Crossing		0.10								
23	206+83 / 209+84 -L-	Roadway Fill	0.54			0.03						
24	265+81 / 274+26 -L-	Roadway Fill	3.27			0.19	0.12					
25	275+89 / 279+03 -L-	Roadway Fill	0.61			0.04						
26	283+43 -L-	36" RCP						0.01		***		
27	280+70 / 293+82 -L-	Roadway Fill	4.56			0.25						
28	304+55 / 316+77 -L-	Roadway Fill	3.52			0.24		0.02		***		
29	329+70 -L-	Bridge	<0.01				0.15					
30	21+97 / 23+48 -RPA1-	Roadway Fill	0.40			0.04						
31	5+29 / 7+09 -LPA1-	Roadway Fill	0.53			0.06						
32	0+00 / 12+98 -LPD1-	Roadway Fill	4.27		0.07	0.30						
33	18+96 / 25+57-Y04-	Bridge	0.12			0.03	0.39					
34	19+26 / 20+50 -Y5-	Roadway Fill	0.02			0.01						
35**	22+50 -RP_D1-	Roadway Fill	0.16			0.01						
TOTALS:			18.10	0.10	0.07	1.22	0.84	0.03	0.00	0	0	0
Totals: Sheet 1 and 2			22.56	0.54	0.34	1.56	1.70	0.30	<0.01	695	145	66

**Site 35 total take includes an additional 0.02 AC of impacted area between -RP_D1- and -L-.

***Tributary waters of the US contain SW impacts but no channel impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
WBS - 34491.3.GV2 (R-2633AA&AB)

ATN Revised 3/31/05

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633AA&AB	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34491.3.GV2	NHF-0017 (96)	CONSTRUCTION
34491.3.ST1	STM-0017 (97)	CONSTRUCTION

See Sheet 1-A For Index of Sheets

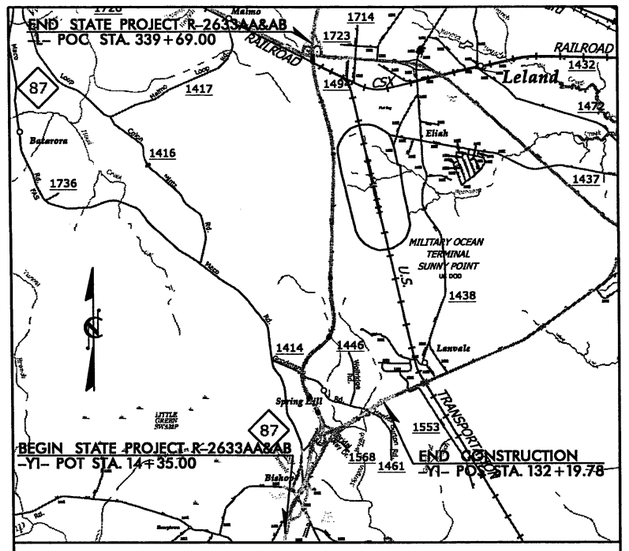
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: WILMINGTON BYPASS (FUTURE I-140) FROM NC 87 TO US 74/76

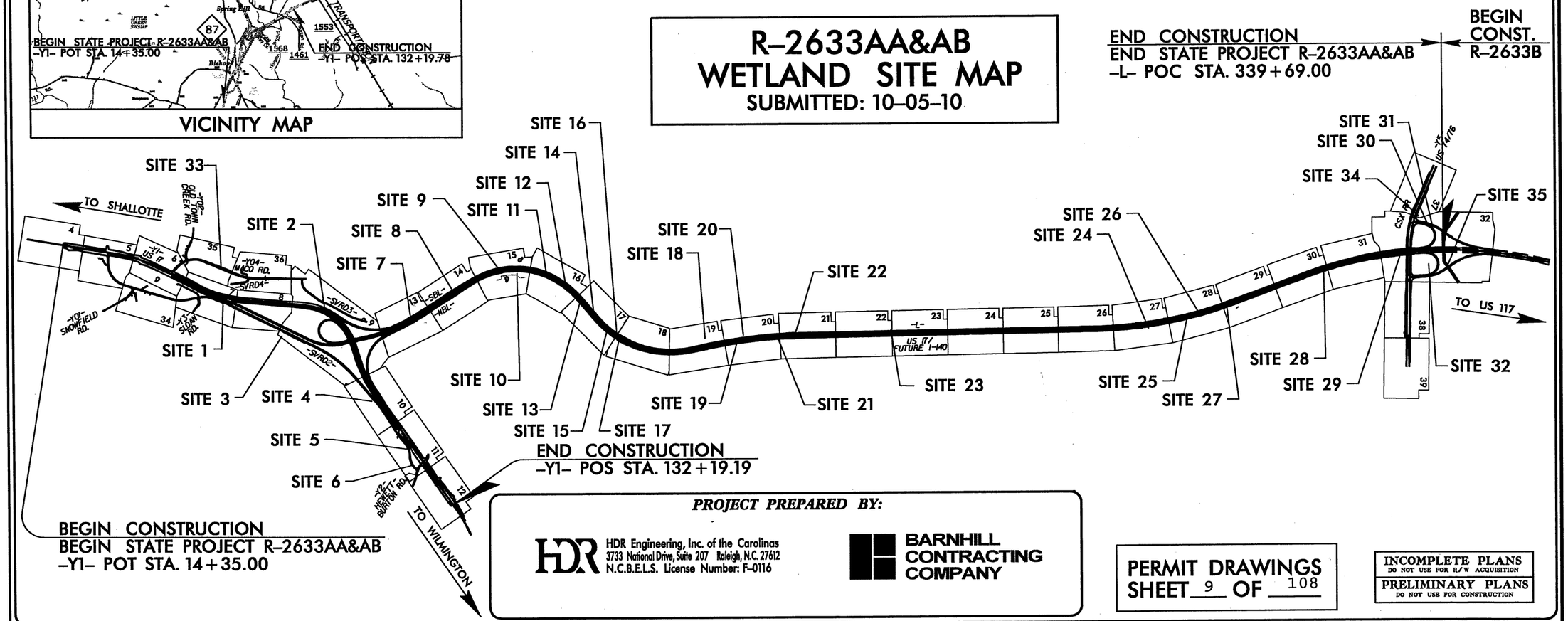
TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS

NAD 83



VICINITY MAP

R-2633AA&AB
WETLAND SITE MAP
SUBMITTED: 10-05-10



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

BARNHILL CONTRACTING COMPANY

PERMIT DRAWINGS
SHEET 9 OF 108

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA -L-

ADT 2010	=	21,615
ADT 2035	=	46,800
DHV	=	12 %
D	=	60 %
T	=	15 % *
V	=	70 MPH

* TTST 10 % DUAL 5 %

DESIGN DATA -Y1-

ADT 2010	=	34,081
ADT 2035	=	80,100
DHV	=	9 %
D	=	55 %
T	=	15 % *
V	=	60 MPH

* TTST 10 % DUAL 5 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2633AA&BB (-Y1-, -NBL-, -L-)	=	7.657 MILES
LENGTH STRUCTURE TIP PROJECT R-2633AA&BB (-Y1-, -NBL-, -L-)	=	0.320 MILES
TOTAL LENGTH STATE PROJECT R-2633AA&BB (-Y1-, -NBL-, -L-)	=	7.977 MILES

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 20, 2008

LETTING DATE: FEBRUARY 16, 2010

GREGORY KEMPF, P.E.
PROJECT ENGINEER

PAUL A. MEEHAN, 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

TIP PROJECT: R-2633AA&AB

CONTRACT: C 202384

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Hydraulics\PERMITS_Environmental\Drawings\R2633AA&AB_HYD_PRM_TSH.DGN
PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 8:44:50 AM SCALE: 1:2500
09/08/99

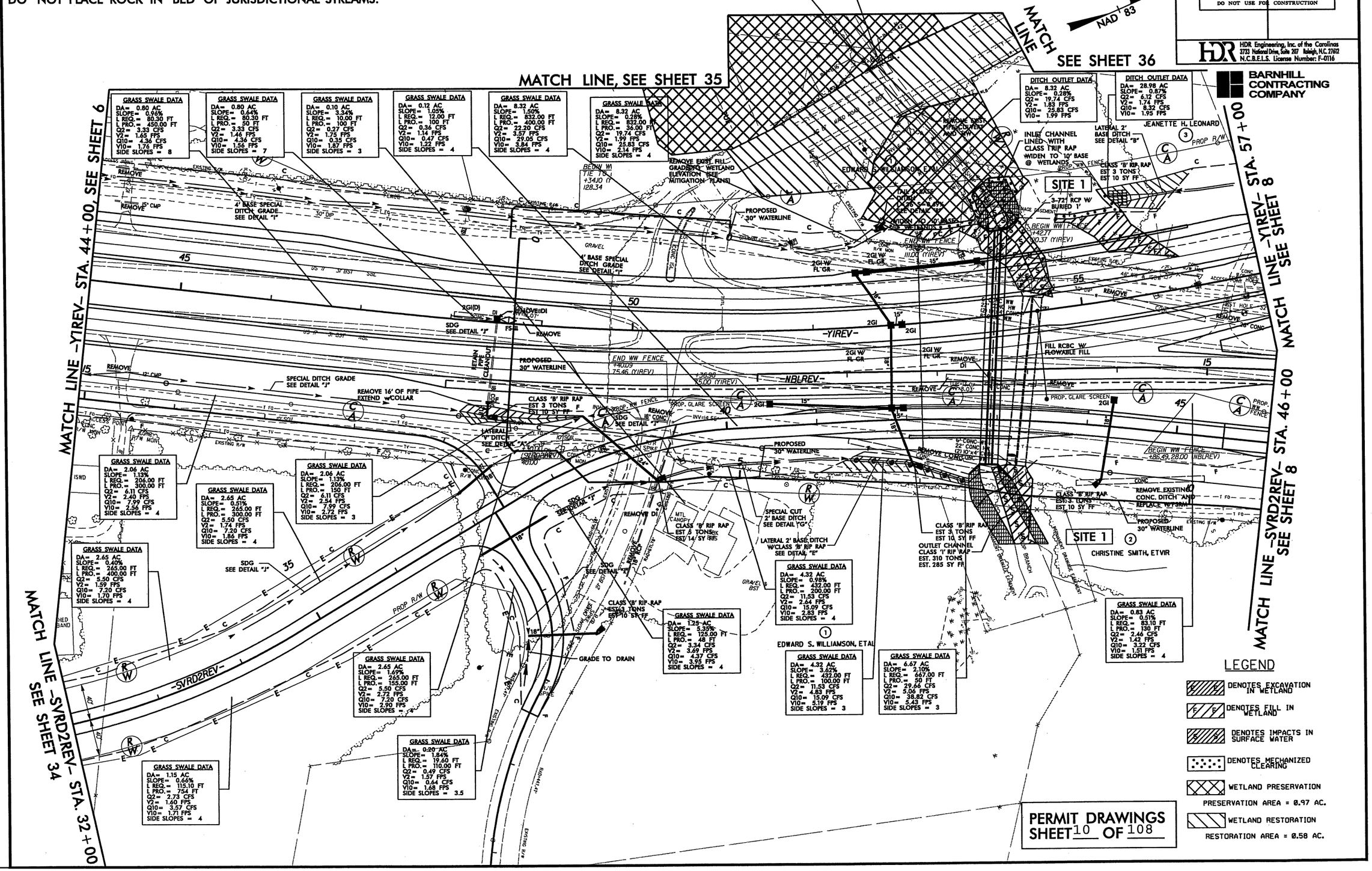
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
SEE SHEET NO. 40 FOR -NBLREV- PROFILE.
SEE SHEET NO. 75, 76 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 55, 56, 57 FOR -Y1REV- PROFILE.
SEE SHEET NO. 63 FOR -Y3- PROFILE.
SEE SHEET NO. 80 FOR -D2REV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	7
R/W SHEET NO. R-2633A PSH 6,7,8,33 & 34	
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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 10 OF 108

8/17/99

REVISIONS

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ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
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SEE SHEET NO. 75, 76 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 55, 56, 57 FOR -Y1REV- PROFILE.
SEE SHEET NO. 63 FOR -Y3- PROFILE.
SEE SHEET NO. 80 FOR -D2REV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	7
R/W SHEET NO. R-2633A PSH 6,7,8,33 & 34	
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
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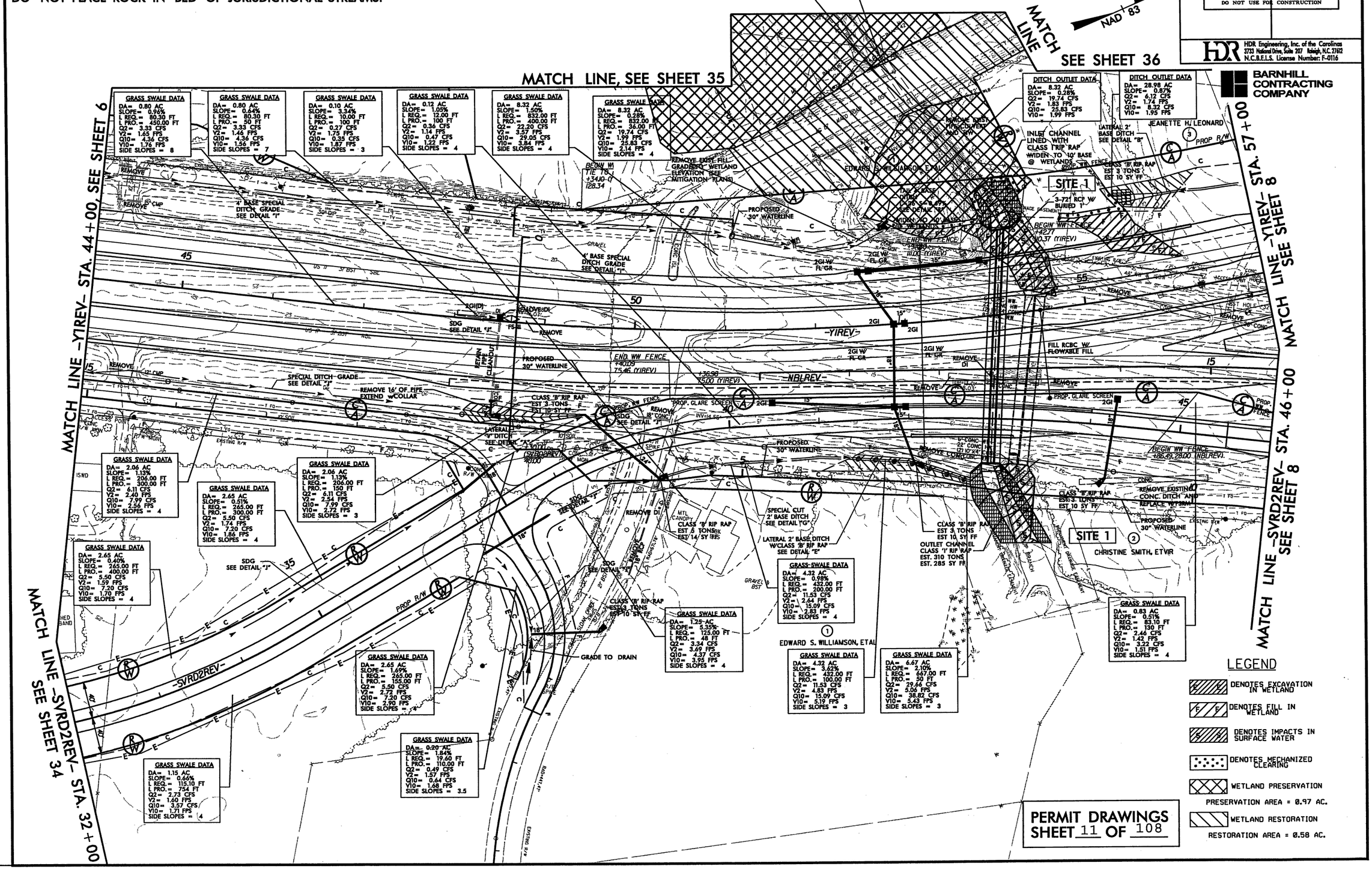
BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 11 OF 108

8/17/99

REVISIONS

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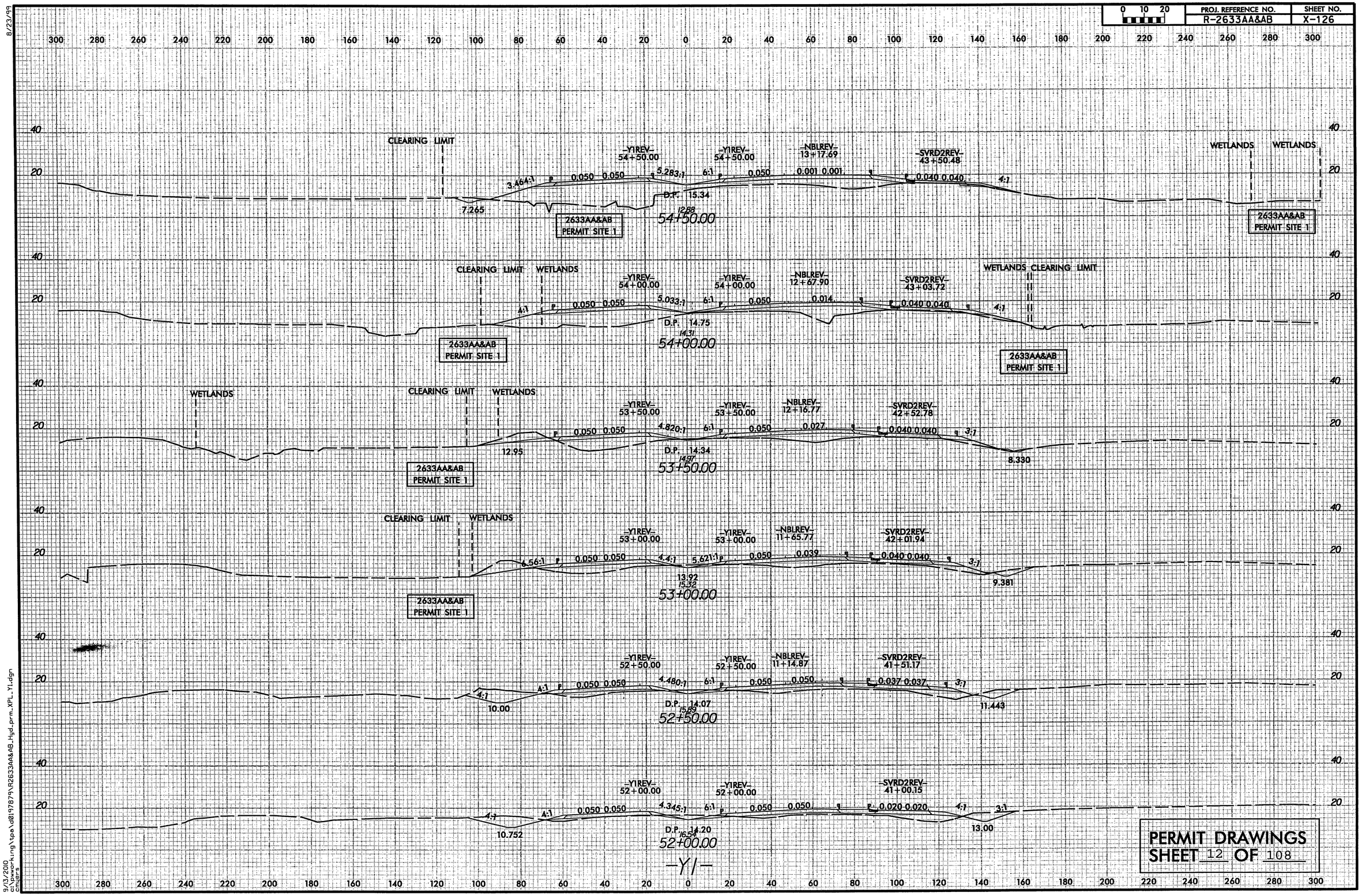
8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-126

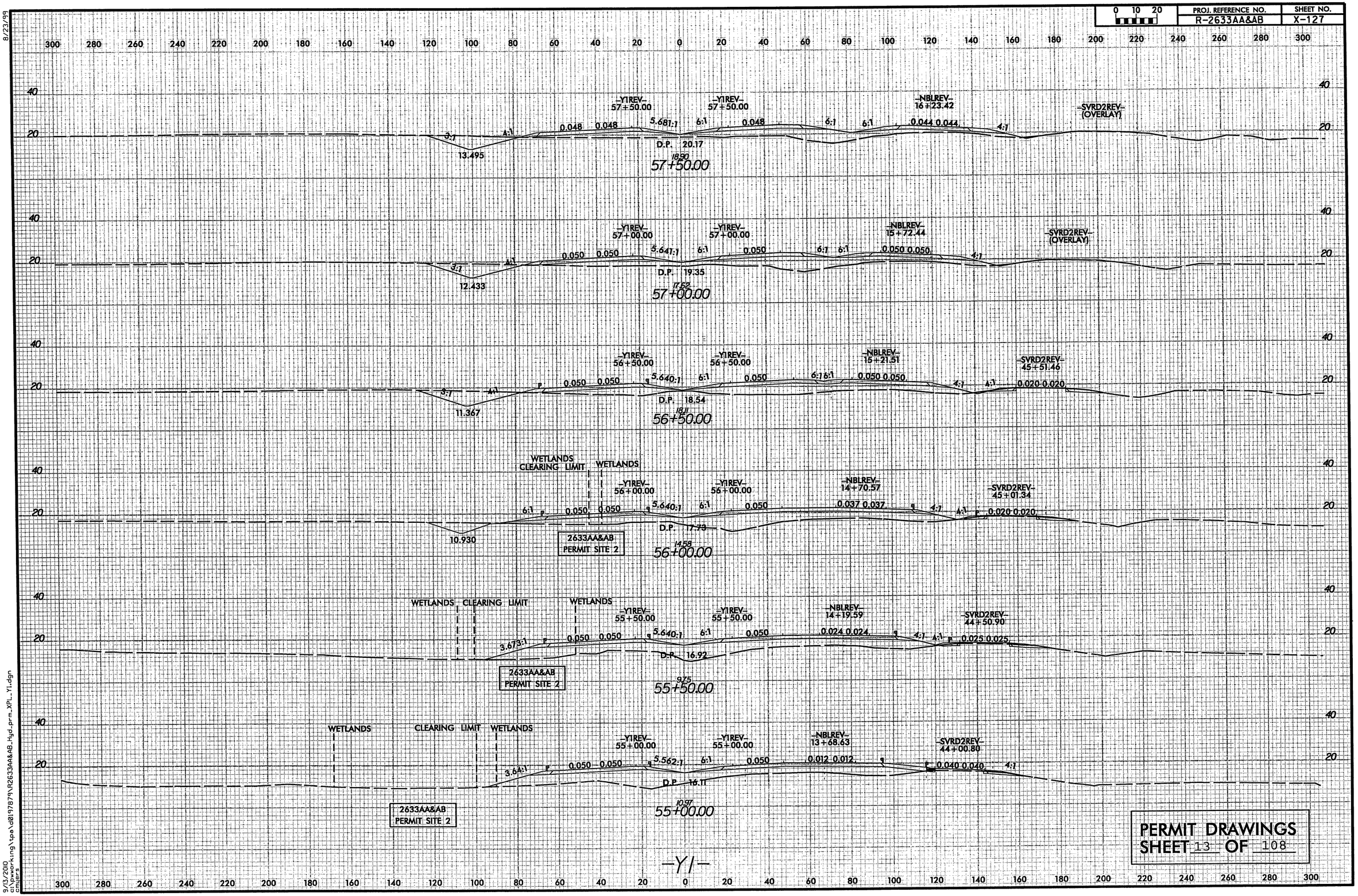


PERMIT DRAWINGS
SHEET 12 OF 108

9/13/2010
\\Ussewrkjng\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_Y1.dgn
Chuck Lewis

PROJ. REFERENCE NO.	SHEET NO.
R-2633AA&AB	X-127

0 10 20



PERMIT DRAWINGS
SHEET 13 OF 108

8/23/99

9/15/2010
cjhunter
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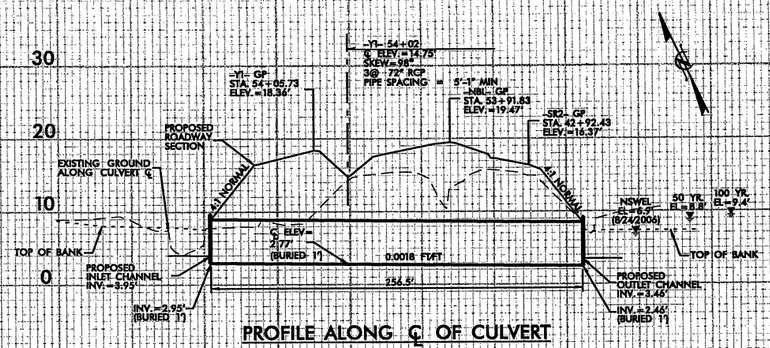
PROJECT REFERENCE NO.	SHEET NO.
2633AA&AB	CSR 1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 1 2633AA&AB



PROFILE ALONG ℄ OF CULVERT

RURAL REGRESSION WSEL TABLE (STA 4720.7)

YEAR	DISCHARGE (CFS)	NATURAL	PROPOSED
10	210	7.9	7.8
50	370	8.7	8.8
100	460	9.1	9.4
500	660	9.8	10.9

FEMA WSEL TABLE (STA 4720.7)

YEAR	DISCHARGE (CFS)	CORRECTED EFFECTIVE	REVISED
100	622	10.84	10.60
100 FW	622	11.52	11.28

PERMIT DRAWINGS
SHEET 14 OF 108

5/28/99

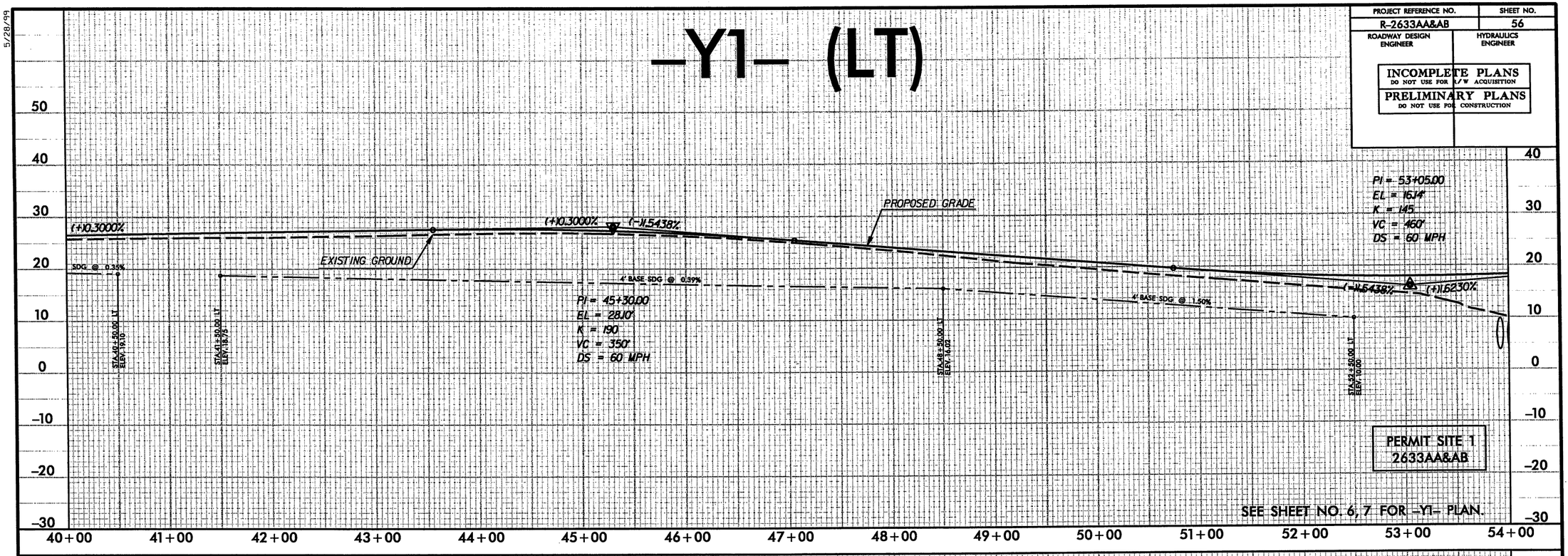
PLOT DRIVER: $PLTDRVS$
USER: $USER$ DATE: 9/13/2010
FILE: $PWVARVAUL TPATHDESC$
PENTABLE: $PENTBLS$
TIME: 3:13:04 PM SCALE: $SCALESHORT$

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

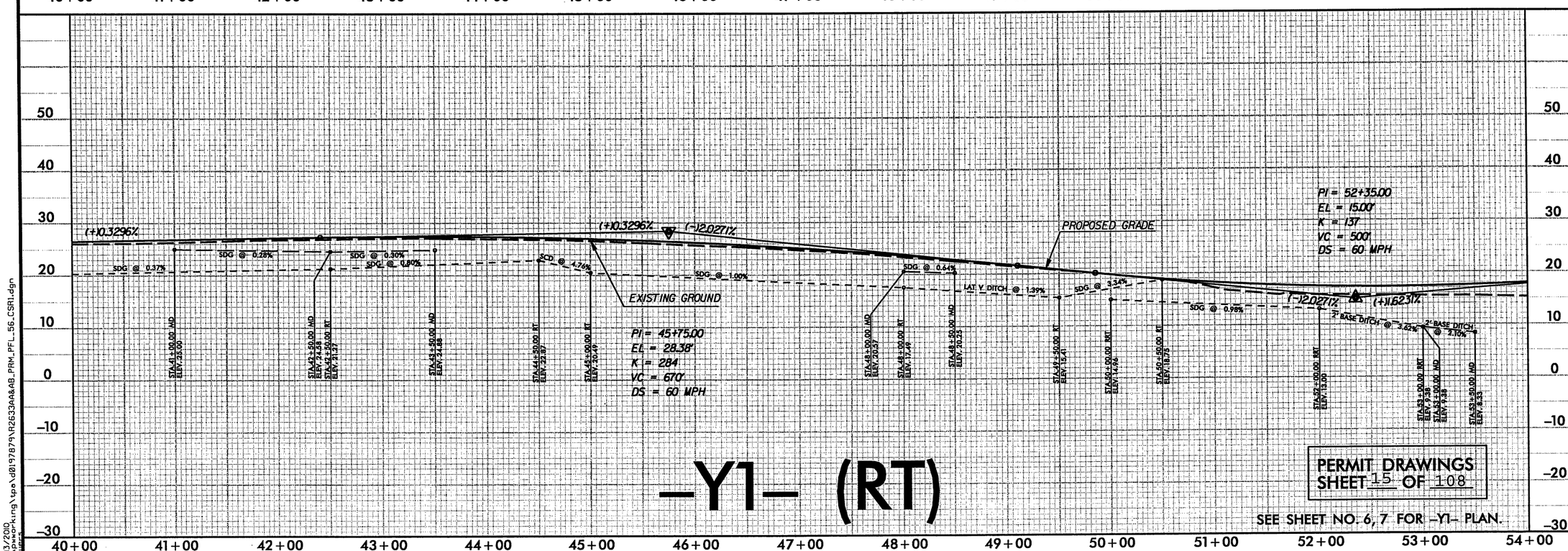
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1- (LT)



-Y1- (RT)



5/28/99

9/13/2010
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pmulder

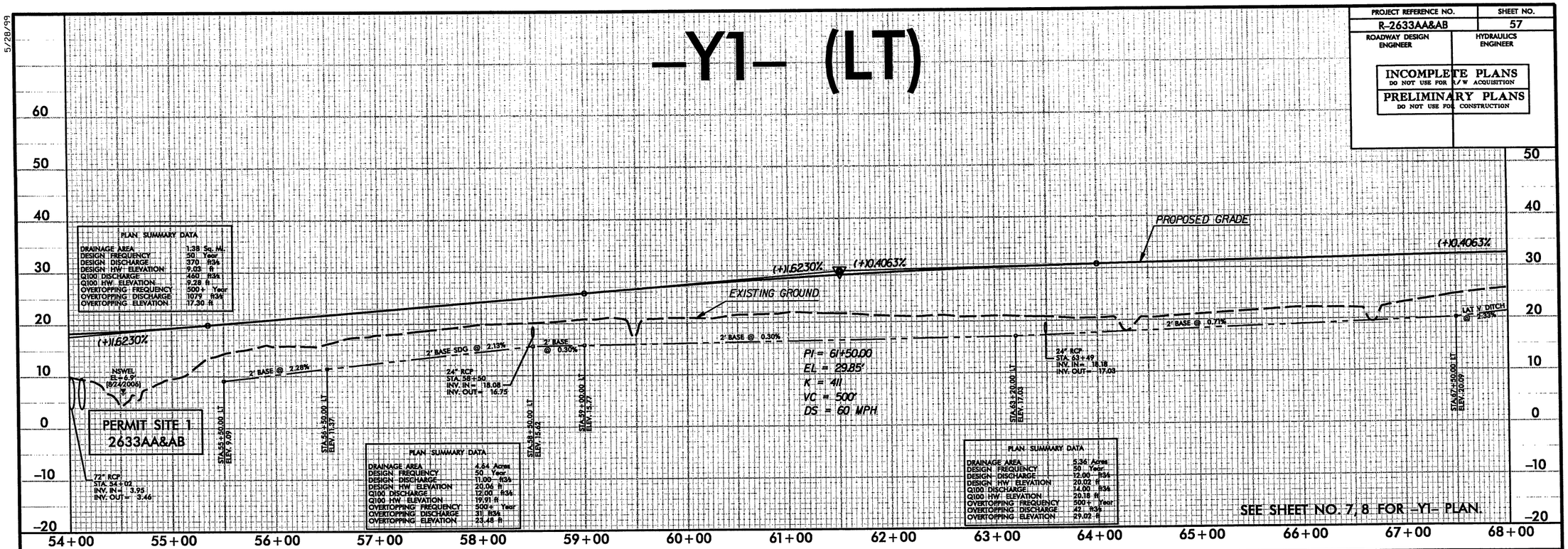
5/28/99

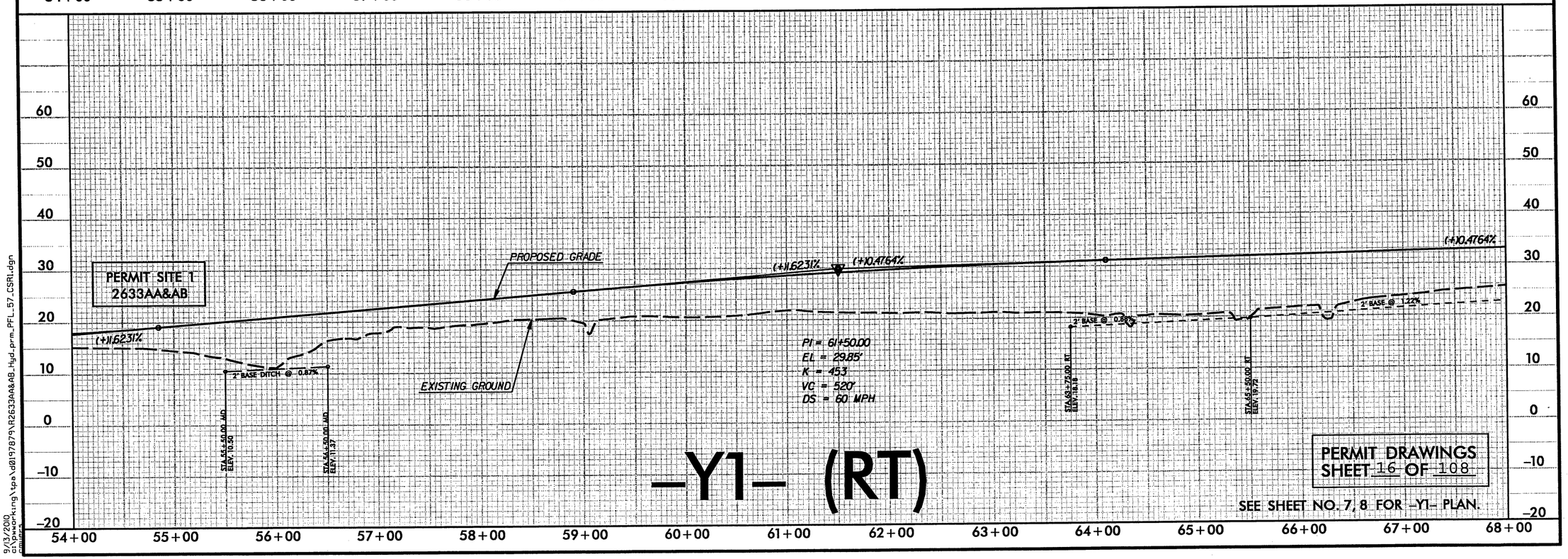
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	57
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1- (LT)





-Y1- (RT)

9/13/2010
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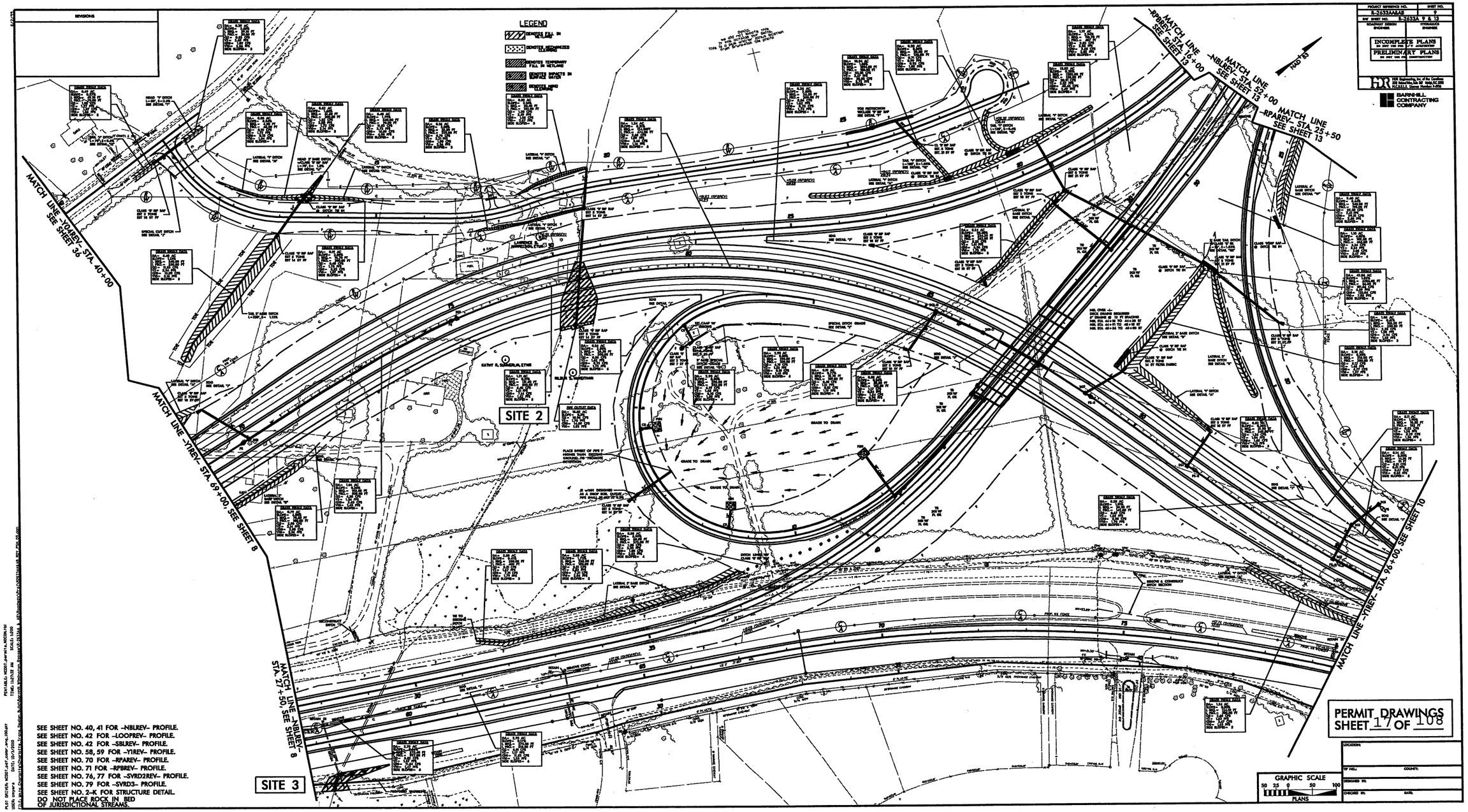
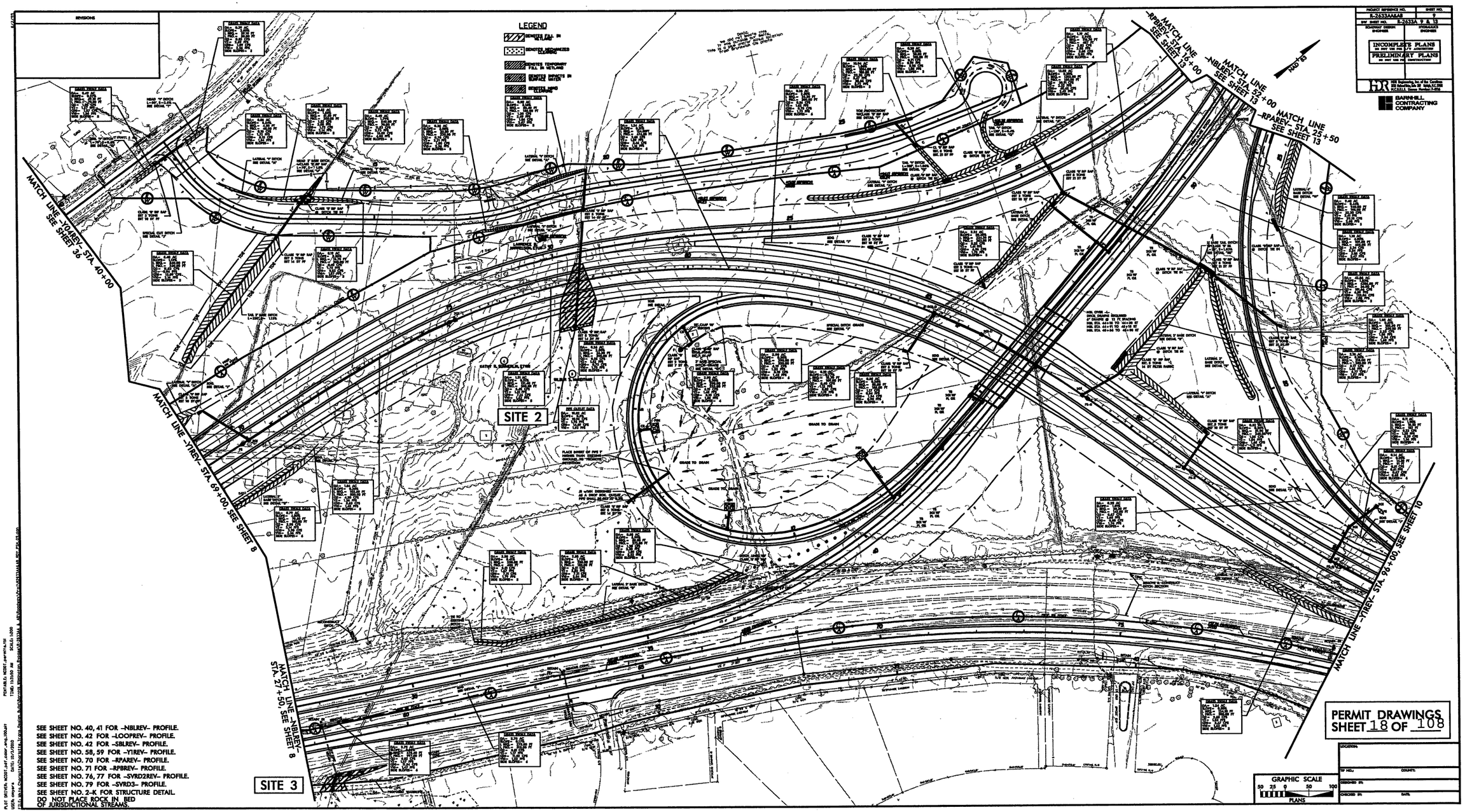


SEE SHEET NO. 40, 41 FOR -NBLREV- PROFILE.
SEE SHEET NO. 42 FOR -LOOPREV- PROFILE.
SEE SHEET NO. 42 FOR -SBLREV- PROFILE.
SEE SHEET NO. 58, 59 FOR -Y1REV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
SEE SHEET NO. 71 FOR -RPBREV- PROFILE.
SEE SHEET NO. 76, 77 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 79 FOR -SVRD3- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.



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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

BARNHILL CONTRACTING COMPANY

PROJECT REFERENCE NO.	SHEET NO.
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 MECHANIZED CLEARING

NAD 83

MATCH LINE -Y0A- STA. 40+00 SEE SHEET 36

MATCH LINE -Y1- STA. 69+00, SEE SHEET 8

GRASS SWALE DATA
DA= 0.49 AC
SLOPE= 0.57%
L REQ.= 49.10 FT
L PRO.= 70.00 FT
Q2= 1.05 CFS
V2= 1.27 FPS
Q10= 1.37 CFS
V10= 1.36 FPS
SIDE SLOPES= 3

HEAD 'V' DITCH
L=50', S=3.6%
SEE DETAIL "T"

TAIL 'V' DITCH
L=70', S=0.6%
SEE DETAIL "Q"

GRASS SWALE DATA
DA= 0.05 AC
SLOPE= 8.64%
L REQ.= 4.50 FT
L PRO.= 48.00 FT
Q2= 0.10 CFS
V2= 1.72 FPS
Q10= 0.13 CFS
V10= 1.84 FPS
SIDE SLOPES= 5

GRASS SWALE DATA
DA= 0.62 AC
SLOPE= 1.65%
L REQ.= 61.60 FT
L PRO.= 200.00 FT
Q2= 1.32 CFS
V2= 2.00 FPS
Q10= 1.72 CFS
V10= 2.14 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 5.40 AC
SLOPE= 1.79%
L REQ.= 540.00 FT
L PRO.= 70.00 FT
Q2= 11.53 CFS
V2= 3.73 FPS
Q10= 15.09 CFS
V10= 4.00 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.36 AC
SLOPE= 3.08%
L REQ.= 35.80 FT
L PRO.= 220.00 FT
Q2= 0.76 CFS
V2= 2.21 FPS
Q10= 1.00 CFS
V10= 2.36 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.50 AC
SLOPE= 3.16%
L REQ.= 50.40 FT
L PRO.= 165.00 FT
Q2= 1.20 CFS
V2= 2.49 FPS
Q10= 1.56 CFS
V10= 2.67 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 1.24 AC
SLOPE= 0.31%
L REQ.= 124.00FT
L PRO.= 474.00 FT
Q2= 2.65 CFS
V2= 1.09 FPS
Q10= 3.46 CFS
V10= 1.16 FPS
SIDE SLOPES= 6

LATERAL 'V' DITCH
SEE DETAIL "A"

HEAD 2' BASE DITCH
wCLASS 'B' RIP RAP
L=70', S= 1.8%
SEE DETAIL "U"

CLASS 'B' RIP RAP
EST 3 TONS
EST 10 SY FF

SPECIAL CUT DITCH
SEE DETAIL "J"

CLASS 'B' RIP RAP
@ DITCH TIE IN

CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY FF

GRASS SWALE DATA
DA= 5.40 AC
SLOPE= 1.13%
L REQ.= 540.00 FT
L PRO.= 330.00 FT
Q2= 11.53 CFS
V2= 2.94 FPS
Q10= 15.09 CFS
V10= 3.16 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.19 AC
SLOPE= 2.55%
L REQ.= 18.70 FT
L PRO.= 200.00 FT
Q2= 0.40 CFS
V2= 1.75 FPS
Q10= 0.52 CFS
V10= 1.87 FPS
SIDE SLOPES= 3

TAIL 2' BASE DITCH
L=330', S= 1.13%

LATERAL 'V' DITCH
SEE DETAIL "A"

SDG
SEE DETAIL "J"

CLASS 'B' RIP RAP
EST 3 TONS
EST 10 SY FF

LATERAL 2'
BASE DITCH
SEE DETAIL "B"

GRASS SWALE DATA
DA= 0.79 AC
SLOPE= 4.80%
L REQ.= 78.60 FT
L PRO.= 100.00 FT
Q2= 2.98 CFS
V2= 3.14 FPS
Q10= 3.90 CFS
V10= 3.36 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 1.04 AC
SLOPE= 0.36%
L REQ.= 103.60 FT
L PRO.= 500.00 FT
Q2= 4.30 CFS
V2= 1.36 FPS
Q10= 5.63 CFS
V10= 1.45 FPS
SIDE SLOPES= 5

LAWRENCE B. HARRELSON, ETUX

KATHY R. SUMMERLIN, ETVIR

WILBUR S. McKEITHAN

GRASS SWALE DATA
DA= 1.31 AC
SLOPE= 0.31%
L REQ.= 131.40 FT
L PRO.= 550.00 FT
Q2= 5.45 CFS
V2= 1.51 FPS
Q10= 7.14 CFS
V10= 1.62 FPS
SIDE SLOPES= 5

GRASS SWALE DATA
DA= 0.26 AC
SLOPE= 2.50%
L REQ.= 26.30 FT
L PRO.= 200.00 FT
Q2= 0.56 CFS
V2= 1.62 FPS
Q10= 0.73 CFS
V10= 1.73 FPS
SIDE SLOPES= 6

PIPE OUTLET DATA
DA= 18.02 AC
SLOPE= 0.3%
Q2= 10.96 CFS
V2= 1.76 FPS
Q10= 14.89 CFS
V10= 1.93 FPS

SITE 2

CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY FF

CLASS 'B'
RIP RAP
EST 2 TONS
EST 7 SY FF

2' BASE SPECIAL
DITCH-GRADE
SEE DETAIL "C"

GRASS SWALE DATA
DA= 2.90 AC
SLOPE= 0.30%
L REQ.= 290.00 FT
L PRO.= 233.00 FT
Q2= 6.19 CFS
V2= 1.45 FPS
Q10= 8.10 CFS
V10= 1.55 FPS
SIDE SLOPES= 4

15" CAAP W/ ELBOWS

PLACE INVERT OF PIPE 1' HIGHER THAN EXISTING GROUND TO PROMOTE DETENTION

GRADE TO DRAIN

JB w/MH DESIGNED AS A DROP BOX. OUTLET PIPE SHALL RE-SET AT 0.5%

CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY FF

PERMIT DRAWINGS
SHEET 19 OF 108

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color-eng.100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Pro\R2633AA&AB_RDY_PSH_09.dgn

PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 8:51:04 AM 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

BARNHILL CONTRACTING COMPANY

PROJECT REFERENCE NO.	SHEET NO.
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 MECHANIZED CLEARING

NAD 83

MATCH LINE -Y0A- STA. 40+00 SEE SHEET 36

MATCH LINE -Y1- STA. 69+00, SEE SHEET 8

GRASS SWALE DATA
DA= 0.49 AC
SLOPE= 0.57%
L REQ.= 49.10 FT
L PRO.= 70.00 FT
Q2= 1.05 CFS
V2= 1.27 FPS
Q10= 1.37 CFS
V10= 1.36 FPS
SIDE SLOPES= 3

HEAD 'V' DITCH
L=50', S=3.6%
SEE DETAIL "T"

TAIL 'V' DITCH
L=70', S=0.6%
SEE DETAIL "Q"

GRASS SWALE DATA
DA= 0.05 AC
SLOPE= 8.54%
L REQ.= 4.50 FT
L PRO.= 48.00 FT
Q2= 0.10 CFS
V2= 1.72 FPS
Q10= 0.13 CFS
V10= 1.84 FPS
SIDE SLOPES= 5

GRASS SWALE DATA
DA= 0.62 AC
SLOPE= 1.65%
L REQ.= 61.60 FT
L PRO.= 200.00 FT
Q2= 1.32 CFS
V2= 2.00 FPS
Q10= 1.72 CFS
V10= 2.14 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 5.40 AC
SLOPE= 1.79%
L REQ.= 540.00 FT
L PRO.= 70.00 FT
Q2= 11.53 CFS
V2= 3.73 FPS
Q10= 15.09 CFS
V10= 4.00 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.36 AC
SLOPE= 3.08%
L REQ.= 35.80 FT
L PRO.= 220.00 FT
Q2= 0.76 CFS
V2= 2.21 FPS
Q10= 1.90 CFS
V10= 2.36 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.50 AC
SLOPE= 3.16%
L REQ.= 50.40 FT
L PRO.= 155.00 FT
Q2= 1.20 CFS
V2= 2.49 FPS
Q10= 1.56 CFS
V10= 2.67 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 1.24 AC
SLOPE= 0.31%
L REQ.= 124.00FT
L PRO.= 474.00 FT
Q2= 2.65 CFS
V2= 1.09 FPS
Q10= 3.46 CFS
V10= 1.16 FPS
SIDE SLOPES= 6

LATERAL 'V' DITCH
SEE DETAIL "A"

HEAD 2' BASE DITCH
w/CLASS 'B' RIP RAP
L=70', S= 1.8%
SEE DETAIL "U"

CLASS 'B' RIP RAP
@ DITCH TIE IN

CLASS 'B' RIP RAP
EST 3 TONS
EST 10 SY FF

SPECIAL CUT DITCH
SEE DETAIL "J"

CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY FF

GRASS SWALE DATA
DA= 5.40 AC
SLOPE= 1.13%
L REQ.= 540.00 FT
L PRO.= 330.00 FT
Q2= 11.53 CFS
V2= 2.94 FPS
Q10= 15.09 CFS
V10= 3.16 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.19 AC
SLOPE= 2.55%
L REQ.= 18.70 FT
L PRO.= 200.00 FT
Q2= 0.40 CFS
V2= 1.75 FPS
Q10= 0.52 CFS
V10= 1.87 FPS
SIDE SLOPES= 3

TAIL 2' BASE DITCH
L=330', S= 1.13%

LATERAL 'V' DITCH
SEE DETAIL "A"

SDG
SEE DETAIL "J"

CLASS 'B' RIP RAP
EST 3 TONS
EST 10 SY FF

LATERAL 2'
BASE DITCH
SEE DETAIL "B"

GRASS SWALE DATA
DA= 0.79 AC
SLOPE= 4.80%
L REQ.= 78.60 FT
L PRO.= 100.00 FT
Q2= 2.98 CFS
V2= 3.14 FPS
Q10= 3.90 CFS
V10= 3.36 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 1.04 AC
SLOPE= 0.36%
L REQ.= 103.60 FT
L PRO.= 500.00 FT
Q2= 4.30 CFS
V2= 1.36 FPS
Q10= 5.63 CFS
V10= 1.45 FPS
SIDE SLOPES= 5

GRASS SWALE DATA
DA= 0.26 AC
SLOPE= 2.60%
L REQ.= 26.30 FT
L PRO.= 200.00 FT
Q2= 0.56 CFS
V2= 1.62 FPS
Q10= 0.73 CFS
V10= 1.73 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 1.31 AC
SLOPE= 0.31%
L REQ.= 131.40 FT
L PRO.= 550.00 FT
Q2= 5.45 CFS
V2= 1.51 FPS
Q10= 7.14 CFS
V10= 1.62 FPS
SIDE SLOPES= 5

PIPE OUTLET DATA
DA= 18.02 AC
SLOPE= 0.3%
Q2= 10.96 CFS
V2= 1.76 FPS
Q10= 14.89 CFS
V10= 1.93 FPS

SITE 2

PLACE INVERT OF PIPE 1' HIGHER THAN EXISTING GROUND TO PROMOTE DETENTION

JB w/MH DESIGNED AS A DROP BOX. OUTLET PIPE SHALL BE SET AT 0.5%

CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY FF

GRADE TO DRAIN

GRADE TO

SDG
SEE DETAIL "J"

15" CAAP W/ ELBOWS

CLASS 'B' RIP RAP
EST 2 TONS
EST 7 SY FF

2' BASE SPECIAL DITCH GRADE
SEE DETAIL "G"

GRASS SWALE DATA
DA= 2.90 AC
SLOPE= 0.30%
L REQ.= 290.00 FT
L PRO.= 233.00 FT
Q2= 6.19 CFS
V2= 1.45 FPS
Q10= 8.10 CFS
V10= 1.55 FPS
SIDE SLOPES= 4

LAWRENCE B. HARRELSON, ETUX

KATHY R. SUMMERLIN, ETVIR

WILBUR S. McKEITHAN

PERMIT DRAWINGS
SHEET 20 OF 108

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Pro\R2633AA&AB_RDY_PSH_09.dgn
PENTABLE: NCDOT_permits.tbl
DATE: 10/3/2010
TIME: 9:25:51 AM
SCALE: 1:100

8/17/99

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3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

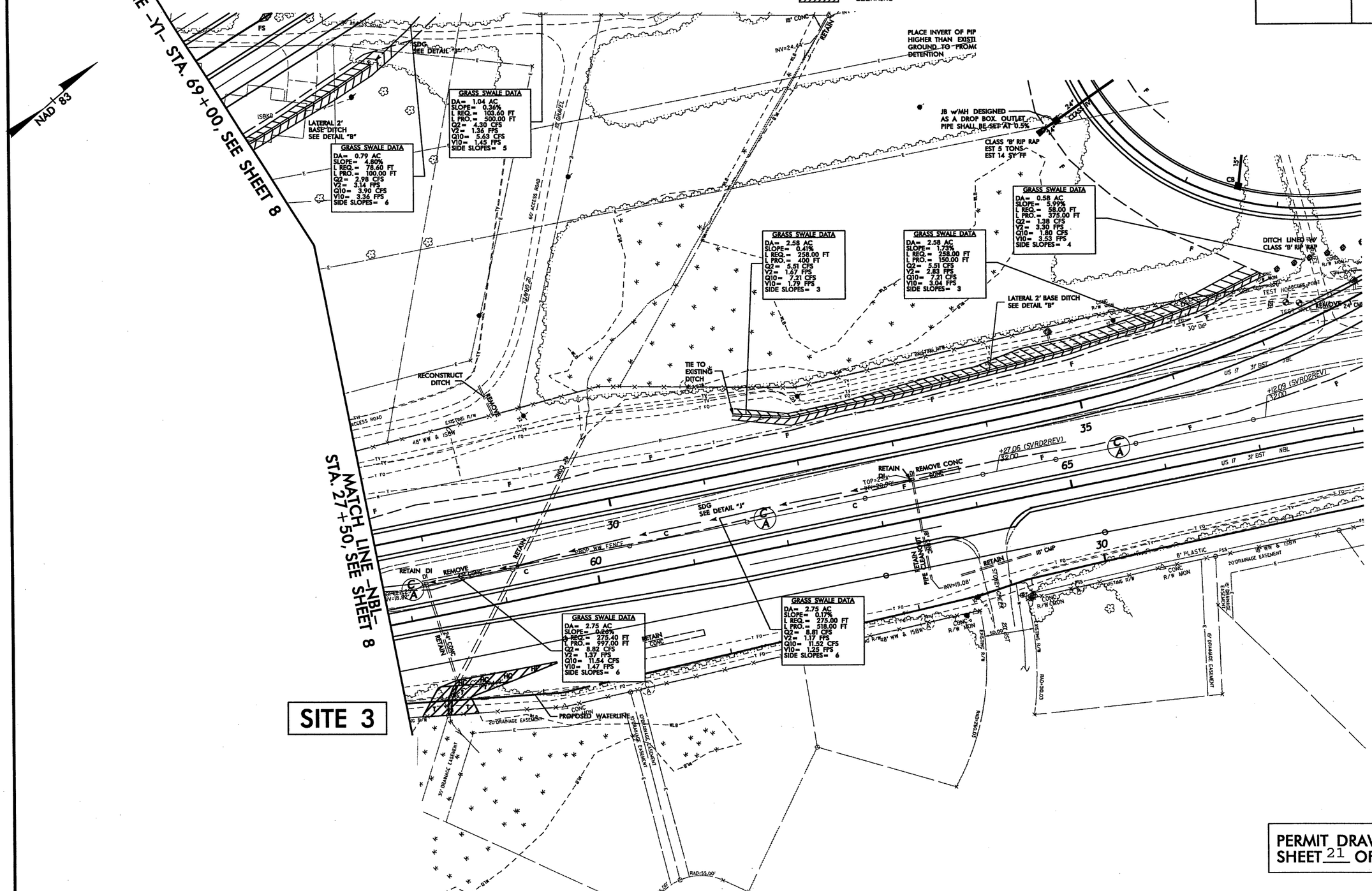
PROJECT REFERENCE NO.	SHEET NO.
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

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



PERMIT DRAWINGS
SHEET 21 OF 108

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REVISIONS

8/17/99

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3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

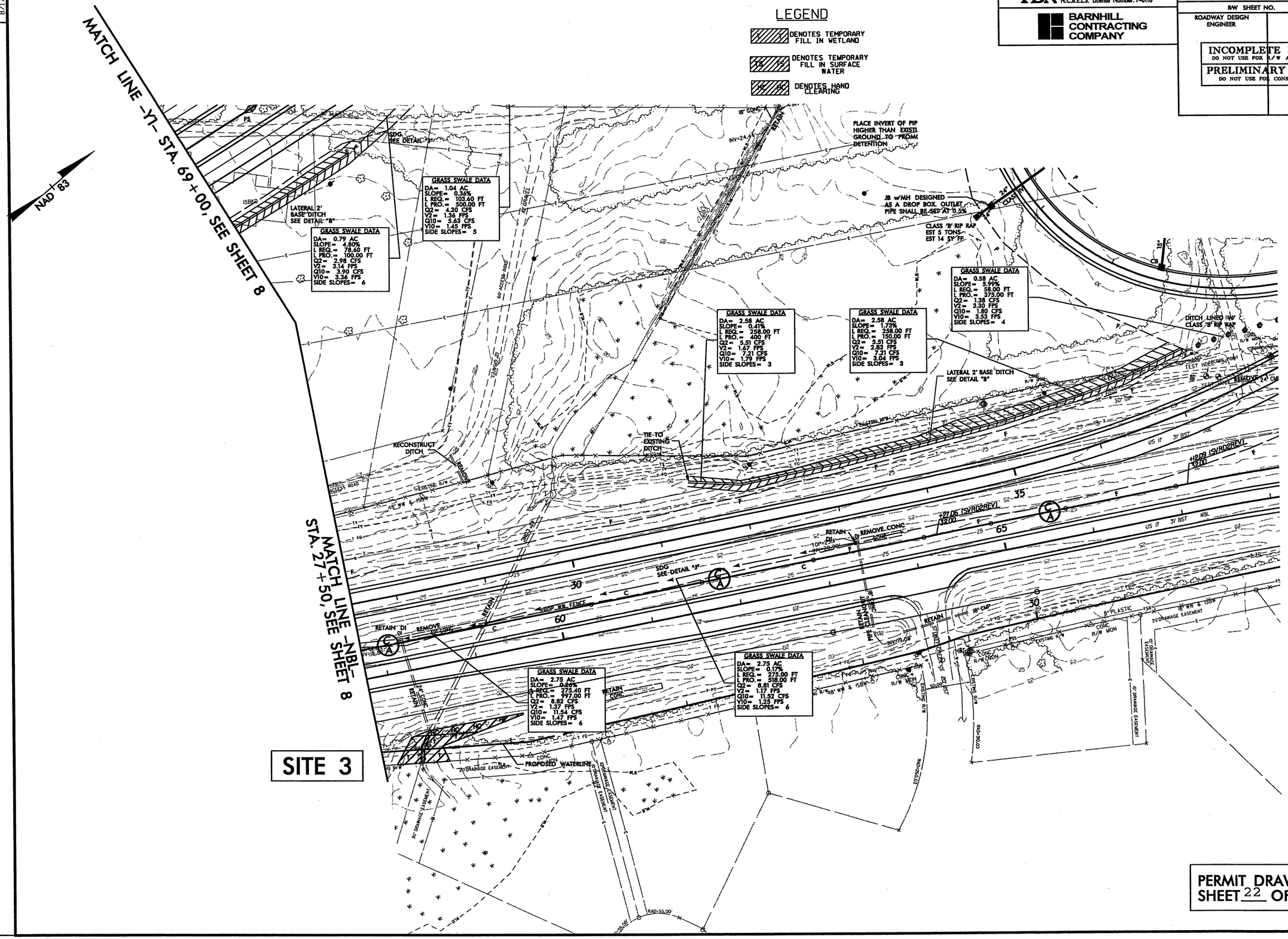
PROJECT REFERENCE NO.	SHEET NO.
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

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



PERMIT DRAWINGS
SHEET 22 OF 108

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: Jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_09.dgn
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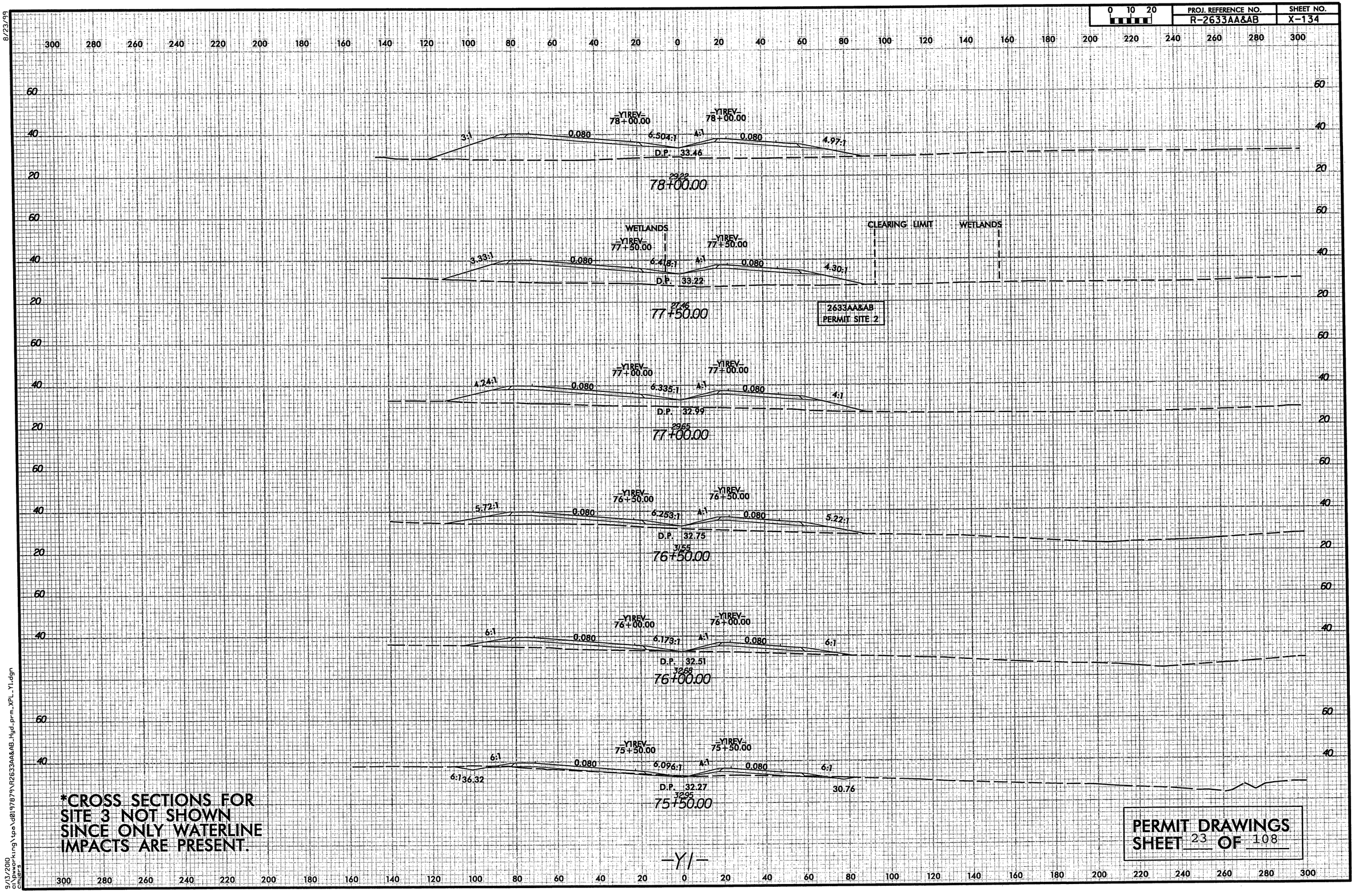

*CROSS SECTIONS FOR SITE 3 NOT SHOWN SINCE ONLY WATERLINE IMPACTS ARE PRESENT.

PERMIT DRAWINGS
SHEET 23 OF 108

8/23/99

9/13/2010
c:\pwworking\tpo\d0197879\R2633AA&AB_Hyd_prm_XPL_Y1.dgn
cmiers

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	10
R/W SHEET NO. R-2633A 9 & 10	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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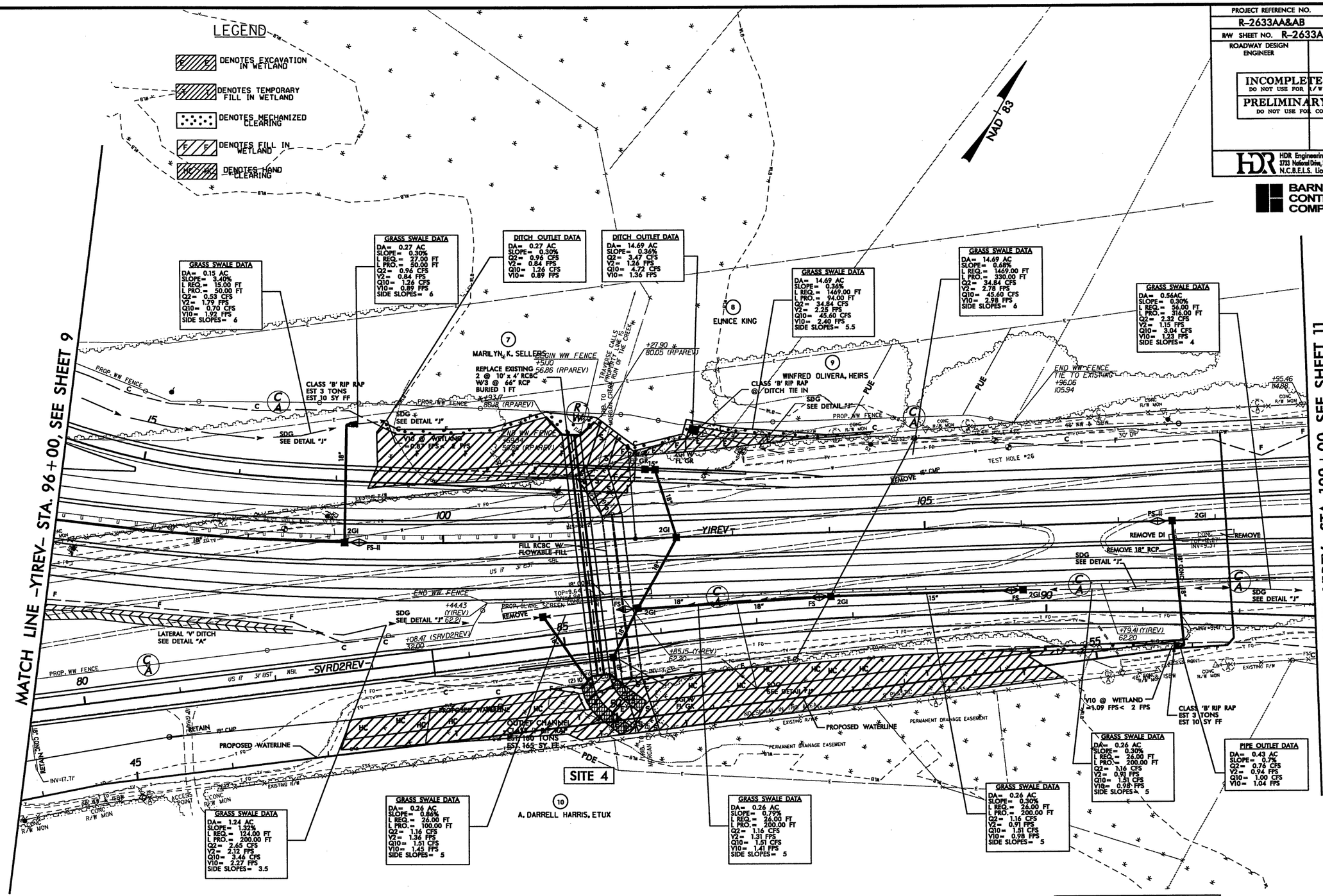
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 24 OF 108

SEE SHEET NO. 60 FOR -Y1REV- PROFILE.
SEE SHEET NO. 77 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_10.dgn
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TIME: 8:53:06 AM
DATE: 10/3/2010
SCALE: 1:100

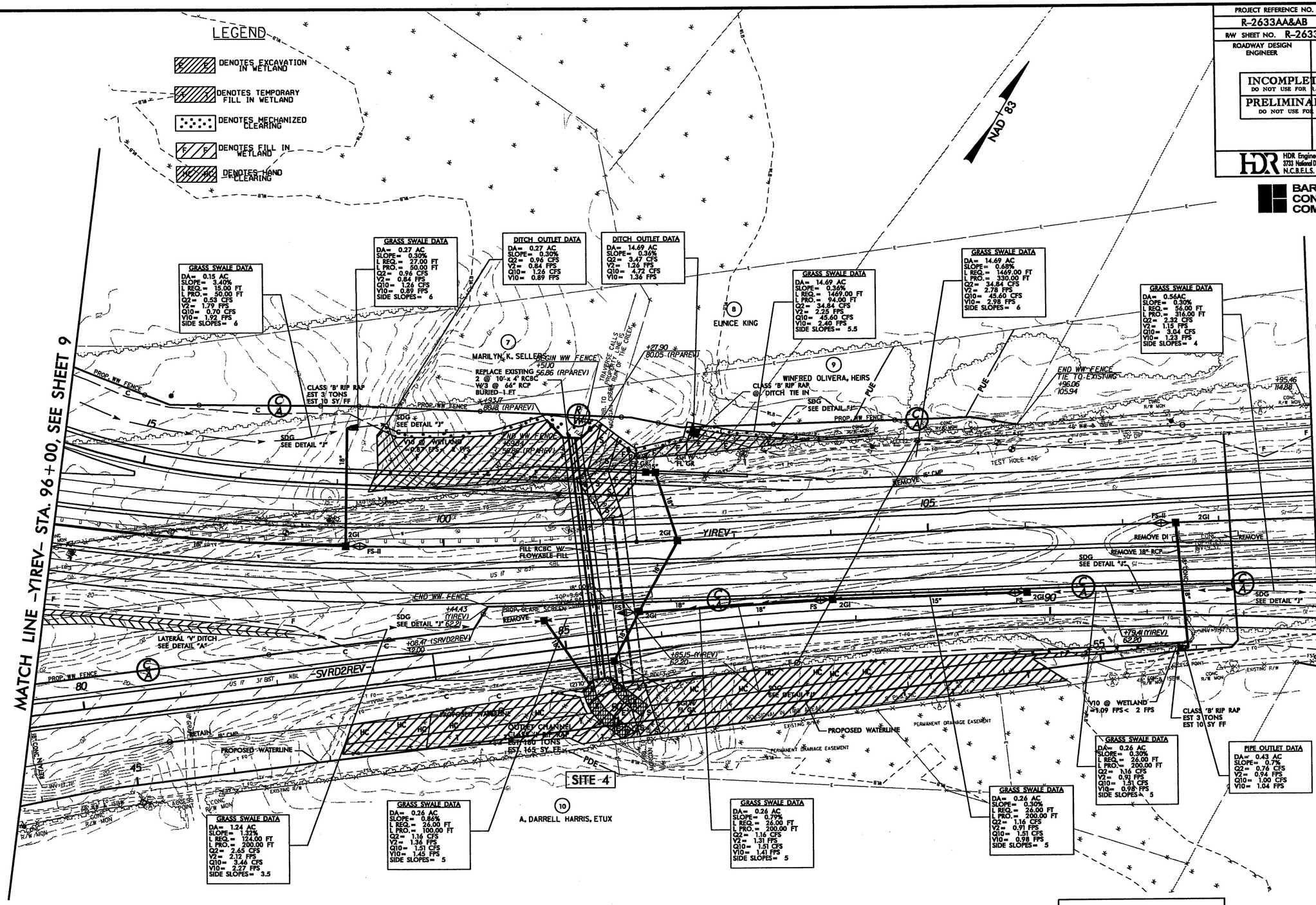
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	10
R/W SHEET NO. R-2633A 9 & 10	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 25 OF 108

SEE SHEET NO. 60 FOR -Y1REV- PROFILE.
SEE SHEET NO. 77 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

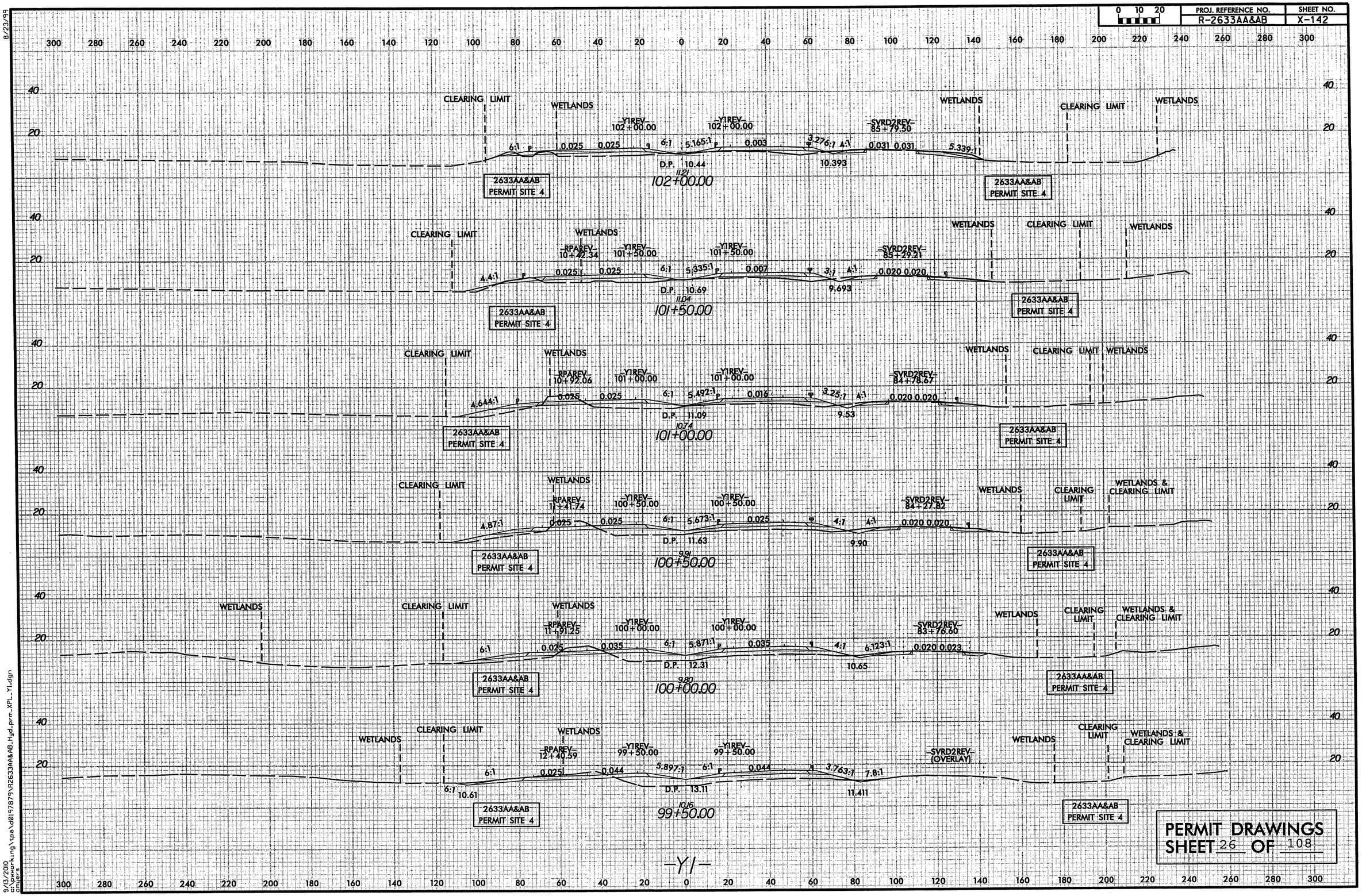
REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: jmossroc DATE: 10/3/2010 TIME: 9:27:58 AM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_10.dgn

8/17/99

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-142



PERMIT DRAWINGS
SHEET 26 OF 108

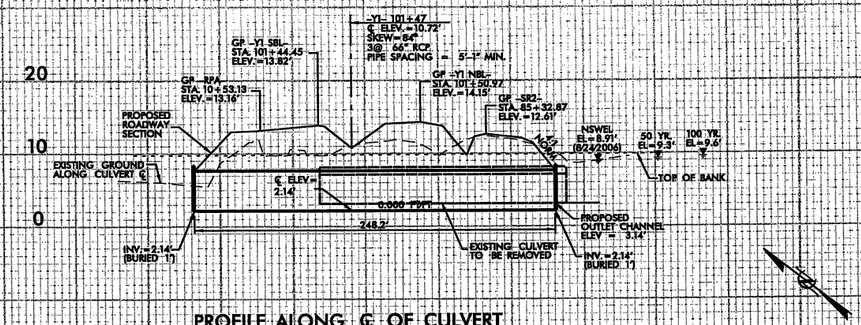
9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_Y1.dgn
cmiers

PROJECT REFERENCE NO.	SHEET NO.
2633AA&AB	CSR 2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 4 2633AA&AB



PROFILE ALONG ℄ OF CULVERT

WSEL TABLE

YEAR	DISCHARGE (CFS)	EXISTING (CORRECTED EFFECTIVE)	PROPOSED
10	250	9.1	9.1
50	380	9.6	9.3
100	490	9.9	9.6
500	600	11.3	10.0

PERMIT DRAWINGS
SHEET 27 OF 108

PLOT DRIVER: $PLTDRVS$
USER: $USER$ DATE: 9/13/2010
FILE: $PWVARVAULTPATHDESC$
PENTABLE: $PENTBLS$
TIME: 3:13:19 PM SCALE: $SCALESHORT$
5/28/99

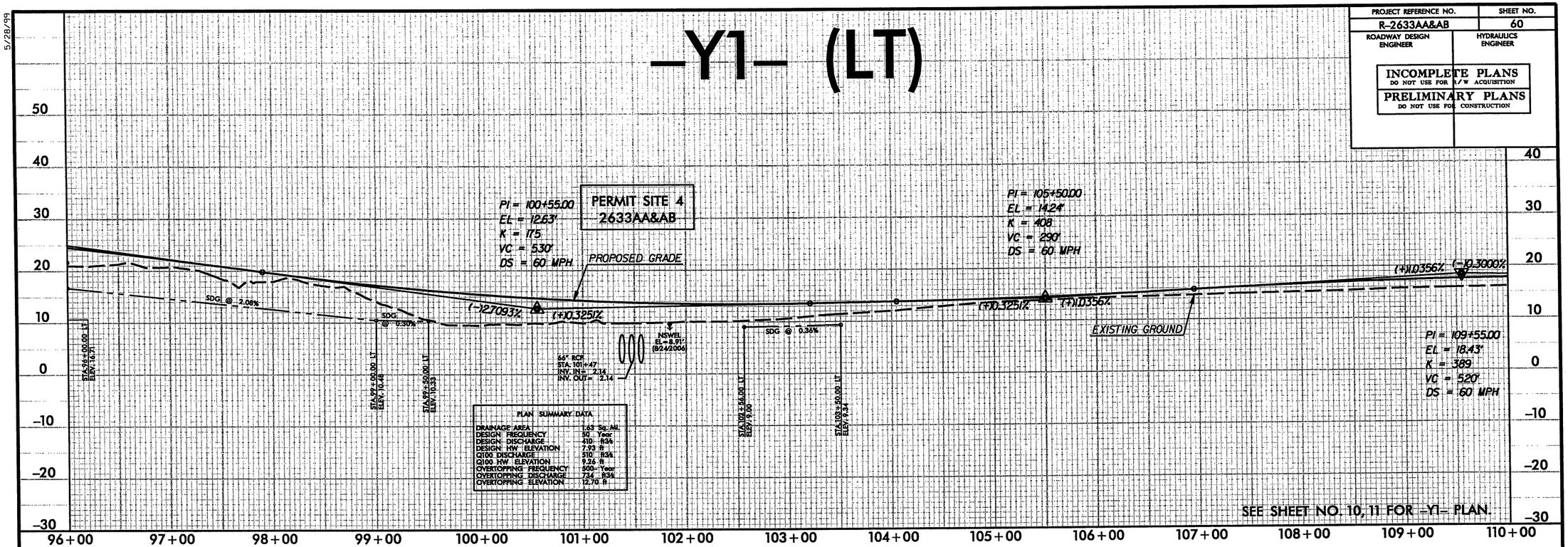
5/28/99

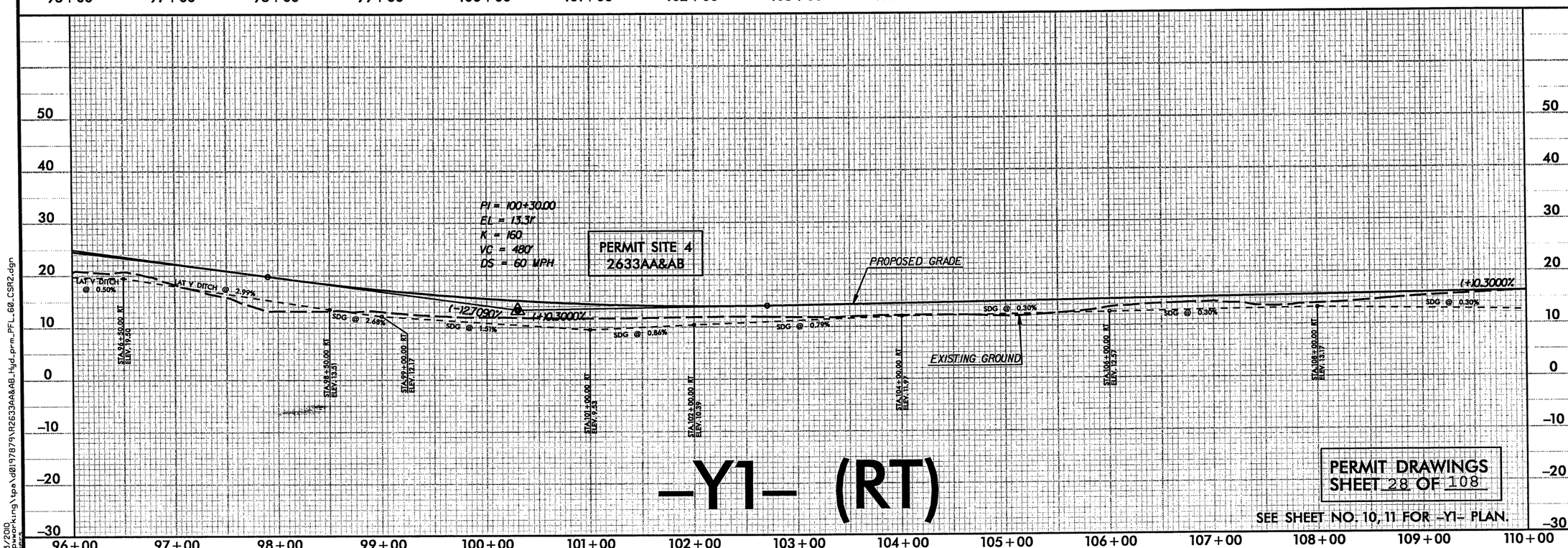
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	60
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1- (LT)





-Y1- (RT)

9/13/2010
c:\pwworking\tpe\d0197879\R2633AA&AB_Hyd_prm_PFL_60_CSR2.dgn

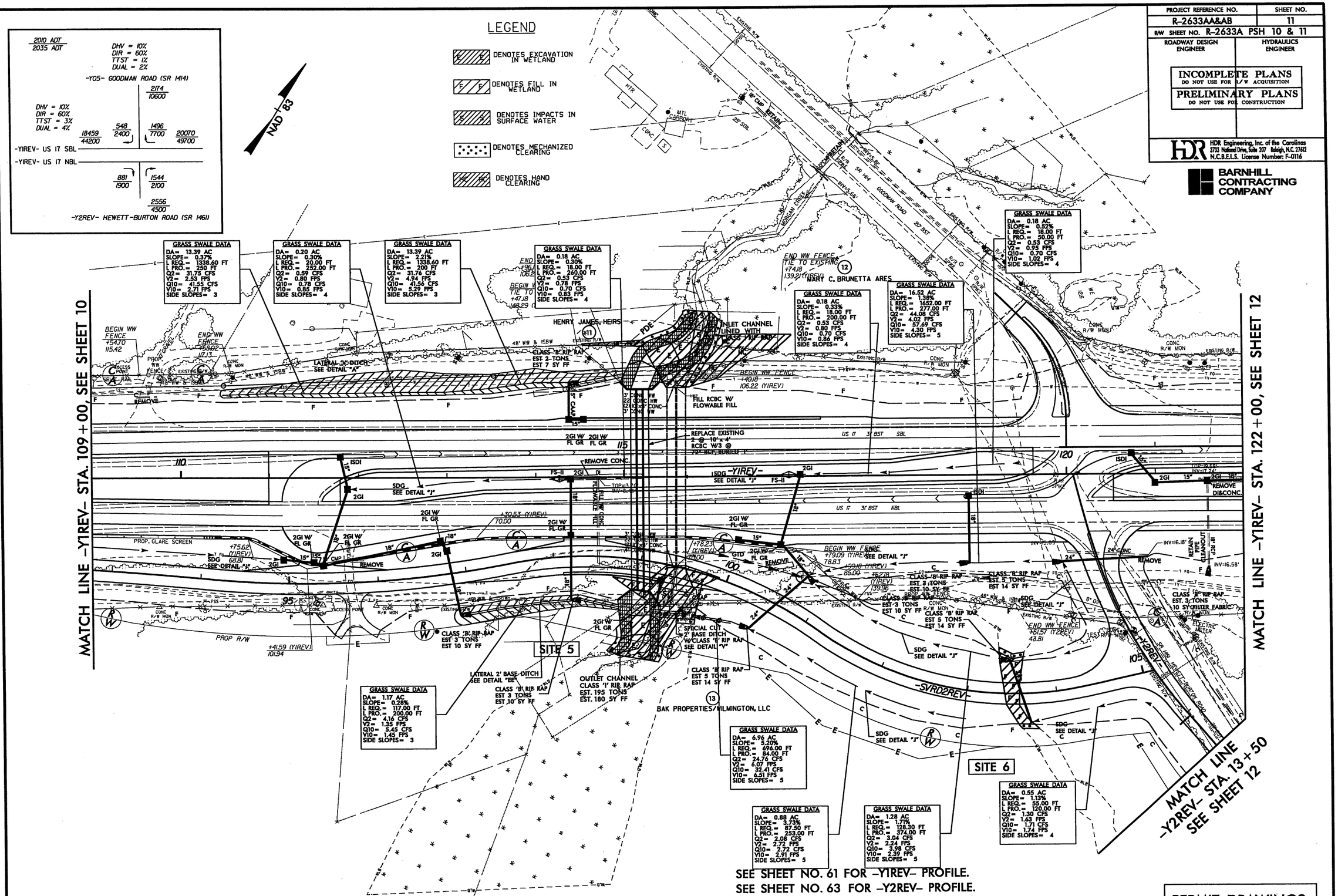
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	11
R/W SHEET NO. R-2633A PSH 10 & 11	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 61 FOR -Y1REV- PROFILE.
SEE SHEET NO. 63 FOR -Y2REV- PROFILE.
SEE SHEET NO. 77, 78 FOR -SVRD2REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 29 OF 108

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_11.dgn
PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 1:55:43 PM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	11
R/W SHEET NO. R-2633A PSH 10 & 11	
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

BARNHILL CONTRACTING COMPANY

2010 ADT
2035 ADT

DHV = 10%
DIR = 60%
TTST = 1%
DUAL = 2%

-Y05- GOODMAN ROAD (SR 1414)

2174
10600

DHV = 10%
DIR = 60%
TTST = 3%
DUAL = 4%

18459
44200

548
2400

1496
7700

20070
49700

-YIREV- US 17 SBL

-YIREV- US 17 NBL

881
1900

1544
2100

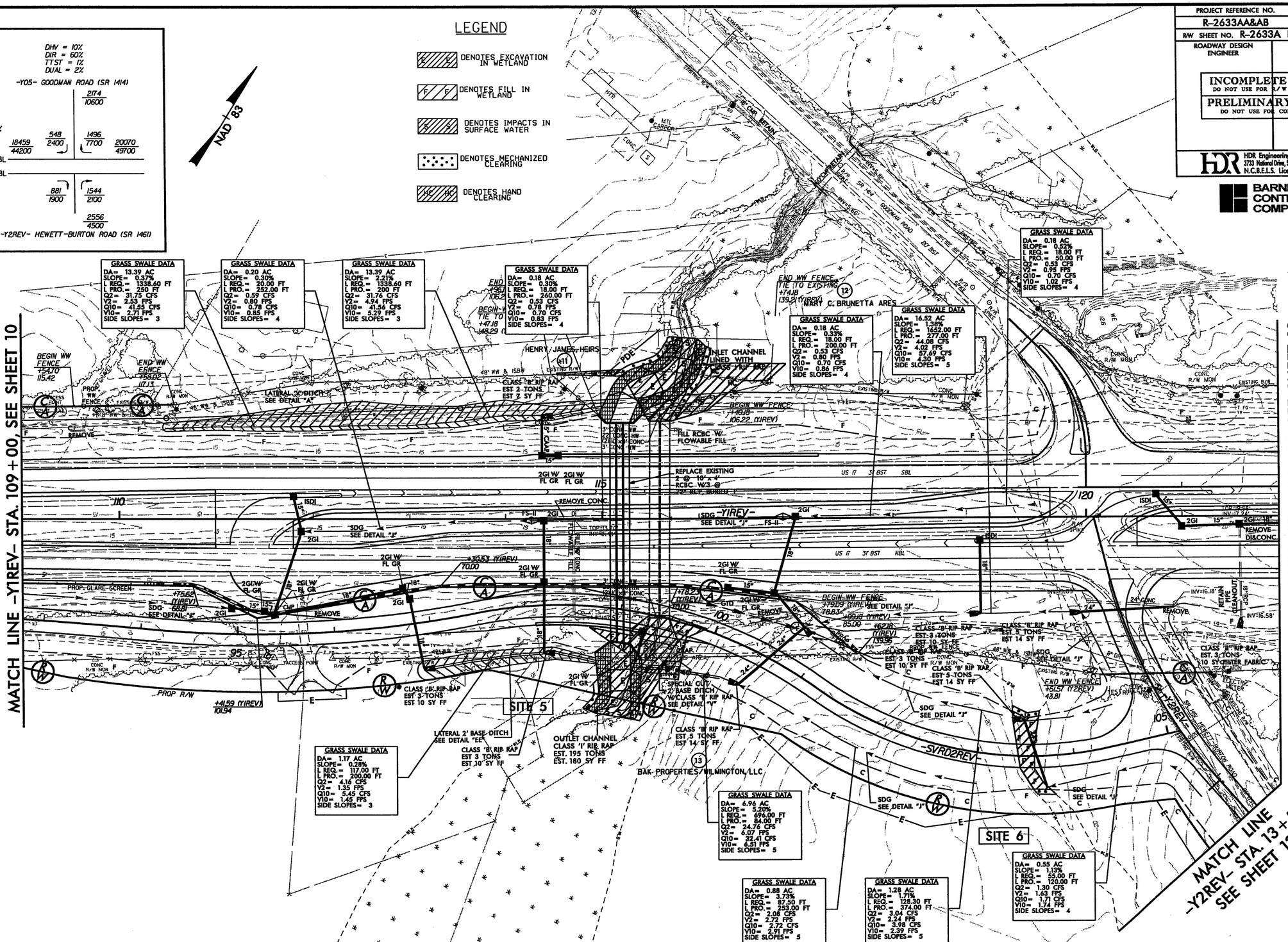
2556
4500

-Y2REV- HEWETT-BURTON ROAD (SR 1461)

NAD 83

LEGEND

- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING



SEE SHEET NO. 61 FOR -YIREV- PROFILE.
SEE SHEET NO. 63 FOR -Y2REV- PROFILE.
SEE SHEET NO. 77, 78 FOR -SVRD2REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 30 OF 108

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: jmassroc DATE: 10/3/2010 TIME: 11:57:01 PM SCALE: 1:100
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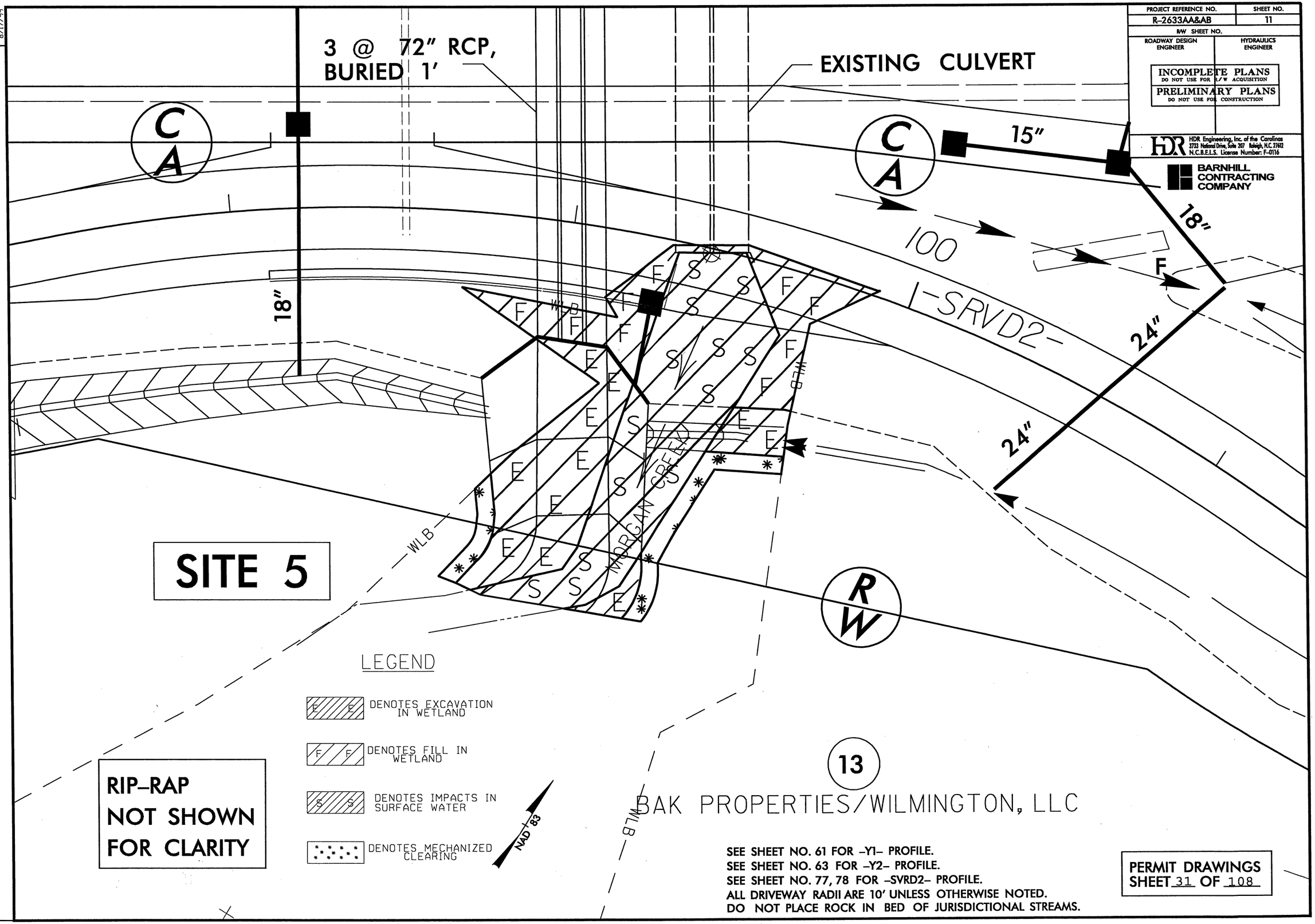
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 61 FOR -Y1- PROFILE.
SEE SHEET NO. 63 FOR -Y2- PROFILE.
SEE SHEET NO. 77, 78 FOR -SVRD2- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 31 OF 108

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_11.dgn
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TIME: 2:10:49 PM SCALE: 1:25

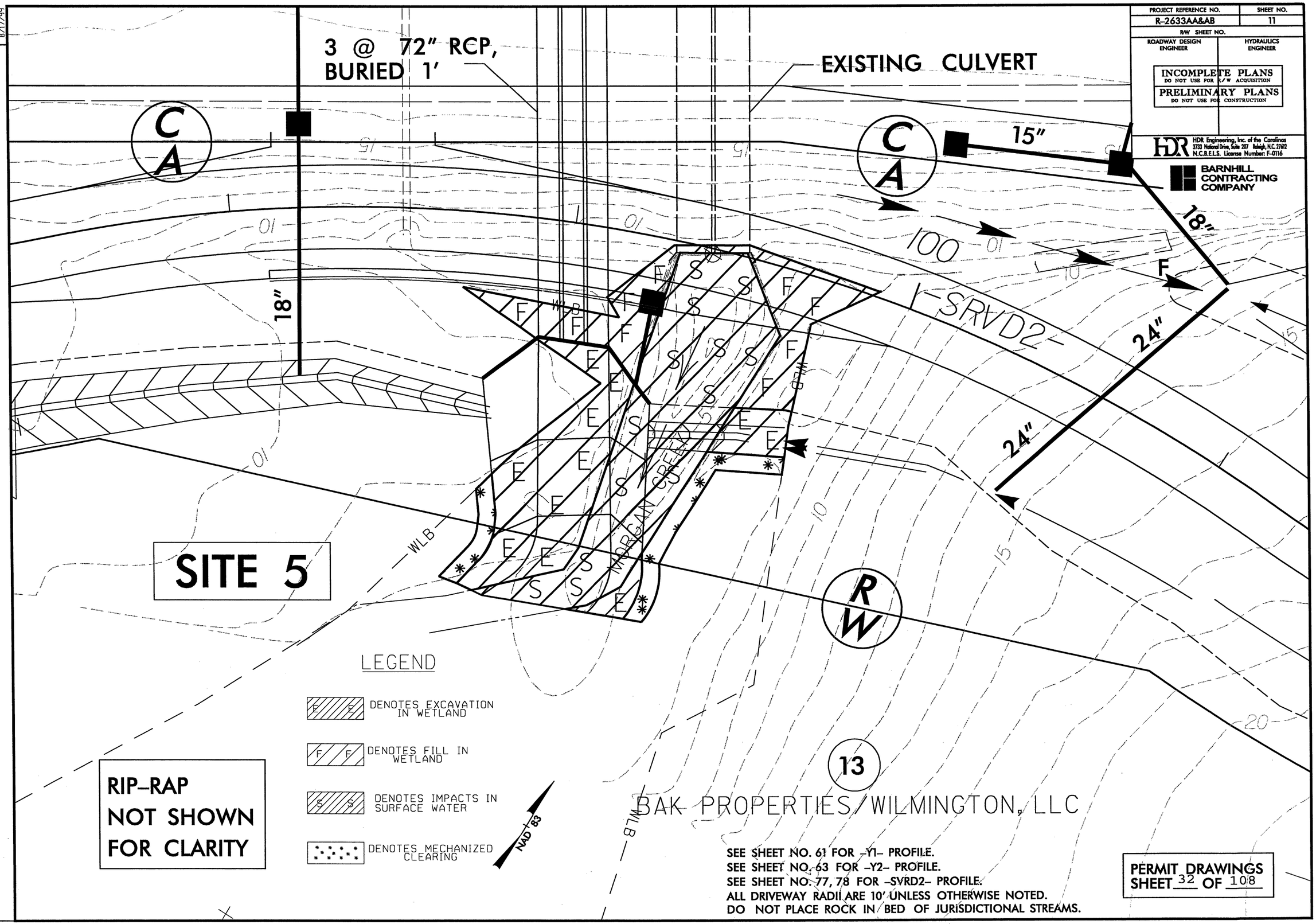
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 61 FOR -Y1- PROFILE.
SEE SHEET NO. 63 FOR -Y2- PROFILE.
SEE SHEET NO. 77, 78 FOR -SVRD2- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 32 OF 108

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng.100.plt PENTABLE: NCDOT_permits.tbl
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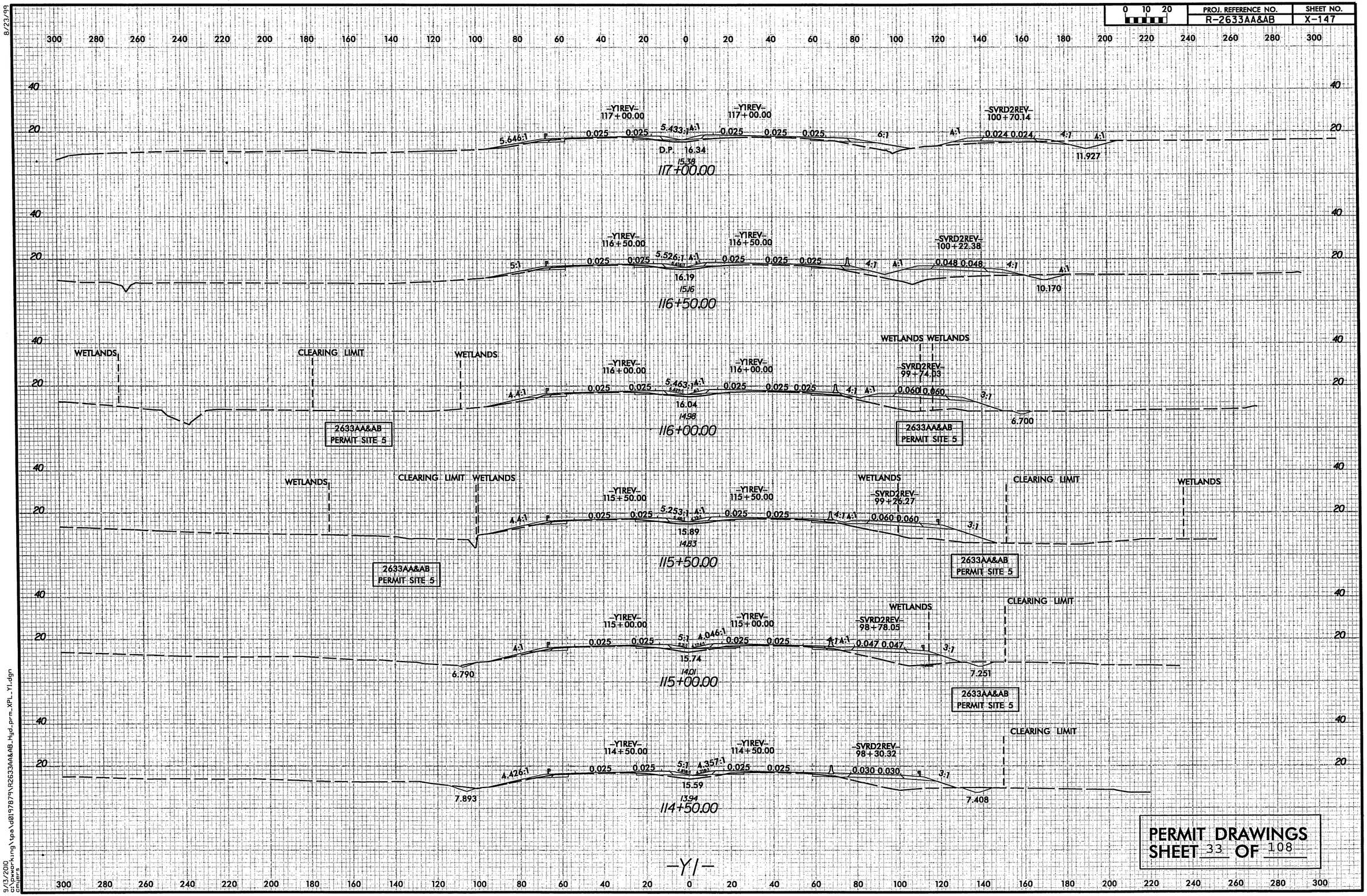
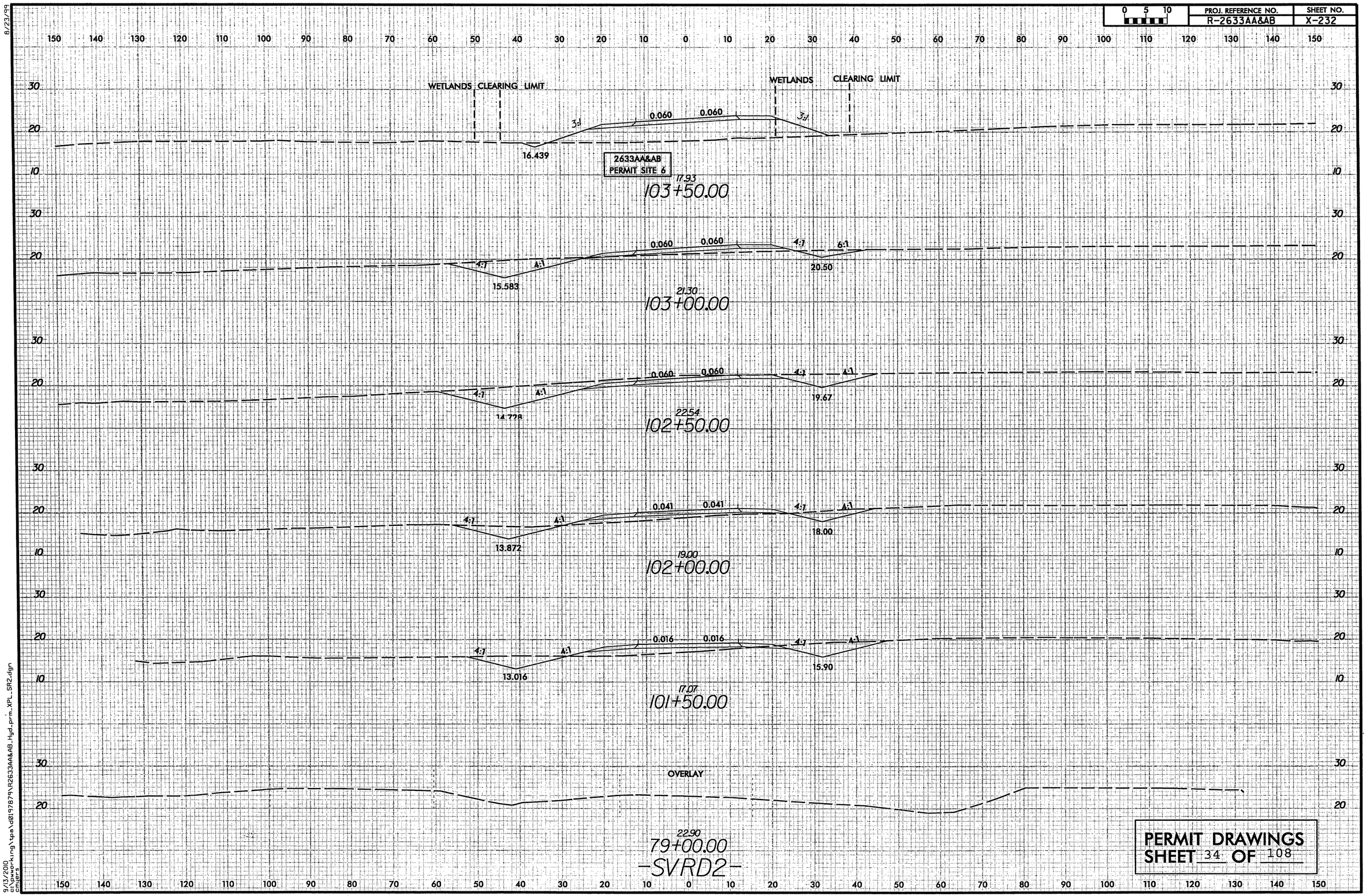


8/23/99

9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_Y1.dgn
cmiers

PROJ. REFERENCE NO.	SHEET NO.
R-2633AA&AB	X-232



PERMIT DRAWINGS
SHEET 34 OF 108

8/23/99

9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_SR2.dgn
cmiers

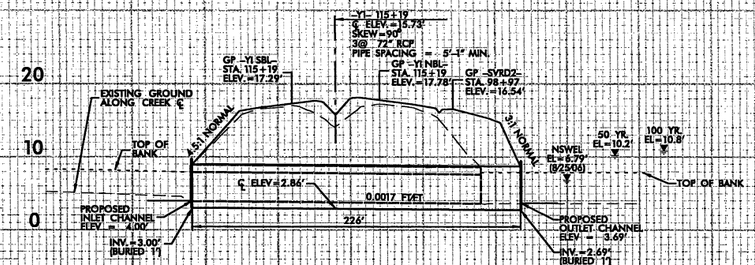
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
2633AA&AB	CSR 3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 5 2633AA&AB



PROFILE ALONG ℄ OF CULVERT

RURAL REGRESSION
WSEL TABLE (STA. 10815.7)

YEAR	DISCHARGE (CFS)	NATURAL	PROPOSED
10	310	9.5	9.7
50	550	10.5	11.6
100	650	11.0	12.7
500	950	11.8	15.7

FEMA WSEL TABLE (STA 10815.7)

YEAR	DISCHARGE (CFS)	CORRECTED EFFECTIVE	REVISED
100	1120	16.9	16.9
100 FW	1120	17.2	17.7

PERMIT DRAWINGS
SHEET 35 OF 108

PLOT DRIVER: $PLTDRVS$
USER: $USER$ DATE: 9/13/2010
FILE: $PWVARVAU$TPATHDESC$

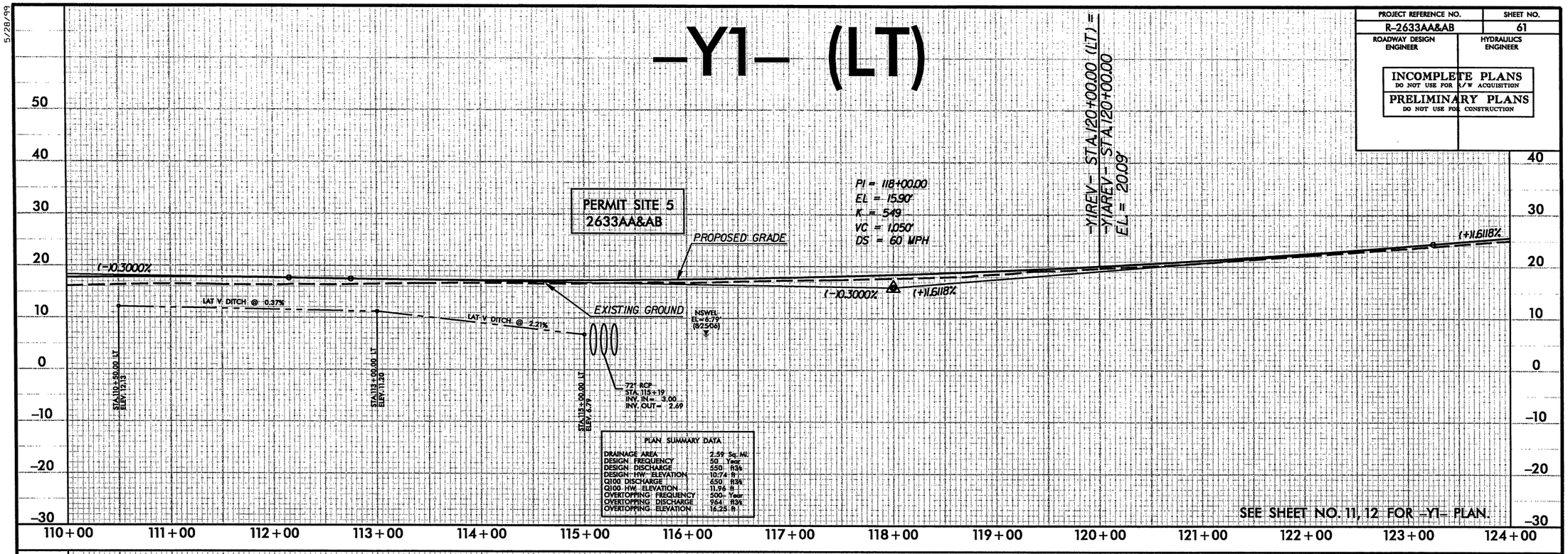
PENTABLE: $PENTBLS$
TIME: 3:13:34 PM SCALE: $SCALESHORT$

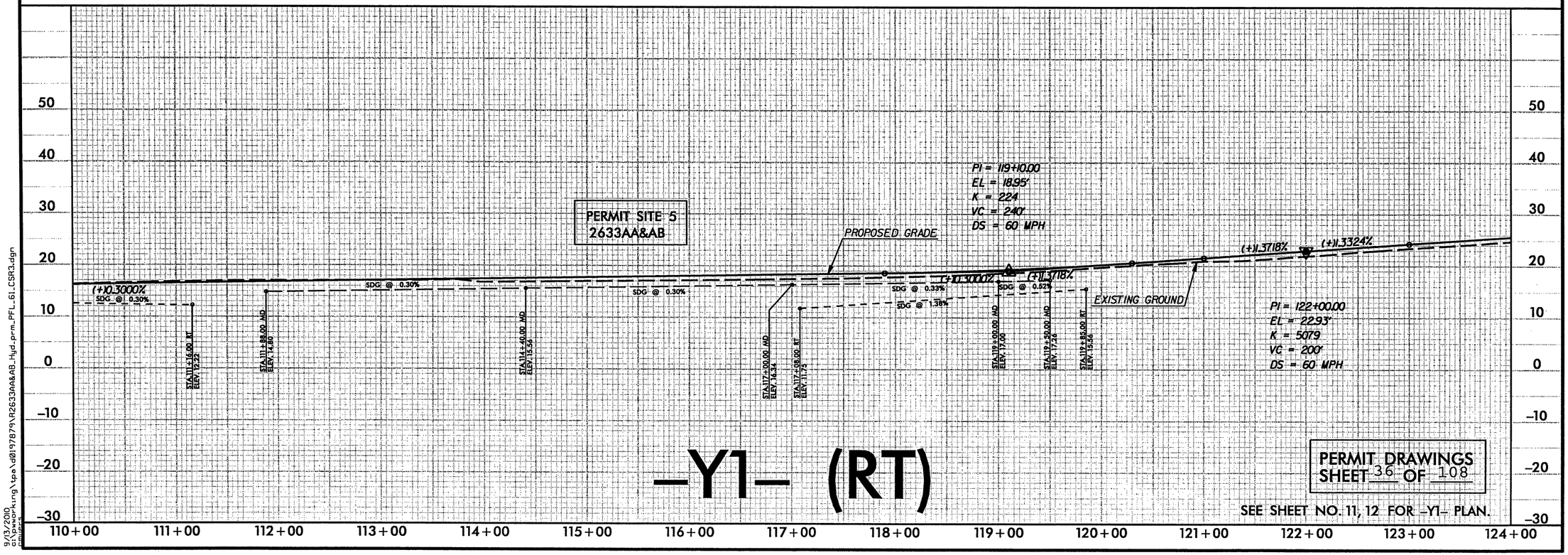
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1- (LT)





-Y1- (RT)

PERMIT DRAWINGS
SHEET 36 OF 108

5/28/99

9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_PFL_61_CSR3.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	13
R/W SHEET NO. R-2633A PSH 13 &14	
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

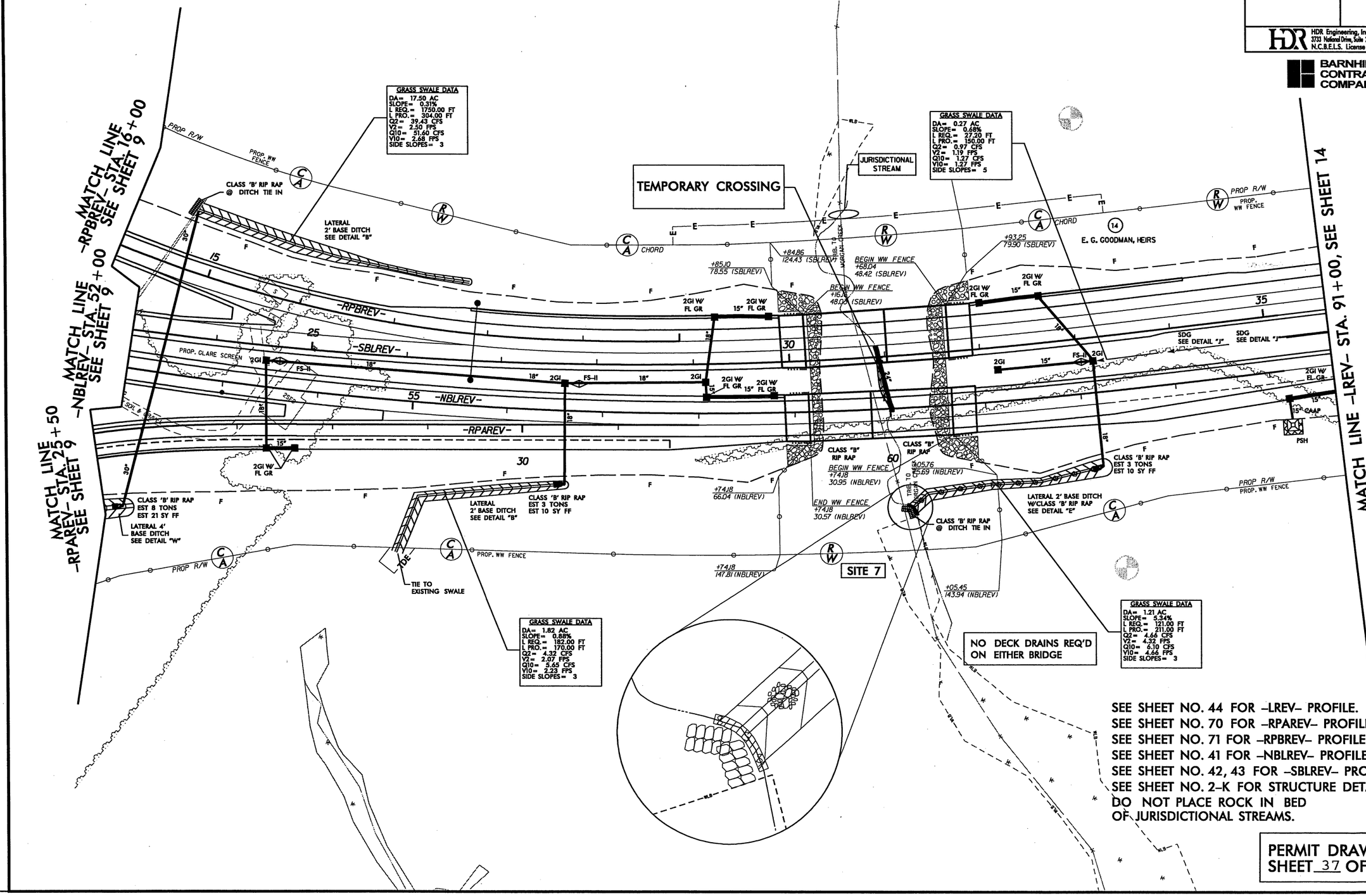
BARNHILL CONTRACTING COMPANY

LEGEND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83



SEE SHEET NO. 44 FOR –LREV– PROFILE.
SEE SHEET NO. 70 FOR –RPAREV– PROFILE.
SEE SHEET NO. 71 FOR –RPBREV– PROFILE.
SEE SHEET NO. 41 FOR –NBLREV– PROFILE.
SEE SHEET NO. 42, 43 FOR –SBLREV– PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 37 OF 108

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	13
R/W SHEET NO. R-2633A PSH 13 &14	
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

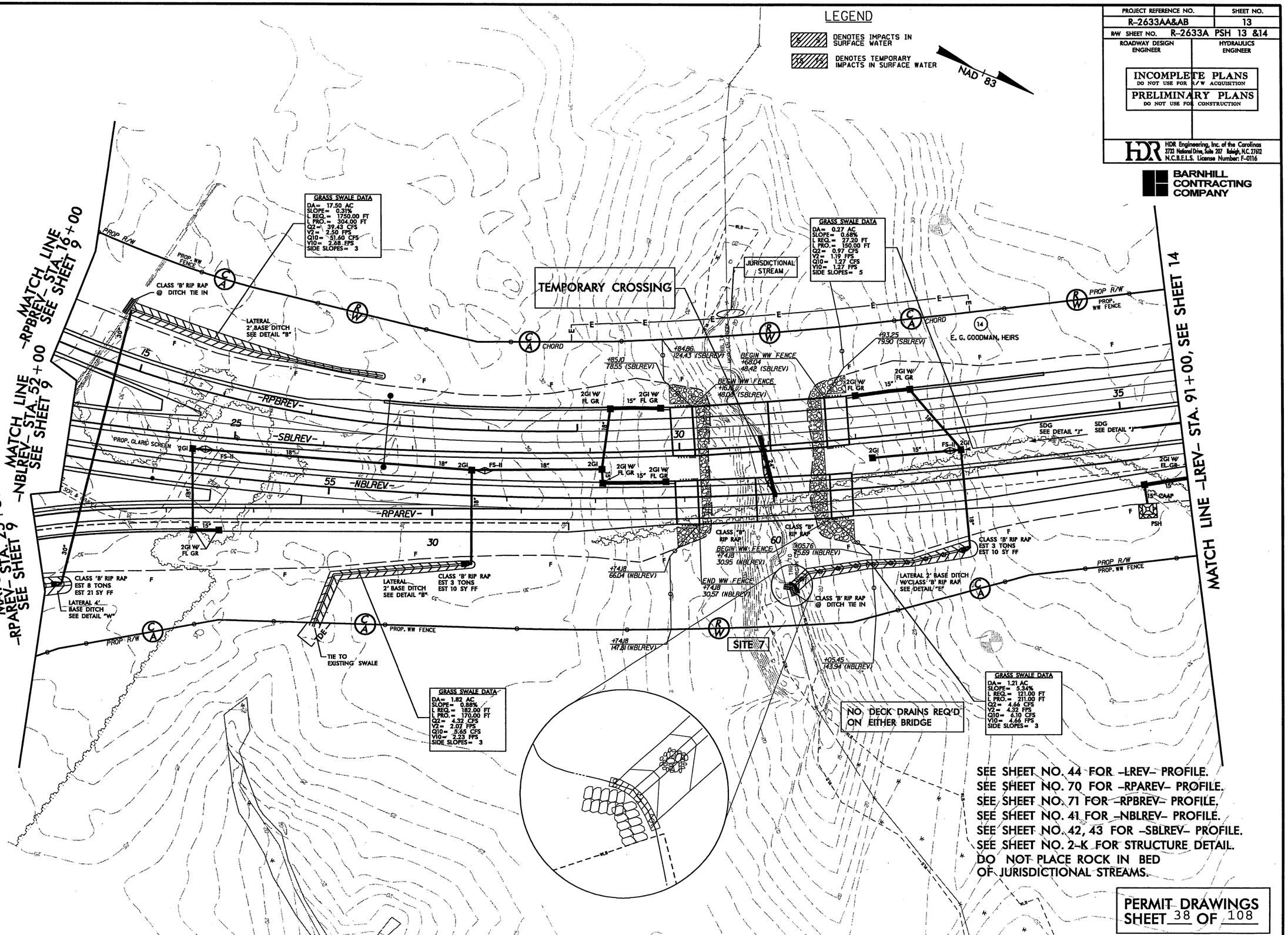
BARNHILL CONTRACTING COMPANY

LEGEND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83



SEE SHEET NO. 44 FOR -LREV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
SEE SHEET NO. 71 FOR -RPBREV- PROFILE.
SEE SHEET NO. 41 FOR -NBLREV- PROFILE.
SEE SHEET NO. 42, 43 FOR -SBLREV- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 38 OF 108

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: jmassroc DATE: 10/3/2010 TIME: 9:30:46 AM SCALE: 1:100
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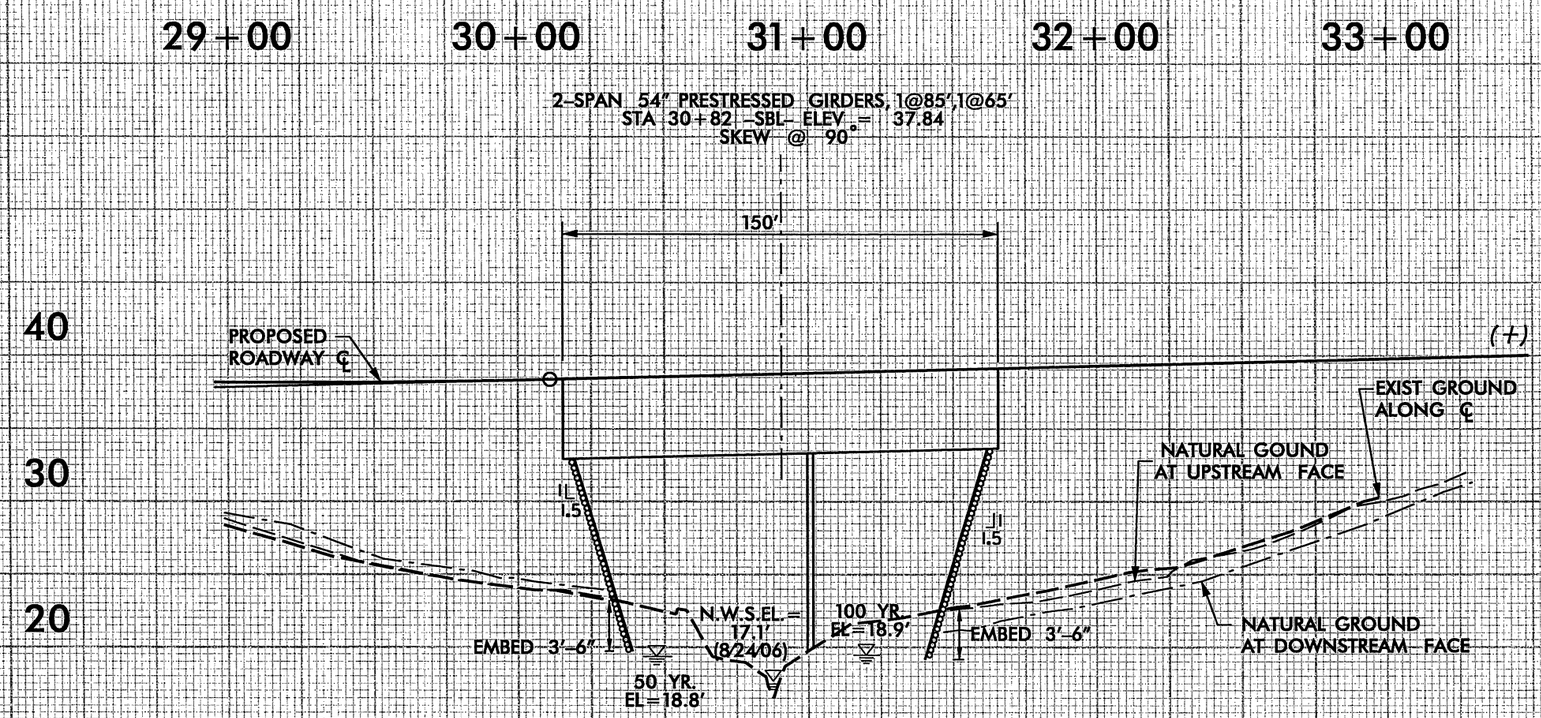
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE (-SBL-)

PERMIT DRAWINGS
SHEET 39 OF 108

5/14/99

9/13/2010
c:\pwworking\tpo\d0197879\R2633AA&AB_HYD_PRM_BSR2.dgn

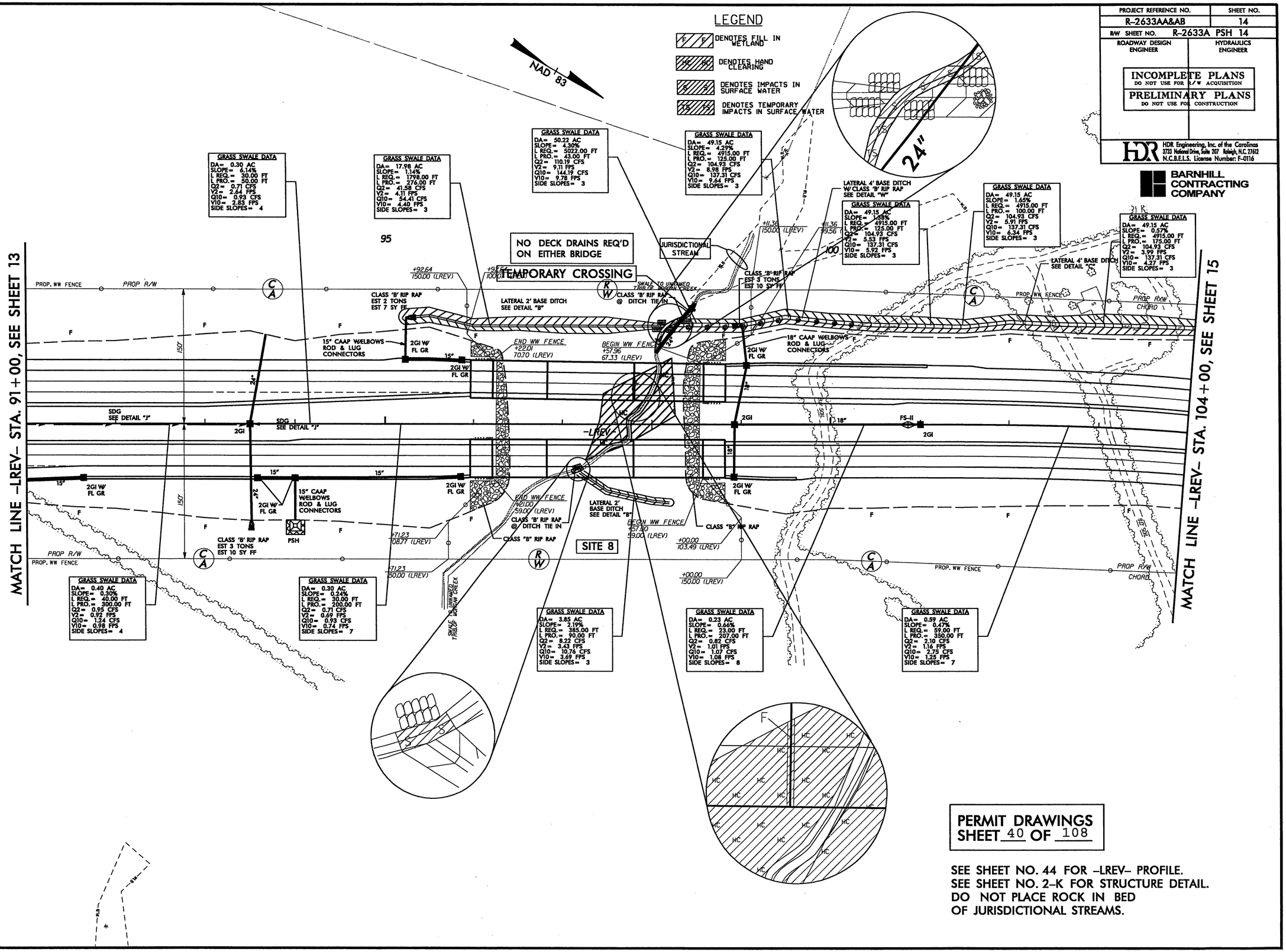
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	14
R/W SHEET NO. R-2633A PSH 14	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 40 OF 108

SEE SHEET NO. 44 FOR -LREV- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
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PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 8:57:05 AM SCALE: 1:100

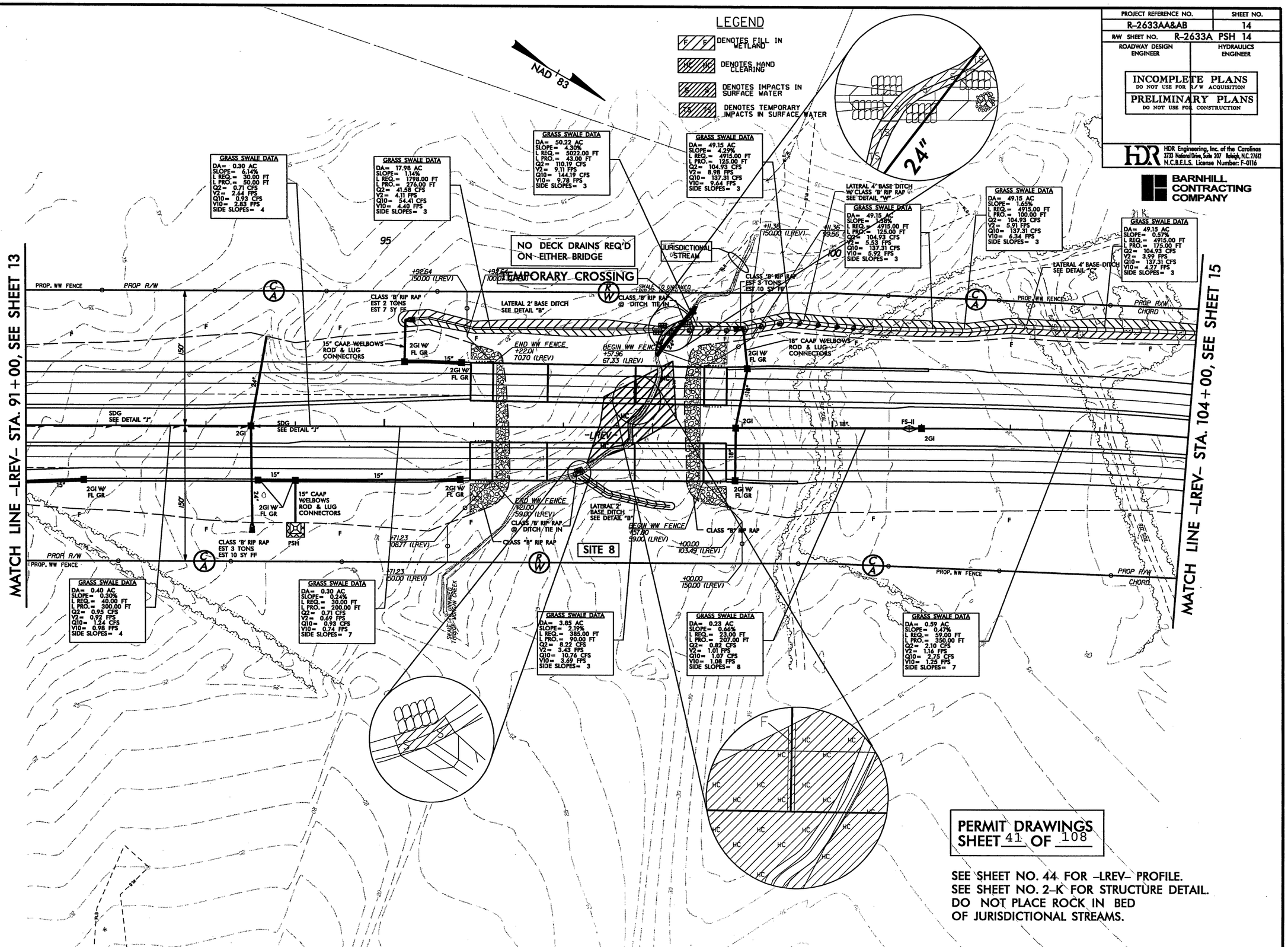
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	14
R/W SHEET NO. R-2633A PSH 14	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 41 OF 108

SEE SHEET NO. 44 FOR -LREV- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
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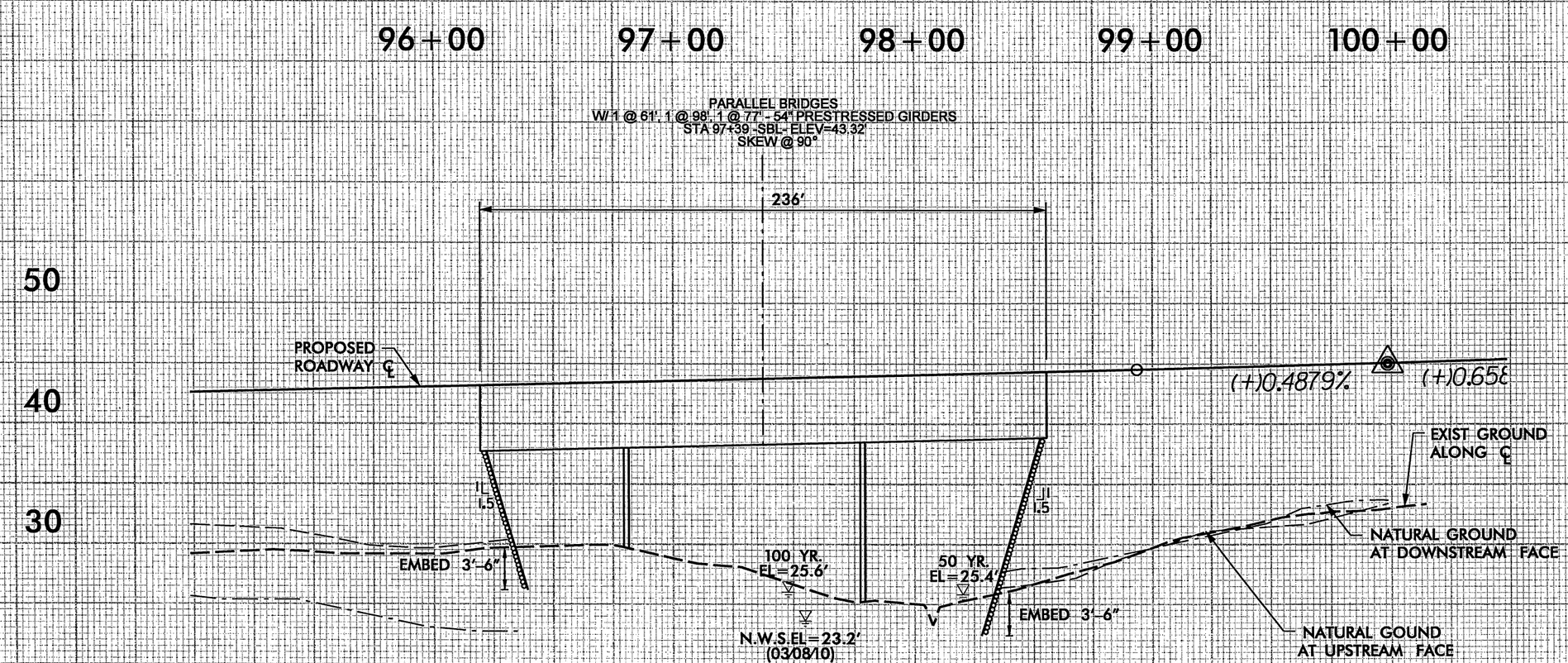
PENTABLE: NCDOT_permits.tbl
TIME: 9:32:06 AM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE (SBL)

PERMIT DRAWINGS
SHEET 42 OF 108

5/14/99

9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_HYD_PRM_BSR3.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	15
RW SHEET NO. R-2633AA&AB RW-15	
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

BARNHILL CONTRACTING COMPANY

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83/95

MATCH LINE -LREV- STA. 104+00, SEE SHEET 14

MATCH LINE -LREV- STA. 117+00, SEE SHEET 16

-LREV-

PROP. R/W

PROP. WW FENCE

105

110

115

14 E. G. GOODMAN, HEIRS

SITE 9

SITE 10A

SITE 10B

LATERAL 4' BASE DITCH SEE DETAIL "C"

LATERAL 2' BASE DITCH SEE DETAIL "B"

LATERAL 2' BASE DITCH W/CLASS "B" RIP RAP SEE DETAIL "E"

CLASS "B" RIP RAP @ DITCH TIE IN

CLASS "B" RIP RAP EST 5 TONS EST 14 SY FF

CLASS "B" RIP RAP EST 8 TONS EST 24 SY FF

2GI

FS-II

2GI W/ FL GR

18" CAAP

PSH

VEGETATIVE SCREENING

BEGIN VEGETATIVE SCREENING STA. 110+00 TO BE INSTALLED BY NCDOT

END VEGETATIVE SCREENING STA. 115+75 TO BE INSTALLED BY NCDOT

RETAIN

GRASS SWALE DATA
DA= 49.15 AC
SLOPE= 1.00%
L REQ.= 4915.00 FT
L PRO.= 200.00 FT
Q2= 104.93 CFS
V2= 4.91 FPS
Q10= 137.31 CFS
V10= 5.26 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 49.15 AC
SLOPE= 0.89%
L REQ.= 4915.00 FT
L PRO.= 200.00 FT
Q2= 104.93 CFS
V2= 4.70 FPS
Q10= 137.31 CFS
V10= 5.04 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 1.10 AC
SLOPE= 0.41%
L REQ.= 110.00 FT
L PRO.= 580.00 FT
Q2= 4.57 CFS
V2= 1.42 FPS
Q10= 5.98 CFS
V10= 1.52 FPS
SIDE SLOPES= 5.5

PIPE OUTLET DATA
DA= 44.21 AC
SLOPE= 0.26%
Q2= 21.18 CFS
V2= 1.73 FPS
Q10= 28.78 CFS
V10= 1.93 FPS

GRASS SWALE DATA
DA= 0.72 AC
SLOPE= 0.56%
L REQ.= 72.00 FT
L PRO.= 400.00 FT
Q2= 2.99 CFS
V2= 1.43 FPS
Q10= 3.91 CFS
V10= 1.53 FPS
SIDE SLOPES= 5.5

GRASS SWALE DATA
DA= 0.32 AC
SLOPE= 0.22%
L REQ.= 32.00 FT
L PRO.= 170.00 FT
Q2= 1.33 CFS
V2= 0.83 FPS
Q10= 1.74 CFS
V10= 0.89 FPS
SIDE SLOPES= 5.5

GRASS SWALE DATA
DA= 15.42 AC
SLOPE= 1.26%
L REQ.= 1542.00 FT
L PRO.= 257.00 FT
Q2= 32.42 CFS
V2= 4.01 FPS
Q10= 42.42 CFS
V10= 4.30 FPS
SIDE SLOPES= 3

PERMIT DRAWINGS
SHEET 43 OF 108

SEE SHEET NO. 44 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/14/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_15.dgn

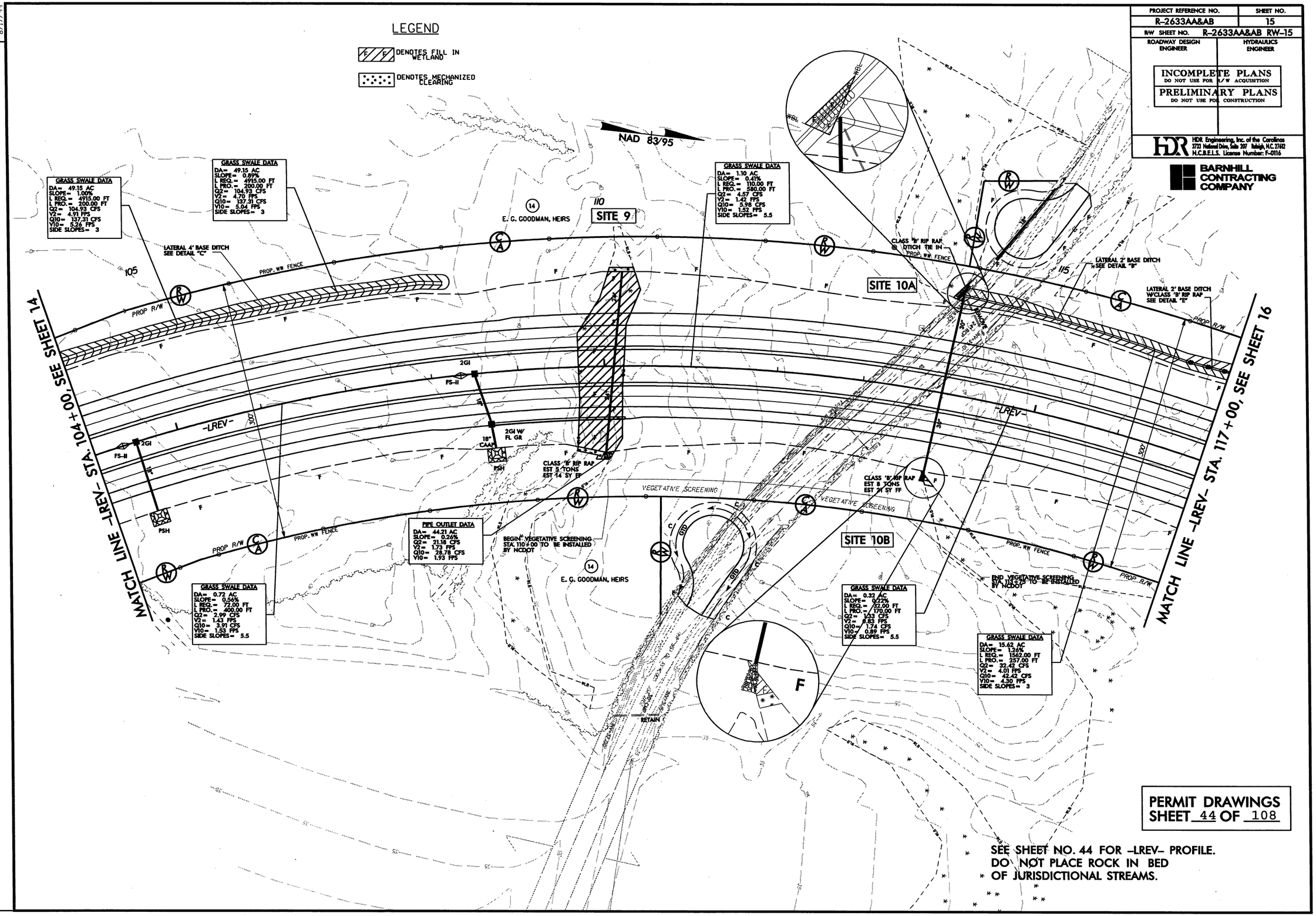
PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 11:03:51 AM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	15
R/W SHEET NO. R-2633AA&AB RW-15	
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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 44 OF 108

SEE SHEET NO. 44 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

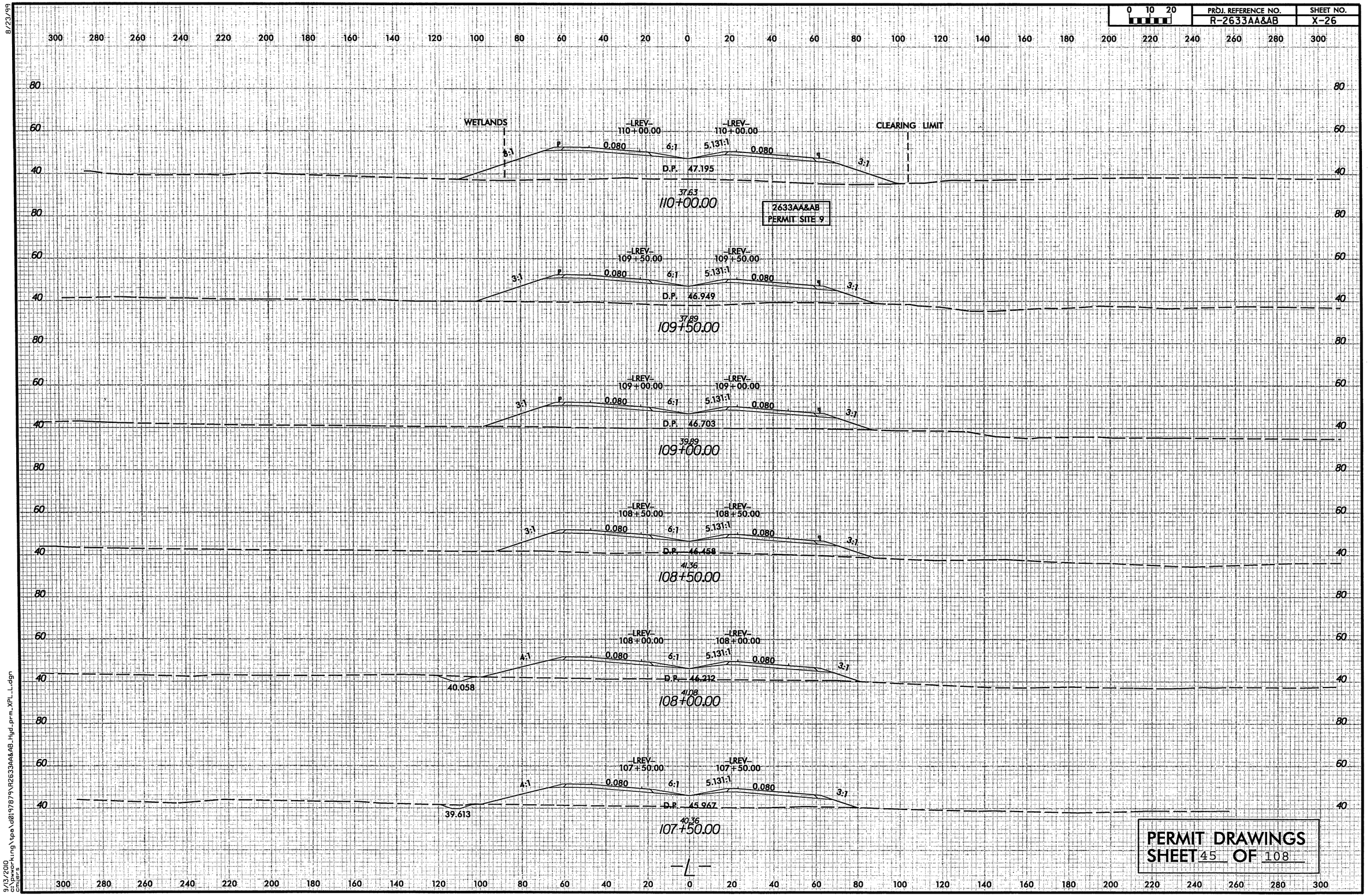
8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: jmassroc DATE: 10/14/2010 TIME: 11:01:47 AM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_15.dgn

8/23/99

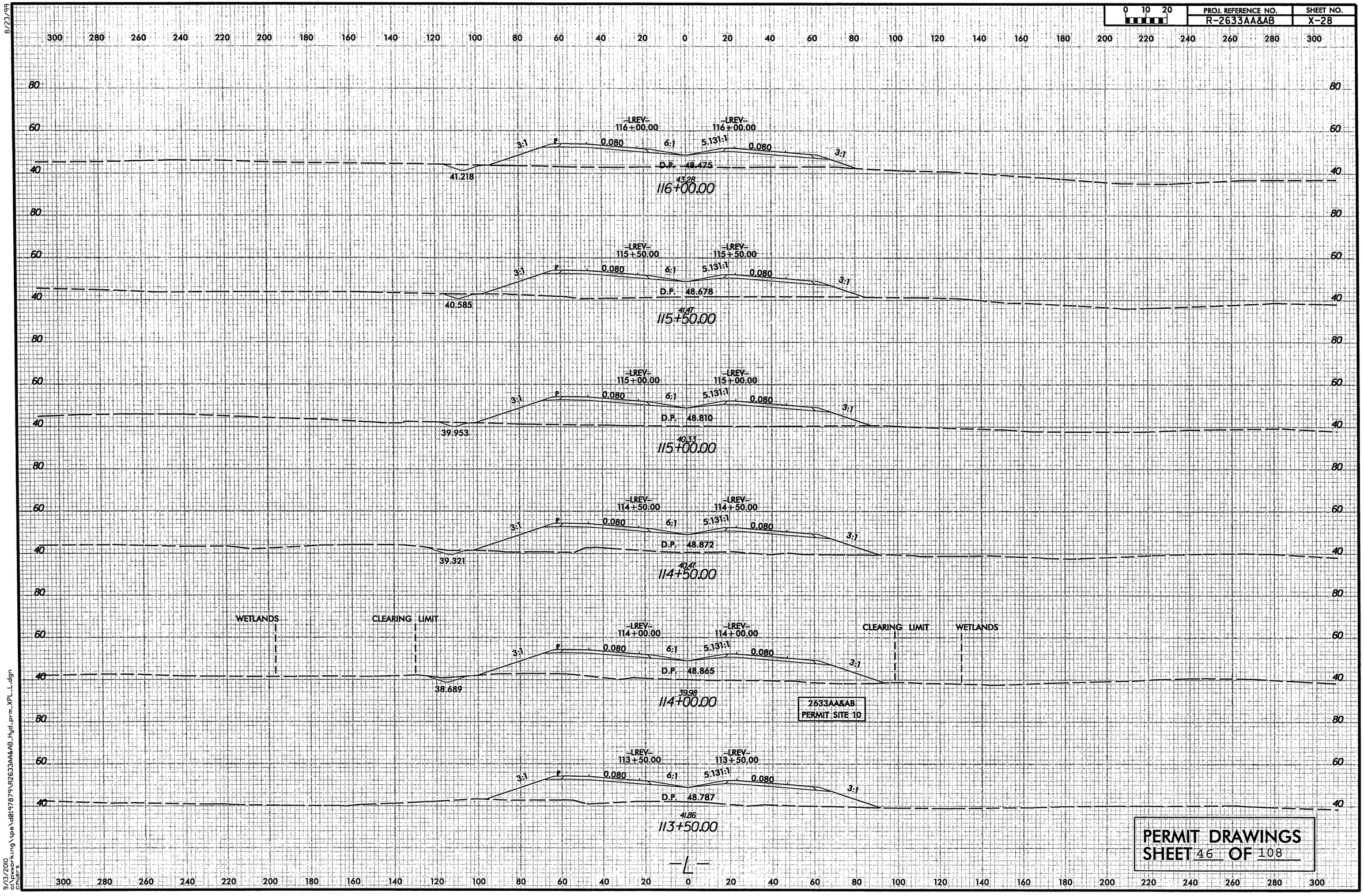
0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-26



PERMIT DRAWINGS
SHEET 45 OF 108

9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_L.dgn
gmiller3

PROJ. REFERENCE NO.	SHEET NO.
R-2633AA&AB	X-28



PERMIT DRAWINGS
SHEET 46 OF 108

8/23/99

9/13/2000
c:\projects\pwork\ing\tpo\d0197879\R2633AA&AB_Hyd_prm_XPL_L_dgn
cmiller's

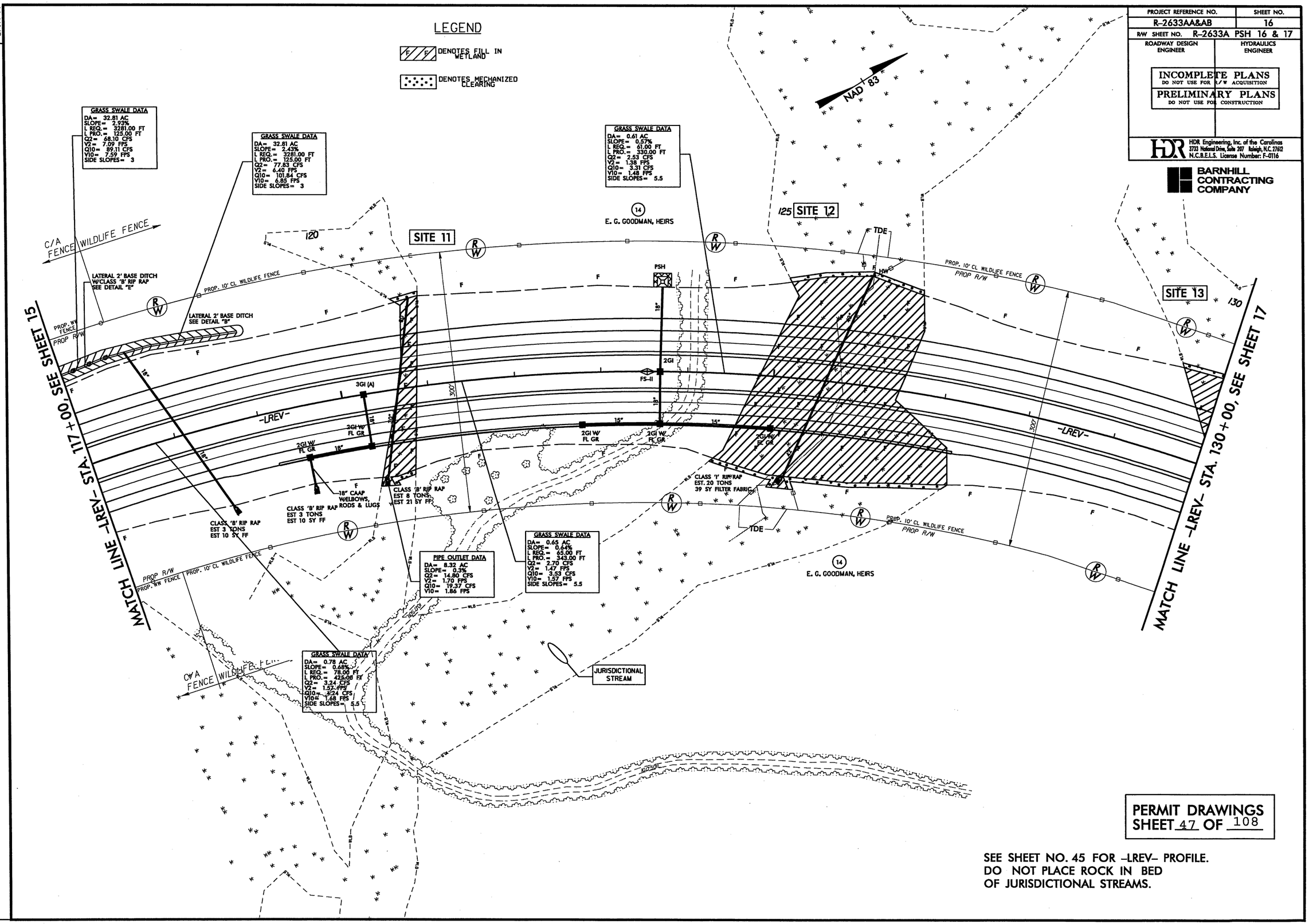
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	16
R/W SHEET NO. R-2633A PSH 16 & 17	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 47 OF 108

SEE SHEET NO. 45 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
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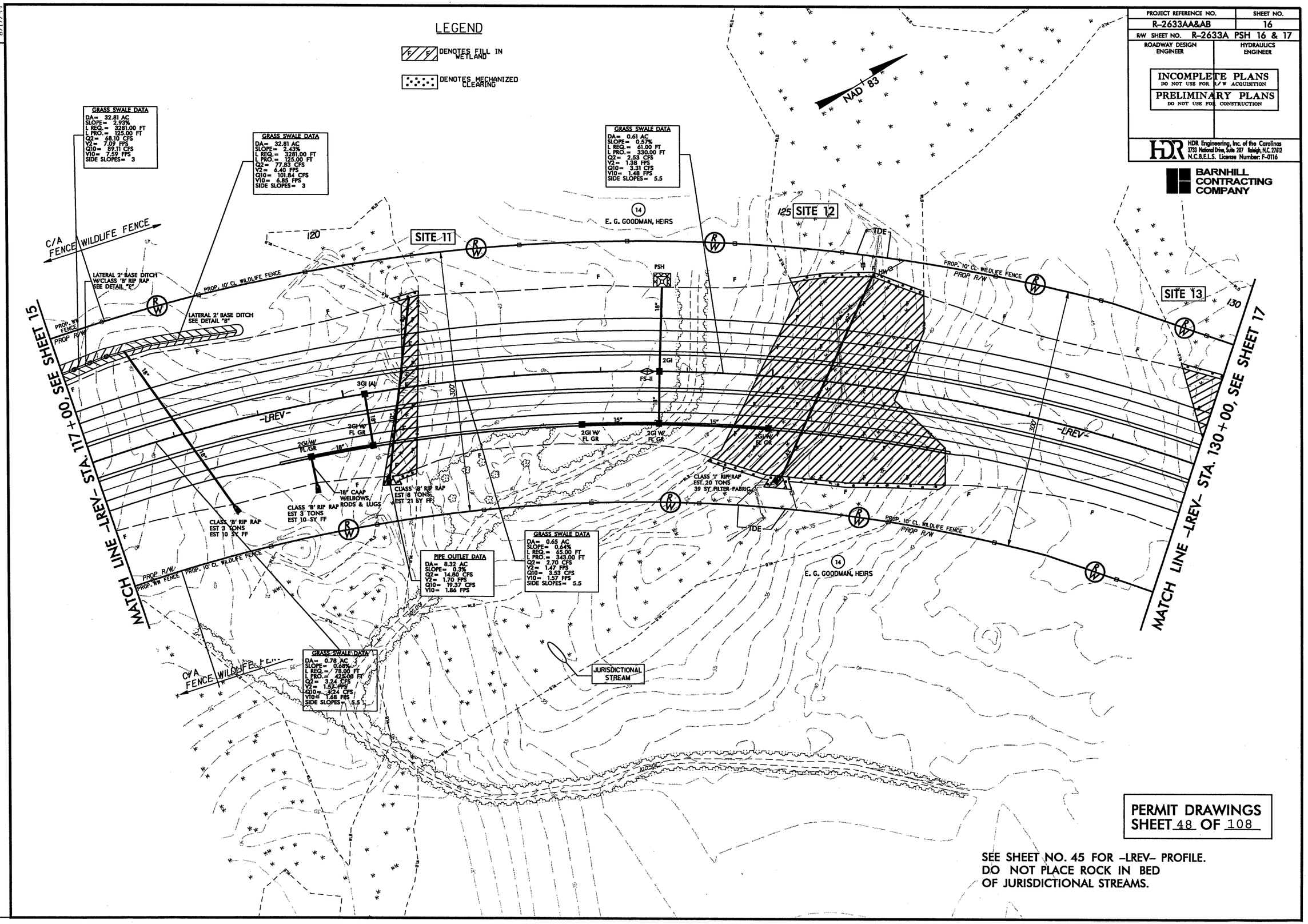
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	16
R/W SHEET NO. R-2633A PSH 16 & 17	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



8/17/99

REVISIONS

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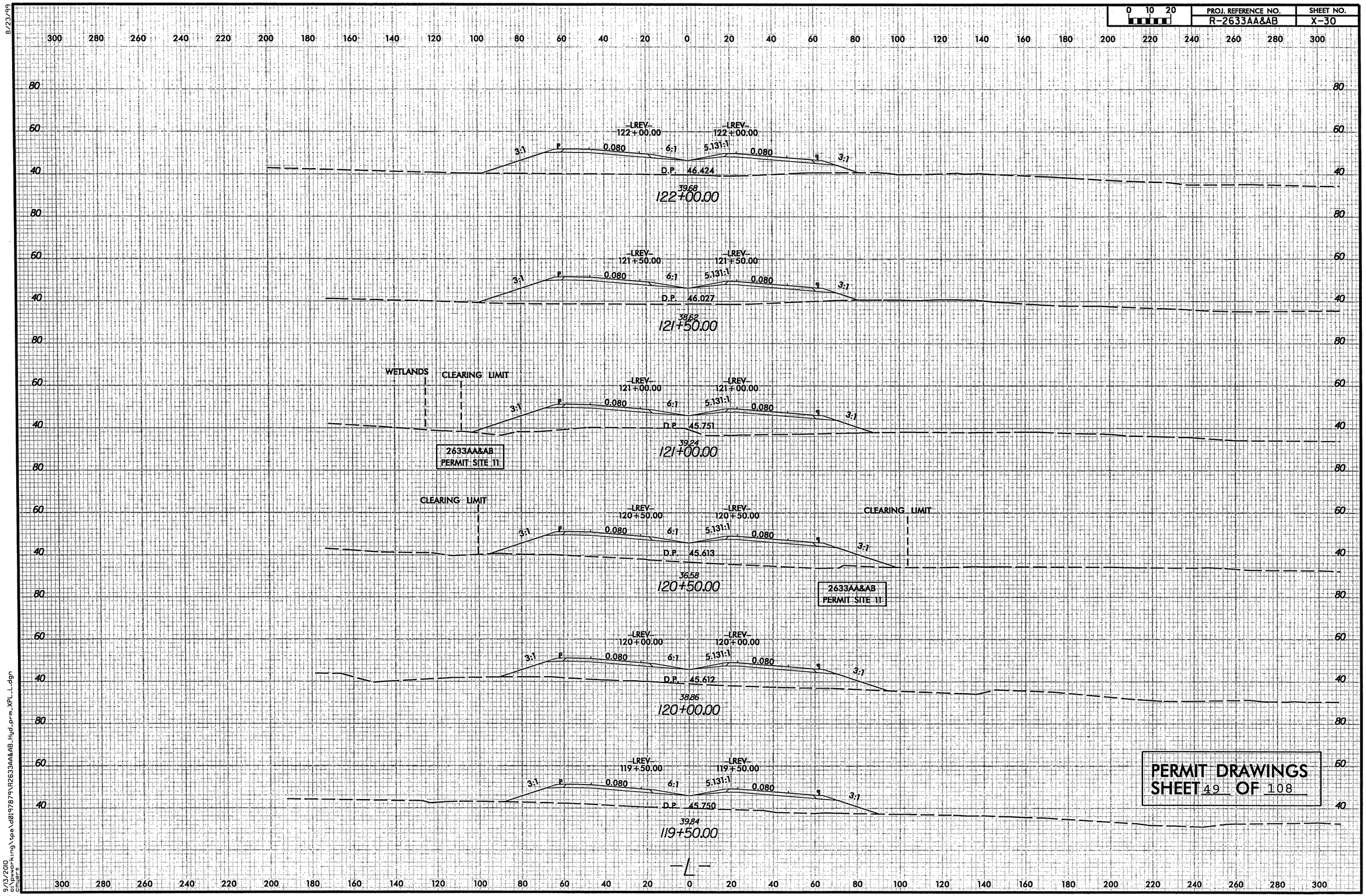
8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-30



PERMIT DRAWINGS
SHEET 49 OF 108

9/13/2010
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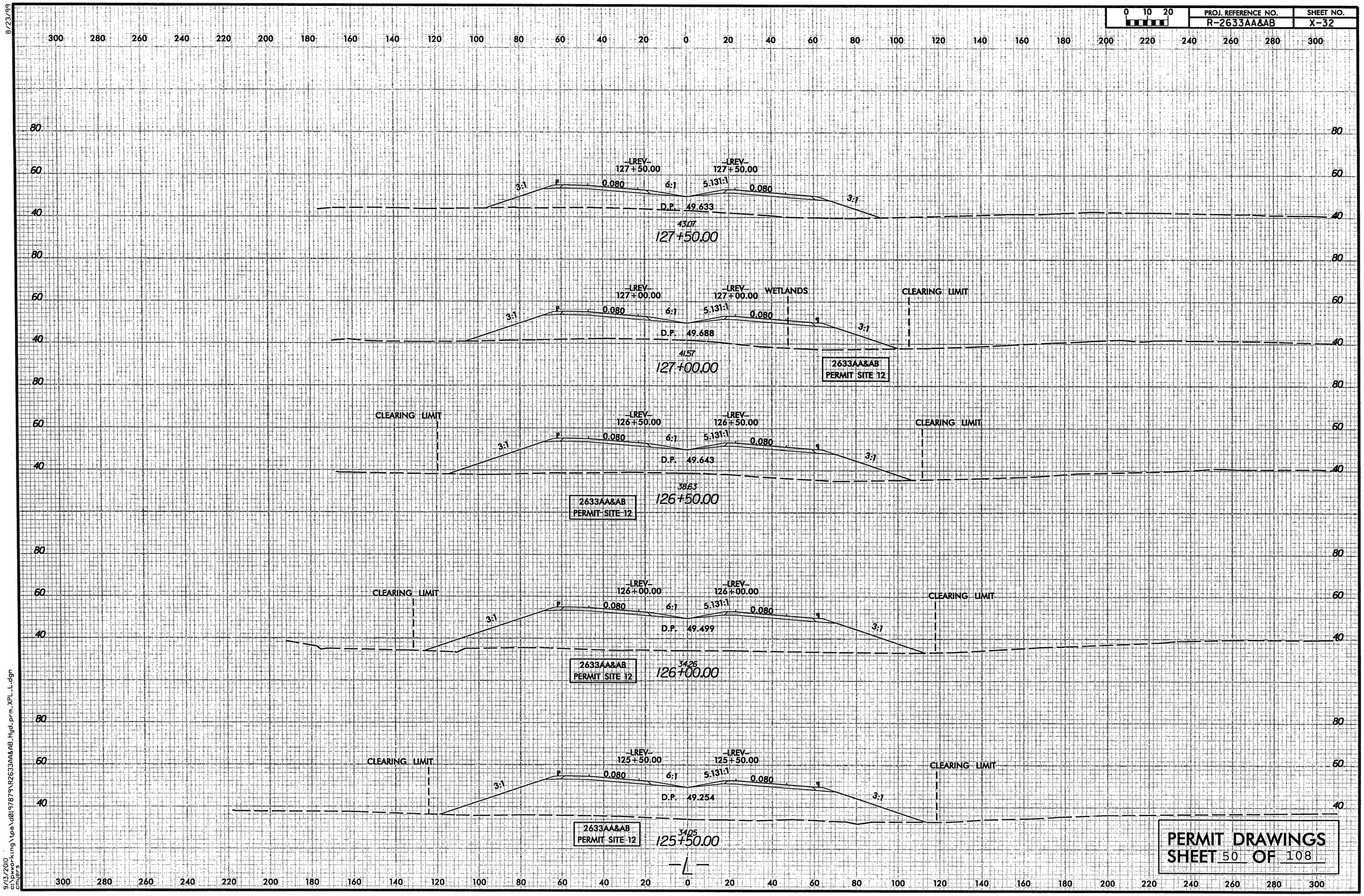
cmiers

8/23/99



PERMIT DRAWINGS
SHEET 50 OF 108

9/13/2010
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cmiers

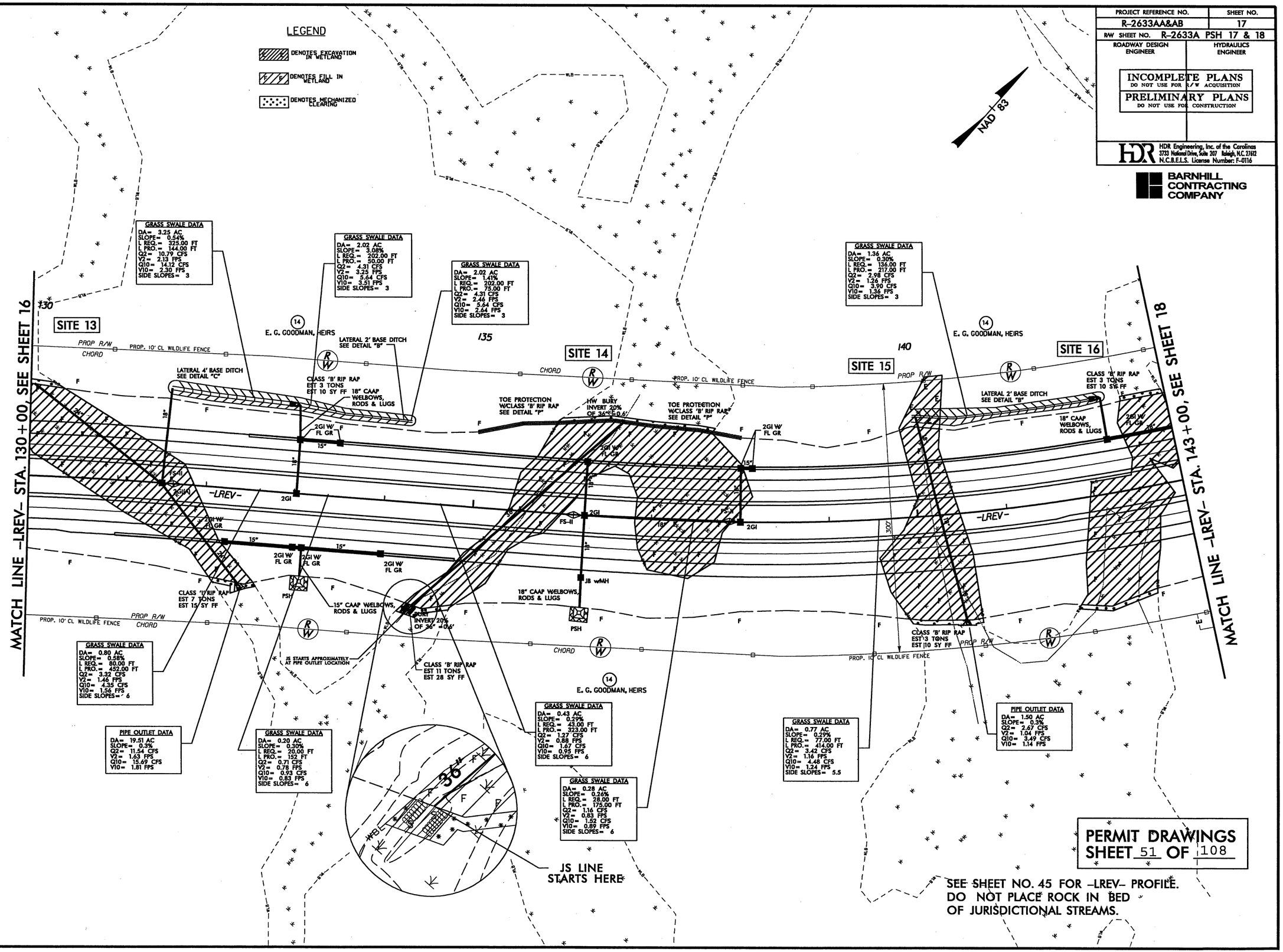
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	17
R/W SHEET NO. R-2633A PSH 17 & 18	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 51 OF 108

SEE SHEET NO. 45 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
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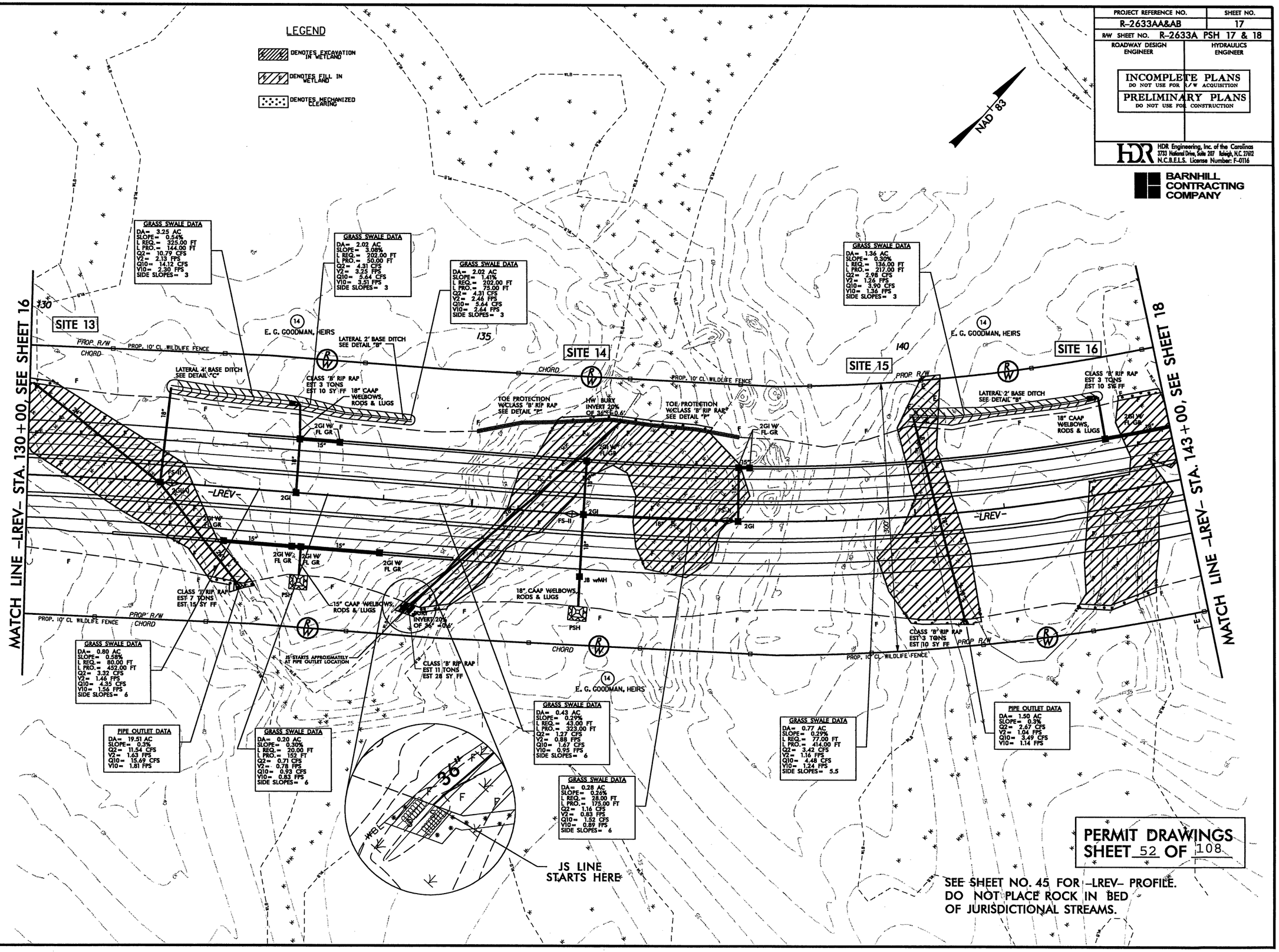
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	17
R/W SHEET NO. R-2633A PSH 17 & 18	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 52 OF 108

SEE SHEET NO. 45 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: jmassroc DATE: 10/3/2010 TIME: 9:35:49 AM SCALE: 1:100
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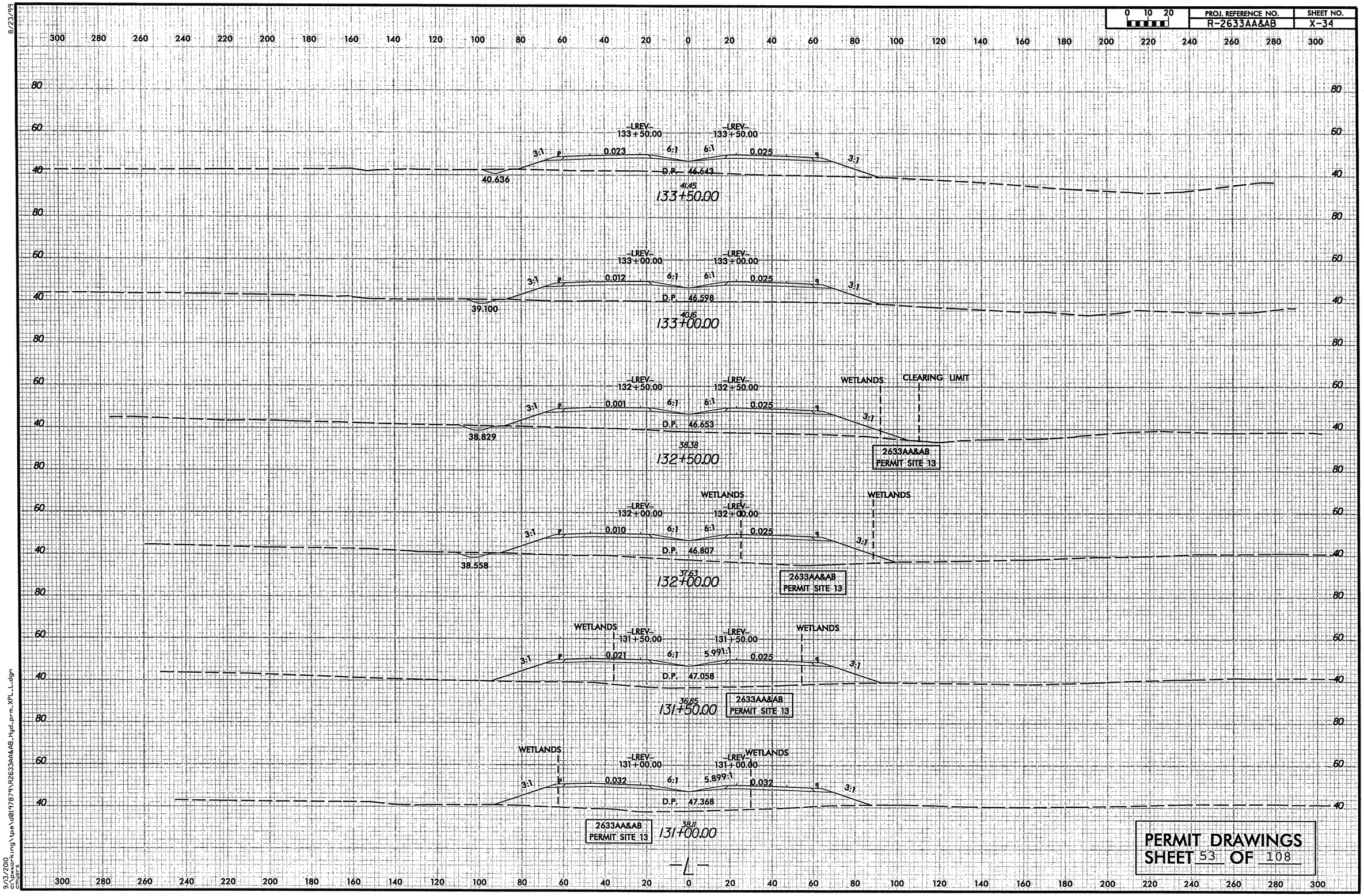

PERMIT DRAWINGS
SHEET 53 OF 108

8/23/99
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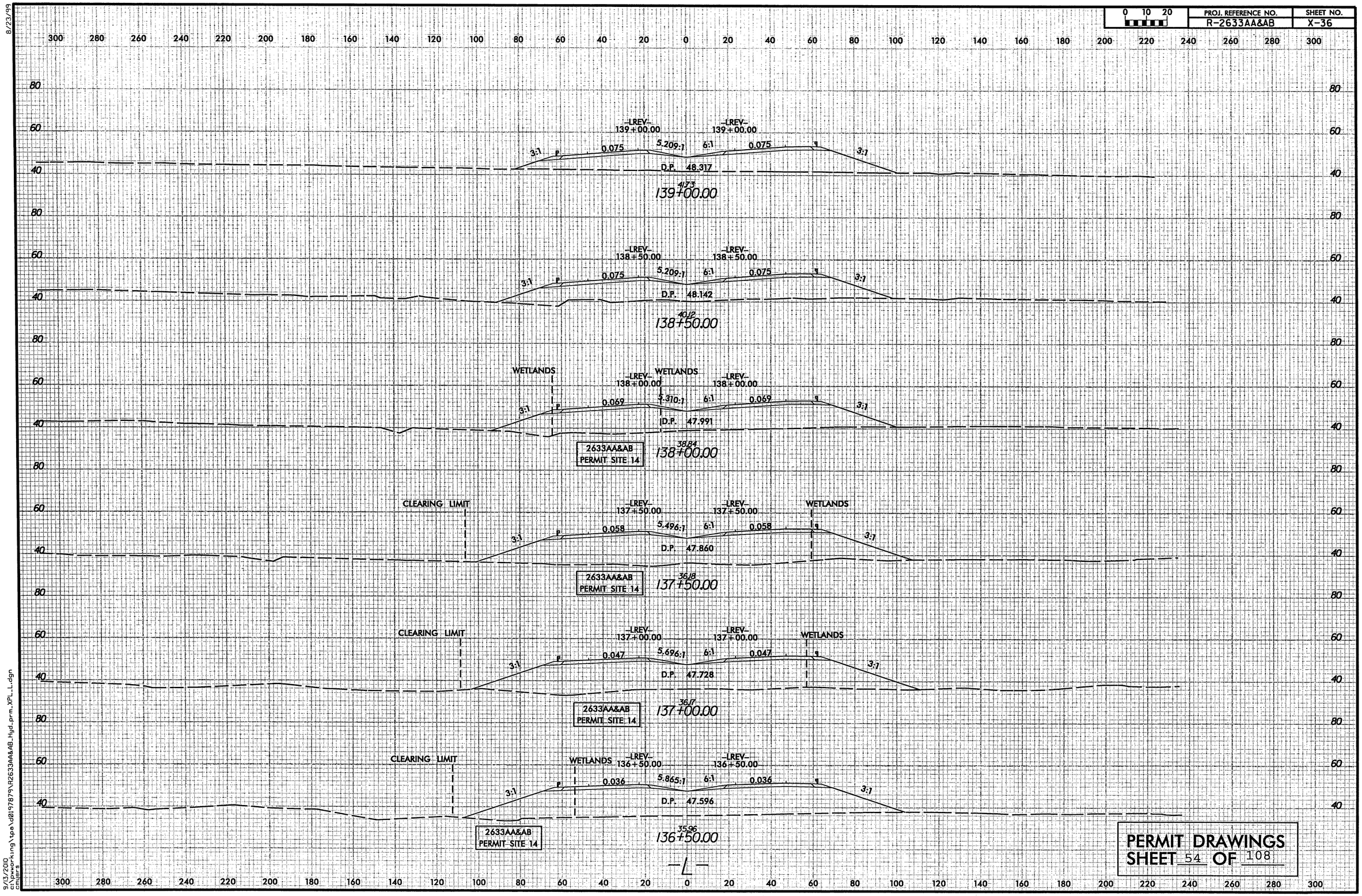
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2633AA&AB	X-36

0 10 20



PERMIT DRAWINGS
SHEET 54 OF 108

9/13/2010
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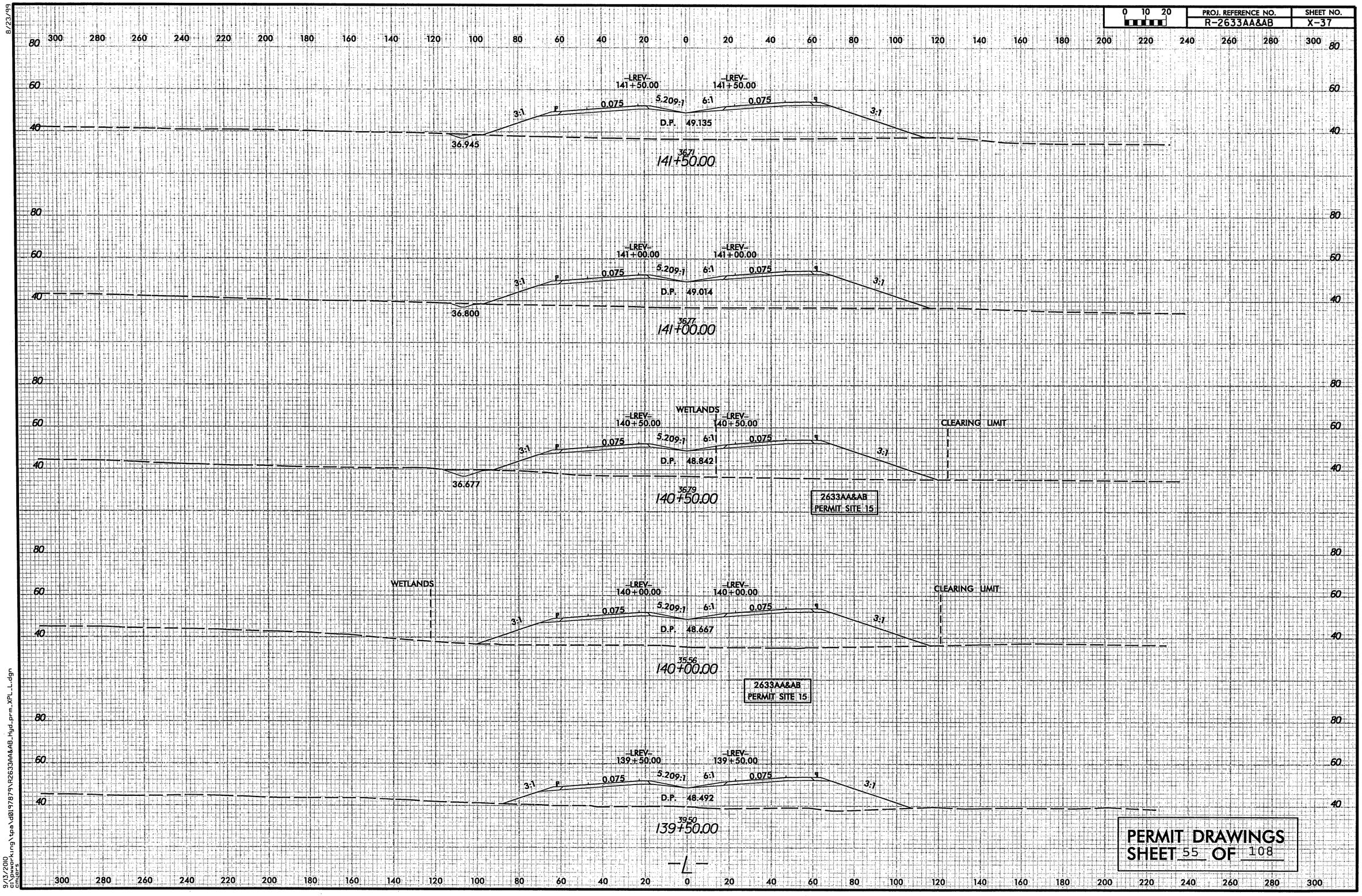

PERMIT DRAWINGS
SHEET 55 OF 108

8/23/99

9/13/2010
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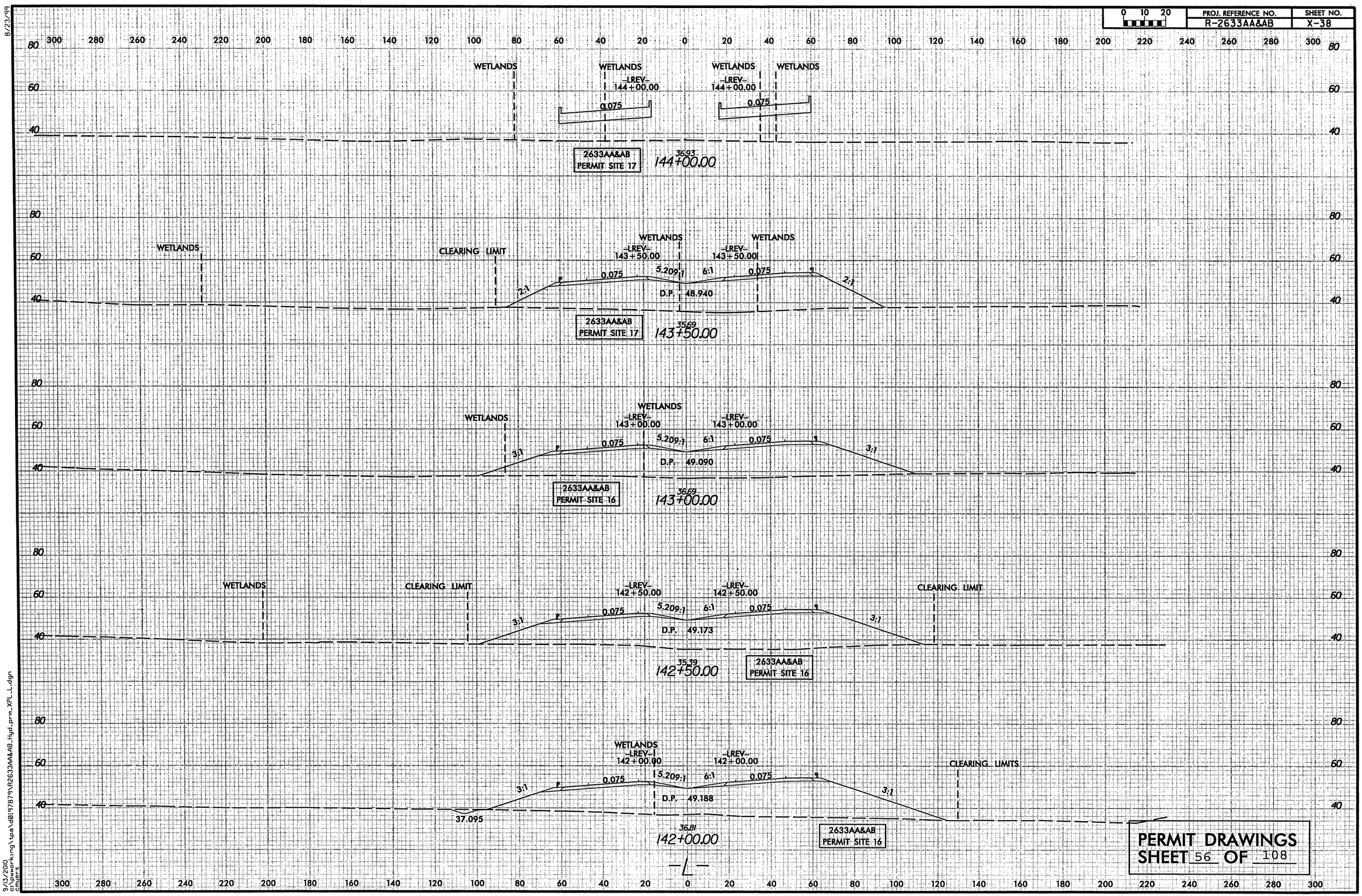

PERMIT DRAWINGS
SHEET 56 OF 108

8/23/99

9/13/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	18
R/W SHEET NO. R-2633A	PSH 18 & 19

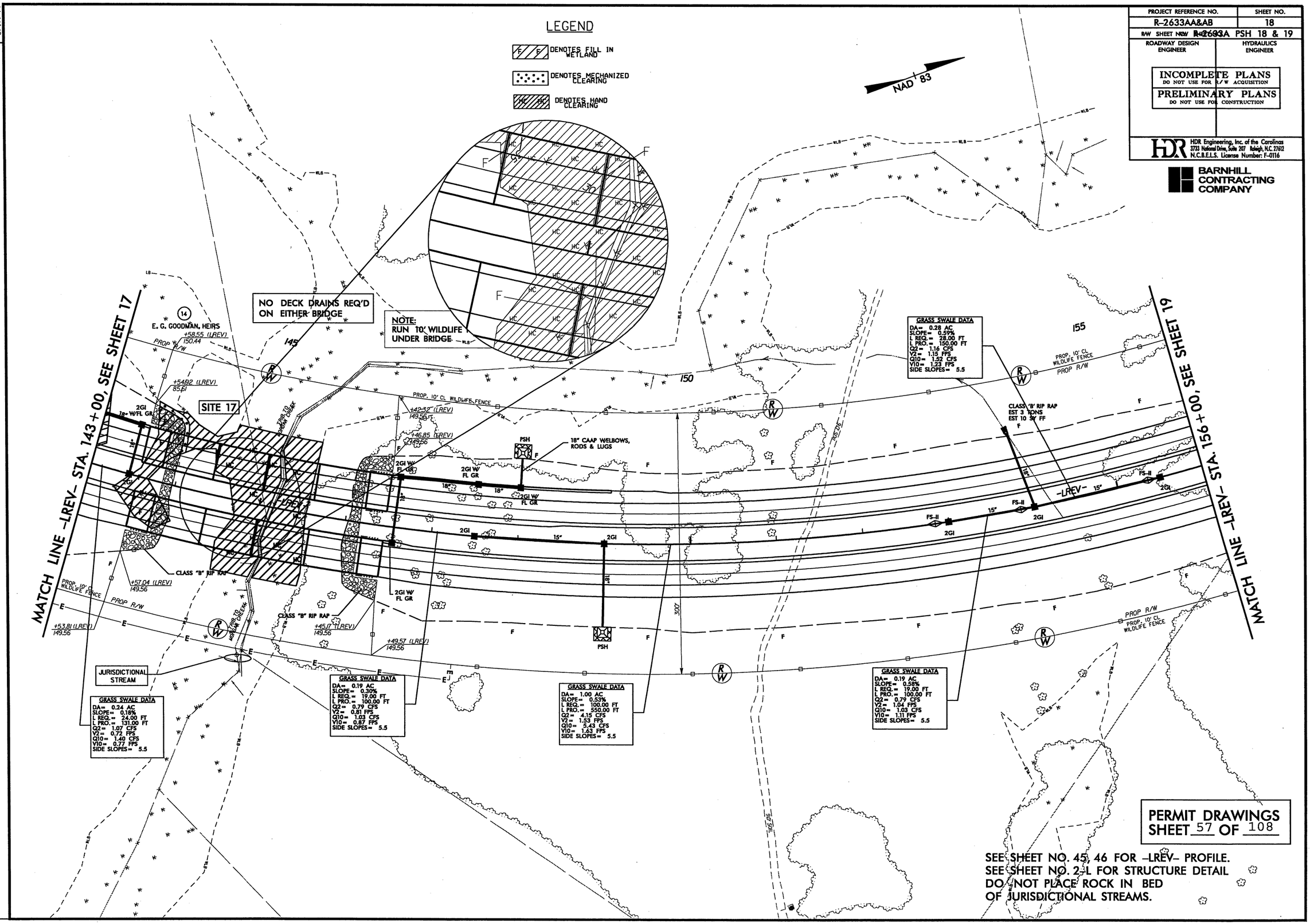
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 57 OF 108

SEE SHEET NO. 45, 46 FOR -LREV- PROFILE.
SEE SHEET NO. 2-L FOR STRUCTURE DETAIL
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS 8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
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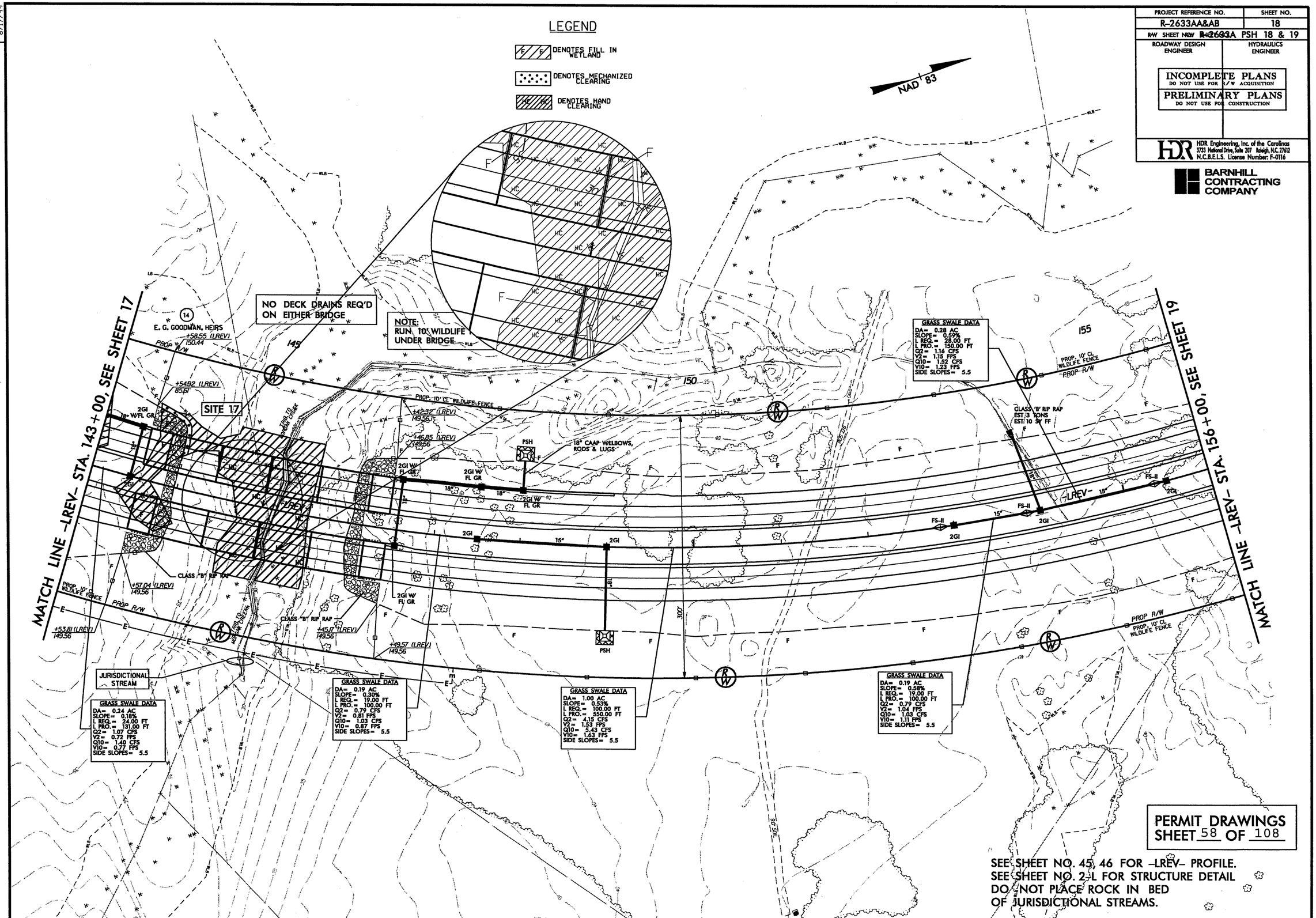
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	18
R/W SHEET NO. R-2633A PSH 18 & 19	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



8/17/99

REVISIONS

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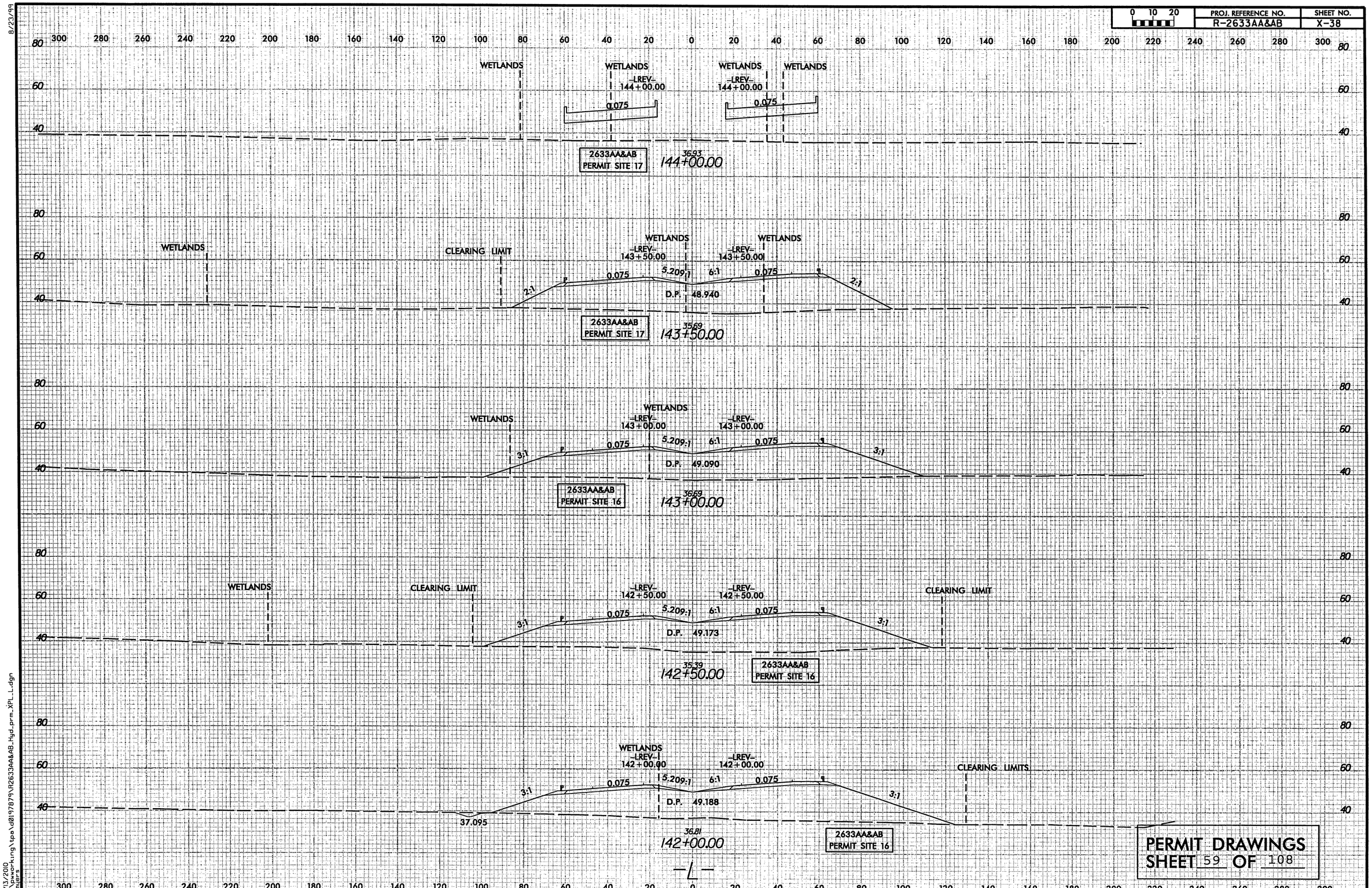
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2633AA&AB	X-38

0 10 20



PERMIT DRAWINGS
SHEET 59 OF 108

9/13/2010
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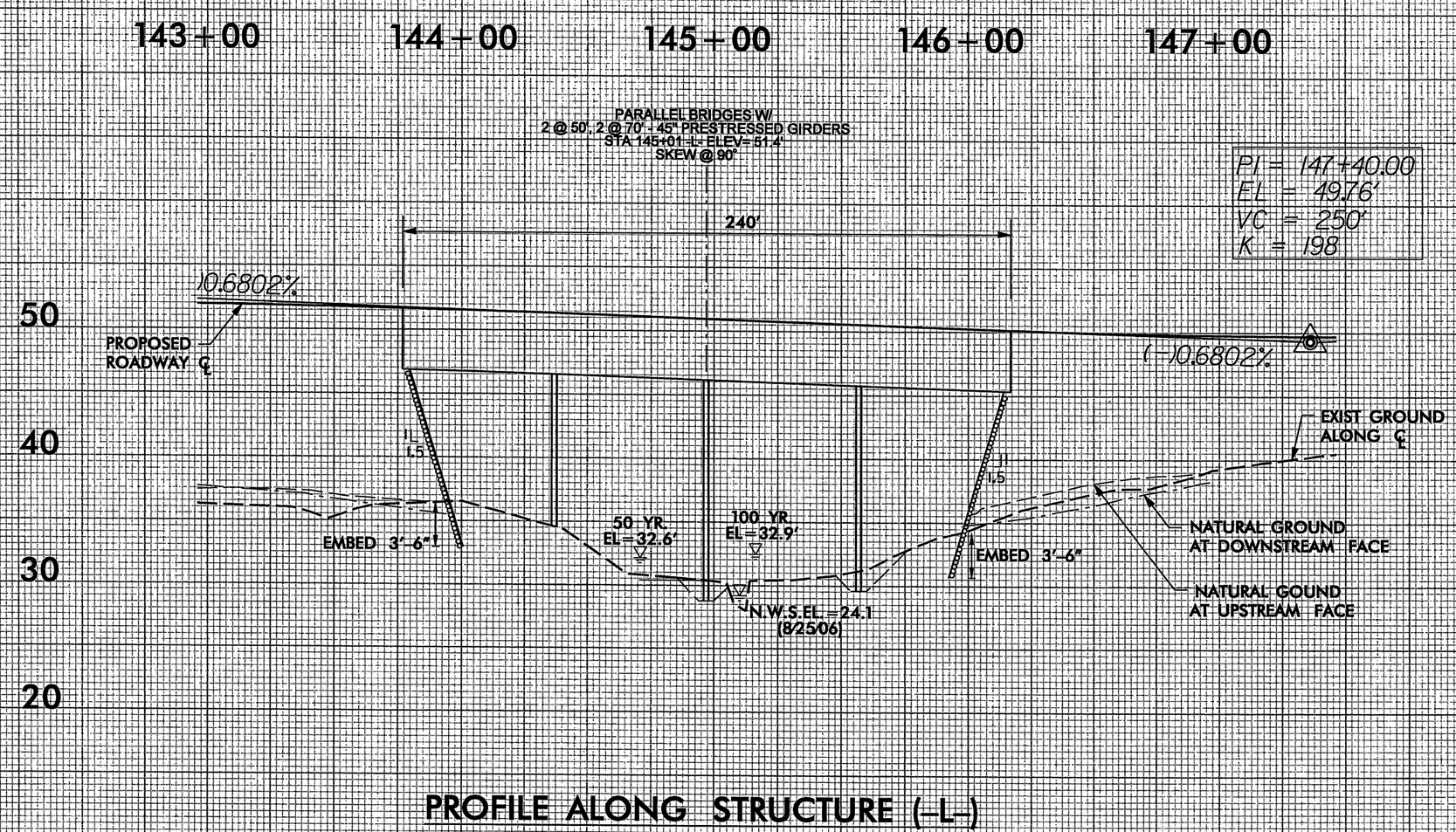
cbaker

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE (-L-)

PERMIT DRAWINGS
SHEET 60 OF 108

5/14/99

9/13/2010
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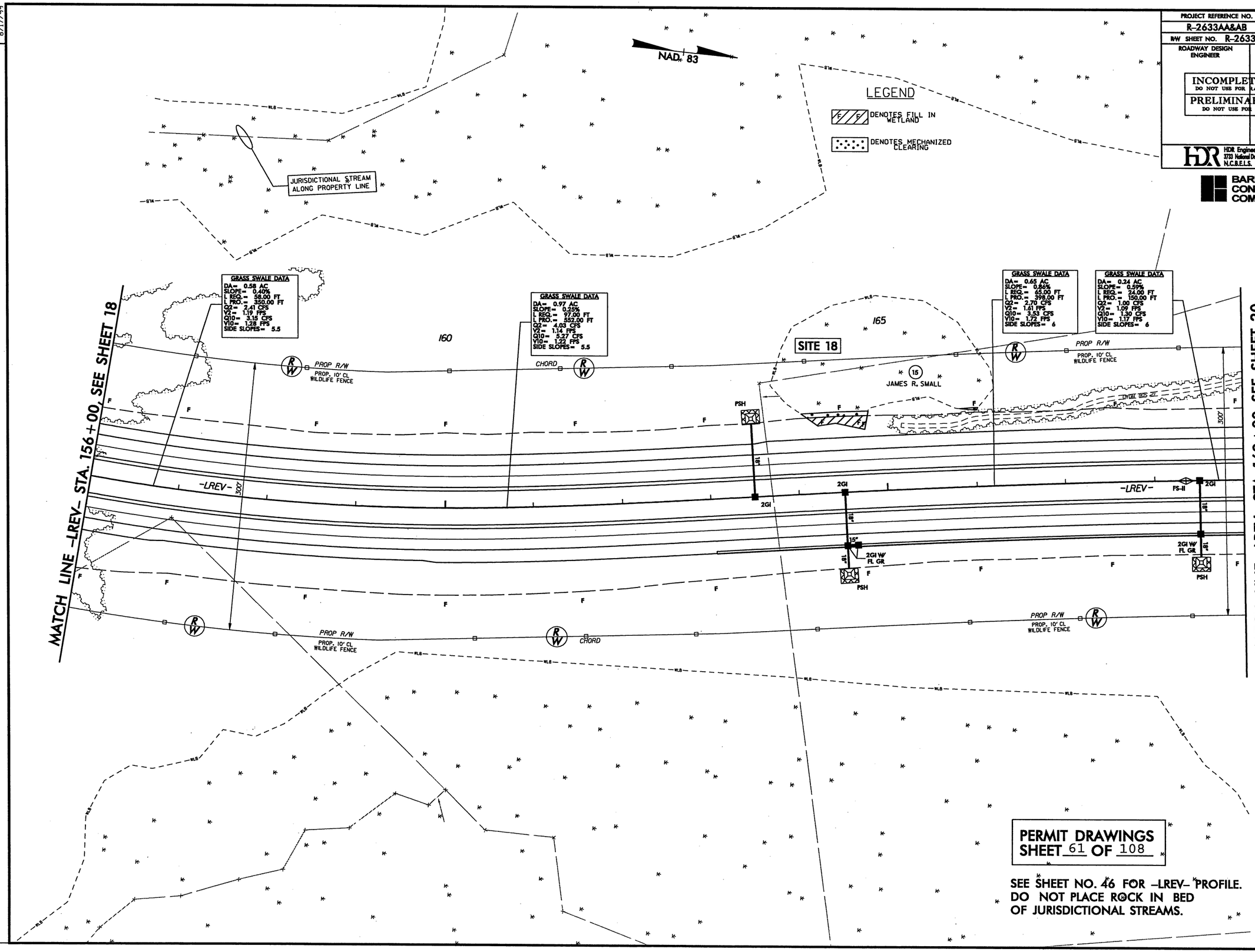
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	19
R/W SHEET NO. R-2633A PSH 19 & 20	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 61 OF 108

SEE SHEET NO. 46 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
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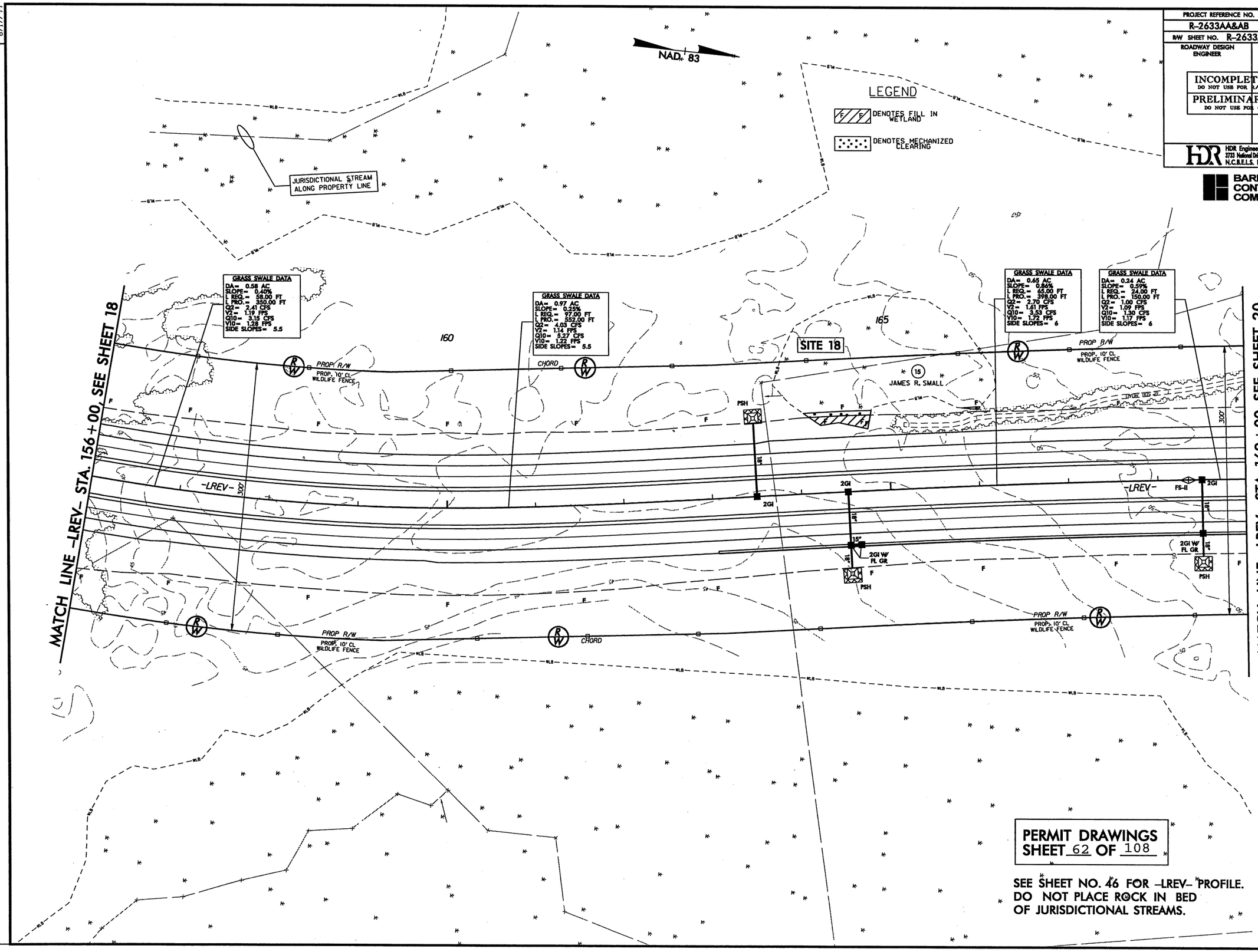
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	19
R/W SHEET NO. R-2633A PSH 19 & 20	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 62 OF 108

SEE SHEET NO. 46 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
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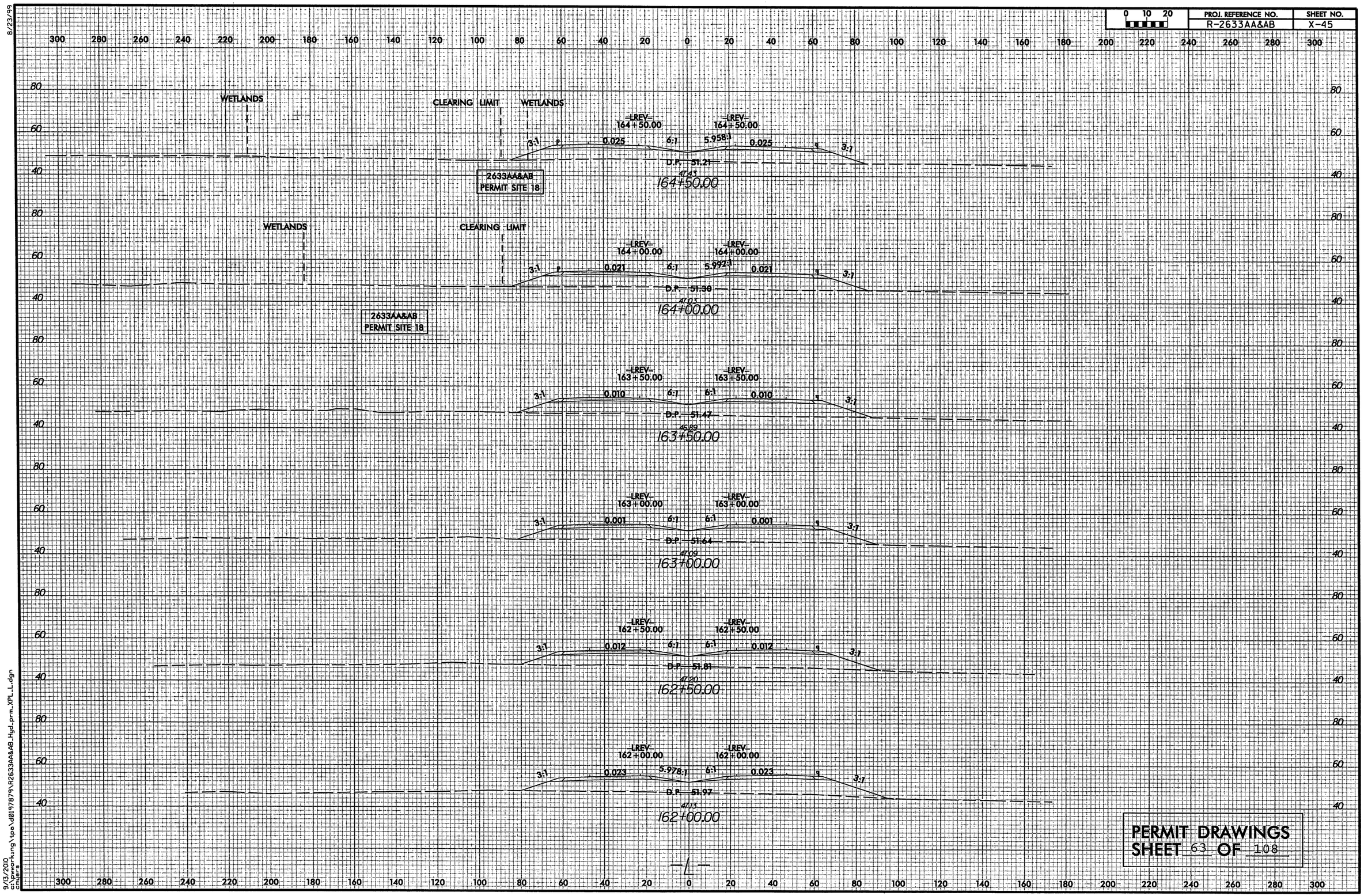
8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-45



PERMIT DRAWINGS
SHEET 63 OF 108

9/13/2000
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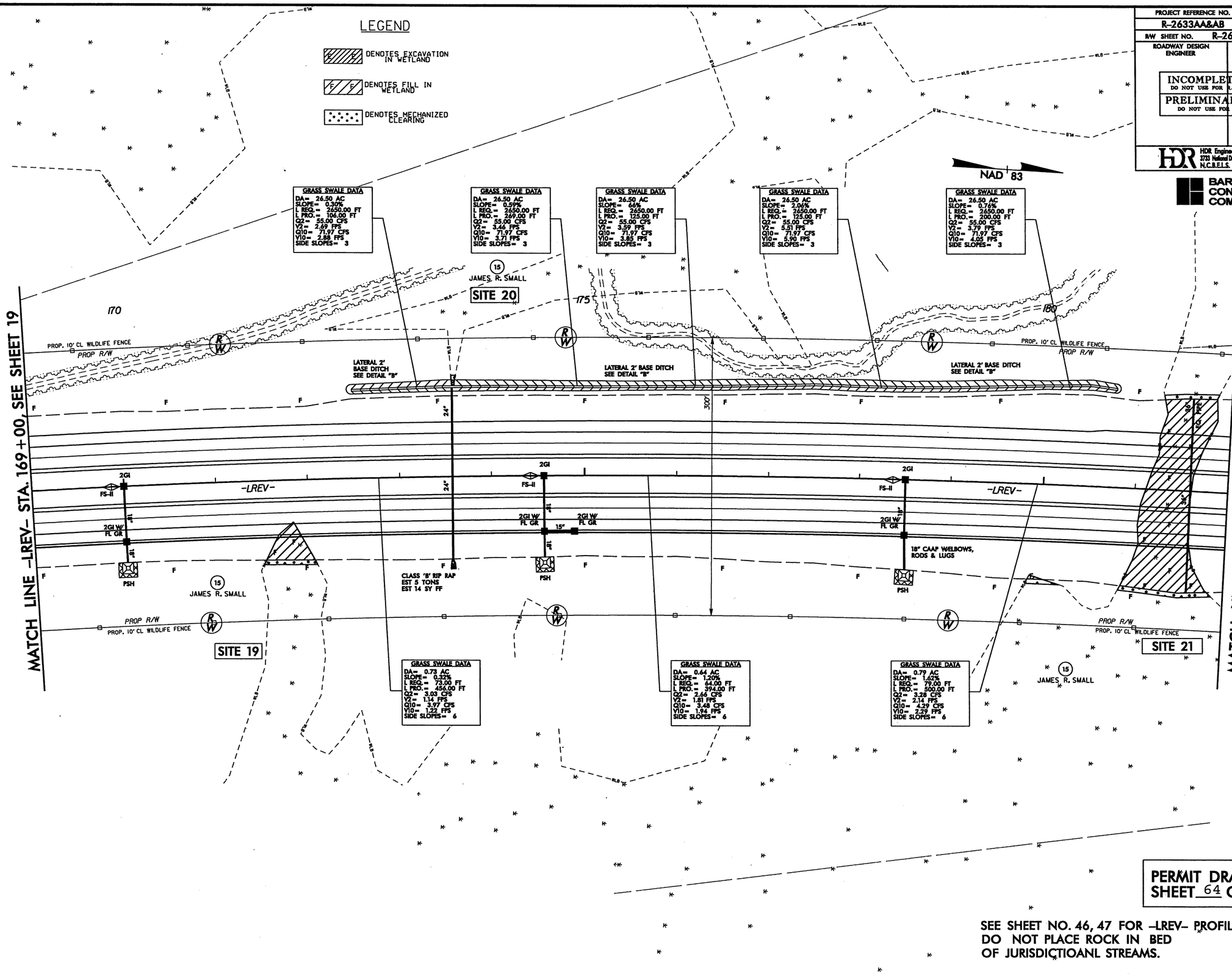
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	20
R/W SHEET NO. R-2633A PSH 20	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 64 OF 108

SEE SHEET NO. 46, 47 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIOANL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: Jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_20.dgn
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TIME: 9:04:21 AM SCALE: 1:100

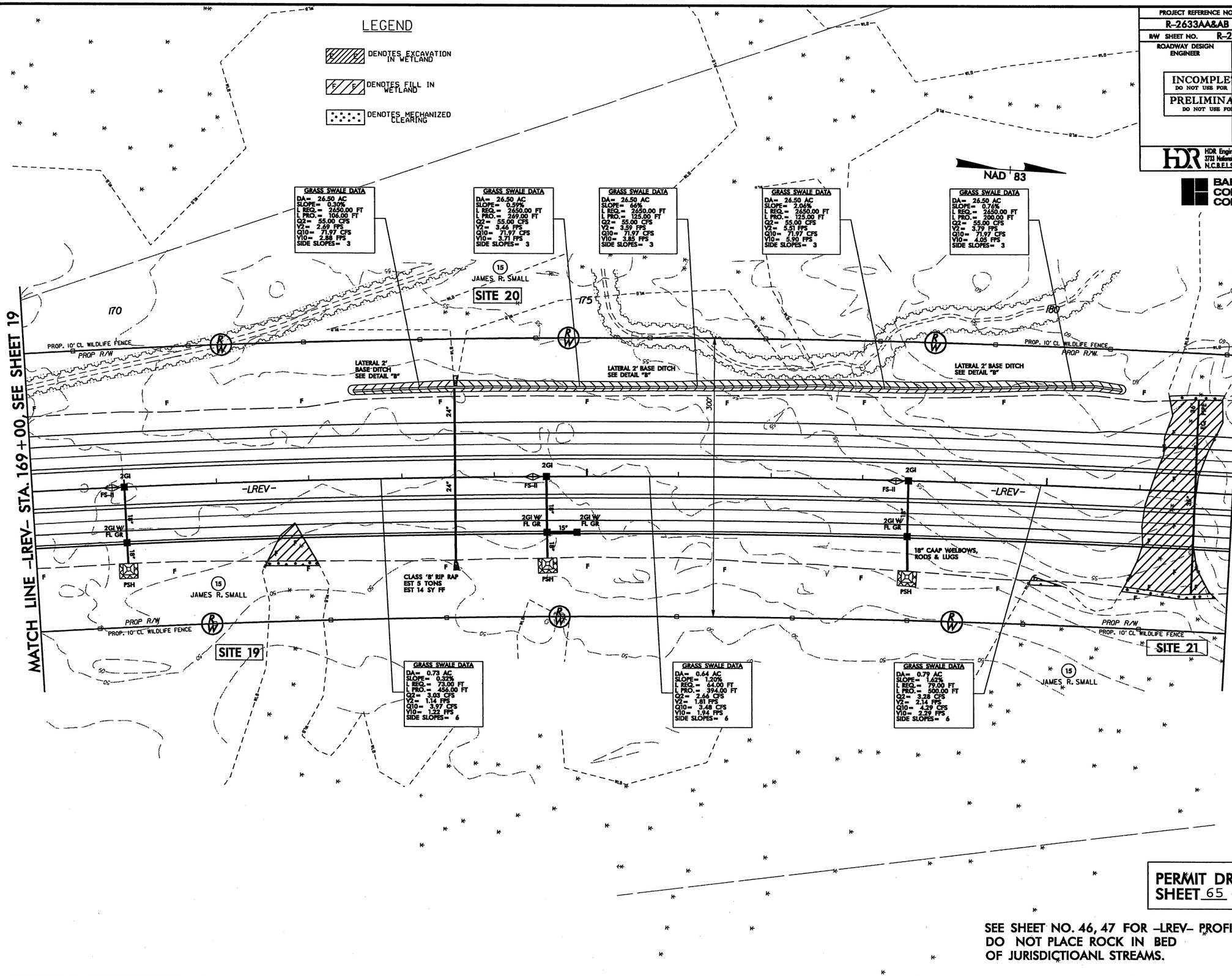
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	20
R/W SHEET NO. R-2633A PSH 20	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 65 OF 108

SEE SHEET NO. 46, 47 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIOANL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_20.dgn

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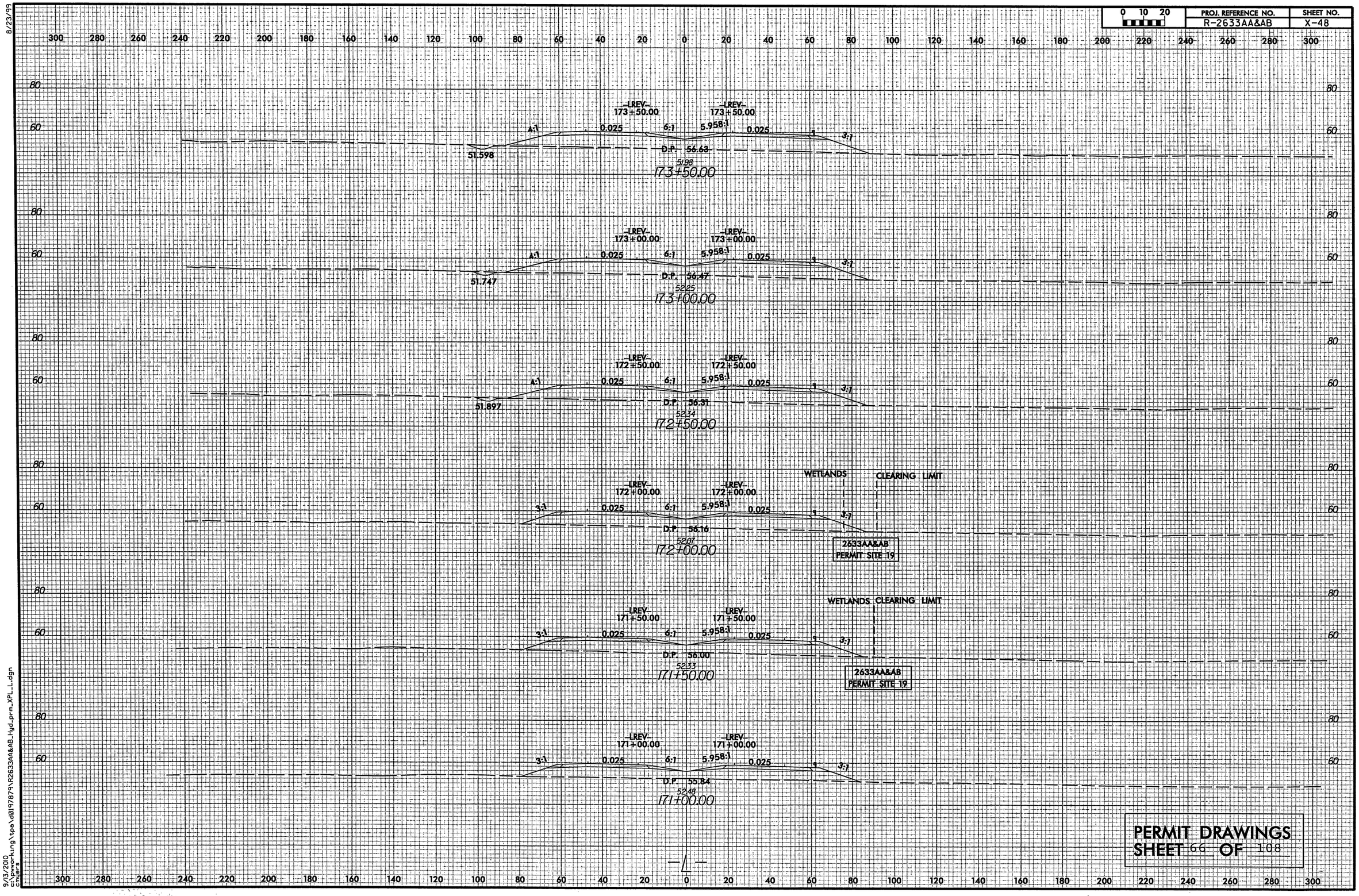

PERMIT DRAWINGS
SHEET 66 OF 108

8/23/99

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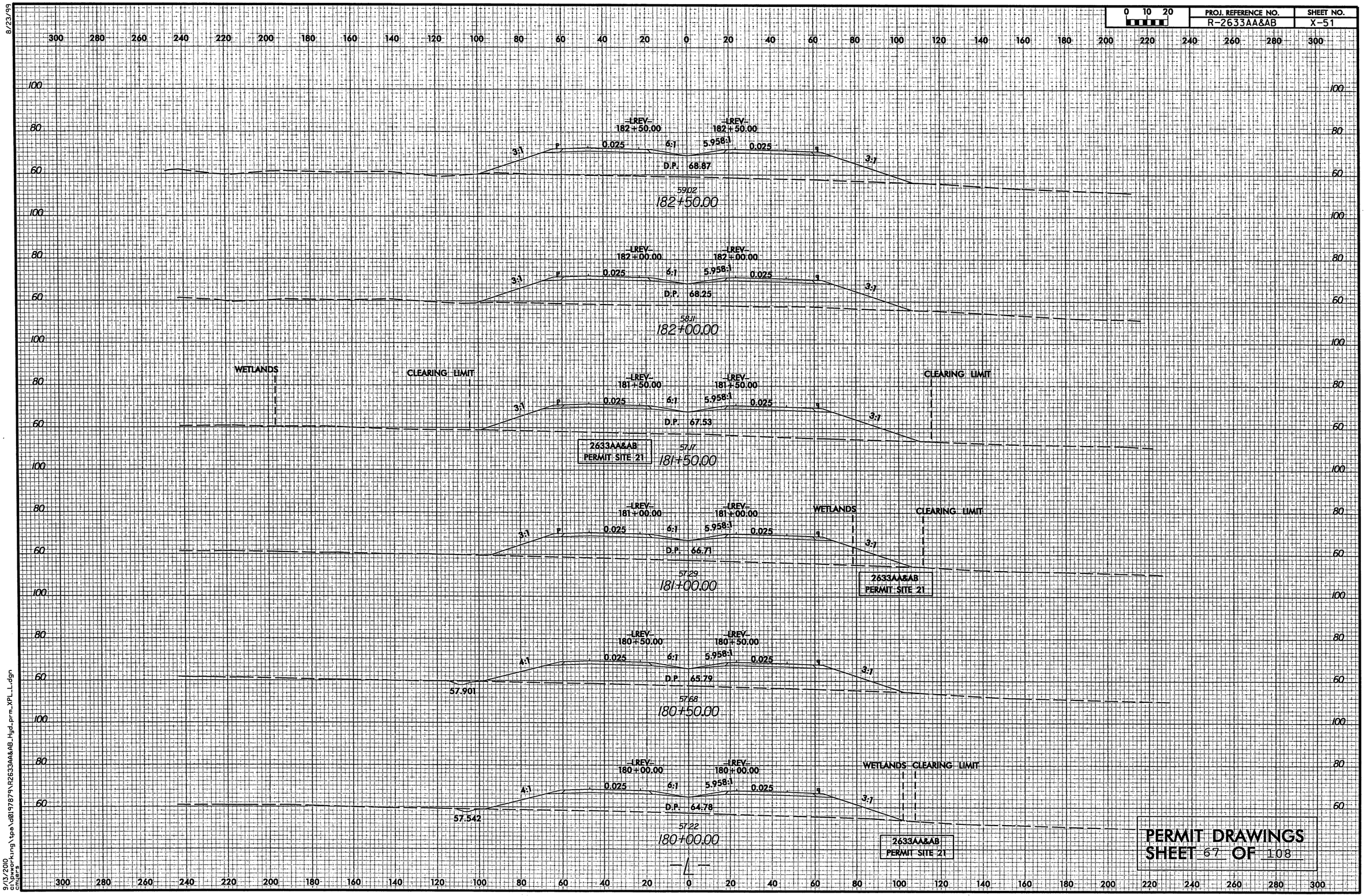
8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-51



PERMIT DRAWINGS
SHEET 67 OF 108

9/13/2010
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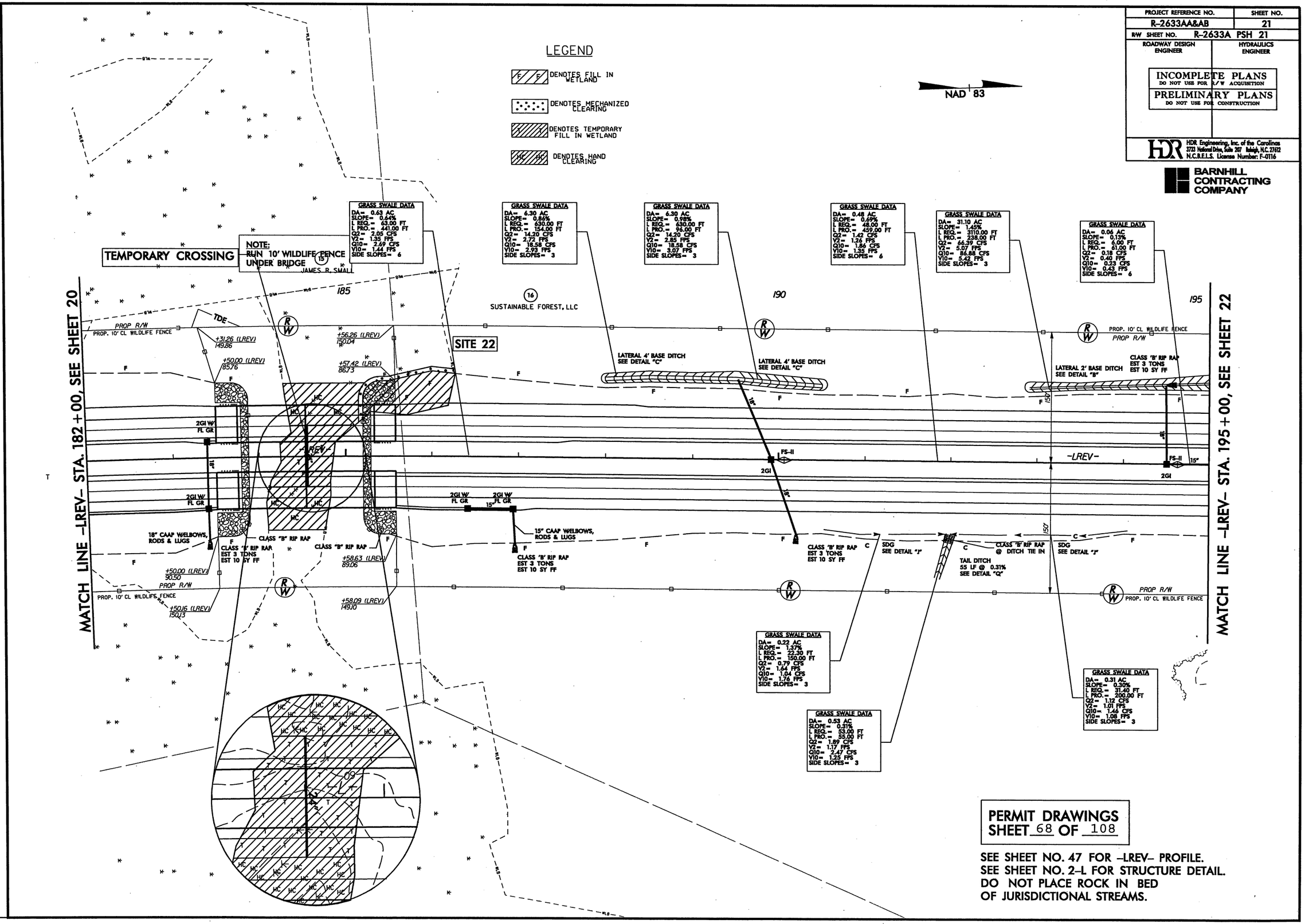
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	21
R/W SHEET NO. R-2633A PSH 21	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 68 OF 108

SEE SHEET NO. 47 FOR -LREV- PROFILE.
SEE SHEET NO. 2-L FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: Jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633A & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_21.dgn
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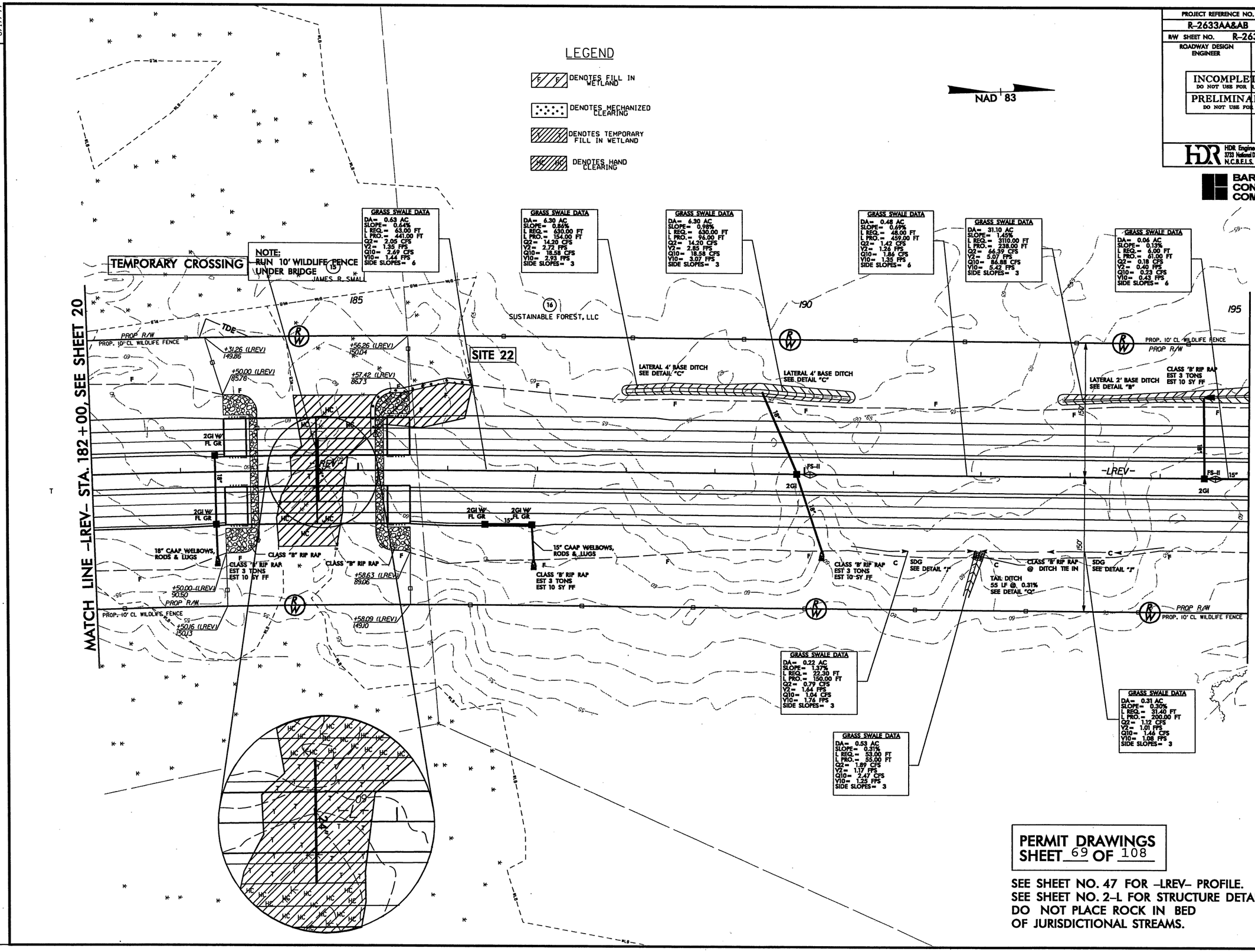
TIME: 9:05:31 AM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	21
R/W SHEET NO. R-2633A PSH 21	
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

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 69 OF 108

SEE SHEET NO. 47 FOR -LREV- PROFILE.
SEE SHEET NO. 2-L FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: Jmassroc DATE: 10/3/2010 TIME: 9:40:44 AM SCALE: 1:100
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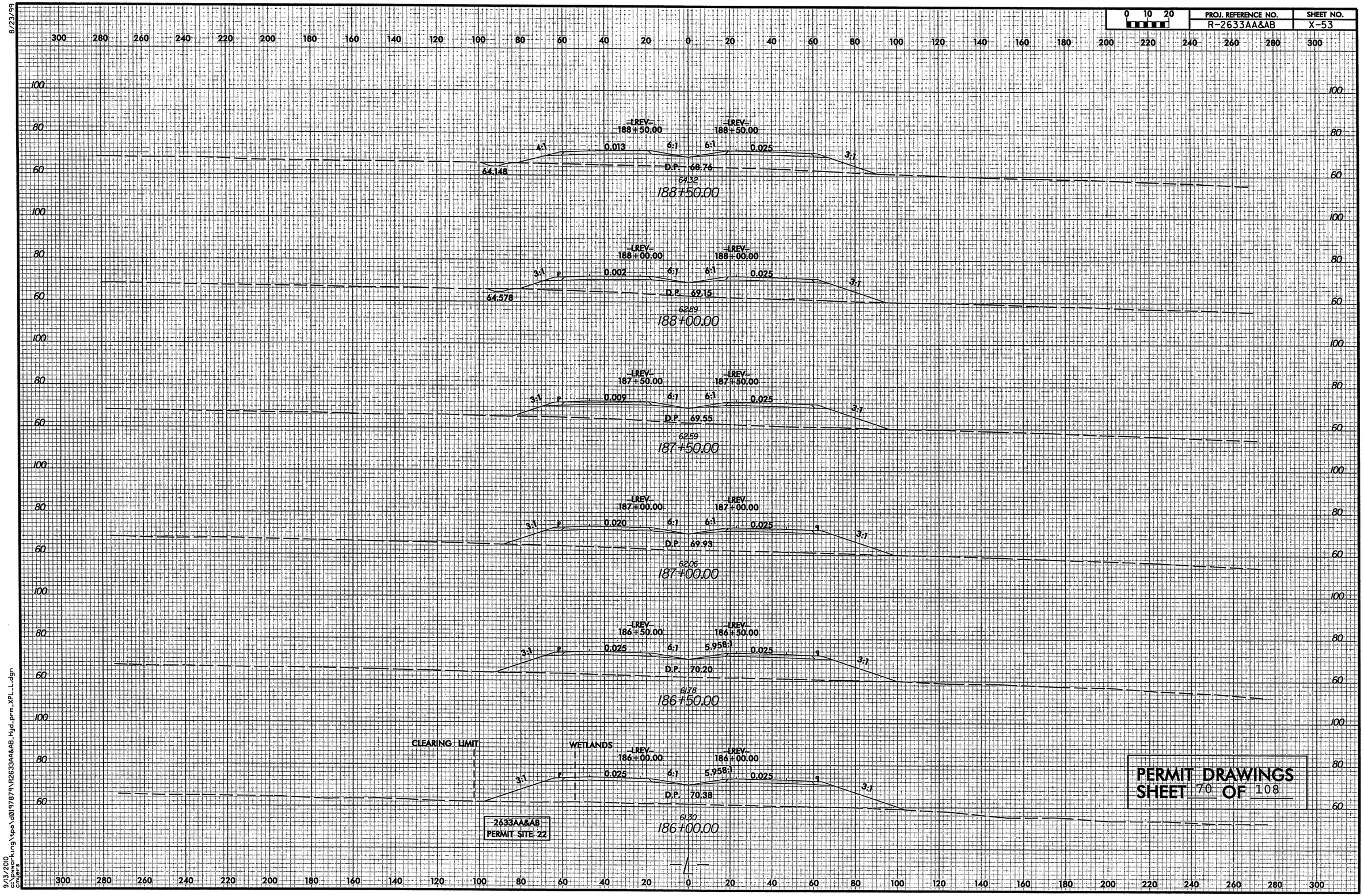
8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-53



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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	22
R/W SHEET NO. R-2633A PSH 21 & 22	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

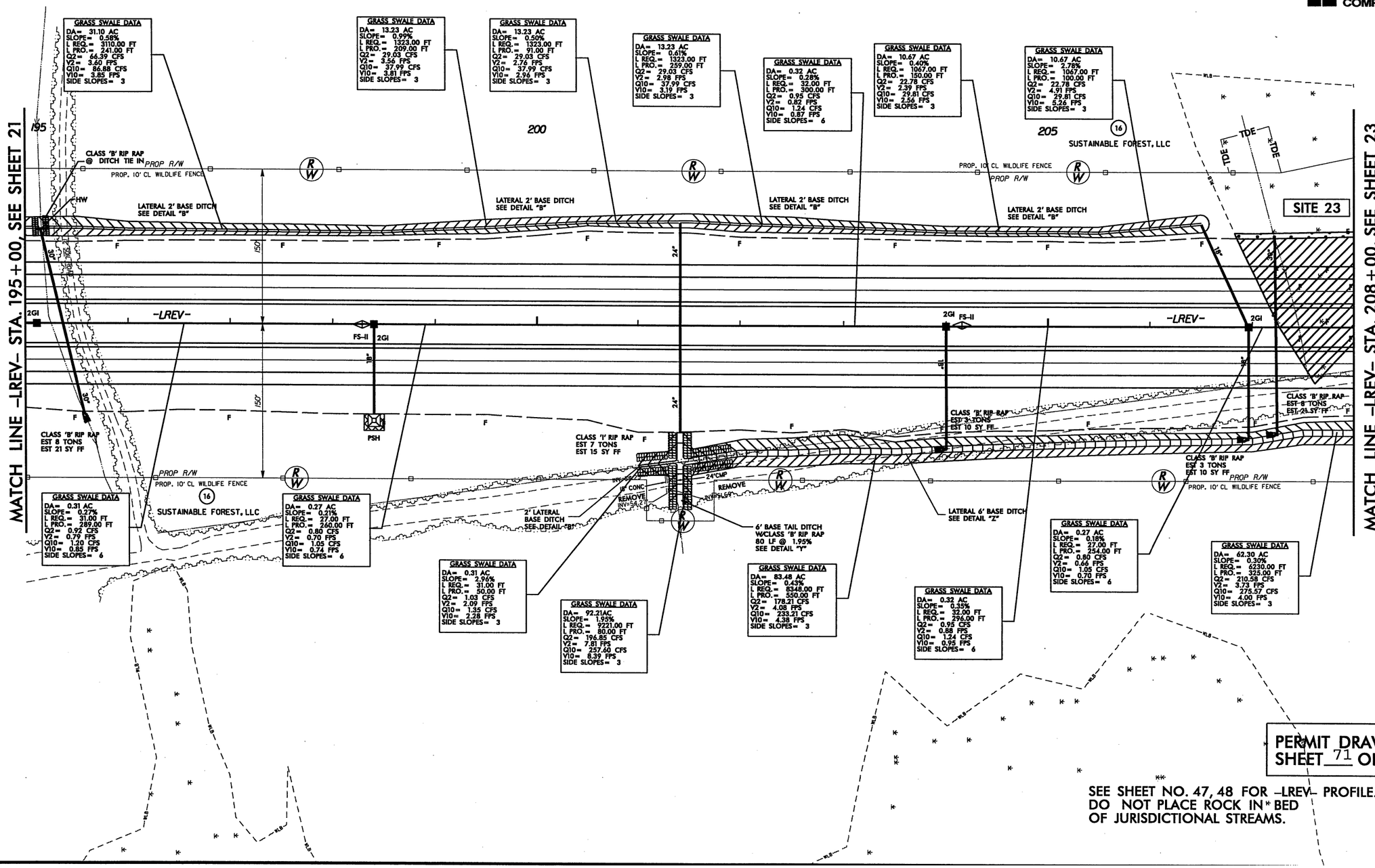
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

LEGEND

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

NAD 83



PERMIT DRAWINGS
SHEET 71 OF 108

SEE SHEET NO. 47, 48 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	22
R/W SHEET NO. R-2633A PSH 21 & 22	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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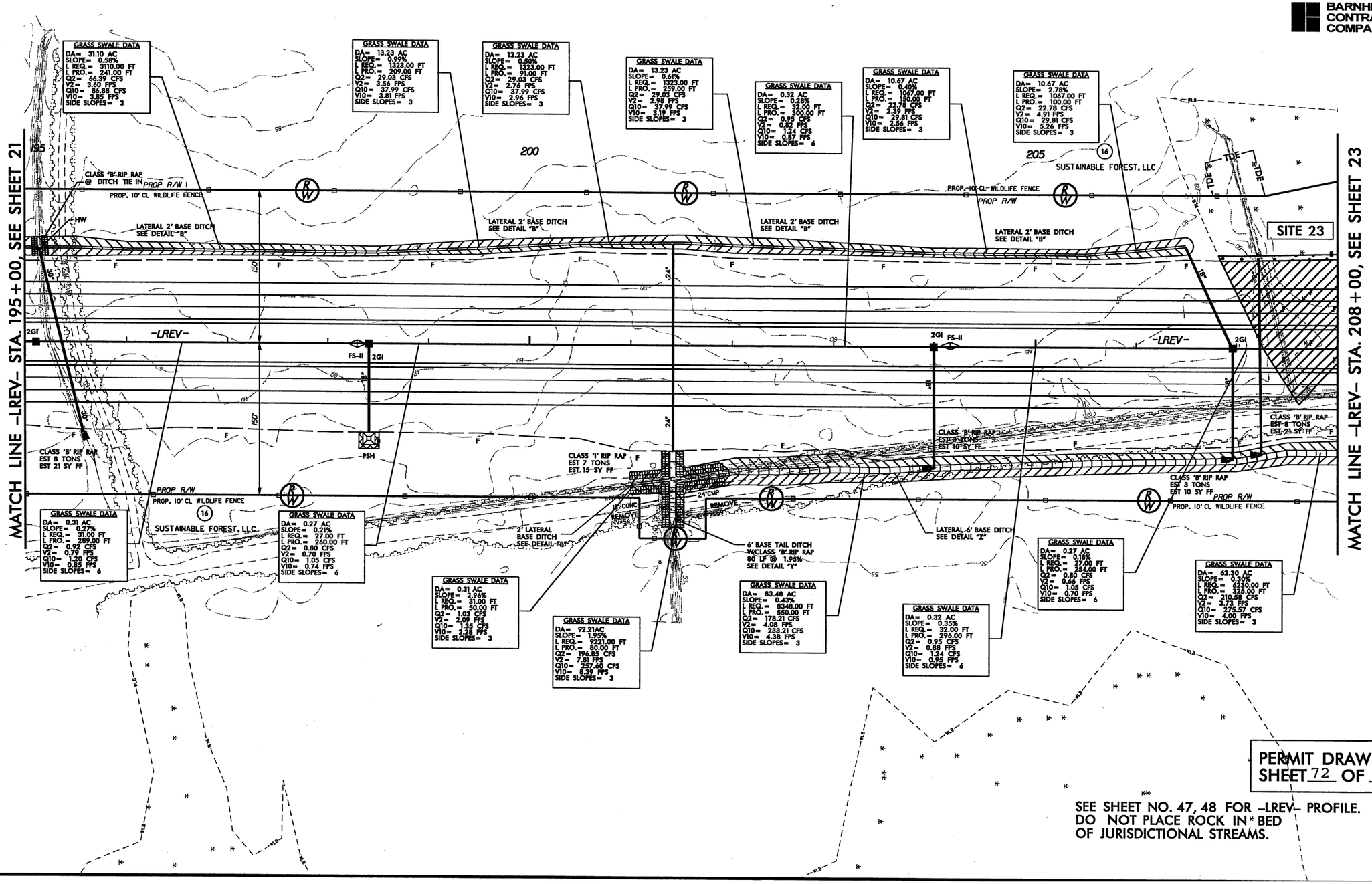
BARNHILL CONTRACTING COMPANY

LEGEND

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

NAD 83



PERMIT DRAWINGS
SHEET 72 OF 108

SEE SHEET NO. 47, 48 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN * BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	23
R/W SHEET NO. R-2633A PSH 22 & 23	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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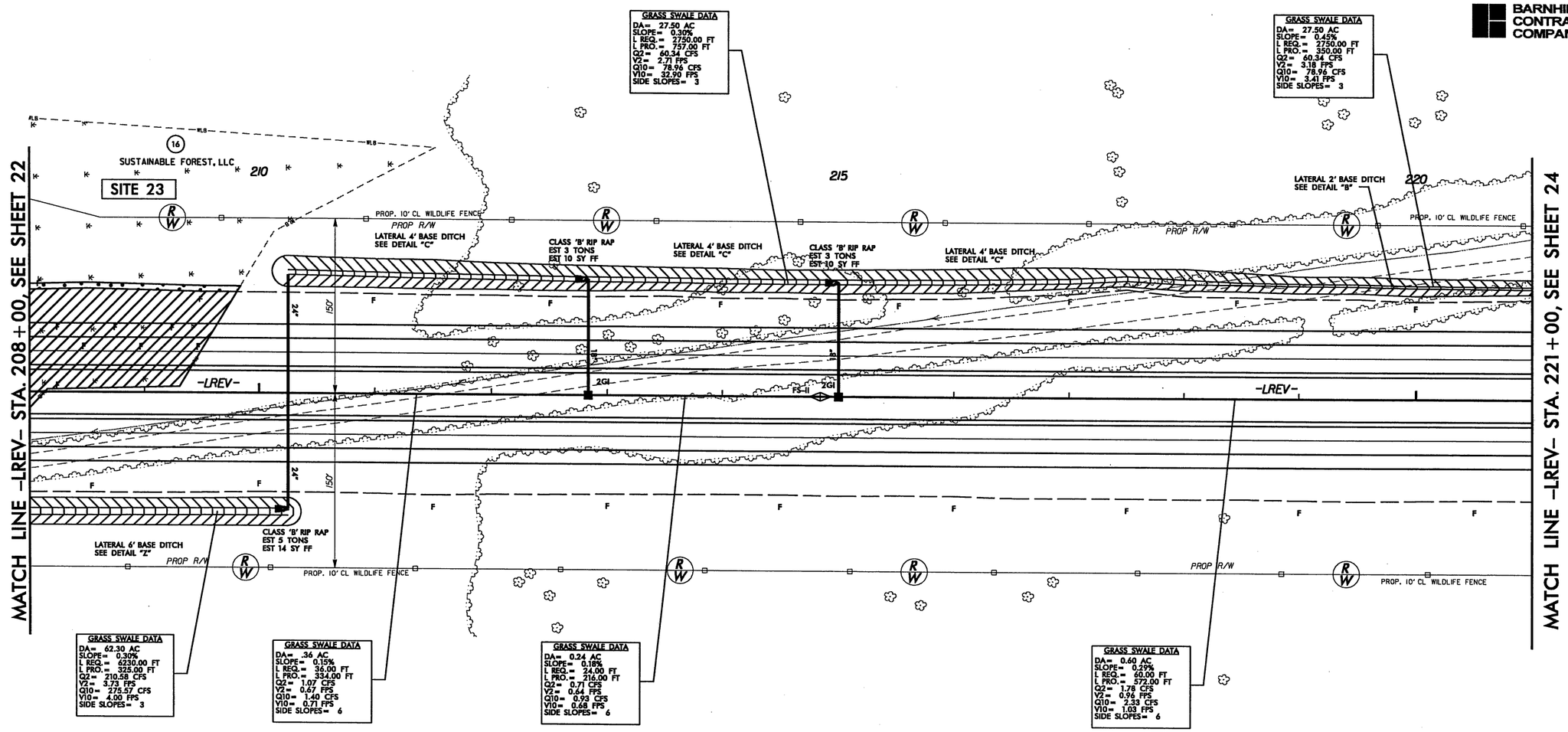
BARNHILL CONTRACTING COMPANY

LEGEND

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83



PERMIT DRAWINGS
SHEET 73 OF 108

SEE SHEET NO. 48 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	23
R/W SHEET NO. R-2633A PSH 22 & 23	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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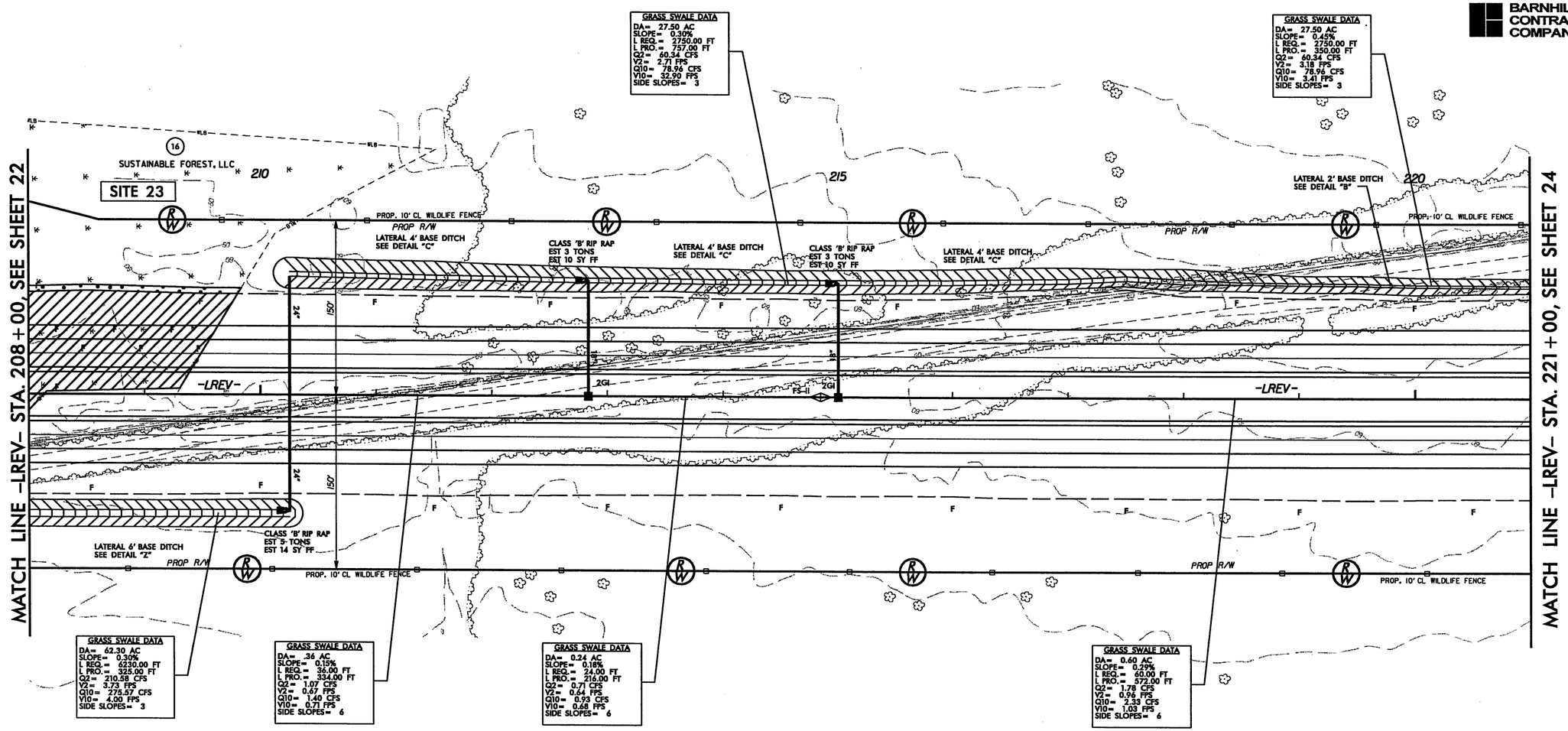
BARNHILL CONTRACTING COMPANY

LEGEND

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83



PERMIT DRAWINGS
SHEET 74 OF 108

SEE SHEET NO. 48 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
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8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
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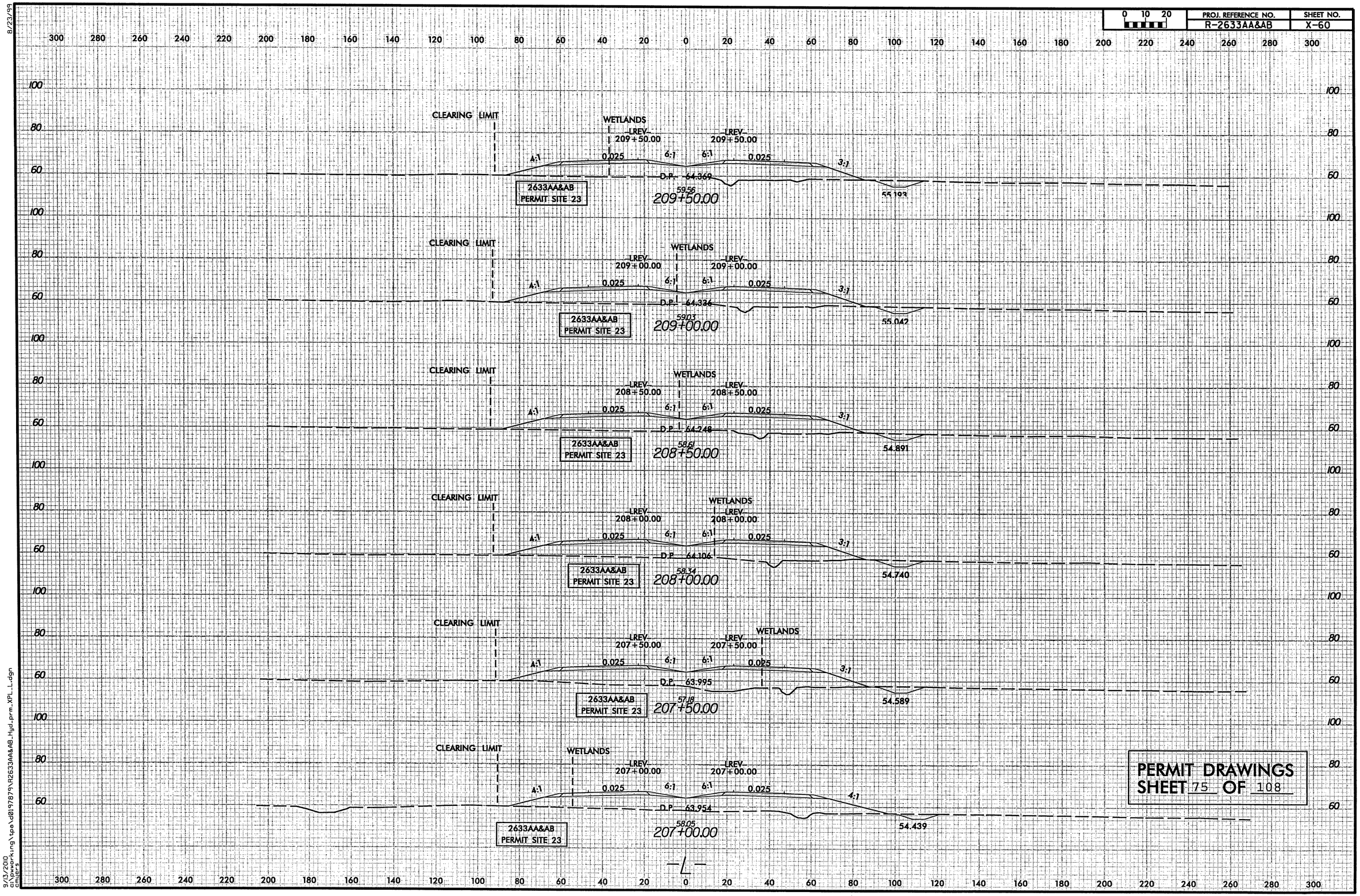

PERMIT DRAWINGS
SHEET 75 OF 108

9/13/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	27
R/W SHEET NO. R-2633A PSH 26 & 27	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
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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

BARNHILL CONTRACTING COMPANY

LEGEND

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

GRASS SWALE DATA
DA= 18.23 AC
SLOPE= 1.15%
L REQ.= 1823.00 FT
L PRO.= 270.00 FT
Q2= 38.92 CFS
V2= 4.80 FPS
Q10= 44.71 CFS
V10= 5.14 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.33 AC
SLOPE= 0.70%
L REQ.= 33.00 FT
L PRO.= 200.00 FT
Q2= 1.47 CFS
V2= 1.27 FPS
Q10= 1.92 CFS
V10= 1.36 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 32.27 AC
SLOPE= 0.30%
L REQ.= 3227.00 FT
L PRO.= 425.00 FT
Q2= 70.80 CFS
V2= 2.83 FPS
Q10= 92.65 CFS
V10= 3.03 FPS
SIDE SLOPES= 3

NOTE:
RUN 10' WILDLIFE FENCE UNDER BRIDGE

NO DECK DRAINS REQ'D ON EITHER BRIDGE

16 SUSTAINABLE FOREST, LLC

17 D+H INVESTORS INC.

SITE 24

MATCH LINE -LREV- STA. 260+00, SEE SHEET 26

MATCH LINE -LREV- STA. 273+00, SEE SHEET 28

260 265 270

PROP. 10' CL WILDLIFE FENCE

PROP R/W

LATERAL "V" DITCH SEE DETAIL "A"

CLASS 'B' RIP RAP EST 3 TONS EST 10 SY FF

CLASS 'B' RIP RAP EST 3 TONS EST 10 SY FF

LATERAL 4' BASE DITCH SEE DETAIL "C"

RELOCATE EXISTING DITCH TO AVOID WETLAND IMPACTS

FILL ABANDON CHANNEL, 100 LF EST 78 CY

+19.36 (LREV) 149.83

+19.35 (LREV) 96.48

+77.36 (LREV) 149.83

CLASS 'B' RIP RAP @ DITCH TIE 356.38 (LREV)

18" CAAP WELBOWS, RODS & LUGS

2702 2GI W/ FL GR

HW

42"

18"

15"

2GI W/ FL GR

2GI

FS-II

PSH

-LREV-

NC

TIE CLEARANCE = 4.08'

+19.86 (LREV) 102.55

CLASS 'B' RIP RAP EST 5 TONS EST 14 SY FF

CLASS 'B' RIP RAP @ DITCH TIE

CLASS "B" RIP RAP

CLASS "B" RIP RAP

+77.08 (LREV) 101.05

+19.36 (LREV) 150.11

+77.36 (LREV) 150.17

5' BASE TAIL DITCH 150 LF @ 0.39% SEE DETAIL "Z"

TIE TO EXISTING DITCH

TDE

GRASS SWALE DATA
DA= 0.90 AC
SLOPE= 0.87%
L REQ.= 90.00 FT
L PRO.= 250.00 FT
Q2= 3.20 CFS
V2= 1.96 FPS
Q10= 4.19 CFS
V10= 2.10 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 57.81 AC
SLOPE= 0.39%
L REQ.= 5781.00 FT
L PRO.= 150.00 FT
Q2= 130.27 CFS
V2= 3.63 FPS
Q10= 170.47 CFS
V10= 3.89 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 0.80 AC
SLOPE= 1.00%
L REQ.= 80.00 FT
L PRO.= 632.00 FT
Q2= 3.32 CFS
V2= 1.79 FPS
Q10= 4.35 CFS
V10= 1.92 FPS
SIDE SLOPES= 6

PERMIT DRAWINGS
SHEET 76 OF 108

SEE SHEET NO. 50 FOR -LREV- PROFILE.
SEE SHEET NO. 2-M FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	27
R/W SHEET NO. R-2633A PSH 26 & 27	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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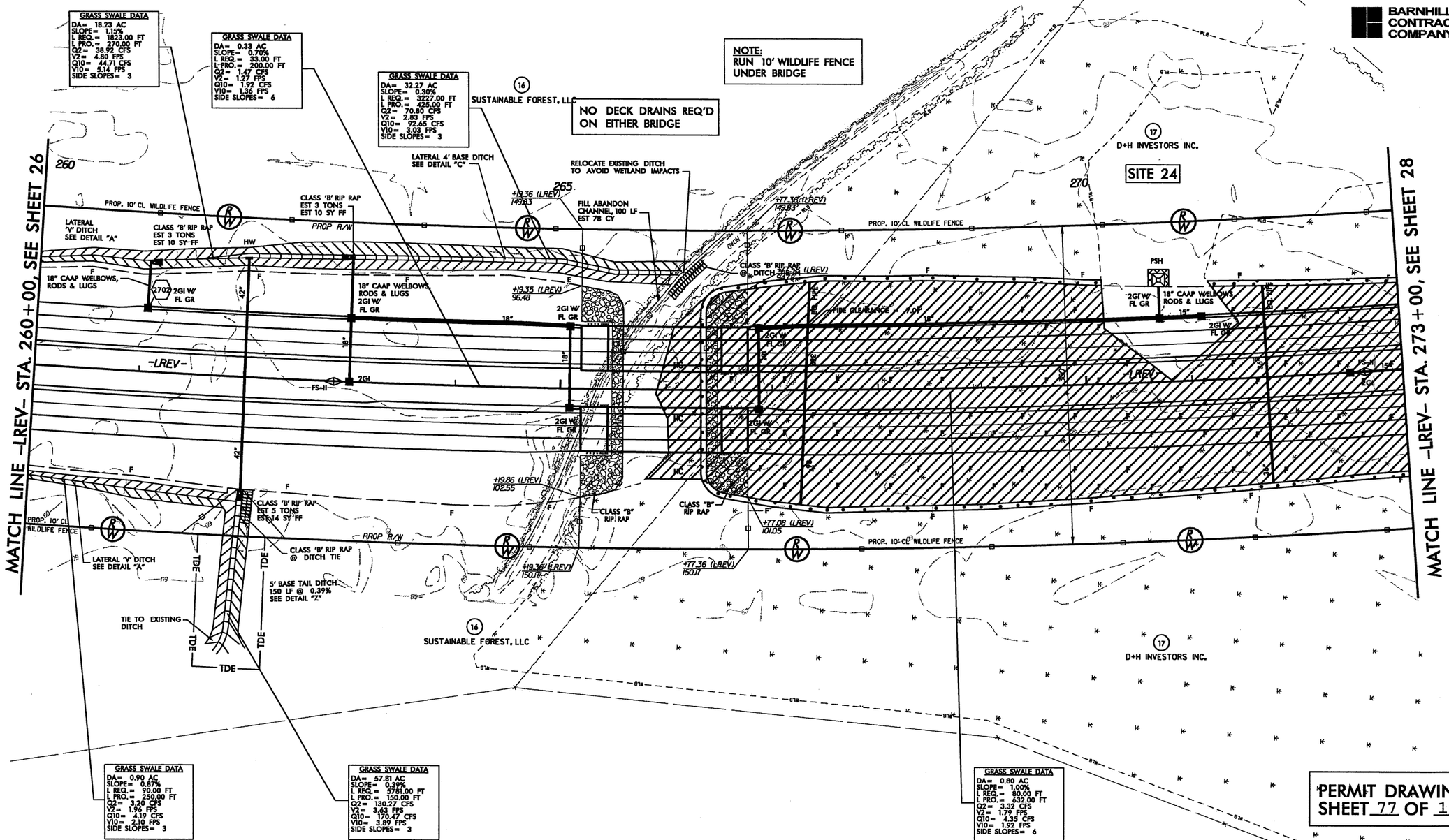
BARNHILL CONTRACTING COMPANY

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83



PERMIT DRAWINGS
SHEET 77 OF 108

SEE SHEET NO. 50 FOR -LREV- PROFILE.
SEE SHEET NO. 2-M FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

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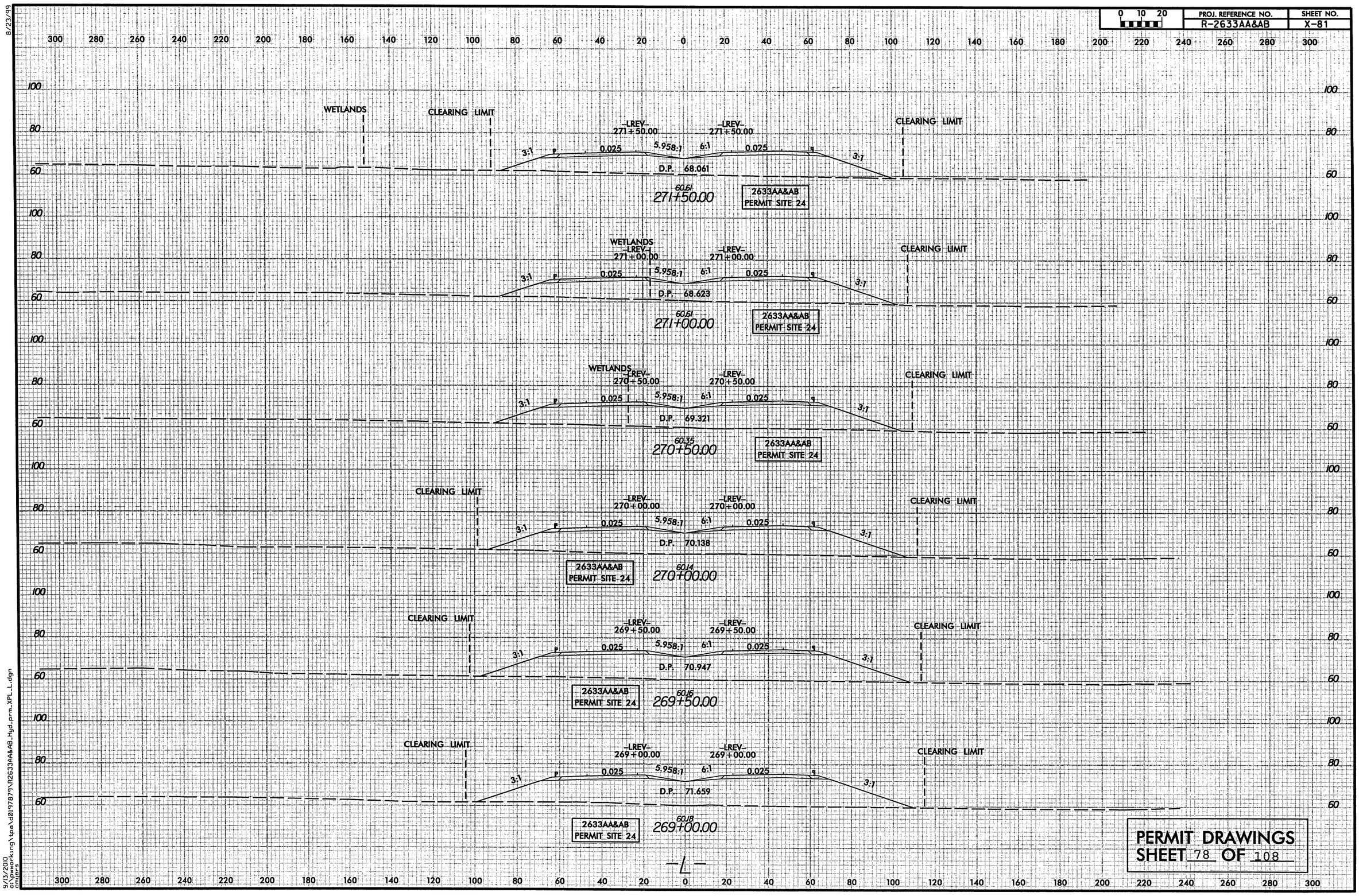

PERMIT DRAWINGS
SHEET 78 OF 108

9/23/99

9/13/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	28
R/W SHEET NO. R-2633A PSH 27 & 28	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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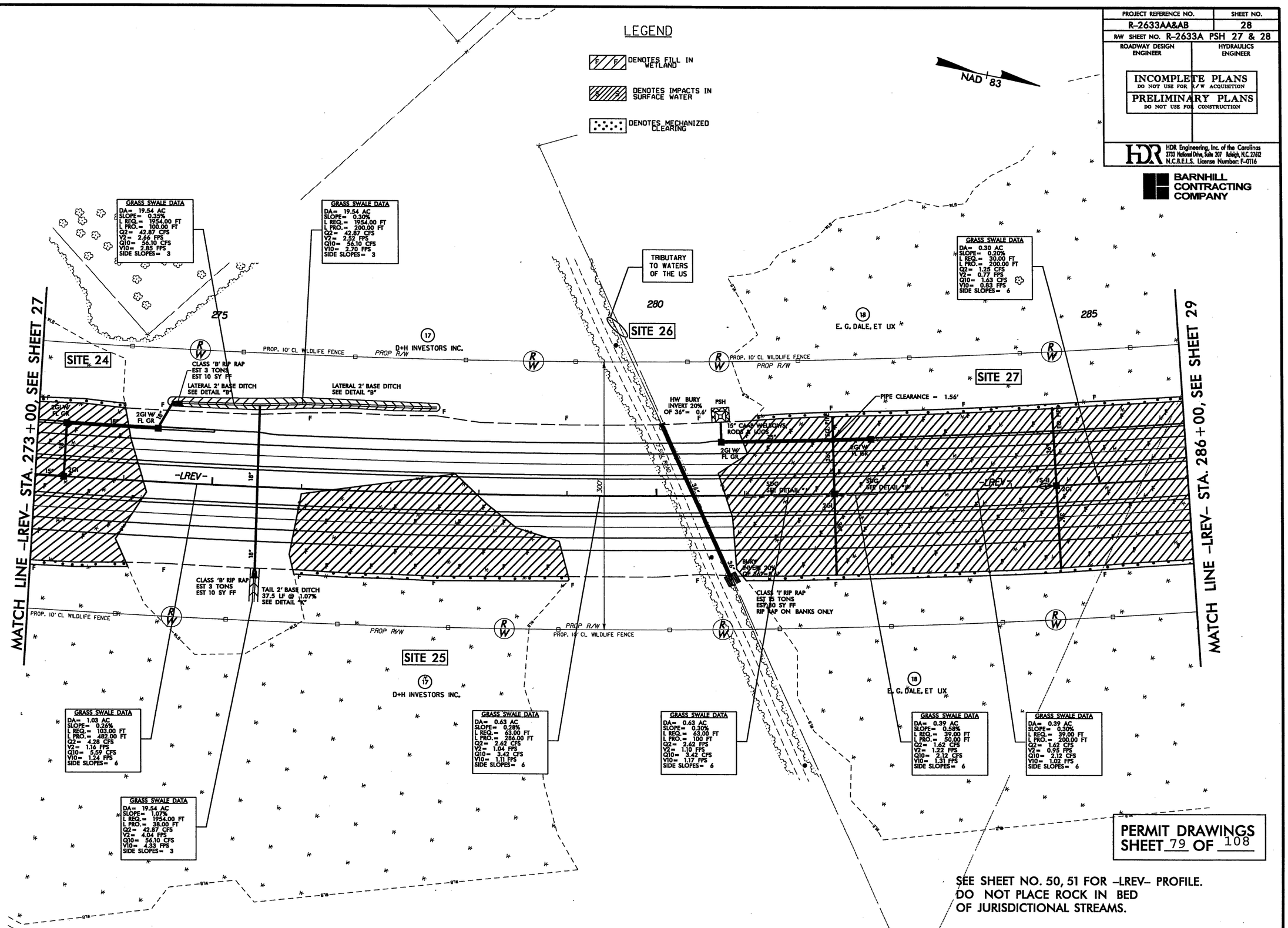
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 79 OF 108

SEE SHEET NO. 50, 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	28
R/W SHEET NO. R-2633A PSH 27 & 28	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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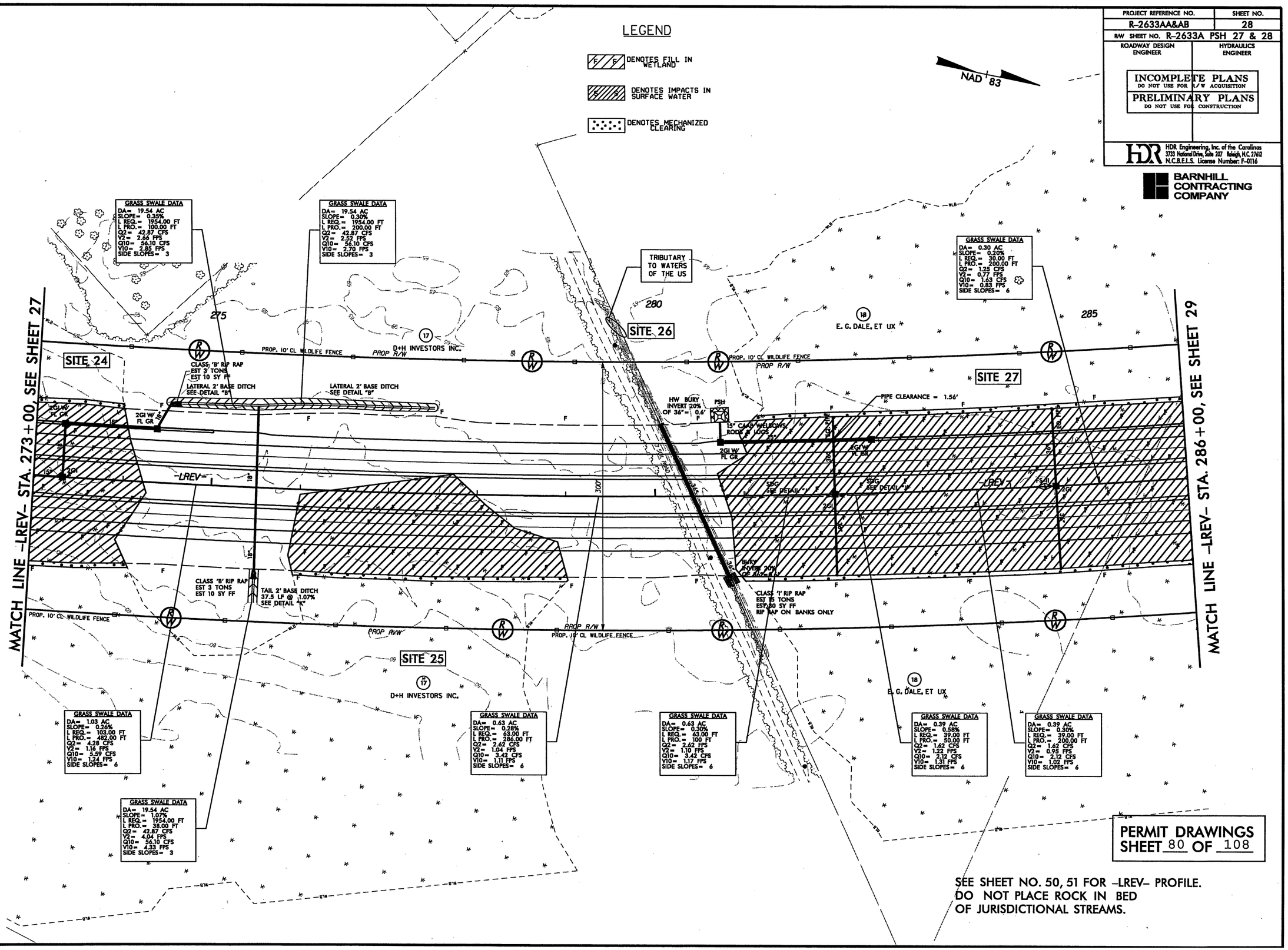
BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 80 OF 108

SEE SHEET NO. 50, 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
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REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
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8/23/99

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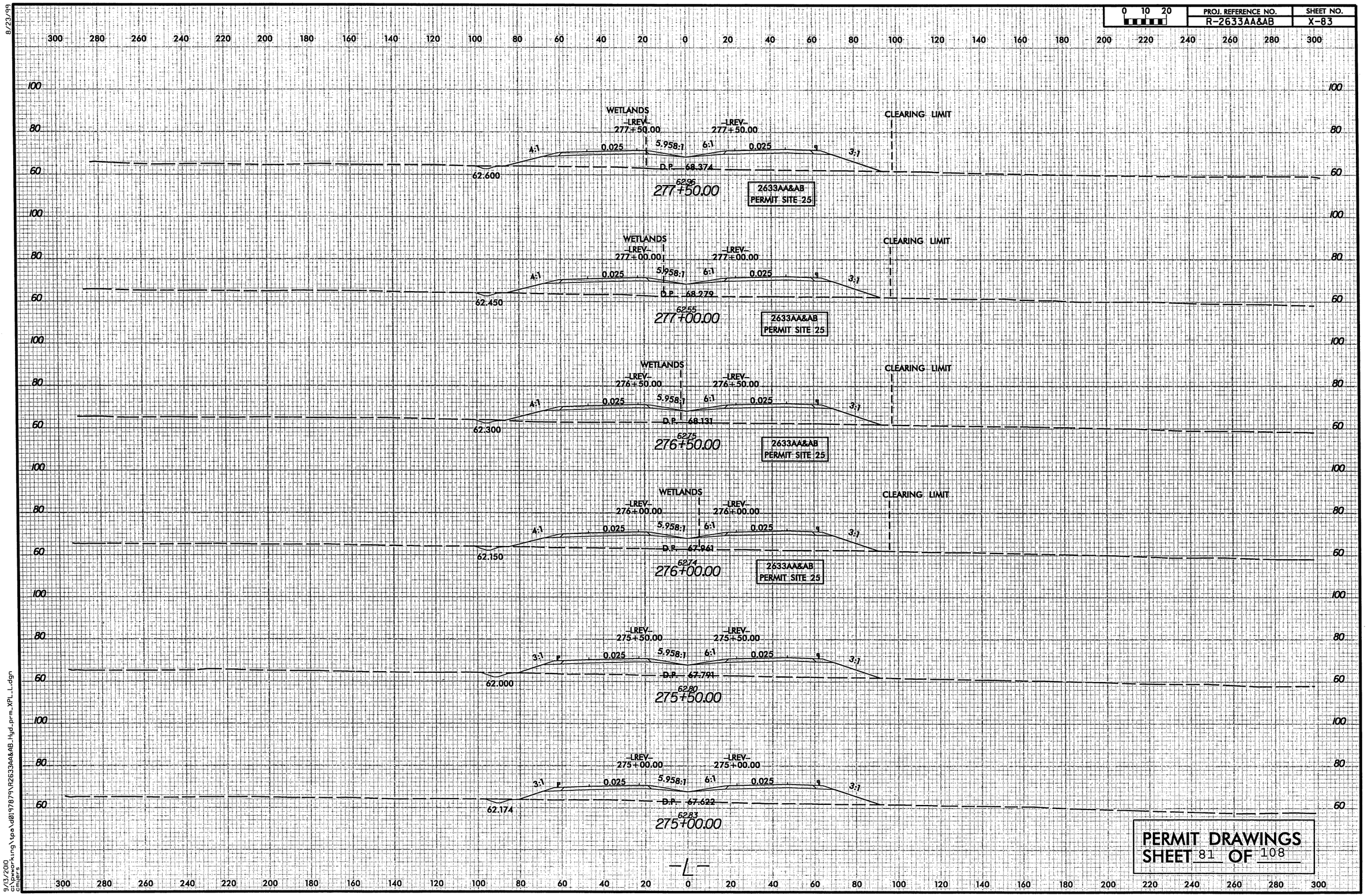

PERMIT DRAWINGS
SHEET 81 OF 108

9/13/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	29
R/W SHEET NO. R-2633A PSH 28 & 29	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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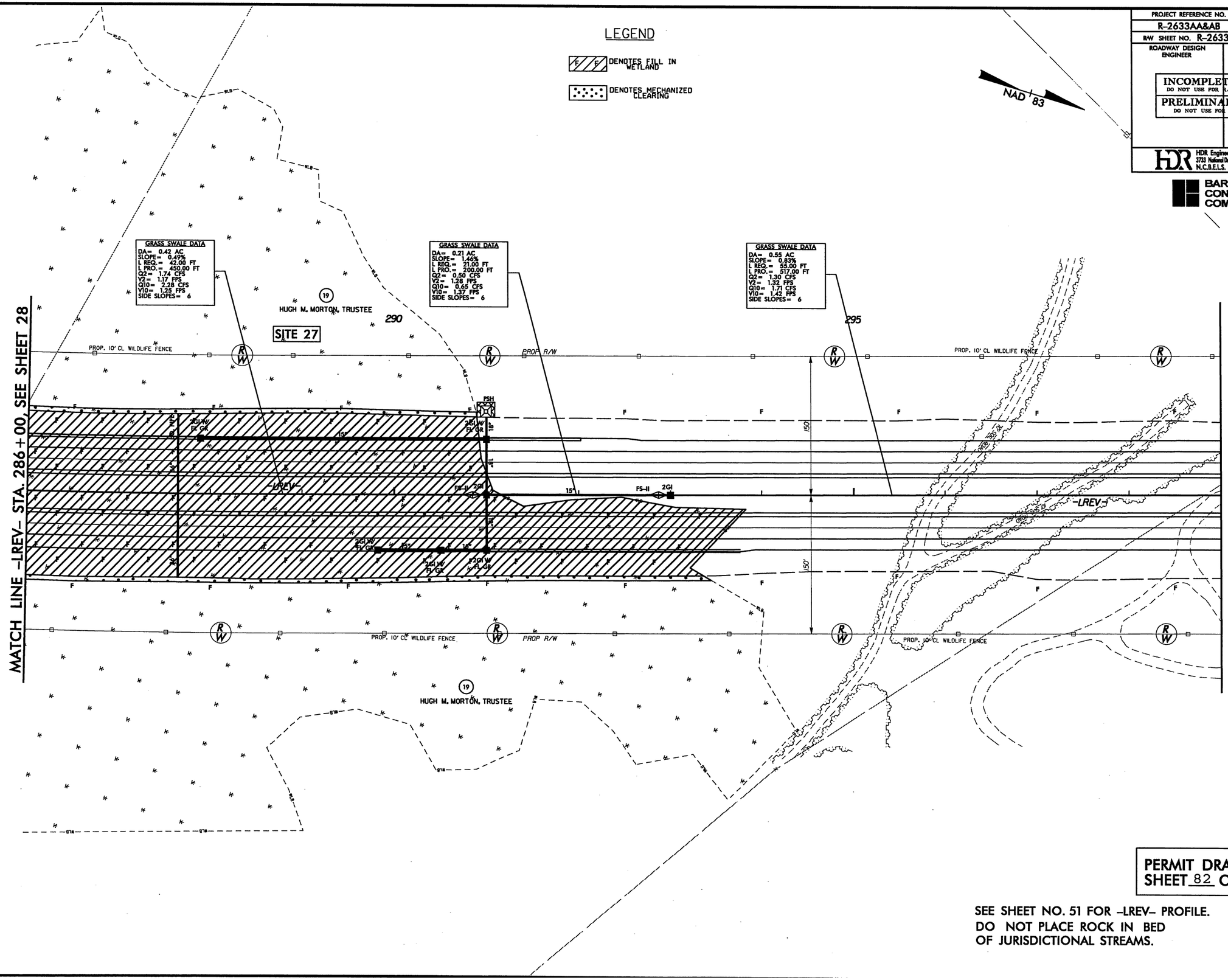
BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 82 OF 108

SEE SHEET NO. 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	29
R/W SHEET NO. R-2633A PSH 28 & 29	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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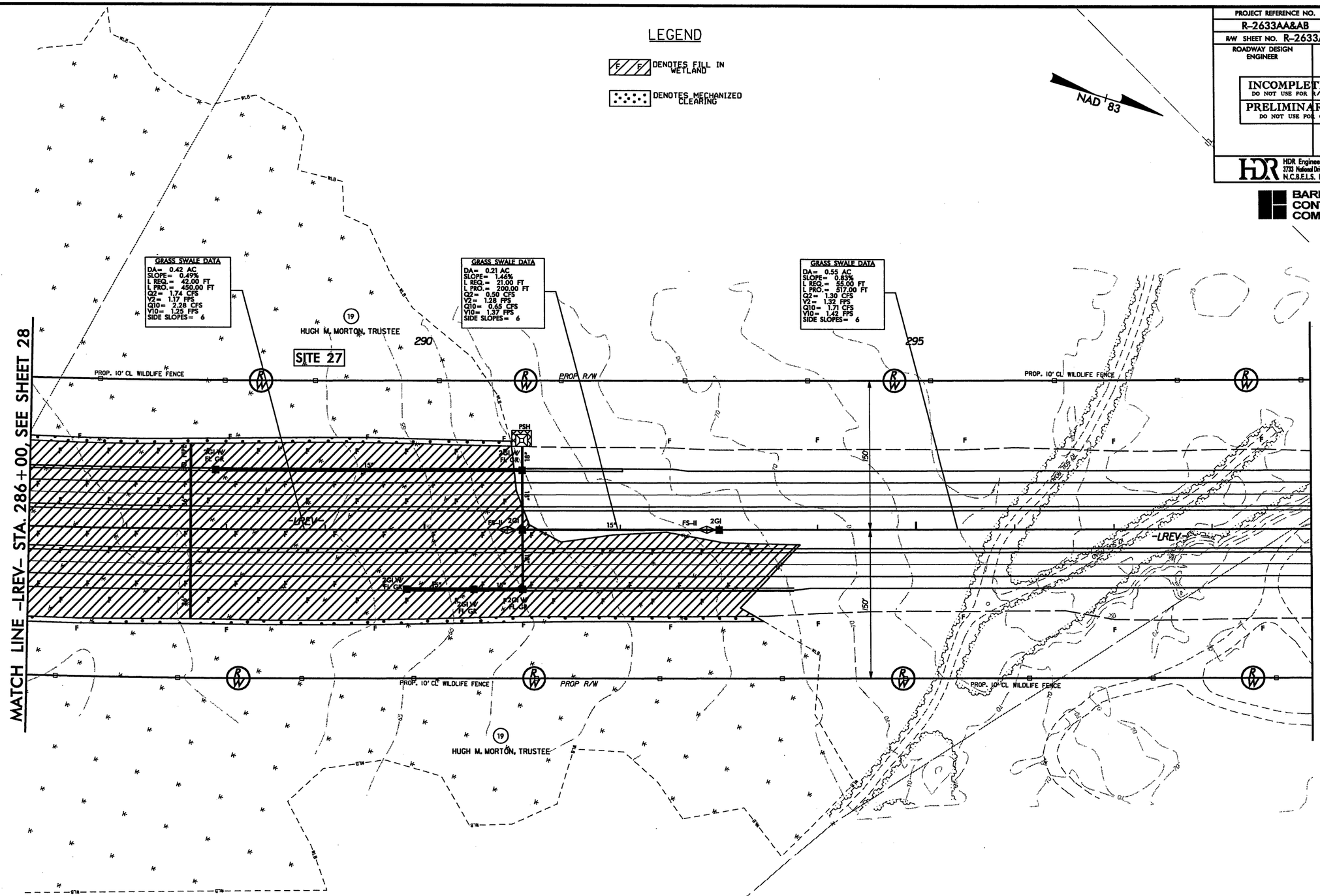
BARNHILL CONTRACTING COMPANY

LEGEND

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83



PERMIT DRAWINGS
SHEET 83 OF 108

SEE SHEET NO. 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
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8/23/99

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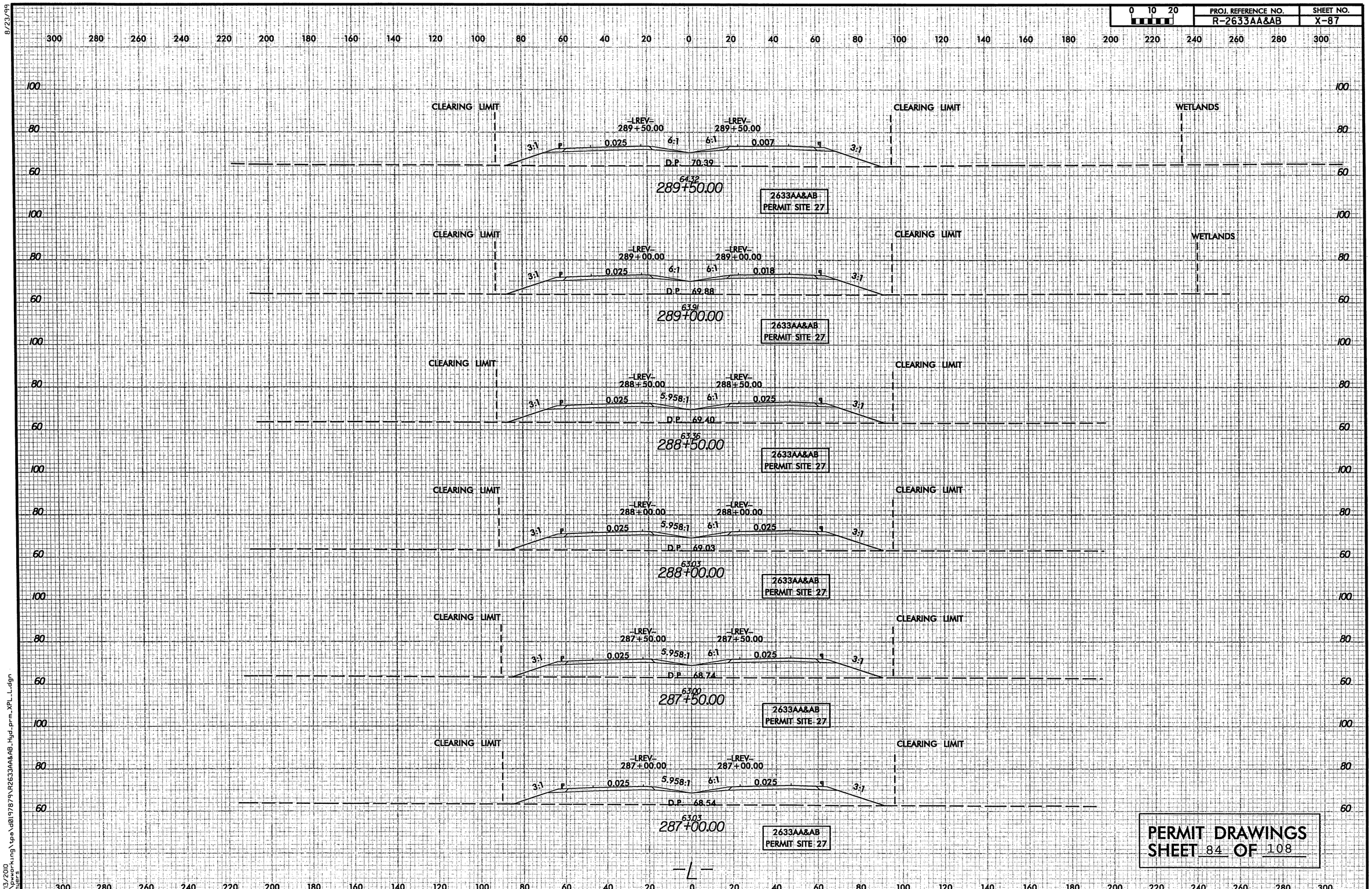

PERMIT DRAWINGS
SHEET 84 OF 108

9/13/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	30
R/W SHEET NO. R-2633A PSH 29 & 30 R-2633B PSH 4 & 5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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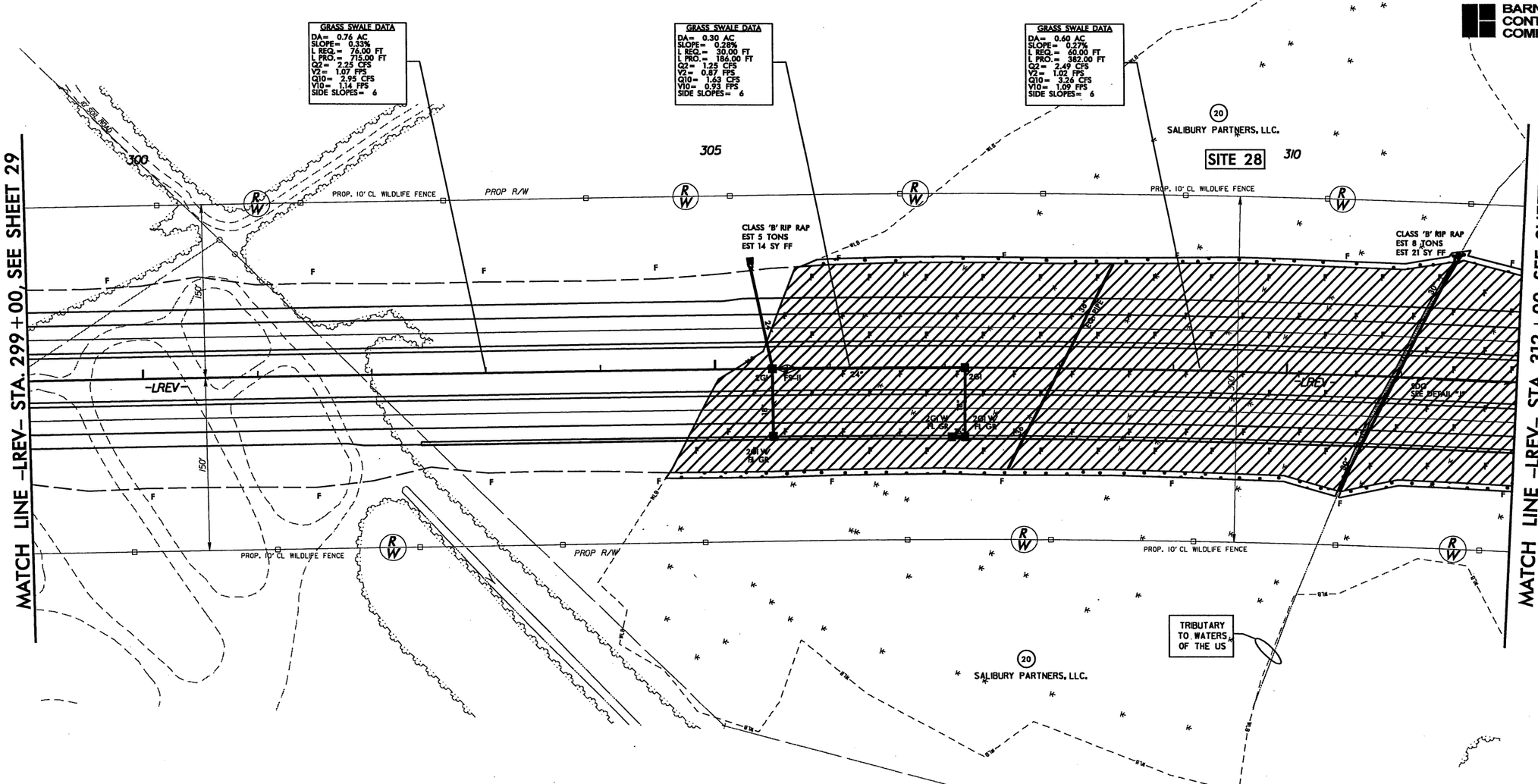
BARNHILL CONTRACTING COMPANY

LEGEND

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

NAD 83



PERMIT DRAWINGS
SHEET 85 OF 108

SEE SHEET NO. 51 FOR -LREV- PROFILE.
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REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	30
R/W SHEET NO. R-2633A PSH 29 & 30 R-2633B PSH 4 & 5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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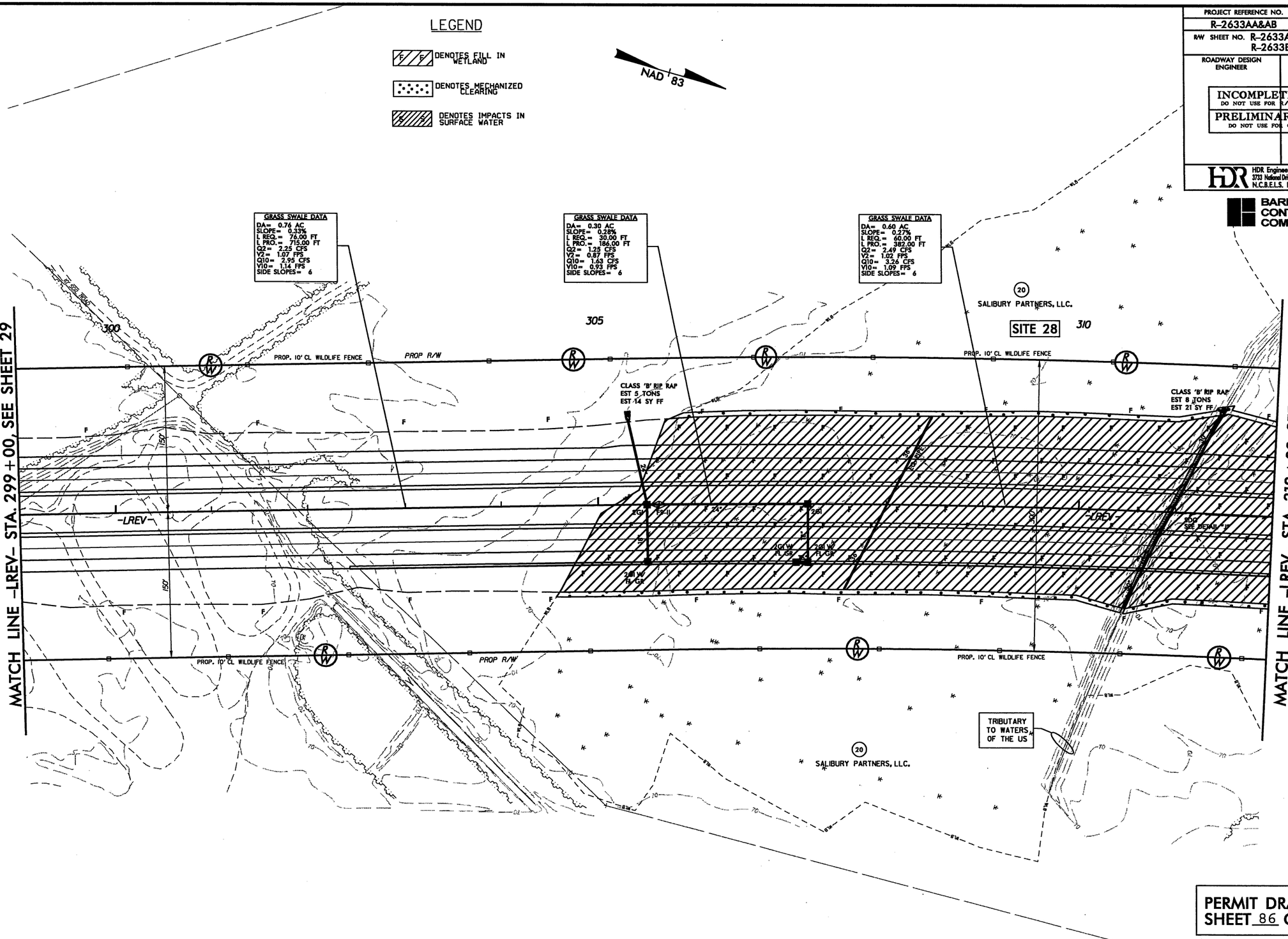
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY



PERMIT DRAWINGS
SHEET 86 OF 108

SEE SHEET NO. 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	31
R/W SHEET NO. R-2633B PSH 4 & 5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

LEGEND

F/F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

MATCH LINE -LREV- STA. 312+00, SEE SHEET 30

MATCH LINE -LREV- STA. 325+00, SEE SHEET 32

GRASS SWALE DATA
DA= 0.43 AC
SLOPE= 0.30%
L REQ.= 43.00 FT
L PRO.= 250.00 FT
Q2= 1.78 CFS
V2= 1.04 FPS
Q10= 2.34 CFS
V10= 1.11 FPS
SIDE SLOPES= 4.6

GRASS SWALE DATA
DA= 0.39AC
SLOPE= 1.44%
L REQ.= 39.00 FT
L PRO.= 200.00 FT
Q2= 1.62 CFS
V2= 1.71 FPS
Q10= 2.12 CFS
V10= 1.83 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 0.83 AC
SLOPE= 2.56%
L REQ.= 83.00 FT
L PRO.= 500.00 FT
Q2= 3.45 CFS
V2= 2.57 FPS
Q10= 4.51 CFS
V10= 2.75 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 0.93 AC
SLOPE= 0.99%
L REQ.= 93.00 FT
L PRO.= 500.00 FT
Q2= 4.14 CFS
V2= 1.88 FPS
Q10= 5.41 CFS
V10= 2.01 FPS
SIDE SLOPES= 6

WILDLIFE FENCE — C/A FENCE

20 SALISBURY PARTNERS, LLC

SITE 28

315

320

PROP. 10' CL WILDLIFE FENCE

PROP. WW FENCE

30'

CLASS B RIP RAP
EST. 5 TON
EST. 14 SY FF

24" CLASS B

MONITORING WELL

FS-II 2GI

-LREV-

18"

2GI W/ FL GR

CLASS B RIP RAP @DITCH TIE IN

CLASS B RIP RAP
EST. 3 TON
EST. 10 SY FF

2GI W/ FL GR

18" CAAP w/ELBOWS w/ROD & LUG CONNECTORS

LATERAL 2' BASE DITCH SEE DETAIL "B"

LATERAL 4' BASE DITCH SEE DETAIL "C"

SDG SEE DETAIL "F"

SDG SEE DETAIL "J"

2GI(D) W/ FL GR

2GI(D) W/ FL GR

GRASS SWALE DATA
DA= 0.39 AC
SLOPE= 2.48%
L REQ.= 39.00 FT
L PRO.= 50.00 FT
Q2= 1.62 CFS
V2= 2.24FPS
Q10= 2.12 CFS
V10= 2.39 FPS
SIDE SLOPES= 4.6

GRASS SWALE DATA
DA= 1.27 AC
SLOPE= 0.68%
L REQ.= 127.00 FT
L PRO.= 70.00 FT
Q2= 4.52 CFS
V2= 1.91 FPS
Q10= 5.91 CFS
V10= 2.05 FPS
SIDE SLOPES= 3

GRASS SWALE DATA
DA= 5.40 AC
SLOPE= 0.64%
L REQ.= 540.00 FT
L PRO.= 430.00 FT
Q2= 13.77 CFS
V2= 2.42 FPS
Q10= 18.02 CFS
V10= 2.60 FPS
SIDE SLOPES= 3

PRIVATE ACCESS EASEMENT

SEE SHEET NO. 51, 52 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 87 OF 108

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: jmassroc DATE: 10/3/2010 TIME: 9:14:05 AM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_31.dgn

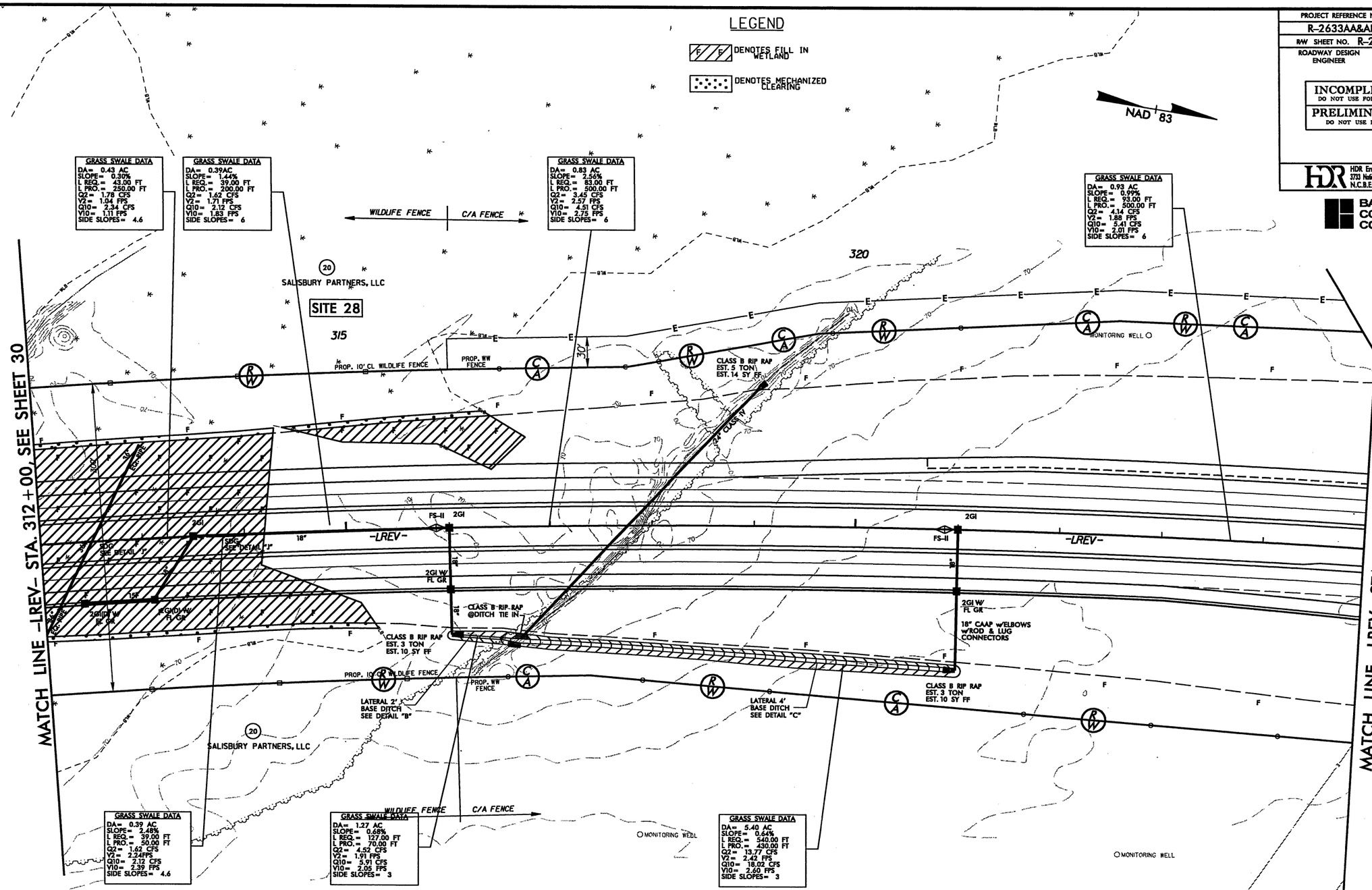
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	31
R/W SHEET NO. R-2633B PSH 4 & 5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 51, 52 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 88 OF 108

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
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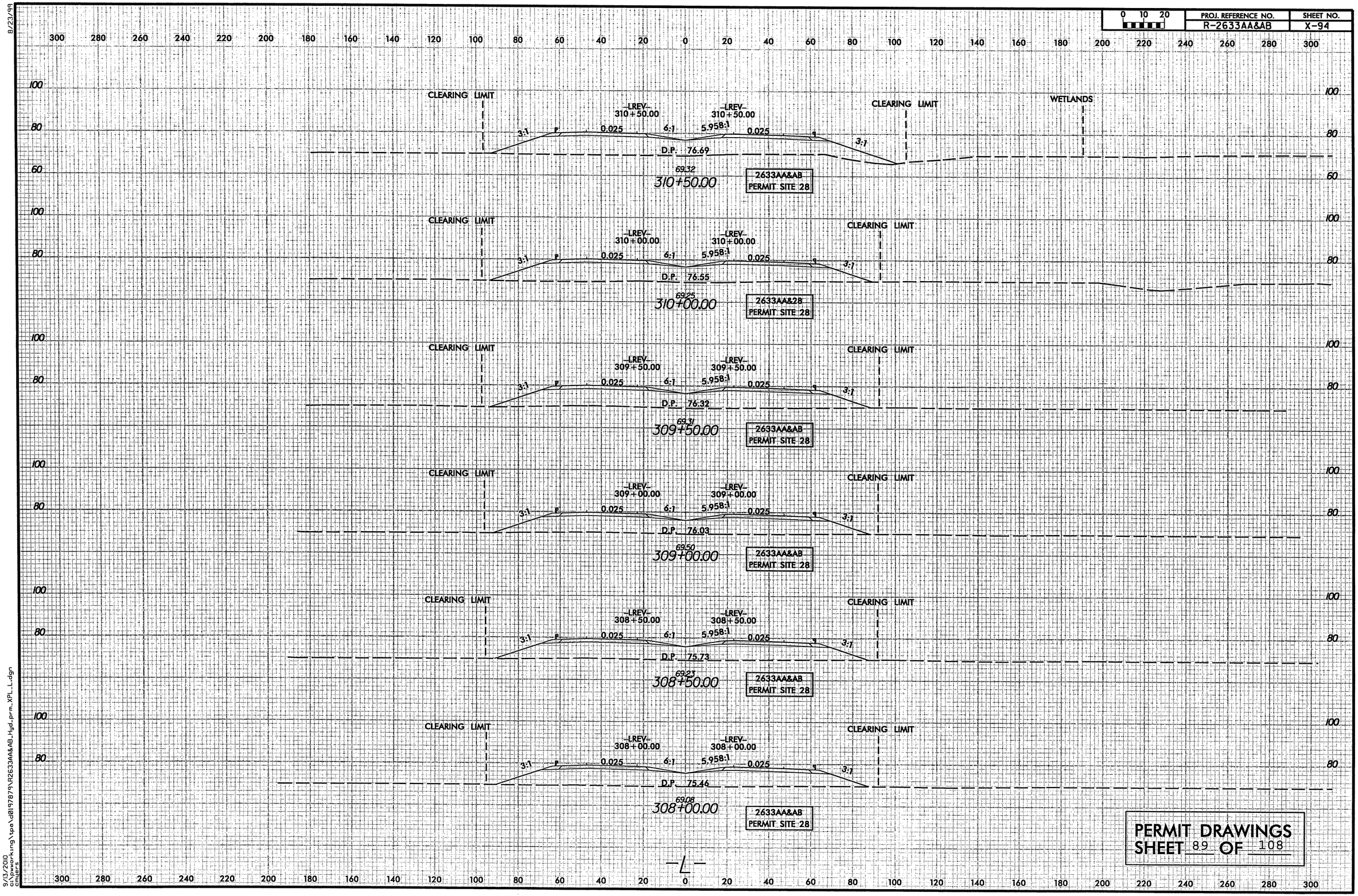
REVISIONS

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-94



PERMIT DRAWINGS
SHEET 89 OF 108

9/13/2000
C:\Pwworking\tpo\d0197879\R2633AA&AB_Hyd-prm_XPL_L.dgn
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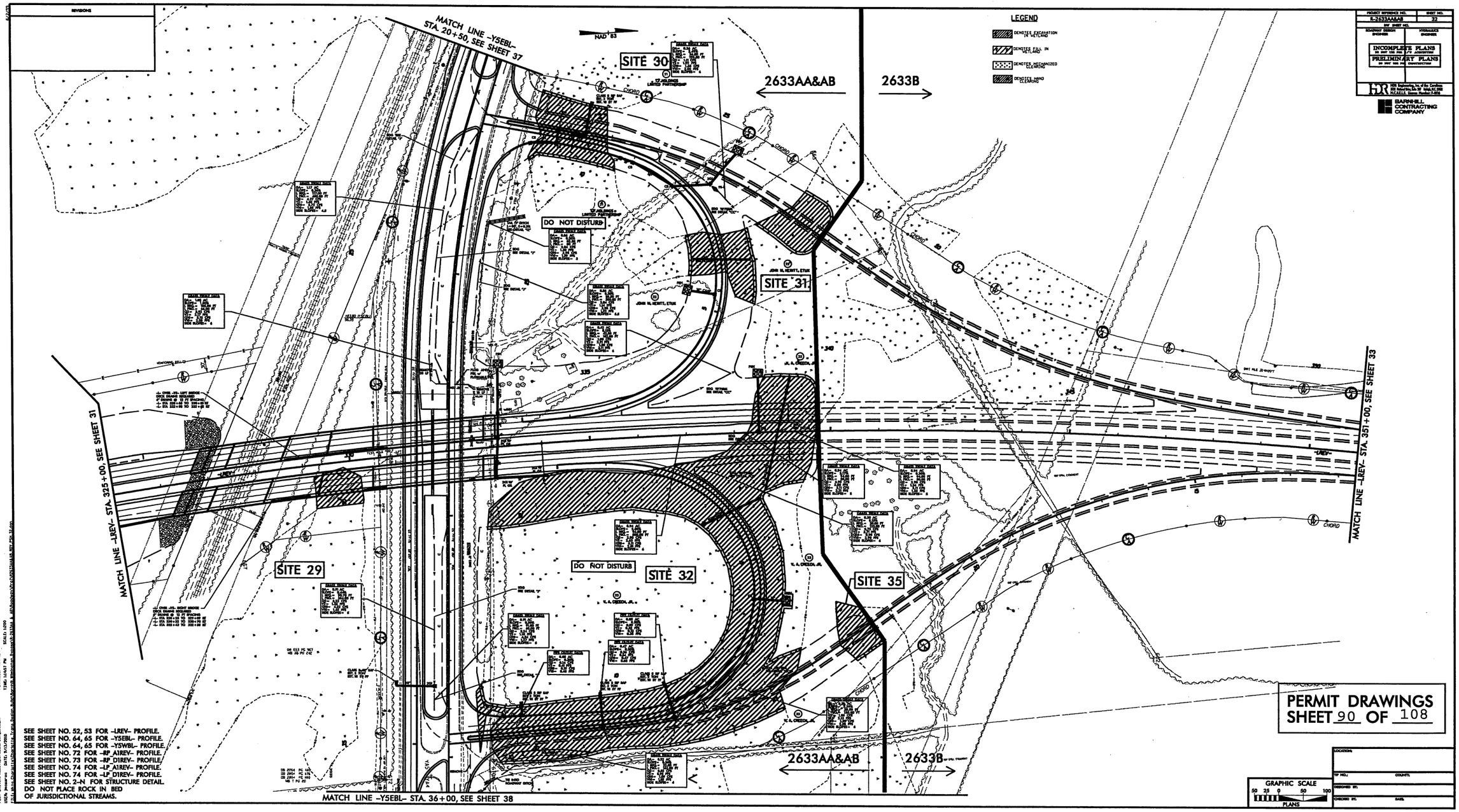

REVISIONS
MATCH LINE -Y5EBL- STA. 20+50, SEE SHEET 37
NAD 83
SITE 30
2633AA&AB
2633B
LEGEND
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES HAND CLEARING
PROJECT REFERENCE NO. R-2633AA&AB
SHEET NO. 32
INCOMPLETE PLANS
PRELIMINARY PLANS
BARNHILL CONTRACTING COMPANY
DO NOT DISTURB
SITE 31
MATCH LINE -LREV- STA. 325+00, SEE SHEET 31
MATCH LINE -LREV- STA. 351+00, SEE SHEET 33
SITE 29
SITE 32
SITE 35
2633AA&AB
2633B
MATCH LINE -Y5EBL- STA. 36+00, SEE SHEET 38
SEE SHEET NO. 52, 53 FOR -LREV- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5EBL- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 72 FOR -RP_A1REV- PROFILE.
SEE SHEET NO. 73 FOR -RP_D1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_A1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_D1REV- PROFILE.
SEE SHEET NO. 2-N FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
GRAPHIC SCALE
50 25 0 50 100
PLANS
PERMIT DRAWINGS
SHEET 90 OF 108

REVISIONS

MATCH LINE -YSEBL- STA. 20+50, SEE SHEET 37

NAD 83

SITE 30

2633AA&AB

2633B

LEGEND

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

DENOTES RECOGNIZED CLEARING

DENOTES LIMITED CLEARING

PROJECT REFERENCE NO.	SHEET NO.
B-2633AA&AB	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W CONSTRUCTION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

HNTB Corporation, Inc. of the Carolinas
1525 Hampton Inn Rd. Suite A-200
McAdenville, Gaston Number 1-2016

BARNHILL CONTRACTING COMPANY

DO NOT DISTURB

SITE 31

MATCH LINE -LREV- STA. 325+00, SEE SHEET 31

MATCH LINE -LREV- STA. 351+00, SEE SHEET 33

SITE 29

DO NOT DISTURB

SITE 32

SITE 35

2633AA&AB

2633B

MATCH LINE -YSEBL- STA. 36+00, SEE SHEET 38

SEE SHEET NO. 52, 53 FOR -LREV- PROFILE.
SEE SHEET NO. 64, 65 FOR -YSEBL- PROFILE.
SEE SHEET NO. 64, 65 FOR -YSWBL- PROFILE.
SEE SHEET NO. 72 FOR -RP_AIREV- PROFILE.
SEE SHEET NO. 73 FOR -RP_DIREV- PROFILE.
SEE SHEET NO. 74 FOR -LP_AIREV- PROFILE.
SEE SHEET NO. 74 FOR -LP_DIREV- PROFILE.
SEE SHEET NO. 2-N FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 91 OF 108

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:	
TIP NO.:	COUNTY:
DESIGNED BY:	
CHECKED BY:	DATE:

PLOT DATE/TIME: 9/22/2010 2:47:20 PM PLOT DRIVER: PCPDF.PRT
USER: jhaverda DATE: 9/23/2010 TIME: 10:42:25 PM SCALE: 1:200
FILE: W:\Projects\Charlotte\Tryon Design Build\Roadway Information Models\B-2633AA & AB\Roadway\Plan\B2633AA&AB_RDWY_PLAN_32.dgn

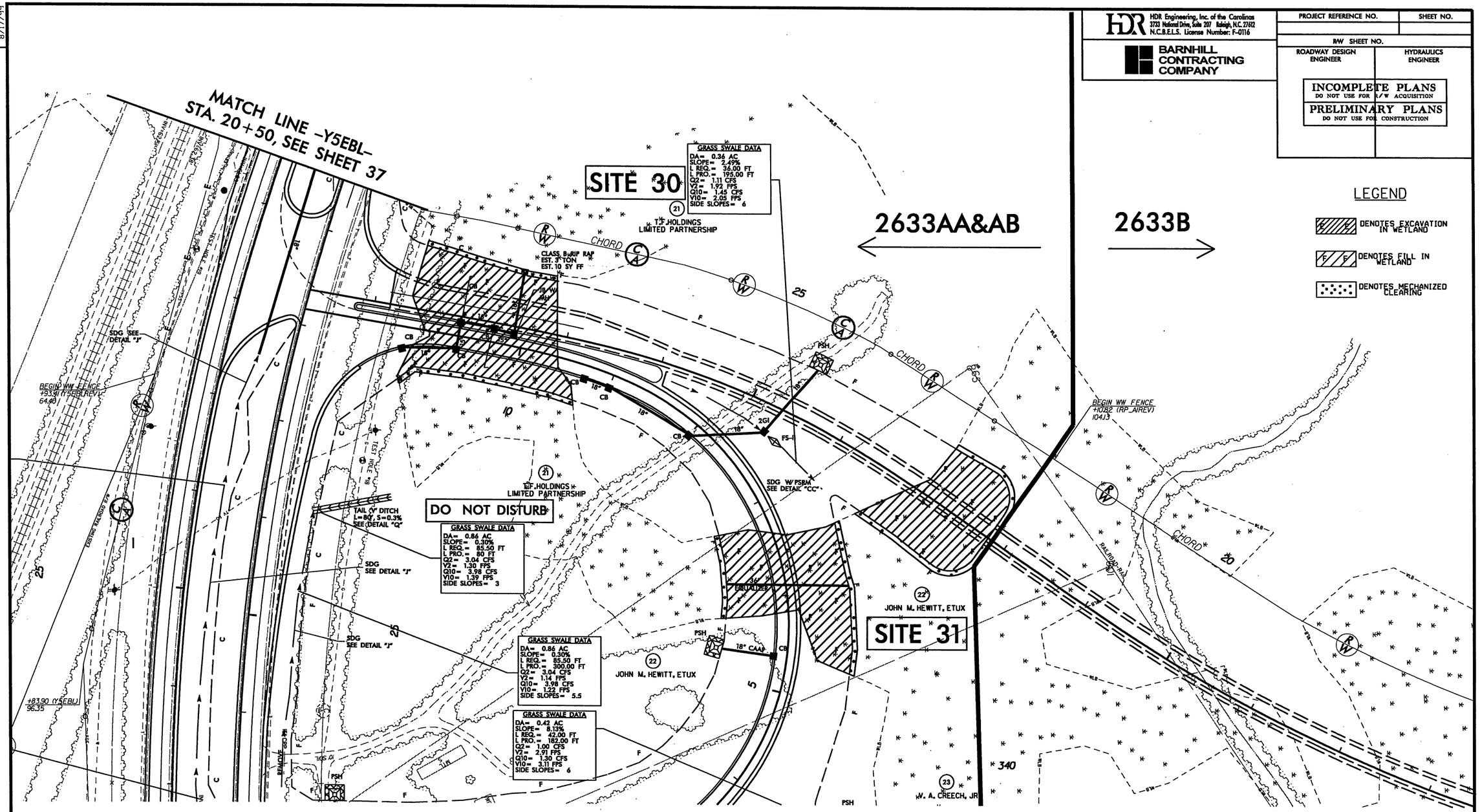
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

PROJECT REFERENCE NO.	SHEET NO.
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 92 OF 108

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_32.dgn

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TIME: 9:14:57 AM SCALE: 1:100

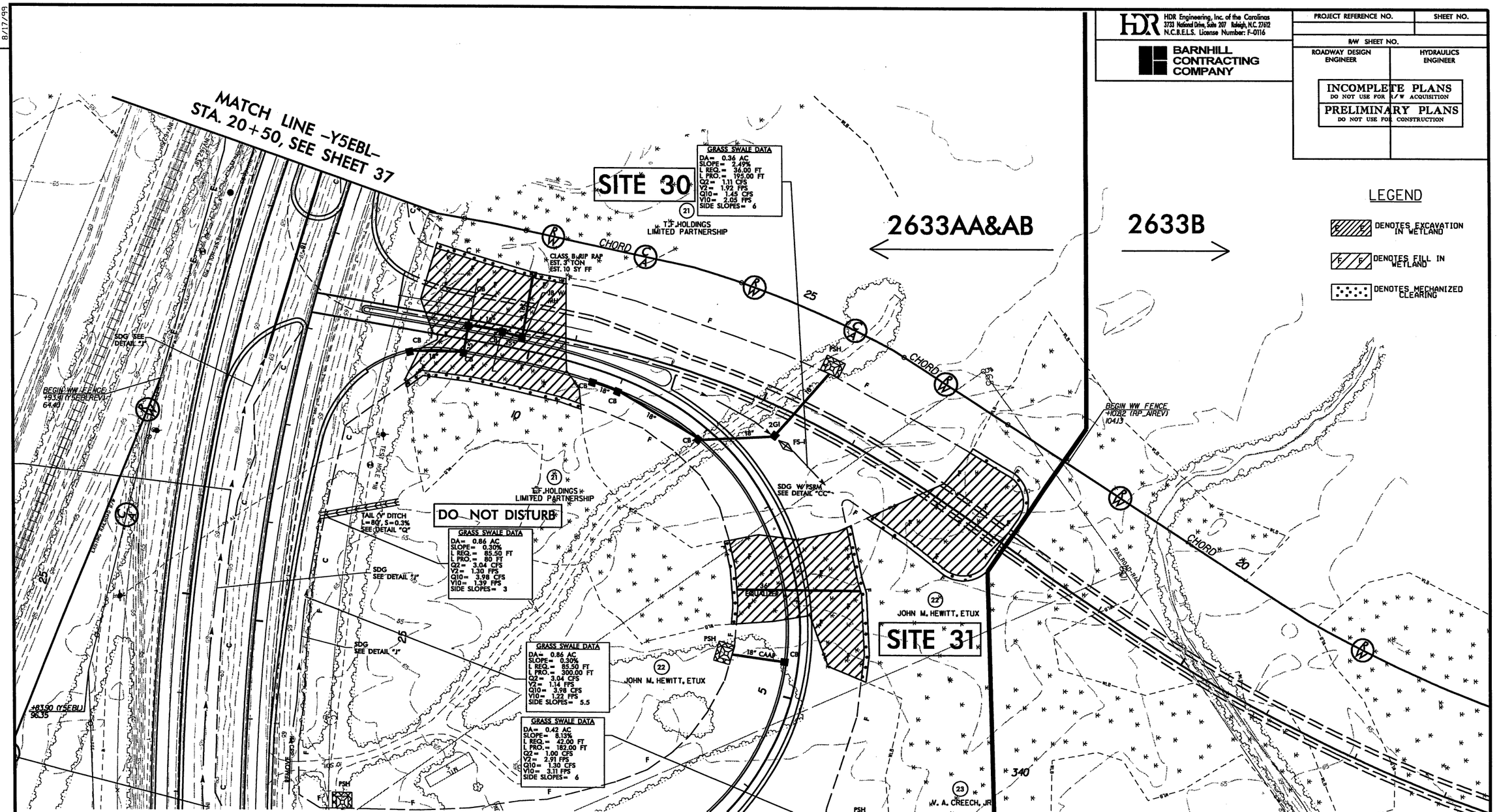
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

PROJECT REFERENCE NO.	SHEET NO.
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 93 OF 108

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_32.dgn

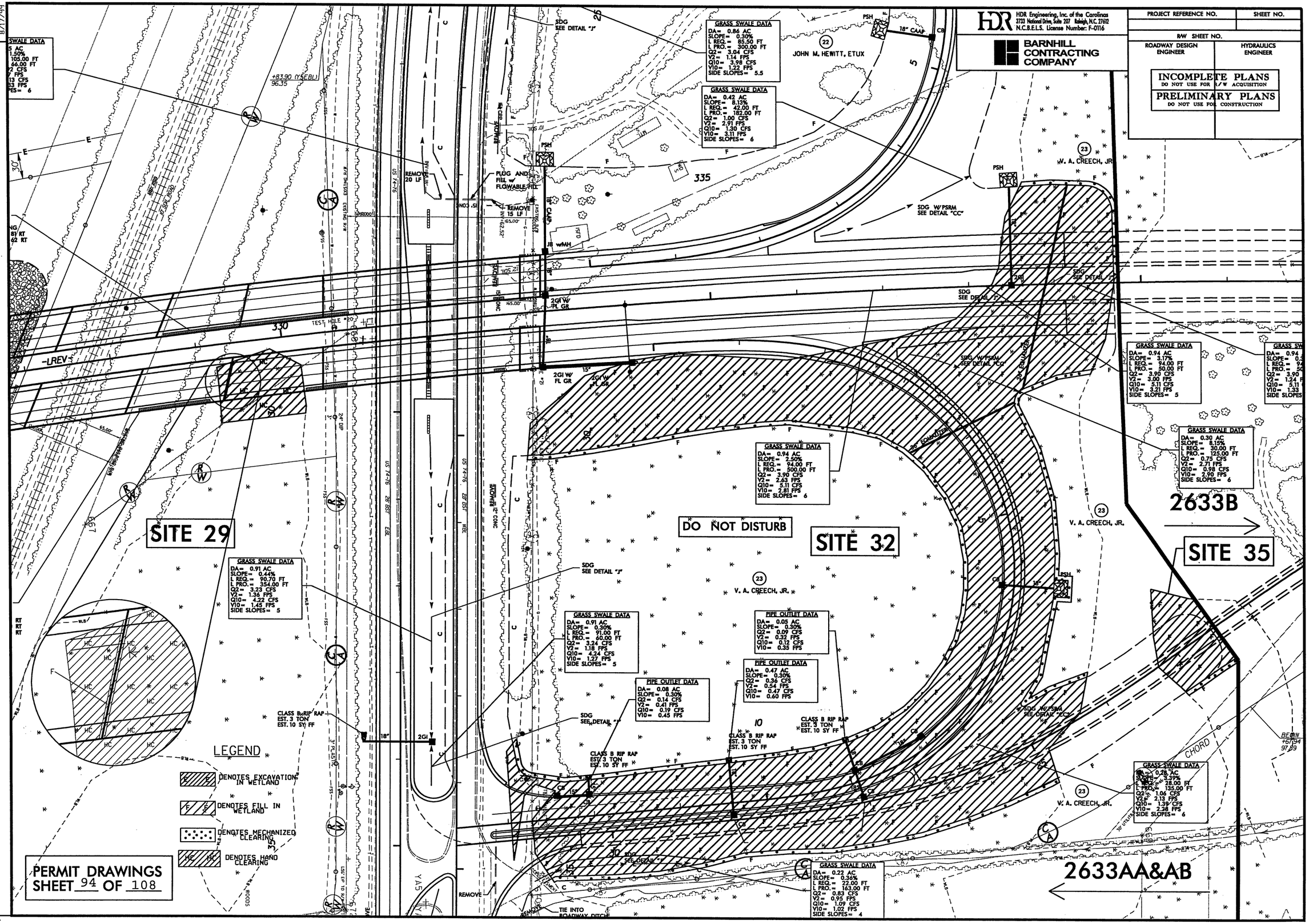
PENTABLE: NCDOT_permits.tbl
TIME: 9:50:13 AM SCALE: 1:100

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

BARNHILL CONTRACTING COMPANY

PROJECT REFERENCE NO.	SHEET NO.
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 94 OF 108

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_32.dgn
PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 9:15:45 AM SCALE: 1:100
REVISIONS
8/17/99

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

BARNHILL CONTRACTING COMPANY

PROJECT REFERENCE NO.	SHEET NO.
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

GRASS SWALE DATA
DA= 0.86 AC
SLOPE= 0.30%
L REQ.= 85.50 FT
L PRO.= 300.00 FT
Q2= 3.04 CFS
V2= 1.14 FPS
Q10= 3.98 CFS
V10= 1.22 FPS
SIDE SLOPES= 5.5

GRASS SWALE DATA
DA= 0.42 AC
SLOPE= 8.13%
L REQ.= 42.00 FT
L PRO.= 182.00 FT
Q2= 1.00 CFS
V2= 2.91 FPS
Q10= 1.30 CFS
V10= 3.11 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 0.94 AC
SLOPE= 3.17%
L REQ.= 94.00 FT
L PRO.= 50.00 FT
Q2= 3.90 CFS
V2= 3.00 FPS
Q10= 5.11 CFS
V10= 3.21 FPS
SIDE SLOPES= 5

GRASS SWALE DATA
DA= 0.30 AC
SLOPE= 8.15%
L REQ.= 30.00 FT
L PRO.= 125.00 FT
Q2= 0.75 CFS
V2= 2.71 FPS
Q10= 0.98 CFS
V10= 2.90 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 0.94 AC
SLOPE= 2.50%
L REQ.= 94.00 FT
L PRO.= 500.00 FT
Q2= 3.90 CFS
V2= 2.63 FPS
Q10= 5.11 CFS
V10= 2.81 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 0.91 AC
SLOPE= 0.44%
L REQ.= 90.70 FT
L PRO.= 354.00 FT
Q2= 3.23 CFS
V2= 1.36 FPS
Q10= 4.22 CFS
V10= 1.45 FPS
SIDE SLOPES= 5

GRASS SWALE DATA
DA= 0.91 AC
SLOPE= 0.30%
L REQ.= 91.00 FT
L PRO.= 60.00 FT
Q2= 3.24 CFS
V2= 1.18 FPS
Q10= 4.24 CFS
V10= 1.27 FPS
SIDE SLOPES= 5

PIPE OUTLET DATA
DA= 0.05 AC
SLOPE= 0.30%
Q2= 0.09 CFS
V2= 0.32 FPS
Q10= 0.12 CFS
V10= 0.35 FPS

PIPE OUTLET DATA
DA= 0.47 AC
SLOPE= 0.30%
Q2= 0.36 CFS
V2= 0.54 FPS
Q10= 0.47 CFS
V10= 0.60 FPS

PIPE OUTLET DATA
DA= 0.08 AC
SLOPE= 0.30%
Q2= 0.14 CFS
V2= 0.41 FPS
Q10= 0.19 CFS
V10= 0.45 FPS

GRASS SWALE DATA
DA= 0.28 AC
SLOPE= 3.39%
L REQ.= 28.00 FT
L PRO.= 135.00 FT
Q2= 1.06 CFS
V2= 2.13 FPS
Q10= 1.39 CFS
V10= 2.28 FPS
SIDE SLOPES= 6

GRASS SWALE DATA
DA= 0.22 AC
SLOPE= 0.36%
L REQ.= 22.00 FT
L PRO.= 163.00 FT
Q2= 0.83 CFS
V2= 0.95 FPS
Q10= 1.09 CFS
V10= 1.02 FPS
SIDE SLOPES= 4

SITE 29

SITE 32

SITE 35

2633B

2633AA&AB

DO NOT DISTURB

JOHN M. HEWITT, ETUX

W. A. CREECH, JR.

V. A. CREECH, JR.

SDG SEE DETAIL "J"

SDG W/PSRM SEE DETAIL "CC"

SDG SEE DETAIL "F"

SDG W/PSRM SEE DETAIL "CC"

SDG SEE DETAIL "I"

SDG SEE DETAIL "J"

SDG SEE DETAIL "F"

SDG W/PSRM SEE DETAIL "CC"

PLUG AND FILL w/ FLOWABLE FILL

REMOVE 20 LF

REMOVE 15 LF

CLASS B RIP RAP EST. 3 TON EST. 10 SY FF

TIE INTO ROADWAY DITCH

TEST HOLE #20

LEGEND

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES HAND CLEARING

PERMIT DRAWINGS
SHEET 95 OF 108

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
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PENTABLE: NCDOT_permits.tbl
TIME: 9:51:02 AM SCALE: 1:100

8/17/99

8/23/99

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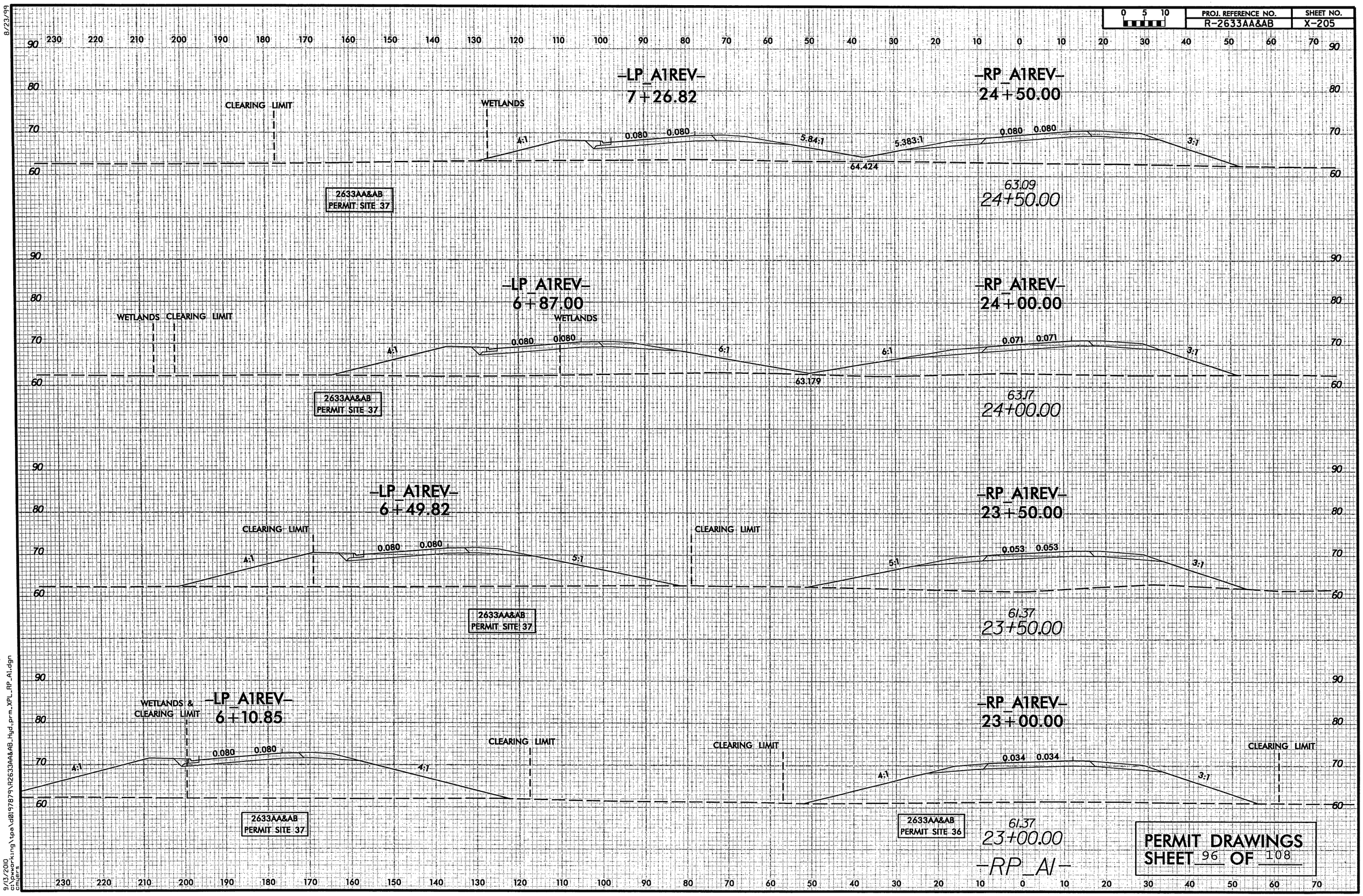
	R-2633AA&AB	X-205



PERMIT DRAWINGS
SHEET 96 OF 108

9/13/2010
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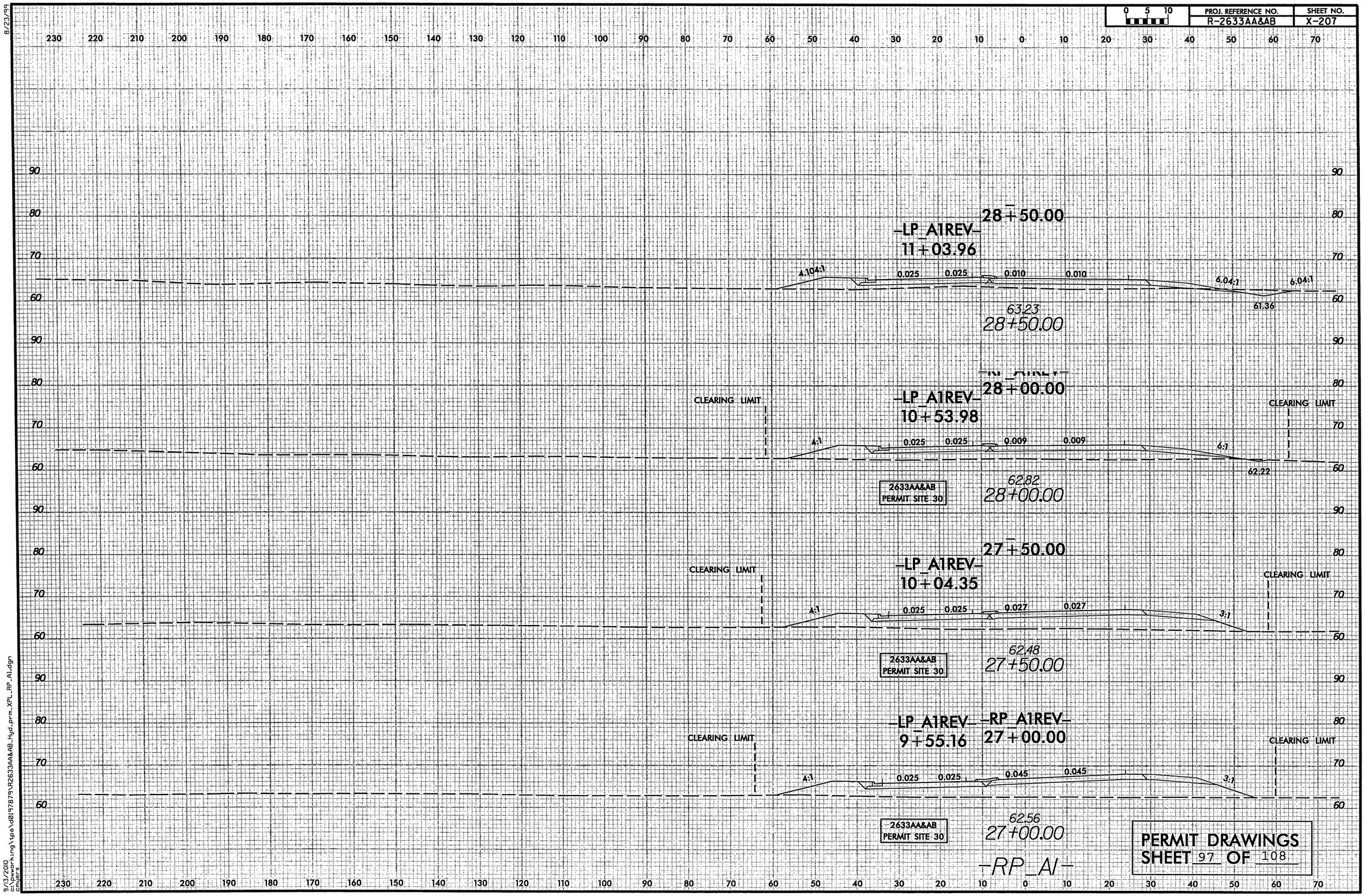

PERMIT DRAWINGS
SHEET 97 OF 108

8/23/99

9/13/2010
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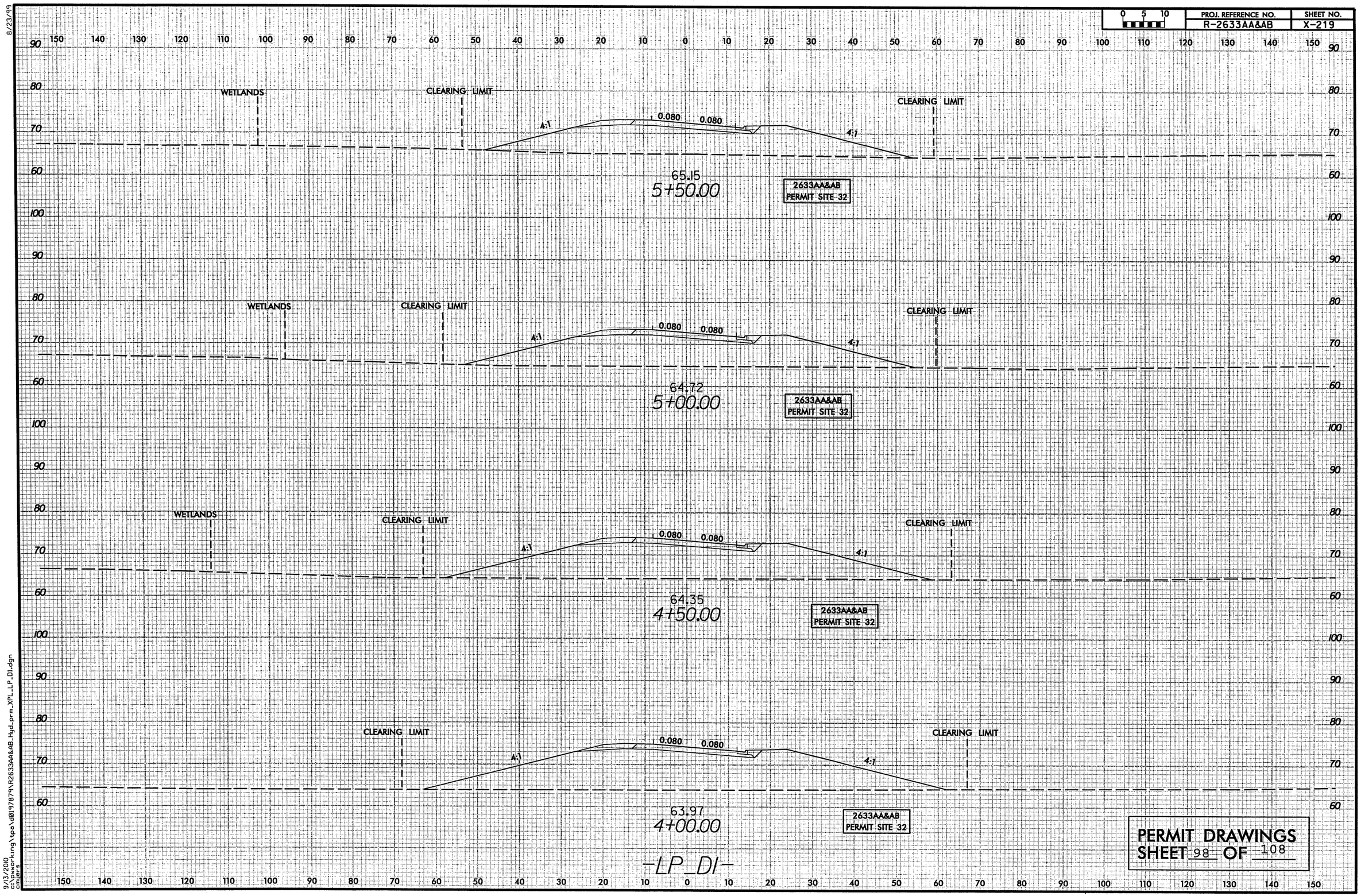
cmiers

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-219



PERMIT DRAWINGS
SHEET 98 OF 108

9/13/2010
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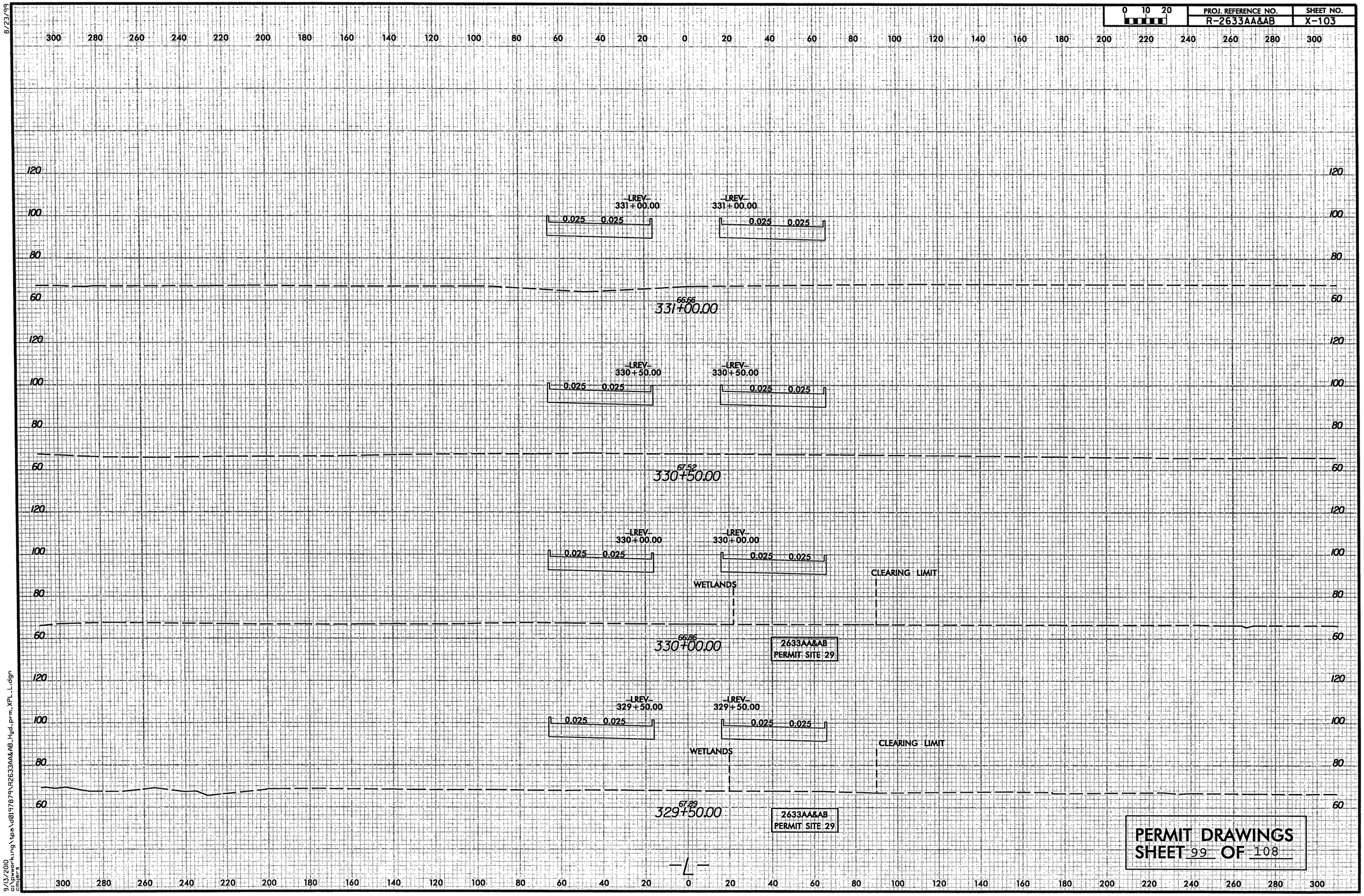
cmiers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PROJ. REFERENCE NO.
R-2633AA&AB
SHEET NO.
X-103
300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
120
100
80
60
-LREV-
331+00.00
0.025 0.025
66.66
331+00.00
-LREV-
330+50.00
67.52
330+50.00
-LREV-
330+00.00
WETLANDS
CLEARING LIMIT
66.86
330+00.00
2633AA&AB
PERMIT SITE 29
-LREV-
329+50.00
67.89
329+50.00
-L-
PERMIT DRAWINGS
SHEET 99 OF 108
8/23/99
9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_L.dgn
cmiers

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	35
R/W SHEET NO. R-2633A PSH 32 & 33	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

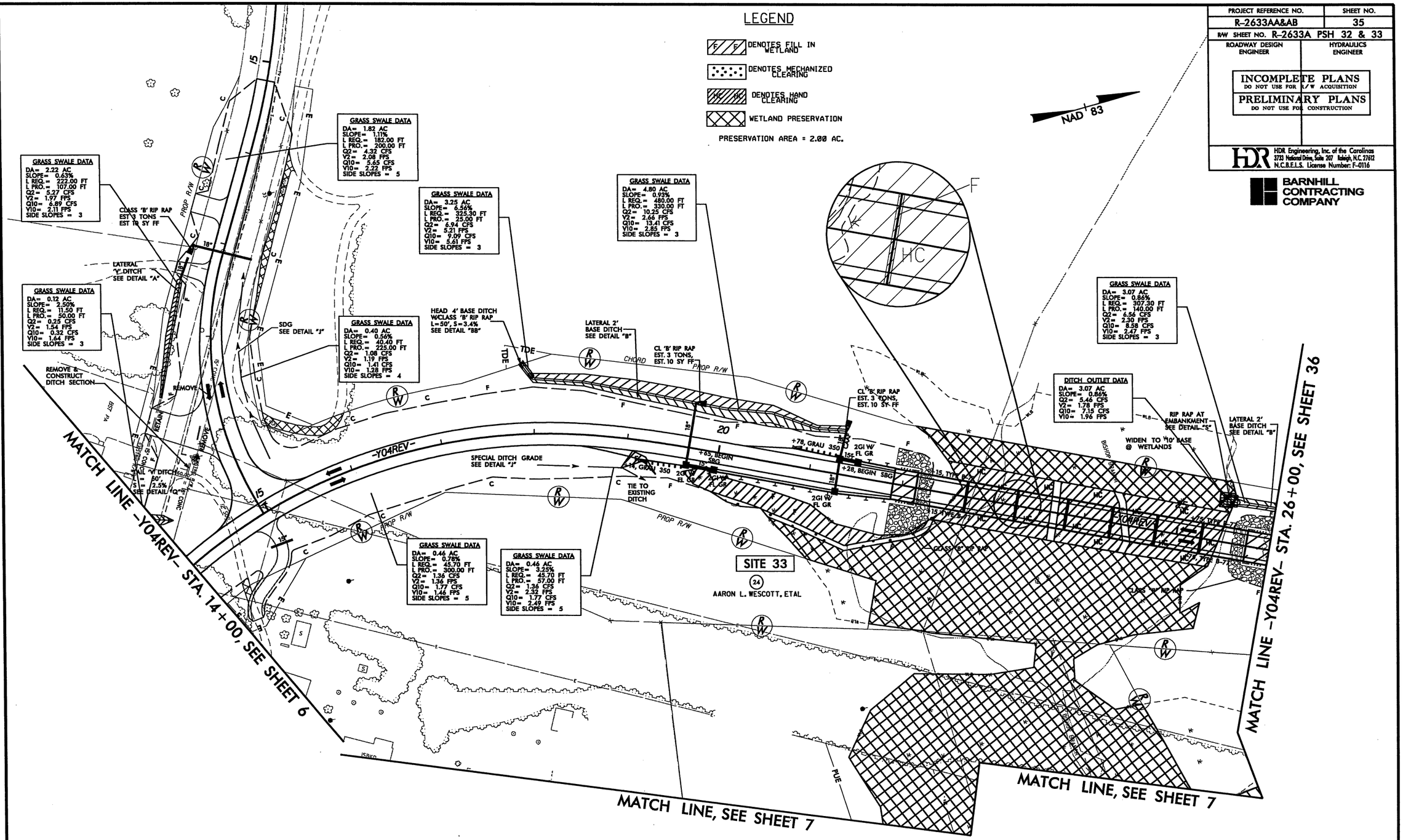
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- WETLAND PRESERVATION

PRESERVATION AREA = 2.00 AC.



PERMIT DRAWINGS
SHEET 100 OF 108

SEE SHEET NO. 68 FOR -Y04REV- PROFILE.
SEE SHEET NO. 67 FOR -Y02- PROFILE.
SEE SHEET NO. 2-M FOR STRUCTURE DETAIL.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_35.dgn
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	35
R/W SHEET NO. R-2633A PSH 32 & 33	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

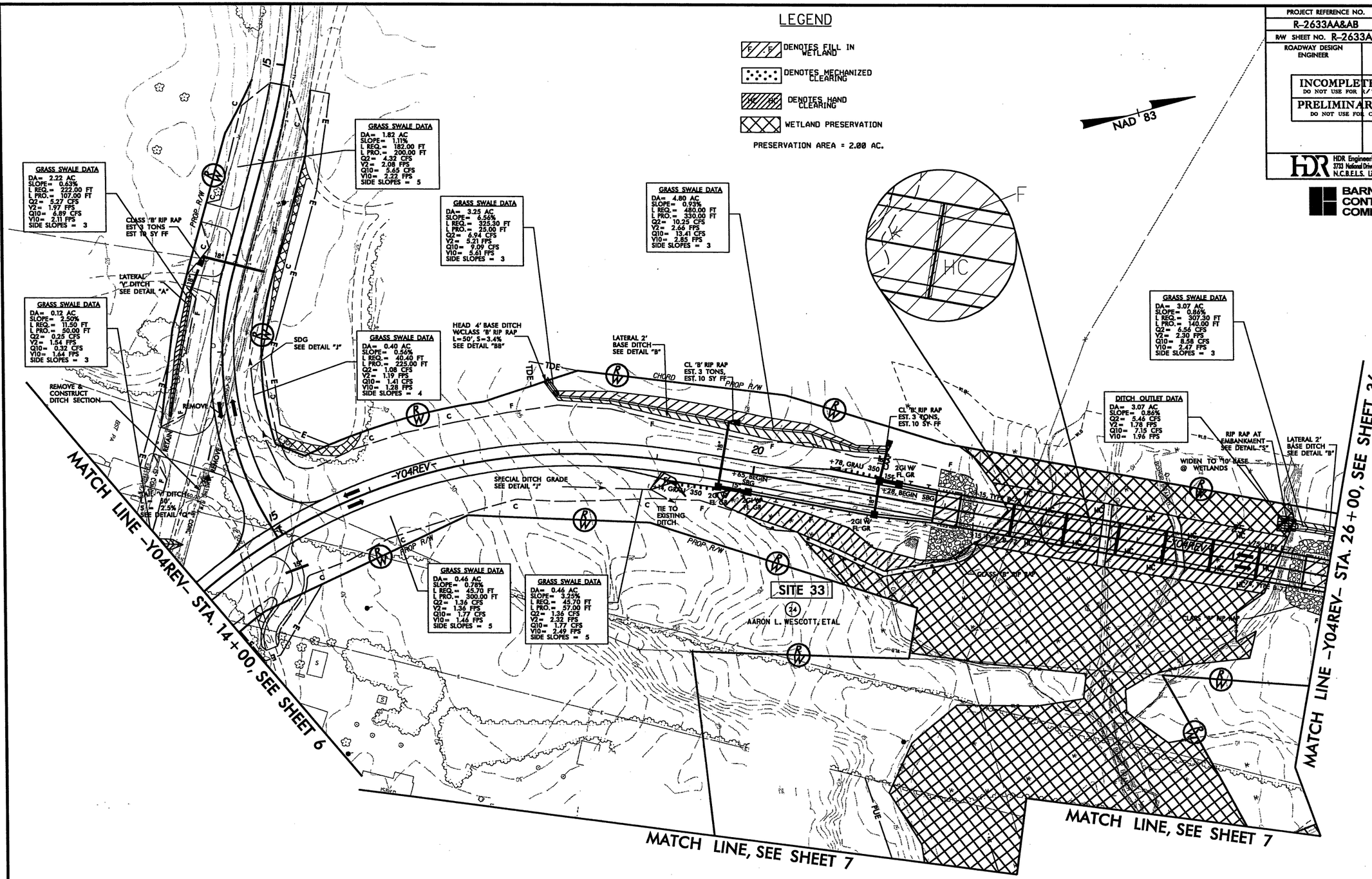
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- WETLAND PRESERVATION

PRESERVATION AREA = 2.00 AC.



PERMIT DRAWINGS
SHEET 101 OF 108

SEE SHEET NO. 68 FOR -Y04REV- PROFILE.
SEE SHEET NO. 67 FOR -Y02- PROFILE.
SEE SHEET NO. 2-M FOR STRUCTURE DETAIL.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

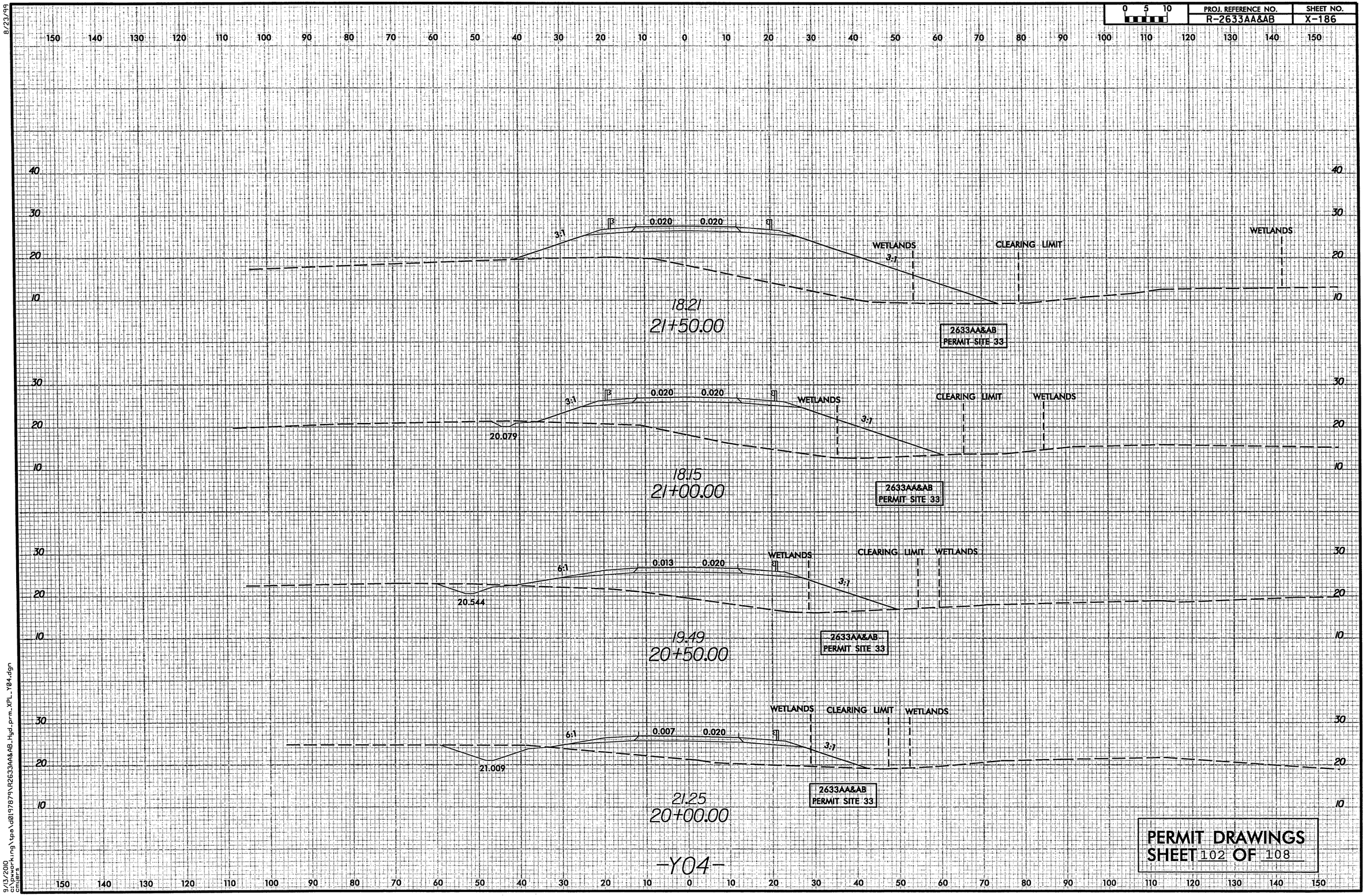
REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmossroc DATE: 10/3/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PSH_35.dgn
PENTABLE: NCDOT_permits.tbl
TIME: 9:52:24 AM SCALE: 1:100

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2633AA&AB	X-186



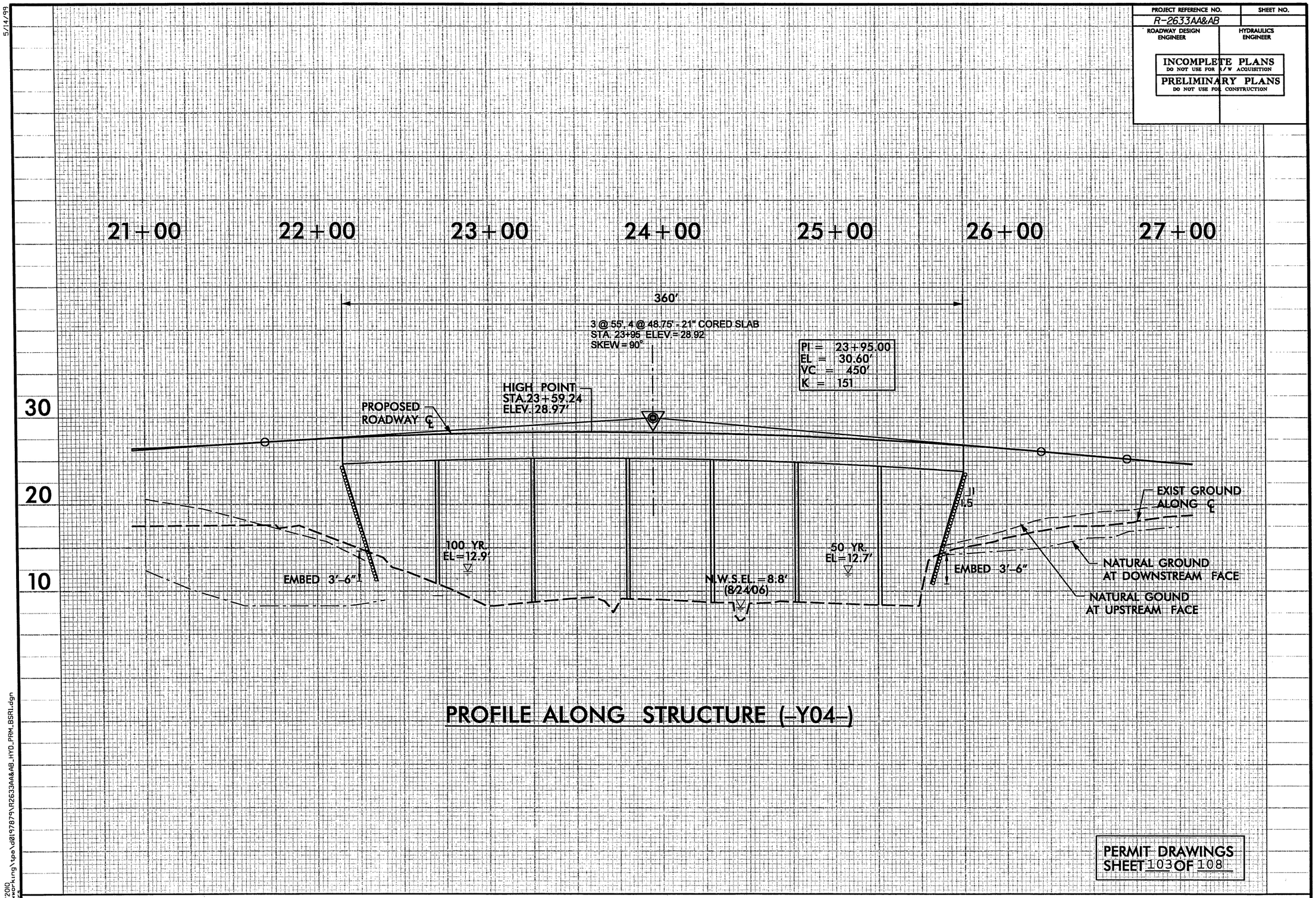
PERMIT DRAWINGS
SHEET 102 OF 108

9/13/2010
c:\pwworking\tpa\d0197879\R2633AA&AB_Hyd_prm_XPL_Y04.dgn
cmiers

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE (-Y04-)

PERMIT DRAWINGS
SHEET 103 OF 108

5/14/99

9/13/2010
c:\pwworking\tpo\d0197879\R2633AA&AB_HYD_PRM_BSR1.dgn
mwiers

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	36
R/W SHEET NO. R-2633A PSH 8, 33 & 34	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

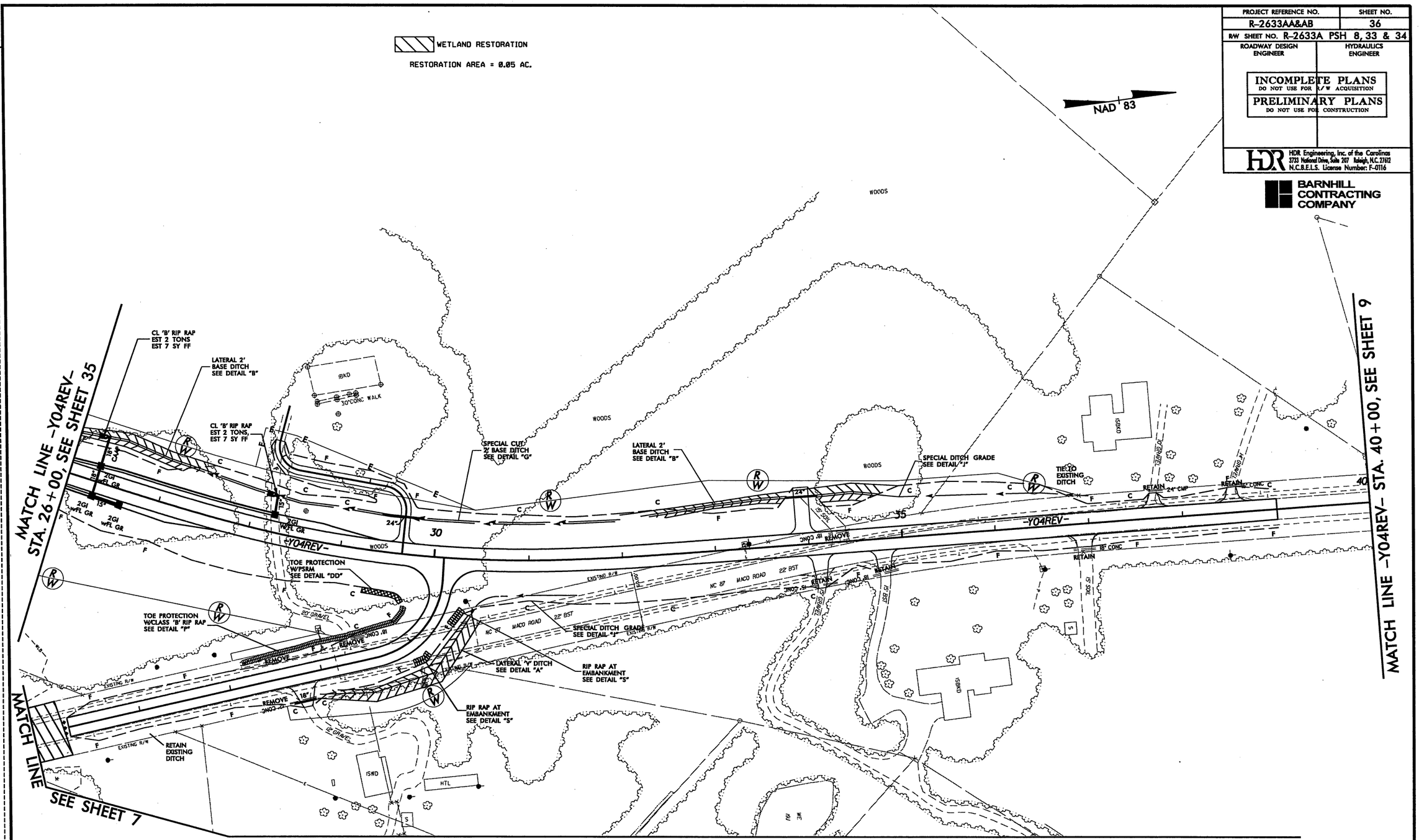
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

WETLAND RESTORATION

RESTORATION AREA = 0.05 AC.

NAD 83



PERMIT DRAWINGS
SHEET 104 OF 108

SEE SHEET NO. 80 FOR -SVRD4REV- PROFILE.
SEE SHEET NO. 68, 69 FOR -Y04REV- PROFILE.
SEE SHEET NO. 80 FOR -D1REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

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USER: cmyers DATE: 10/3/2010 TIME: 12:13:01 PM SCALE: 1:100
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	36
R/W SHEET NO. R-2633A PSH 8, 33 & 34	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

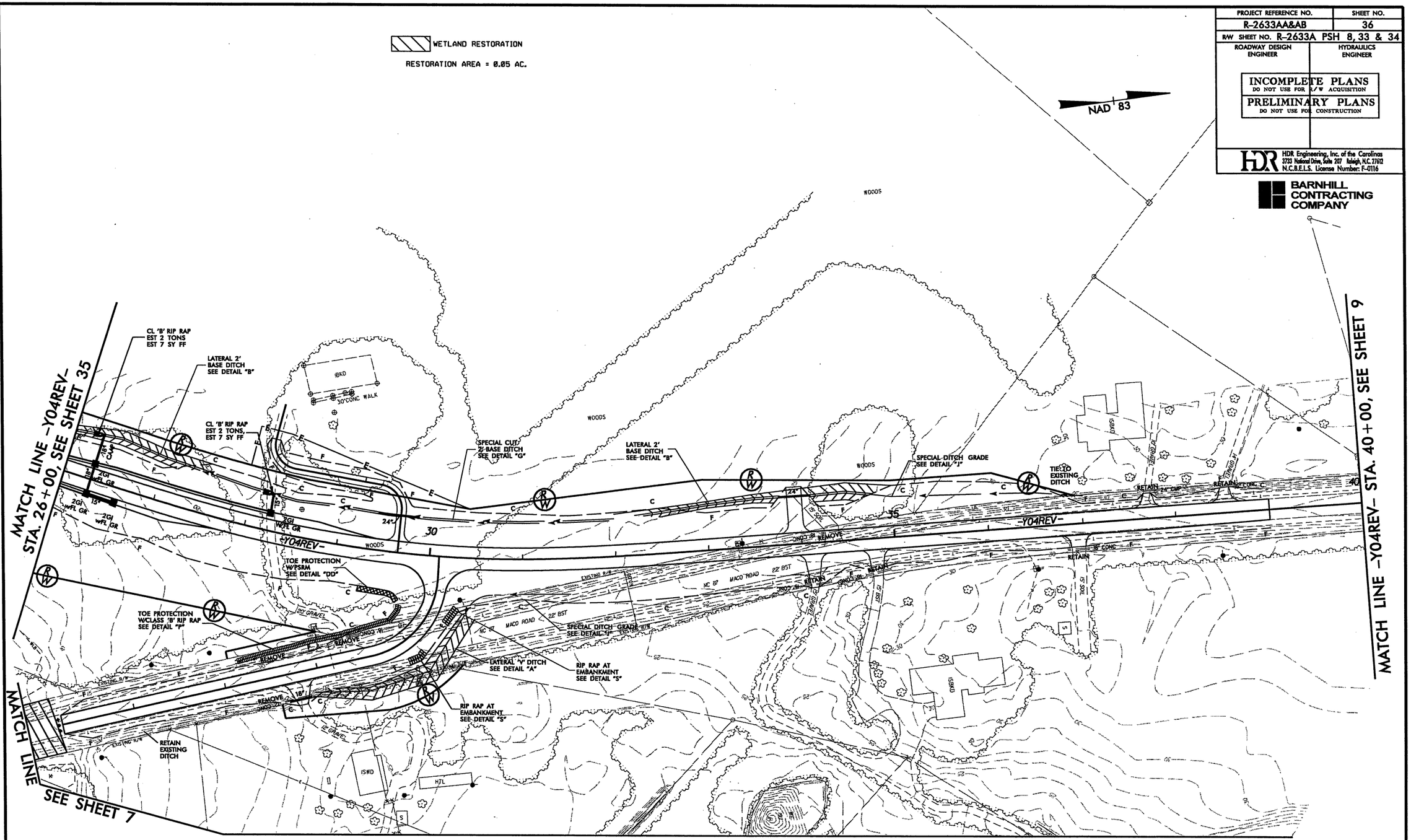
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

WETLAND RESTORATION

RESTORATION AREA = 0.05 AC.

NAD 83



PERMIT DRAWINGS
SHEET 105 OF 108

SEE SHEET NO. 80 FOR -SVRD4REV- PROFILE.
SEE SHEET NO. 68, 69 FOR -Y04REV- PROFILE.
SEE SHEET NO. 80 FOR -D1REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: cmyers DATE: 10/3/2010
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TIME: 12:09:52 PM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	37
R/W SHEET NO. R-2633B PSH 6 & 34	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

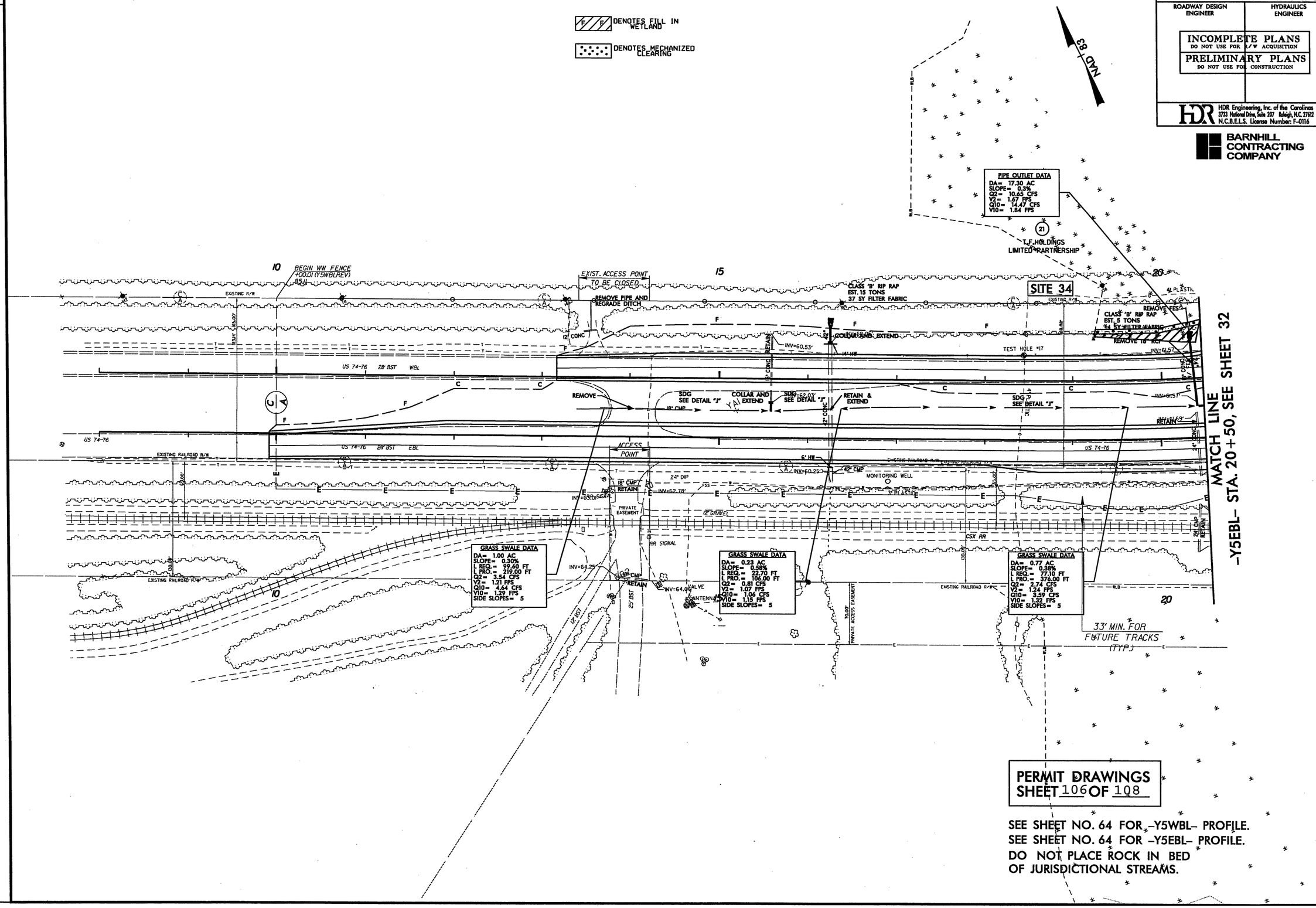
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING



PERMIT DRAWINGS
SHEET 106 OF 108

SEE SHEET NO. 64 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 64 FOR -Y5EBL- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: jmassroc DATE: 10/3/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	37
R/W SHEET NO. R-2633B PSH 6 & 34	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

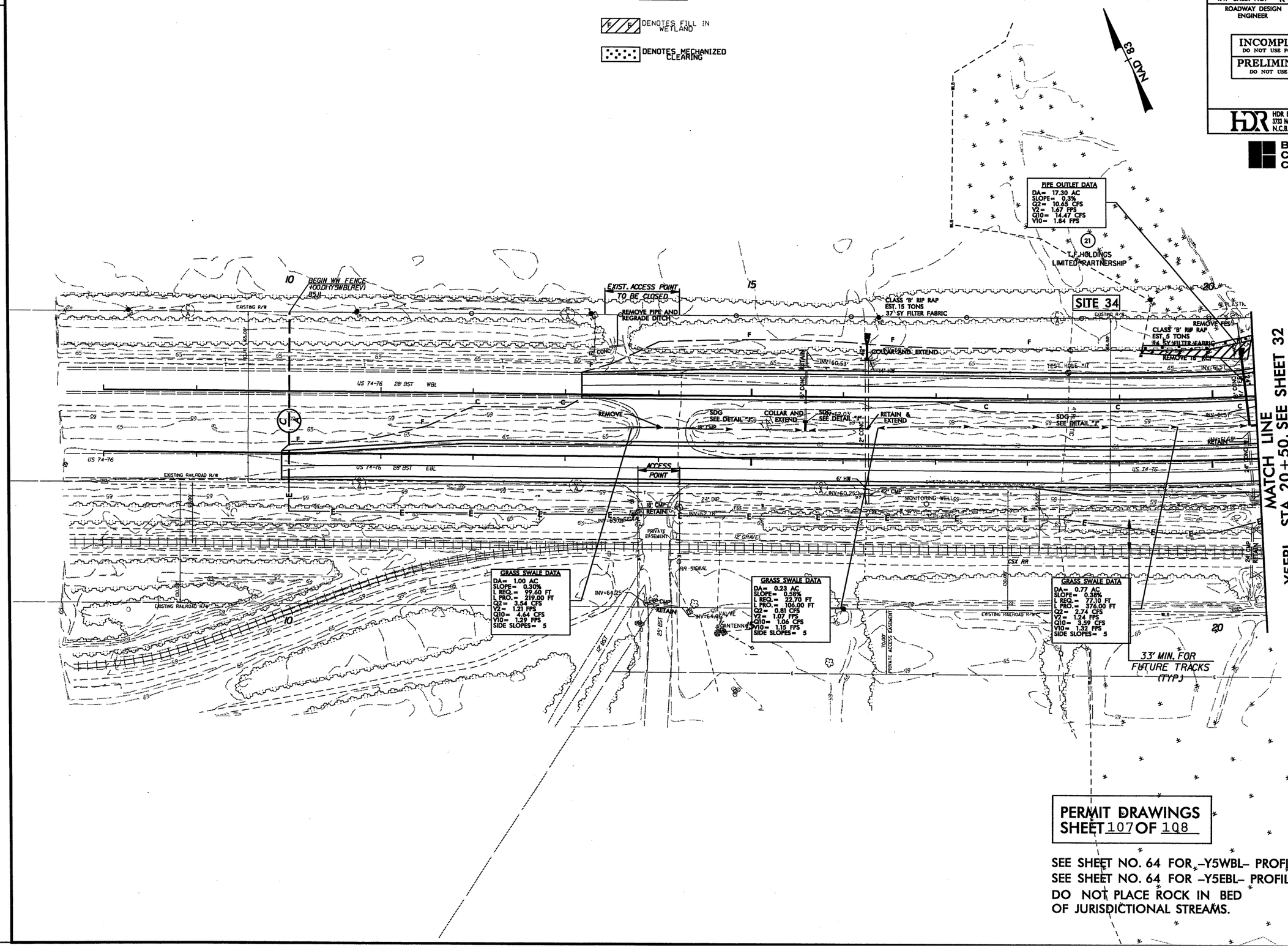
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING



PERMIT DRAWINGS
SHEET 107 OF 108

SEE SHEET NO. 64 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 64 FOR -Y5EBL- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

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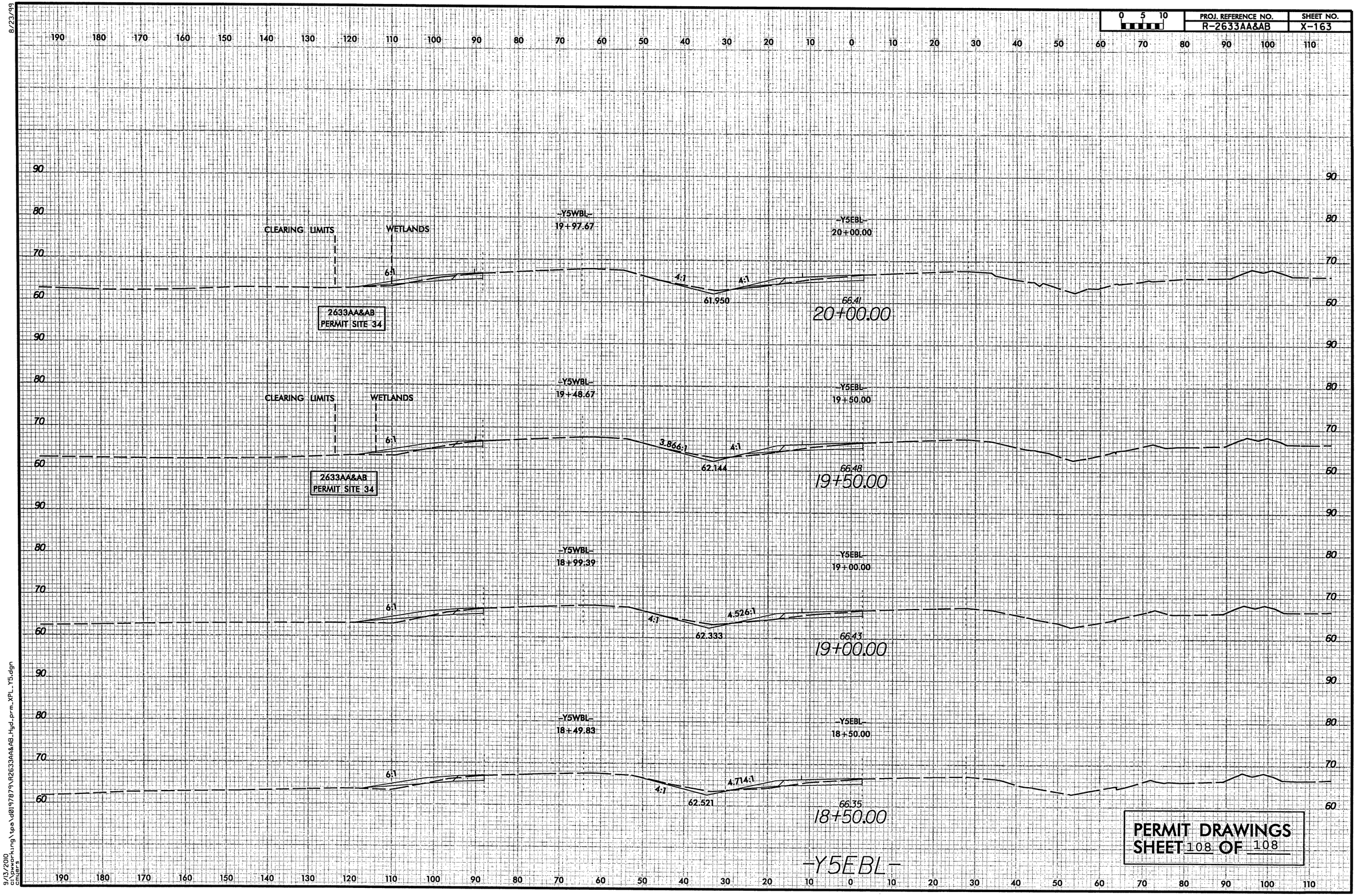
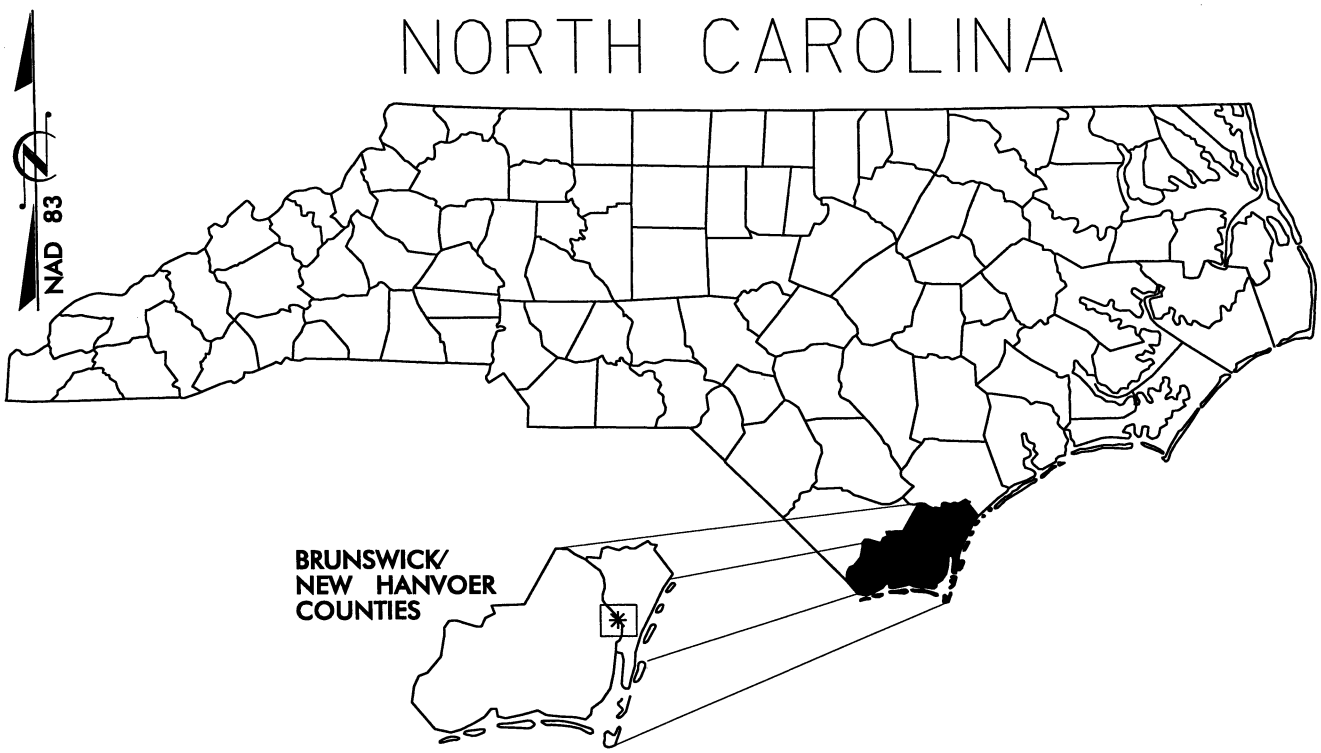
8/23/99

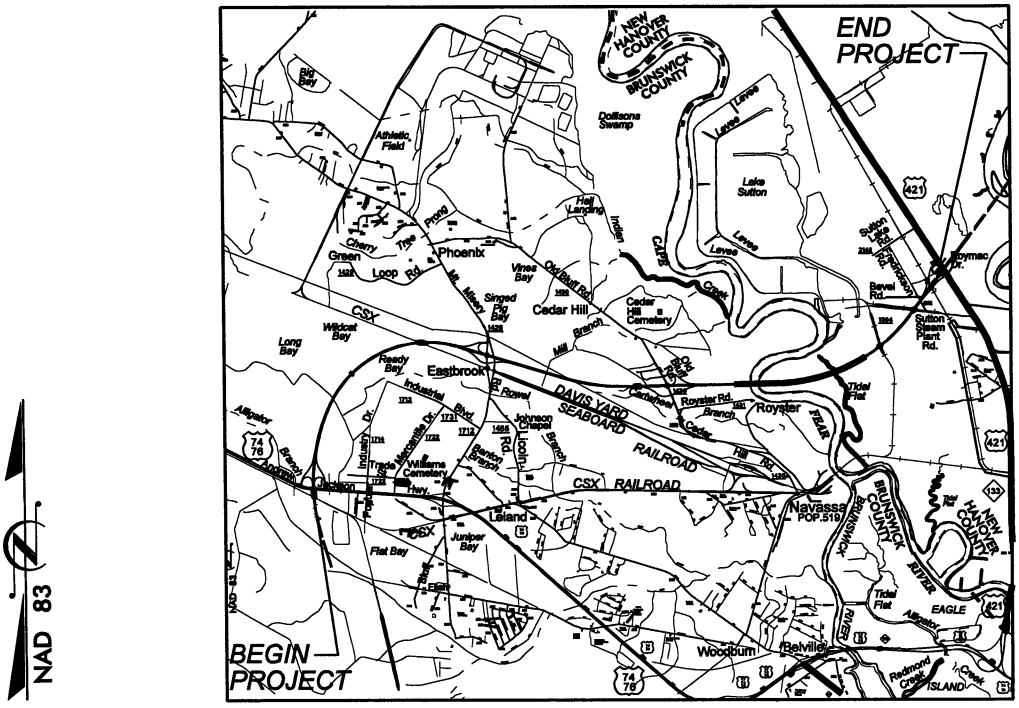
PROJ. REFERENCE NO.	SHEET NO.
R-2633AA&AB	X-163



PERMIT DRAWINGS
SHEET 108 OF 108

9/13/2010
c:\pwworking\tpb\d0197879\R2633AA&AB_Hyd_prm_XPL_Y5.dgn
cmiers



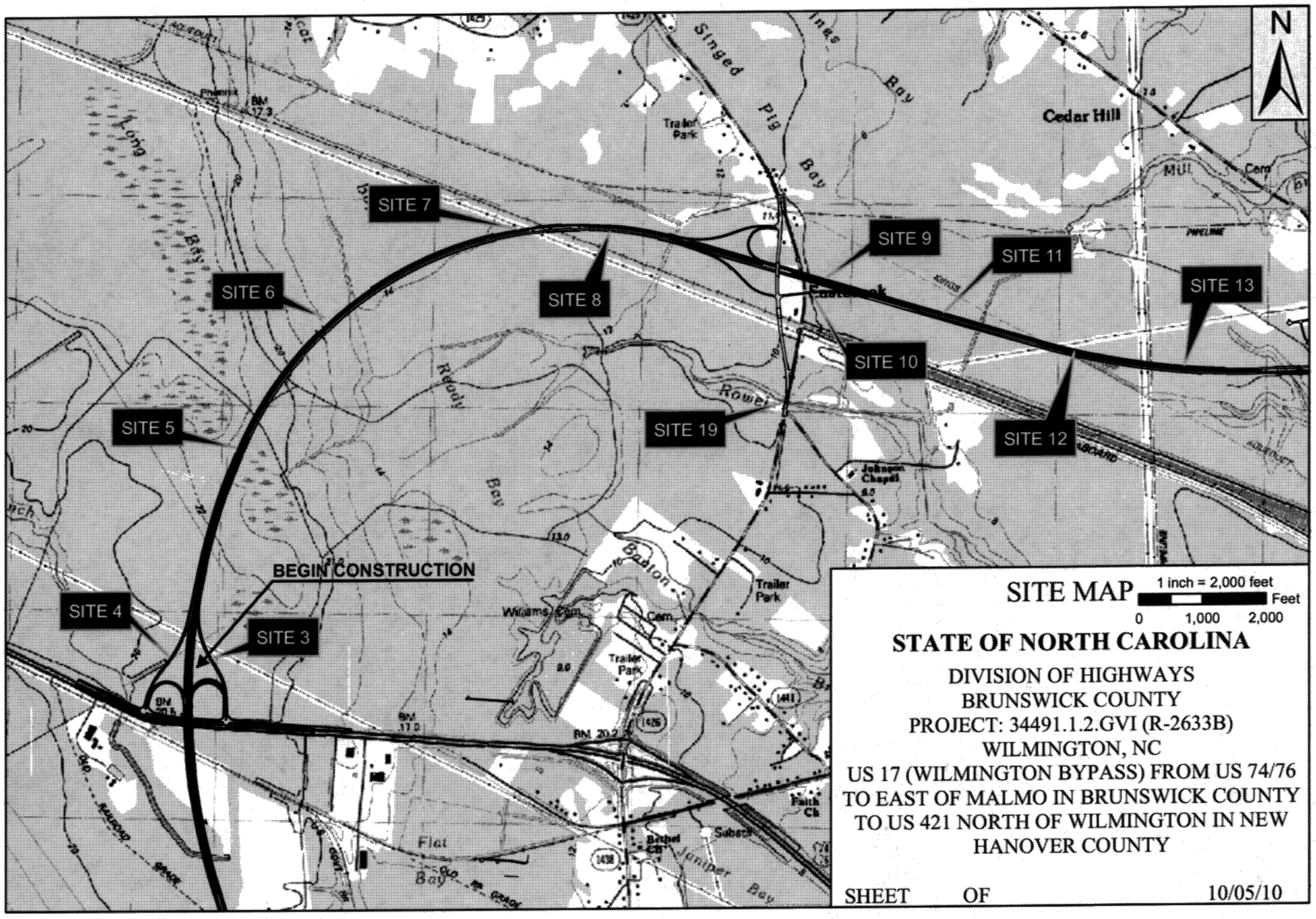


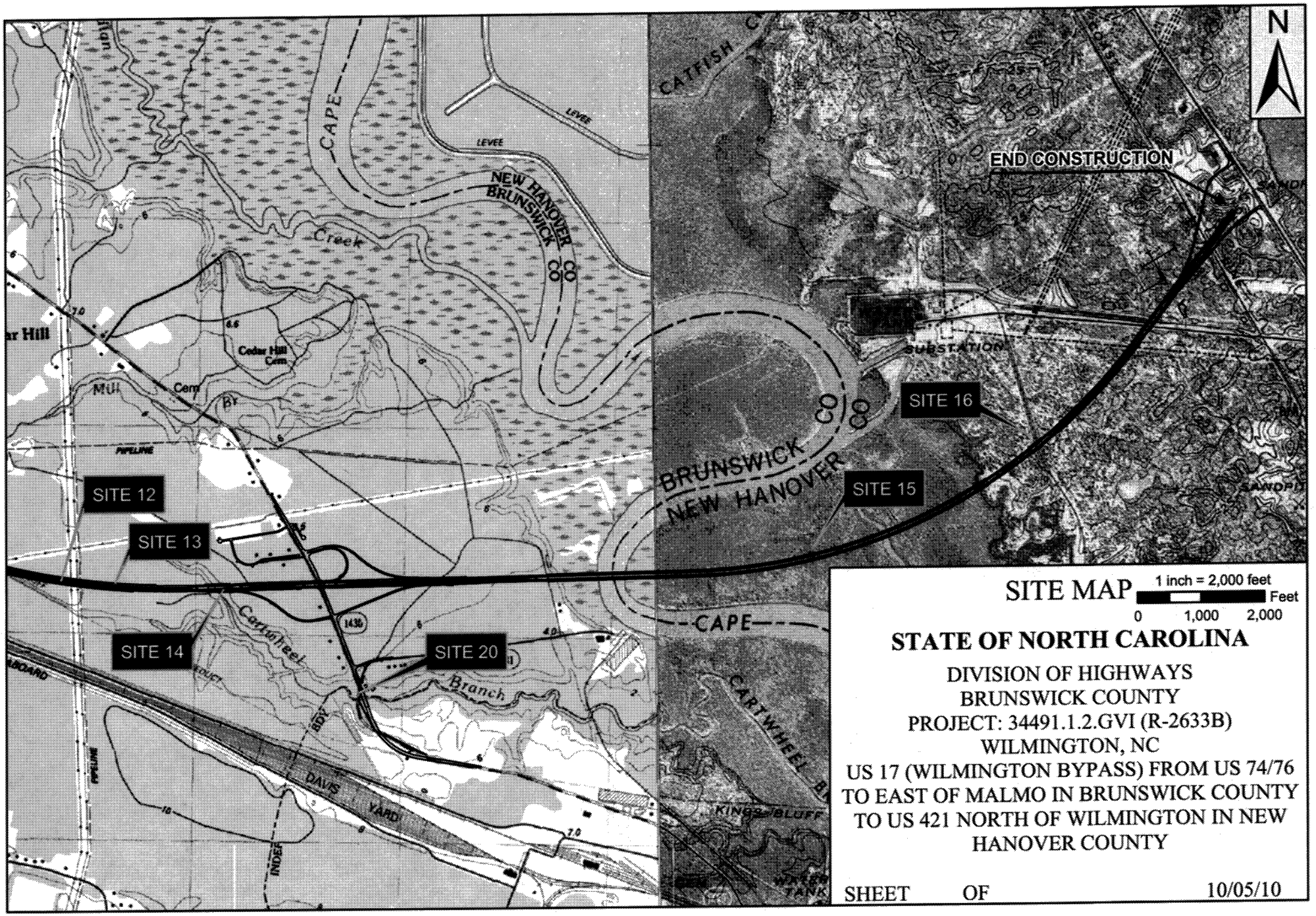
VICINITY MAPS

NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK AND
NEW HANOVER COUNTY
PROJECT: 34491.1.2 / 34491.2.3
(R-2633B)
US 17 (WILMINGTON BYPASS)
FROM US 74/76 EAST OF MALMO
IN BRUNSWICK COUNTY TO
US 421 NORTH OF WILMINGTON
IN NEW HANOVER COUNTY

SHEET OF 10/05/10


N
SITE 3
SITE 4
SITE 5
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
SITE 11
SITE 12
SITE 13
SITE 19
BEGIN CONSTRUCTION
Cedar Hill
Singed Pig Bay
Long Bay
Ready Bay
Rowe Bay
Bradton
Williams Cem.
Trailer Park
Johnson Chapel
Bethel Ch
Flat Bay
Juniper Bay
Faith Ch
Subsch
Cem.
Mill
Pipeline
BM 17.3
BM 17.0
BM 20.2
SITE MAP
1 inch = 2,000 feet
Feet
0
1,000
2,000
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 34491.1.2.GVI (R-2633B)
WILMINGTON, NC
US 17 (WILMINGTON BYPASS) FROM US 74/76
TO EAST OF MALMO IN BRUNSWICK COUNTY
TO US 421 NORTH OF WILMINGTON IN NEW
HANOVER COUNTY
SHEET OF
10/05/10


N
END CONSTRUCTION
SITE 12
SITE 13
SITE 14
SITE 15
SITE 16
SITE 20
CAPE
NEW HANOVER
BRUNSWICK
CO
Creek
LEVEE
Cedar Hill Cem.
Mill
Cem
PIPELINE
Cartwheel
Branch
DAVIS YARD
CATFISH
SUBSTATION
CARTWHEEL
KINGS BLUFF
WATER TANK
SANDY
SANDPI
SITE MAP
1 inch = 2,000 feet
Feet
0
1,000
2,000
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 34491.1.2.GVI (R-2633B)
WILMINGTON, NC
US 17 (WILMINGTON BYPASS) FROM US 74/76
TO EAST OF MALMO IN BRUNSWICK COUNTY
TO US 421 NORTH OF WILMINGTON IN NEW
HANOVER COUNTY
SHEET OF
10/05/10

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
1	T.F HOLDINGS, LIMITED PARTNERSHIP	1202 EASTWOOD RD WILMINGTON, NC 28403	3
2	YDV, INC.	P.O. BOX 1967 WILMINGTON,NC 28402	3
3	VA CREECH, JR.	P.O. BOX 66 LELAND, NC 28541	4
4	74 HOLDING, LLC	P.O. BOX 1967 WILMINGTON,NC 28402	3,4, 5,6
5	CKC, LLC	5022 WRIGHTVILLE AVE WILMINGTON,NC 28403	5,6
6	SOUTHWOOD DEVELOPERS, INC.	P.O. BOX 4127 WILMINGTON,NC 28406	6
7	CHADWICK-ONE, LLC	P.O. BOX 452 LELAND, NC 28541	6,7
8	WCM ENTERPRISES, LLC	305 COLONIAL DRIVE WILMINGTON, NC 284023	6
9	BARNEY L. PADGETT, ET UX	P.O. BOX 7332 WILMINGTON, NC 28456	7
10	TILLMAN IVEY, JR., ETAL	P.O. BOX 537 LELAND, NC 28541	8

NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK AND
NEW HANOVER COUNTY
PROJECT: 34491.1.2 / 34491.2.3
(R-2633B)
US 17 (WILMINGTON BYPASS)
FROM US 74/76 EAST OF MALMO
IN BRUNSWICK COUNTY TO
US 421 NORTH OF WILMINGTON
IN NEW HANOVER COUNTY

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
11	LOUISE VERZAAL JOYNER	5644 56TH WAY WEST PALM BEACH, FL 33409	9,10,11
12	LINCOLN DEVELOPMENT CO. INC.	P.O. BOX 2021 WILMINGTON, NC 28402	11
13	RAIFORD G. TRASK, JR	1202 EASTWOOD RD WILMINGTON, NC 28403	11,12,13
14	CAROLINA POWER AND LIGHT	P.O. BOX 1551 RALEIGH, NC 27602	16
15	WILMINGTON RIVER CLUB	1508 MILITARY CUTOFF RD WILMINGTON, NC 28403	
16	CITY OF WILMINGTON	102 N. THIRD ST. WILMINGTON, NC 28402	

NORTH CAROLINA

DIVISION OF HIGHWAYS
BRUNSWICK AND
NEW HANOVER COUNTY
PROJECT: 34491.1.2 / 34491.2.3
(R-2633B)
US 17 (WILMINGTON BYPASS)
FROM US 74/76 EAST OF MALMO
IN BRUNSWICK COUNTY TO
US 421 NORTH OF WILMINGTON
IN NEW HANOVER COUNTY

SHEET OF 10/05/10

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*	~~-L- 24+75 Lt.~~	~~Roadway Fill~~										
2*	~~-L- 37+96 Rt.~~	~~Bridge~~										
3**	-L- 40+57 to 66+97	Roadway Fill	9.49				0.68					
4**	-RP_D1- 22+60	Roadway Fill	0.07				0.01					
5	-L- 80+35 to 85+08	Roadway Fill	1.04				0.11					
6	-L- 99+90 to 146+00	Roadway Fill	18.79				2.05					
7	-L- 146+78 to 165+66	Roadway Fill	10.62				0.85					
8	-L- 166+60	Roadway Fill	0.06				0.01					
9	-L- 186+74 to 191+61	Roadway Fill	1.10				0.10					
10	-RP_D2- 19+20 Lt.	Roadway Fill	0.02				0.10					
11	-L- 194+58 to 234+75	3@42"; Roadway Fill	15.37				1.61	0.07		222		
12	-L- 230+39 to 242+11	Roadway Fill	3.31				0.37					
13	-L- 243+53 to 253+30	Roadway Fill	3.89				0.44					
14	-L- 265+36 to 265+87	Bridge	0.01				0.47					
	-L- 264+32 to 265+70	Temp. Work Bridge Left		<0.01			0.11					
	-L- 265+49 to 267+10	Temp. Work Bridge Right		<0.01			0.13					
15	319+80 to 325+47.50 330+17.50 to 387+68.50	Temp. Work Bridge Left		0.05			30.10		<0.01			
	320+47.50 to 325+47.50 330+17.50 to 387+53	Temp. Work Bridge Right		0.05					<0.01			
	319+80 to 387+53	Temp. Work Bridge Platform		0.01								
	319+80 to 387+53	Bridge Bent Footings	0.89					0.02		50		
	373+92 to 376+07	Toomer's Creek Trib.			0.02			0.02				
16	-L- 399+22 to 400+87	Roadway Fill	0.46									
17*	~~-Y5- 16+25 Lt~~	~~48" RCP~~										
18*	~~-Y5- 20+36 Lt~~	~~18" RCP~~										
19	-Y7- 52+09	Culvert						<0.01	0.01	4	39	
	-Y7 DET- 16+45	Detour Culvert							0.07		108	
20	-Y8- 47+15 to 50+43	Bridge	0.01				0.30					
	-Y8- 46+69 to 50+52	Temp. Work Bridge Left		<0.01			0.25					
	-Y8- 48+81 to 49+95	Temp. Work Bridge Right		<0.01			0.05					
TOTALS:			65.13	0.12	0.02		37.74	0.11	0.08	276	147	

Temporary Surface Water Impacts for Temporary Work Bridges

The length used to determine the Temporary Surface Water Impact was calculated by summing the widths of all Jurisdictional Streams crossing the temporary work bridge and multiplying by the 0.377 ft^2/LF calculated below.

Temporary Work Bridge Impacts

2' Diameter Piles X 3 Piles per Bent with Bents spaced at 25'

Area of Pile = $(\pi/4) \times 2^2 = 3.14\ ft^2$ Area of Piles per Bent = $3 \times 3.14 = 9.42\ ft^2$

Area per Linear Foot of Work Bridge = 9.42 ft^2 / 25 ft spacing = 0.377 ft^2/LF

Temporary Work Bridge Platform Impacts

2' Diameter Piles X 3 Piles per Platform X 51 Platforms

*Sites 1, 2, 17, and 18 are now permitted with R-2633AA&AB and impacts are included with that project.

**A portion of Sites 3 and 4 are now permitted with R-2633AA&AB and impacts are included with that project.

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

BRUNSWICK AND NEW HANOVER COUNTIES

WBS - 34491.1.2 (R-2633B)

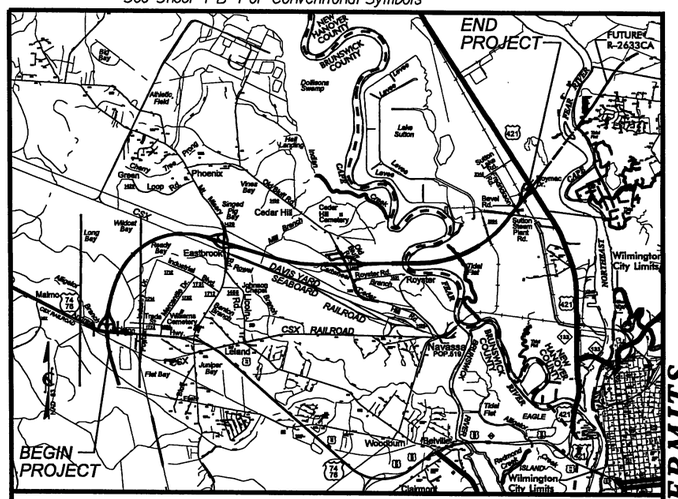
SHEET 10/05/2010

ATN Revised 3/31/05

TIP PROJECT: R-2633B

CONTRACT:

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



VICINITY MAP FOR STATE PROJECT R-2633B

PERMITS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

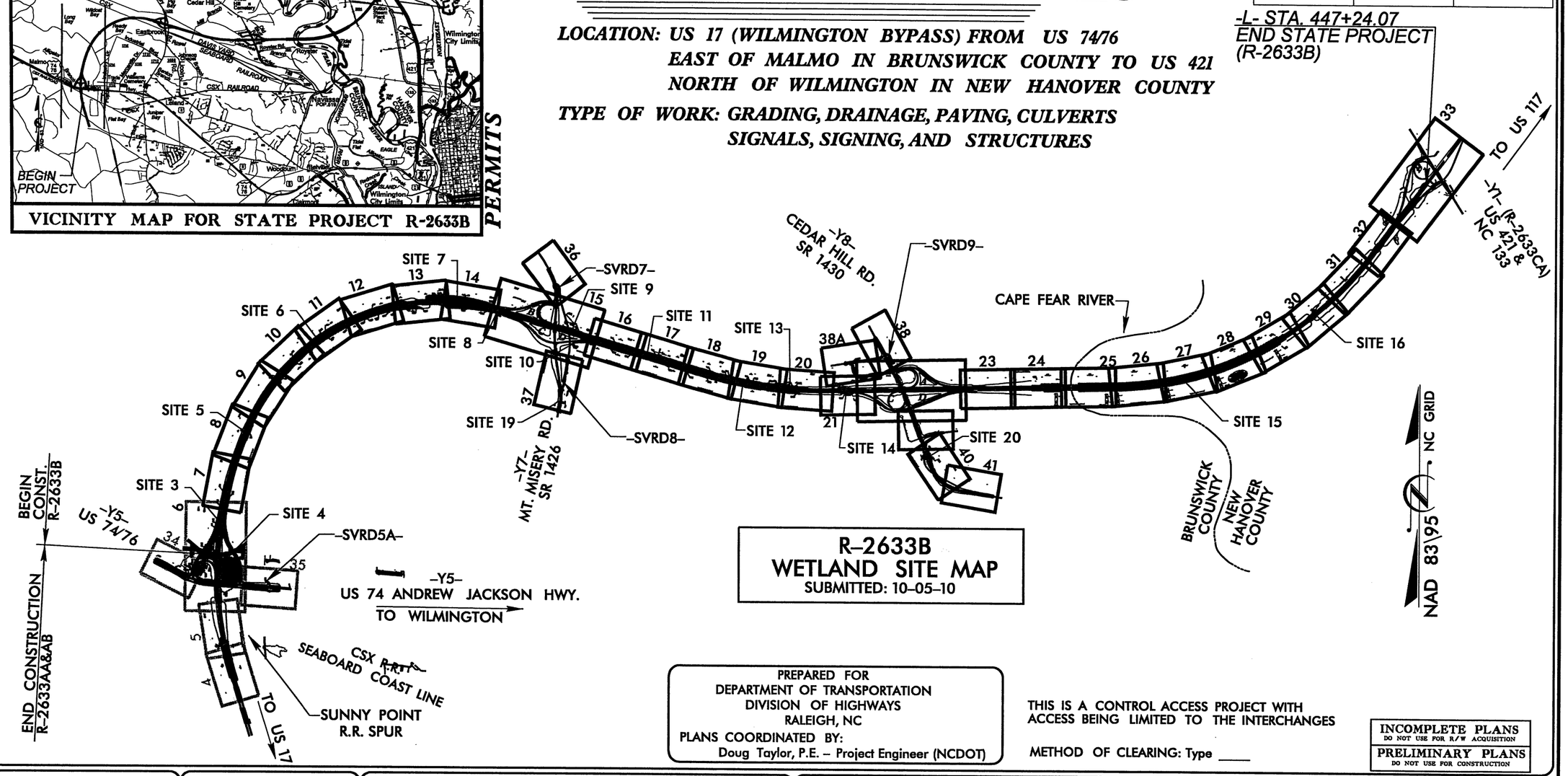
BRUNSWICK & NEW HANOVER COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34491.1.2	STPNHF-17(1)	P.E.
34491.2.3		R/W

LOCATION: US 17 (WILMINGTON BYPASS) FROM US 74/76 EAST OF MALMO IN BRUNSWICK COUNTY TO US 421 NORTH OF WILMINGTON IN NEW HANOVER COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS SIGNALS, SIGNING, AND STRUCTURES



R-2633B WETLAND SITE MAP
SUBMITTED: 10-05-10

PREPARED FOR
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC
PLANS COORDINATED BY:
Doug Taylor, P.E. – Project Engineer (NCDOT)

THIS IS A CONTROL ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGES

METHOD OF CLEARING: Type ____

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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 2009 = 16,400
ADT 2025 = 24,900
DHV = 12 %
D = 60 %
T = 15 % *
V = 70 MPH
* TTST 10% DUAL 5%
FUNC. CLASS. = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2633B = 6.26 Miles
LENGTH STRUCTURES TIP PROJECT R-2633B = 1.76 Miles
TOTAL LENGTH STATE TIP PROJECT R-2633B = 8.02 Miles

THIS IS A FULL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

Prepared In the Office of:

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
June 20, 2008

LETTING DATE:
July 19, 2011

PROJECT ENGINEER

PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: cmyers DATE: 10/1/2010
FILE: Mkta_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Hydraulics\PERMITS_Environmental\Drawings\2633B_PERMITS\R2633B_HYD_PRM_tsh.dgn
PENTABLE: NCDOT_permits.tbl
TIME: 1:07:26 PM SCALE: 1:3000

REVISIONS

MATCH LINE -YSEBL- STA. 20+50, SEE SHEET 37

NAD 83

SITE 30

SITE 31

SITE 29

SITE 32

SITE 35

DO NOT DISTURB

DO NOT DISTURB

2633AA&AB

2633B

2633AA&AB

2633B

MATCH LINE -LREV- STA. 325+00, SEE SHEET 31

MATCH LINE -LREV- STA. 351+00, SEE SHEET 33

MATCH LINE -YSEBL- STA. 36+00, SEE SHEET 38

LEGEND

- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	32
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

HDR Engineering, Inc. of the Carolinas
230 Peachtree, Suite 1800 Atlanta, GA 30303
NC License Number F-0176

BARNHILL CONTRACTING COMPANY

SEE SHEET NO. 52, 53 FOR -LREV- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5EBL- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 72 FOR -RP_A1REV- PROFILE.
SEE SHEET NO. 73 FOR -RP_D1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_A1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_D1REV- PROFILE.
SEE SHEET NO. 2-N FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET ___ OF ___

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:	
TIP NO.:	COUNTY:
DESIGNED BY:	
CHECKED BY:	DATE:

PLOT DRIVER: MODOT.pltf color_wing_100.pltf
USER: jhaverson DATE: 5/13/2020
FILE NAME: C:\Users\jhaverson\AppDataLocal\Temp\acpublish_23320\R-2633AA&AB_PROOF_PLAN_32.dgn
PENTABLE: MODOT.pwrmt14_MODOT.tbl
TIME: 11:14:57 PM SCALE: 1:1000

REVISIONS

MATCH LINE -Y5EBL- STA. 20+50, SEE SHEET 37

NAD 83

SITE 30

2633AA&AB

2633B

LEGEND

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES HAND CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	32

INCOMPLETE PLANS
PRELIMINARY PLANS

BARNHILL CONTRACTING COMPANY

DO NOT DISTURB

SITE 31

MATCH LINE -LREV- STA. 325+00, SEE SHEET 31

MATCH LINE -LREV- STA. 351+00, SEE SHEET 33

SITE 29

DO NOT DISTURB

SITE 32

SITE 35

2633AA&AB

2633B

MATCH LINE -Y5EBL- STA. 36+00, SEE SHEET 38

SEE SHEET NO. 52, 53 FOR -LREV- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5EBL- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 72 FOR -RP_A1REV- PROFILE.
SEE SHEET NO. 73 FOR -RP_D1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_A1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_D1REV- PROFILE.
SEE SHEET NO. 2-N FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET___ OF ___

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:

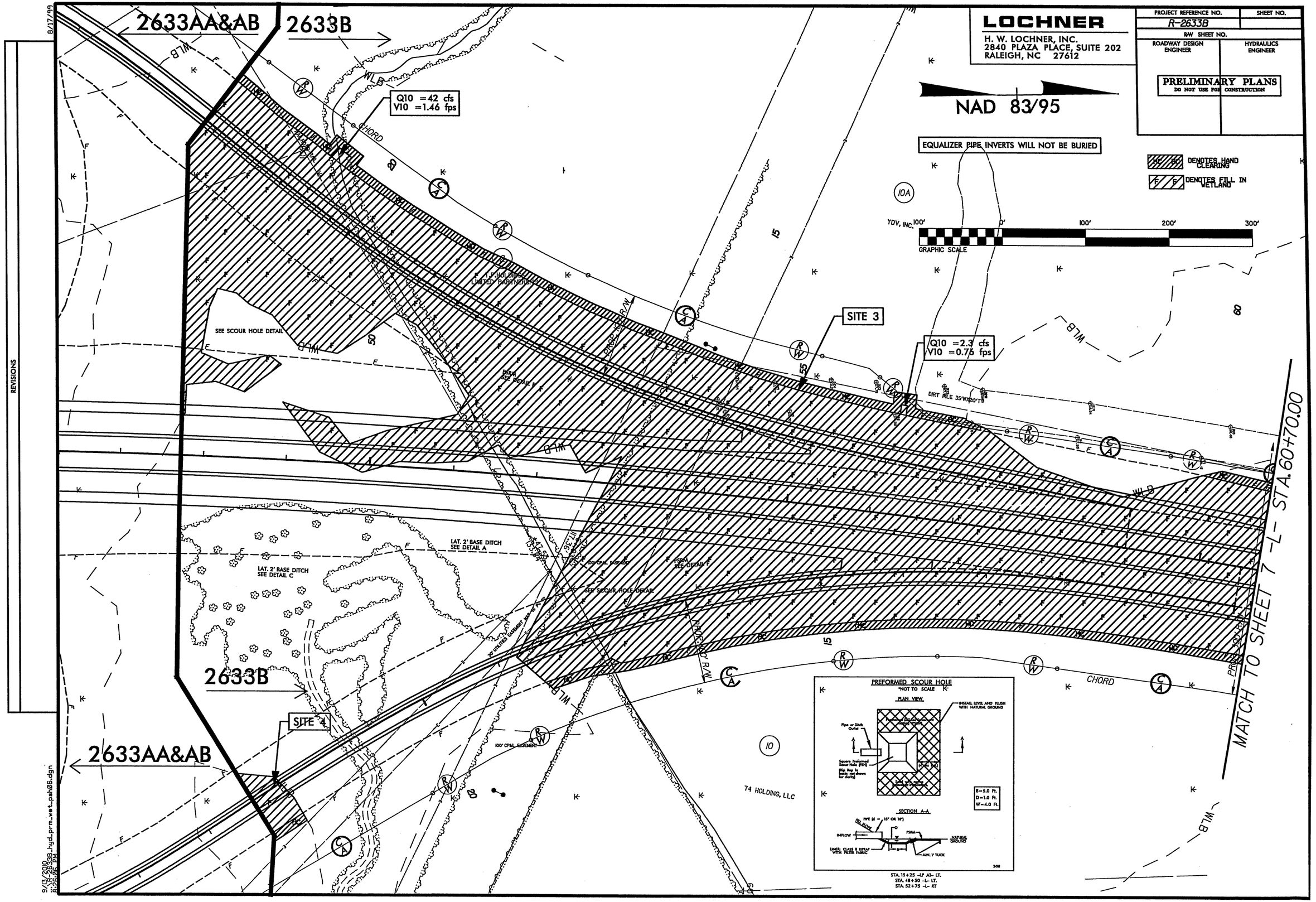
TIP NO.: COUNTY:

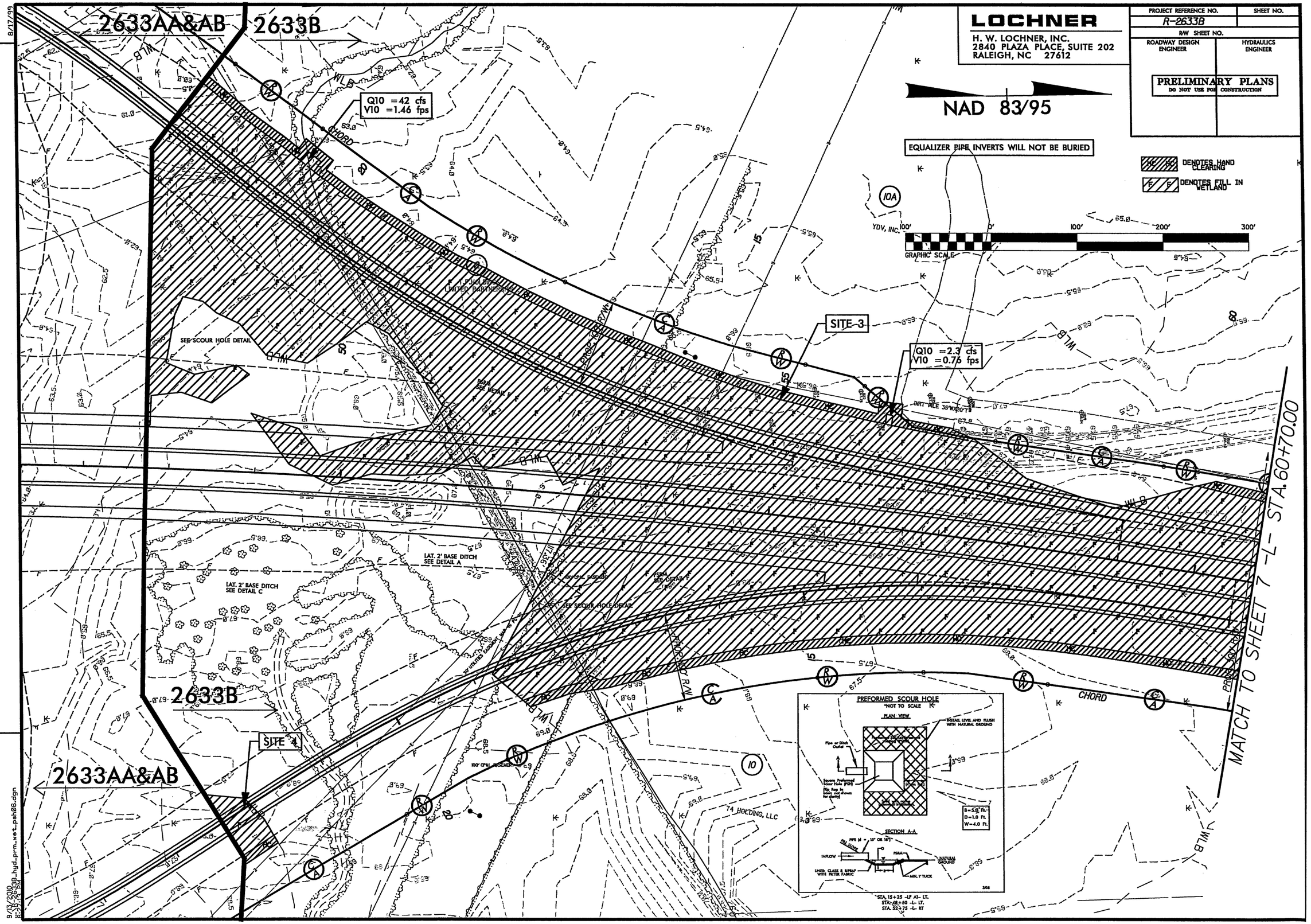
DESIGNED BY:

CHECKED BY: DATE:

PLOT: 08/16/05, NCDOT_psf_color_wbg_100.psf
USER: jhearne DATE: 5/13/2010
FILE: W:\R-2633AA&AB_Forest Station Bypass\Roadway\Production\R-2633AA_B_MS\Roadway\Sheets\R-2633AA_B_MS_PDP_32.dgn

FILE: R2633AA_NCDOT.prefs
TIME: 10:04:08 PM SCALE: 1:200

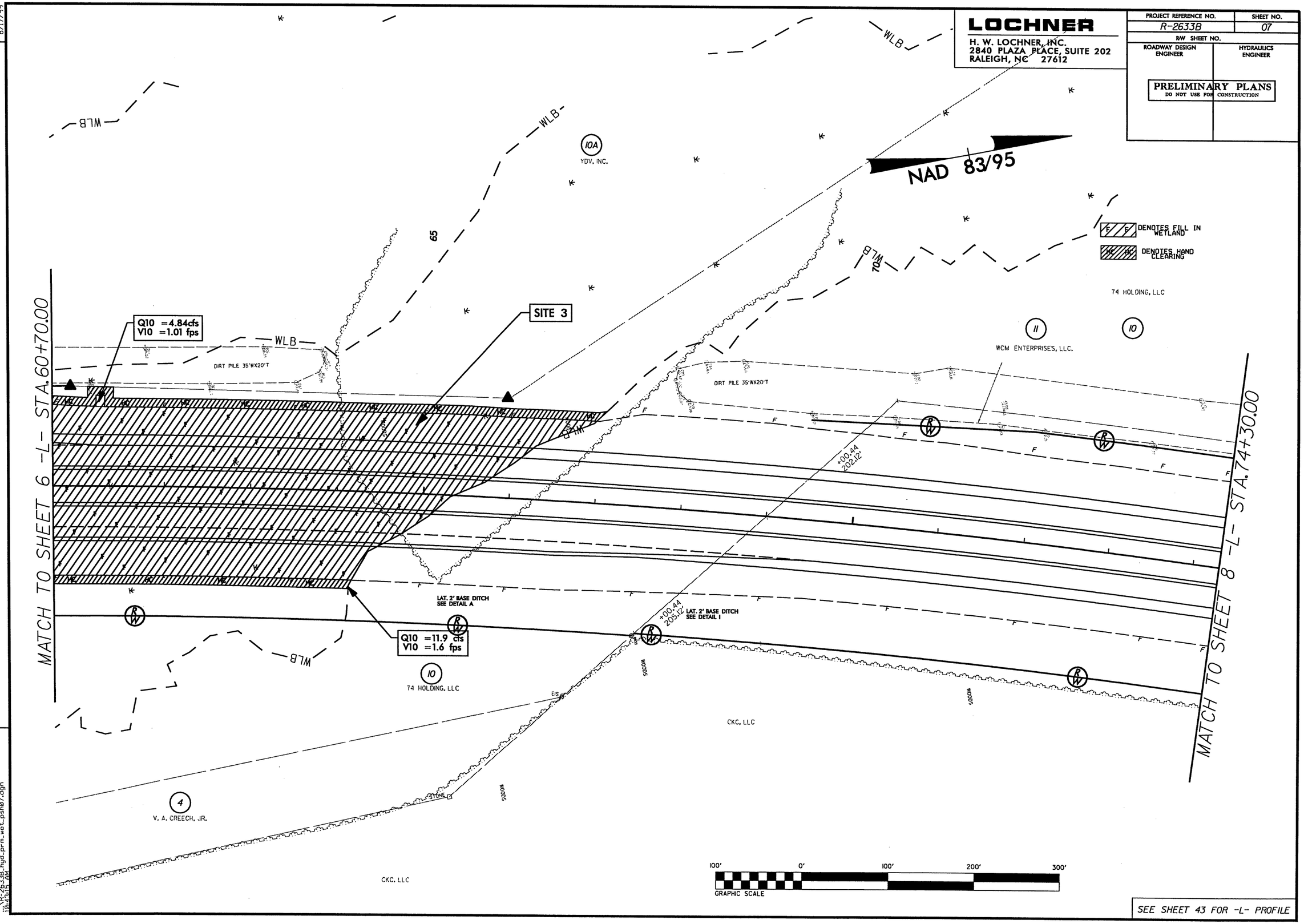

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
EQUALIZER PIPE INVERTS WILL NOT BE BURIED
DENOTES HAND CLEARING
DENOTES FILL IN WETLAND
GRAPHIC SCALE
2633AA&AB
2633B
Q10 =42 cfs
V10 =1.46 fps
SITE 3
Q10 =2.3 cfs
V10 =0.75 fps
SITE 4
SEE SCOUR HOLE DETAIL
LAT. 2' BASE DITCH SEE DETAIL A
LAT. 2' BASE DITCH SEE DETAIL C
74 HOLDING, LLC
MATCH TO SHEET 7 -L- STA. 60+70.00
PREFORMED SCOUR HOLE
*NOT TO SCALE
PLAN VIEW
SECTION A-A
B=5.0 Ft.
D=1.0 Ft.
W=4.0 Ft.
STA. 15+25 -LF A1- LT.
STA. 48+50 -L- LT.
STA. 52+75 -L- RT
REVISIONS
8/17/99
9/13/2010
R-2633B_hyd_prm_wet_psh06.dgn
8:26:06 PM


LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
EQUALIZER PIPE INVERTS WILL NOT BE BURIED
DENOTES HAND CLEARING
DENOTES FILL IN WETLAND
GRAPHIC SCALE
2633AA&AB
2633B
Q10 = 42 cfs
V10 = 1.46 fps
SITE-3
Q10 = 2.3 cfs
V10 = 0.75 fps
SITE 4
SEE SCOUR HOLE DETAIL
LAT. 2' BASE DITCH SEE DETAIL A
LAT. 2' BASE DITCH SEE DETAIL C
PROP. GRADE
CHORD
MATCH TO SHEET 7 -L- STA. 60+70.00
PREFORMED SCOUR HOLE
*NOT TO SCALE
PLAN VIEW
SECTION A-A
B=5.0 Ft.
D=1.0 Ft.
W=4.0 Ft.
*STA. 15+25 -LP A1- LT.
STA. 48+50 -L- LT.
STA. 52+75 -L- RT
REVISIONS
8/17/99
9/13/2000
R:\R-2633B\R-2633B_hyd_prm_wet_psh06.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 43 FOR -L- PROFILE

REVISIONS
R/W REVISION:10/ /09 - NAME AND DEED CHANGE PARCEL 10. PROPERTY OWNER NAME CHANGE FROM WCM ENTERPRISES,LLC TO CKC,LLC

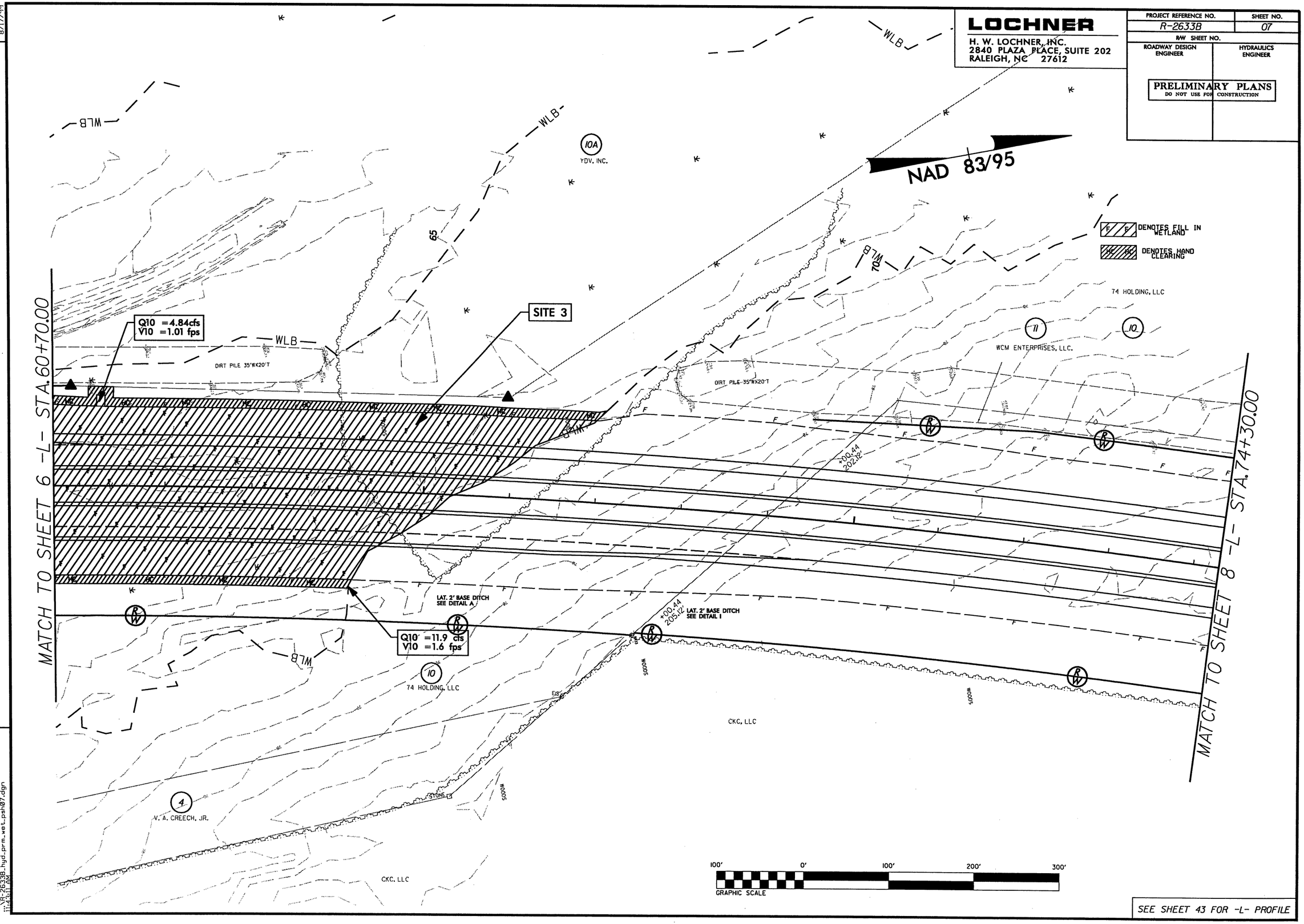
8/17/99

7/30/2010
12:43:10 PM
r2633_hyd_prm_wet_psh07.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 43 FOR -L- PROFILE

REVISIONS
R/W REVISION:10/ /09 - NAME AND DEED CHANGE PARCEL 10. PROPERTY OWNER NAME CHANGE FROM WCM ENTERPRISES,LLC TO CKC,LLC

8/17/99

7/30/2010
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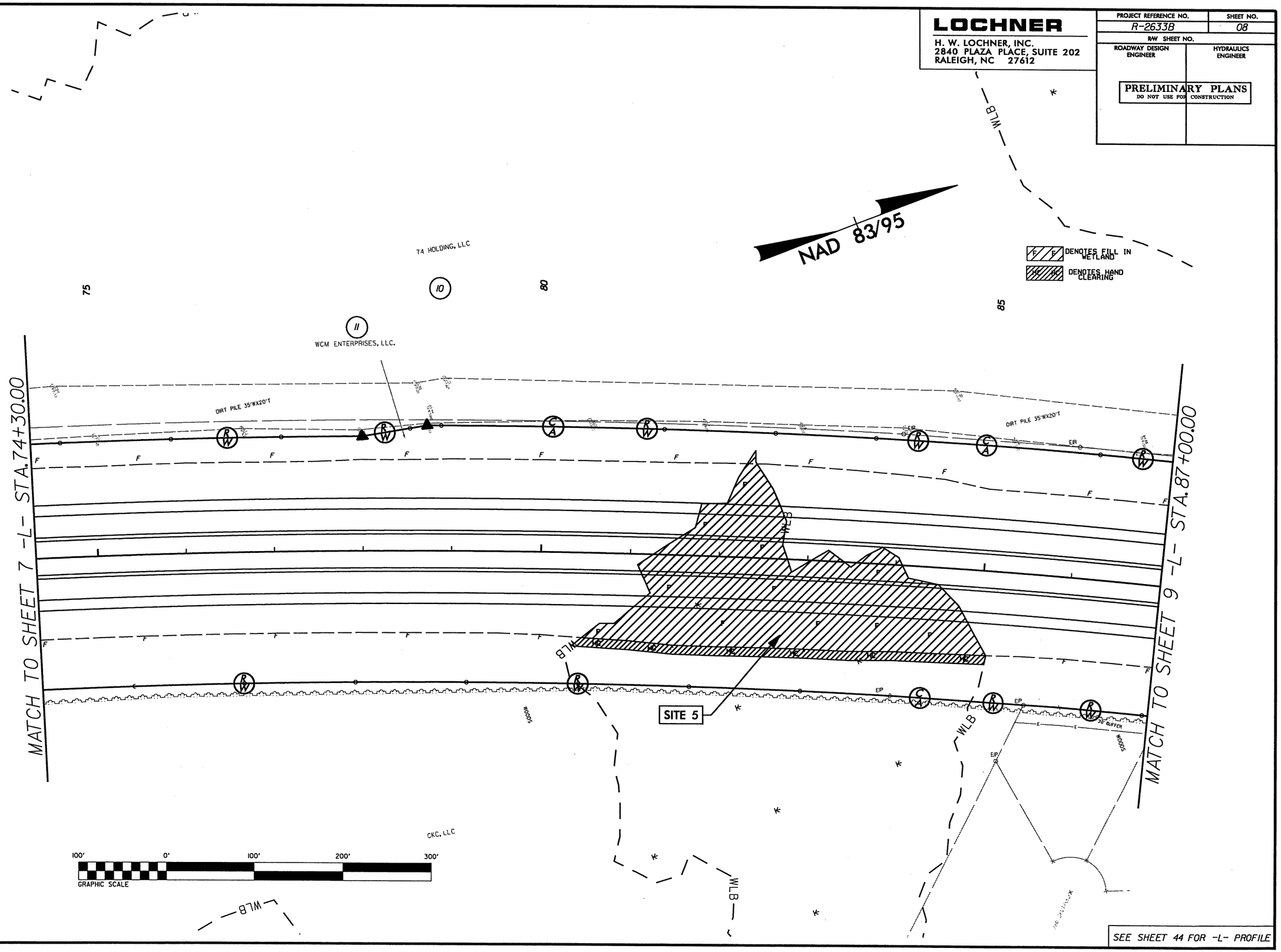
11:43:16 AM

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 44 FOR -L- PROFILE

REVISIONS

R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10.

8/17/99

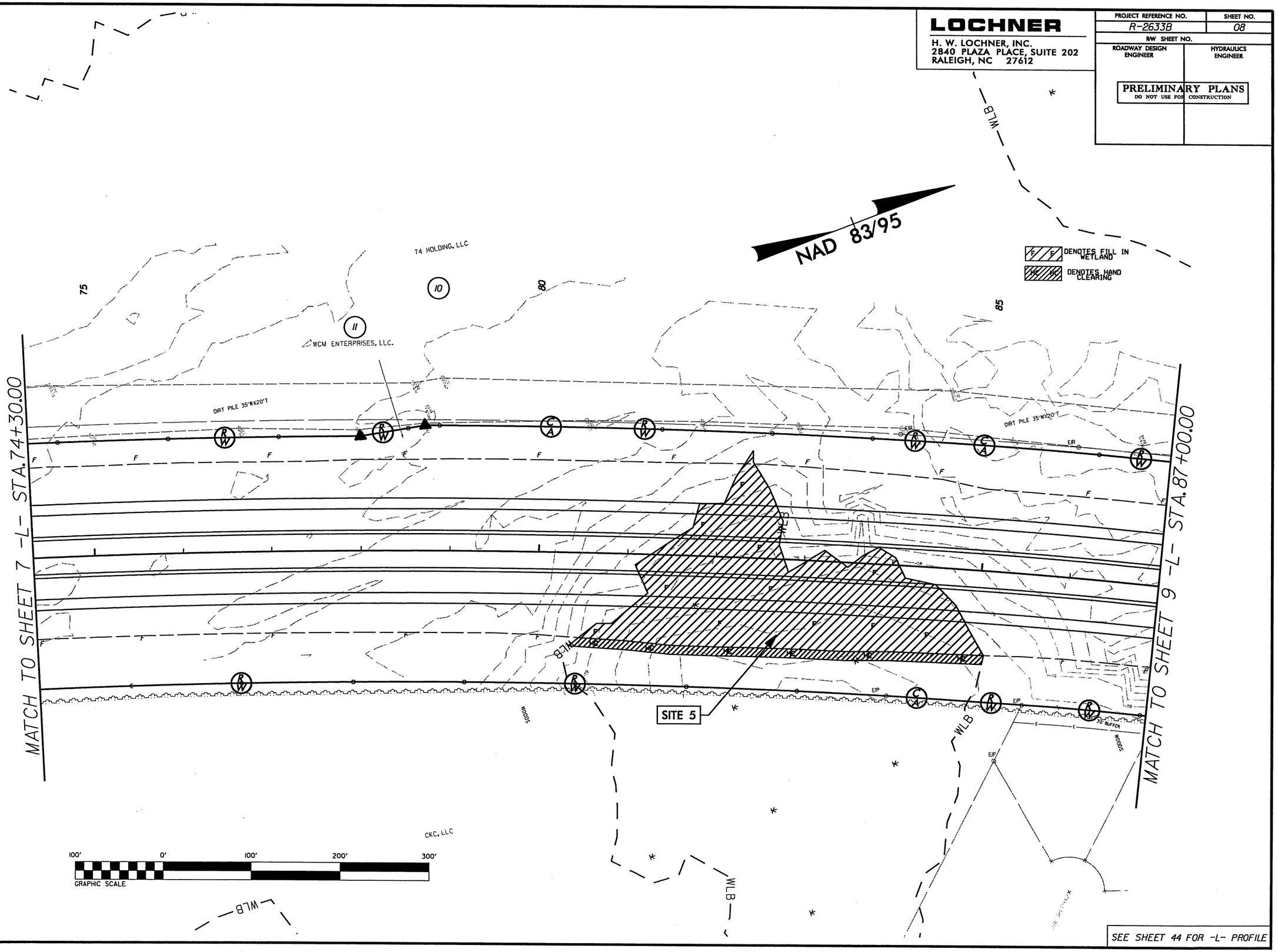
7/30/2010
R2633B_hyd_prm_wet_psh08.dgn
11:43:13 AM

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 44 FOR -L- PROFILE

REVISIONS

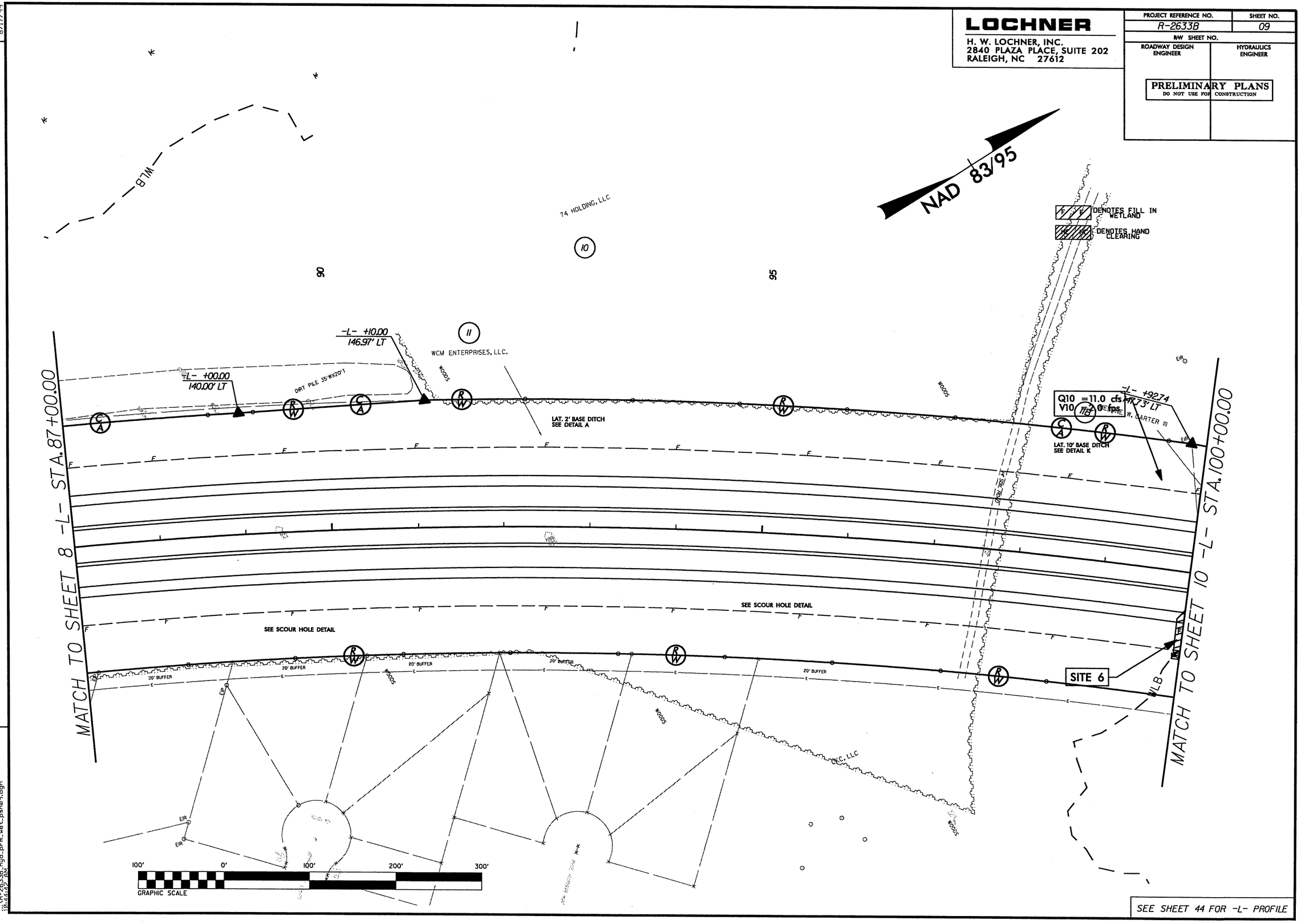
R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10.

8/17/99

7/30/2010
11:45:29 AM
R-2633B_hyd_prm_wet_psh08.dgn

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612	R-2633B	09
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 44 FOR -L- PROFILE

REVISIONS

R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10.

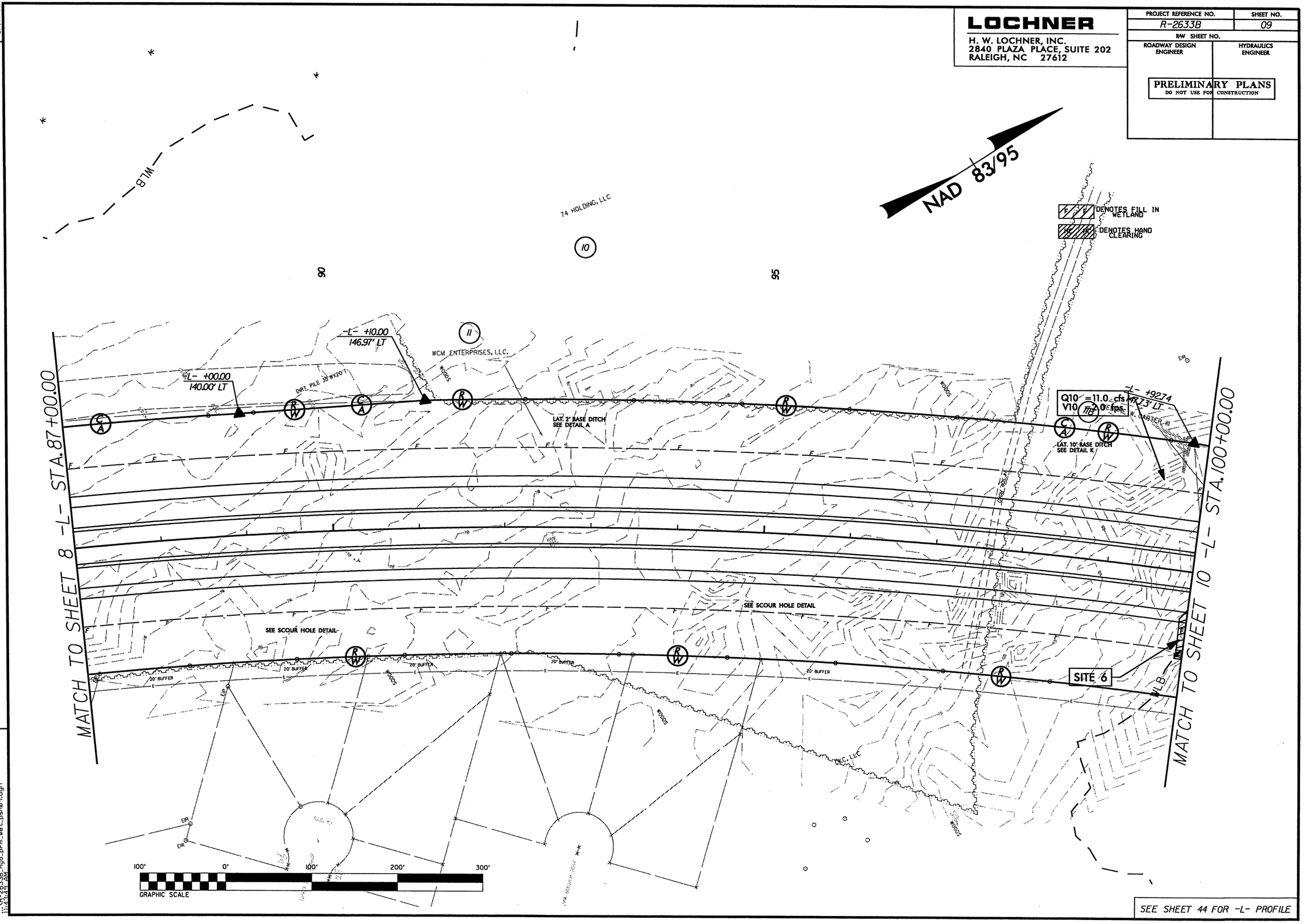
8/17/99

7/30/2010
10:14:12 AM
hyd_prm_wet_psh09.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	09
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 44 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10.

8/17/99

7/30/2010
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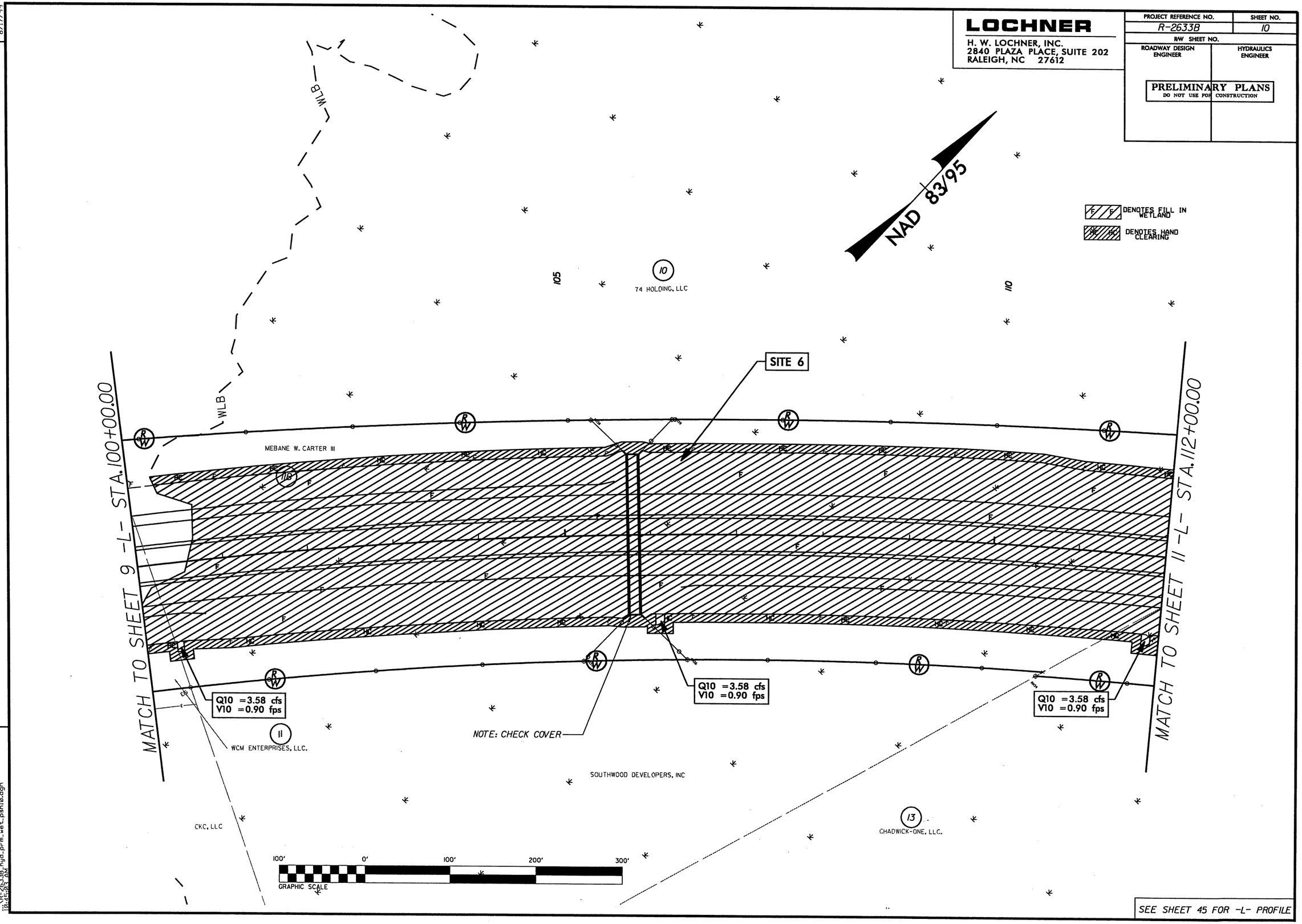
11:44:49 AM

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 45 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10. ELIMANATED PARCEL 12 NO CLAIM. ADDED PARCEL 11B.

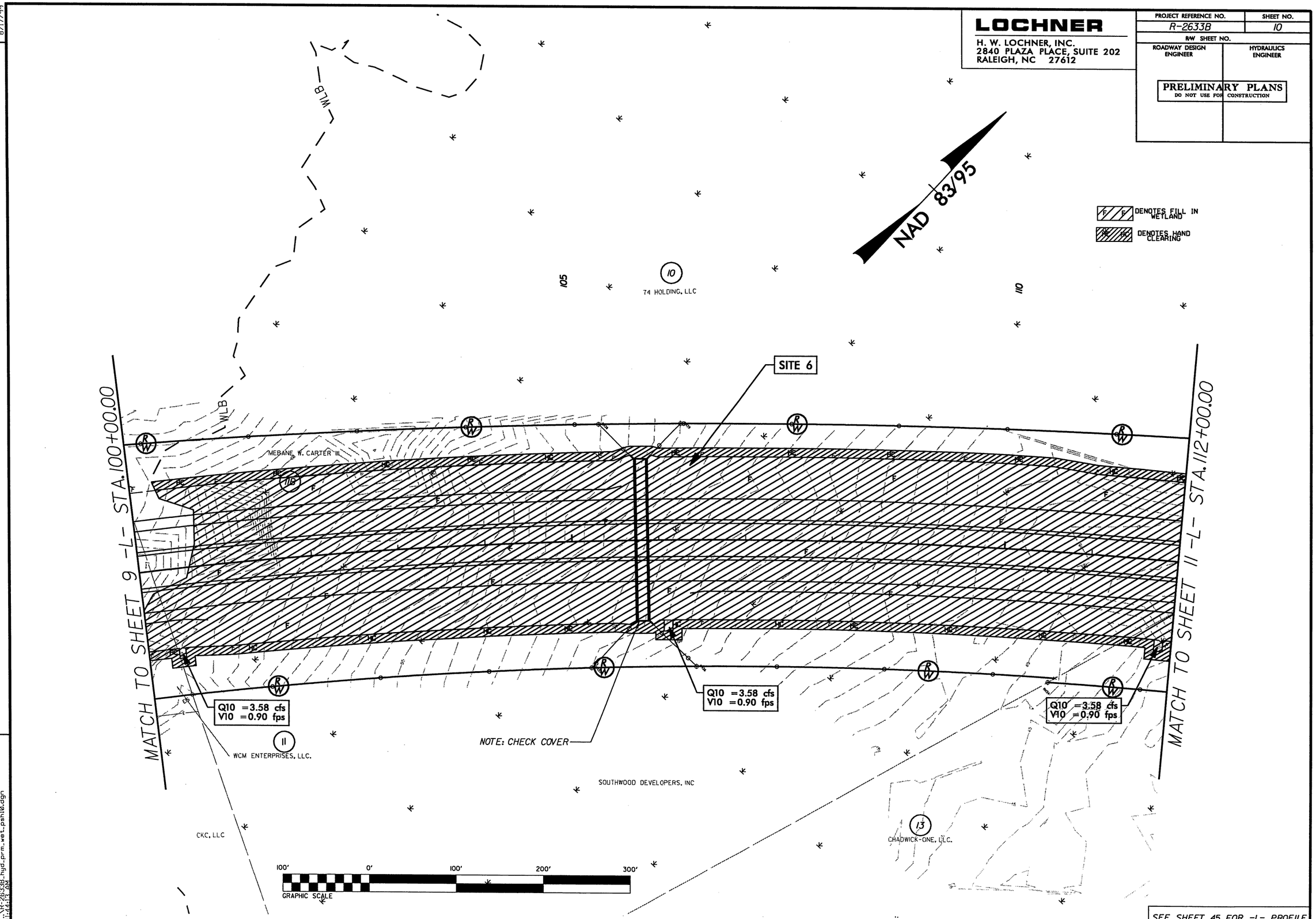
8/17/99

7/30/2010
12:45:03 PM
i:\r-2633b_hyd_prm_wet_psh10.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 45 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10. ELIMANATED PARCEL 12 NO CLAIM. ADDED PARCEL 11B.

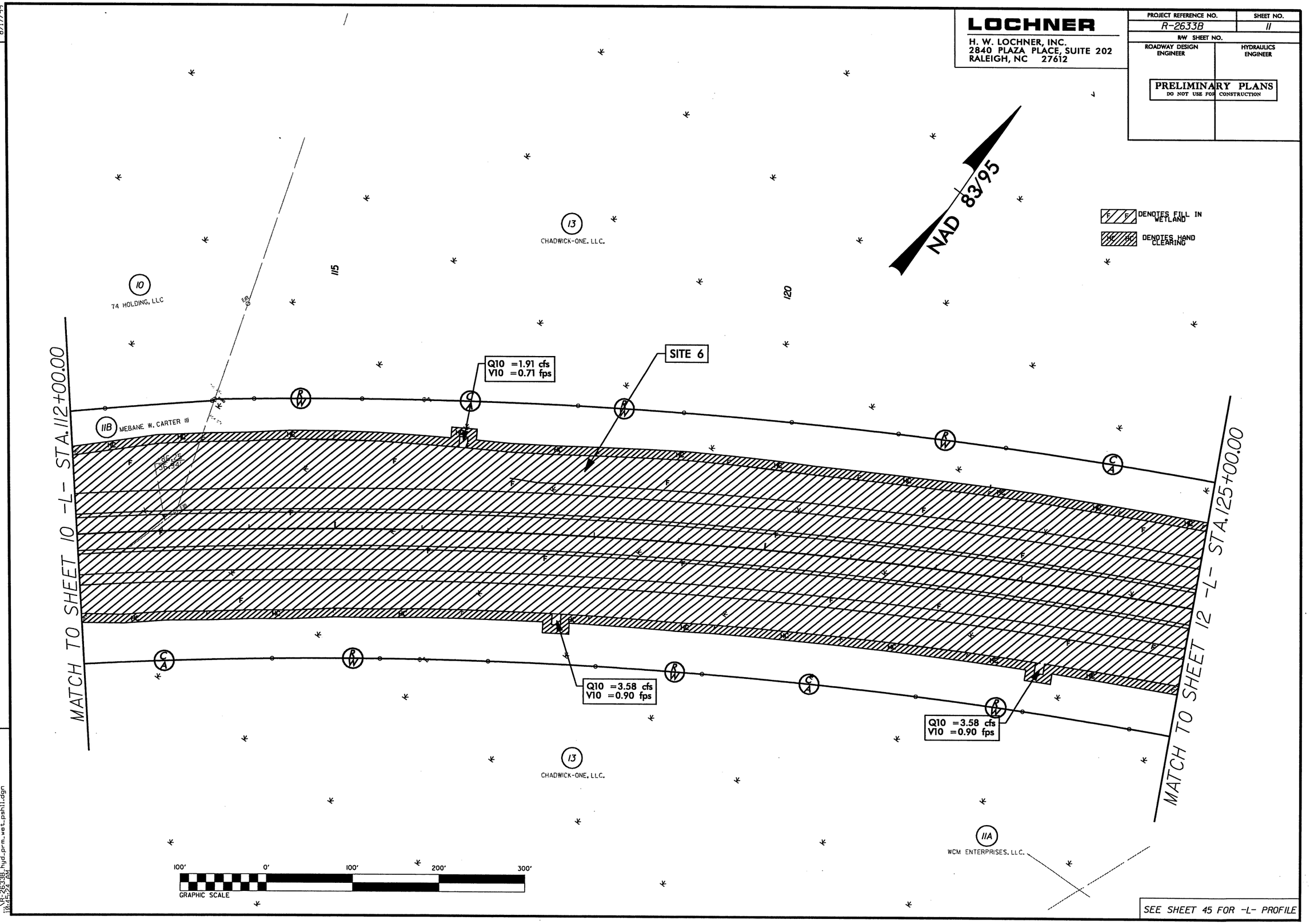
8/17/99

7/30/2010
R-2633B_hyd_prm_wet_psh10.dgn
11:44:13 AM

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 45 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - ADDED PARCEL 11B. CHANGED PARCEL #11 TO 11A.

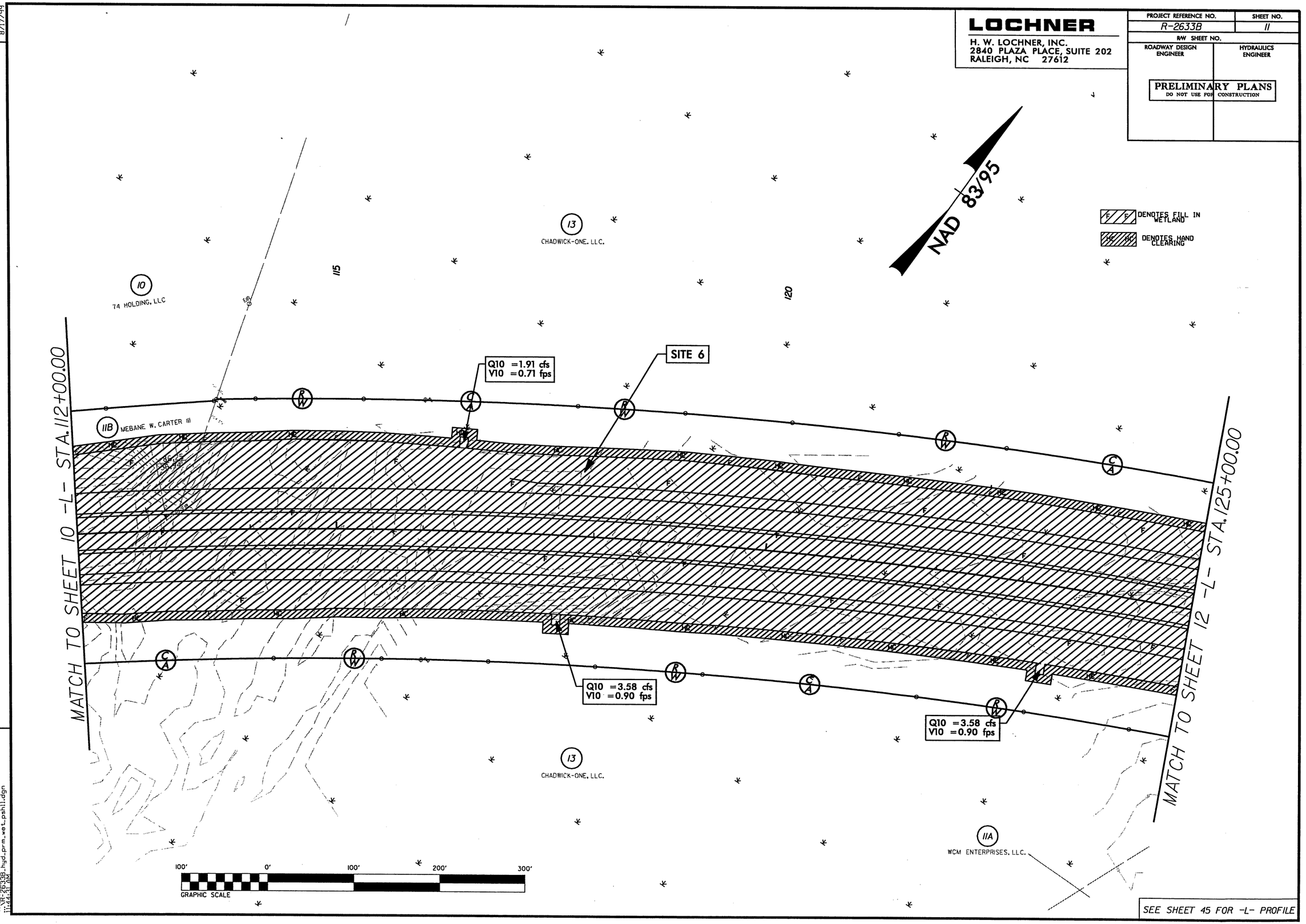
8/17/99

7/30/2010
i:\r-2633b\hyd_prm\r_wet_pshi11.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 45 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - ADDED PARCEL 11B. CHANGED PARCEL #11 TO 11A.

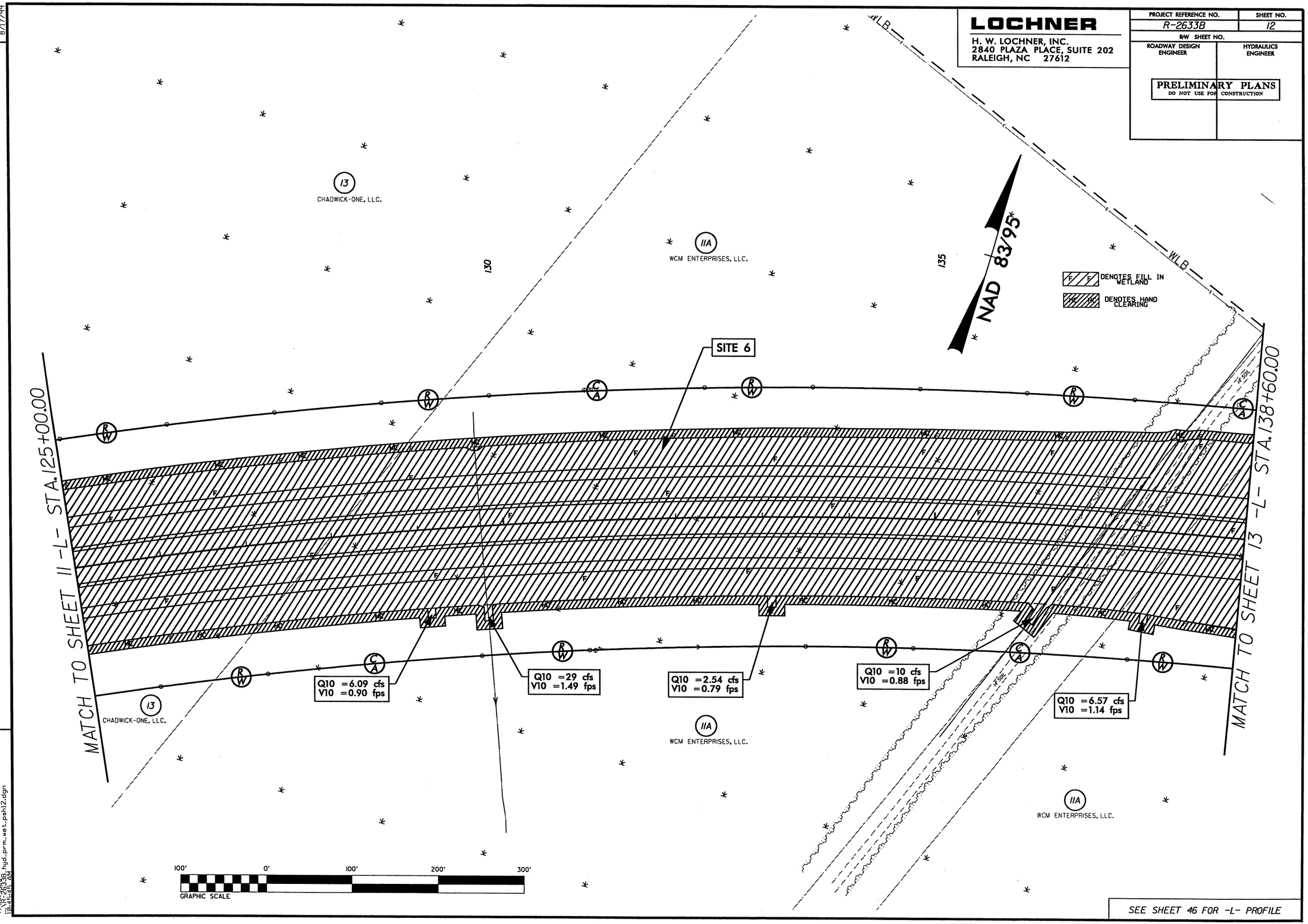
8/17/99

7/30/2010
R-2633B_hyd_prm_wet_pshi1.dgn
11:44:51 AM

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 46 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - CHANGE PARCEL # 11 TO 11A

8/17/99

7/30/2009
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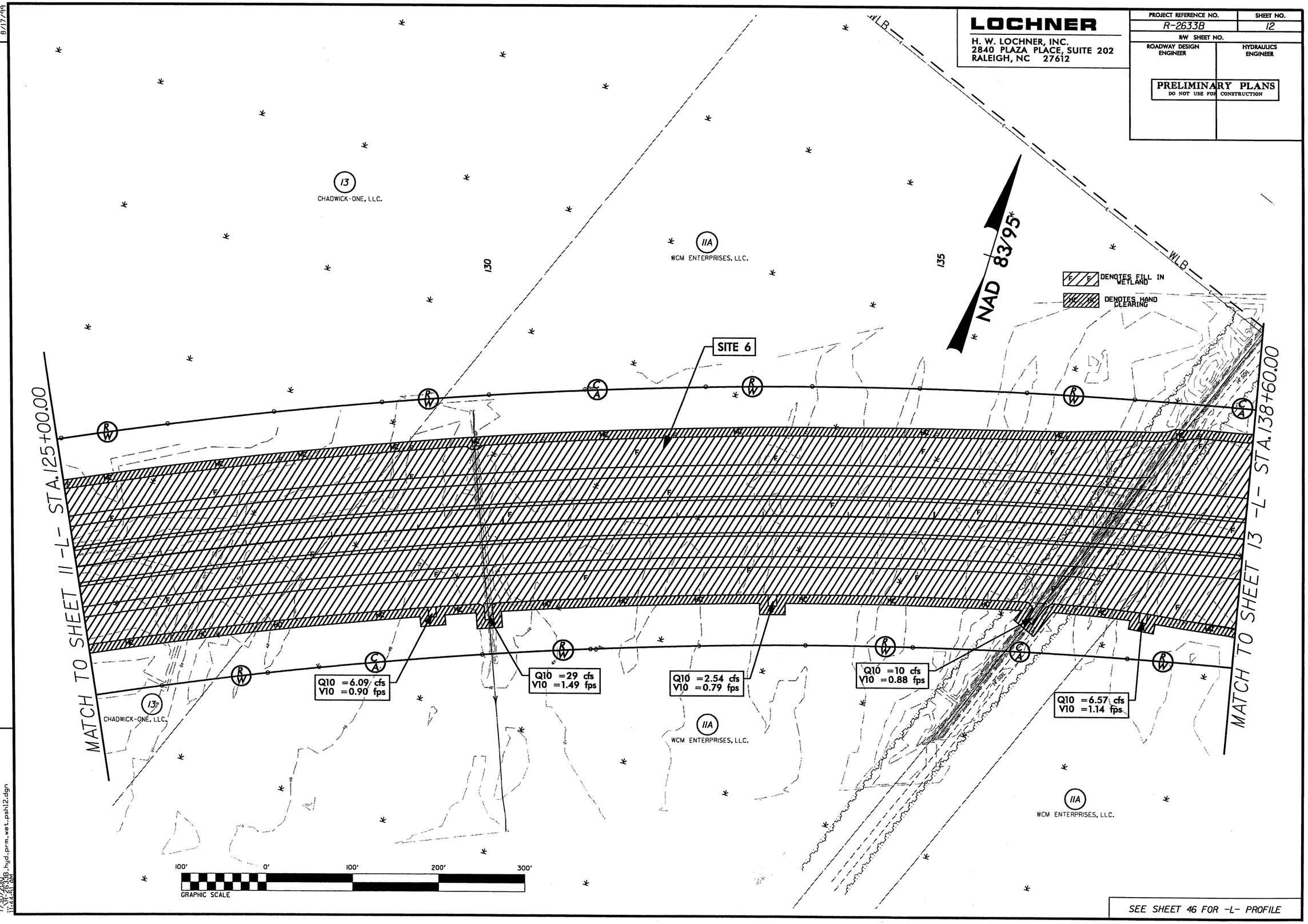
12-2633_hyd_prm_wet_psh12.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 46 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - CHANGE PARCEL # 11 TO 11A

8/17/99

7/30/2010
11:44:51 AM
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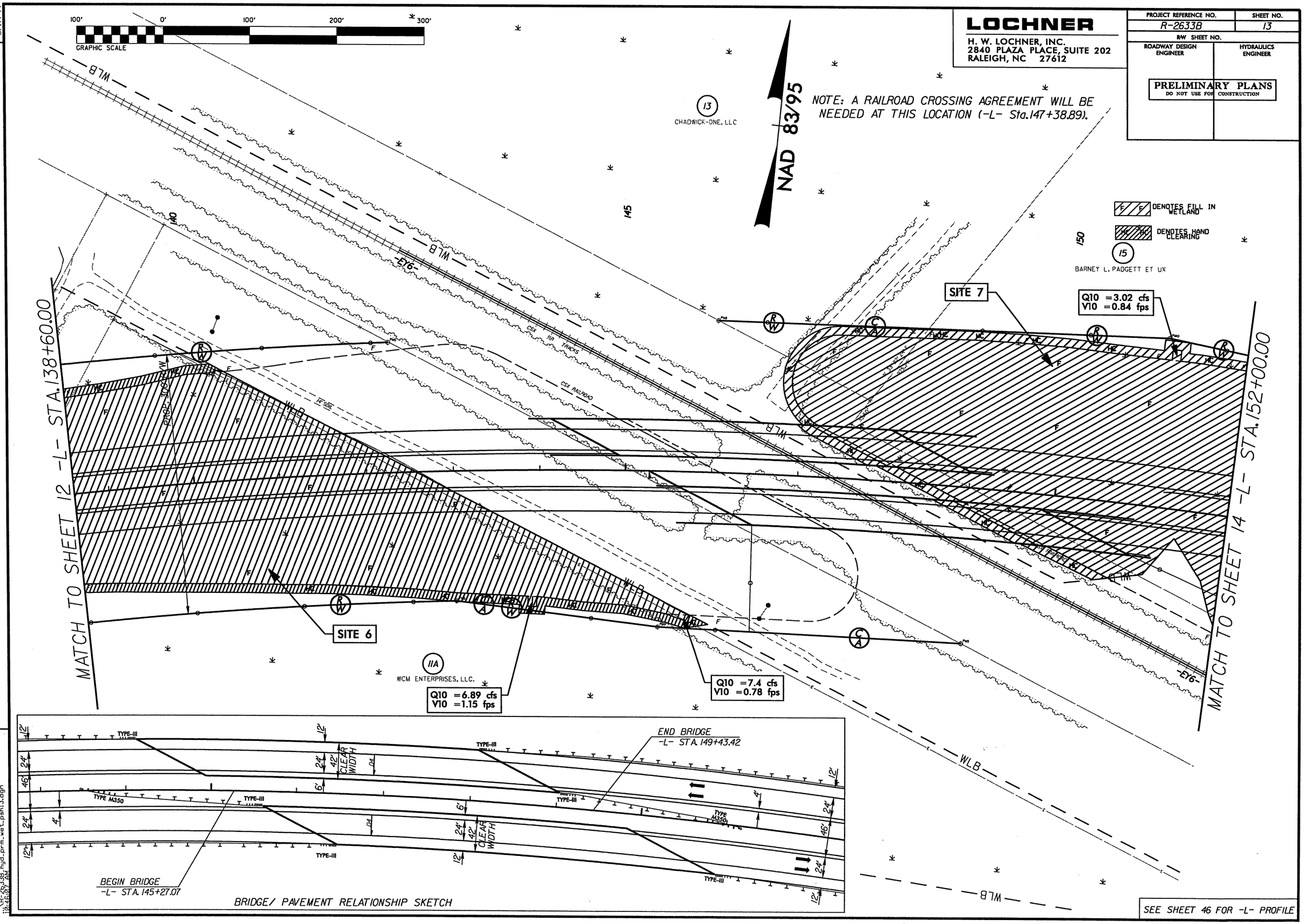
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
10/ /09 - CHANGED PARCEL #11 TO 11A, COMBINED PARCEL 13 AND 14 AND ELIMINATED 14, CORRECTED PROPERTY LINES AND RAILROAD R/W LINE ON PARCEL 15.
8/17/99



SEE SHEET 46 FOR -L- PROFILE

7/30/2010
R-2633B_hyd_prm_wet_pshl3.dgn
11:46:07 AM

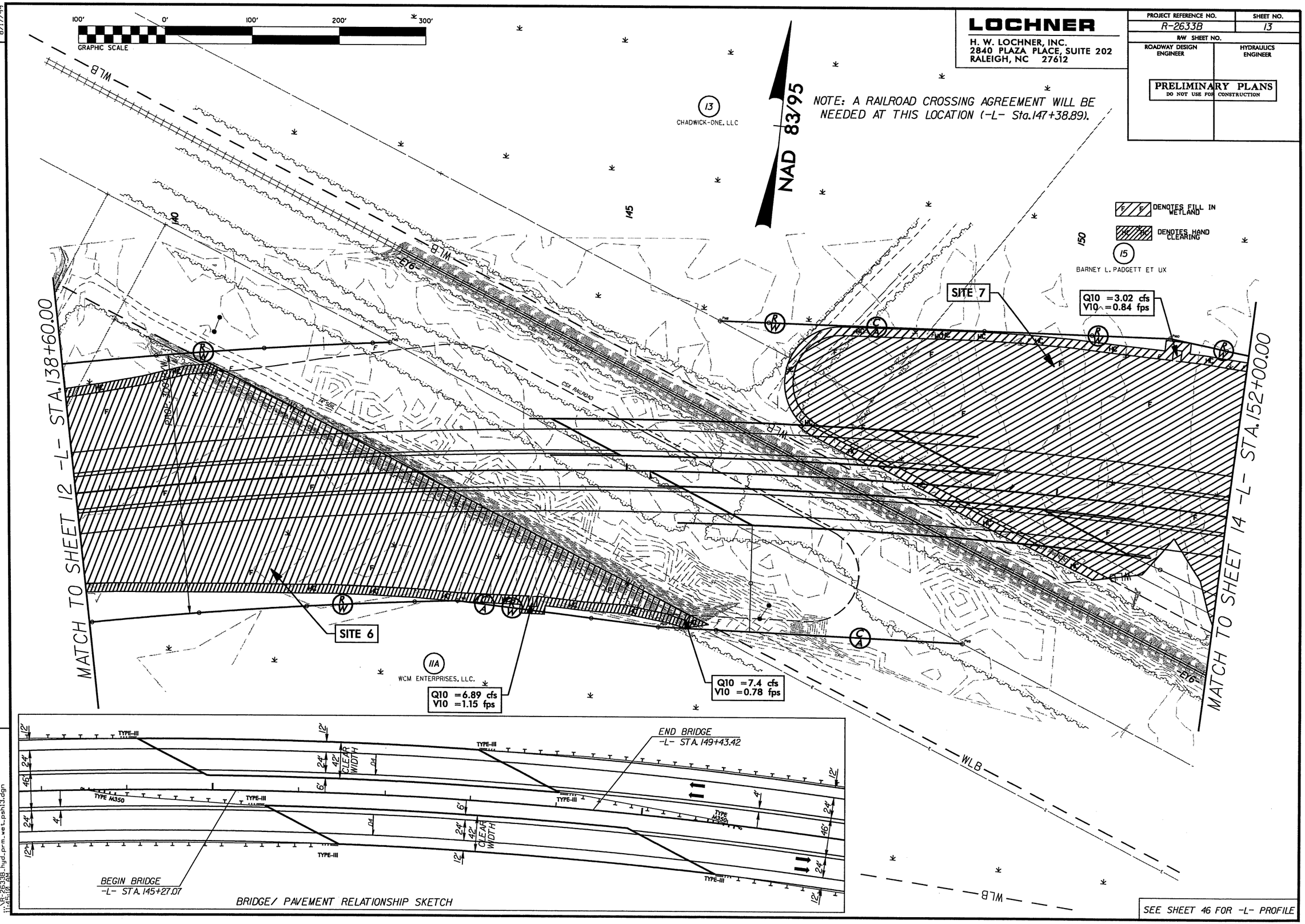
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
10/ /09 - CHANGED PARCEL #11 TO 11A, COMBINED PARCEL 13 AND 14 AND ELIMINATED 14, CORRECTED PROPERTY LINES AND RAILROAD R/W LINE ON PARCEL 15.

8/17/99



SEE SHEET 46 FOR -L- PROFILE

7/30/2009
11:45:10 AM
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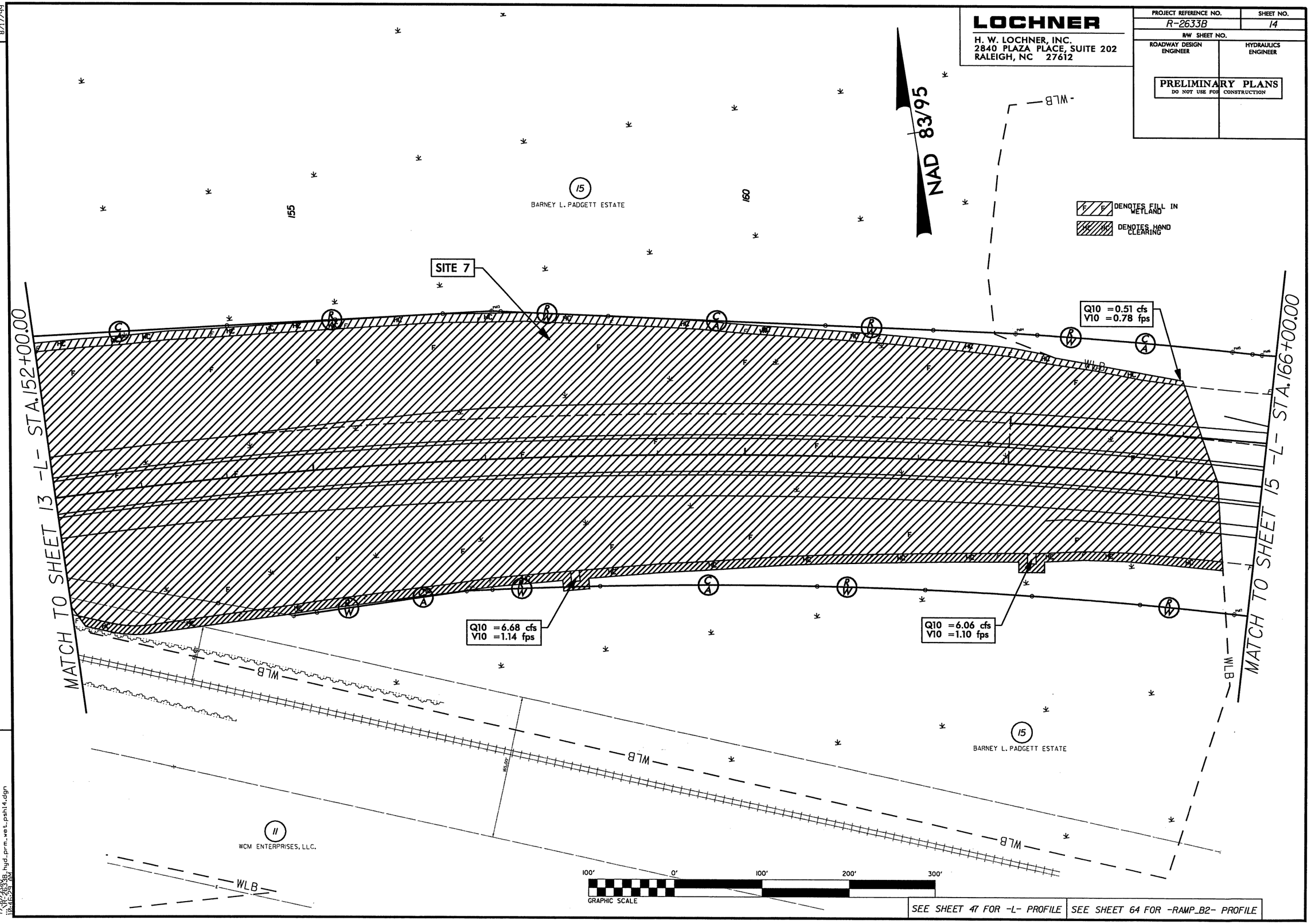
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

10/ /09 - CORRECTED PROPERTY LINES AND RAILROAD R/W LINE ON PARCEL 15.

8/17/99

7/30/2010
10:41:53 AM
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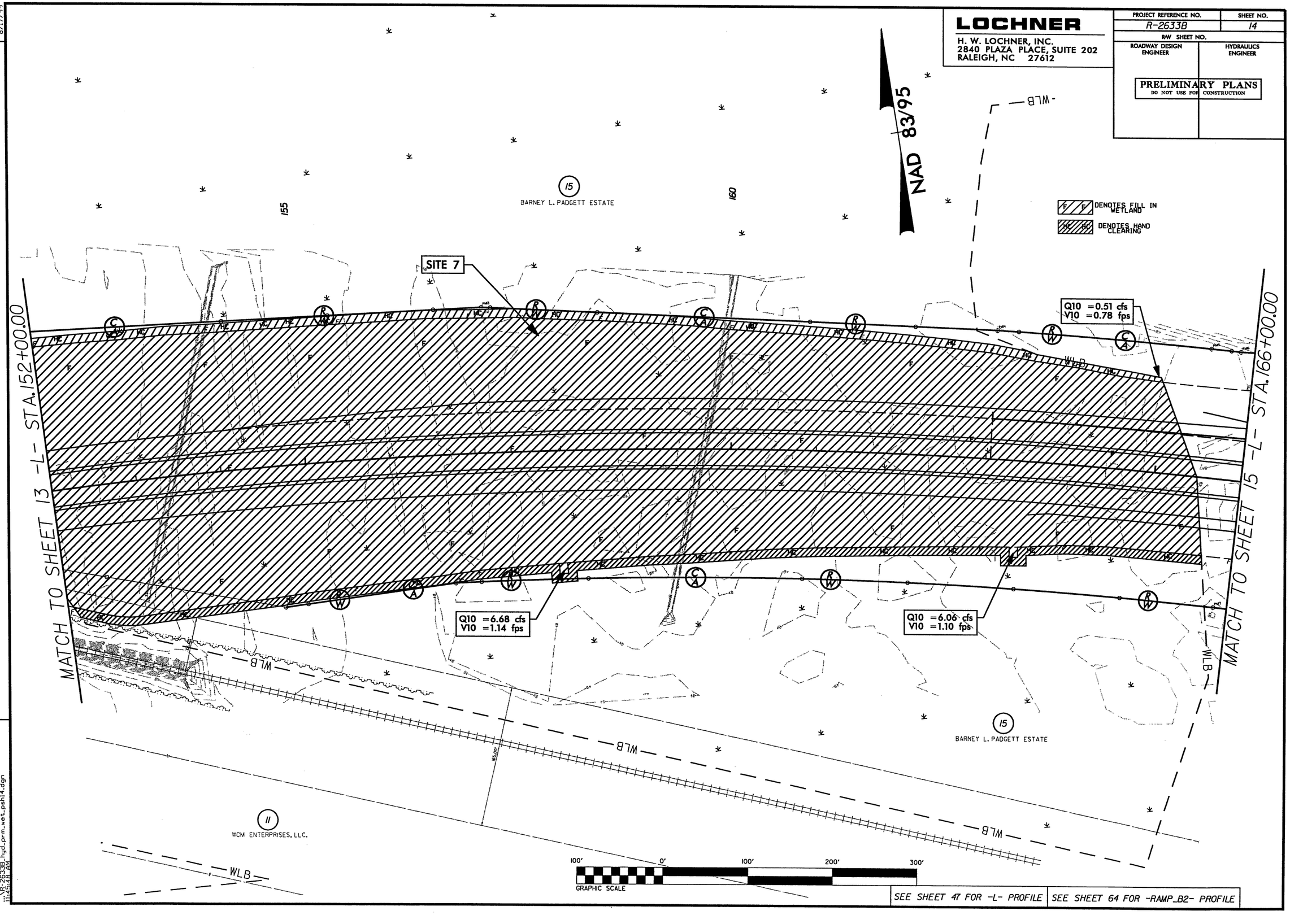
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

10/ /09 - CORRECTED PROPERTY LINES AND RAILROAD R/W LINE ON PARCEL 15.

8/17/99

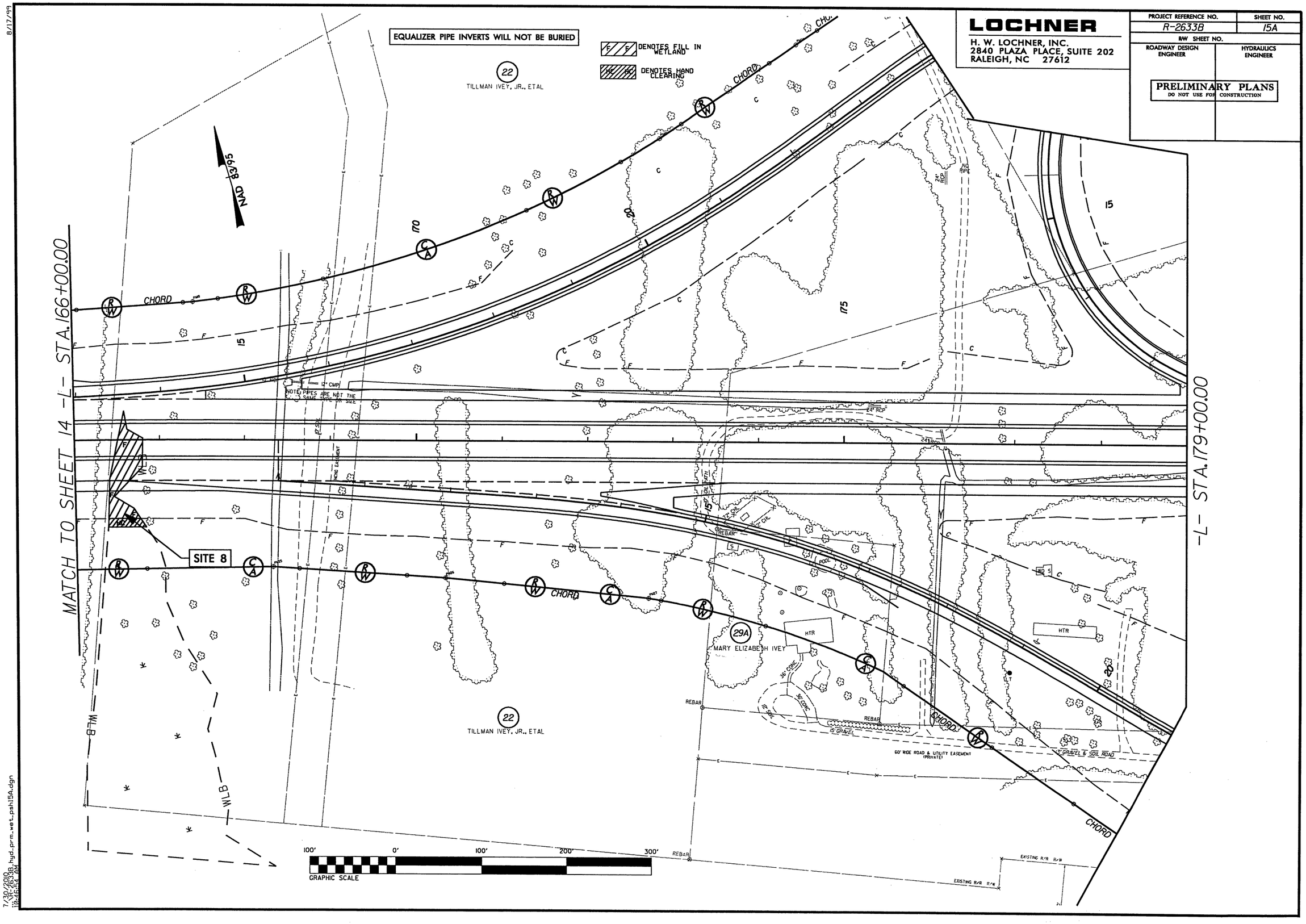
7/30/2010
R-2633B_hyd_prm_wet_psh14.dgn
jt.vbaden

8/17/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	15A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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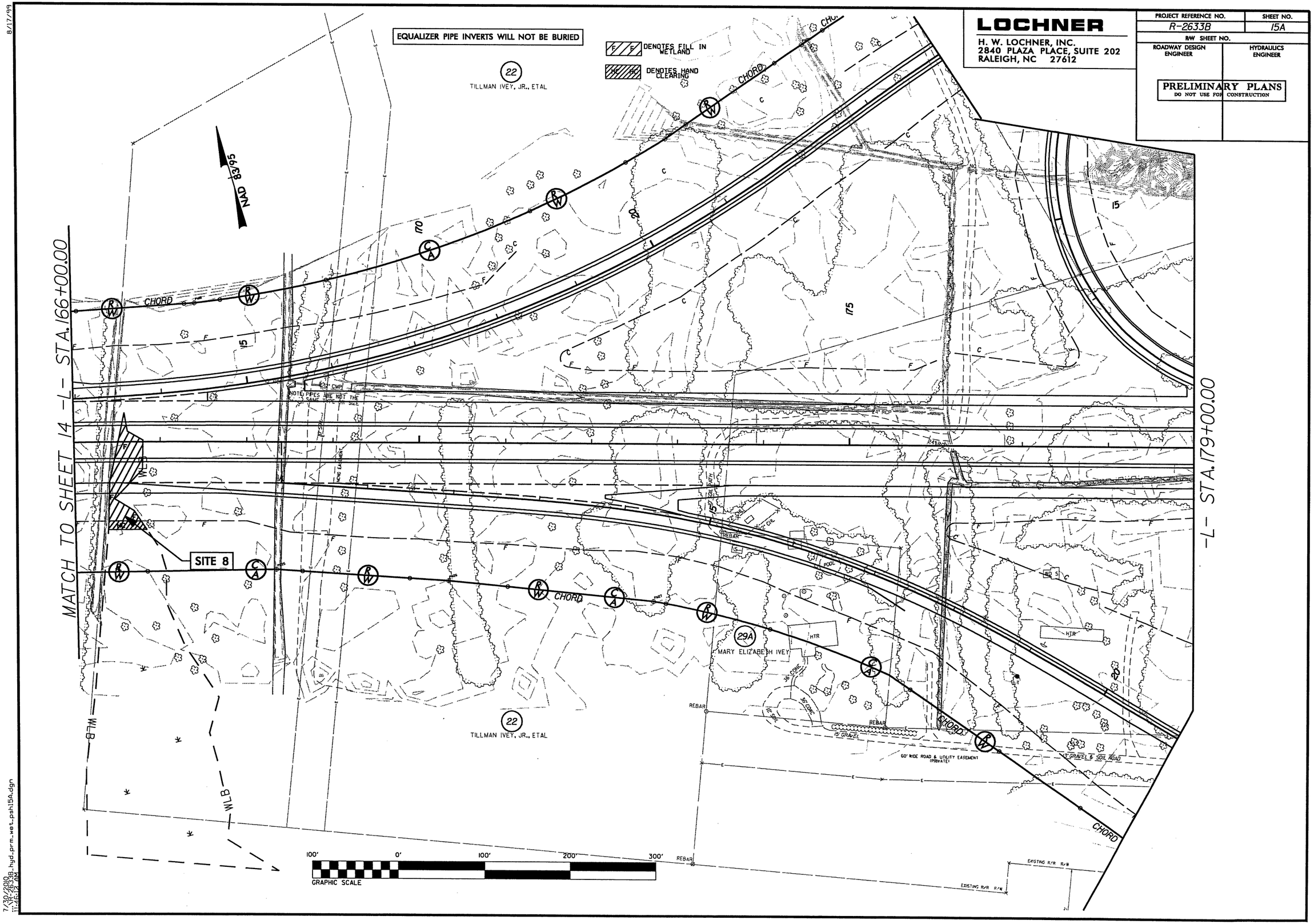
8/17/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	15A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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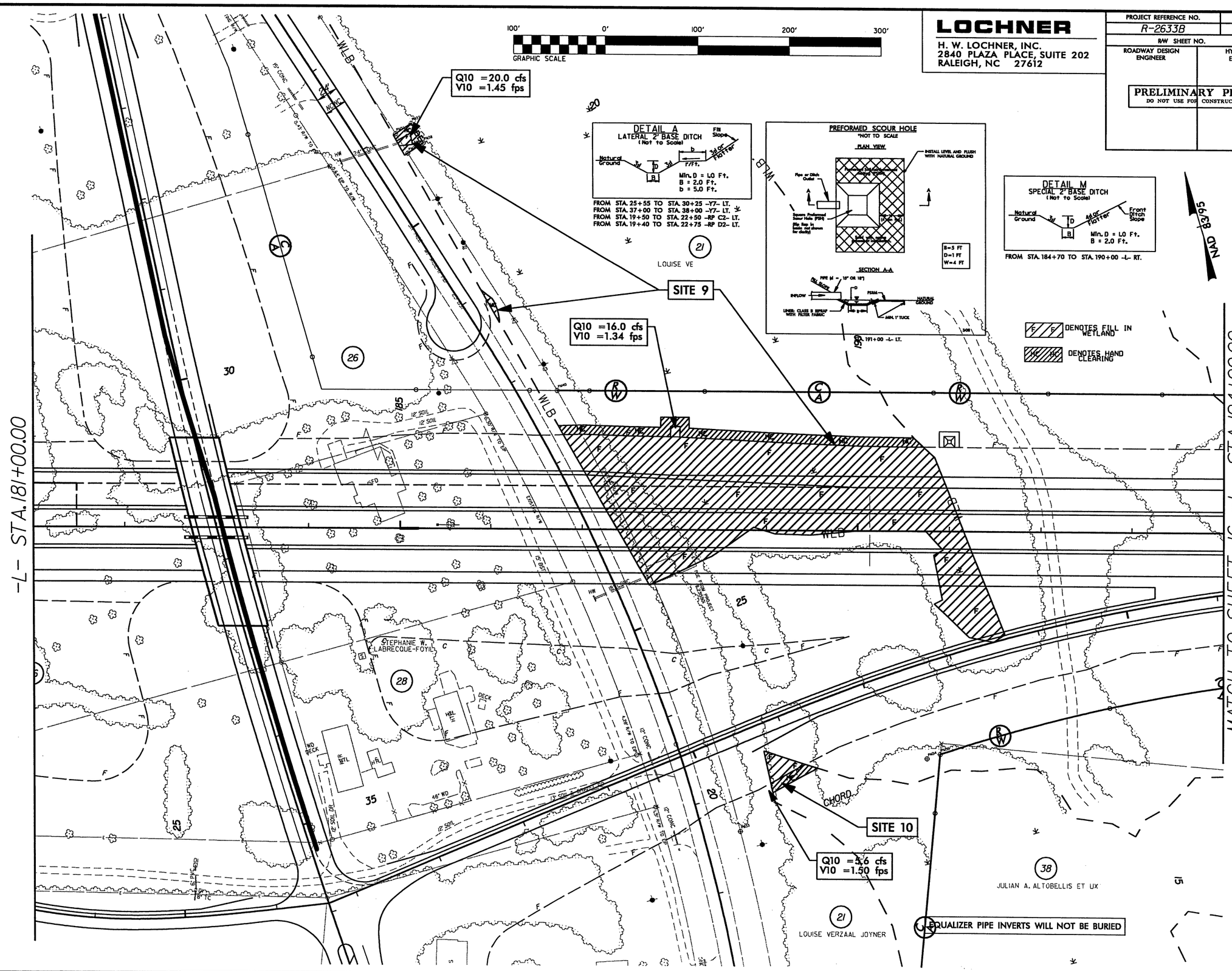
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	15B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



8/17/99

REVISIONS

7/30/2009
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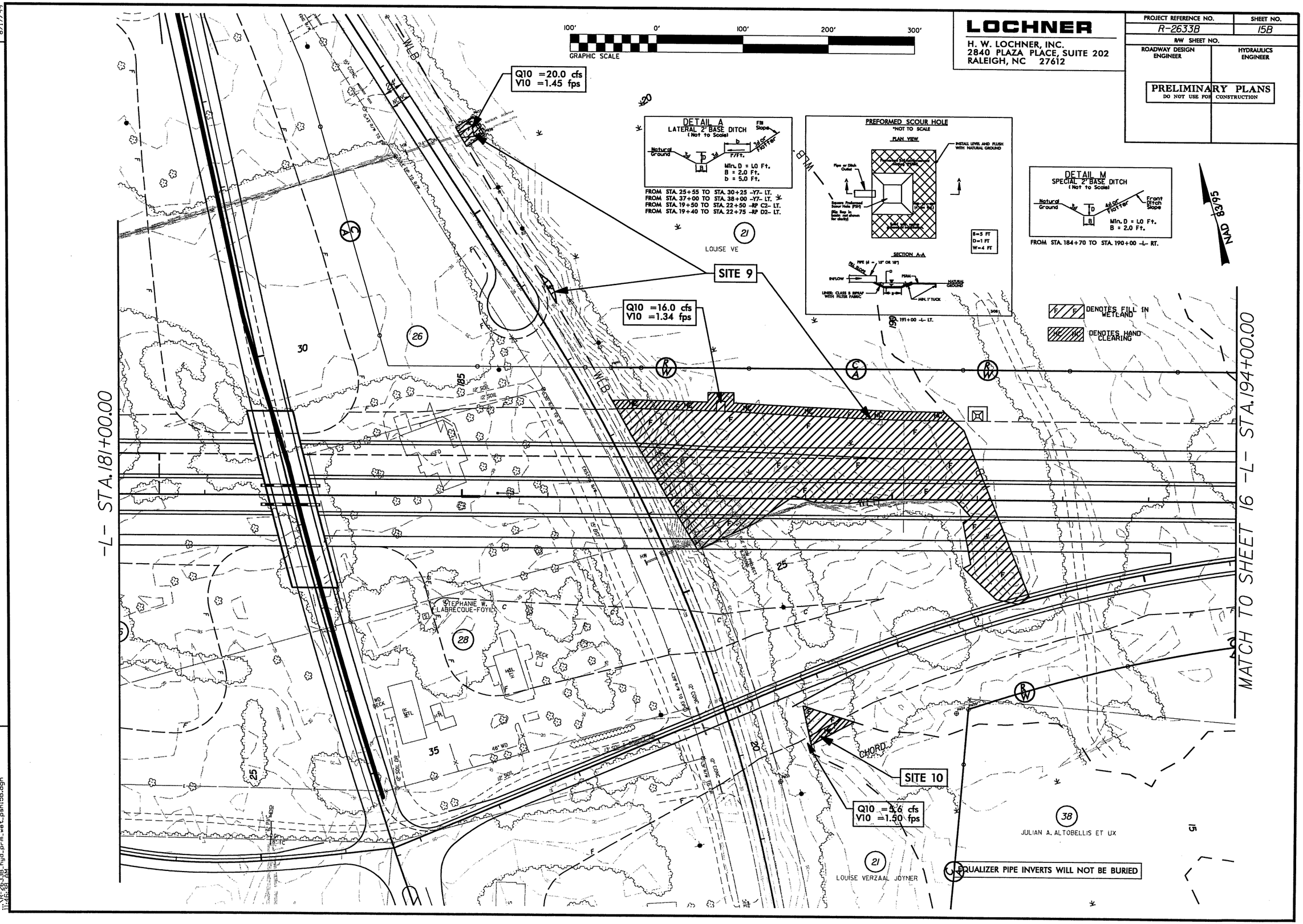
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
15B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
GRAPHIC SCALE
100' 0' 100' 200' 300'
Q10 =20.0 cfs
V10 =1.45 fps
SITE 9
Q10 =16.0 cfs
V10 =1.34 fps
SITE 10
Q10 =5.6 cfs
V10 =1.50 fps
EQUALIZER PIPE INVERTS WILL NOT BE BURIED
DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
3:1 or Flatter
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
FROM STA. 25+55 TO STA. 30+25 -Y7- LT.
FROM STA. 37+00 TO STA. 38+00 -Y7- LT.
FROM STA. 19+50 TO STA. 22+50 -RP C2- LT.
FROM STA. 19+40 TO STA. 22+75 -RP D2- LT.
PREFORMED SCOUR HOLE
*NOT TO SCALE
PLAN VIEW
SECTION A-A
B=5 FT
D=1 FT
W=4 FT
DETAIL M
SPECIAL 2' BASE DITCH
(Not to Scale)
Front Ditch Slope
Min. D = 1.0 Ft.
B = 2.0 Ft.
FROM STA. 184+70 TO STA. 190+00 -L- RT.
NAD 83/95
DENOTES FILL IN WETLAND
DENOTES HAND CLEARING
-L- STA. 181+00.00
-L- STA. 194+00.00
MATCH TO SHEET 16
LOUISE VE
LOUISE VERZAAL JOYNER
JULIAN A. ALTOBELLIS ET UX
STEPHANIE W. LABRECQUE-FOYIL
CHORD
REVISIONS
8/17/99
7/30/2010
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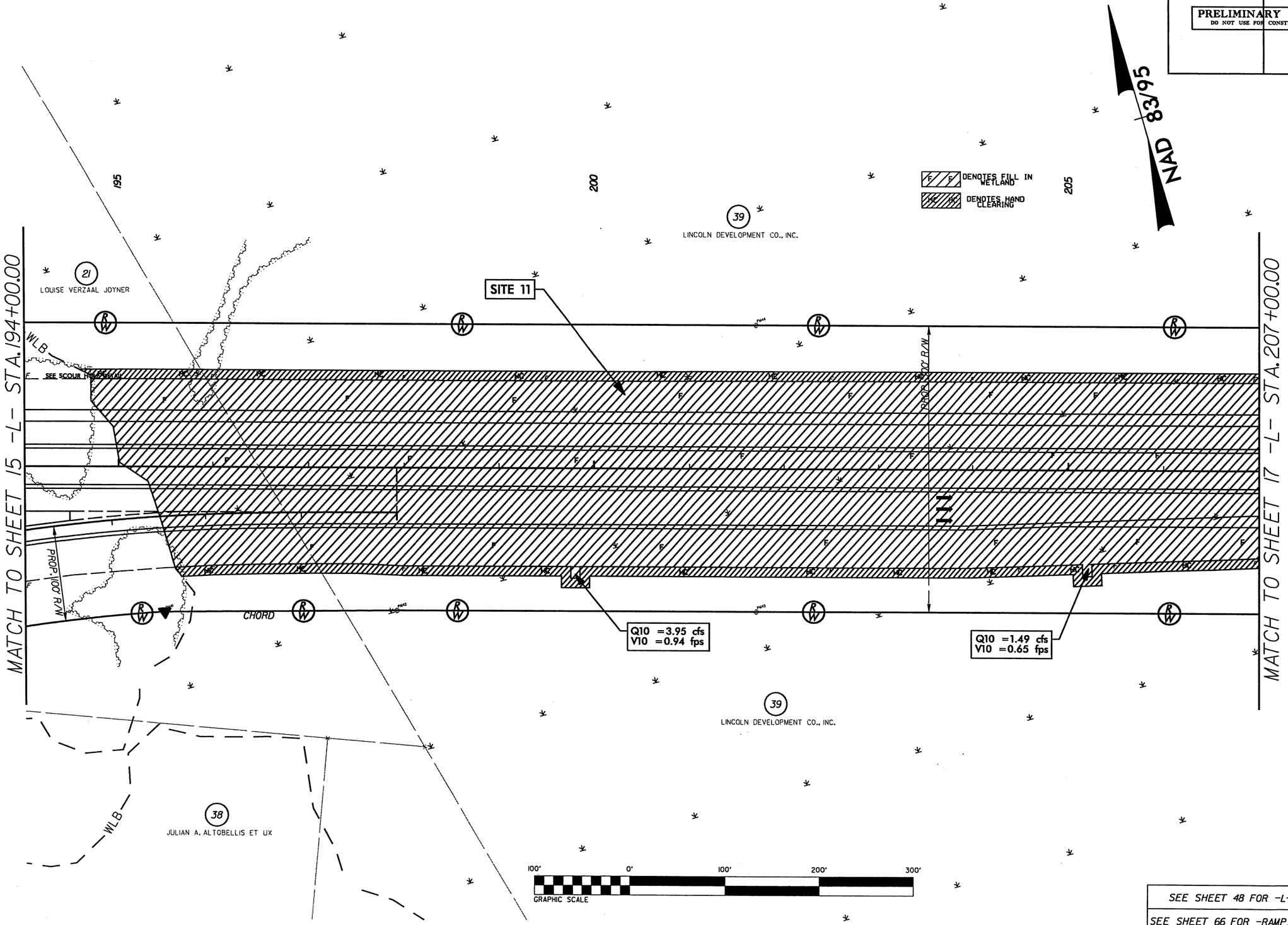
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 48 FOR -L- PROFILE

SEE SHEET 66 FOR -RAMP_D2- PROFILE

REVISIONS

8/17/99

7/30/2009
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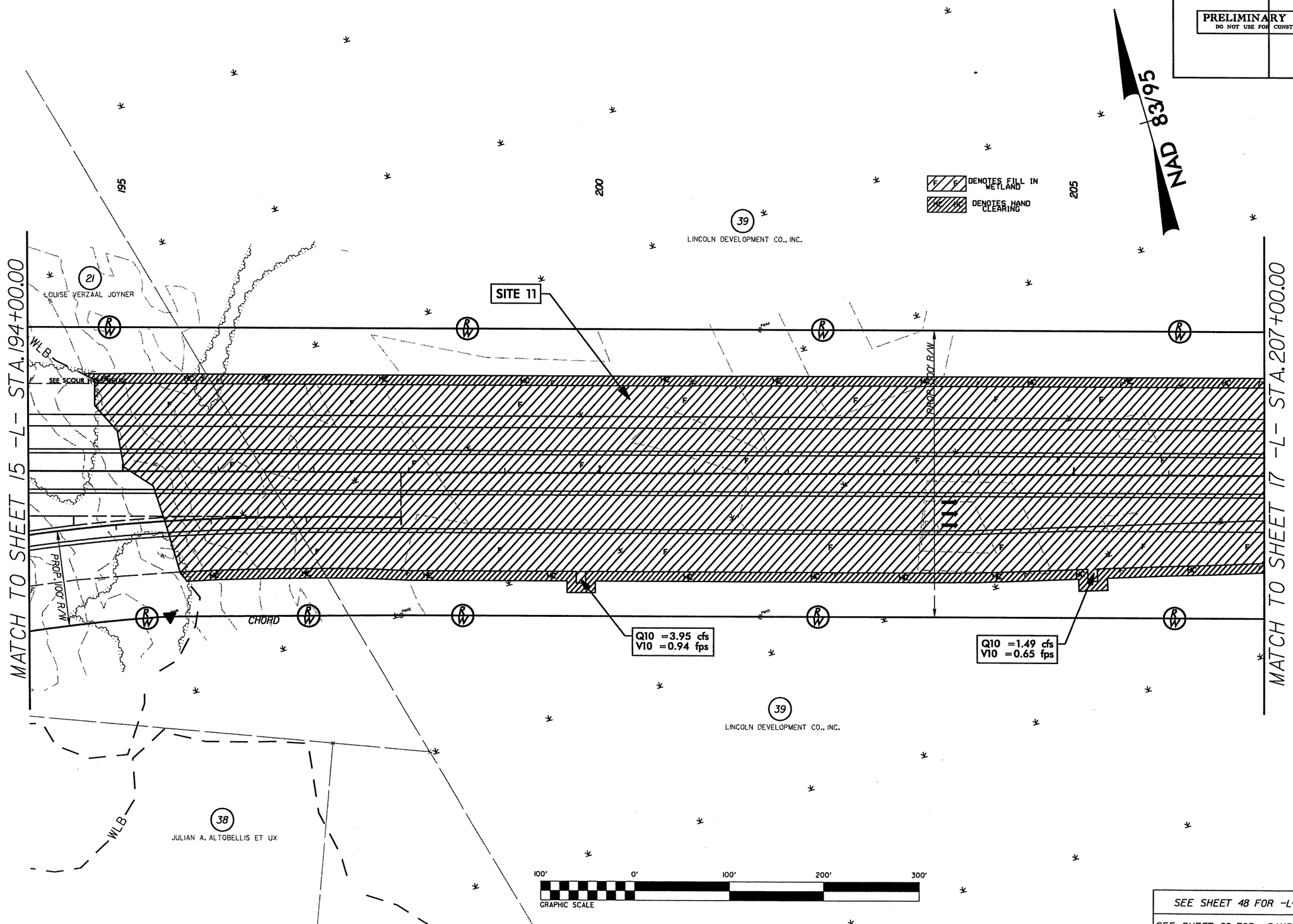
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 48 FOR -L- PROFILE
SEE SHEET 66 FOR -RAMP_D2- PROFILE

REVISIONS

8/17/99

7/30/2010
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8/17/99

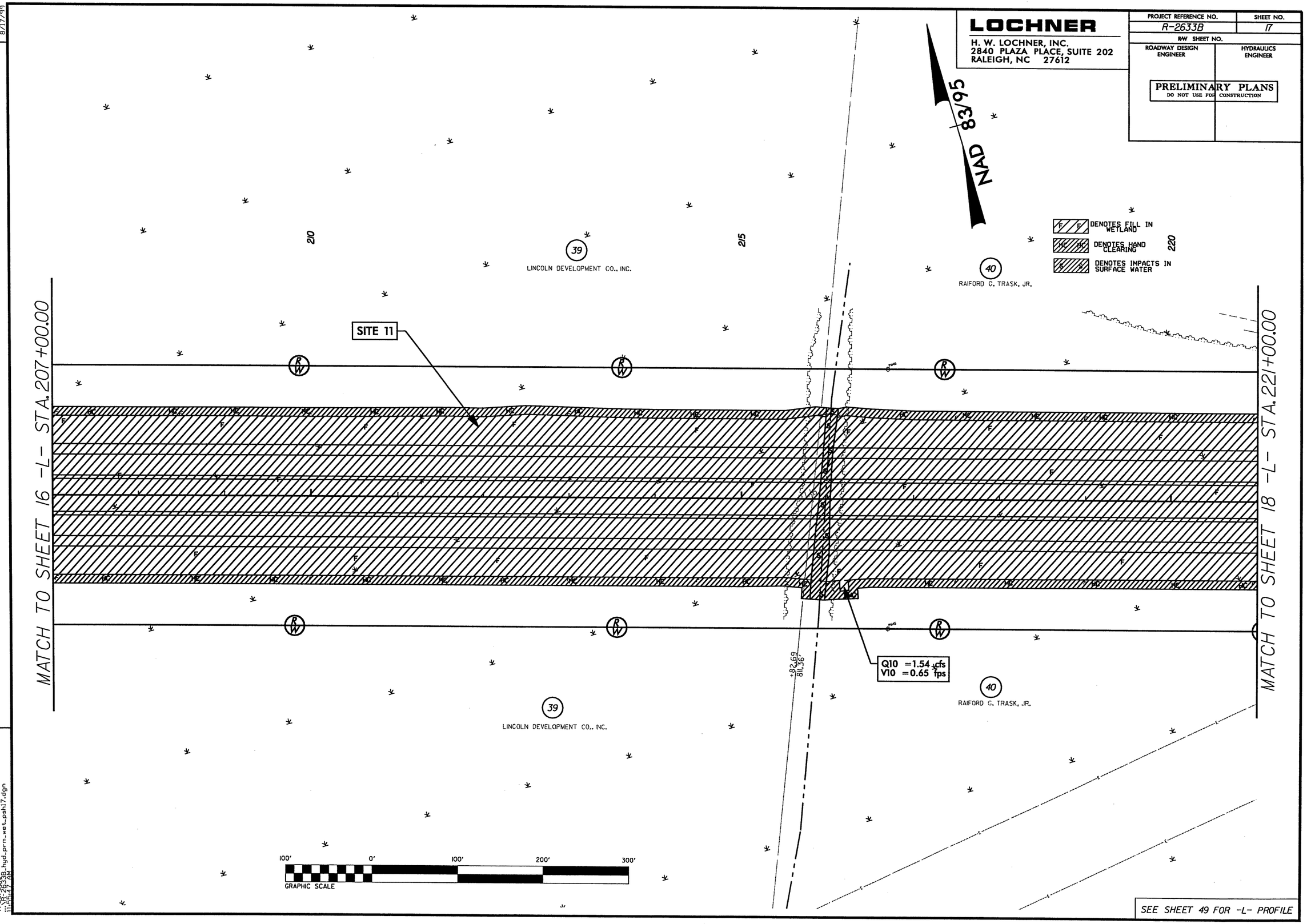
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 49 FOR -L- PROFILE

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8/17/99

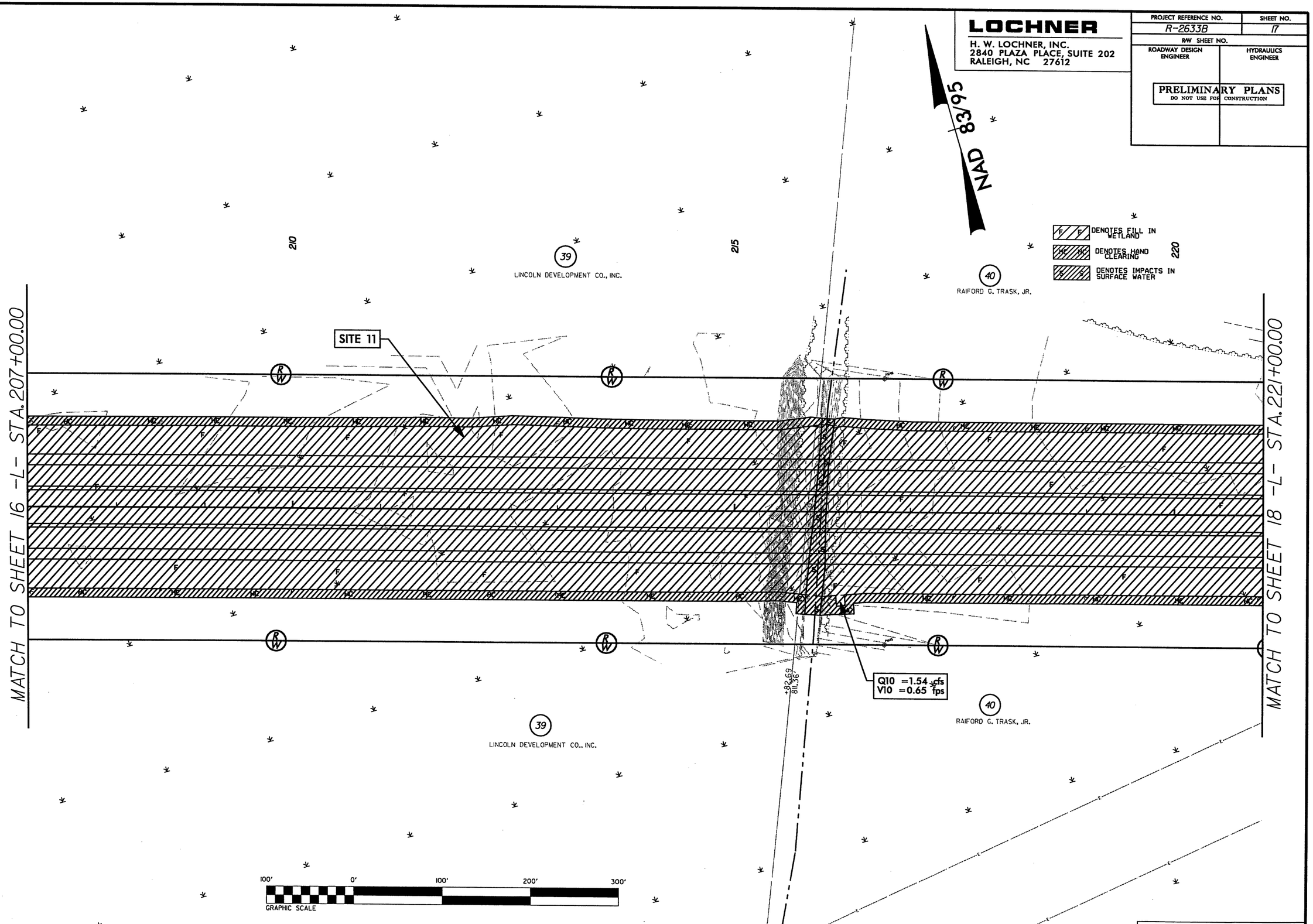
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 49 FOR -L- PROFILE

7/30/2010
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LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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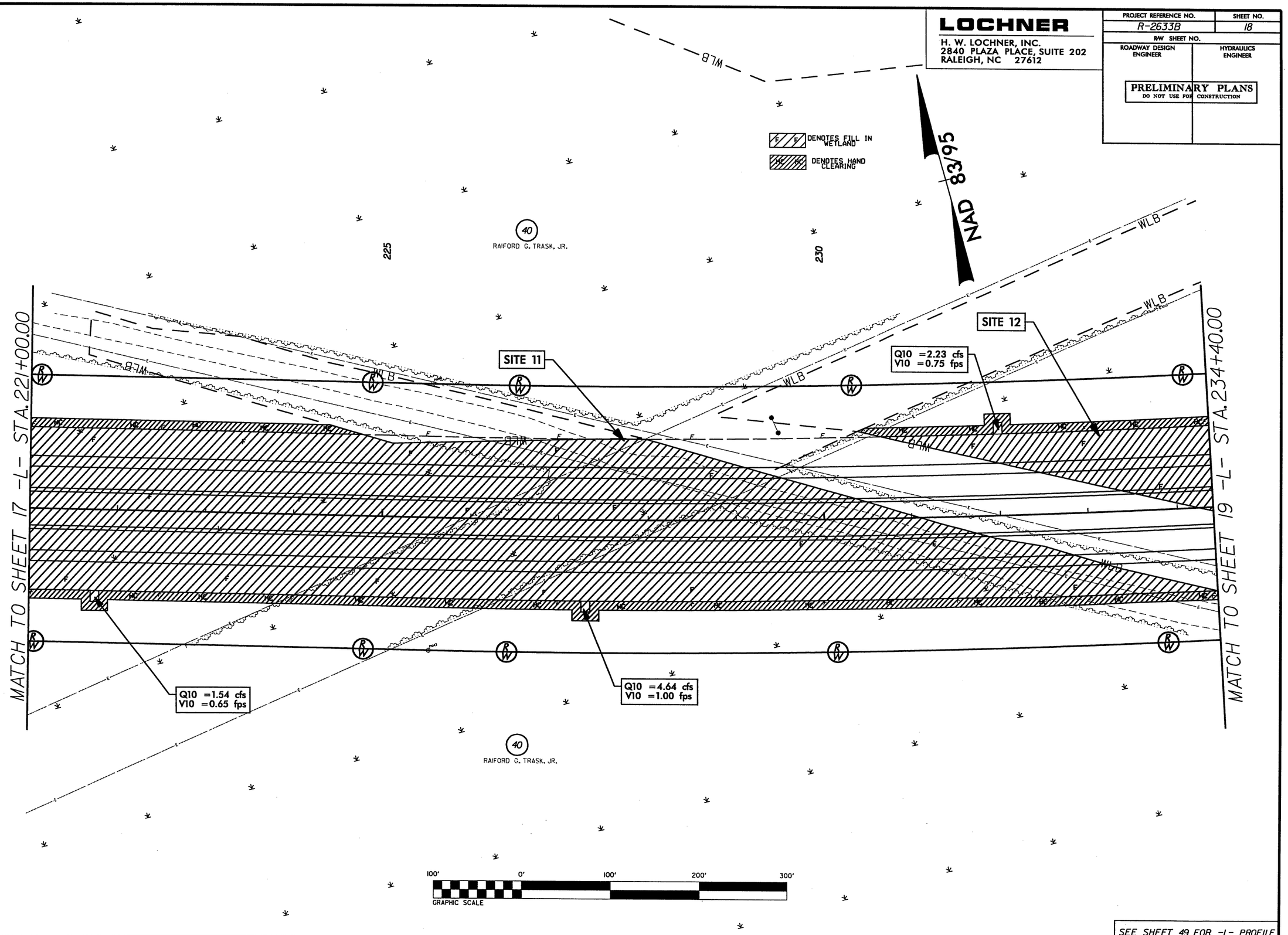

SEE SHEET 49 FOR -L- PROFILE

REVISIONS

8/17/99

7/30/2010
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10:48:16 AM

8/17/99

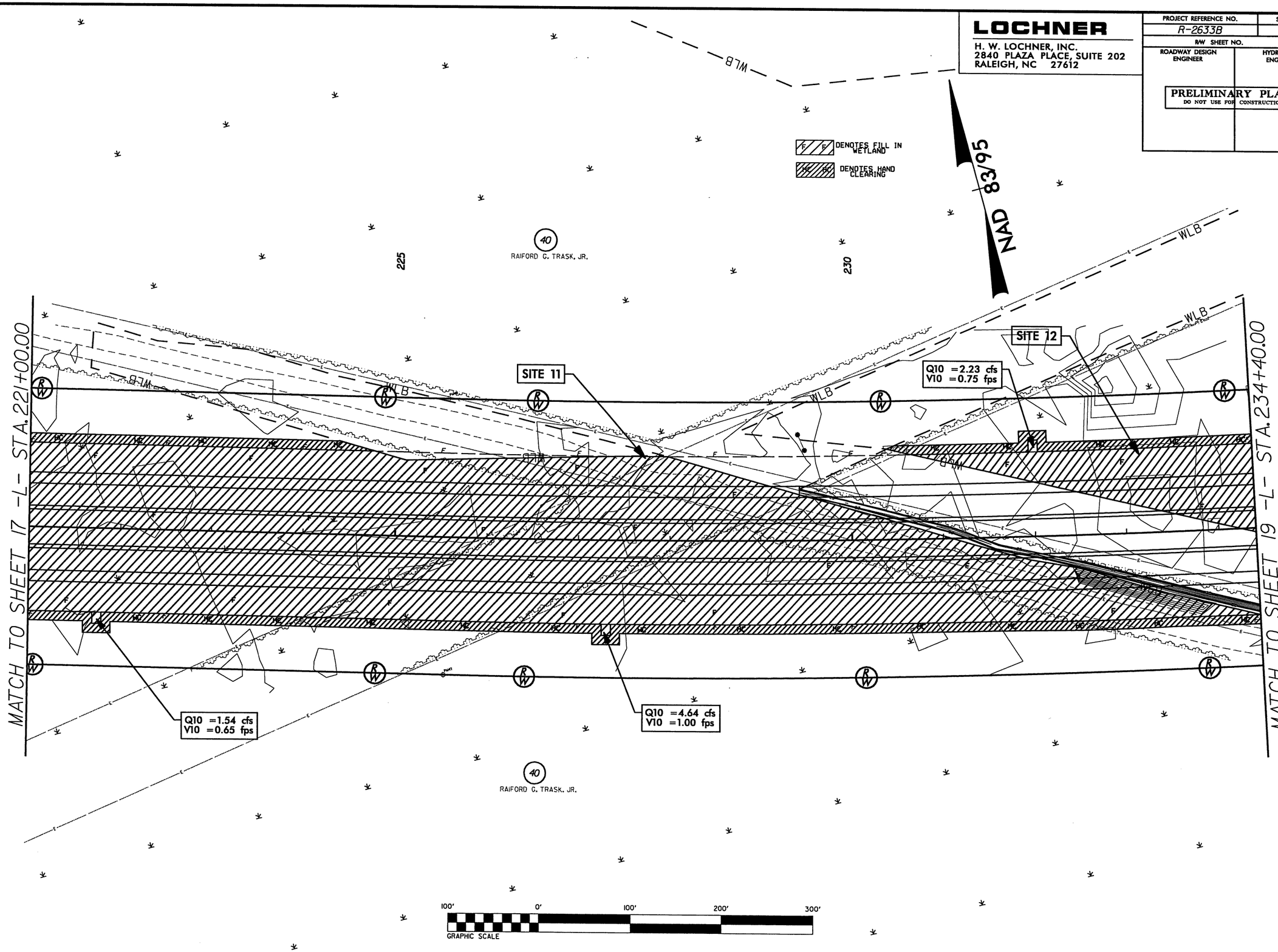
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 49 FOR -L- PROFILE

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8/17/99

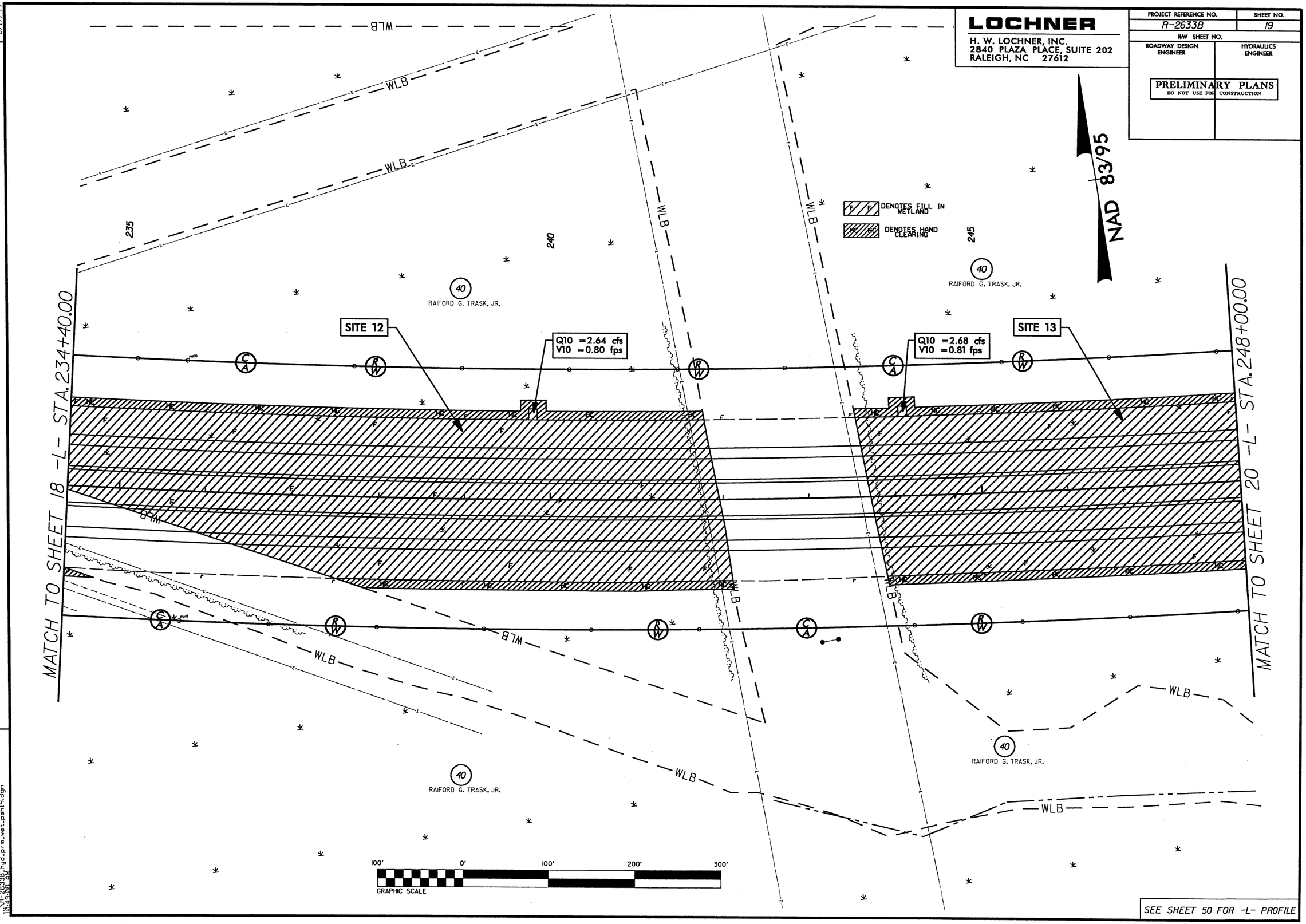
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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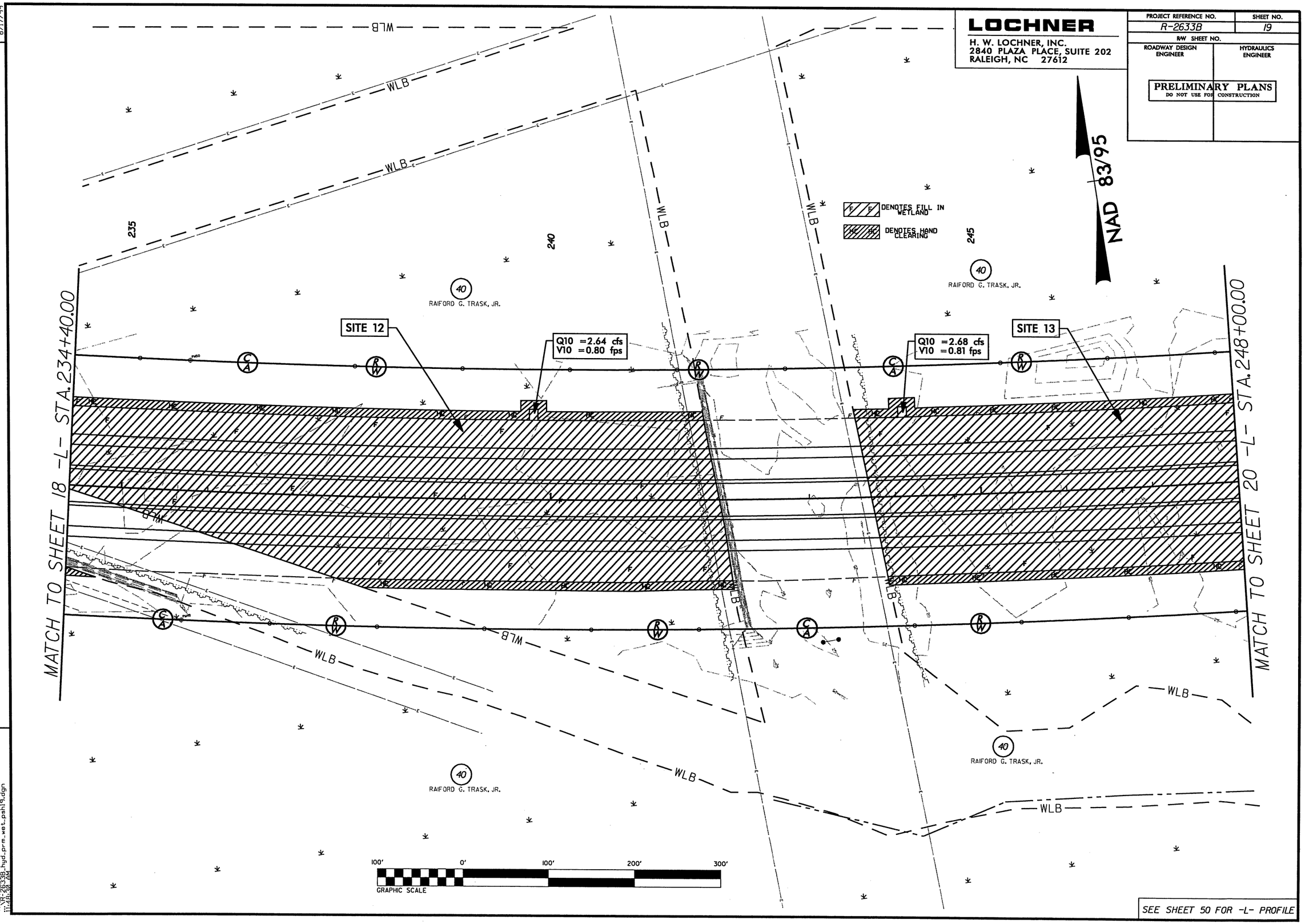
8/17/99

REVISIONS

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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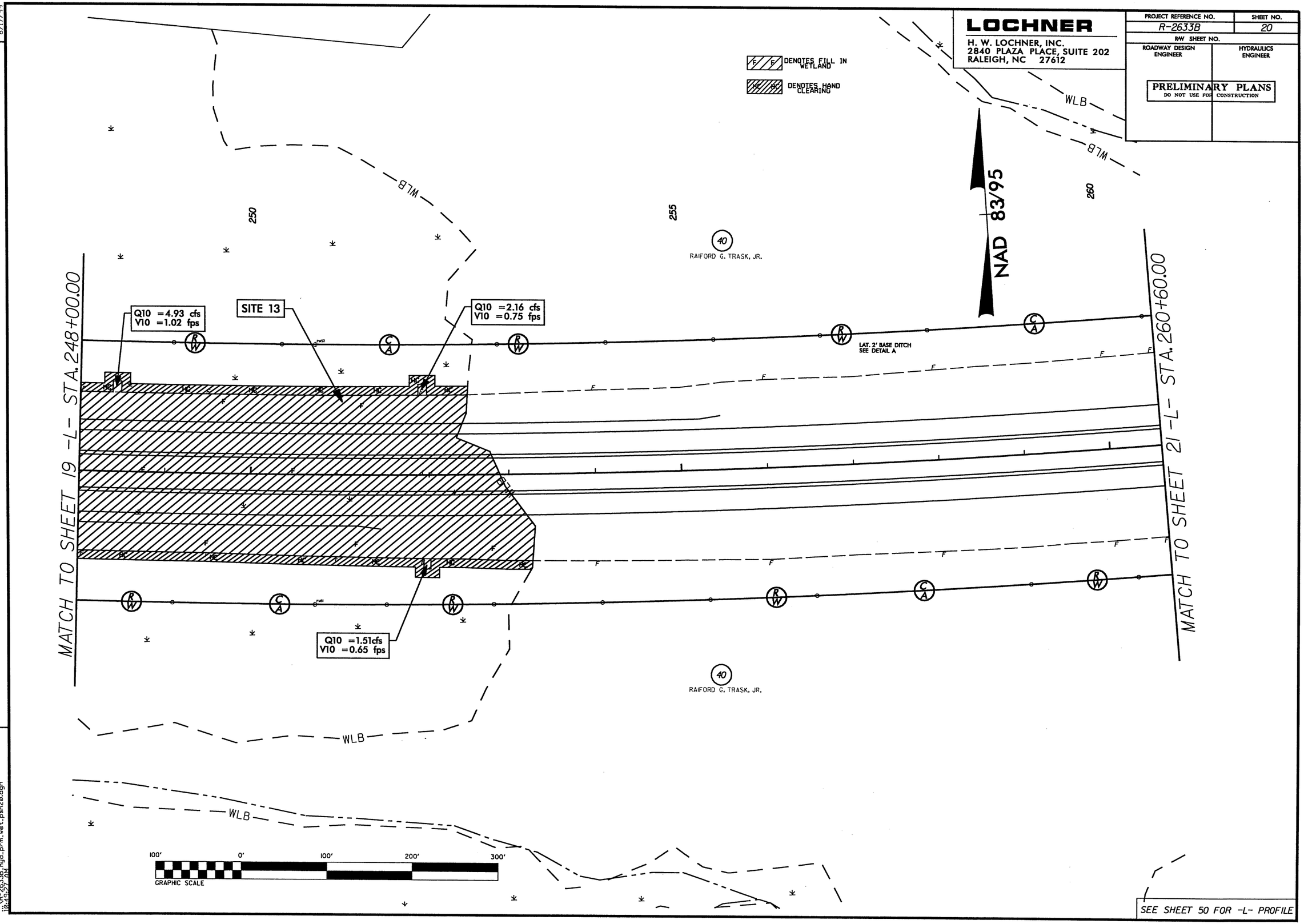
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
20
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DENOTES FILL IN WETLAND
DENOTES HAND CLEARING
NAD 83/95
WLB
250
255
260
40
RAIFORD G. TRASK, JR.
SITE 13
Q10 =4.93 cfs
V10 =1.02 fps
Q10 =2.16 cfs
V10 =0.75 fps
Q10 =1.51cfs
V10 =0.65 fps
LAT. 2' BASE DITCH
SEE DETAIL A
MATCH TO SHEET 19 -L- STA. 248+00.00
MATCH TO SHEET 21 -L- STA. 260+60.00
100' 0' 100' 200' 300'
GRAPHIC SCALE
SEE SHEET 50 FOR -L- PROFILE
REVISIONS
8/17/99
7/30/2019
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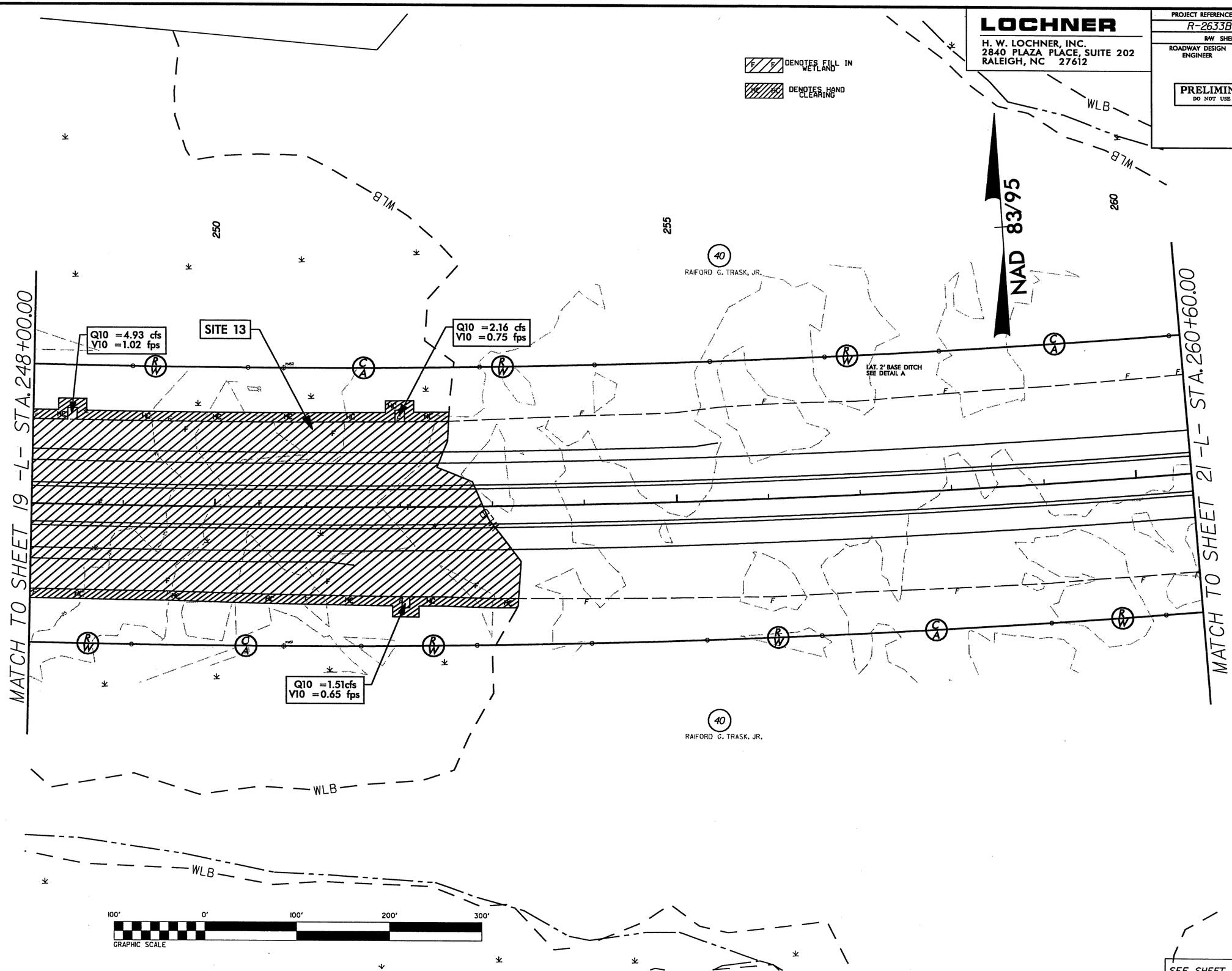
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612



SEE SHEET 50 FOR -L- PROFILE

REVISIONS

8/17/99

7/30/2010
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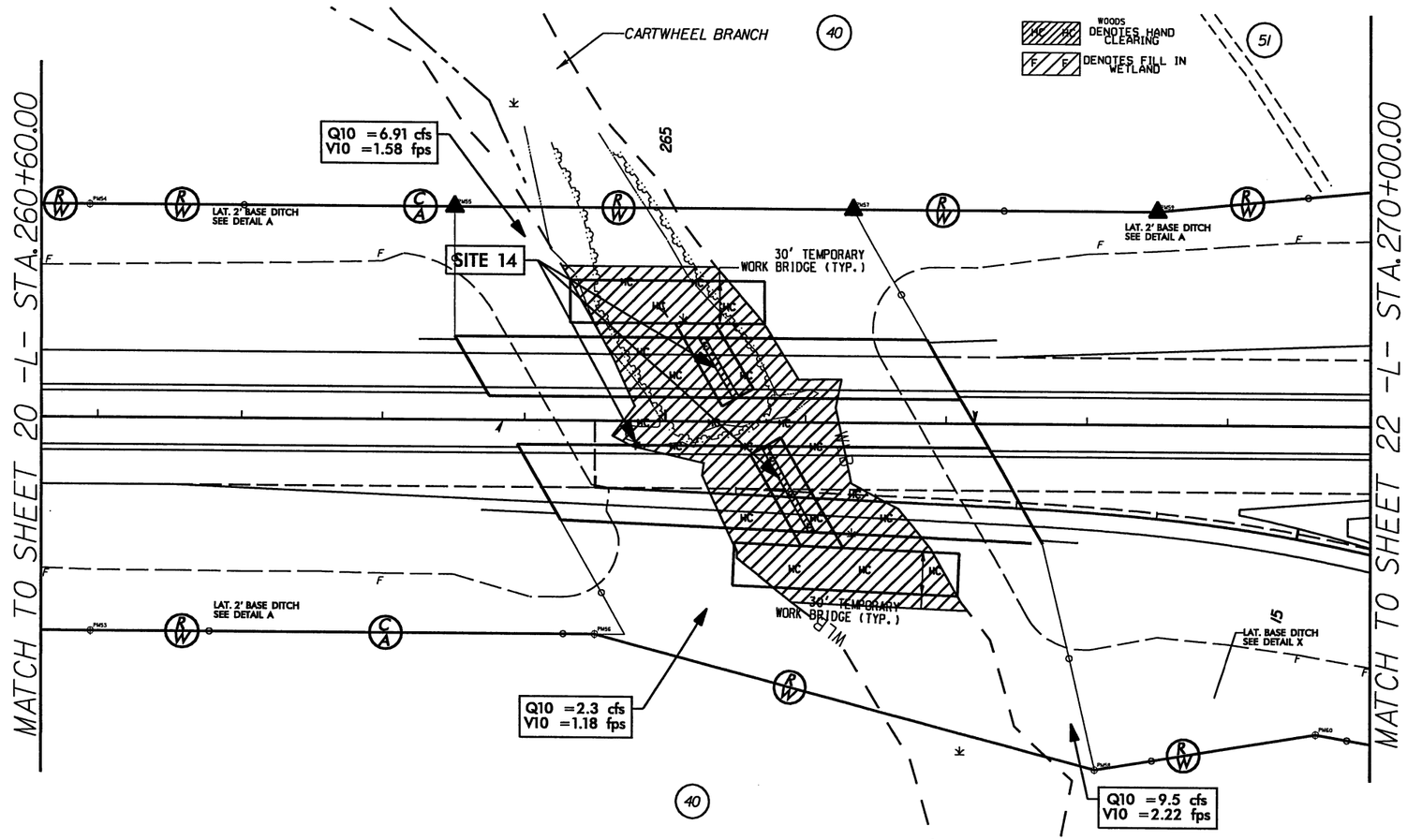
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

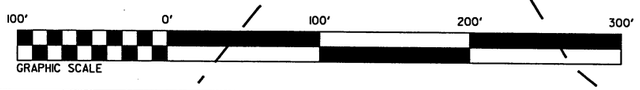
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

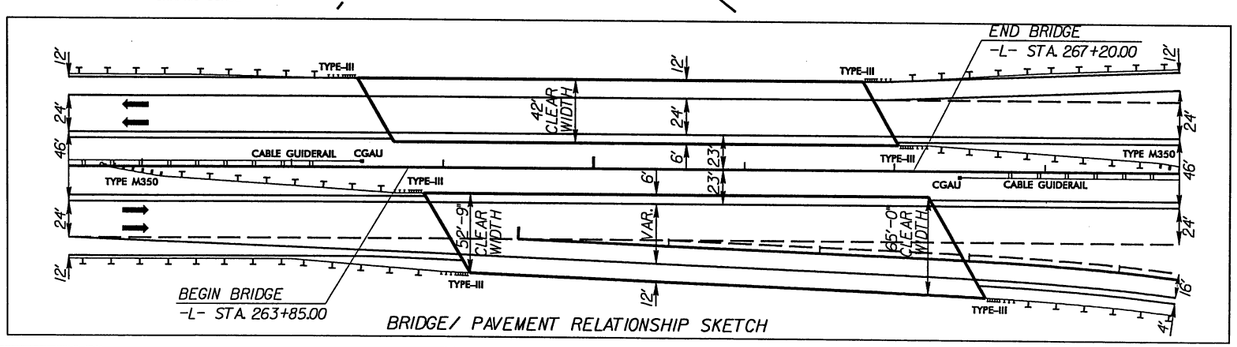
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99







BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEETS 72 FOR -RP_C3- PROFILE

SEE SHEET 51 FOR -L- PROFILE

7/30/2010
12:49:50 PM
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LOCHNER

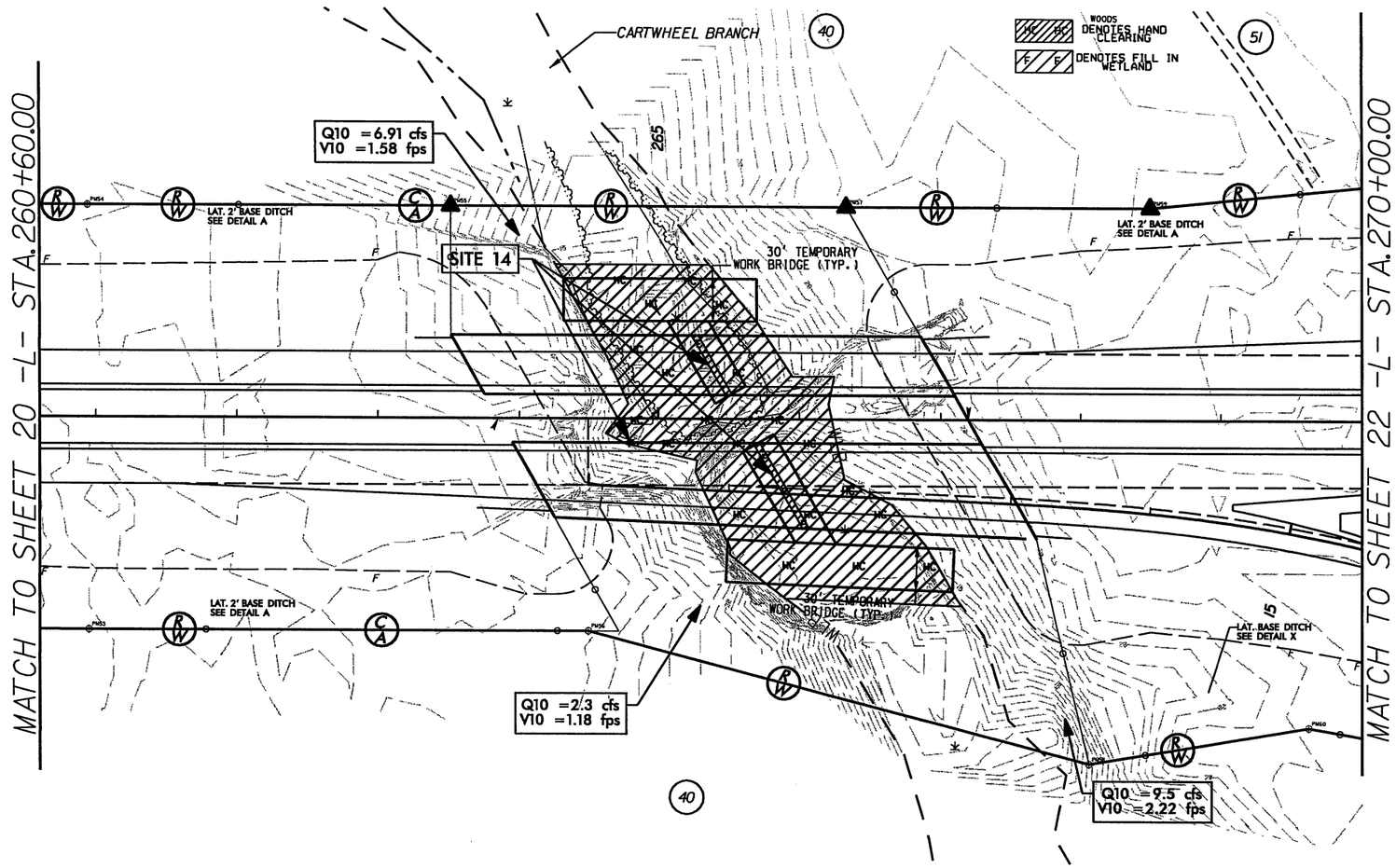
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

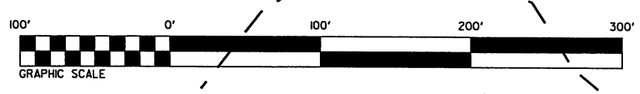
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

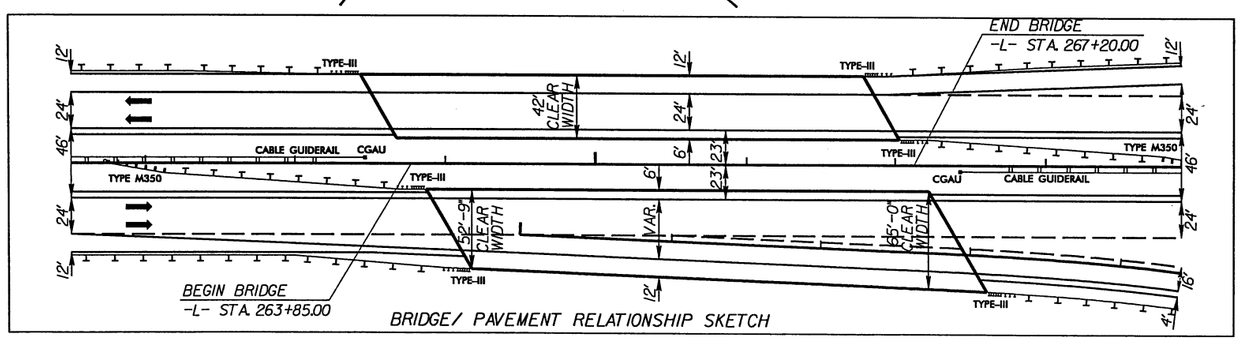
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99







BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEETS 72 FOR -RP_C3- PROFILE

SEE SHEET 51 FOR -L- PROFILE

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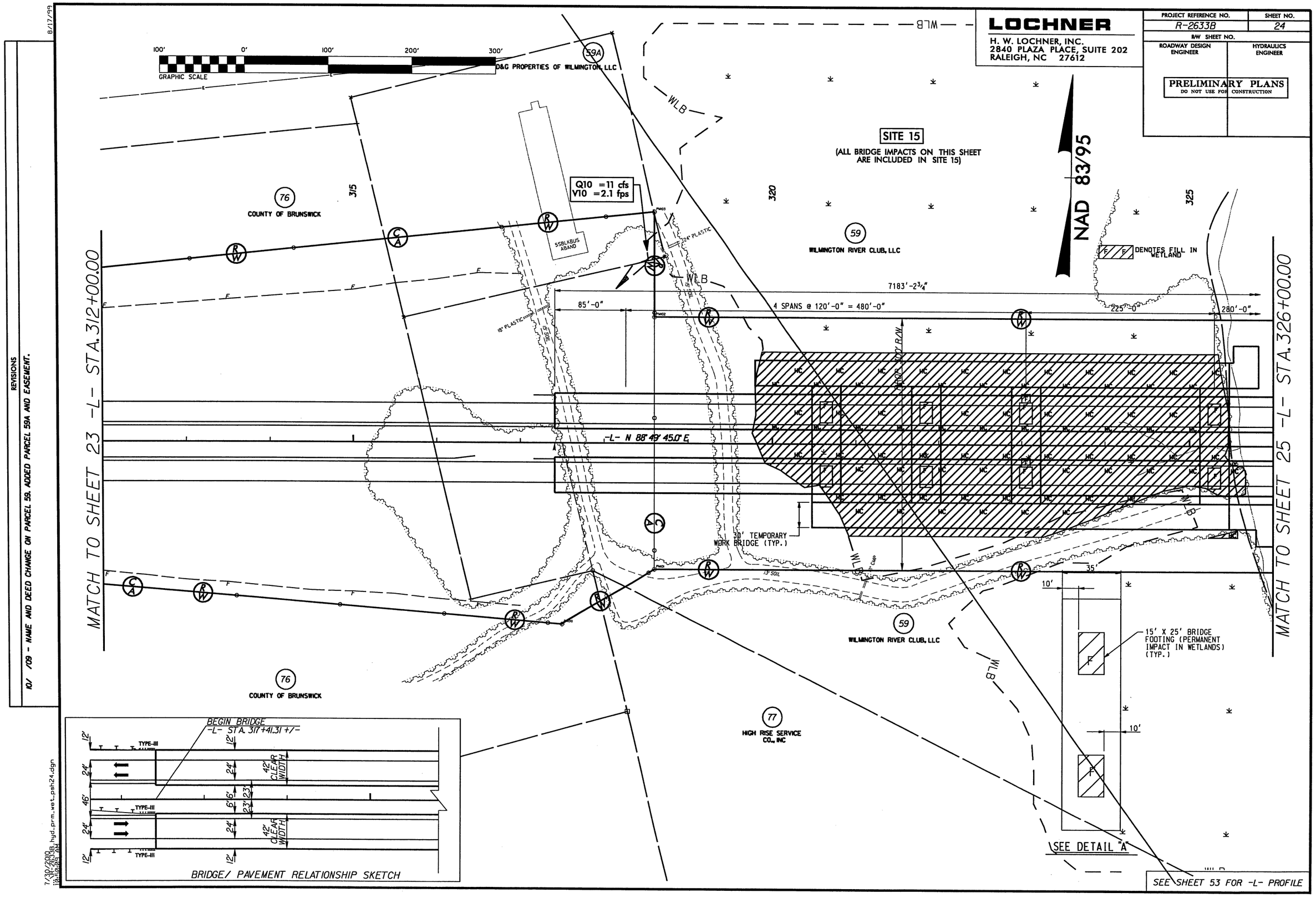
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
24
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
GRAPHIC SCALE
100' 0' 100' 200' 300'
D&G PROPERTIES OF WILMINGTON LLC
59A
SITE 15
(ALL BRIDGE IMPACTS ON THIS SHEET ARE INCLUDED IN SITE 15)
NAD 83/95
Q10 =11 cfs
V10 =2.1 fps
76
COUNTY OF BRUNSWICK
59
WILMINGTON RIVER CLUB, LLC
DENOTES FILL IN WETLAND
MATCH TO SHEET 23 -L- STA. 312+00.00
MATCH TO SHEET 25 -L- STA. 326+00.00
7183'-2¾"
4 SPANS @ 120'-0" = 480'-0"
85'-0"
225'-0"
280'-0"
-L- N 88° 49' 45.0" E
30' TEMPORARY WORK BRIDGE (TYP.)
15' X 25' BRIDGE FOOTING (PERMANENT IMPACT IN WETLANDS) (TYP.)
SEE DETAIL "A"
77
HIGH RISE SERVICE CO., INC
BEGIN BRIDGE
-L- STA. 317+41.31 +/-
TYPE-III
42' CLEAR WIDTH
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH
SEE SHEET 53 FOR -L- PROFILE
REVISIONS
10/ /09 - NAME AND DEED CHANGE ON PARCEL 59. ADDED PARCEL 59A AND EASEMENT.
8/17/99
7/30/2010
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8/17/99

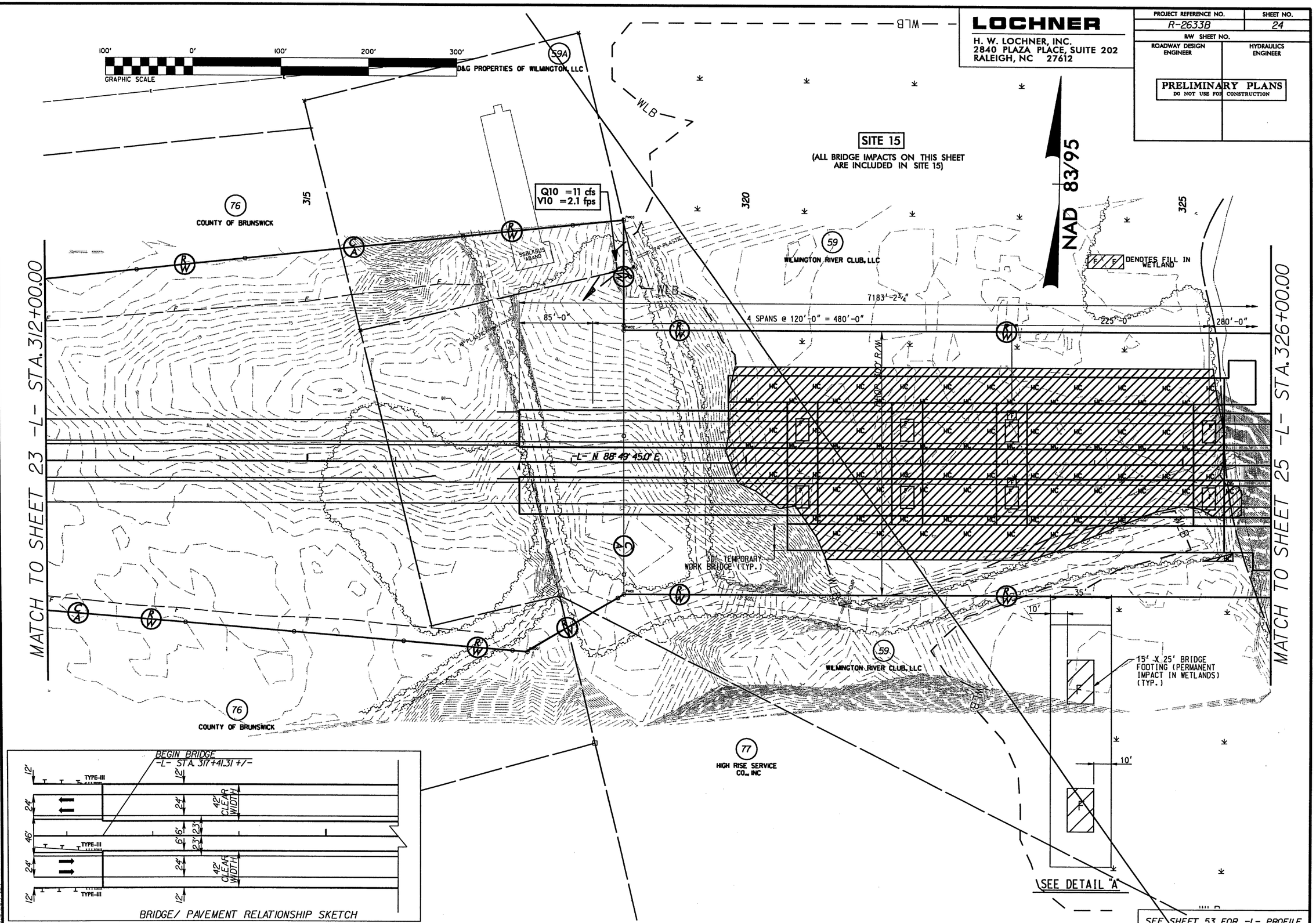
REVISIONS

10/ /09 - NAME AND DEED CHANGE ON PARCEL 59. ADDED PARCEL 59A AND EASEMENT.

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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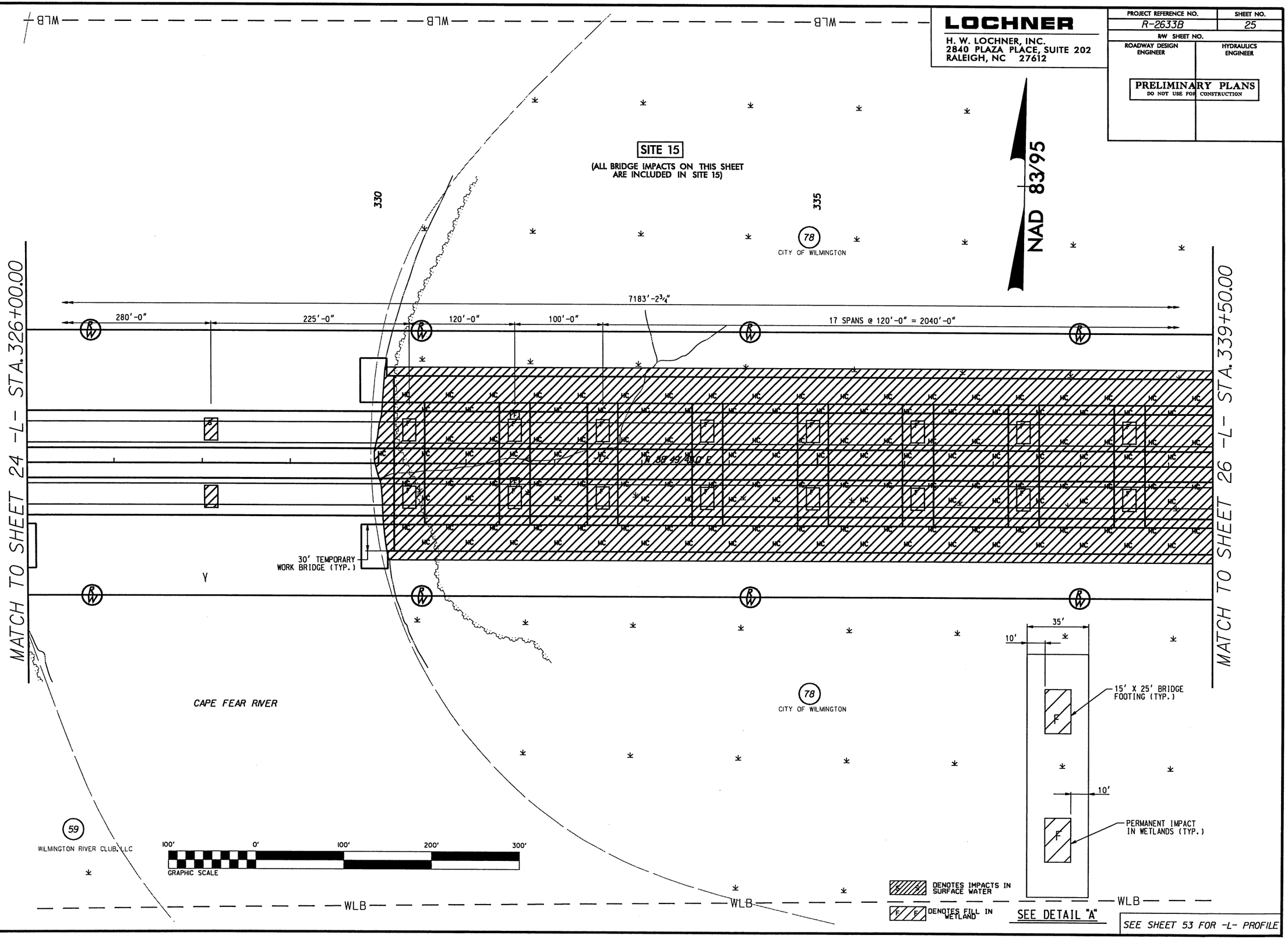
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS
10/ /09 - NAME AND DEED CHANGE ON PARCEL 59.

8/17/99

7/30/2010
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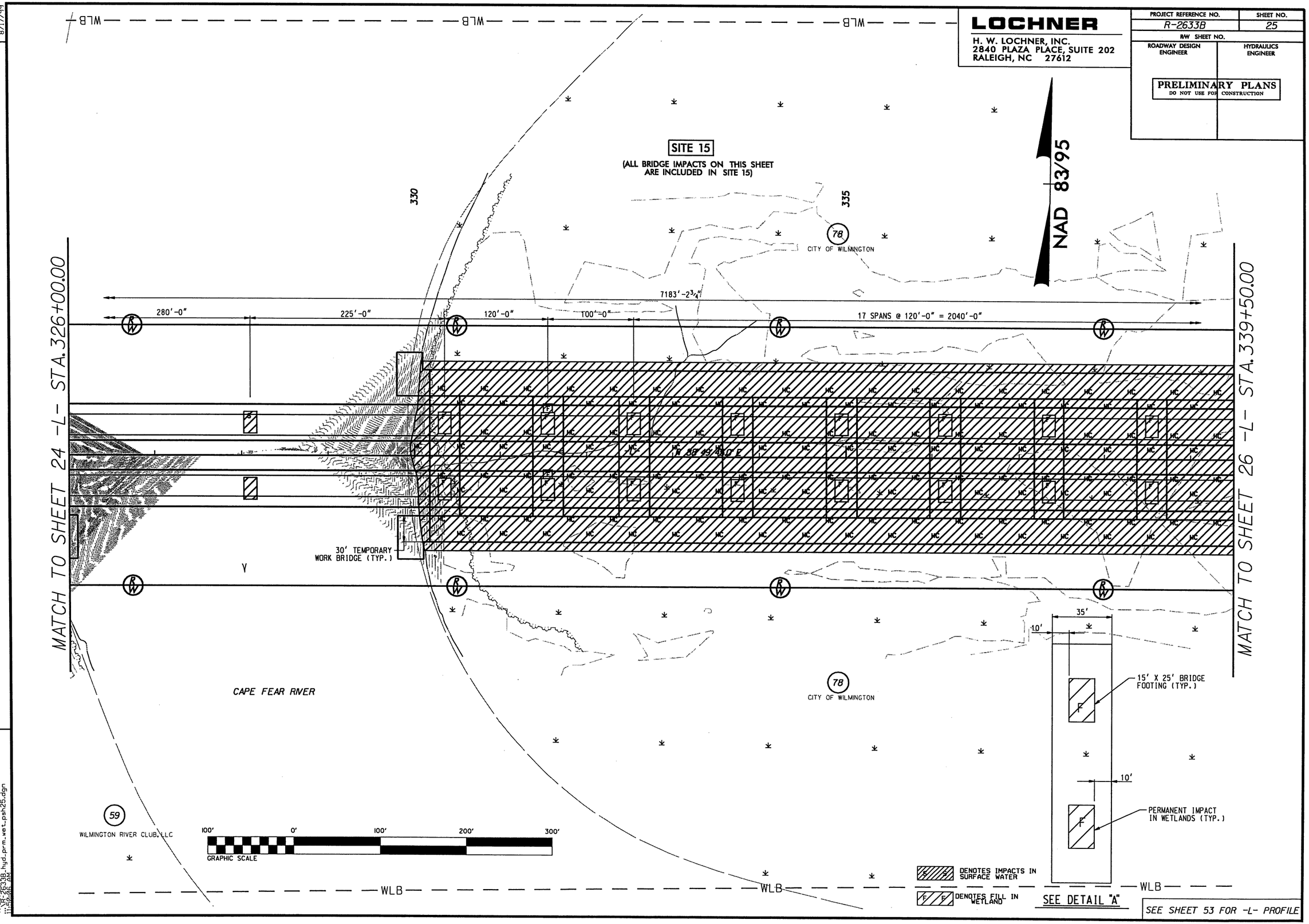
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS
10/ 109 - NAME AND DEED CHANGE ON PARCEL 59.

8/17/99

7/30/2010
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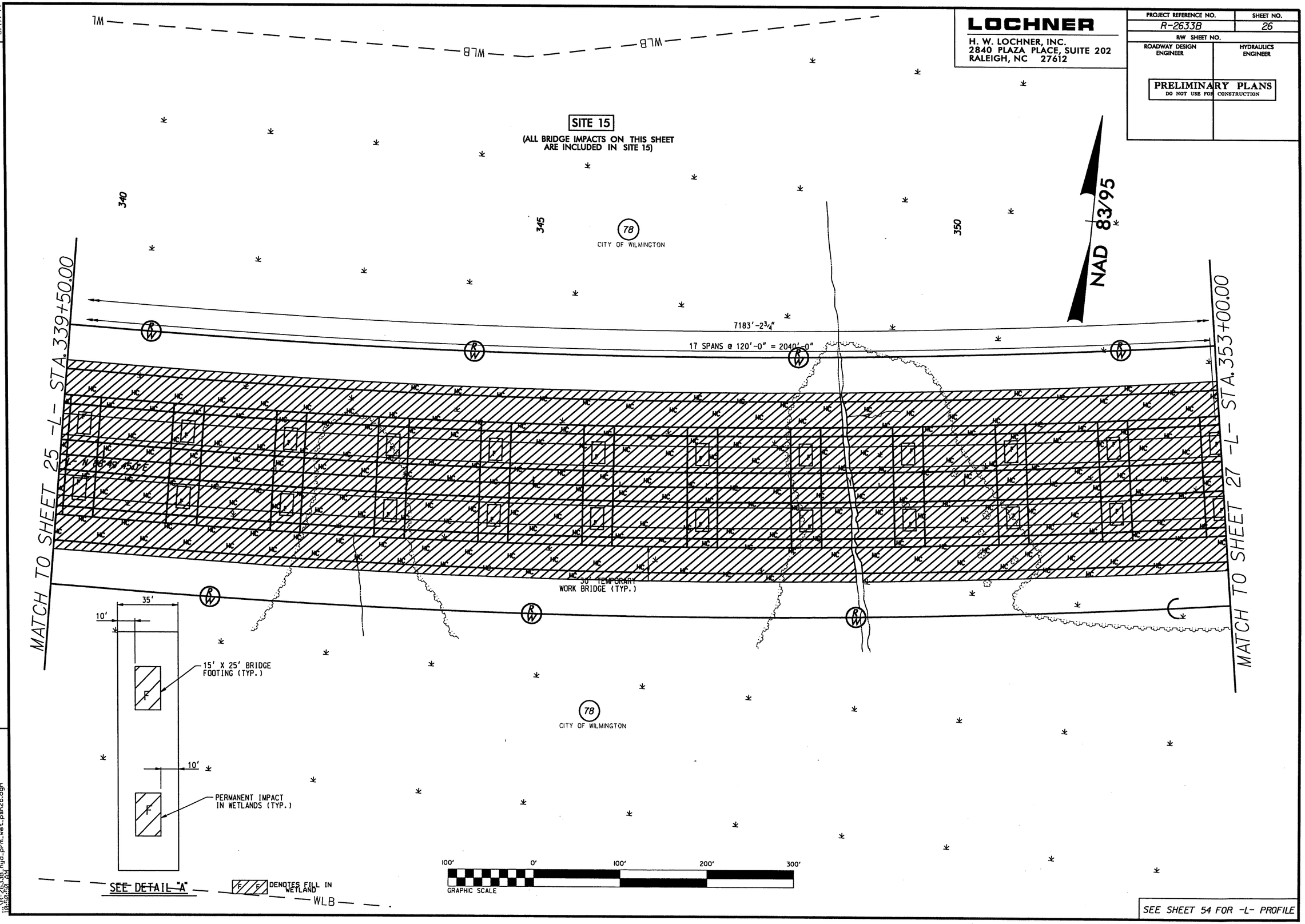
lisbmain PM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 54 FOR -L- PROFILE

REVISIONS

8/17/99

7/30/2010
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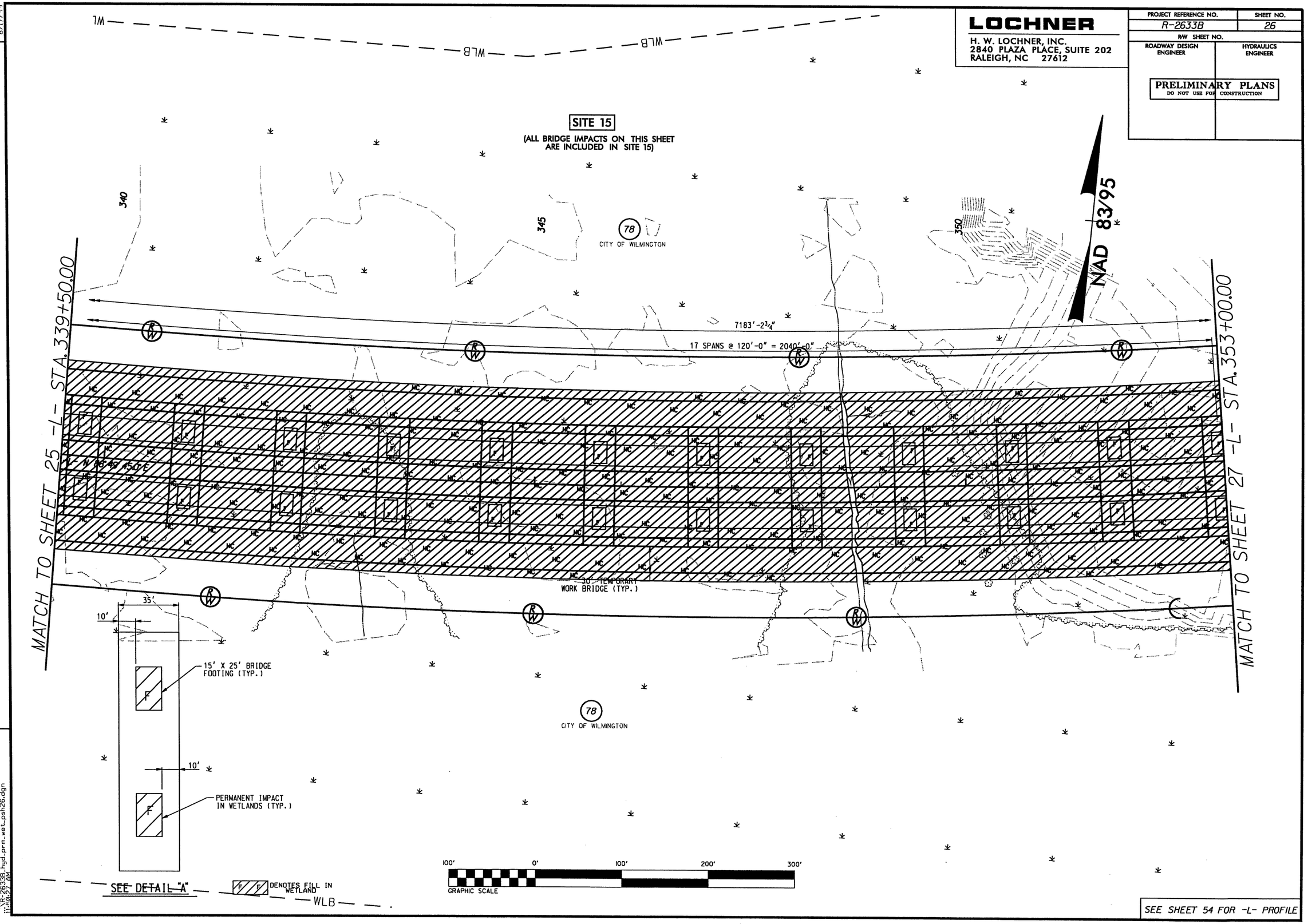
jrobinson.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 54 FOR -L- PROFILE

REVISIONS

8/17/99

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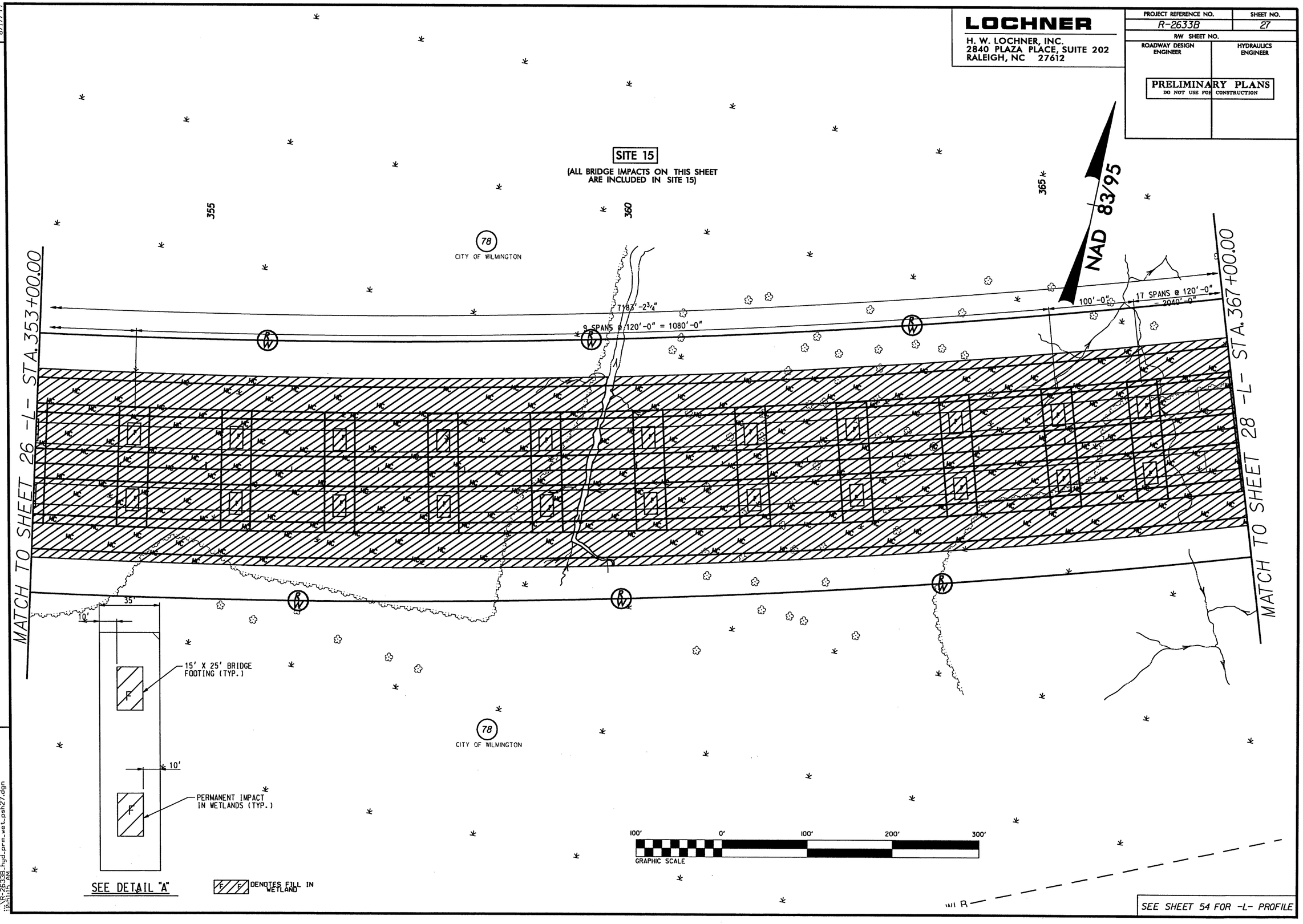
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99



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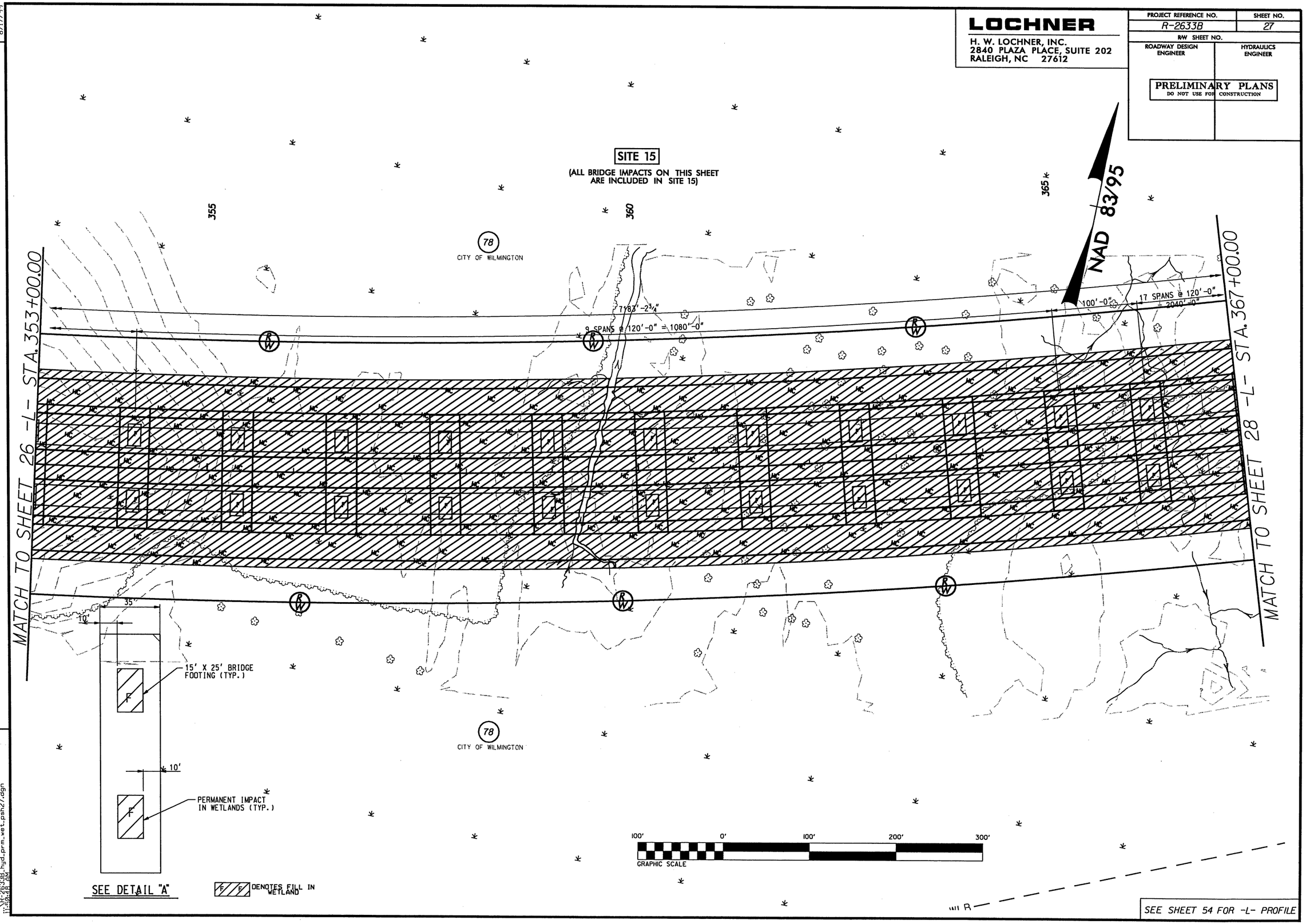
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

8/17/99

7/30/2010
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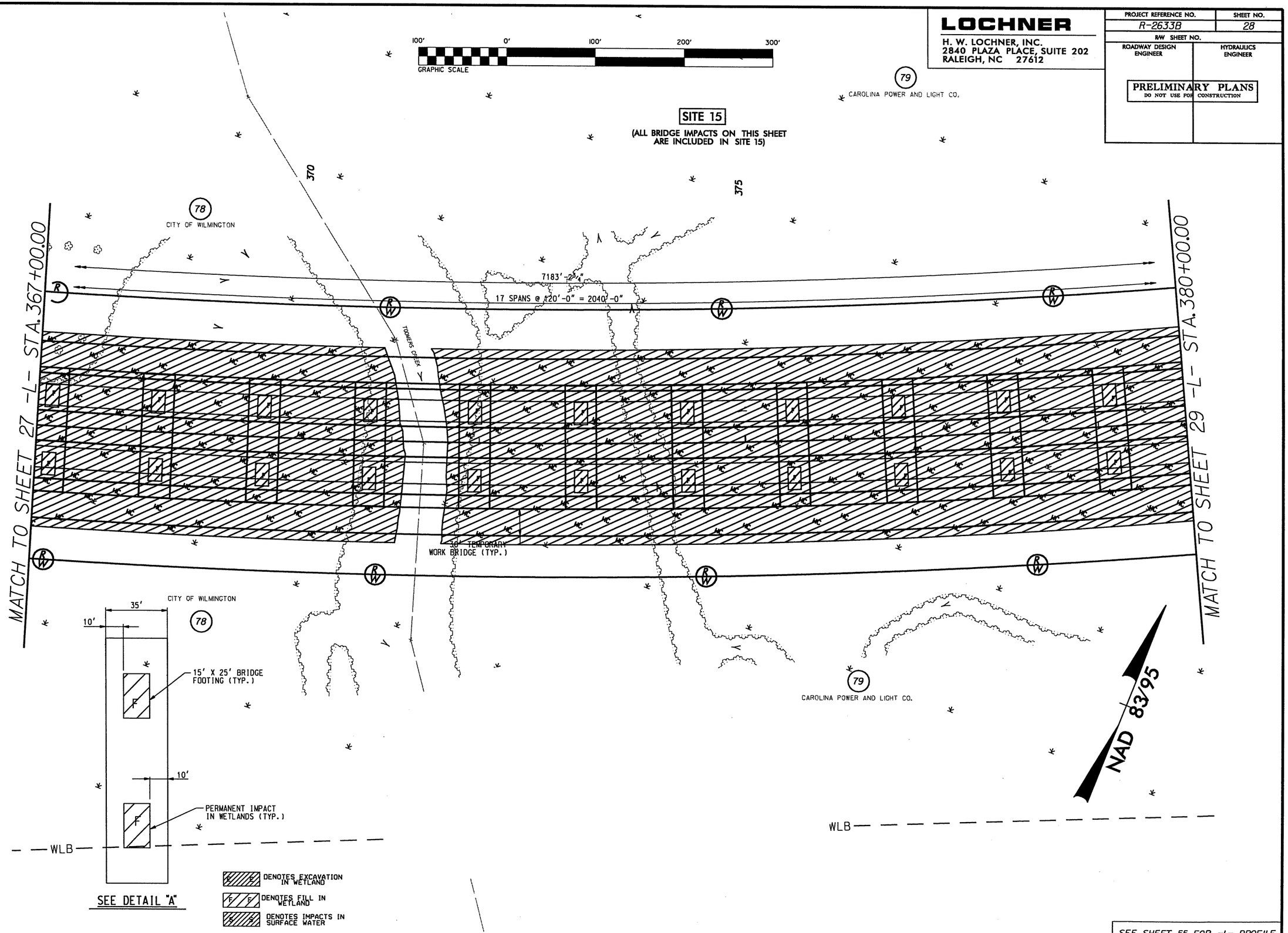
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 55 FOR -L- PROFILE

REVISIONS

8/17/99

7/30/2010
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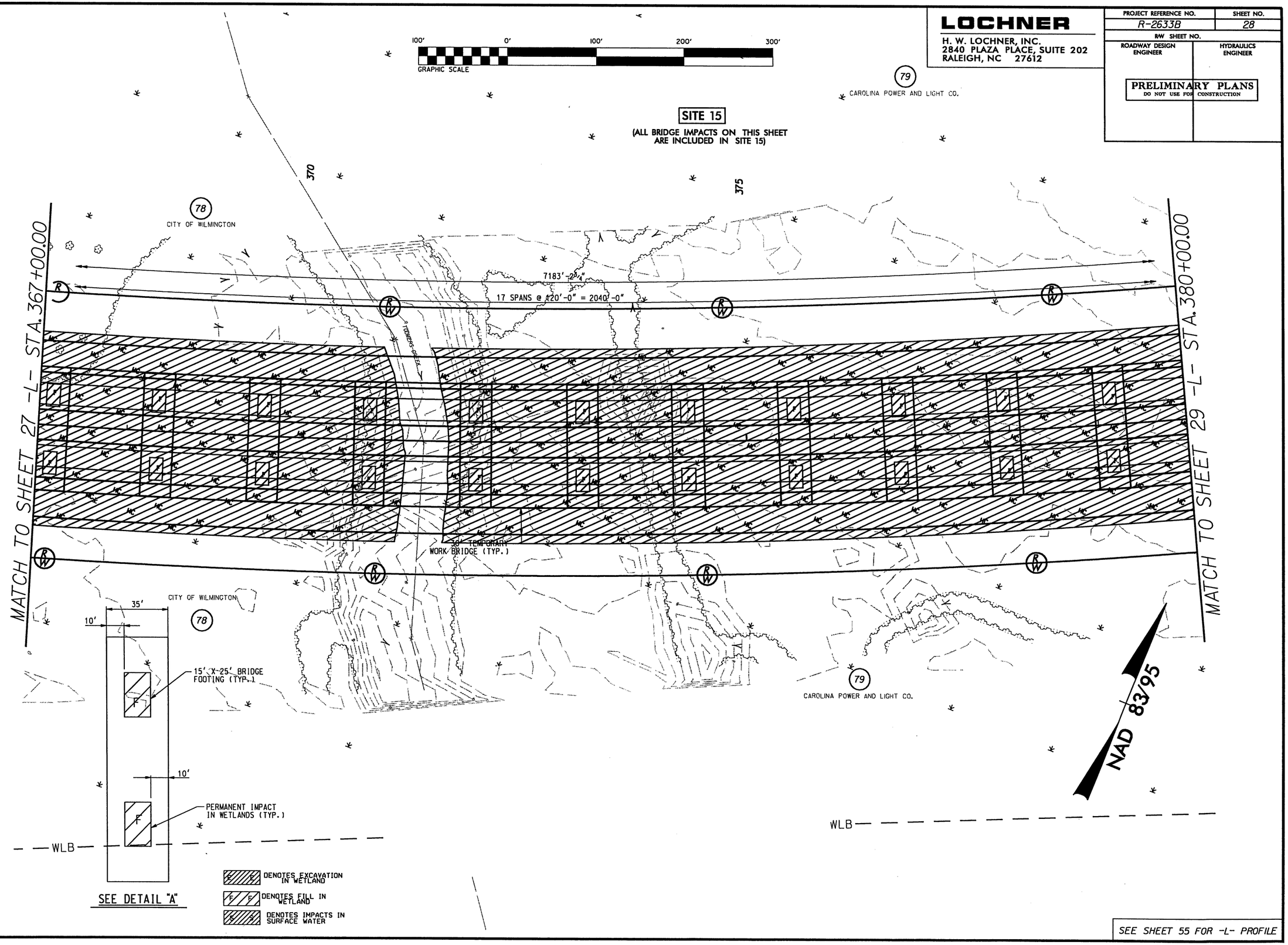
10:51:49 AM

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612	R-2633B	28
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 55 FOR -L- PROFILE

REVISIONS

8/17/99

7/30/2010
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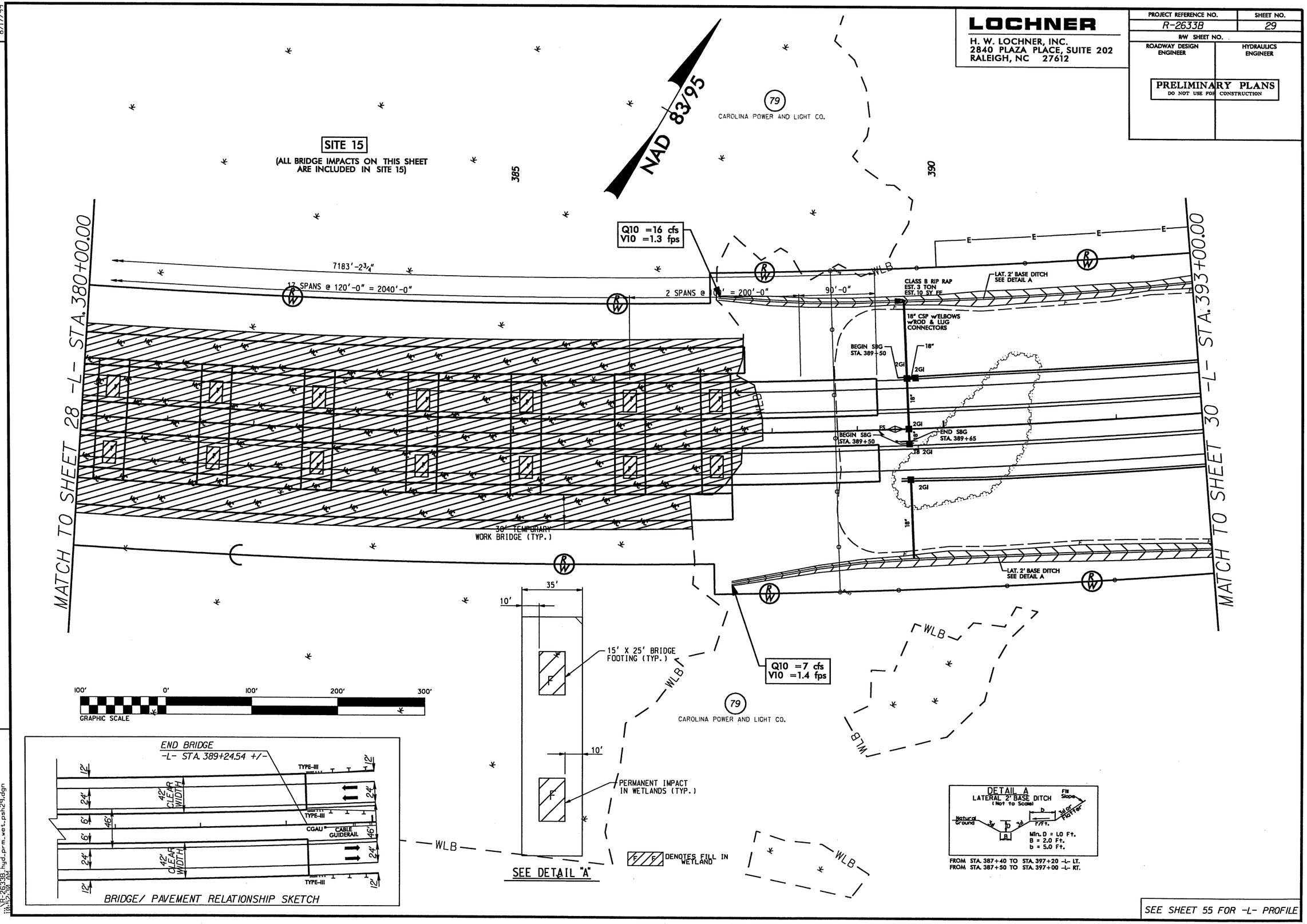
LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612	R-2633B	29
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

8/17/99

7/30/2010
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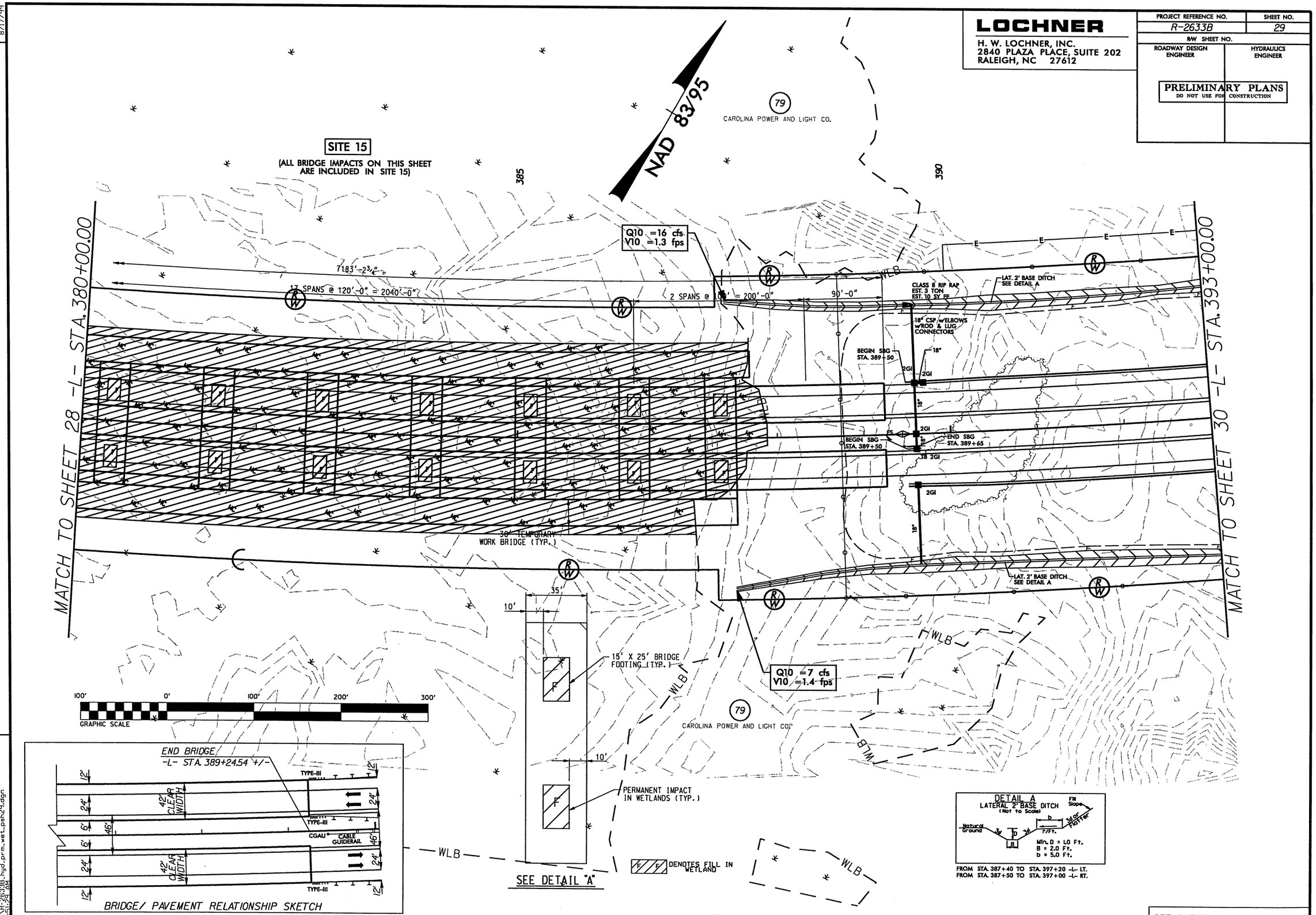
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 55 FOR -L- PROFILE

REVISIONS

8/17/99

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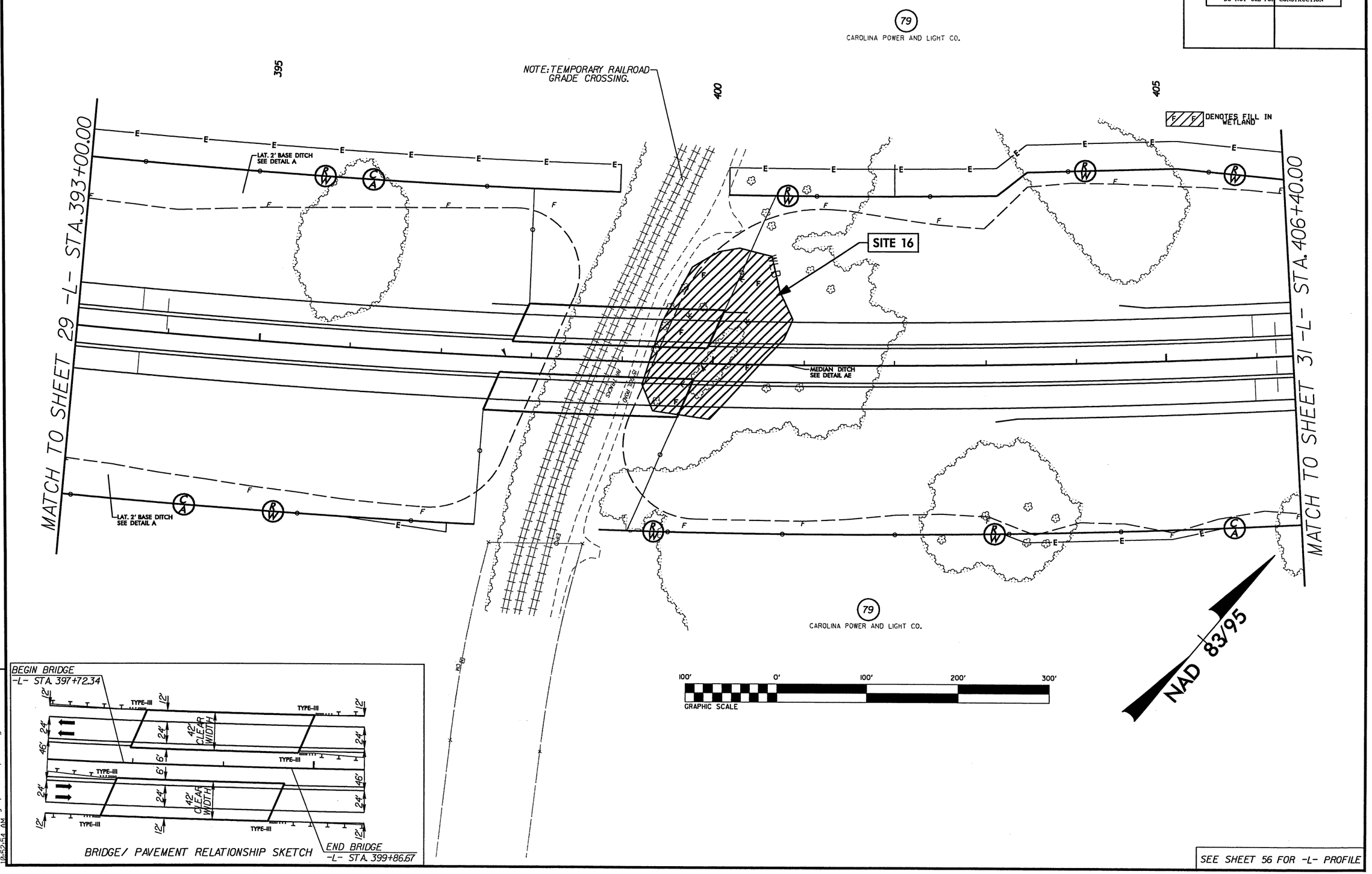
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
R/W Revision: September 17, 2008, Revised r/w label -L- Sta. 397+15 from 205' RT to 195' RT. 8/17/99



SEE SHEET 56 FOR -L- PROFILE

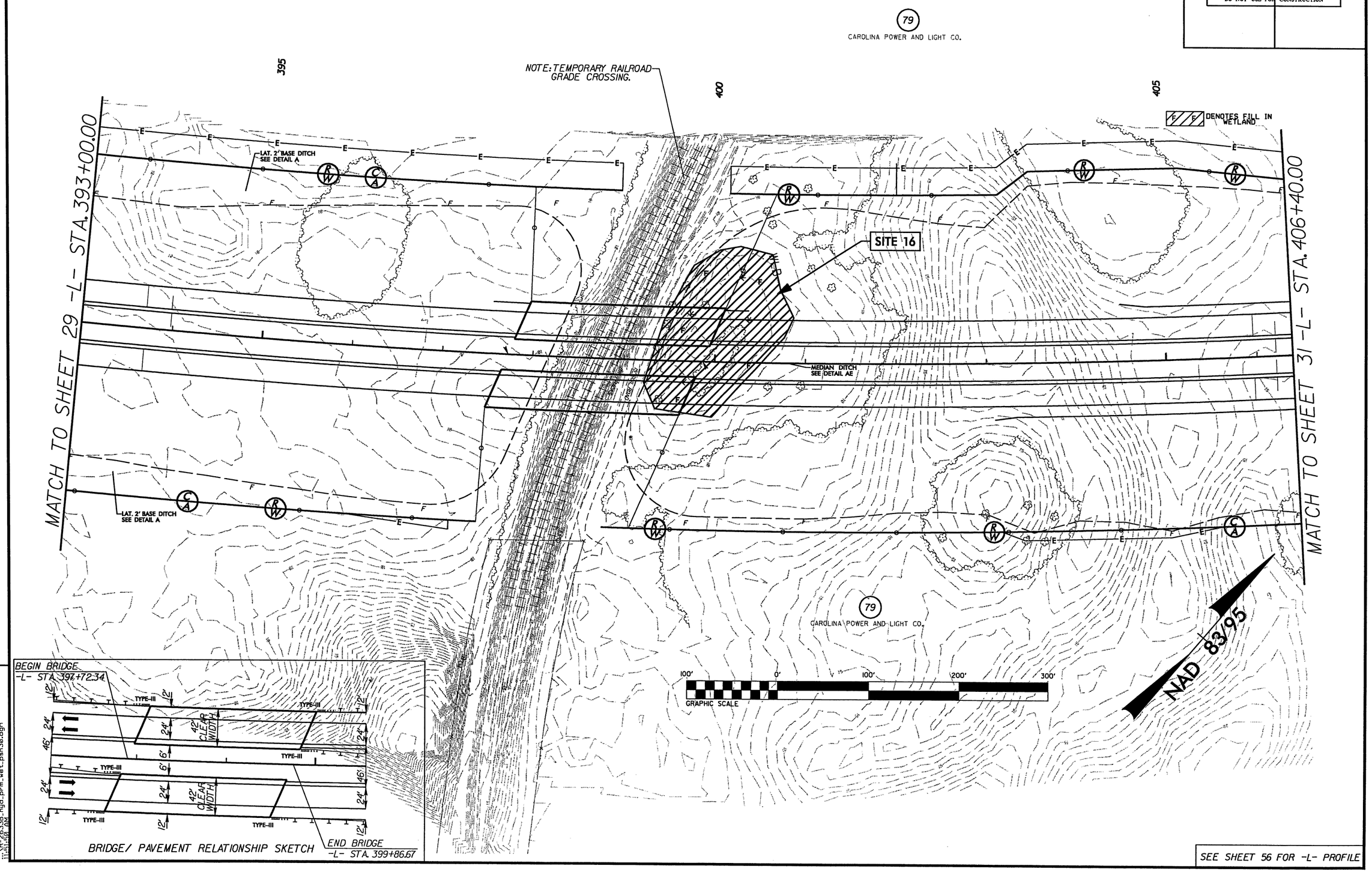
7/30/2010
10:42:43 AM hyd_prm_wet_psh30.dgn

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 56 FOR -L- PROFILE

REVISIONS

R/W Revision: September 17, 2008, Revised r/w label -L- Sta. 397+15 from 205' RT to 195' RT.

8/17/99

7/30/2010
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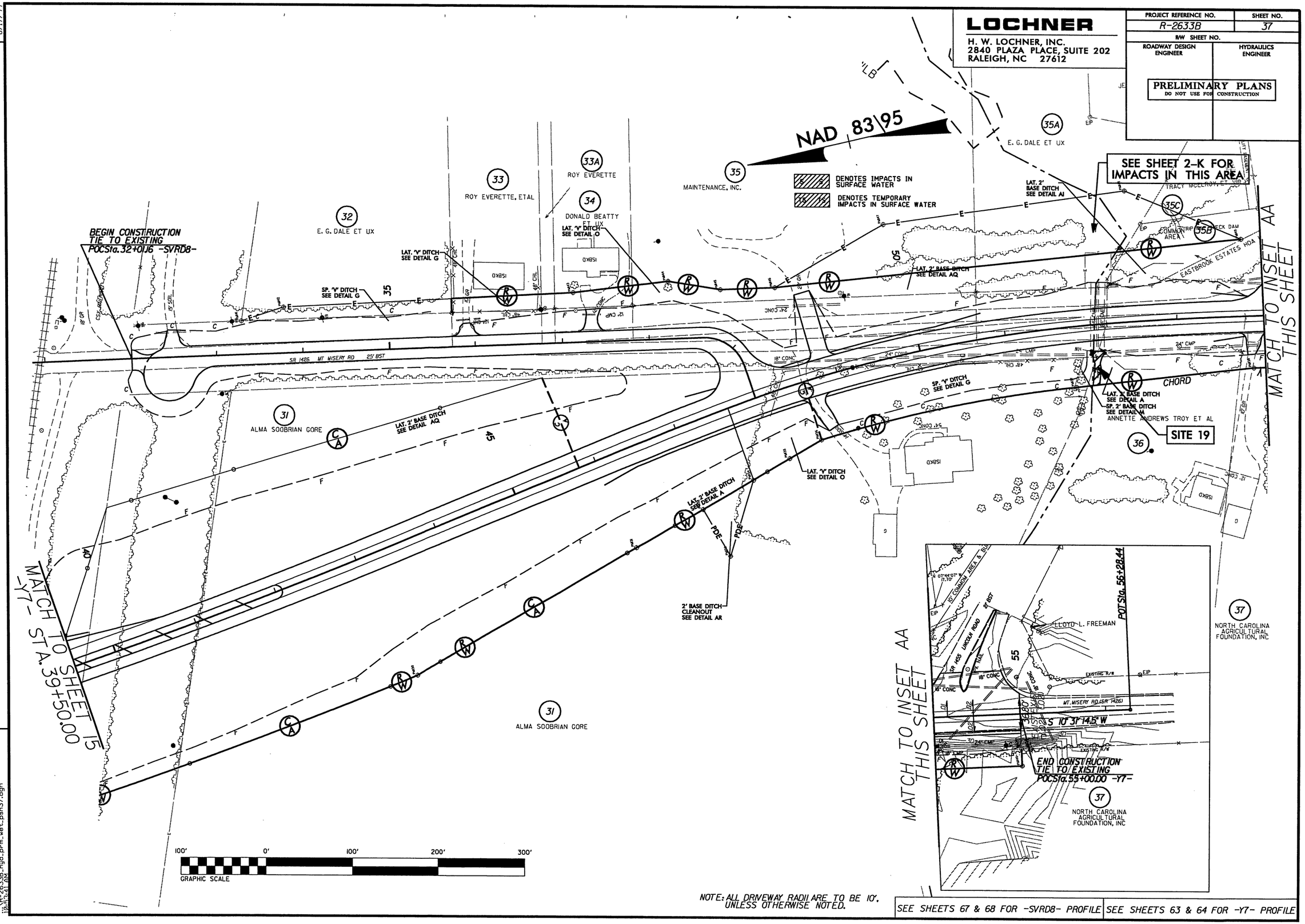
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
8/17/99
R/W REVISION: 10/ /09 - LABELED PDE ON PARCEL 31. NAME AND DEED CHANGE ON PARCEL 33. ADDED NEW PARCEL 35A. ADDED NEW PARCEL AND PROPERTY LINE PARCEL 33A,35B,AND 35C. MOVED CLU-DE-SAC FROM STA 31+50 TO 32+44.8 -SRVD8-



NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

SEE SHEETS 67 & 68 FOR -SVRD8- PROFILE | SEE SHEETS 63 & 64 FOR -Y7- PROFILE

7/30/2009
10:35:26 AM
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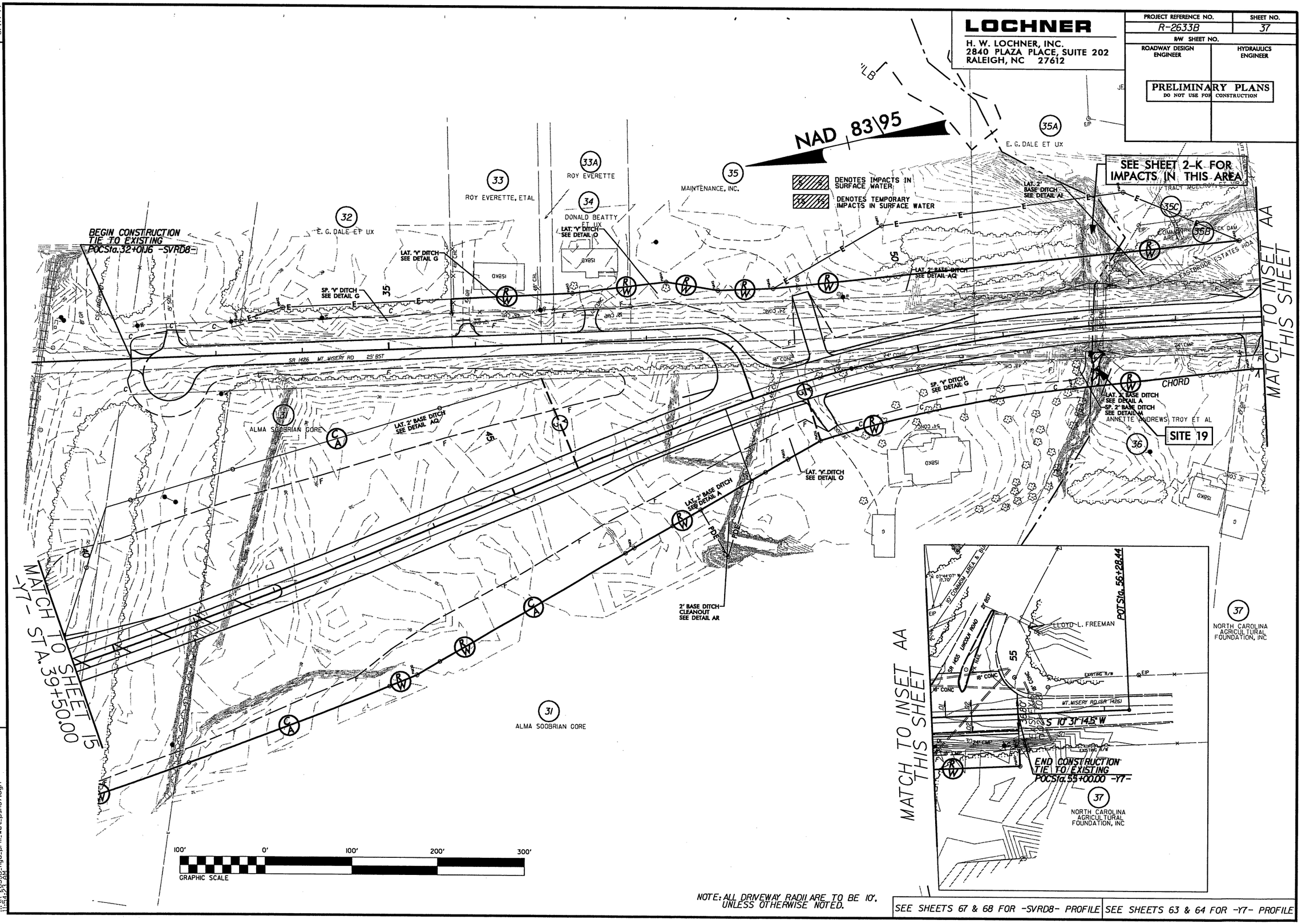
8/17/99

REVISIONS

R/W REVISION: 10/ /09 - LABELED PDE ON PARCEL 31. NAME AND DEED CHANGE ON PARCEL 33. ADDED NEW PARCEL 35A. ADDED NEW PARCEL AND PROPERTY LINE PARCEL 33A,35B,AND 35C. MOVED CLU-DE-SAC FROM STA 31+50 TO 32+44.8 -SRVD8-



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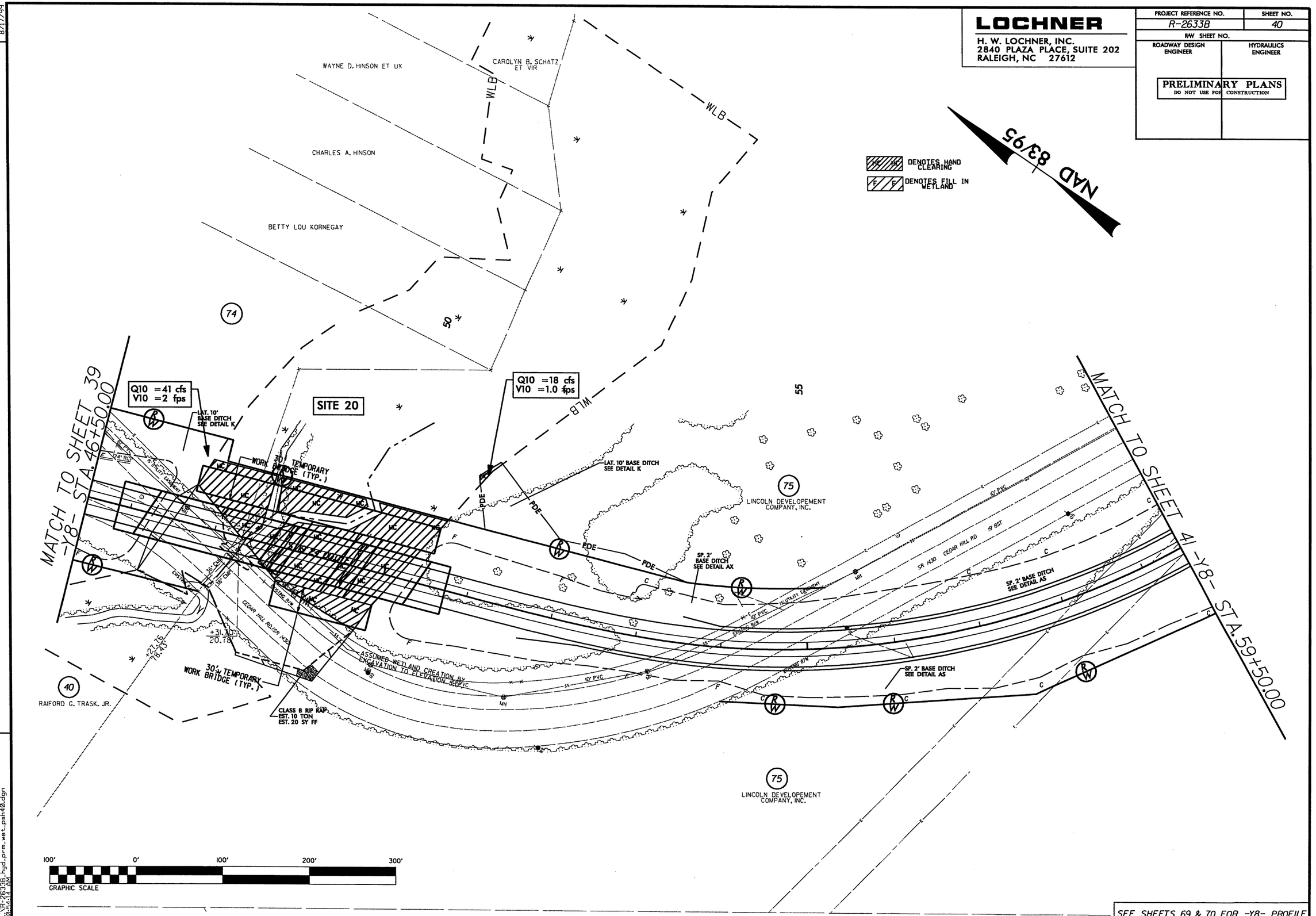
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEETS 69 & 70 FOR -Y8- PROFILE

REVISIONS

8/17/99

7/30/2009
R-2633B_hyd_prm_wet_psh40.dgn
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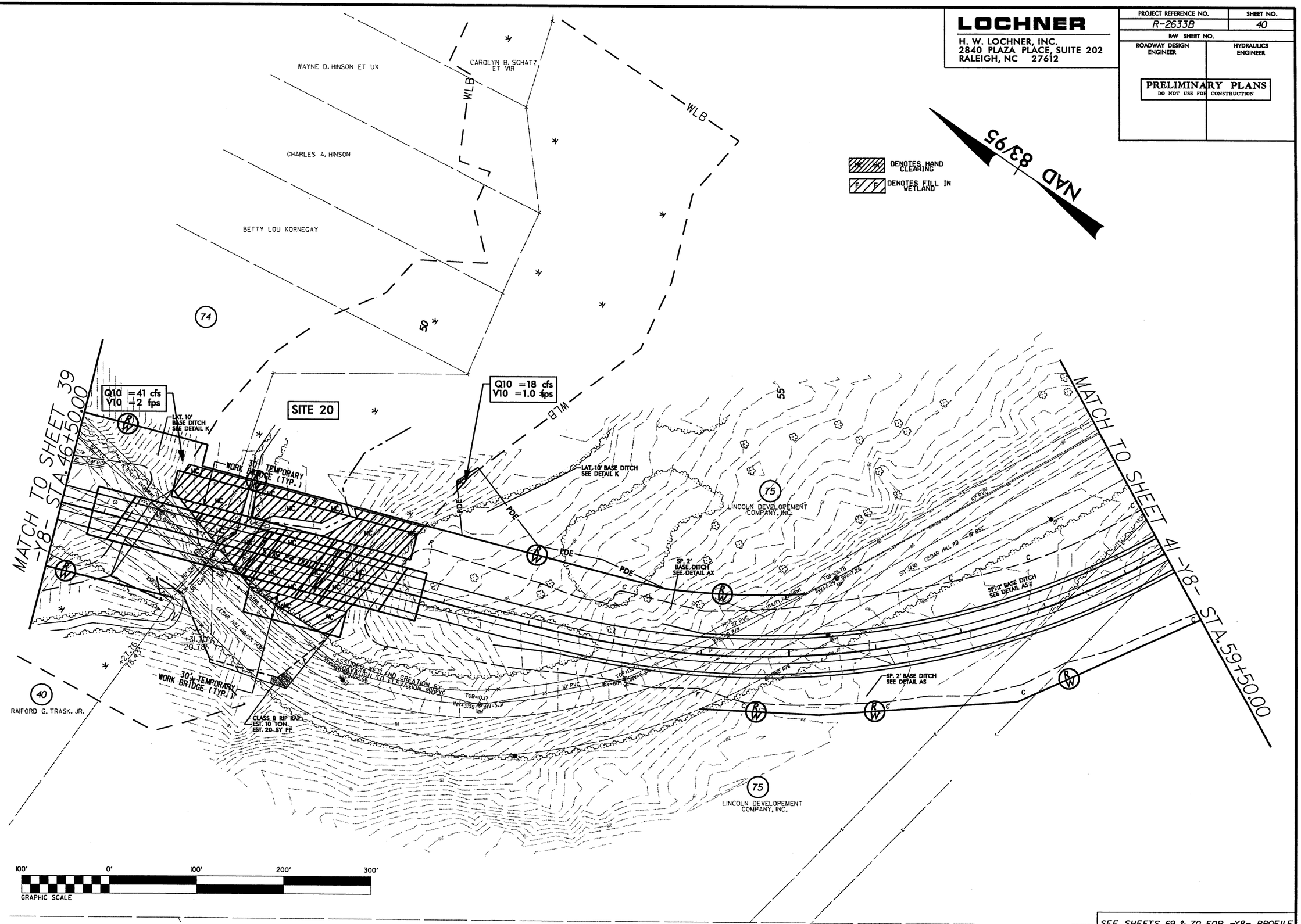
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEETS 69 & 70 FOR -Y8- PROFILE

REVISIONS

8/17/99

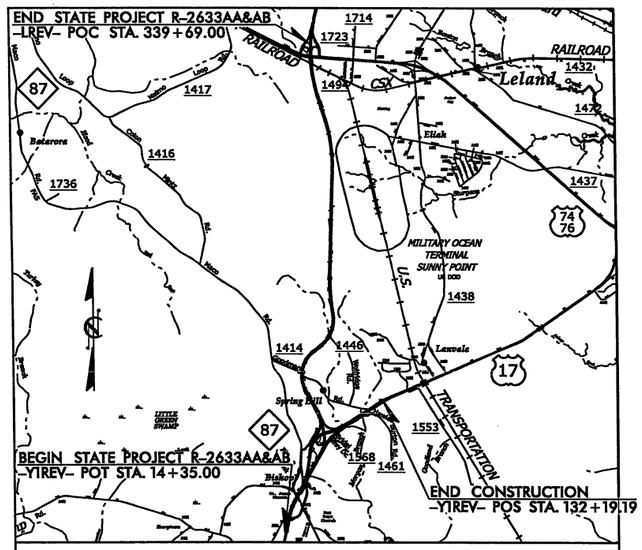
7/30/2010
R-2633B_hyd_prm_wet_psh40.dgn
11:24:55 AM

09/08/99

TIP PROJECT: R-2633AA&AB

CONTRACT: C 202384

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633AA&AB	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34491.3.GV2	NHF-0017 (96)	CONSTRUCTION
34491.3.ST1	STM-0017 (97)	CONSTRUCTION

BRUNSWICK COUNTY

LOCATION: WILMINGTON BYPASS (FUTURE I-140) FROM NC 87 TO US 74/76

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

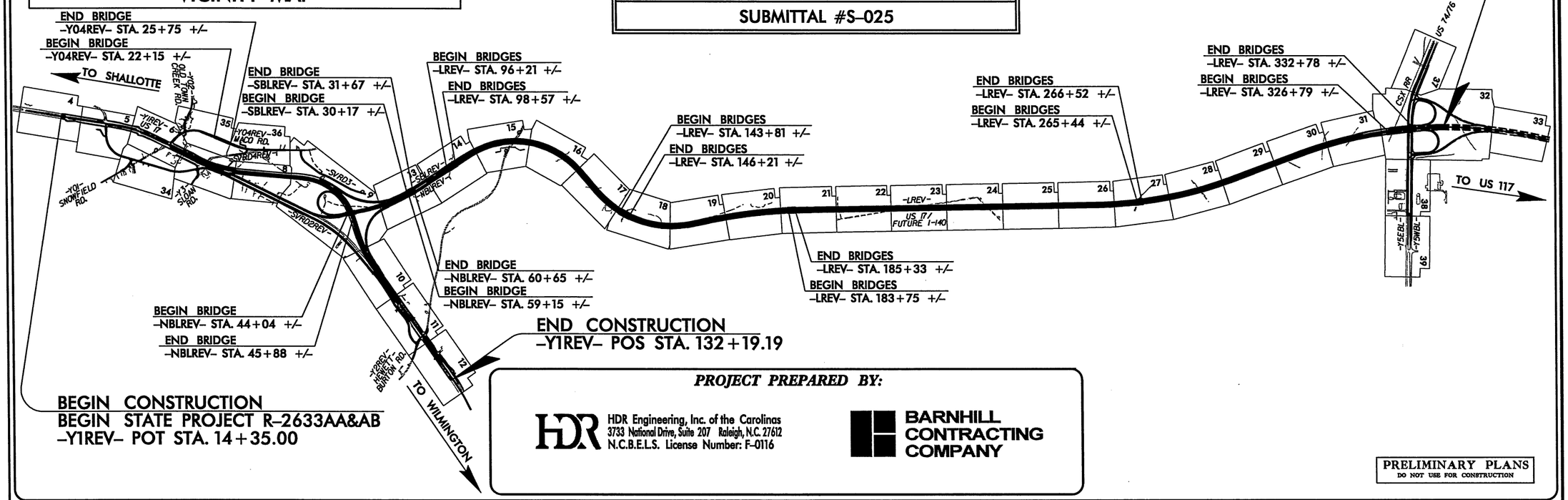
NAD 83

FINAL ROADWAY PLANS

SUBMITTED: 09-13-2010

SUBMITTAL #S-025

END CONSTRUCTION
END STATE PROJECT R-2633AA&AB
-LREV- POC STA. 339+69.00



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

BARNHILL CONTRACTING COMPANY

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA -LREV-

ADT 2010 = 21,615
ADT 2035 = 46,800
DHV = 12 %
D = 60 %
T = 15 % *
V = 70 MPH
* TTST 10 % DUAL 5 %

DESIGN DATA -Y1REV-

ADT 2010 = 34,081
ADT 2035 = 80,100
DHV = 9 %
D = 55 %
T = 15 % *
V = 60 MPH
* TTST 10 % DUAL 5 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2633AA&BB (-Y1REV-, -NBLREV-, -LREV-) = 7.657 MILES

LENGTH STRUCTURE TIP PROJECT R-2633AA&BB (-Y1REV-, -NBLREV-, -LREV-) = 0.320 MILES

TOTAL LENGTH STATE PROJECT R-2633AA&BB (-Y1REV-, -NBLREV-, -LREV-) = 7.977 MILES

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 20, 2008

LETTING DATE: FEBRUARY 16, 2010

GREGORY KEMPF, P.E.
PROJECT ENGINEER

PAUL A. MEEHAN, 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

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwainwri DATE: 9/10/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_TSH.DGN
PENTABLE: NCDOT_pshpfl.tbl
TIME: 2:12:43 PM SCALE: 1:1250

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	1-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:

- 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 — S
- Well — W
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- 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 — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — G
- Designated U/G Gas Line (S.U.E.*) — G
- 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 — S
- 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.

09/08/09
USER: dwainwri DATE: 9/10/2010 TIME: 2:12:59 PM
FILE: Mkt-g_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_TSH.DGN

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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

BARNHILL CONTRACTING COMPANY

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E6	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 5½" IN DEPTH.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E7	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 5½" IN DEPTH.
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.	J1	PROP. 6.0" DEPTH AGGREGATE BASE COURSE
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.	J2	PROP. 8.0" DEPTH AGGREGATE BASE COURSE
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 LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.	J3	PROP. 10.0" DEPTH AGGREGATE BASE COURSE
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 LESS THAN 1.5 " IN DEPTH OR GREATER THAN 2" IN DEPTH.	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER
D2	PROP. APPROX. 3.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R2	SINGLE FACED CONCRETE BARRIER
D3	PROP. APPROX. 3.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.	R3	DOUBLE FACED CONCRETE BARRIER (TYPE T)
D4	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	CONCRETE SHOULDER BERM GUTTER
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 2.5" IN DEPTH OR GREATER THAN 4.0" IN DEPTH.	R5	CONCRETE EXPRESSWAY GUTTER
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 2.5" IN DEPTH OR GREATER THAN 4.0" IN DEPTH.	R6	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
E1	PROP. APPROX. 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	S	8" INCIDENTAL STONE
E2	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
E3	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
E4	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL W1)
E5	PROP. APPROX. 8.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 484.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL W2)
		Y	PROPOSED RUMBLE STRIPS

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

5/14/99
9/9/2010
R:\R2633AA&AB_RDY_TYP.DGN
8:14:42 PM

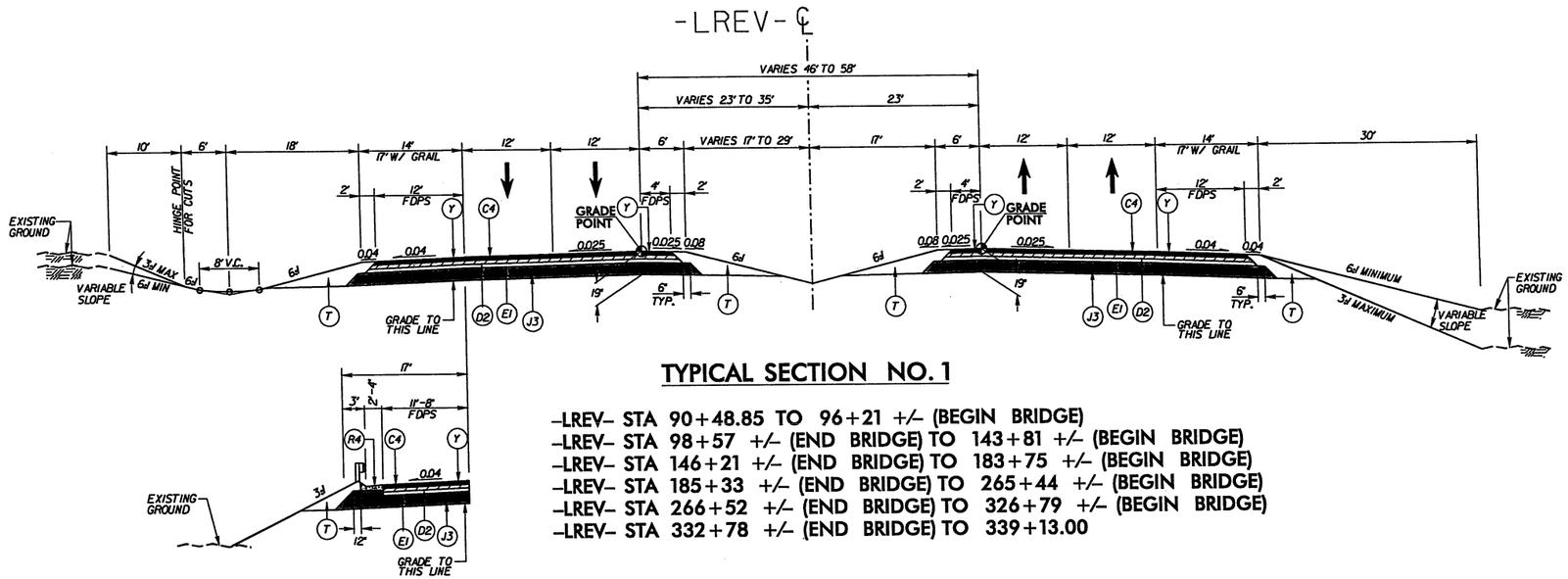
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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

BARNHILL CONTRACTING COMPANY

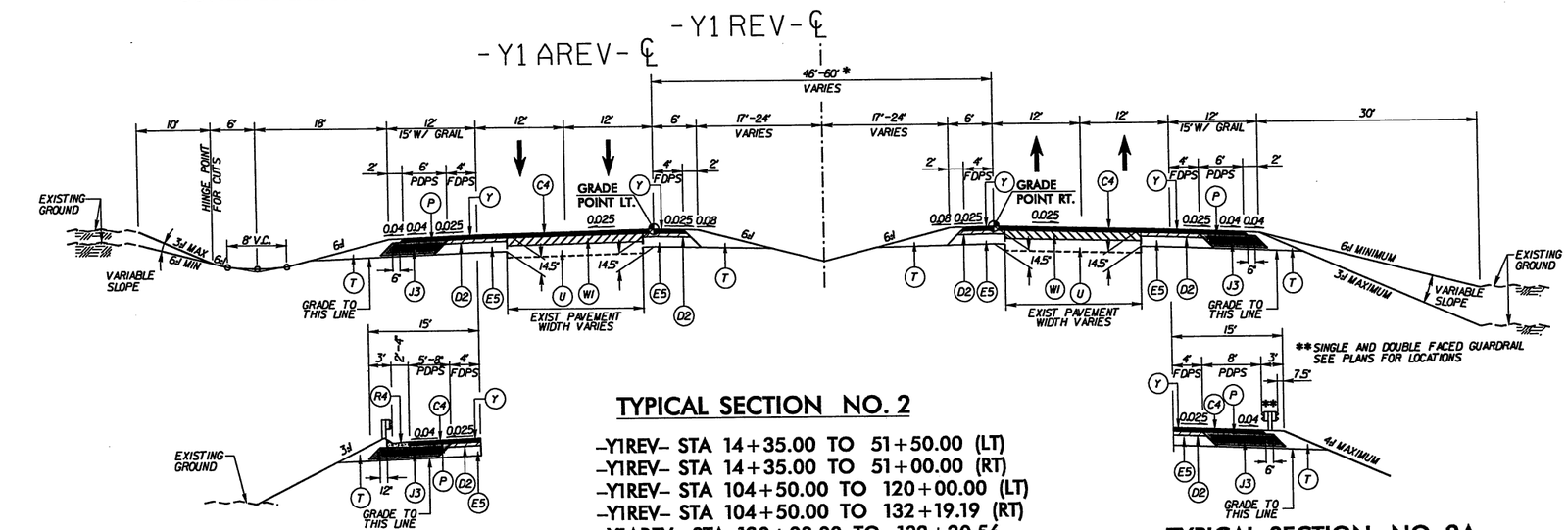


TYPICAL SECTION NO. 1

-LREV- STA 90+48.85 TO 96+21 +/- (BEGIN BRIDGE)
-LREV- STA 98+57 +/- (END BRIDGE) TO 143+81 +/- (BEGIN BRIDGE)
-LREV- STA 146+21 +/- (END BRIDGE) TO 183+75 +/- (BEGIN BRIDGE)
-LREV- STA 185+33 +/- (END BRIDGE) TO 265+44 +/- (BEGIN BRIDGE)
-LREV- STA 266+52 +/- (END BRIDGE) TO 326+79 +/- (BEGIN BRIDGE)
-LREV- STA 332+78 +/- (END BRIDGE) TO 339+13.00

TYPICAL SECTION NO. 1A

SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS



TYPICAL SECTION NO. 2

-Y1REV- STA 14+35.00 TO 51+50.00 (LT)
-Y1REV- STA 14+35.00 TO 51+00.00 (RT)
-Y1REV- STA 104+50.00 TO 120+00.00 (LT)
-Y1REV- STA 104+50.00 TO 132+19.19 (RT)
-Y1AREV- STA 120+00.00 TO 132+20.56

TYPICAL SECTION NO. 2A

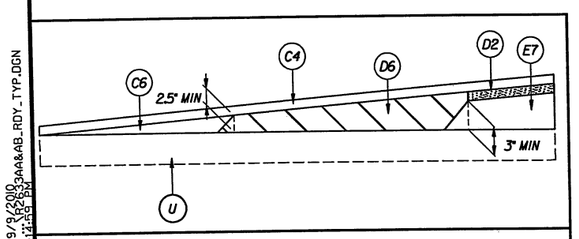
SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS

*60' FROM -Y1REV- STA 14+35.00 TO 46+47.33
VARIES 60' TO 46' FROM -Y1REV- STA 46+47.33 TO 51+41.19
46' FROM -Y1REV- STA 51+41.19 TO 106+79.00
VARIES 46' TO 60' FROM -Y1REV- STA 106+79.00 TO 110+99.00
60' FROM -Y1REV- STA 110+99.00 TO 123+69.81

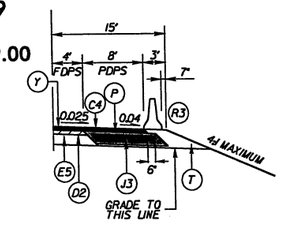
NOTE:
SEE PLANS FOR LOCATION OF TURN LANES, MEDIAN CROSSOVERS AND INTERSTATE TURNOUTS. AREAS WITH GREATER THAN 6' OF WIDENING WILL USE (E3) ON TOP OF (J3) IN LIEU OF (E5).

TYPICAL SECTION NO. 2A

-Y1REV- STA 100+45.00 TO 110+45.00 (RT)



DETAIL W1 SHOWING METHOD OF WEDGING

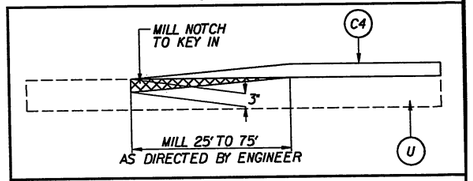


TYPICAL SECTION NO. 2B

-Y1REV- STA 110+45.00 TO 116+79.18 (RT)

C1	1.5" S9.5B
C2	1.5" S9.5C
C3	3.0" S9.5B
C4	3.0" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	2.5" I19.0B
D2	3.0" I19.0C
D3	3.5" I19.0C
D4	4.0" I19.0B
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3.0" B25.0C
E2	4.0" B25.0B
E3	4.0" B25.0C
E4	5.0" B25.0C
E5	8.5" B25.0C
E6	VAR. B25.0B
E7	VAR. B25.0C
J1	6.0" ABC
J2	8.0" ABC
J3	10.0" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	SINGLE FACED BARRIER
R3	DOUBLE FACED BARRIER
R4	SHOULDER BERM GUTTER
R5	EXPRESSWAY GUTTER
R6	MONO. CONCRETE ISLAND
S	8" INCIDENTAL STONE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING
Y	RUMBLE STRIPS

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



KEY-IN DETAIL

9/3/2000
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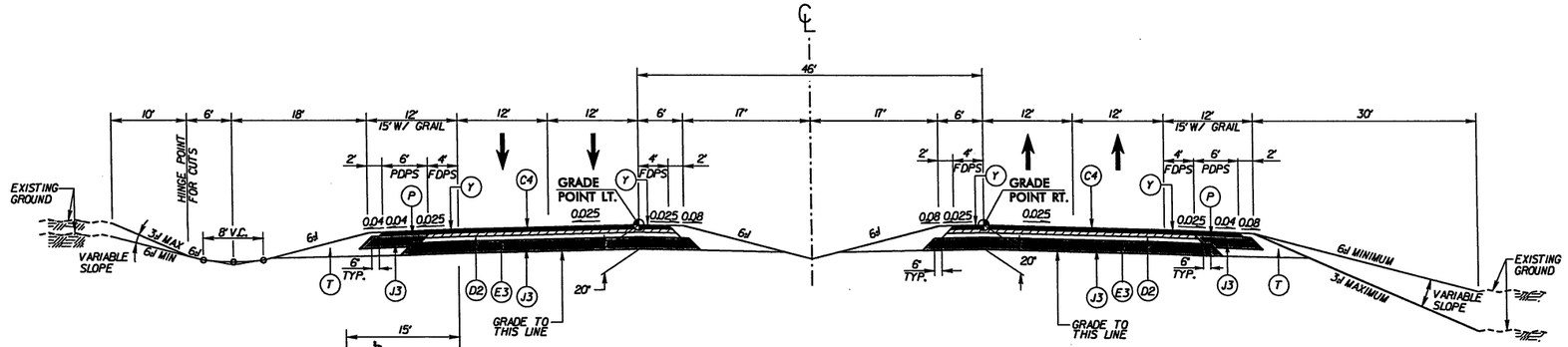
5/14/99

-Y1REV-



TYPICAL SECTION NO. 3

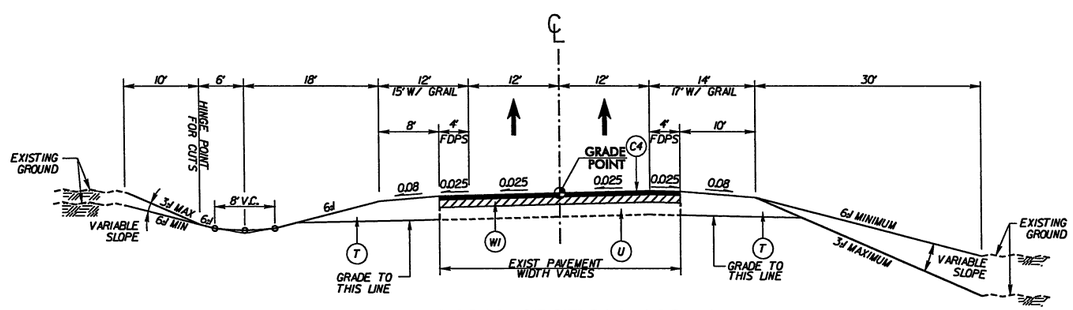
-Y1REV- STA 51+50.00 TO 104+50.00 (LT)
-Y1REV- STA 51+00.00 TO 105+50.00 (RT)

NOTE:
SEE PLANS FOR LOCATION OF TURN LANES, MEDIAN CROSSOVERS AND INTERSTATE TURNOUTS.

TYPICAL SECTION NO. 3A

SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS

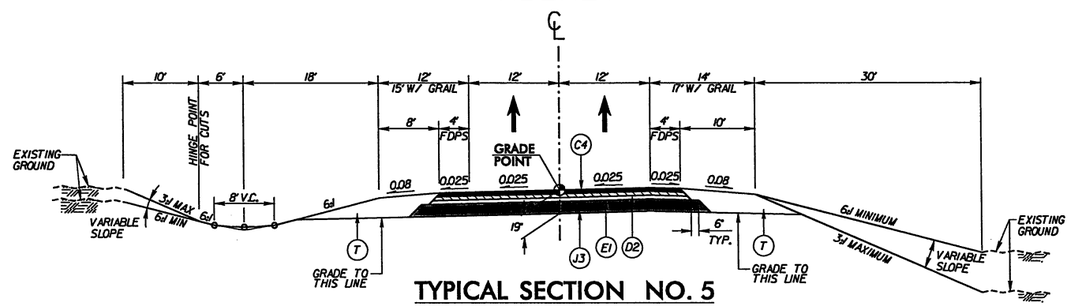
-NBLREV-



TYPICAL SECTION NO. 4

-NBLREV- STA 15+16.18 TO 35+00.00

-NBLREV-



TYPICAL SECTION NO. 5

-NBLREV- STA 35+00.00 TO 40+94.00

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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

BARNHILL CONTRACTING COMPANY

C1	1.5" S9.5B
C2	1.5" S9.5C
C3	3.0" S9.5B
C4	3.0" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	2.5" I19.0B
D2	3.0" I19.0C
D3	3.5" I19.0C
D4	4.0" I19.0B
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3.0" B25.0C
E2	4.0" B25.0B
E3	4.0" B25.0C
E4	5.0" B25.0C
E5	8.5" B25.0C
E6	VAR. B25.0B
E7	VAR. B25.0C
J1	6.0" ABC
J2	8.0" ABC
J3	10.0" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	SINGLE FACED BARRIER
R3	DOUBLE FACED BARRIER
R4	SHOULDER BERM GUTTER
R5	EXPRESSWAY GUTTER
R6	MONO. CONCRETE ISLAND
S	8" INCIDENTAL STONE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING
Y	RUMBLE STRIPS

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

9/3/2010
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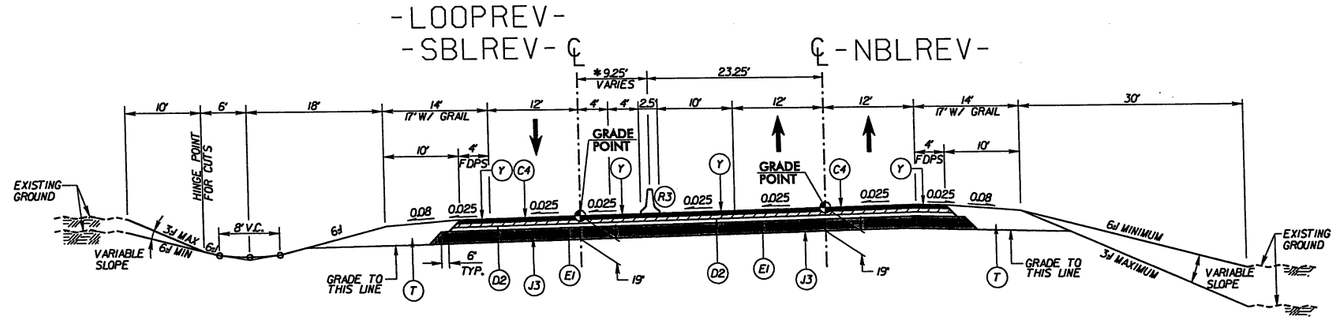
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2-C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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

BARNHILL CONTRACTING COMPANY

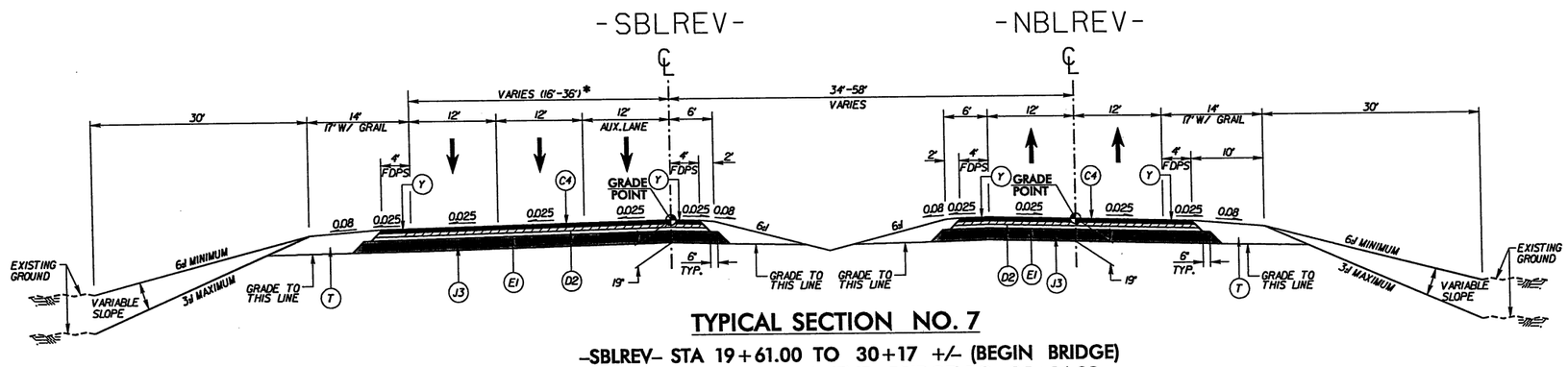


TYPICAL SECTION NO. 6

-LOOPREV- STA 12+15.62 TO 14+89.15
-SBLREV- STA 14+89.15 TO 15+14 +/- (BEGIN BRIDGE)
-SBLREV- STA 16+98 +/- (END BRIDGE) TO 19+61.00

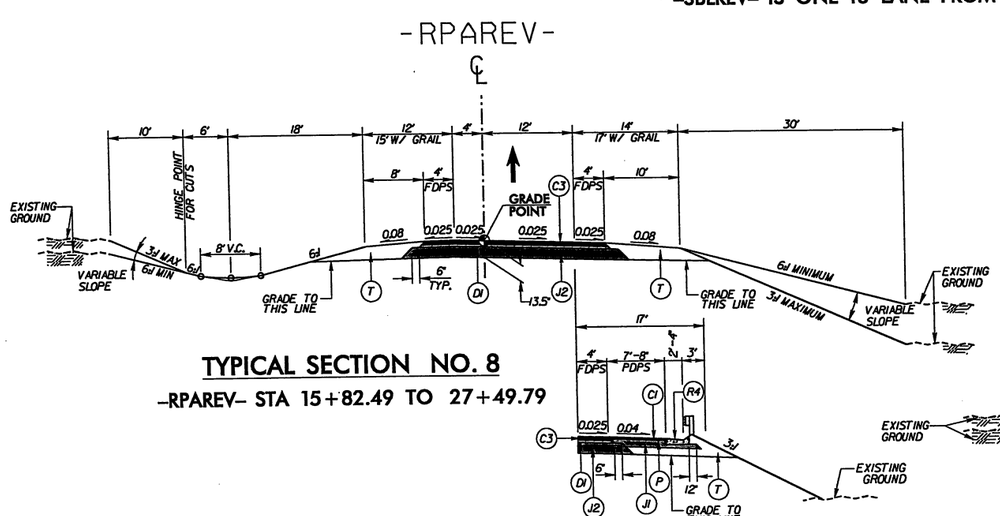
-NBLREV- STA 40+94.00 TO 44+04 +/- (BEGIN BRIDGE)
-NBLREV- STA 45+88 +/- (END BRIDGE) TO 48+45.65

* VARIES 15.08' TO 9.25' FROM -LOOPREV- STA 12+15.62 TO 14+89.15
VARIES 9.25' TO 10.18' FROM -SBLREV- STA 17+78.93 TO 19+61.00



TYPICAL SECTION NO. 7

-SBLREV- STA 19+61.00 TO 30+17 +/- (BEGIN BRIDGE)
-SBLREV- STA 31+67 +/- (END BRIDGE) TO 35+14.99
-NBLREV- STA 48+45.65 TO 59+15 +/- (BEGIN BRIDGE)
-NBLREV- STA 60+65 +/- (END BRIDGE) TO 64+15.58
* -SBLREV- IS ONE 16' LANE FROM -SBLREV- STA 19+61.00 TO 26+66.43

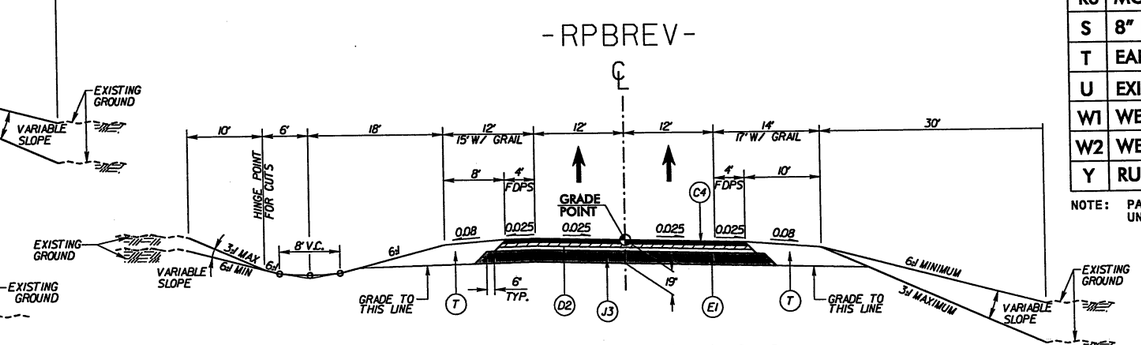


TYPICAL SECTION NO. 8

-RPAREV- STA 15+82.49 TO 27+49.79

TYPICAL SECTION NO. 8A

SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS



TYPICAL SECTION NO. 9

-RPBREV- STA 14+66.15 TO 25+53.56

C1	1.5" S9.5B
C2	1.5" S9.5C
C3	3.0" S9.5B
C4	3.0" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	2.5" I19.0B
D2	3.0" I19.0C
D3	3.5" I19.0C
D4	4.0" I19.0B
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3.0" B25.0C
E2	4.0" B25.0B
E3	4.0" B25.0C
E4	5.0" B25.0C
E5	8.5" B25.0C
E6	VAR. B25.0B
E7	VAR. B25.0C
J1	6.0" ABC
J2	8.0" ABC
J3	10.0" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	SINGLE FACED BARRIER
R3	DOUBLE FACED BARRIER
R4	SHOULDER BERM GUTTER
R5	EXPRESSWAY GUTTER
R6	MONO. CONCRETE ISLAND
S	8" INCIDENTAL STONE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING
Y	RUMBLE STRIPS

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

5/14/99

9/3/2010
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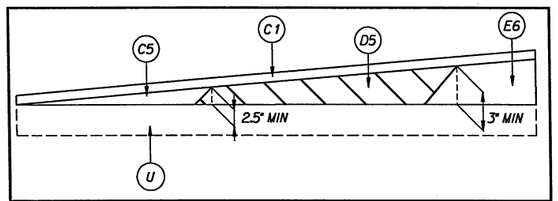
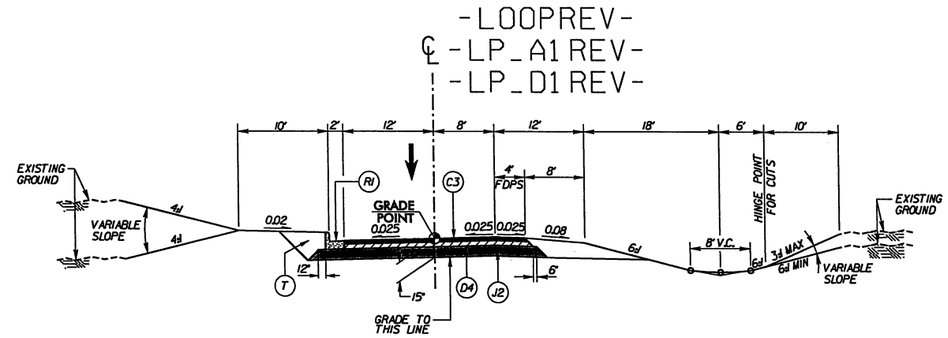
5/14/99

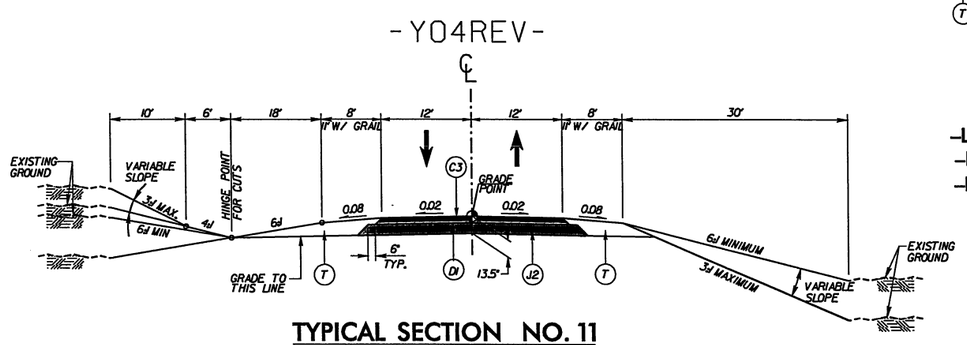


DETAIL W2 SHOWING METHOD OF WEDGING



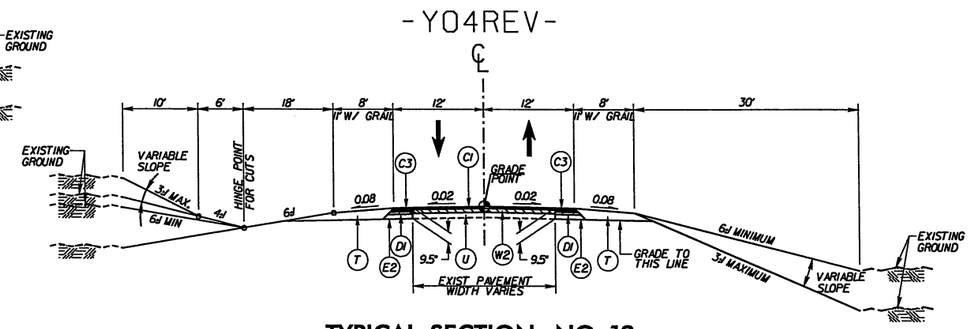
TYPICAL SECTION NO. 10

-LOOPREV- STA 2+32.17 TO 12+15.62
-LP_A1REV- STA 2+61.36 TO 11+99.33
-LP_D1REV- STA 2+81.33 TO 13+36.19



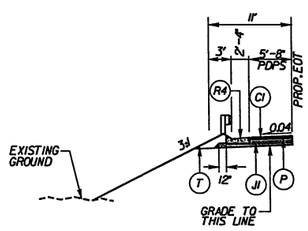
TYPICAL SECTION NO. 11

-Y04REV- STA 10+55.93 TO 22+15 +/- (BEGIN BRIDGE)
-Y04REV- STA 25+75 +/- (END BRIDGE) TO 34+00.00



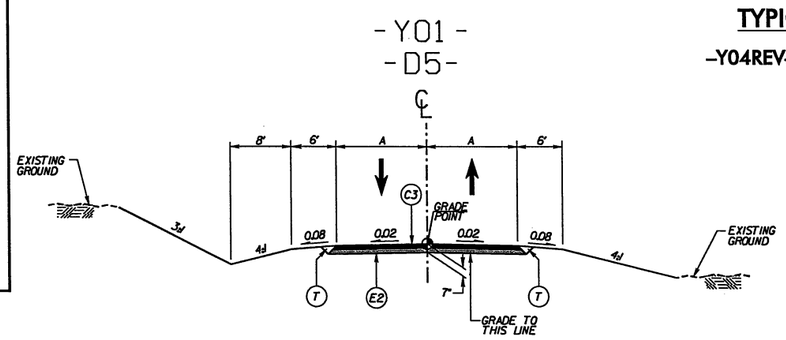
TYPICAL SECTION NO. 12

-Y04REV- STA 34+00.00 TO 39+00.00



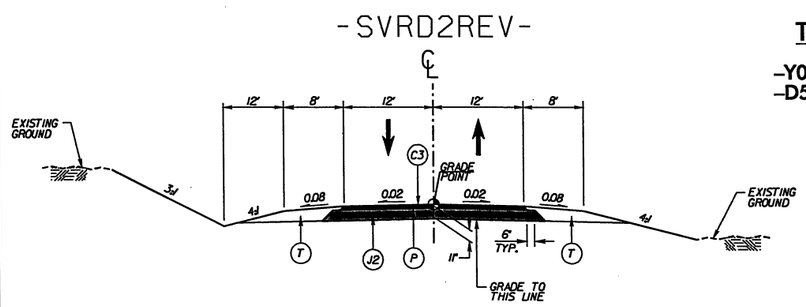
SBG DETAIL FOR -Y04REV- & -SVRD2REV-

SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS



TYPICAL SECTION NO. 13

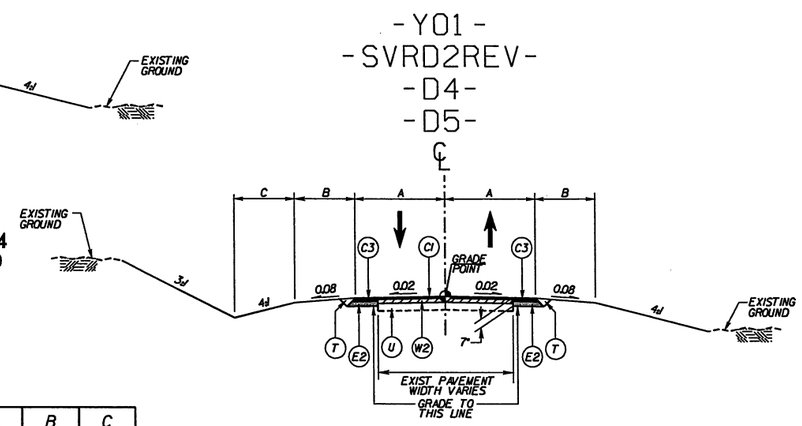
-Y01- STA 16+67.00 TO 19+08.14
-D5- STA 10+13.92 TO 10+62.00



TYPICAL SECTION NO. 14

-SVRD2REV- STA 10+54.90 TO 43+50.00
-SVRD2REV- STA 88+50.00 TO 104+99.24

	A	B	C
-Y01-	12'	6'	8'
-SVRD2REV-	12'	8'	12'
-D4-	9'	6'	8'
-D5-	12.5'	6'	8'



TYPICAL SECTION NO. 15

-Y01- STA 15+40.00 TO 16+67.00
-SVRD2REV- STA 43+50.00 TO 45+52.00
-SVRD2REV- STA 83+62.50 TO 88+50.00
-D4- STA 10+16.96 TO 10+98.36
-D5- STA 10+62.00 TO 11+52.00

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2-D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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

BARNHILL CONTRACTING COMPANY

C1	1.5" S9.5B
C2	1.5" S9.5C
C3	3.0" S9.5B
C4	3.0" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	2.5" I19.0B
D2	3.0" I19.0C
D3	3.5" I19.0C
D4	4.0" I19.0B
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3.0" B25.0C
E2	4.0" B25.0B
E3	4.0" B25.0C
E4	5.0" B25.0C
E5	8.5" B25.0C
E6	VAR. B25.0B
E7	VAR. B25.0C
J1	6.0" ABC
J2	8.0" ABC
J3	10.0" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	SINGLE FACED BARRIER
R3	DOUBLE FACED BARRIER
R4	SHOULDER BERM GUTTER
R5	EXPRESSWAY GUTTER
R6	MONO. CONCRETE ISLAND
S	8" INCIDENTAL STONE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING
Y	RUMBLE STRIPS

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

9/9/2010
R-2633AA&AB_RDY_TYP.DGN
8:15:13 PM

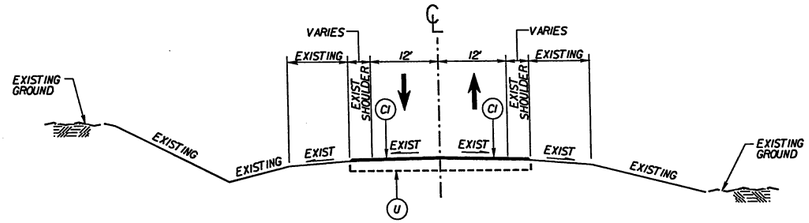
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2-E
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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

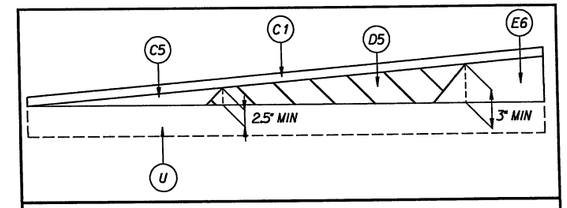
BARNHILL CONTRACTING COMPANY

-SVRD2REV-



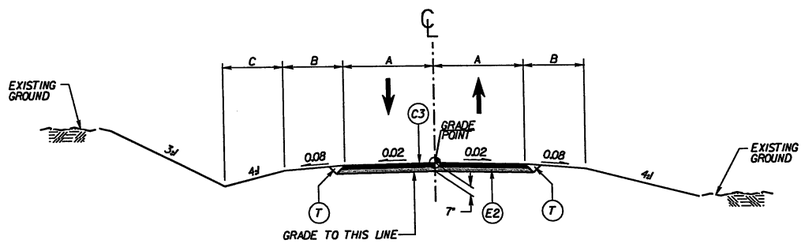
TYPICAL SECTION NO. 16

-SVRD2REV- STA 45+52.00 TO 83+62.50



DETAIL W2 SHOWING METHOD OF WEDGING

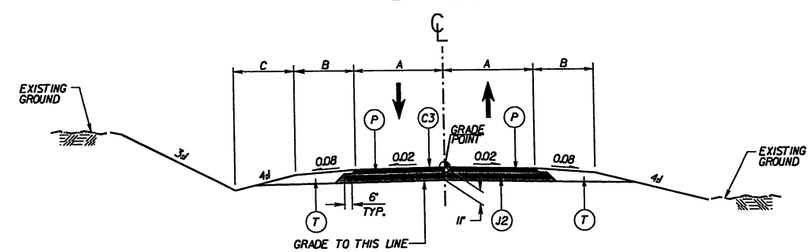
-Y02-
-Y3-
-SVRD4REV-



TYPICAL SECTION NO. 17

-Y02- STA 10+12.00 TO 12+40.00
-Y3- STA 10+12.00 TO 11+70.00
-SVRD4REV- STA 10+12.00 TO 11+50.00

-Y2REV-
-SVRD3-

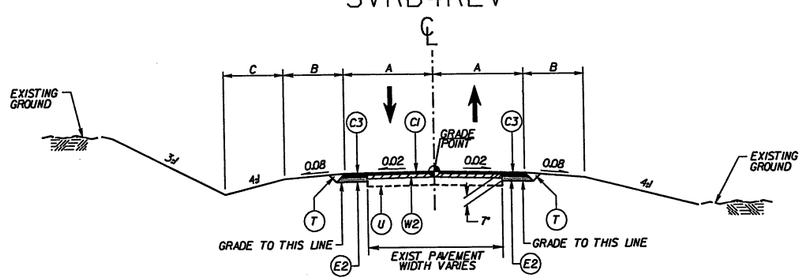


TYPICAL SECTION NO. 18

-Y2REV- STA 10+63.44 TO 14+00.00
-SVRD3- STA 10+10.91 TO 28+41.50

	A	B	C
-Y02-	11'	8'	12'
-Y2REV-	11'	8'	8'
-Y3-	10'	6'	8'
-SVRD3-	10'	5'	8'
-SVRD4REV-	10'	5'	8'

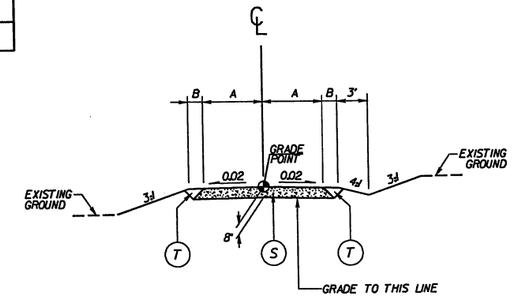
-Y02-
-Y2REV-
-Y3-
-SVRD4REV-



TYPICAL SECTION NO. 19

-Y02- STA 12+40.00 TO 14+80.00
-Y2REV- STA 14+00.00 TO 15+95.33
-Y3- STA 11+70.00 TO 12+40.00
-SVRD4REV- STA 11+50.00 TO 14+78.42

-DIREV-
-D2REV-
-D3-



TYPICAL SECTION NO. 20

-D1REV- STA 10+22.10 TO STA 12+17.71
-D2REV- STA 10+32.00 TO STA 16+15.00
-D3- STA 10+63.79 TO STA 12+98.00

	A	B
-DIREV-	5'	2'
-D2REV-	9'	6'
-D3-	6'	2'

C1	1.5" S9.5B
C2	1.5" S9.5C
C3	3.0" S9.5B
C4	3.0" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	2.5" I19.0B
D2	3.0" I19.0C
D3	3.5" I19.0C
D4	4.0" I19.0B
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3.0" B25.0C
E2	4.0" B25.0B
E3	4.0" B25.0C
E4	5.0" B25.0C
E5	8.5" B25.0C
E6	VAR. B25.0B
E7	VAR. B25.0C
J1	6.0" ABC
J2	8.0" ABC
J3	10.0" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	SINGLE FACED BARRIER
R3	DOUBLE FACED BARRIER
R4	SHOULDER BERM GUTTER
R5	EXPRESSWAY GUTTER
R6	MONO. CONCRETE ISLAND
S	8" INCIDENTAL STONE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING
Y	RUMBLE STRIPS

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

5/14/99

9/3/2010
R:\R2633AA&AB_RDY_TYP.DGN

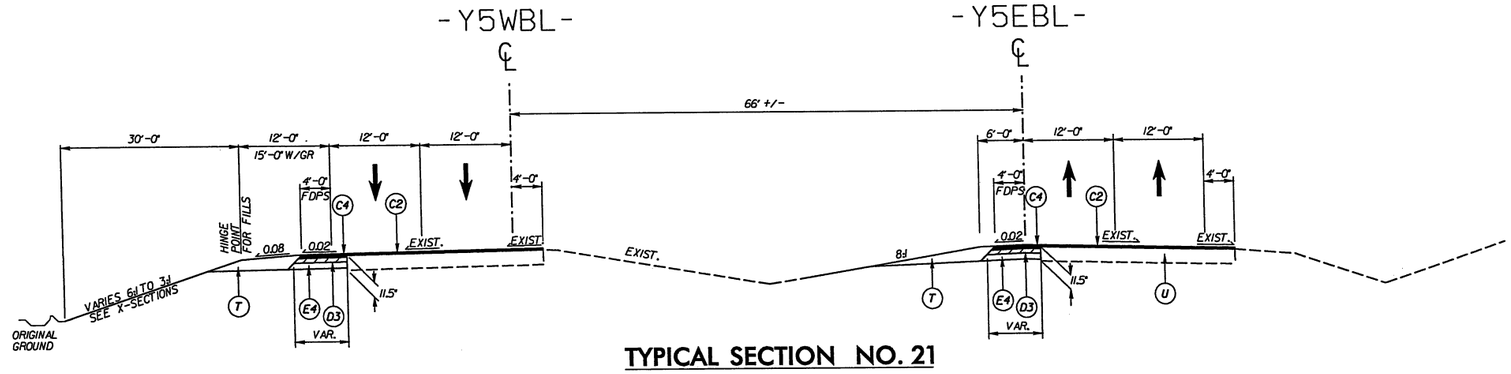
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA & AB	2-F
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

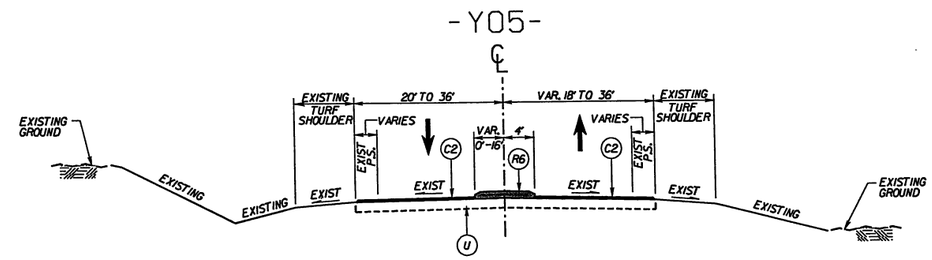
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY



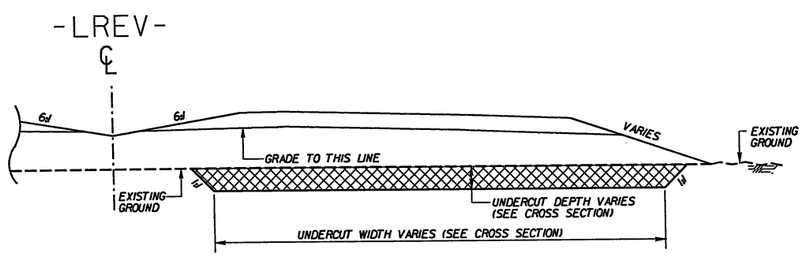
TYPICAL SECTION NO. 21

-Y5EBL- STA 9+92.00 TO 48+85.00
-Y5WBL- STA 13+17.00 TO 54+35.00



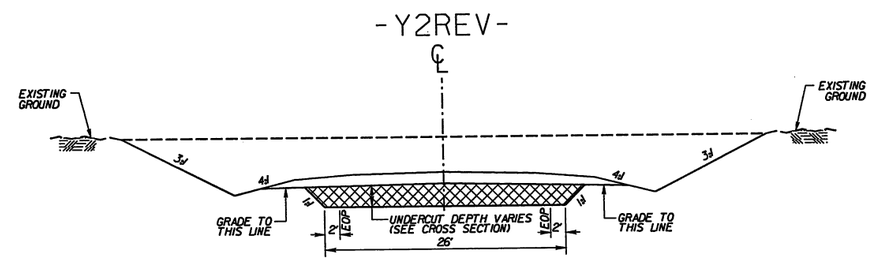
TYPICAL SECTION NO. 22

-Y05- STA 10+24.00 TO 11+67.35



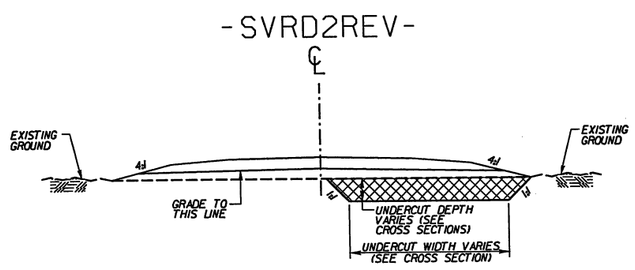
TYPICAL UNDERCUT DETAIL NO. 1

-LREV- STA 109+60 TO 110+30
-LREV- STA 120+70 TO 121+90
-LREV- STA 125+10 TO 126+20
-LREV- STA 135+20 TO 137+20
-LREV- STA 303+70 TO 316+00



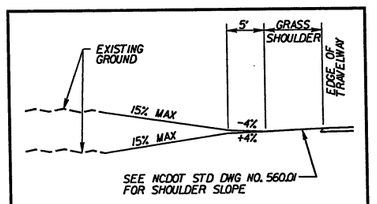
TYPICAL UNDERCUT DETAIL NO. 2

-Y2REV- STA 10+79 TO 14+24

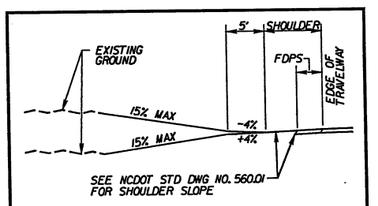


TYPICAL UNDERCUT DETAIL NO. 3

-SVRD2REV- STA 102+40 TO 105+03



DRIVEWAY GRADE DETAIL 1



DRIVEWAY GRADE DETAIL 2

C1	1.5" S9.5B
C2	1.5" S9.5C
C3	3.0" S9.5B
C4	3.0" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	2.5" I19.0B
D2	3.0" I19.0C
D3	3.5" I19.0C
D4	4.0" I19.0B
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3.0" B25.0C
E2	4.0" B25.0B
E3	4.0" B25.0C
E4	5.0" B25.0C
E5	8.5" B25.0C
E6	VAR. B25.0B
E7	VAR. B25.0C
J1	6.0" ABC
J2	8.0" ABC
J3	10.0" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	SINGLE FACED BARRIER
R3	DOUBLE FACED BARRIER
R4	SHOULDER BERM GUTTER
R5	EXPRESSWAY GUTTER
R6	MONO. CONCRETE ISLAND
S	8" INCIDENTAL STONE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING
W2	WEDGING
Y	RUMBLE STRIPS

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

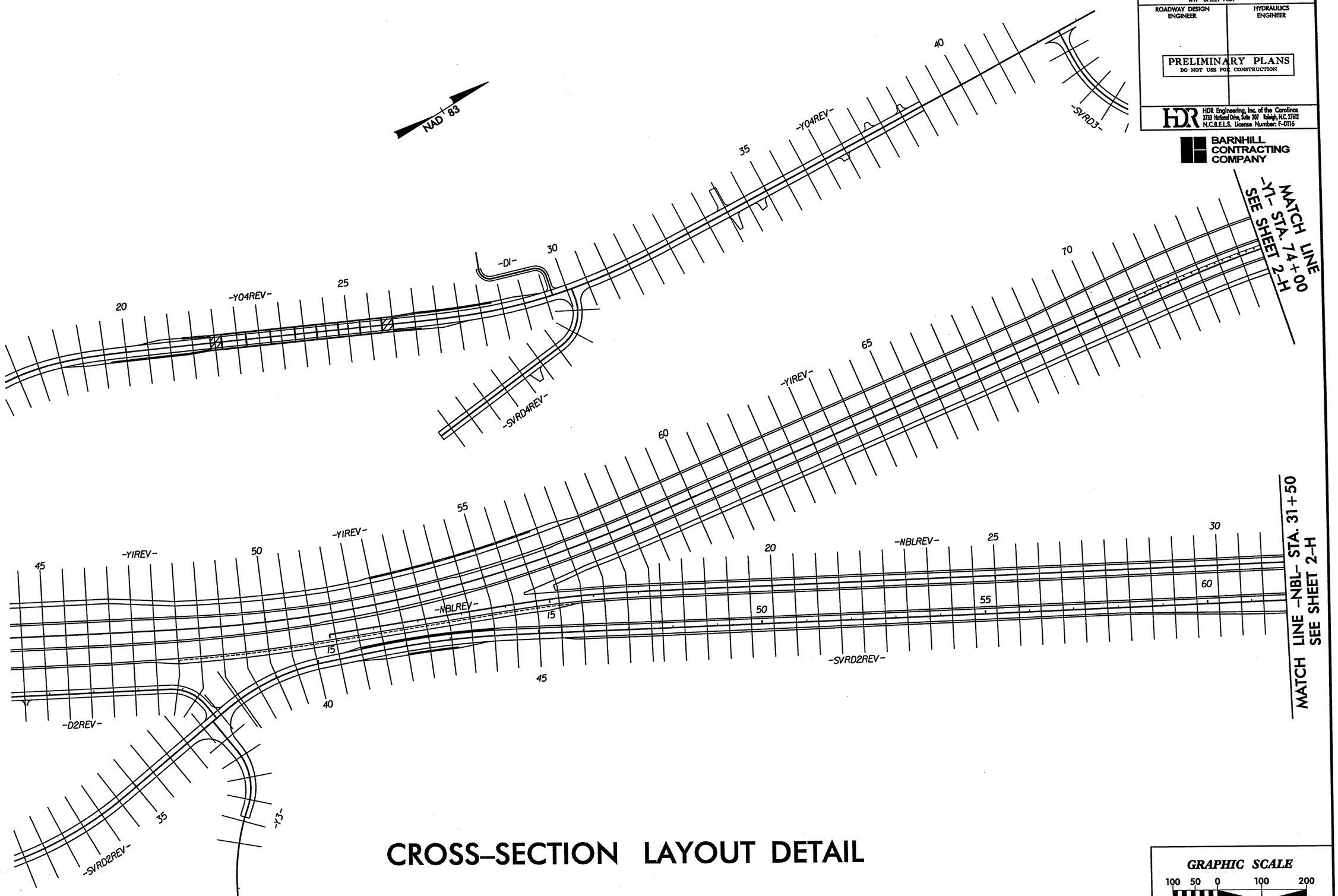
9/3/2010
R:\R-2633AA&AB_RDY_TYP.DGN

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



CROSS-SECTION LAYOUT DETAIL

GRAPHIC SCALE
100 50 0 100 200
PLANS

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrt DATE: 9/9/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_XSC_LAYOUT.dgn

PENTABLE: NCDOT_pshpfl.tbl
TIME: 8:15:41 PM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-H
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

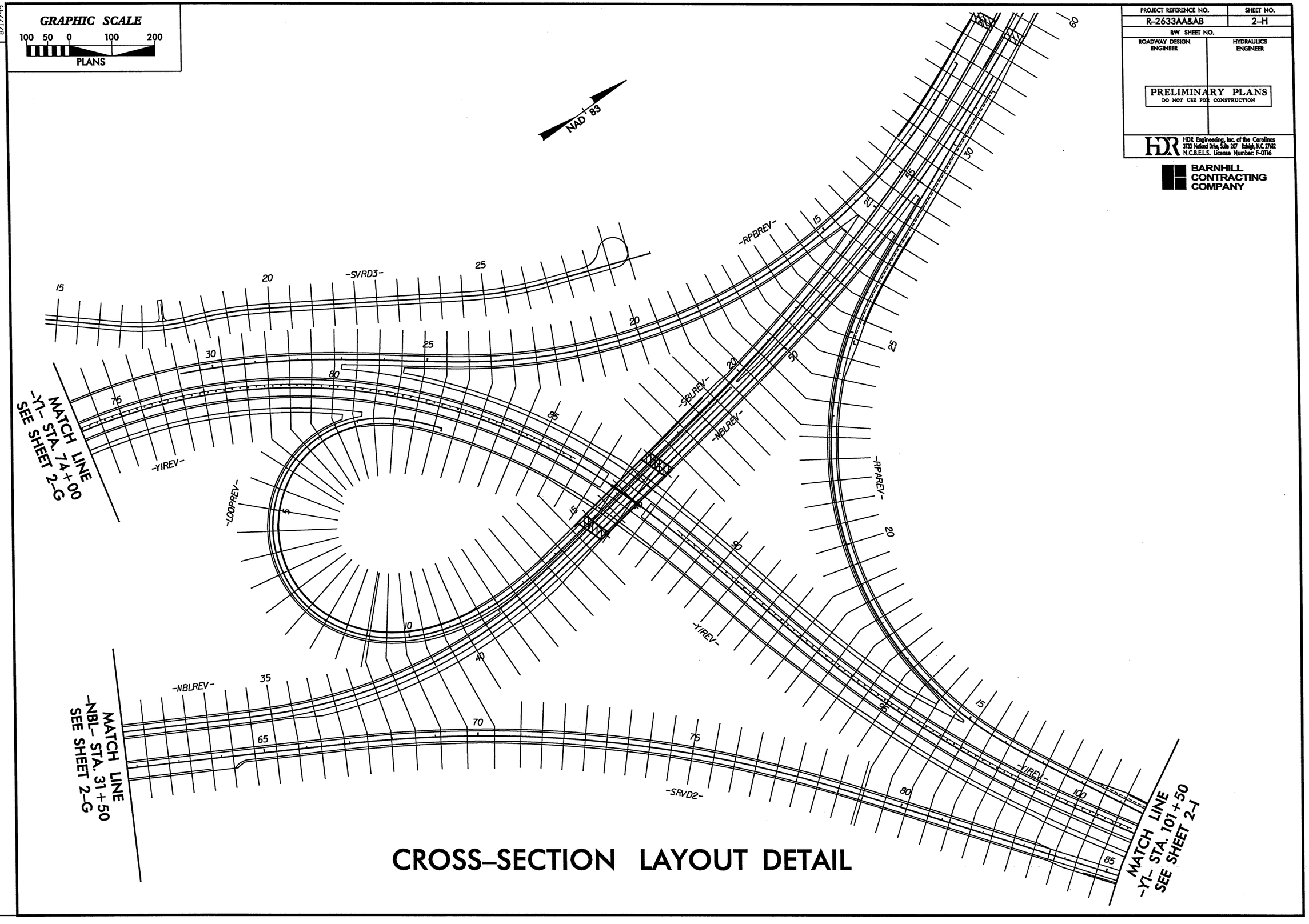
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY

GRAPHIC SCALE
100 50 0 100 200
PLANS

8/17/99



CROSS-SECTION LAYOUT DETAIL

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/9/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_XSC_LAYOUT.dgn

PENTABLE: NCDOT_pshpfl.tbl
TIME: 8:15:46 PM SCALE: 1:100

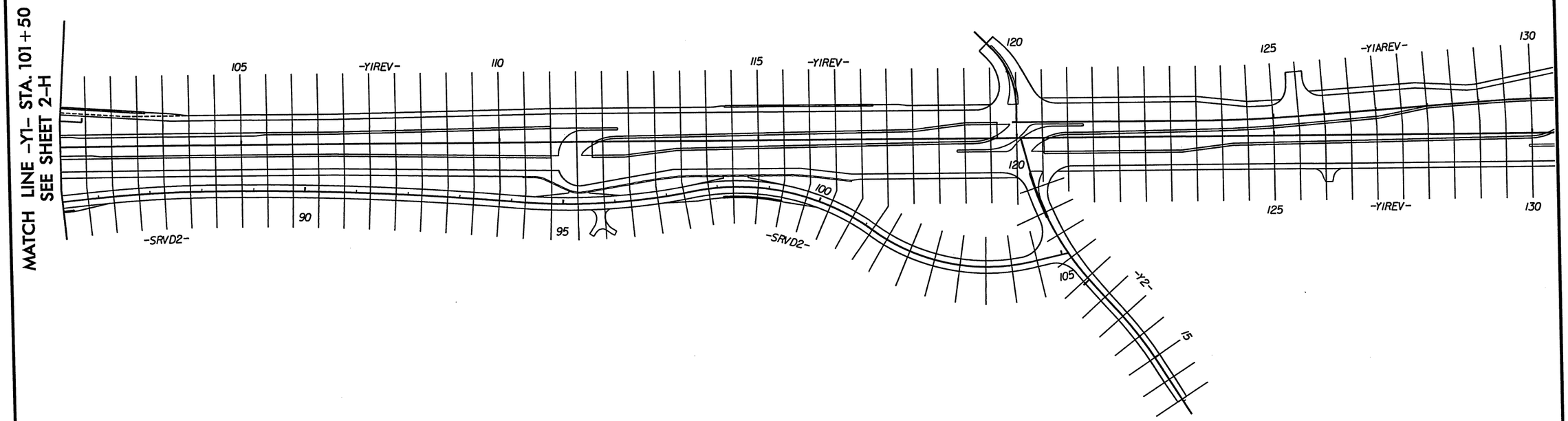
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-I
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



CROSS-SECTION LAYOUT DETAIL

GRAPHIC SCALE
100 50 0 100 200
PLANS

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl.tbl
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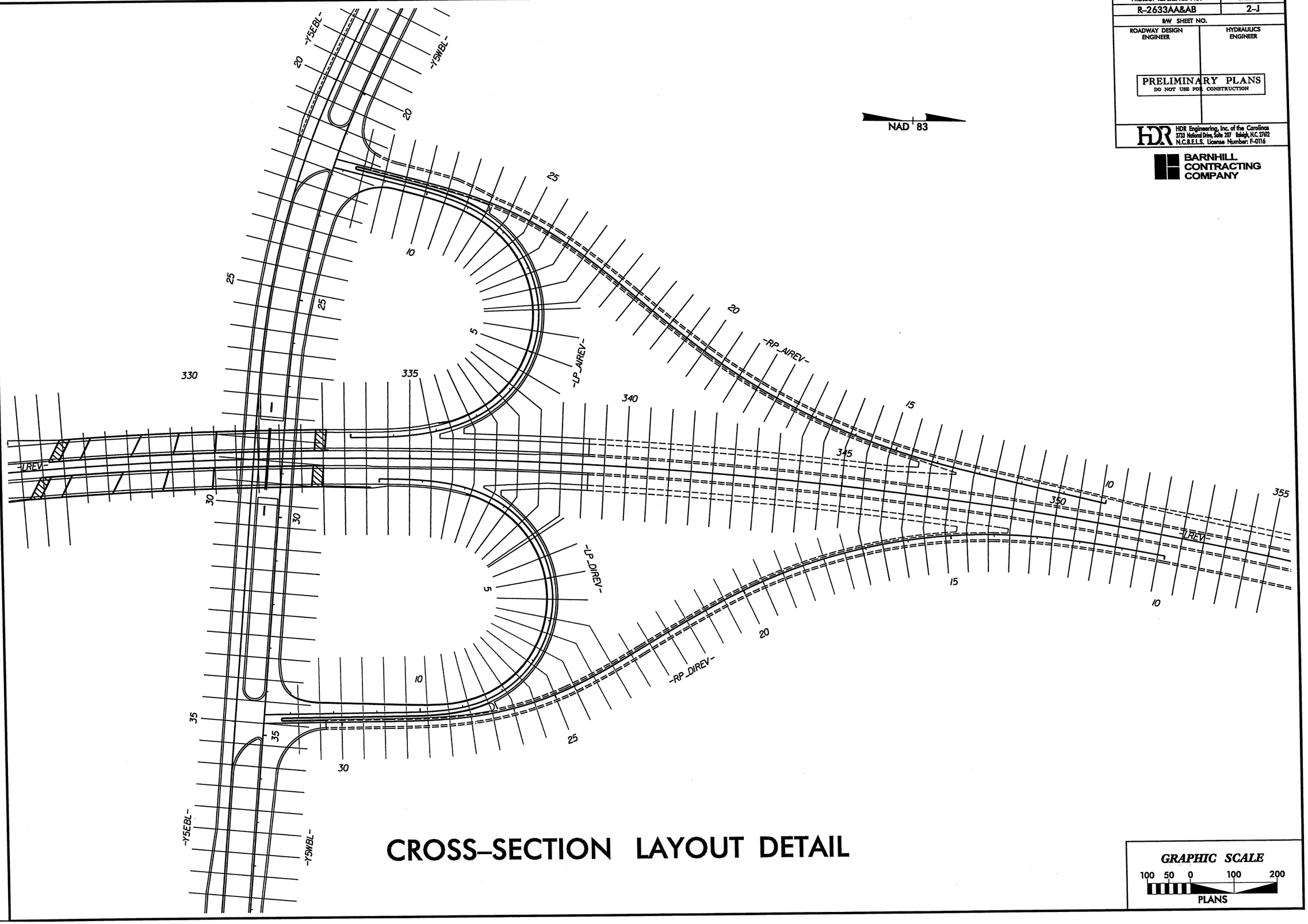
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



CROSS-SECTION LAYOUT DETAIL

GRAPHIC SCALE
100 50 0 100 200
PLANS

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/9/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_XSC_LAYOUT.dgn

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TIME: 8:15:56 PM SCALE: 1:100

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-K
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

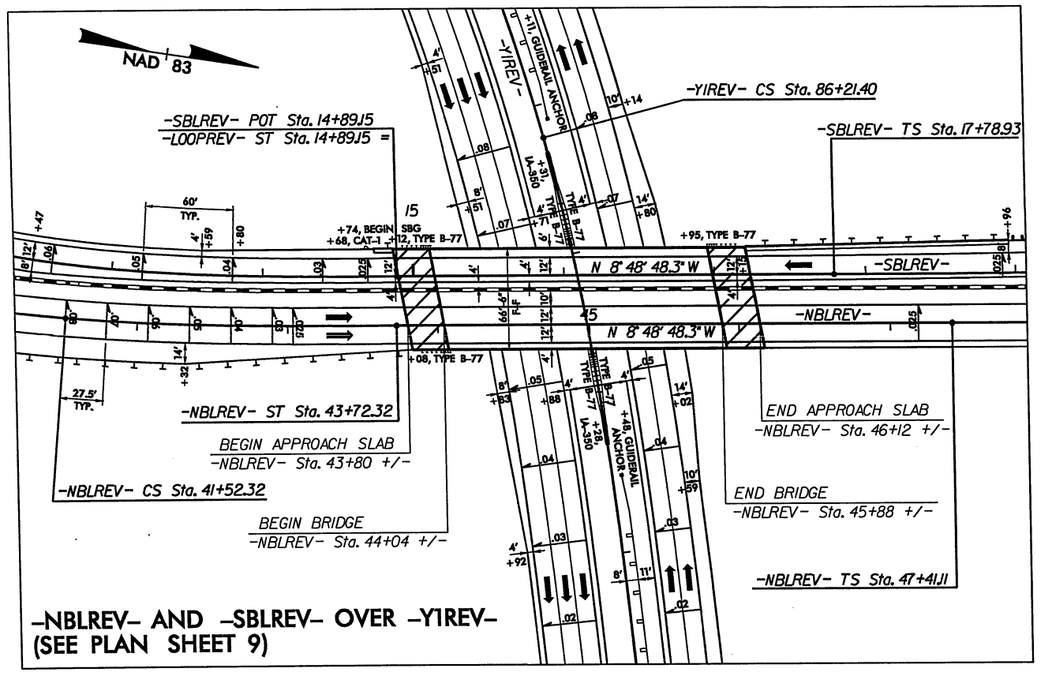
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

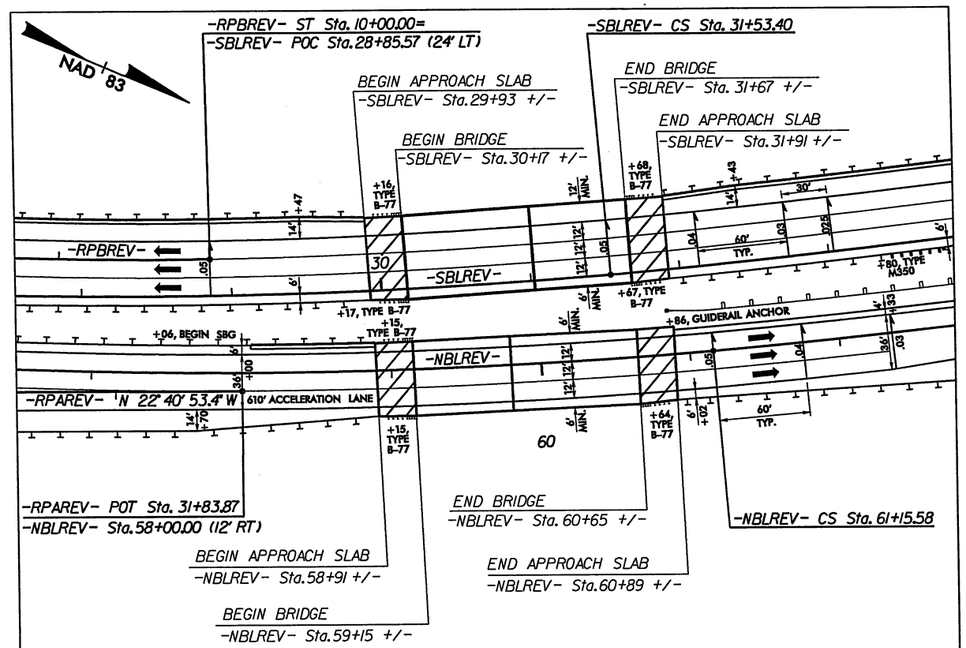
BARNHILL CONTRACTING COMPANY

8/17/99

REVISIONS

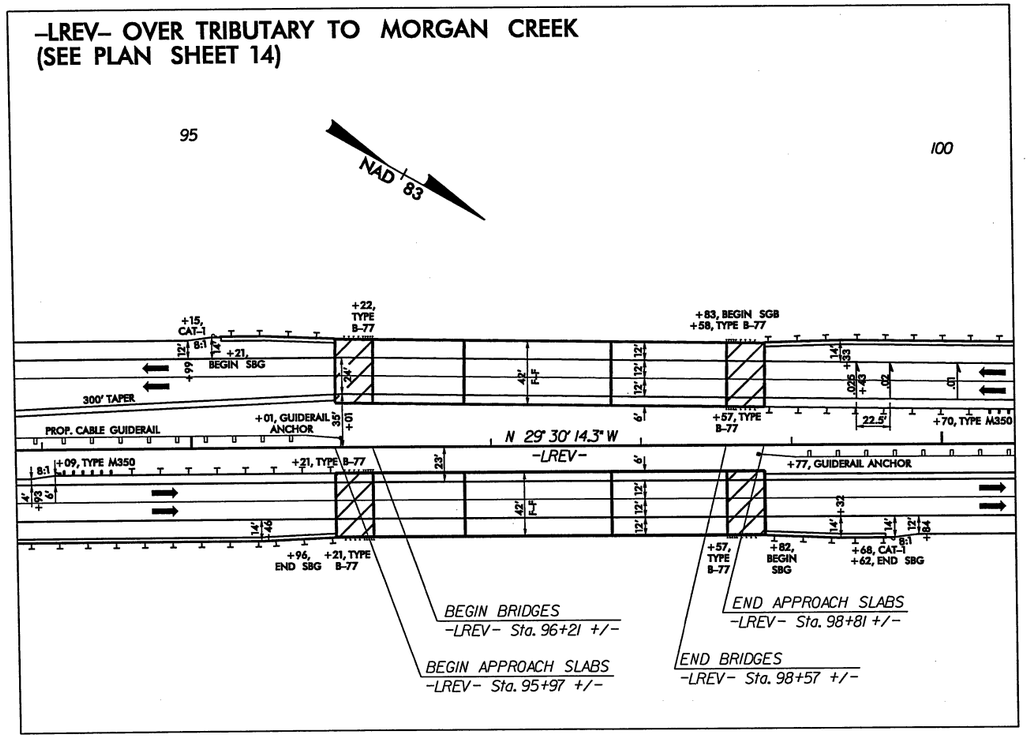


-NBLREV- AND -SBLREV- OVER -Y1REV- (SEE PLAN SHEET 9)



-NBLREV-			-SBLREV-		
PIs Sta 48+91.12	PI Sta 55+45.02	PIs Sta 62+15.60	PIs Sta 19+28.94	PI Sta 25+82.84	PIs Sta 32+53.42
θs = 1° 38' 54.7"	Δ = 16° 50' 38.3" (LT)	θs = 2° 11' 53.0"	θs = 1° 38' 54.7"	Δ = 16° 50' 38.3" (LT)	θs = 2° 11' 53.0"
Ls = 225.00'	D = 1° 27' 55.3"	Ls = 300.00'	Ls = 225.00'	D = 1° 27' 55.3"	Ls = 300.00'
LT = 150.01'	L = 1,149.47'	LT = 200.02'	LT = 150.01'	L = 1,149.47'	LT = 200.02'
ST = 75.01'	T = 578.91'	ST = 100.01'	ST = 75.01'	T = 578.91'	ST = 100.01'
	R = 3,910.00'			R = 3,910.00'	
	DS = 60 mph			DS = 60 mph	
	e = 0.05			e = 0.05	

-SBLREV- AND -NBLREV- OVER TRIBUTARY TO MORGAN CREEK (SEE PLAN SHEET 13)



-LREV- OVER TRIBUTARY TO MORGAN CREEK (SEE PLAN SHEET 14)

9/9/2010
R2633AA&AB_RDY_Structure_2_series_details.dgn
BARNHILL DM

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-L
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

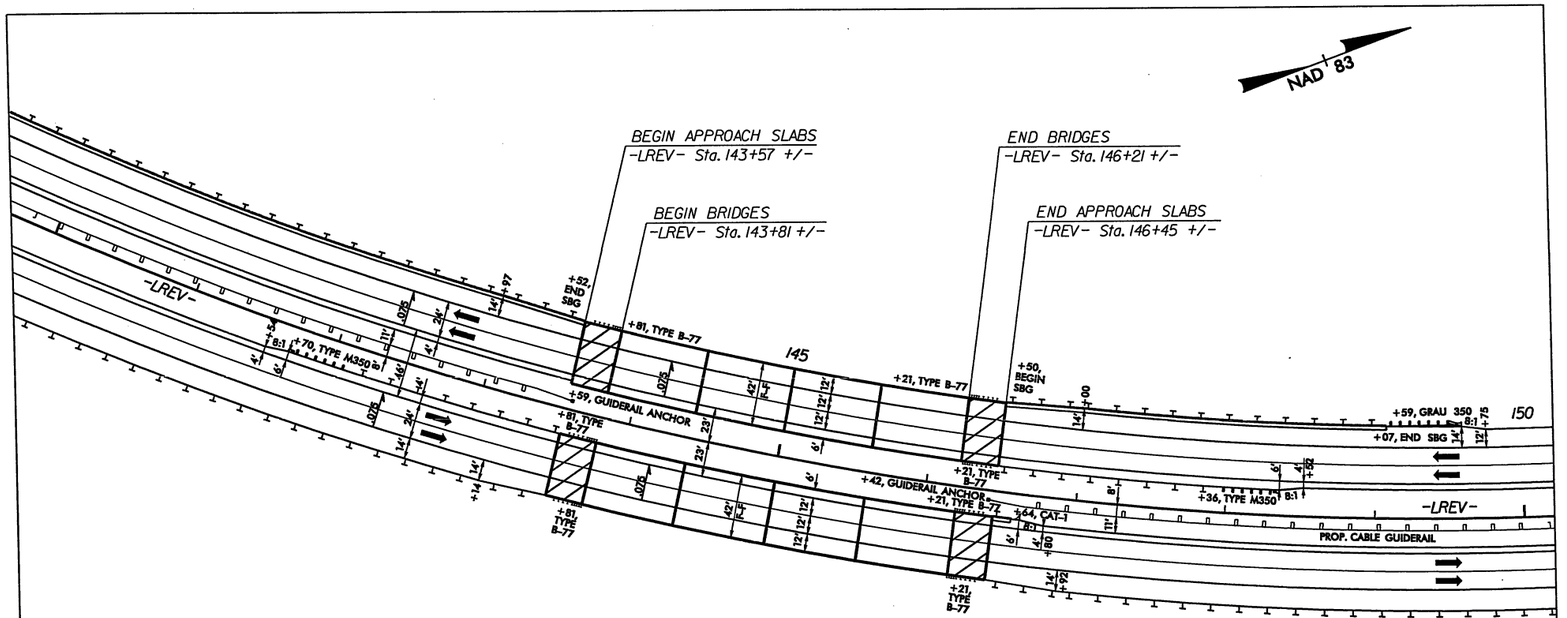
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY

8/17/99

REVISIONS



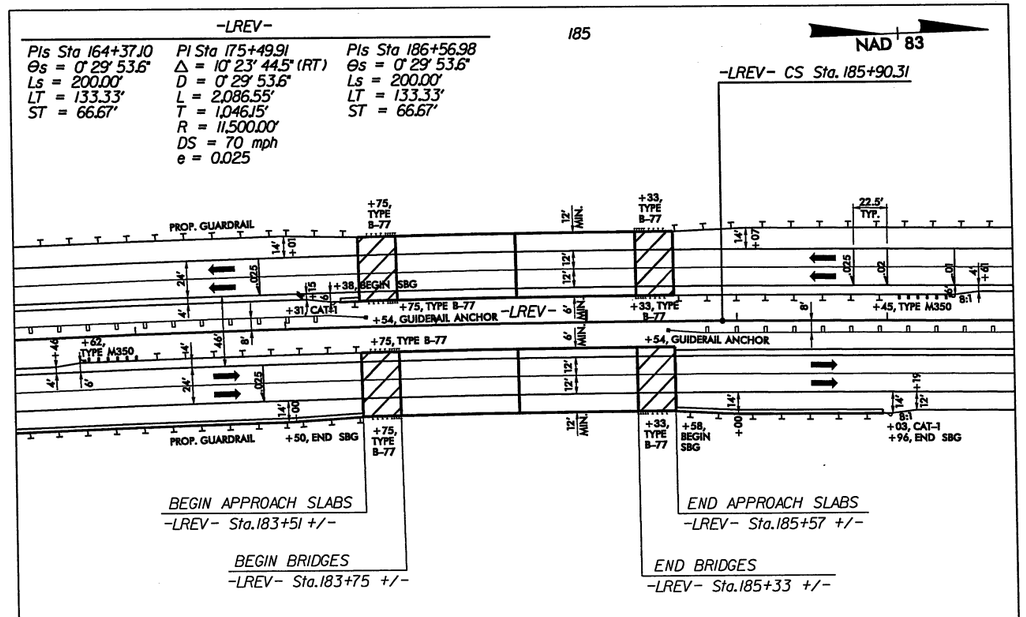
-LREV-

PIs Sta 137+13.31	PI Sta 149+76.83	PIs Sta 160+73.83
Θs = 4° 17' 49.9"	Δ = 53° 04' 26.4" (LT)	Θs = 4° 17' 49.9"
Ls = 345.00'	D = 2° 29' 28.0"	Ls = 345.00'
LT = 230.07'	L = 2,130.53'	LT = 230.07'
ST = 115.06'	T = 1,148.59'	ST = 115.06'
	R = 2,300.00'	
	DS = 70 mph	
	e = 0.075	

-LREV- OVER TRIBUTARY TO MORGAN CREEK
(SEE PLAN SHEET 18)

-LREV-

PIs Sta 164+37.10	PI Sta 175+49.91	PIs Sta 186+56.98
Θs = 0° 29' 53.6"	Δ = 10° 23' 44.5" (RT)	Θs = 0° 29' 53.6"
Ls = 200.00'	D = 0° 29' 53.6"	Ls = 200.00'
LT = 133.33'	L = 2,086.55'	LT = 133.33'
ST = 66.67'	T = 1,046.15'	ST = 66.67'
	R = 11,500.00'	
	DS = 70 mph	
	e = 0.025	



-LREV- OVER WILDLIFE CROSSING 1
(SEE PLAN SHEET 21)

9/9/2010
R2633AA&AB_RDY_Structure_2_series_details.dgn
8:16:21 PM

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-M
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

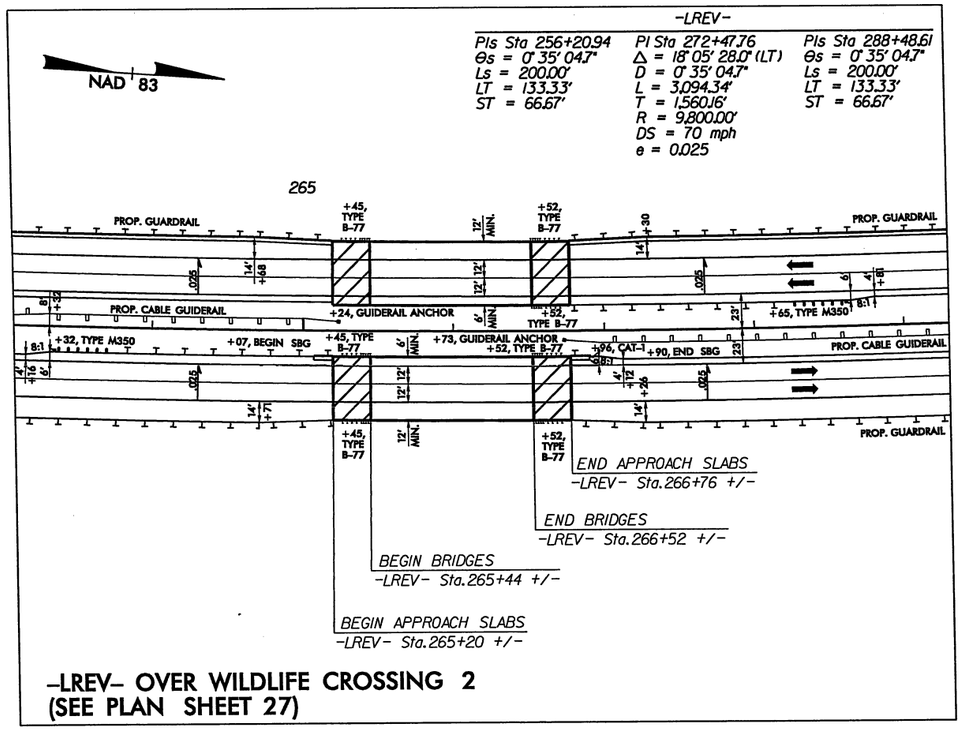
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

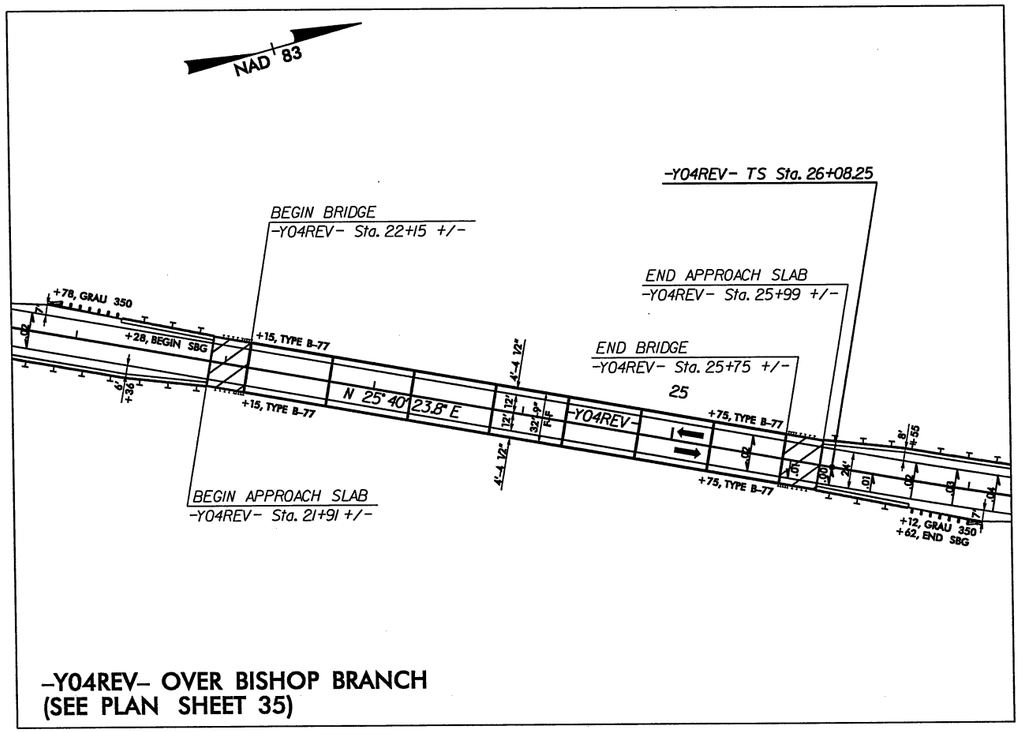
BARNHILL CONTRACTING COMPANY

REVISIONS

8/17/99



-LREV- OVER WILDLIFE CROSSING 2
(SEE PLAN SHEET 27)



-Y04REV- OVER BISHOP BRANCH
(SEE PLAN SHEET 35)

9/9/2010
R2633AA&AB_RDY_Structure_2_series_details.dgn
8:16:15 PM

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	2-N
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

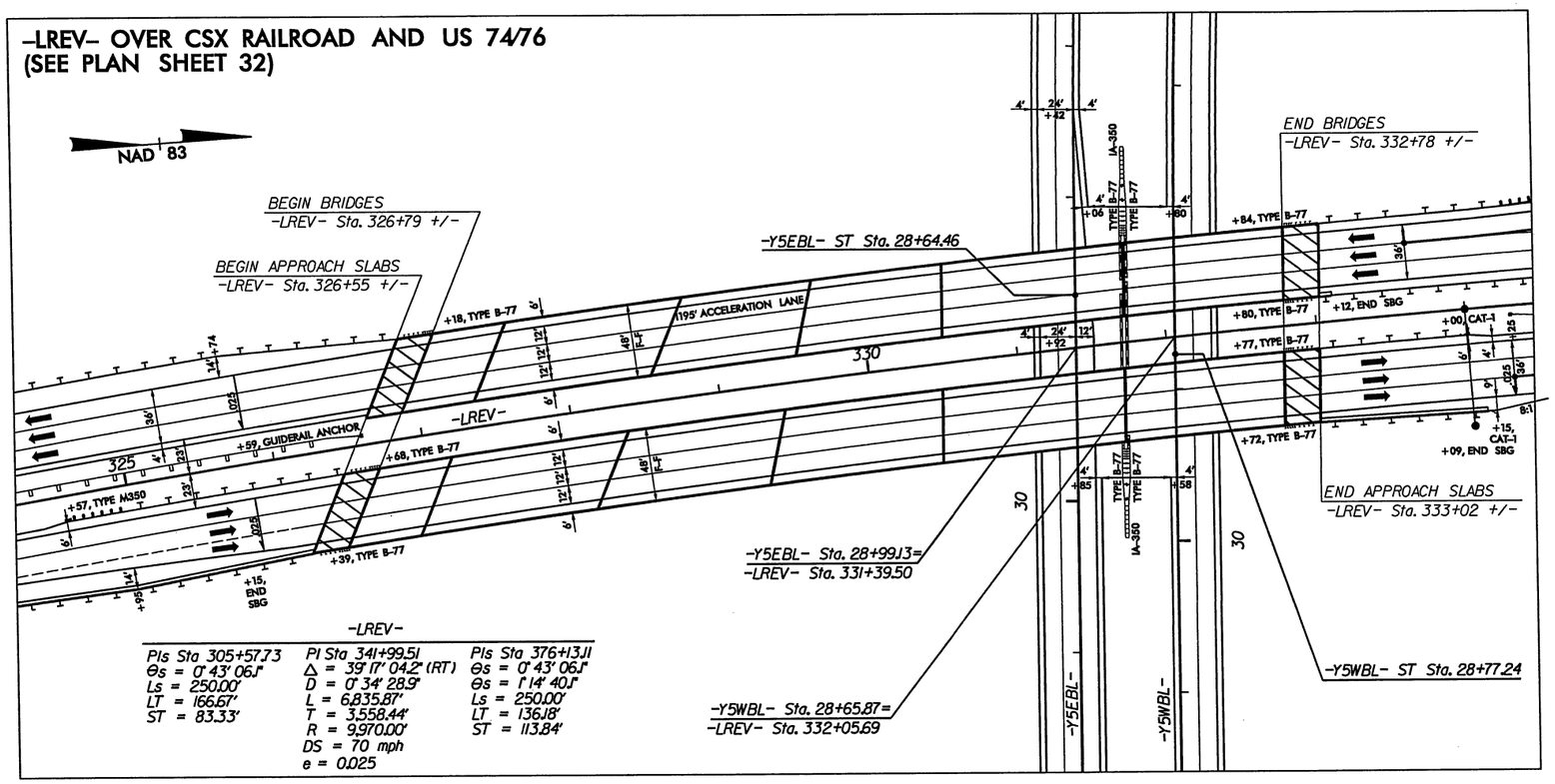
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY

REVISIONS 8/17/99

-LREV- OVER CSX RAILROAD AND US 74/76
(SEE PLAN SHEET 32)



-LREV-

PIs Sta 305+57.73	PI Sta 341+99.51	PIs Sta 376+13.11
Θs = 0° 43' 06.1"	Δ = 39° 17' 04.2" (RT)	Θs = 0° 43' 06.1"
Ls = 250.00'	D = 0° 34' 28.9"	Θs = 1° 14' 40.1"
LT = 166.67'	L = 6,835.87'	Ls = 250.00'
ST = 83.33'	T = 3,558.44'	LT = 136.18'
	R = 9,970.00'	ST = 113.84'
	DS = 70 mph	
	e = 0.025	

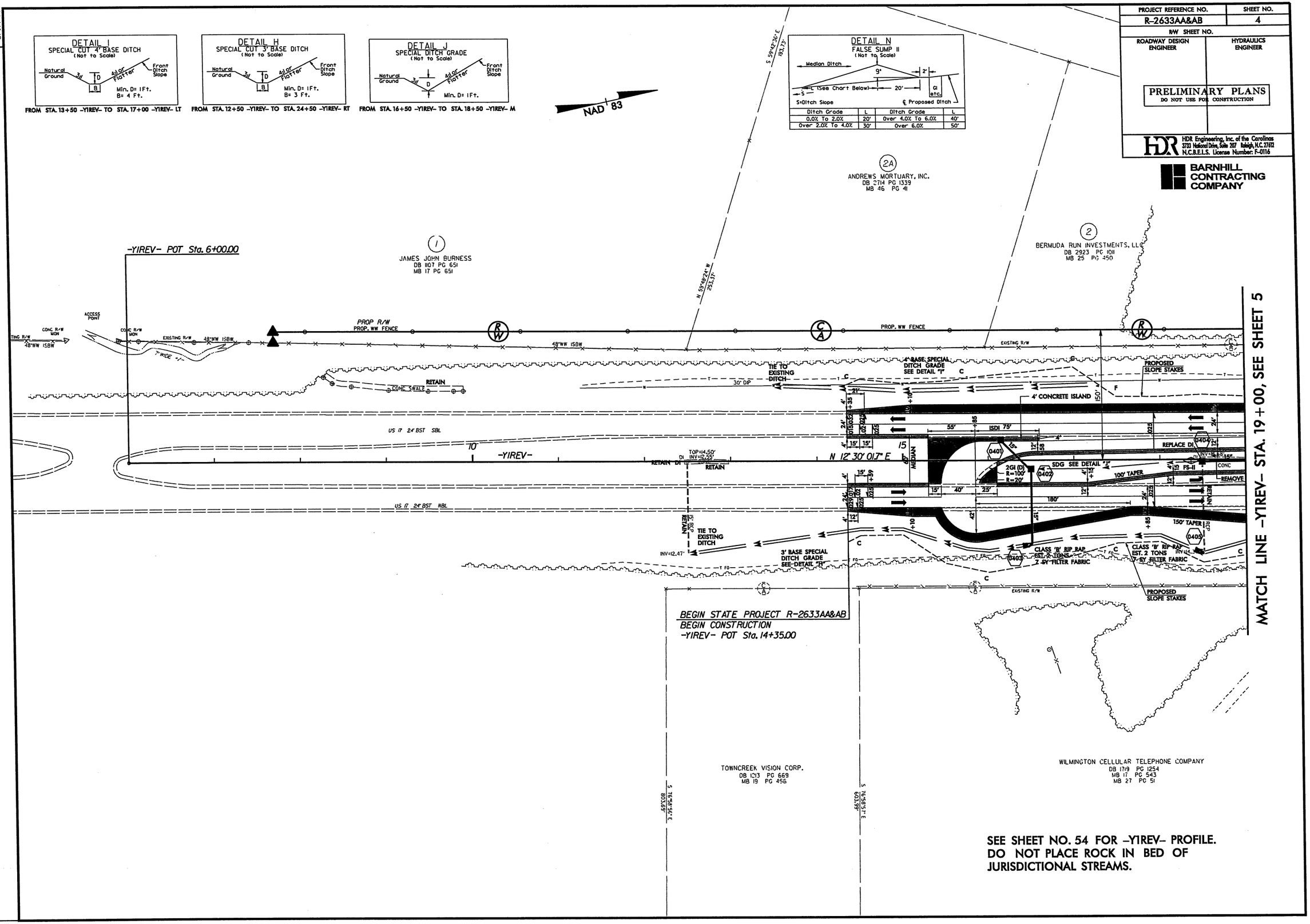
9/9/2010
R2633AA&AB_RDY_Structure_2_series_details.dgn
jjiang

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 54 FOR -YIREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

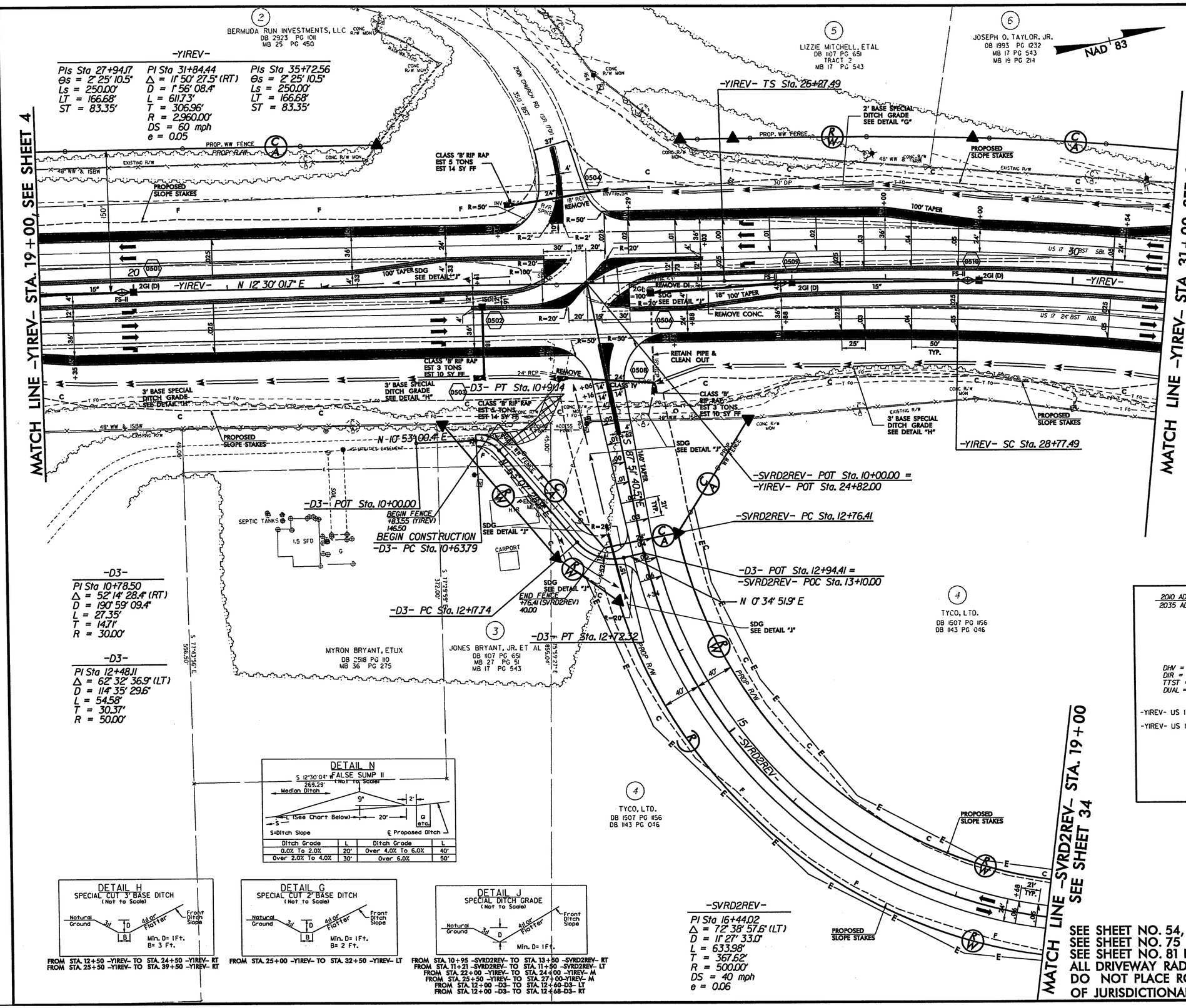
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:04:46 AM
DATE: 9/13/2010
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 54, 55 FOR -YIREV- PROFILE.
SEE SHEET NO. 75 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 81 FOR -D3- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
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DATE: 9/13/2010
TIME: 11:04:54 AM
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

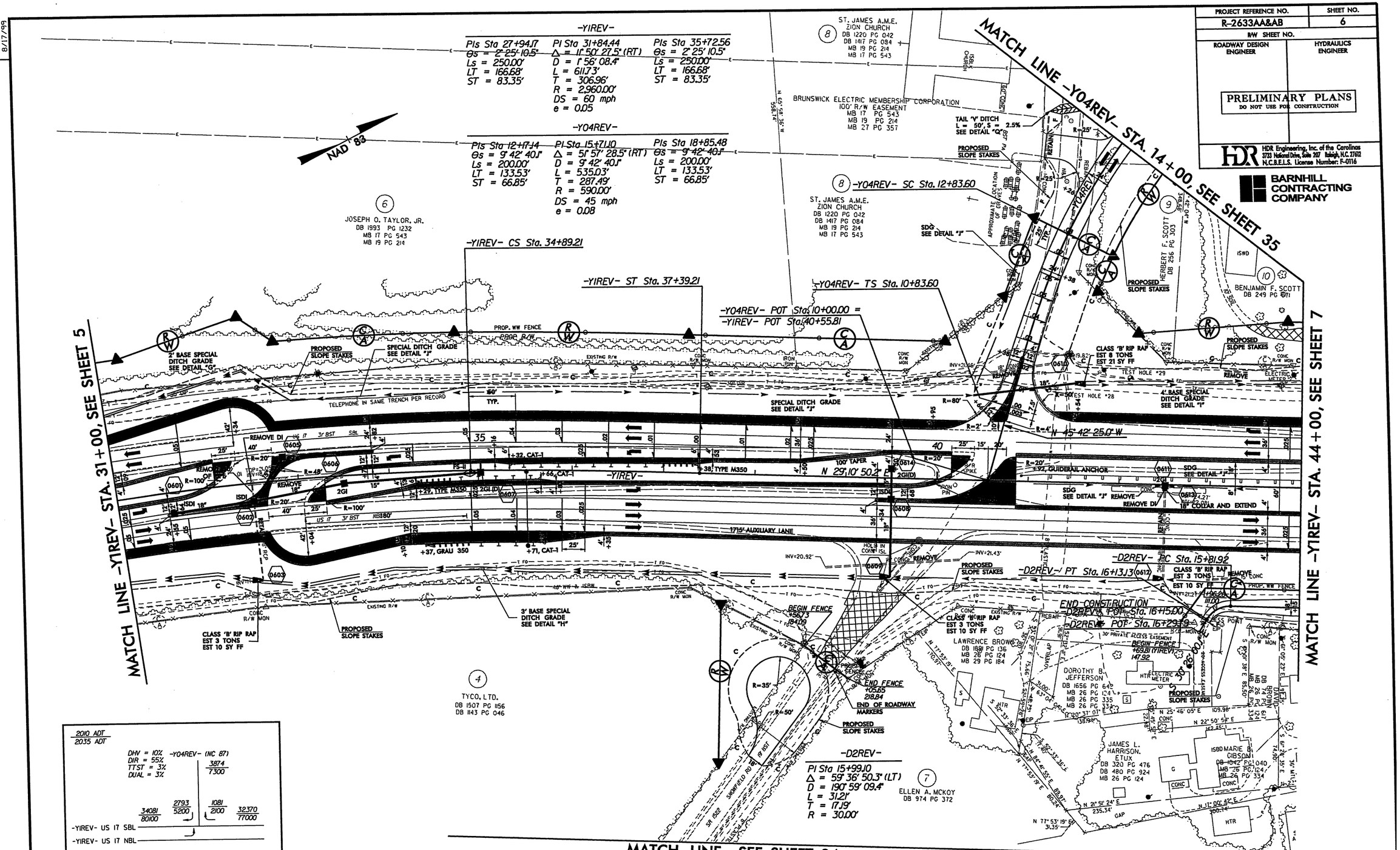
BARNHILL CONTRACTING COMPANY

-YIREV-

PIs Sta 27+94.17	PI Sta 31+84.44	PIs Sta 35+72.56
Θs = 2° 25' 10.5"	Δ = 11° 50' 27.5" (RT)	Θs = 2° 25' 10.5"
Ls = 250.00'	D = 1° 56' 08.4"	Ls = 250.00'
LT = 166.68'	L = 611.73'	LT = 166.68'
ST = 83.35'	T = 306.96'	ST = 83.35'
	R = 2,960.00'	
	DS = 60 mph	
	e = 0.05	

-Y04REV-

PIs Sta 12+17.14	PI Sta 15+71.10	PIs Sta 18+85.48
Θs = 9° 42' 40.1"	Δ = 51° 57' 28.5" (RT)	Θs = 9° 42' 40.1"
Ls = 200.00'	D = 9° 42' 40.1"	Ls = 200.00'
LT = 133.53'	L = 535.03'	LT = 133.53'
ST = 66.85'	T = 287.49'	ST = 66.85'
	R = 590.00'	
	DS = 45 mph	
	e = 0.08	



2010 ADT / 2035 ADT		
DHV = 10%	-Y04REV- (NC 87)	
DIR = 55%	3874 / 7300	
TTST = 3%		
DUAL = 3%		
-YIREV- US 17 SBL	34081 / 80100	2793 / 5200
-YIREV- US 17 NBL	1081 / 2100	32370 / 77000

DHV = 9%
DIR = 55%
TTST = 10%
DUAL = 5%

SEE SHEET NO. 55, 56 FOR -YIREV- PROFILE.
SEE SHEET NO. 68 FOR -Y04REV- PROFILE.
SEE SHEET NO. 80 FOR -D2REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL Q
STANDARD "V" TAIL DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground
Min. D= 1Ft.
FROM STA. 13+82 -Y04REV- TO STA. 14+14 -Y04REV- LT

DETAIL J
SPECIAL DITCH GRADE
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1Ft.
FROM STA. 32+50 -YIREV- TO STA. 35+00 -YIREV- LT
FROM STA. 35+00 -YIREV- TO STA. 40+50 -YIREV- LT
FROM STA. 39+50 -YIREV- TO STA. 44+50 -YIREV- RT
FROM STA. 10+88 -Y04REV- TO STA. 12+50 -Y04REV- LT

DETAIL G
SPECIAL CUT 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D= 1Ft.
B= 2 Ft.
FROM STA. 25+00 -YIREV- TO STA. 32+50 -YIREV- LT

DETAIL H
SPECIAL CUT 3' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D= 1Ft.
B= 3 Ft.
FROM STA. 25+50 -YIREV- TO STA. 39+50 -YIREV- RT

DETAIL I
SPECIAL CUT 4' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D= 1Ft.
B= 4 Ft.
FROM STA. 41+50 -YIREV- TO STA. 52+50 -YIREV- LT

DETAIL N
FALSE SUMP II
(Not to Scale)
Median Ditch, 9', 2', 20', a etc., S, L (See Chart Below), ℄ Proposed Ditch
S=Ditch Slope

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'

8/17/99

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:05:06 AM SCALE: 1:50
USER: dwalnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt

REVISIONS

ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
SEE SHEET NO. 40 FOR –NBLREV– PROFILE.
SEE SHEET NO. 75, 76 FOR –SVRD2REV– PROFILE.
SEE SHEET NO. 55, 56, 57 FOR –Y1REV– PROFILE.
SEE SHEET NO. 63 FOR –Y3– PROFILE.
SEE SHEET NO. 80 FOR –D2REV– PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL I
SPECIAL CUT 4' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope, B
Min. D= 1Ft.
B= 4 Ft.
FROM STA. 41+50 –Y1REV– TO STA. 52+50 –Y1REV– LT

DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, r/Ft., Fill Slope, B
Min. D= 1Ft.
B= 2 Ft.
b= 5 Ft.
FROM STA. 54+30 –Y1REV– TO STA. 56+50 –Y1REV– LT

DETAIL J
SPECIAL DITCH GRADE
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1Ft.
FROM STA. 44+50 –Y1REV– TO STA. 48+00 –Y1REV– RT
FROM STA. 48+00 –Y1REV– TO STA. 48+50 –Y1REV– M
FROM STA. 49+50 –Y1REV– TO STA. 50+50 –Y1REV– RT
FROM STA. 34+00 –SVRD2REV– TO STA. 38+55 –SVRD2REV– LT
FROM STA. 38+54 –SVRD2REV– TO STA. 39+02 –SVRD2REV– RT

DETAIL E
2' LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, r/Ft., Fill Slope, dI, Filter Fabric, B
Min. D= 1Ft.
Max. dI= 1Ft.
B= 2 Ft.
b= 5 Ft.
*When B Is < 6.0'
Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 52+00 –Y1REV– TO STA. 53+50 –Y1REV– RRT

DETAIL G
SPECIAL CUT 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope, B
Min. D= 1Ft.
B= 2 Ft.
FROM STA. 50+00 –Y1REV– TO STA. 52+00 –Y1REV– RRT

DETAIL F
MEDIAN DITCH
(Not to Scale)
Shoulder Point, 4:1 or Flatter, D, 4:1 or Flatter, Shoulder Point
Min. D= 1Ft.
FROM STA. 43+50 –Y1REV– TO STA. 48+00 –Y1REV– M

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, r/Ft., Fill Slope
Min. D= 1Ft.
b= 5 Ft.
FROM STA. 48+00 –Y1REV– TO STA. 49+50 –Y1REV– RT

DETAIL EE
STREAM RESTORATION
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground, B
Min. D= 1Ft.
B= 10 Ft.
STA. 53+00 –Y1REV– LT

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

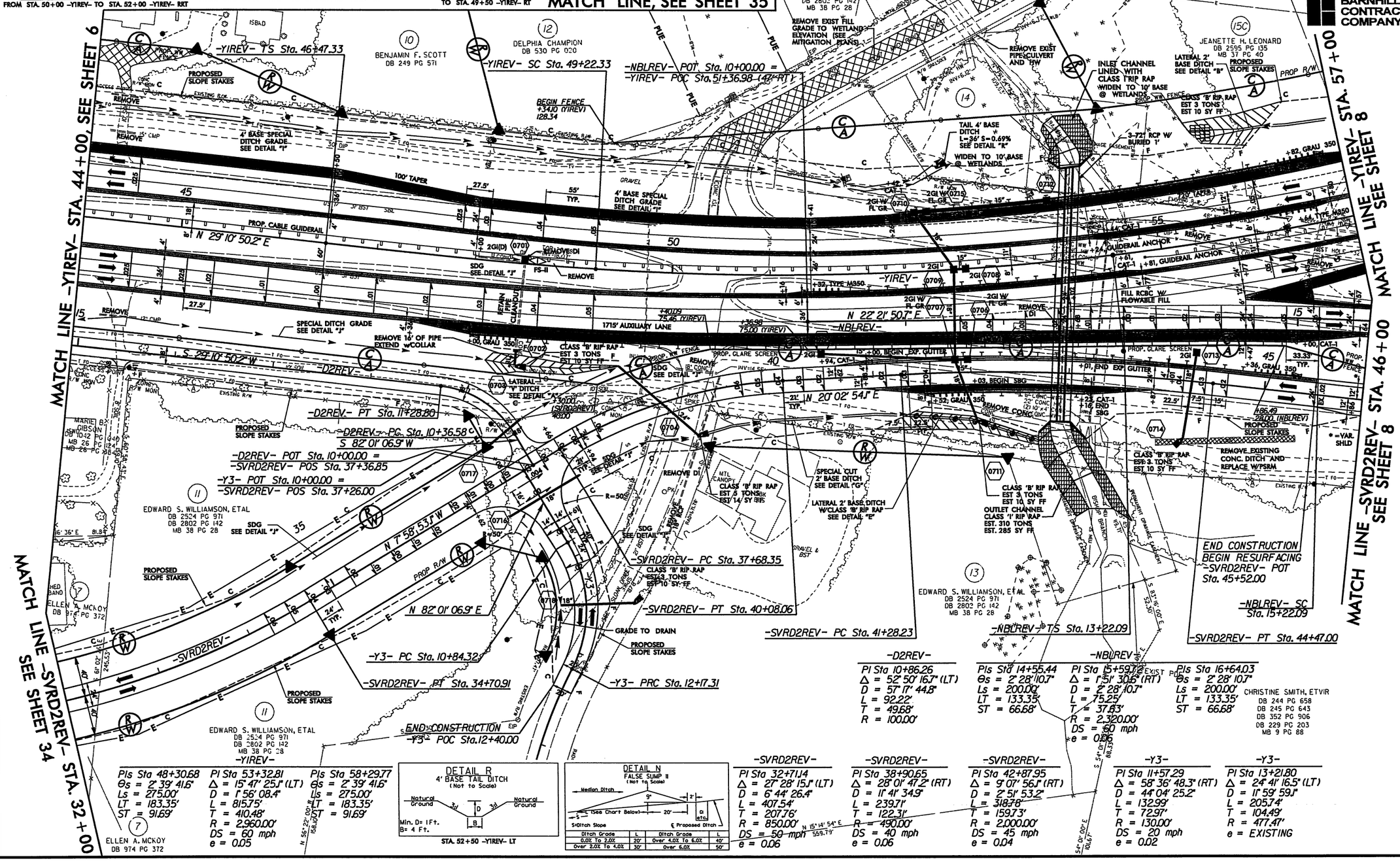
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

NAD '83

MATCH LINE, SEE SHEET 35

SEE SHEET 36



–D2REV–
PI Sta 10+86.26
Δ = 52° 50' 16.7" (LT)
D = 57° 11' 44.8"
L = 92.22'
T = 49.68'
R = 100.00'

–NBLREV–
PIs Sta 14+55.44
Θs = 2° 28' 10.7"
Ls = 200.00'
LT = 133.35'
ST = 66.68'

PI Sta 15+59.72
Δ = 1° 51' 30.6" (RT)
D = 2° 28' 10.7"
L = 75.25'
T = 37.63'
R = 2,320.00'
DS = 60 mph
e = 0.06

PIs Sta 16+64.03
Θs = 2° 28' 10.7"
Ls = 200.00'
LT = 133.35'
ST = 66.68'

–Y1REV–
PIs Sta 48+30.68
Θs = 2° 39' 41.6"
Ls = 275.00'
LT = 183.35'
ST = 91.69'

PI Sta 53+32.81
Δ = 15° 47' 25.1" (LT)
D = 1° 56' 08.4"
L = 815.75'
T = 410.48'
R = 2,960.00'
DS = 60 mph
e = 0.05

PIs Sta 58+29.77
Θs = 2° 39' 41.6"
Ls = 275.00'
LT = 183.35'
ST = 91.69'

DETAIL R
4' BASE TAIL DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground, B
Min. D= 1Ft.
B= 4 Ft.
STA. 52+50 –Y1REV– LT

DETAIL N
FALSE SUMP II
(Not to Scale)
Median Ditch, 9', 2', (See Chart Below), 20', Q, etc., S=Ditch Slope, ℄ Proposed Ditch

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'

–SVRD2REV–
PI Sta 32+71.14
Δ = 27° 28' 15.1" (LT)
D = 6° 44' 26.4"
L = 407.54'
T = 207.76'
R = 850.00'
DS = 50 mph
e = 0.06

–SVRD2REV–
PI Sta 38+90.65
Δ = 28° 01' 47.2" (RT)
D = 11° 41' 34.9"
L = 239.71'
T = 122.31'
R = 490.00'
DS = 40 mph
e = 0.06

–SVRD2REV–
PI Sta 42+87.95
Δ = 9° 07' 56.1" (RT)
D = 2° 51' 53.2"
L = 318.78'
T = 159.73'
R = 2,000.00'
DS = 45 mph
e = 0.04

–Y3–
PI Sta 11+57.29
Δ = 58° 36' 48.3" (RT)
D = 44° 04' 25.2"
L = 132.99'
T = 72.97'
R = 130.00'
DS = 20 mph
e = 0.02

–Y3–
PI Sta 13+21.80
Δ = 24° 41' 16.5" (LT)
D = 11° 59' 59.1"
L = 205.74'
T = 104.49'
R = 477.47'
e = EXISTING

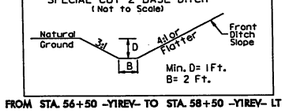
REVISIONS
8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Pro\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:05:22 AM
DATE: 9/13/2010
SCALE: 1:50

8/17/99

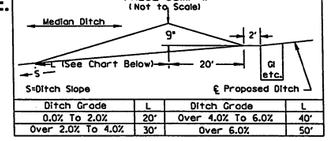
SEE SHEET NO. 57, 58 FOR -Y1REV- PROFILE.
SEE SHEET NO. 76 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 40 FOR -NBLREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL G
SPECIAL CUT 2' BASE DITCH
(Not to Scale)



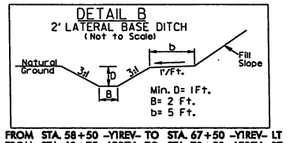
FROM STA. 56+50 -Y1REV- TO STA. 58+50 -Y1REV- LT

DETAIL N
FALSE SUMP II
(Not to Scale)



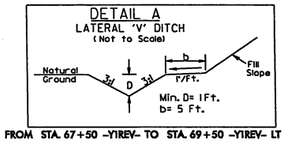
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)



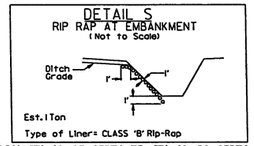
FROM STA. 58+50 -Y1REV- TO STA. 67+50 -Y1REV- LT
FROM STA. 63+75 -Y1REV- TO STA. 70+50 -Y1REV- RT

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)



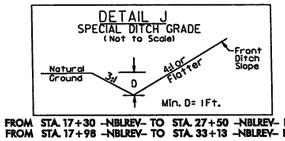
FROM STA. 67+50 -Y1REV- TO STA. 69+50 -Y1REV- LT

DETAIL S
RIP RAP AT EMBANKMENT
(Not to Scale)



FROM STA. 60+05 -Y1REV- TO STA. 60+30 -Y1REV- LT
FROM STA. 62+50 -Y1REV- TO STA. 62+75 -Y1REV- LT
FROM STA. 67+20 -Y1REV- TO STA. 67+50 -Y1REV- LT

DETAIL J
SPECIAL DITCH GRADE
(Not to Scale)



FROM STA. 17+30 -NBLREV- TO STA. 27+50 -NBLREV- LT
FROM STA. 17+98 -NBLREV- TO STA. 33+13 -NBLREV- RT

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

MATCH LINE, SEE SHEET 36

MATCH LINE -Y1REV- STA. 57+00, SEE SHEET 7

MATCH LINE -Y1REV- STA. 69+00, SEE SHEET 9

MATCH LINE -SVRD2REV- STA. 46+00, SEE SHEET 7

MATCH LINE -NBLREV- STA. 27+50, SEE SHEET 9

BRUNSWICK ELECTRIC MEMBERSHIP CORPORATION
100' R/W EASEMENT
MB 27 PG 357

HARRY D. HEWETT
MB 37 PG 40
DB 2589 PG 136

PHILLIPS NURSERY, INC.
DB 864 PG 997
DB 711 PG 362

WILBUR E. RABON, ETUX
DB 190 PG 370
SD-76-CVS-298
DB 1271 PG 1204
MB 0 PG 125
MB 35 PG 270
DB 1111 PG 587
DB 522 PG 240

-Y1REV- ST Sta. 60+13.08
-Y1REV- CS Sta. 57+38.08
PROPOSED SLOPE STAKES
PROP. WW FENCE
2' BASE SPECIAL DITCH GRADE SEE DETAIL "G"
BERNICE H. GRANT
DB 2595 PG 115
MB 37 PG 40
CLASS 'B' RIP RAP EST 5 TONS EST 14 SY FF
RIP RAP AT EMBANKMENT SEE DETAIL "S"
LATERAL 2' BASE DITCH SEE DETAIL "B"
CLASS 'B' RIP RAP EST 5 TONS EST 14 SY FF
RIP RAP AT EMBANKMENT SEE DETAIL "S"
LATERAL 2' BASE DITCH SEE DETAIL "B"
LATERAL 'V' DITCH SEE DETAIL "A"
PROP. R/W
REMOVE
RETAIN
300' TAPER
720' TAPER
2500' AUXILIARY LANE
PROP. CABLE GUIDERAIL
16:1 TAPER
-Y1REV-
N 8°04'020" E
55' TYP.
27.5'
150'
CLASS 'B' RIP RAP @ RIP RAP TIE IN
DAVID A. PHILLIPS
DB 1869 PG 958
SDG SEE DETAIL "J"
NCDOT (FORMERLY DONALD M. SELLERS, ETUX)
DB 5053 PG 267
ROQUE R. LUGO ETUX
DB 1271 PG 1204
DB 2413 PG 358
MB 35 PG 270
-SVRD2REV-
-NBLREV-
-NBLREV- CS Sta. 15+97.35
-NBLREV- ST Sta. 17+97.35
RESURFACING ONLY
N 29°09'42.8" E
N 29°10'50.2" E
CHRISTINE SMITH, ETVIR
DB 244 PG 658
DB 245 PG 643
DB 352 PG 906
DB 229 PG 203
MB 9 PG 88
ENNIS BECK, ETUX
DB 268 PG 899
MB 9 PG 88
WARREN F. MINTZ, ETUX
DB 389 PG 764
MB 9 PG 88
BEVERLY A. MERCER
DB 935 PG 538
DB 338 PG 735
MB 9 PG 88
ALVIN B. MERCER
DB 337 PG 334
DB 1173 PG 910
MB 9 PG 88
MB 19 PG 83
BRENDA L. MERCER
DB 1173 PG 912
DB 377 PG 875
MB 9 PG 88
MB 19 PG 83
MB H PG 155
BONNIE L. MERCER
DB 914 PG 116
MB 9 PG 88
MB H PG 155
*=VAR. SHLD

-NBLREV-

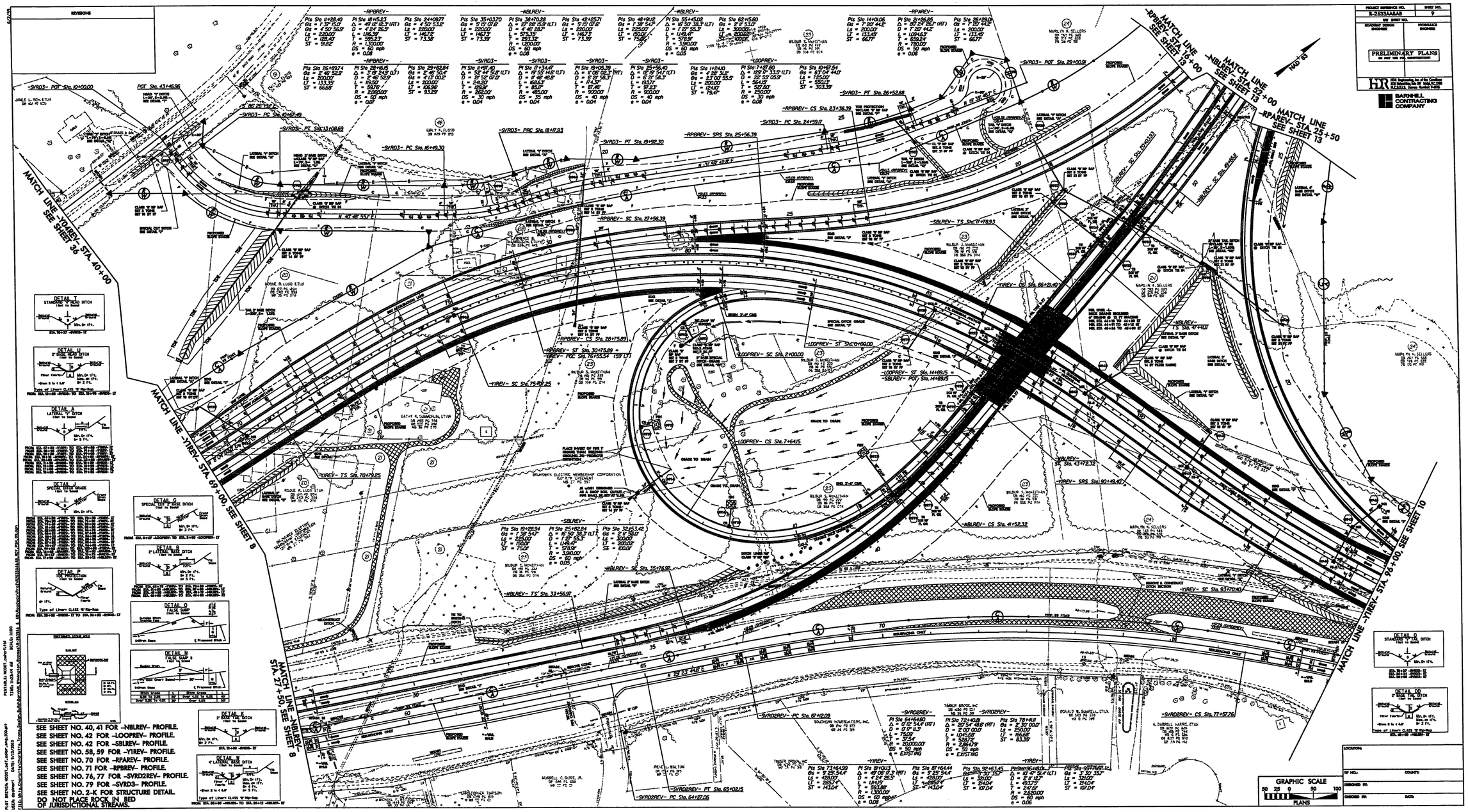
PIs Sta 14+55.44	PI Sta 15+59.72	PIs Sta 16+64.03
Θs = 2° 28' 10.7"	Δ = 1° 51' 30.6" (RT)	Θs = 2° 28' 10.7"
Ls = 200.00'	D = 2° 28' 10.7"	Ls = 200.00'
LT = 133.35'	L = 75.25'	LT = 133.35'
ST = 66.68'	T = 37.63'	ST = 66.68'
	R = 2,320.00'	
	DS = 60 mph	
	e = 0.06	

-Y1REV-

PIs Sta 48+30.68	PI Sta 53+32.81	PIs Sta 58+29.78
Θs = 2° 39' 41.6"	Δ = 15° 47' 25.1" (LT)	Θs = 2° 39' 41.6"
Ls = 275.00'	D = 1° 56' 08.4"	Ls = 275.00'
LT = 183.35'	L = 815.75'	LT = 183.35'
ST = 91.69'	T = 410.48'	ST = 91.69'
	R = 2,960.00'	
	DS = 60 mph	
	e = 0.05	

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:05:39 AM
DATE: 9/13/2010
SCALE: 1:50

REVISIONS

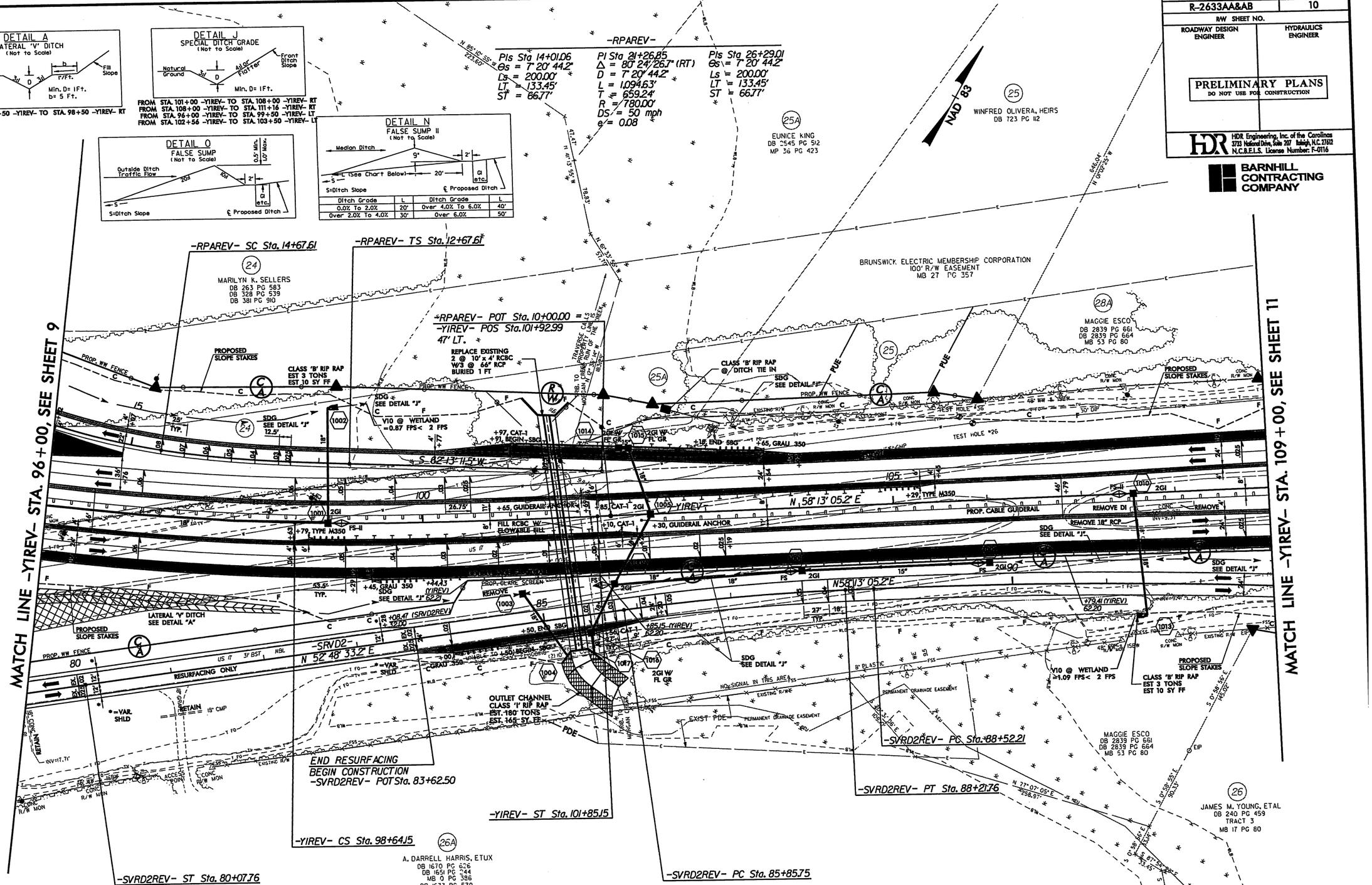

REVISIONS
PROJECT REFERENCE NO.
R-2633AAAAB
SHEET NO.
9
MY SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULIC ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HR
BARNHILL CONTRACTING COMPANY
MATCH LINE -YDREV- STA. 40+00 SEE SHEET 38
MATCH LINE -YREV- STA. 69+00 SEE SHEET 8
MATCH LINE -YREV- STA. 77+50 SEE SHEET 8
MATCH LINE -YREV- STA. 96+00 SEE SHEET 10
MATCH LINE -RPAREV- STA. 14+00 SEE SHEET 13
MATCH LINE -NBLREV- STA. 5+00 SEE SHEET 13
MATCH LINE -RPAREV- STA. 25+50 SEE SHEET 13
NORTH
DETAIL T STANDARD "V" ROAD DITCH
DETAIL U 2' BASIC ROAD DITCH
DETAIL A LATERAL "V" DITCH
DETAIL J SPECIAL DITCH GRADE
DETAIL G SPECIAL "UT" TO BASE DITCH
DETAIL L 2' LATERAL BASE DITCH
DETAIL P TOE PROTECTION
DETAIL O FALSE SUMP
DETAIL N FALSE SUMP B
DETAIL K 2' BASE TRI. DITCH
DETAIL W 4' LATERAL BASE DITCH
DETAIL Q STANDARD "U" TRI. DITCH
DETAIL QQ 2' BASE TRI. DITCH
SEE SHEET NO. 40, 41 FOR -NBLREV- PROFILE.
SEE SHEET NO. 42 FOR -LOOPREV- PROFILE.
SEE SHEET NO. 42 FOR -SBLREV- PROFILE.
SEE SHEET NO. 58, 59 FOR -YIREV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
SEE SHEET NO. 71 FOR -RPBREV- PROFILE.
SEE SHEET NO. 76, 77 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 79 FOR -SVRD3- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
GRAPHIC SCALE
50 25 0 50 100
PLANS
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



-SVRD2REV-

PI Sta 72+40.81	PIs Sta 78+41.11
Δ = 20° 54' 48.6" (RT)	Θs = 2° 30' 00.0"
D = 2° 00' 00.0"	Ls = 250.00'
L = 1,045.68'	LT = 166.68'
T = 528.72'	ST = 83.35'
R = 2,864.79'	
DS = 50 mph	
e = EXISTING	

-SVRD2REV-

PI Sta 87+03.84
Δ = 5° 24' 32.0" (RT)
D = 2° 17' 30.6"
L = 236.01'
T = 118.09'
R = 2,500.00'
DS = 50 mph
e = 0.05

-SVRD2REV-

PI Sta 91+31.73
Δ = 5° 14' 19.3" (RT)
D = 0° 56' 15.9"
L = 558.65'
T = 279.52'
R = 6,110.00'
DS = 50 mph
e = 0.03

-YIREV-

PIs Sta 92+63.45	PI Sta 96+18.01	PIs Sta 99+71.19
Θs = 3° 30' 35.7"	Δ = 10° 47' 51.4" (LT)	Θs = 3° 30' 35.7"
Ls = 321.00'	D = 2° 11' 12.7"	Ls = 321.00'
LT = 214.04'	L = 493.75'	LT = 214.04'
ST = 107.04'	T = 247.61'	ST = 107.04'
	R = 2,620.00'	
	DS = 60 mph	
	e = 0.06	

SEE SHEET NO. 60 FOR -YIREV- PROFILE.
SEE SHEET NO. 77 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:05:52 AM SCALE: 1:50
.OT DRIVER: NCDOT_pdf_color_eng_50.plt
SER: dwalnwrl DATE: 9/13/2010
ILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

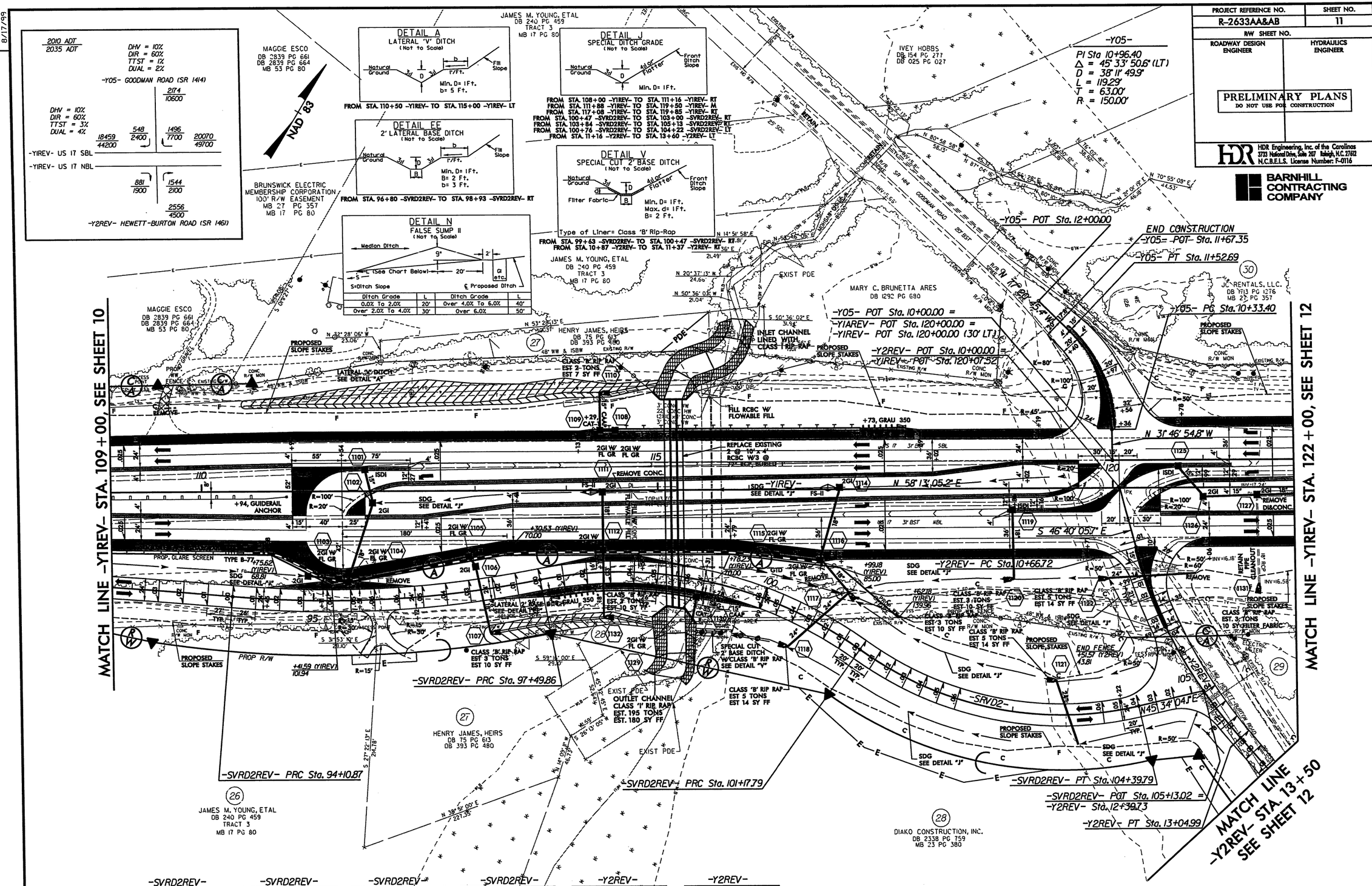
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



-SVRD2REV-	-SVRD2REV-	-SVRD2REV-	-SVRD2REV-	-Y2REV-	-Y2REV-
PI Sta 91+31.73	PI Sta 95+81.50	PI Sta 99+44.81	PI Sta 102+89.17	PI Sta 11+88.10	PI Sta 14+50.40
Δ = 5° 14' 19.3" (RT)	Δ = 16° 11' 08.1" (LT)	Δ = 46° 50' 50.3" (RT)	Δ = 48° 33' 02.7" (LT)	Δ = 26° 58' 46.6" (LT)	Δ = 9° 13' 54.1" (RT)
D = 0° 56' 15.9"	D = 4° 46' 28.7"	D = 12° 43' 56.6"	D = 15° 04' 40.2"	D = 11° 19' 23.8"	D = 7° 33' 31.7"
L = 558.65'	L = 338.99'	L = 367.94'	L = 322.00'	L = 238.27'	L = 122.13'
T = 279.52'	T = 170.63'	T = 194.95'	T = 171.38'	T = 121.38'	T = 61.20'
R = 6,110.00'	R = 1,200.00'	R = 450.00'	R = 380.00'	R = 506.00'	R = 758.00'
DS = 50 mph	DS = 50 mph	DS = 35 mph	DS = 35 mph	DS = 20 mph	DS = 45 mph
e = 0.03	e = 0.06	e = 0.06	e = 0.06	e = 0.04	e = 0.06

SEE SHEET NO. 61 FOR -YIREV- PROFILE.
SEE SHEET NO. 63 FOR -Y2REV- PROFILE.
SEE SHEET NO. 77, 78 FOR -SVRD2REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:06:07 AM SCALE: 1:50
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

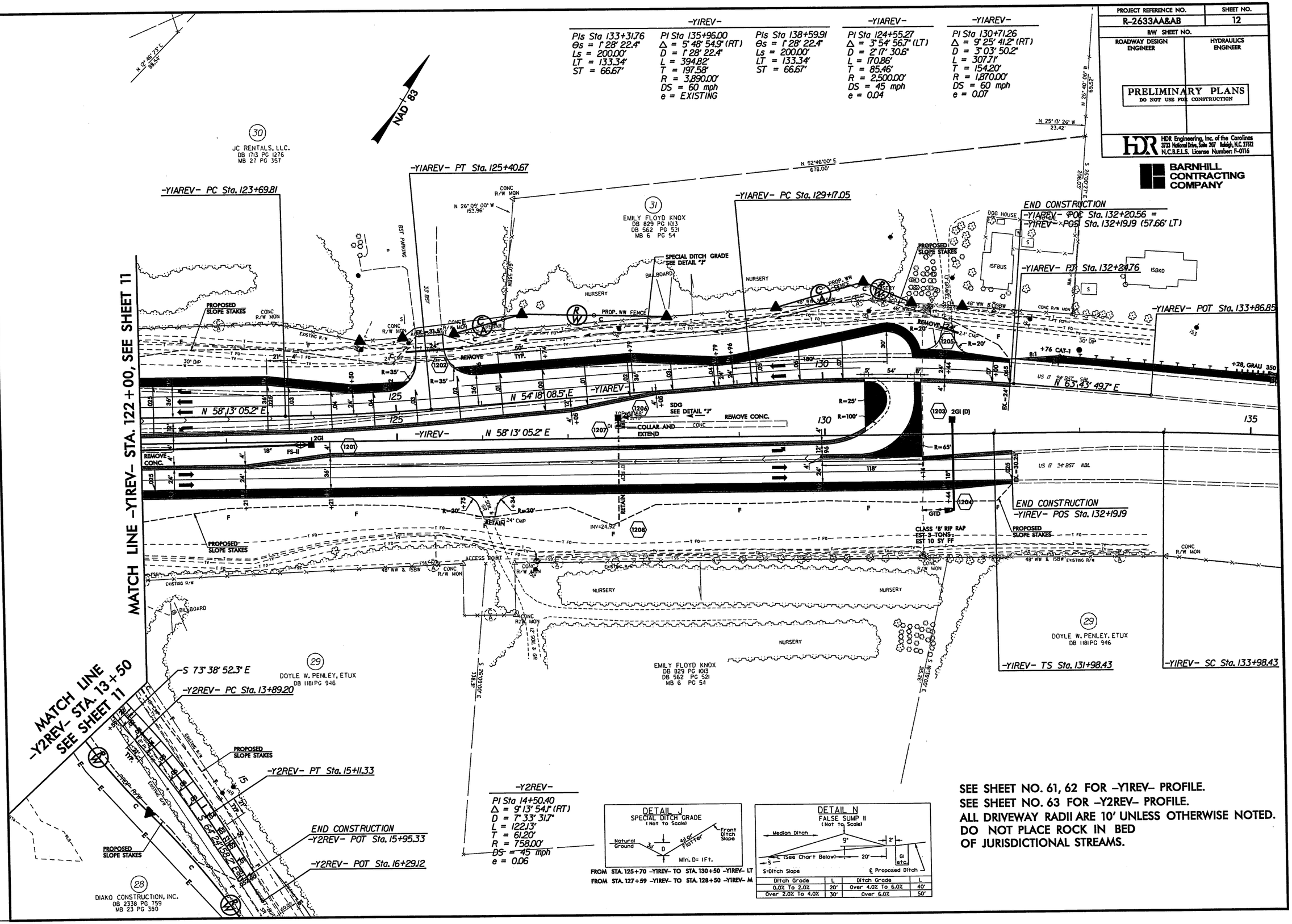
-YIREV-
PIs Sta 133+31.76
Θs = 1° 28' 22.4"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

PI Sta 135+96.00
Δ = 5° 48' 54.9" (RT)
D = 1° 28' 22.4"
L = 394.82'
T = 197.58'
R = 3,890.00'
DS = 60 mph
e = EXISTING

PIs Sta 138+59.91
Θs = 1° 28' 22.4"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

-YIAREV-
PI Sta 124+55.27
Δ = 3° 54' 56.7" (LT)
D = 2° 17' 30.6"
L = 170.86'
T = 85.46'
R = 2,500.00'
DS = 45 mph
e = 0.04

-YIAREV-
PI Sta 130+71.26
Δ = 9° 25' 41.2" (RT)
D = 3° 03' 50.2"
L = 307.71'
T = 154.20'
R = 1,870.00'
DS = 60 mph
e = 0.07



-Y2REV-
PI Sta 14+50.40
Δ = 9° 13' 54.1" (RT)
D = 1° 33' 31.7"
L = 122.13'
T = 61.20'
R = 758.00'
DS = 45 mph
e = 0.06

DETAIL J
SPECIAL DITCH GRADE
(Not To Scale)

FROM STA. 125+70 -YIREV- TO STA. 130+50 -YIREV- LT
FROM STA. 127+59 -YIREV- TO STA. 128+50 -YIREV- M

DETAIL N
FALSE SUMP II
(Not To Scale)

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'

SEE SHEET NO. 61, 62 FOR -YIREV- PROFILE.
SEE SHEET NO. 63 FOR -Y2REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshp-fl.tbl
TIME: 11:06:23 AM
DATE: 9/13/2010
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

-RPBREV-

Pls Sta 11+28.40	Pl Sta 18+15.23	Pls Sta 24+09.77
Θs = 1° 37' 15.0"	Δ = 49° 12' 12.3" (RT)	Θs = 4° 50' 53.2"
Θs = 4° 50' 56.9"	D = 4° 24' 26.5"	Ls = 220.00'
Ls = 220.00'	L = 1,116.39'	LT = 146.72'
LT = 128.40'	T = 595.23'	ST = 73.38'
ST = 91.82'	R = 1,300.00'	
	DS = 60 mph	
	e = 0.08	

-SBLREV-

Pls Sta 19+28.94	Pl Sta 25+82.84	Pls Sta 32+53.42
Θs = 1° 38' 54.7"	Δ = 16° 50' 38.3" (LT)	Θs = 2° 11' 53.0"
Ls = 225.00'	D = 1° 27' 55.3"	Ls = 300.00'
LT = 150.01'	L = 1,149.47'	LT = 200.02'
ST = 75.01'	T = 578.91'	ST = 100.01'
	R = 3,910.00'	
	DS = 60 mph	
	e = 0.05	

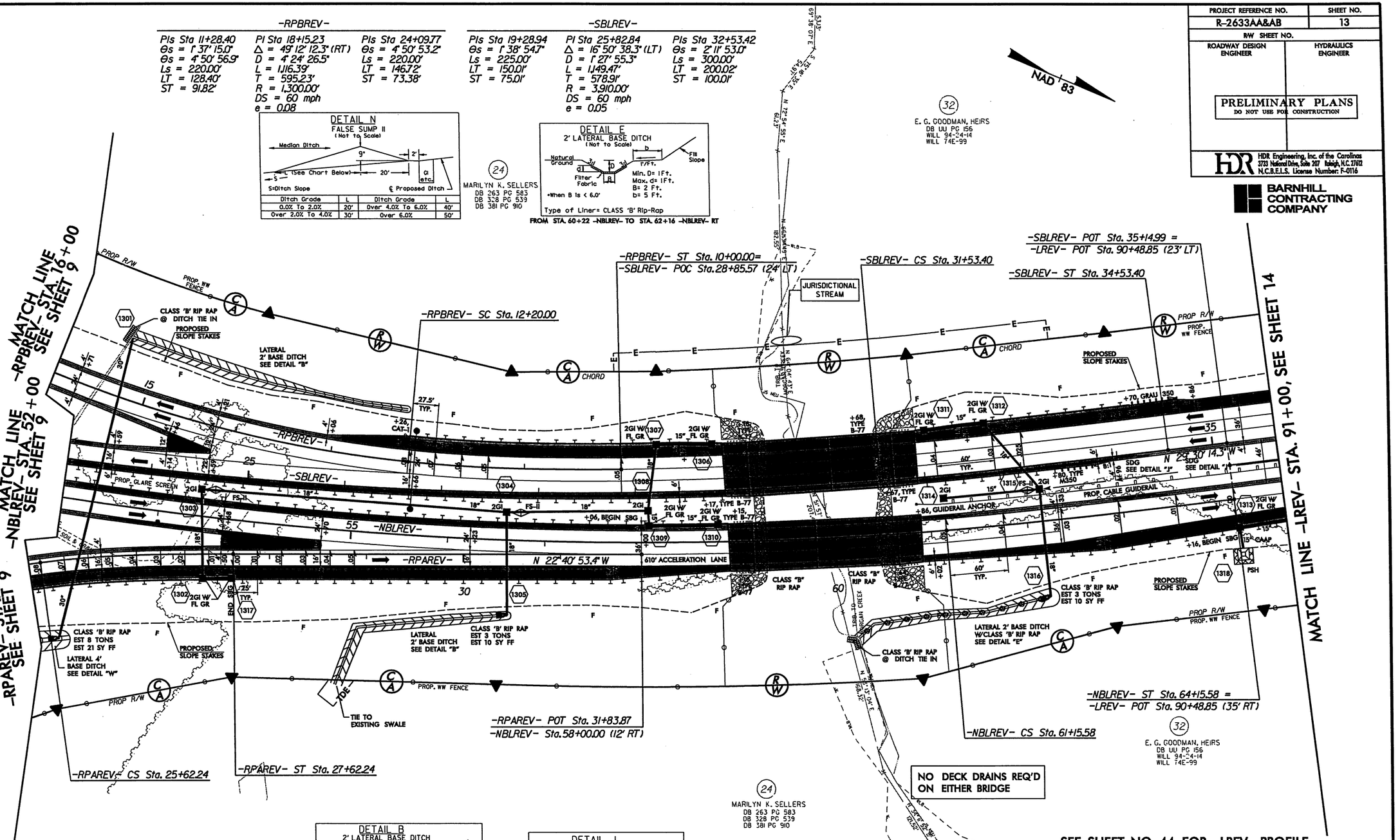
DETAIL N
FALSE SUMP II
(Not to Scale)

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'

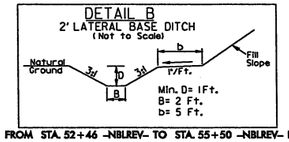
DETAIL E
2' LATERAL BASE DITCH
(Not to Scale)

Type of Liner= CLASS 'B' Rip-Rap

FROM STA. 60+22 -NBLREV- TO STA. 62+16 -NBLREV- RT

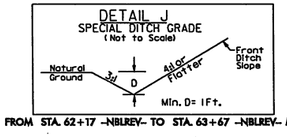


DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)



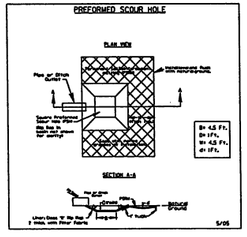
FROM STA. 52+46 -NBLREV- TO STA. 55+50 -NBLREV- LT
FROM STA. 54+93 -NBLREV- TO STA. 56+63 -NBLREV- RT

DETAIL J
SPECIAL DITCH GRADE
(Not to Scale)



FROM STA. 62+17 -NBLREV- TO STA. 63+67 -NBLREV- M

PREFORMED SCOUR HOLE



-RPAREV-

Pls Sta 14+01.06	Pl Sta 21+26.85	Pls Sta 26+29.01
Θs = 7° 20' 44.2"	Δ = 80° 24' 26.7" (RT)	Θs = 7° 20' 44.2"
Ls = 200.00'	D = 7° 20' 44.2"	Ls = 200.00'
LT = 133.45'	L = 1,094.63'	LT = 133.45'
ST = 66.77'	T = 659.24'	ST = 66.77'
	R = 780.00'	
	DS = 50 mph	
	e = 0.08	

-NBLREV-

Pls Sta 48+91.12	Pl Sta 55+45.02	Pls Sta 62+15.60
Θs = 1° 38' 54.7"	Δ = 16° 50' 38.3" (LT)	Θs = 2° 11' 53.0"
Ls = 225.00'	D = 1° 27' 55.3"	Ls = 300.00'
LT = 150.01'	L = 1,149.47'	LT = 200.02'
ST = 75.01'	T = 578.91'	ST = 100.01'
	R = 3,910.00'	
	DS = 60 mph	
	e = 0.05	

SEE SHEET NO. 44 FOR -LREV- PROFILE.
SEE SHEET NO. 70 FOR -RPAREV- PROFILE.
SEE SHEET NO. 71 FOR -RPBREV- PROFILE.
SEE SHEET NO. 41 FOR -NBLREV- PROFILE.
SEE SHEET NO. 42, 43 FOR -SBLREV- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

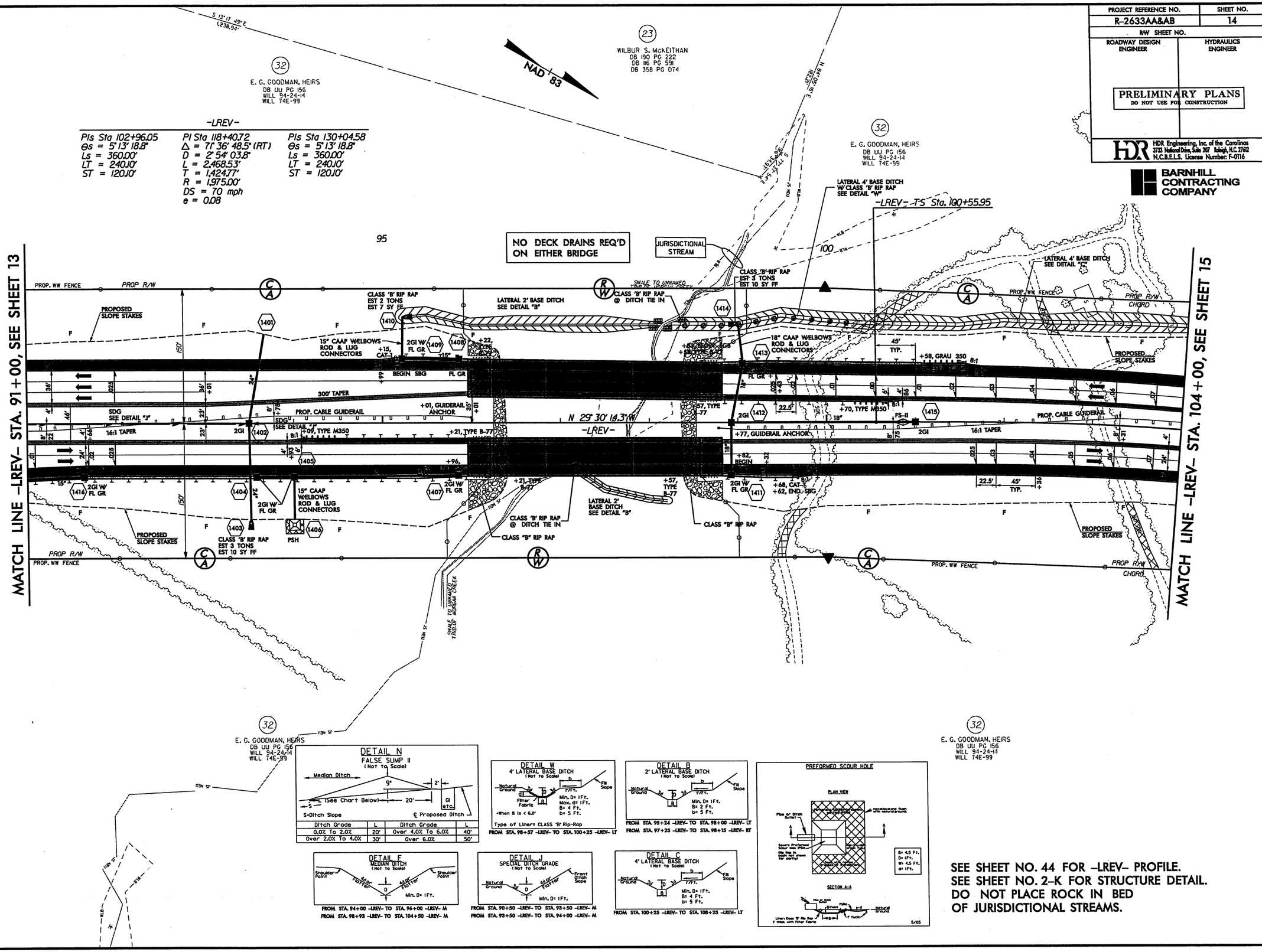
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY

-LREV-

PIs Sta 102+96.05	PI Sta 118+40.72	PIs Sta 130+04.58
θs = 5°13' 18.8"	Δ = 71° 36' 48.5" (RT)	θs = 5°13' 18.8"
Ls = 360.00'	D = 2° 54' 03.8"	Ls = 360.00'
LT = 240.10'	L = 2,468.53'	LT = 240.10'
ST = 120.10'	T = 1,424.77'	ST = 120.10'
	R = 1,975.00'	
	DS = 70 mph	
	e = 0.08	



SEE SHEET NO. 44 FOR -LREV- PROFILE.
SEE SHEET NO. 2-K FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Bldg\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:06:47 AM
DATE: 9/13/2010
SCALE: 1:50

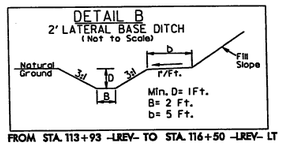
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

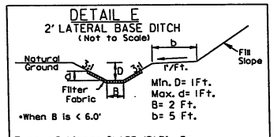
BARNHILL CONTRACTING COMPANY

DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)



FROM STA. 113+93 -LREV- TO STA. 116+50 -LREV- LT

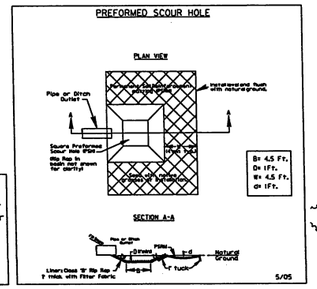
DETAIL E
2' LATERAL BASE DITCH
(Not to Scale)



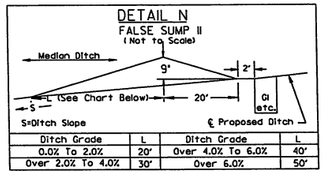
Type of Liner= CLASS 'B' Rip-Rap

FROM STA. 116+50 -LREV- TO STA. 117+75 -LREV- LT

PREFORMED SCOUR HOLE

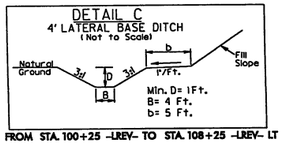


DETAIL N
FALSE SUMP II
(Not to Scale)



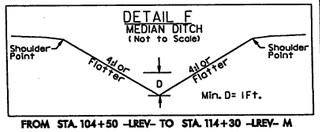
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL C
4' LATERAL BASE DITCH
(Not to Scale)



FROM STA. 100+25 -LREV- TO STA. 108+25 -LREV- LT

DETAIL F
MEDIAN DITCH
(Not to Scale)



FROM STA. 104+50 -LREV- TO STA. 114+30 -LREV- M
FROM STA. 114+30 -LREV- TO STA. 120+25 -LREV- M

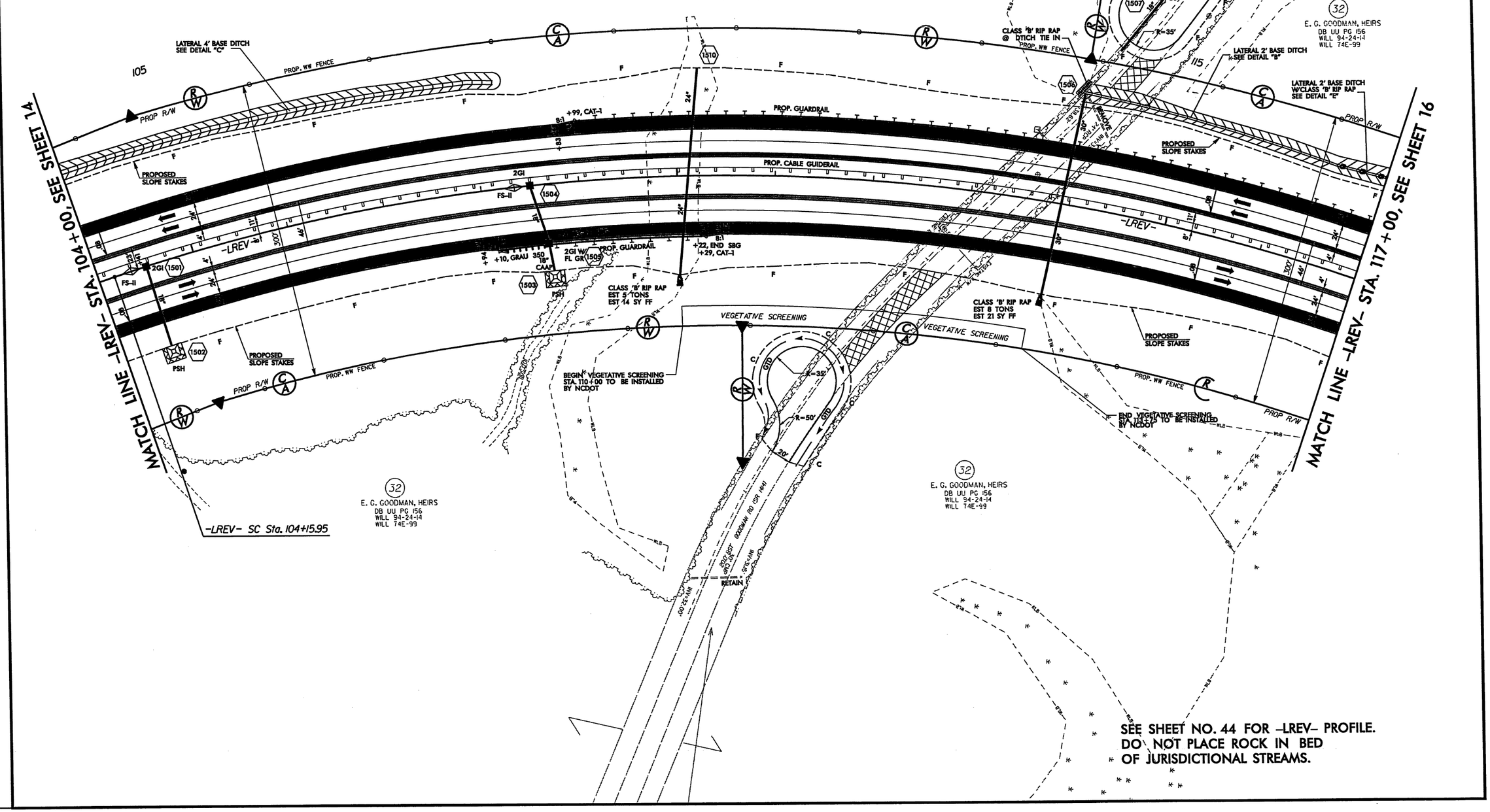
-LREV-

PIs Sta 102+96.05
Θs = 5°13' 18.8"
Ls = 360.00'
LT = 240.10'
ST = 120.10'

PI Sta 118+40.72
Δ = 71° 36' 48.5" (RT)
D = 2° 54' 03.8"
L = 2,468.53'
T = 1,424.77'
R = 1,975.00'
DS = 70 mph
e = 0.08

PIs Sta 130+04.58
Θs = 5°13' 18.8"
Ls = 360.00'
LT = 240.10'
ST = 120.10'

NAD 83



SEE SHEET NO. 44 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:06:58 AM SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

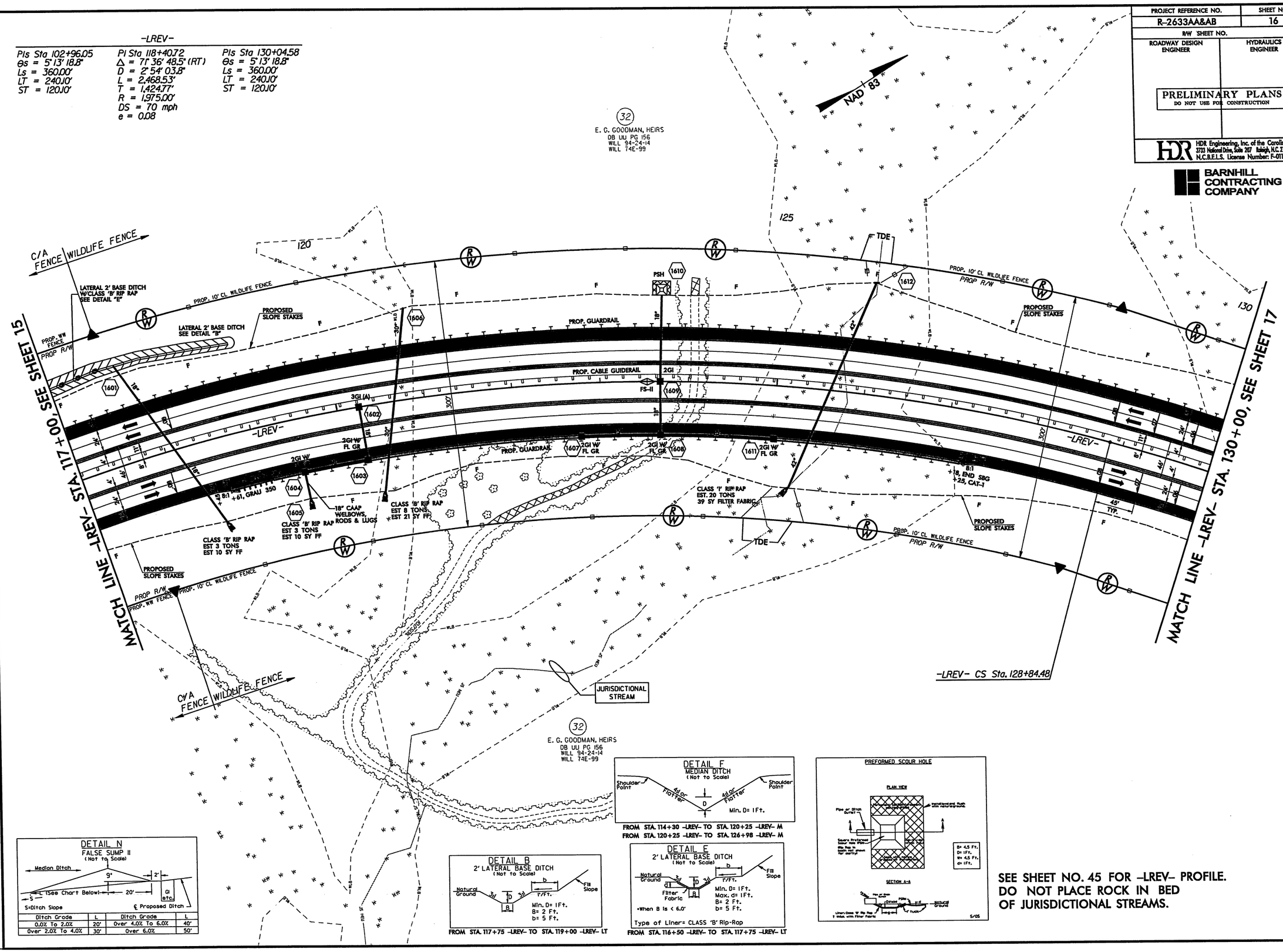
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY

-LREV-

Pls Sta 102+96.05	Pi Sta 118+40.72	Pls Sta 130+04.58
Θs = 5° 13' 18.8"	Δ = 71° 36' 48.5" (RT)	Θs = 5° 13' 18.8"
Ls = 360.00'	D = 2° 54' 03.8"	Ls = 360.00'
LT = 240.10'	L = 2,468.53'	LT = 240.10'
ST = 120.10'	T = 1,424.77'	ST = 120.10'
	R = 1,975.00'	
	DS = 70 mph	
	e = 0.08	



DETAIL N
FALSE SUMP II
(Not to Scale)

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'

DETAIL F
MEDIAN DITCH
(Not to Scale)

FROM STA. 114+30 -LREV- TO STA. 120+25 -LREV- M
FROM STA. 120+25 -LREV- TO STA. 126+98 -LREV- M

DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)

FROM STA. 117+75 -LREV- TO STA. 119+00 -LREV- LT

DETAIL E
2' LATERAL BASE DITCH
(Not to Scale)

FROM STA. 116+50 -LREV- TO STA. 117+75 -LREV- LT

PREFORMED SCOUR HOLE

SEE SHEET NO. 45 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:07:07 AM SCALE: 1:50
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwri DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

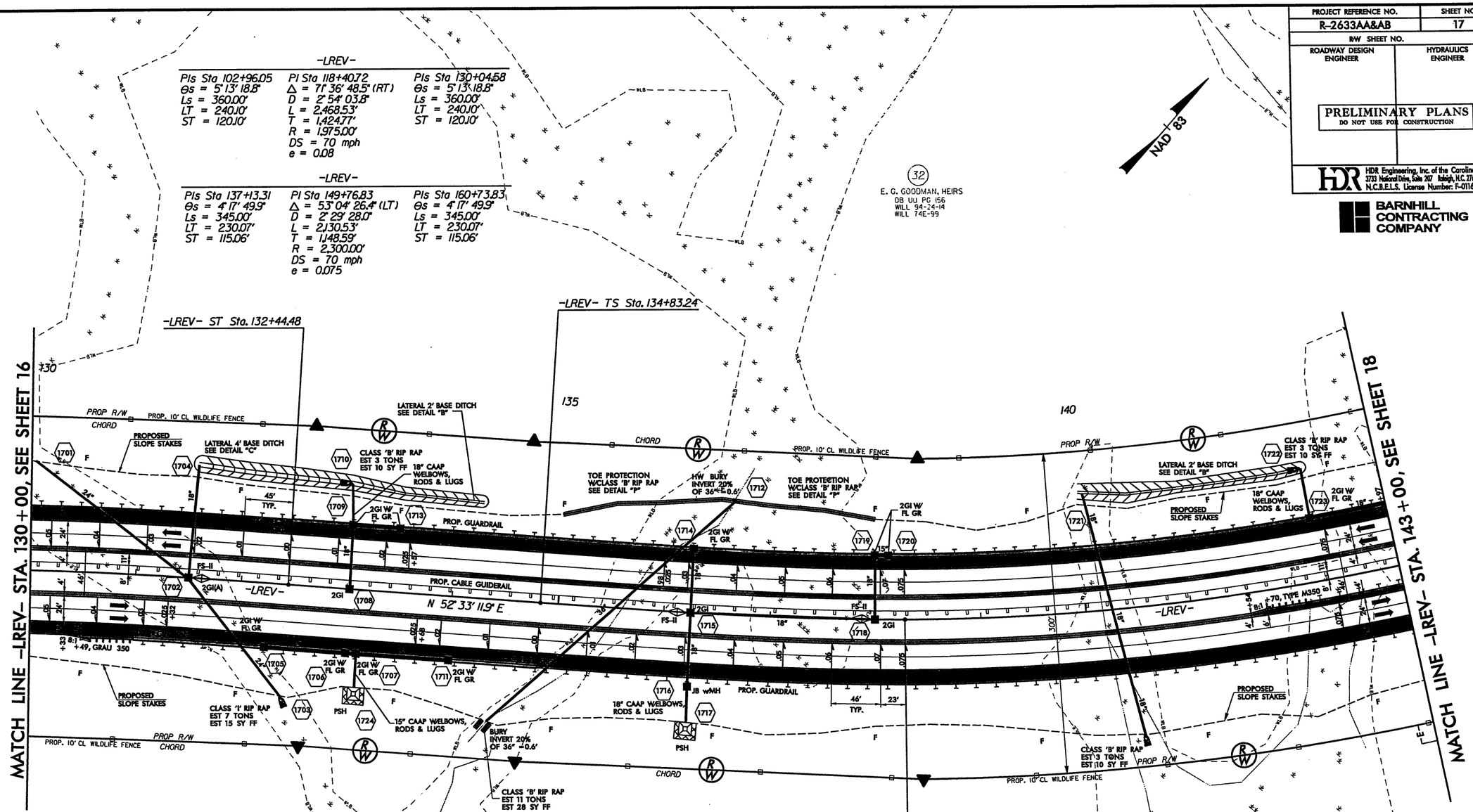
BARNHILL CONTRACTING COMPANY

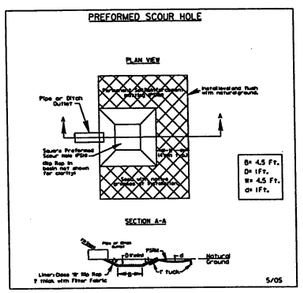
-LREV-

Pls Sta 102+96.05	Pl Sta 118+40.72	Pls Sta 130+04.58
Θs = 5° 13' 18.8"	Δ = 71° 36' 48.5" (RT)	Θs = 5° 13' 18.8"
Ls = 360.00'	D = 2° 54' 03.8"	Ls = 360.00'
LT = 240.10'	L = 2,468.53'	LT = 240.10'
ST = 120.10'	T = 1,424.77'	ST = 120.10'
	R = 1,975.00'	
	DS = 70 mph	
	e = 0.08	

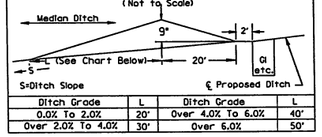
-LREV-

Pls Sta 137+13.31	Pl Sta 149+76.83	Pls Sta 160+73.83
Θs = 4° 17' 49.9"	Δ = 53° 04' 26.4" (LT)	Θs = 4° 17' 49.9"
Ls = 345.00'	D = 2° 29' 28.0"	Ls = 345.00'
LT = 230.07'	L = 2,130.53'	LT = 230.07'
ST = 115.06'	T = 1,148.59'	ST = 115.06'
	R = 2,300.00'	
	DS = 70 mph	
	e = 0.075	



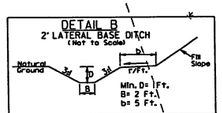


DETAIL N
FALSE SUMP II
(Not to Scale)



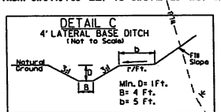
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%		Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)



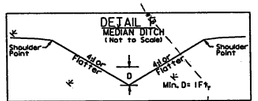
FROM STA. 133+00 -LREV- TO STA. 134+25 -LREV- LT
FROM STA. 140+08 -LREV- TO STA. 142+25 -LREV- LT

DETAIL C
4' LATERAL BASE DITCH
(Not to Scale)



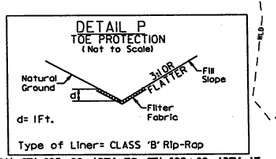
FROM STA. 131+56 -LREV- TO STA. 133+00 -LREV- LT

DETAIL M
MEDIAN DITCH
(Not to Scale)



FROM STA. 126+98 -LREV- TO STA. 133+02 -LREV- M
FROM STA. 133+02 -LREV- TO STA. 142+14 -LREV- M

DETAIL P
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS 'B' Rip-Rap

FROM STA. 135+00 -LREV- TO STA. 138+00 -LREV- LT

SEE SHEET NO. 45 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
PENTABLE: NCDOT_pshpfl.tbl
USER: dwalnwrl DATE: 9/13/2010 TIME: 11:07:17 AM SCALE: 1:50
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Pro\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

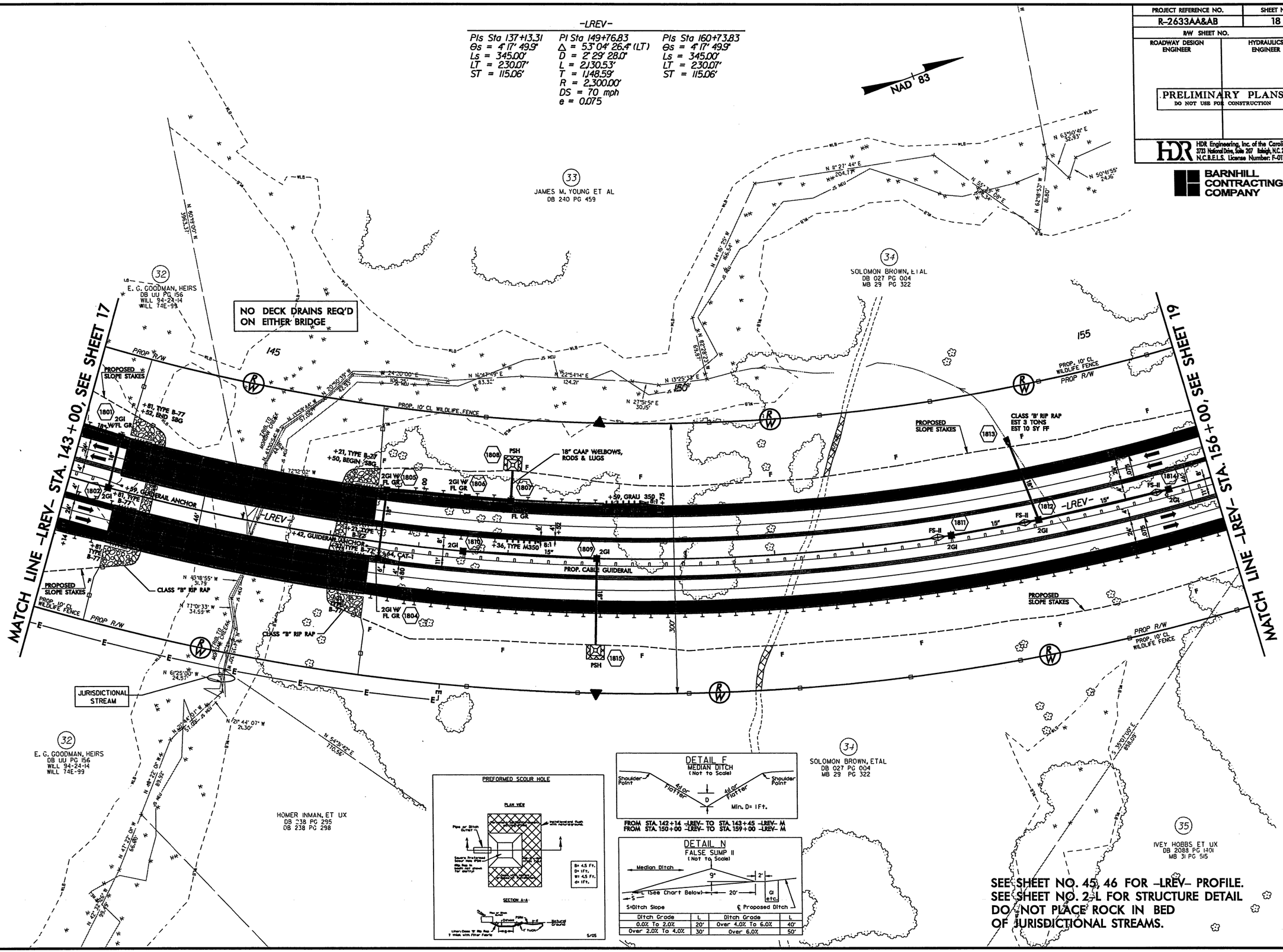
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY

-LREV-

PIs Sta 137+13.31	PI Sta 149+76.83	PIs Sta 160+73.83
Θs = 4° 17' 49.9"	Δ = 53° 04' 26.4" (LT)	Θs = 4° 17' 49.9"
Ls = 345.00'	D = 2° 29' 28.0"	Ls = 345.00'
LT = 230.07'	L = 2,130.53'	LT = 230.07'
ST = 115.06'	T = 1,148.59'	ST = 115.06'
	R = 2,300.00'	
	DS = 70 mph	
	e = 0.075	



PREFORMED SCOUR HOLE

DETAIL F
MEDIAN DITCH
(Not to Scale)

FROM STA. 142+14 -LREV- TO STA. 143+45 -LREV- M
FROM STA. 150+00 -LREV- TO STA. 159+00 -LREV- M

DETAIL N
FALSE SUMP II
(Not to Scale)

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'

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl.tbl
USER: dwainwri DATE: 9/13/2010 TIME: 11:07:28 AM SCALE: 1:50
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

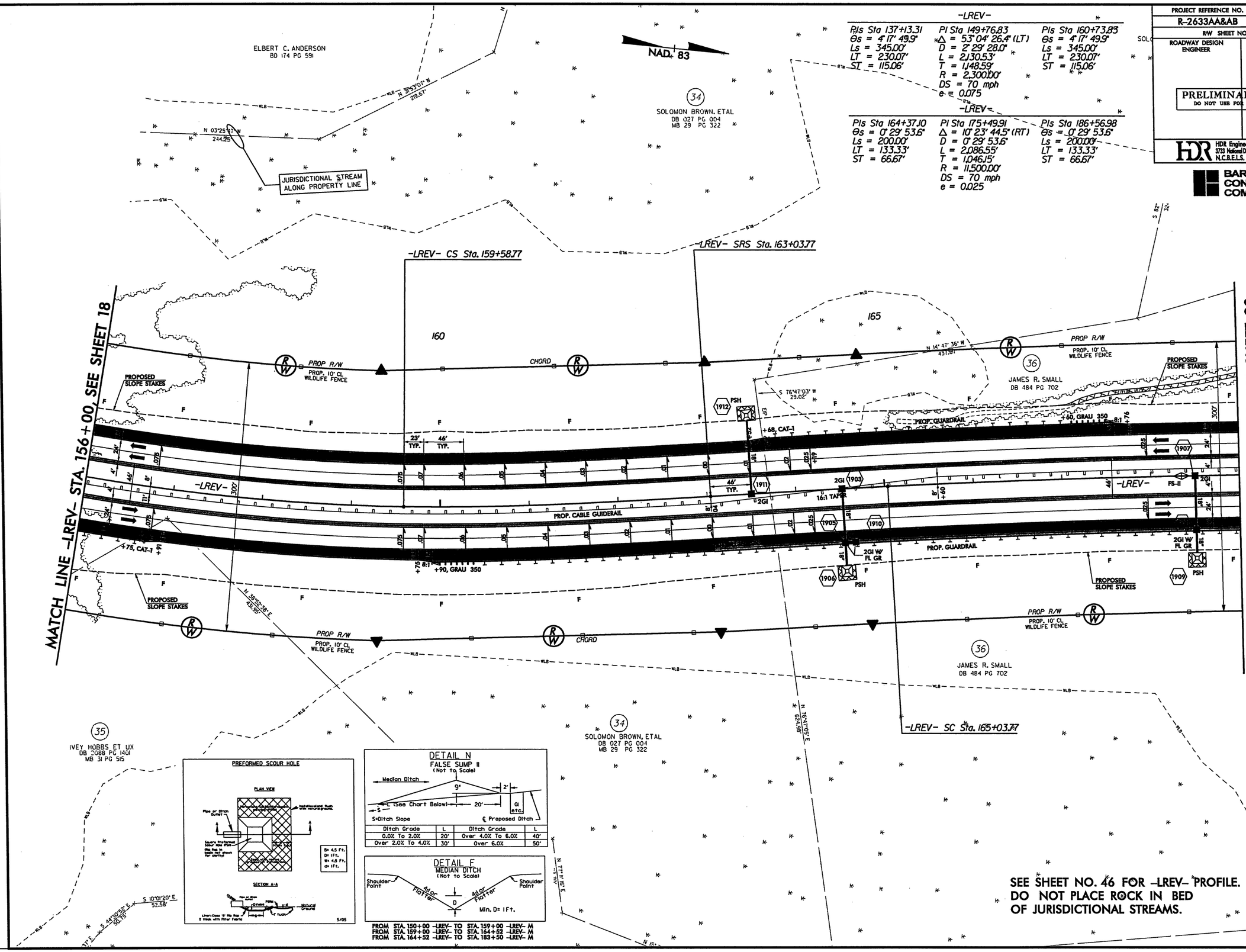
BARNHILL CONTRACTING COMPANY

-LREV-

PIs Sta 137+13.31	PI Sta 149+76.83	PIs Sta 160+73.83
θs = 4° 17' 49.9"	Δ = 53° 04' 26.4" (LT)	θs = 4° 17' 49.9"
Ls = 345.00'	D = 2° 29' 28.0"	Ls = 345.00'
LT = 230.07'	L = 2,130.53'	LT = 230.07'
ST = 115.06'	T = 1,148.59'	ST = 115.06'
	R = 2,300.00'	
	DS = 70 mph	
	e = 0.075	

-LREV-

PIs Sta 164+37.10	PI Sta 175+49.91	PIs Sta 186+56.98
θs = 0° 29' 53.6"	Δ = 10° 23' 44.5" (RT)	θs = 0° 29' 53.6"
Ls = 200.00'	D = 0° 29' 53.6"	Ls = 200.00'
LT = 133.33'	L = 2,086.55'	LT = 133.33'
ST = 66.67'	T = 1,046.15'	ST = 66.67'
	R = 11,500.00'	
	DS = 70 mph	
	e = 0.025	



PREFORMED SCOUR HOLE

B= 4.5 Ft.
D= 1Ft.
W= 4.5 Ft.
d= 1Ft.

DETAIL N
FALSE SUMP II
(Not to Scale)

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'

DETAIL F
MEDIAN DITCH
(Not to Scale)

FROM STA. 150+00 -LREV- TO STA. 159+00 -LREV- M
FROM STA. 159+00 -LREV- TO STA. 164+52 -LREV- M
FROM STA. 164+52 -LREV- TO STA. 183+50 -LREV- M

SEE SHEET NO. 46 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:07:38 AM SCALE: 1:50
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwainwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

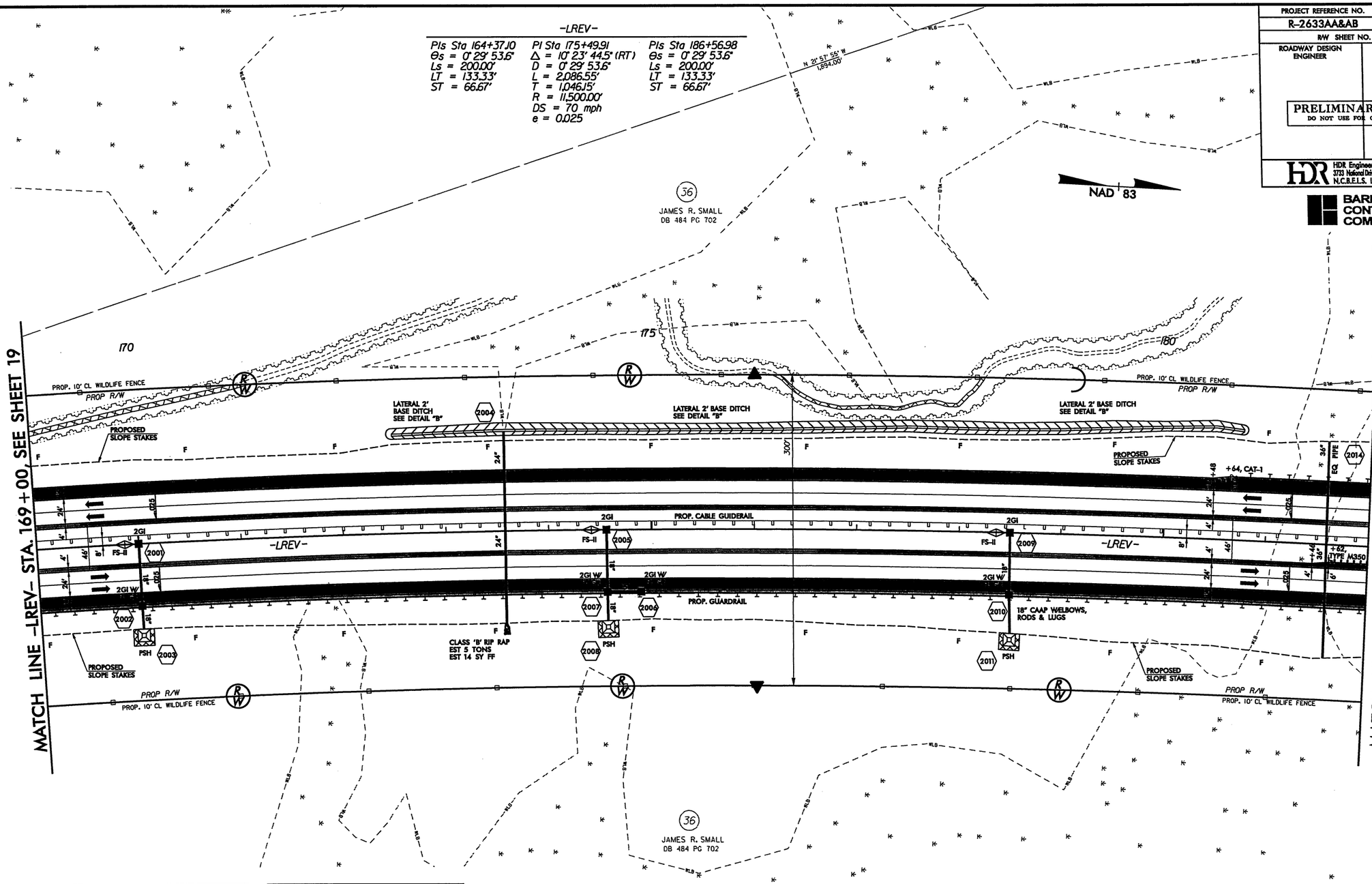
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

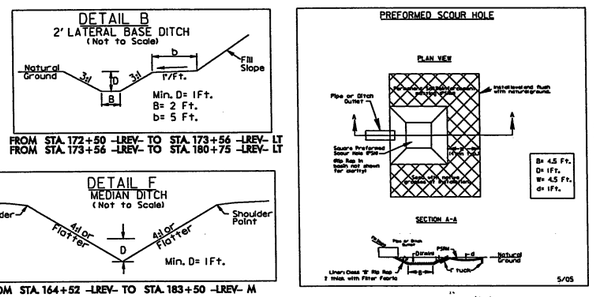
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

-LREV-

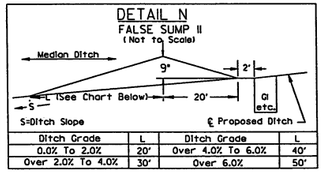
Pls Sta 164+37.10	Pl Sta 175+49.91	Pls Sta 186+56.98
θs = 0° 29' 53.6"	Δ = 10° 23' 44.5" (RT)	θs = 0° 29' 53.6"
Ls = 200.00'	D = 0° 29' 53.6"	Ls = 200.00'
LT = 133.33'	L = 2,086.55'	LT = 133.33'
ST = 66.67'	T = 1,046.15'	ST = 66.67'
	R = 11,500.00'	
	DS = 70 mph	
	e = 0.025	





FROM STA. 172+50 -LREV- TO STA. 173+56 -LREV- LT
FROM STA. 173+56 -LREV- TO STA. 180+75 -LREV- LT

FROM STA. 164+52 -LREV- TO STA. 183+50 -LREV- M



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'

SEE SHEET NO. 46, 47 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIOANL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
DATE: 9/13/2010
TIME: 11:07:47 AM
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

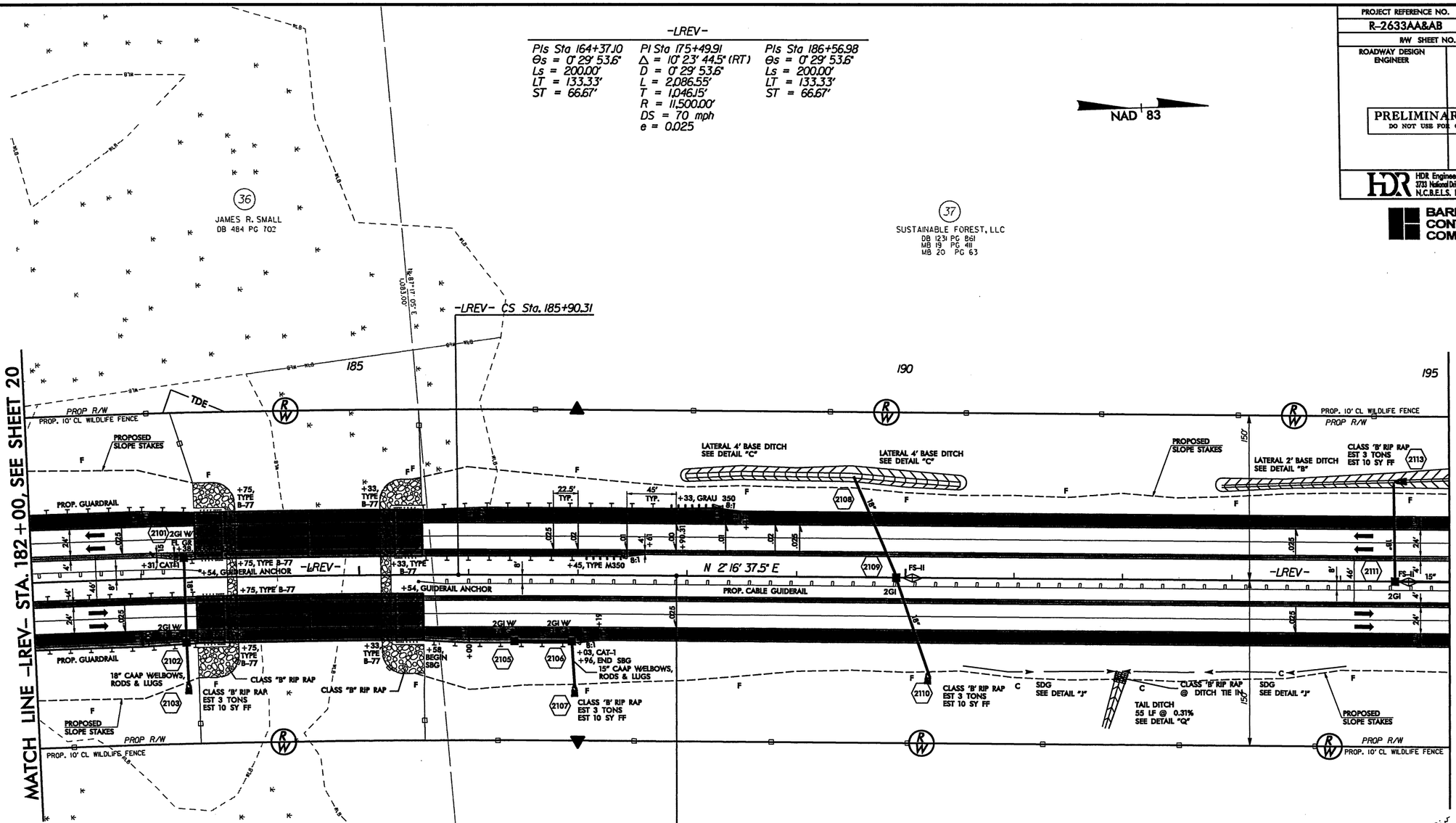
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

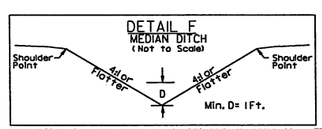
BARNHILL CONTRACTING COMPANY

-LREV-

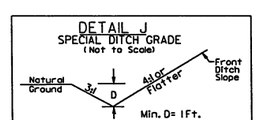
PIs Sta 164+37.10	PI Sta 175+49.91	PIs Sta 186+56.98
Θs = 0° 29' 53.6"	Δ = 10° 23' 44.5" (RT)	Θs = 0° 29' 53.6"
Ls = 200.00'	D = 0° 29' 53.6"	Ls = 200.00'
LT = 133.33'	L = 2,086.55'	LT = 133.33'
ST = 66.67'	T = 1,046.15'	ST = 66.67'
	R = 11,500.00'	
	DS = 70 mph	
	e = 0.025	

NAD 83

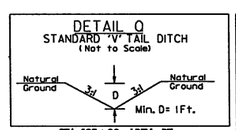




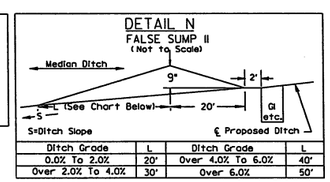
FROM STA. 185+50 -LREV- TO STA. 195+11 -LREV- M



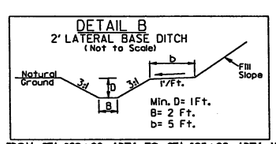
FROM STA. 190+50 -LREV- TO STA. 192+00 -LREV- RT
FROM STA. 192+00 -LREV- TO STA. 194+00 -LREV- RT



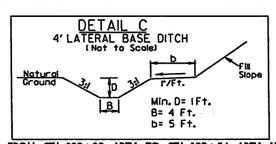
STA. 192+00 -LREV- RT



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'



FROM STA. 192+90 -LREV- TO STA. 195+28 -LREV- LT
FROM STA. 195+28 -LREV- TO STA. 198+41 -LREV- LT



FROM STA. 188+00 -LREV- TO STA. 189+54 -LREV- LT
FROM STA. 189+54 -LREV- TO STA. 190+50 -LREV- LT

SEE SHEET NO. 47 FOR -LREV- PROFILE.
SEE SHEET NO. 2-L FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

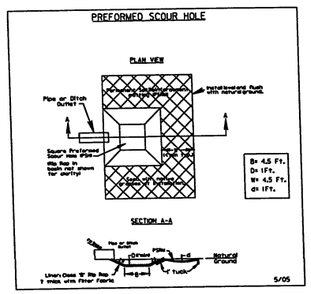
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:07:55 AM SCALE: 1:50
USER: dwalnwrl DATE: 9/13/2010
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

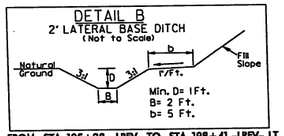
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

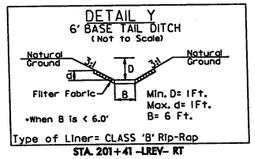
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

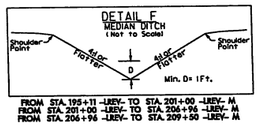




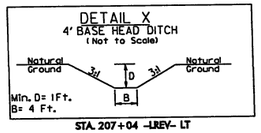
FROM STA. 195+28 -LREV- TO STA. 198+41 -LREV- LT
FROM STA. 198+41 -LREV- TO STA. 201+41 -LREV- LT
FROM STA. 201+41 -LREV- TO STA. 204+00 -LREV- LT
FROM STA. 201+00 -LREV- TO STA. 201+50 -LREV- RT
FROM STA. 204+00 -LREV- TO STA. 206+50 -LREV- LT



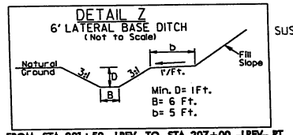
STA. 201+41 -LREV- RT



FROM STA. 195+11 -LREV- TO STA. 201+00 -LREV- M
FROM STA. 201+00 -LREV- TO STA. 206+96 -LREV- M
FROM STA. 206+96 -LREV- TO STA. 209+50 -LREV- M

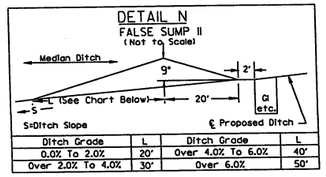


STA. 207+04 -LREV- LT



FROM STA. 201+50 -LREV- TO STA. 207+00 -LREV- RT
FROM STA. 207+00 -LREV- TO STA. 210+25 -LREV- RT

(37)
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63



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'

NAD 83

MATCH LINE -LREV- STA. 195+00, SEE SHEET 21

MATCH LINE -LREV- STA. 208+00, SEE SHEET 23

195 200 205

CLASS 'B' RIP RAP @ DITCH TIE IN
PROP R/W
PROP. 10' CL WILDLIFE FENCE
LATERAL 2' BASE DITCH SEE DETAIL "B"
PROPOSED SLOPE STAKES
N 2°16' 37.5" E
PROP. CABLE GUIDERAIL
-LREV-
CLASS 'B' RIP RAP EST 8 TONS EST 21 SY FF
CLASS '1' RIP RAP EST 7 TONS EST 15 SY FF
CLASS 'B' RIP RAP EST 3 TONS EST 10 SY FF
CLASS 'B' RIP RAP EST 8 TONS EST 21 SY FF
18" CONC
REMOVE
2' LATERAL BASE DITCH SEE DETAIL "B"
6' BASE TAIL DITCH W/CLASS 'B' RIP RAP 80 LF @ 1.95% SEE DETAIL "Y"
LATERAL 6' BASE DITCH SEE DETAIL "Z"
15' SOIL ROAD
TDE
HW
PSH
FS-II
2GI

(37)
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

SEE SHEET NO. 47, 48 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

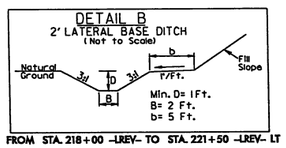
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:08:04 AM SCALE: 1:50
LOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

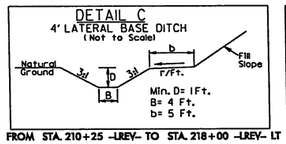
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

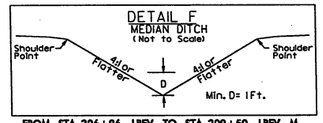
BARNHILL CONTRACTING COMPANY



FROM STA. 218+00 -LREV- TO STA. 221+50 -LREV- LT

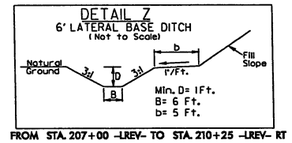


FROM STA. 210+25 -LREV- TO STA. 218+00 -LREV- LT



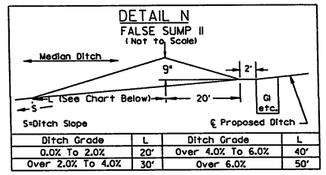
FROM STA. 206+96 -LREV- TO STA. 209+50 -LREV- M
FROM STA. 209+50 -LREV- TO STA. 212+84 -LREV- M
FROM STA. 212+84 -LREV- TO STA. 220+72 -LREV- M
FROM STA. 220+72 -LREV- TO STA. 228+85 -LREV- M

(37)
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

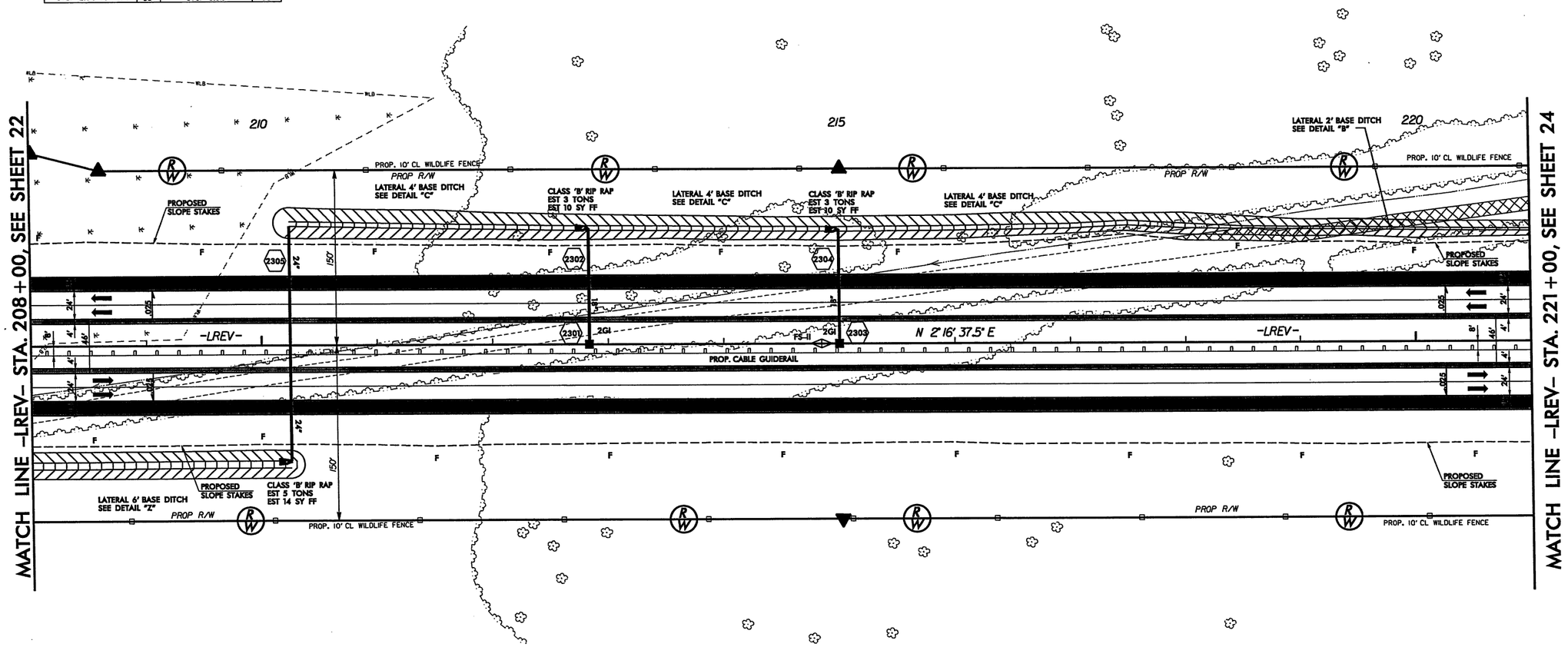


FROM STA. 207+00 -LREV- TO STA. 210+25 -LREV- RT

NAD 83



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'



(37)
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

SEE SHEET NO. 48 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshp-fl.tbl
TIME: 11:08:12 AM SCALE: 1:50
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

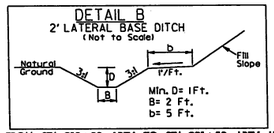
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwainwrl DATE: 9/13/2010

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

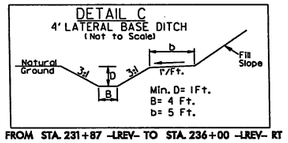
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

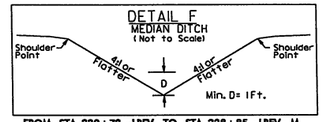
BARNHILL CONTRACTING COMPANY



FROM STA. 218+00 -LREV- TO STA. 221+50 -LREV- LT
FROM STA. 221+50 -LREV- TO STA. 229+45 -LREV- LT
FROM STA. 232+00 -LREV- TO STA. 236+00 -LREV- LT

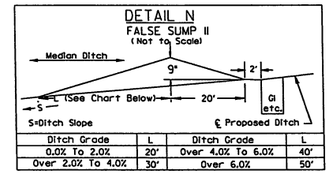


FROM STA. 231+87 -LREV- TO STA. 236+00 -LREV- RT



FROM STA. 220+72 -LREV- TO STA. 228+85 -LREV- M
FROM STA. 228+85 -LREV- TO STA. 233+52 -LREV- M
FROM STA. 233+52 -LREV- TO STA. 273+12 -LREV- M

37
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63



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'

NAD 83

MATCH LINE -LREV- STA. 221+00, SEE SHEET 23

MATCH LINE -LREV- STA. 234+00, SEE SHEET 25

225

30' SOIL ROAD

230

PROP. 10' CL WILDLIFE FENCE

PROP R/W

LATERAL 2' BASE DITCH SEE DETAIL "B"

CLASS 'B' RIP RAP EST 3 TONS EST 10 SY FF

PROPOSED SLOPE STAKES

-LREV-

N 2°16' 37.5" E

PROP. CABLE GUIDERAIL

PROP. GUARDRAIL

+56, CAT-1

+50, GRAU 350

+65, GRAU 350

+66, CAT-1

CLASS 'I' RIP RAP EST. 40 TONS 75 SY FILTER FABRIC

LATERAL 4' BASE DITCH SEE DETAIL "C"

CLASS 'B' RIP RAP @ DITCH TIE IN

TDE

2401 2402 2403 2404 2405 2406

FS-II 2GI 15" PSH

37
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

SEE SHEET NO. 48, 49 FOR -LREV- PROFILE.
DO PLACE ROCK IN BED OF
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

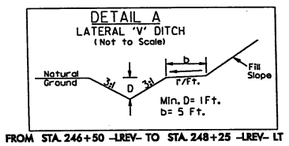
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:08:19 AM SCALE: 1:50
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwainwrl DATE: 9/13/2010
FILE: Wktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

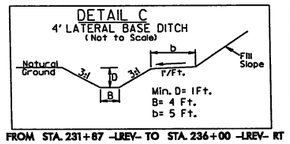
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

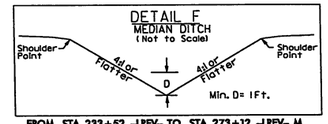
BARNHILL CONTRACTING COMPANY



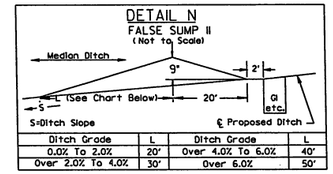
FROM STA. 246+50 -LREV- TO STA. 248+25 -LREV- LT



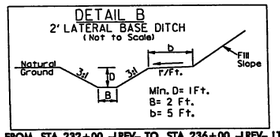
FROM STA. 231+87 -LREV- TO STA. 236+00 -LREV- RT



FROM STA. 233+52 -LREV- TO STA. 273+12 -LREV- M
FROM STA. 237+12 -LREV- TO STA. 249+10 -LREV- M



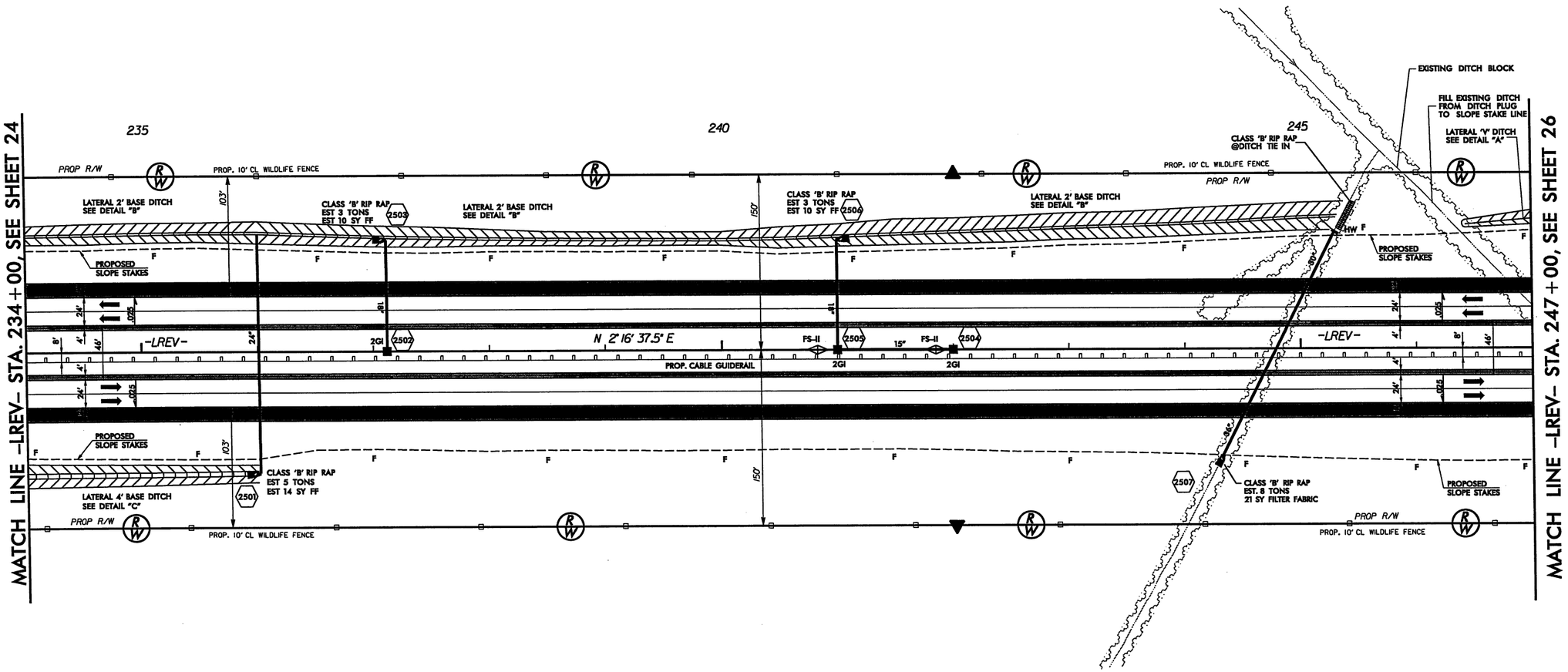
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'



FROM STA. 232+00 -LREV- TO STA. 236+00 -LREV- LT
FROM STA. 236+00 -LREV- TO STA. 240+00 -LREV- LT
FROM STA. 240+00 -LREV- TO STA. 245+25 -LREV- LT

(37)
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

NAD 83



(37)
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

SEE SHEET NO. 49 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:08:26 AM SCALE: 1:50

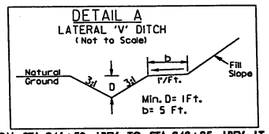
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_ROY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

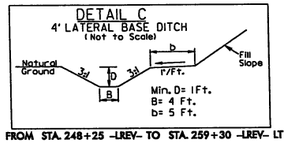
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

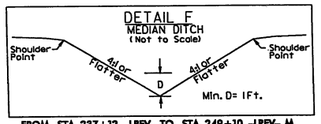
BARNHILL CONTRACTING COMPANY



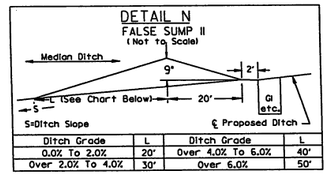
FROM STA. 246+50 -LREV- TO STA. 248+25 -LREV- LT
FROM STA. 259+30 -LREV- TO STA. 262+00 -LREV- LT
FROM STA. 259+30 -LREV- TO STA. 262+00 -LREV- RT



FROM STA. 248+25 -LREV- TO STA. 259+30 -LREV- LT



FROM STA. 237+12 -LREV- TO STA. 249+10 -LREV- M
FROM STA. 249+10 -LREV- TO STA. 257+18 -LREV- M
FROM STA. 257+18 -LREV- TO STA. 265+00 -LREV- M



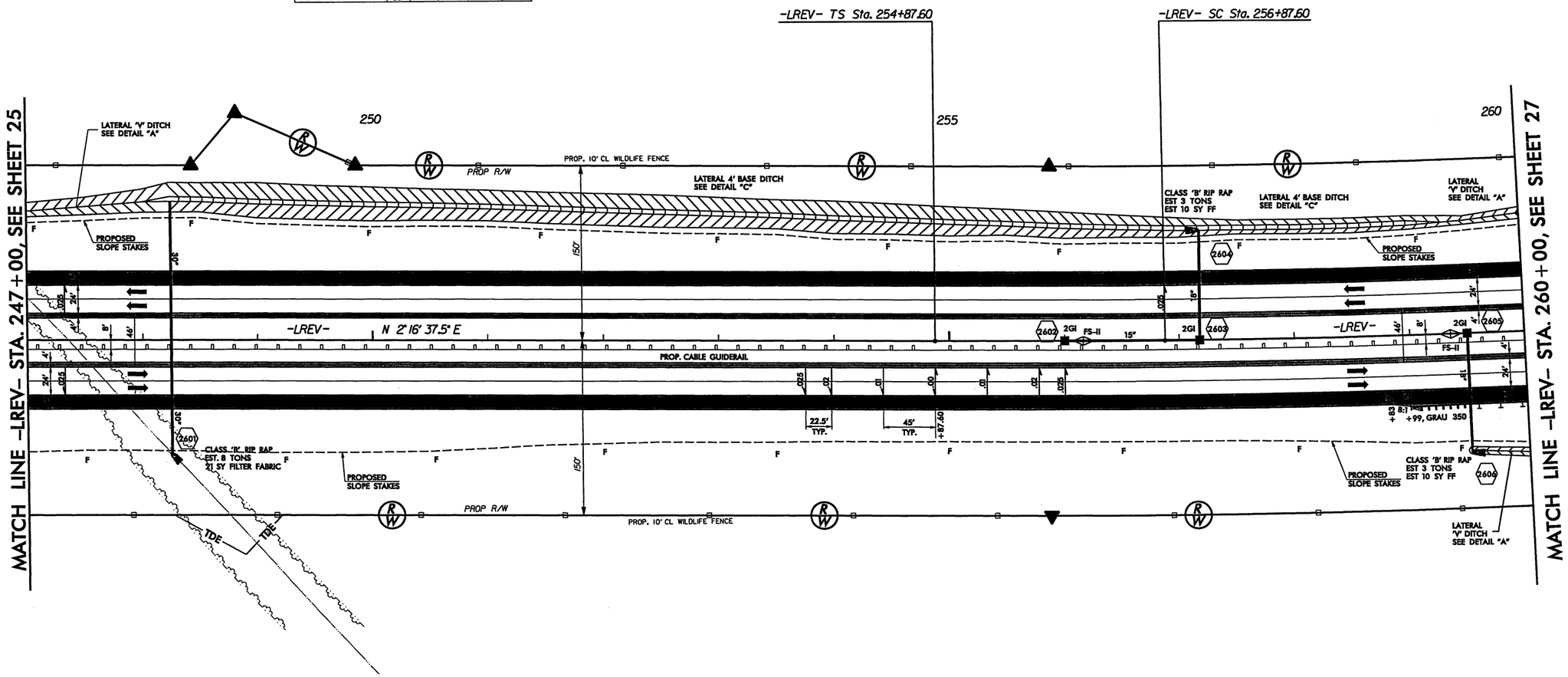
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-LREV-

PIs Sta 256+20.94	PI Sta 272+47.76	PIs Sta 288+48.61
Θs = 0° 35' 04.7"	Δ = 18° 05' 28.0" (LT)	Θs = 0° 35' 04.7"
Ls = 200.00'	D = 0° 35' 04.7"	Ls = 200.00'
LT = 133.33'	L = 3,094.34'	LT = 133.33'
ST = 66.67'	T = 1,560.16'	ST = 66.67'
	R = 9,800.00'	
	DS = 70 mph	
	e = 0.025	

NAD 83

37
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63



37
SUSTAINABLE FOREST, LLC
DB 1231 PG 861
MB 19 PG 411
MB 20 PG 63

SEE SHEET NO. 49, 50 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:08:33 AM SCALE: 1:50
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr1 DATE: 9/13/2010

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

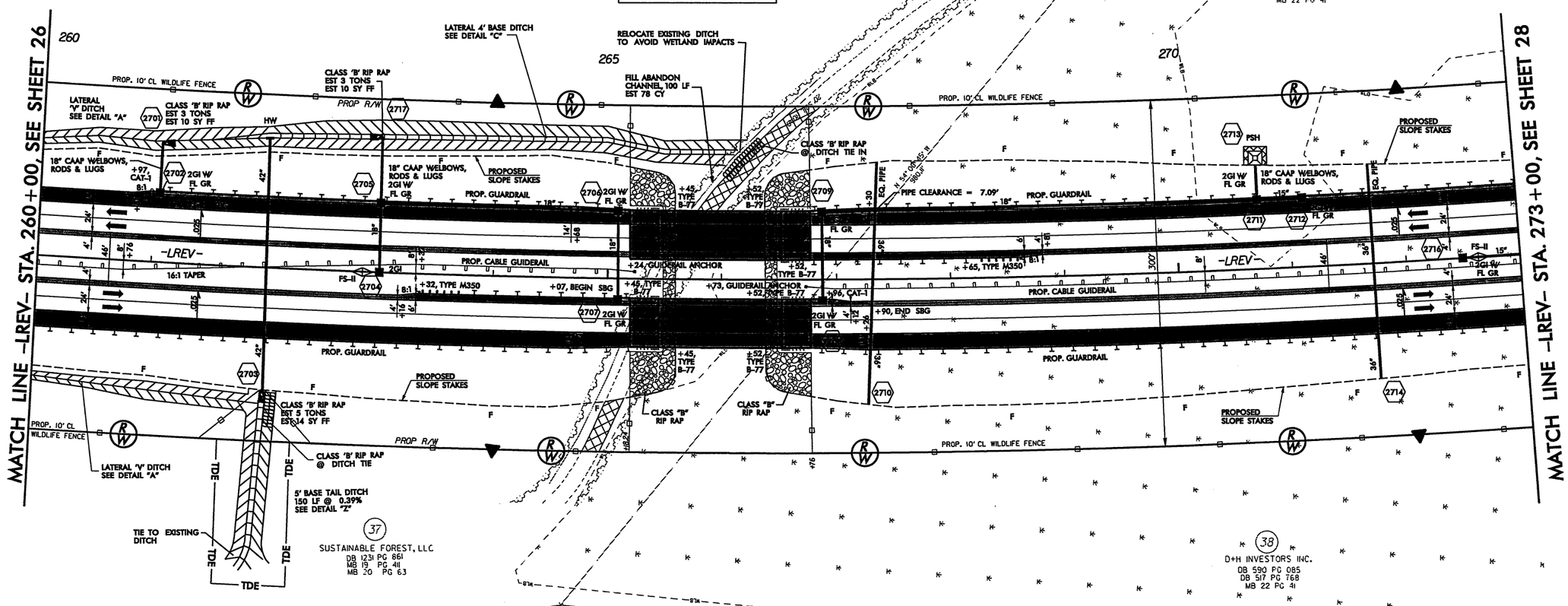
BARNHILL CONTRACTING COMPANY

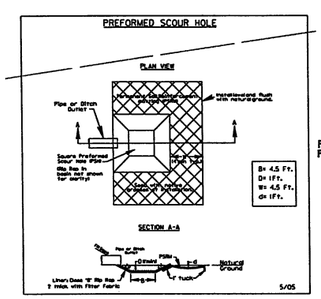
-LREV-

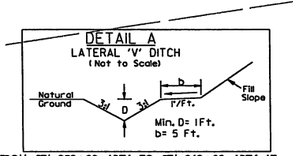
PIs Sta 256+20.94	PI Sta 272+47.76	PIs Sta 288+48.61
Θs = 0° 35' 04.7"	Δ = 18° 05' 28.0" (LT)	Θs = 0° 35' 04.7"
Ls = 200.00'	D = 0° 35' 04.7"	Ls = 200.00'
LT = 133.33'	L = 3,094.34'	LT = 133.33'
ST = 66.67'	T = 1,560.16'	ST = 66.67'
	R = 9,800.00'	
	DS = 70 mph	
	e = 0.025	

NAD 83

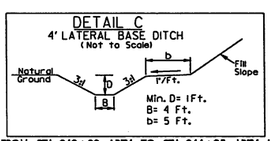
NO DECK DRAINS REQ'D ON EITHER BRIDGE



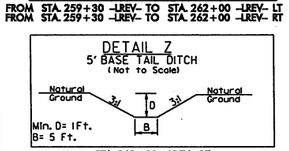




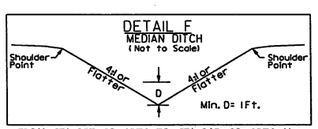
FROM STA. 259+30 -LREV- TO STA. 262+00 -LREV- LT
FROM STA. 259+30 -LREV- TO STA. 262+00 -LREV- RT



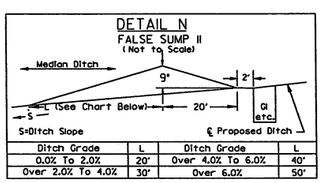
FROM STA. 262+00 -LREV- TO STA. 266+25 -LREV- LT



STA. 262+00 -LREV- RT



FROM STA. 257+18 -LREV- TO STA. 265+00 -LREV- M
FROM STA. 267+00 -LREV- TO STA. 273+32 -LREV- M



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'

SEE SHEET NO. 50 FOR -LREV- PROFILE.
SEE SHEET NO. 2-M FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwainwrl DATE: 9/13/2010
FILE: M:\tg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:08:41 AM SCALE: 1:50

REVISIONS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

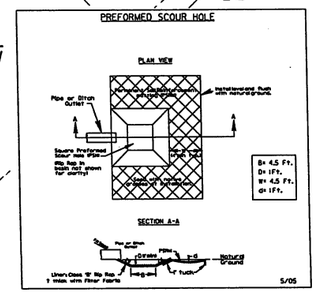
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

BARNHILL CONTRACTING COMPANY

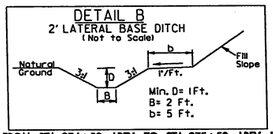
-LREV-

PIs Sta 256+20.94	PI Sta 272+47.76	PIs Sta 288+48.61
Θs = 0° 35' 04.7"	Δ = 18° 05' 28.0" (LT)	Θs = 0° 35' 04.7"
Ls = 200.00'	D = 0° 35' 04.7"	Ls = 200.00'
LT = 133.33'	L = 3,094.34'	LT = 133.33'
ST = 66.67'	T = 1,560.16'	ST = 66.67'
	R = 9,800.00'	
	DS = 70 mph	
	e = 0.025	

PREFORMED SCOUR HOLE

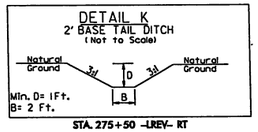


DETAIL B
2' LATERAL BASE DITCH
(Not to Scale)



FROM STA. 274+50 -LREV- TO STA. 275+50 -LREV- LT
FROM STA. 275+50 -LREV- TO STA. 277+50 -LREV- LT

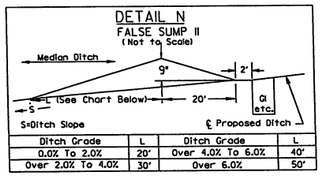
DETAIL K
2' BASE TAIL DITCH
(Not to Scale)



STA. 275+50 -LREV- RT

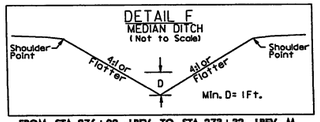
NAD 83

DETAIL N
FALSE SUMP II
(Not to Scale)



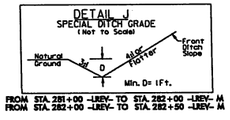
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL F
MEDIAN DITCH
(Not to Scale)

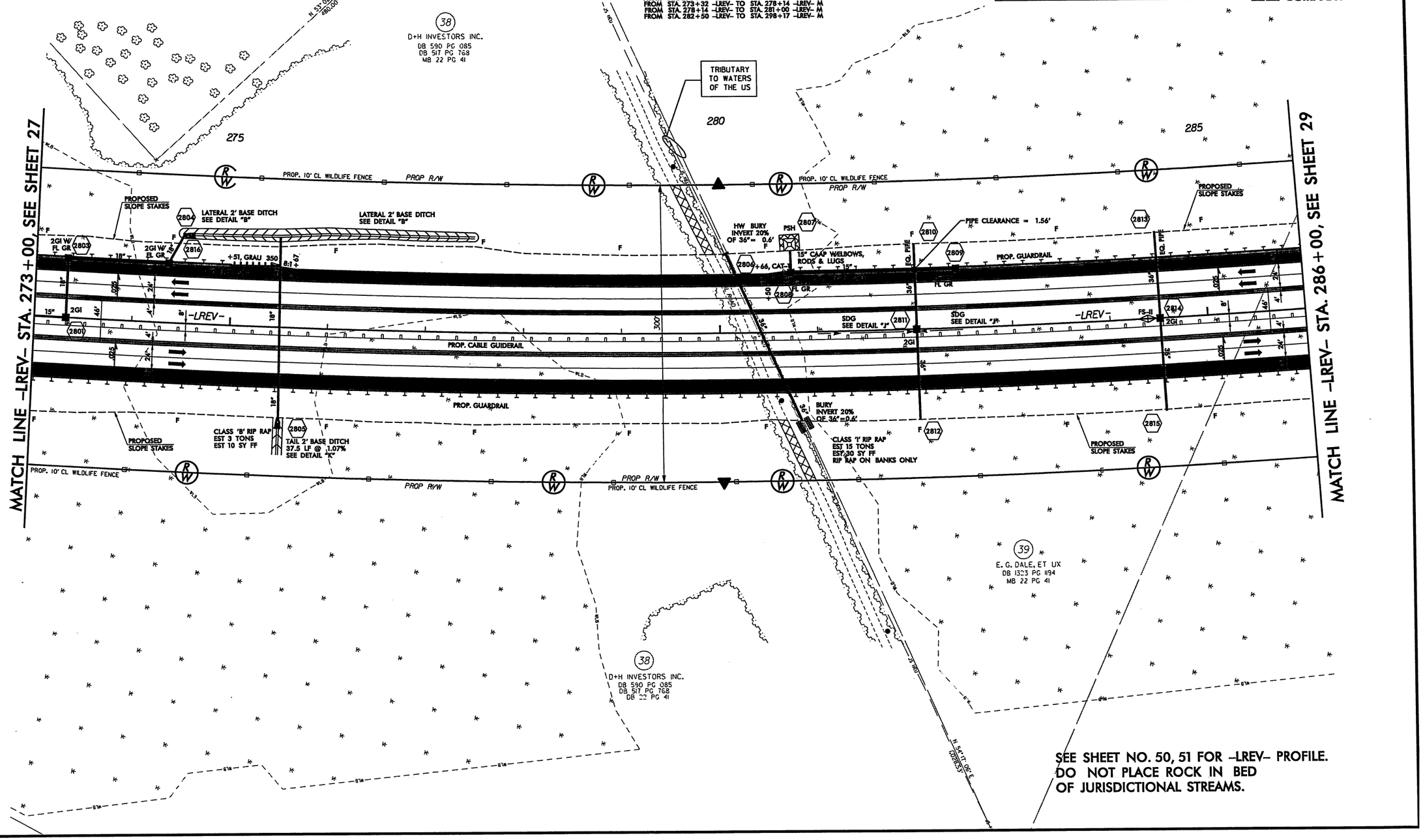


FROM STA. 276+00 -LREV- TO STA. 273+32 -LREV- M
FROM STA. 273+32 -LREV- TO STA. 278+14 -LREV- M
FROM STA. 278+14 -LREV- TO STA. 281+00 -LREV- M
FROM STA. 282+50 -LREV- TO STA. 298+17 -LREV- M

DETAIL J
SPECIAL DITCH GRADE
(Not to Scale)



FROM STA. 281+00 -LREV- TO STA. 282+00 -LREV- M
FROM STA. 282+00 -LREV- TO STA. 282+50 -LREV- M



SEE SHEET NO. 50, 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:08:56 AM SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

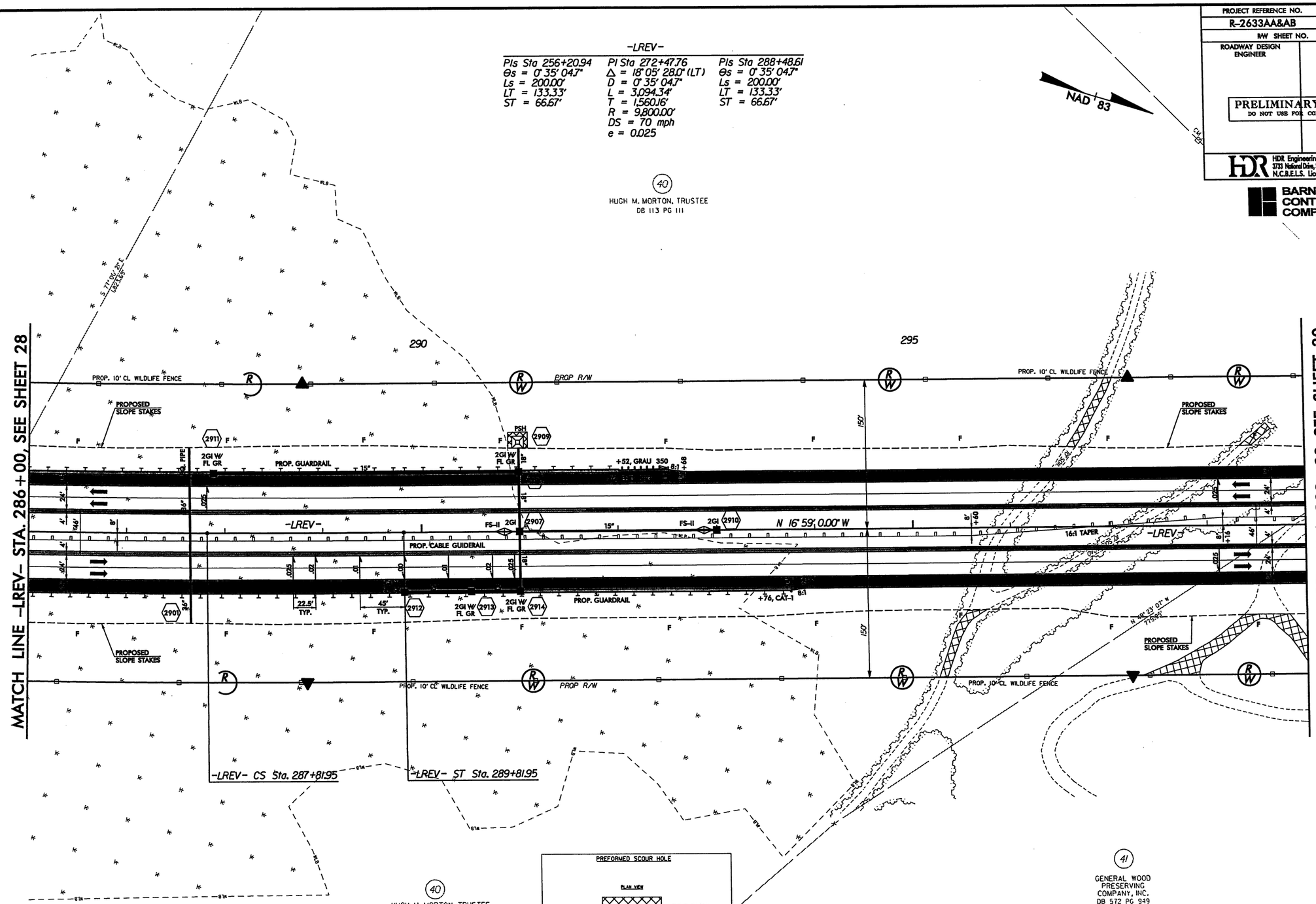
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

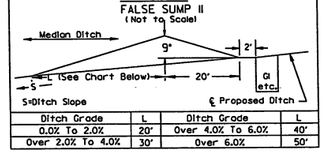
BARNHILL CONTRACTING COMPANY

-LREV-

PIs Sta 256+20.94	PI Sta 272+47.76	PIs Sta 288+48.61
Θs = 0° 35' 04.7"	Δ = 18° 05' 28.0" (LT)	Θs = 0° 35' 04.7"
Ls = 200.00'	D = 0° 35' 04.7"	Ls = 200.00'
LT = 133.33'	L = 3,094.34'	LT = 133.33'
ST = 66.67'	T = 1,560.16'	ST = 66.67'
	R = 9,800.00'	
	DS = 70 mph	
	e = 0.025	

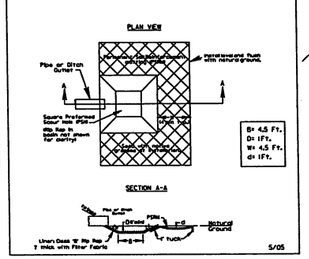


DETAIL N
FALSE SUMP II
(Not To Scale)

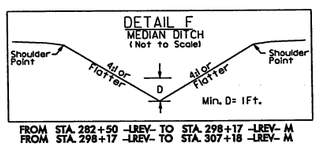


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

PREFORMED SCOUR HOLE



DETAIL F
MEDIAN DITCH
(Not To Scale)



FROM STA. 282+50 -LREV- TO STA. 298+17 -LREV- M
FROM STA. 298+17 -LREV- TO STA. 307+18 -LREV- M

SEE SHEET NO. 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Pro\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
DATE: 9/13/2010
TIME: 11:09:09 AM
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

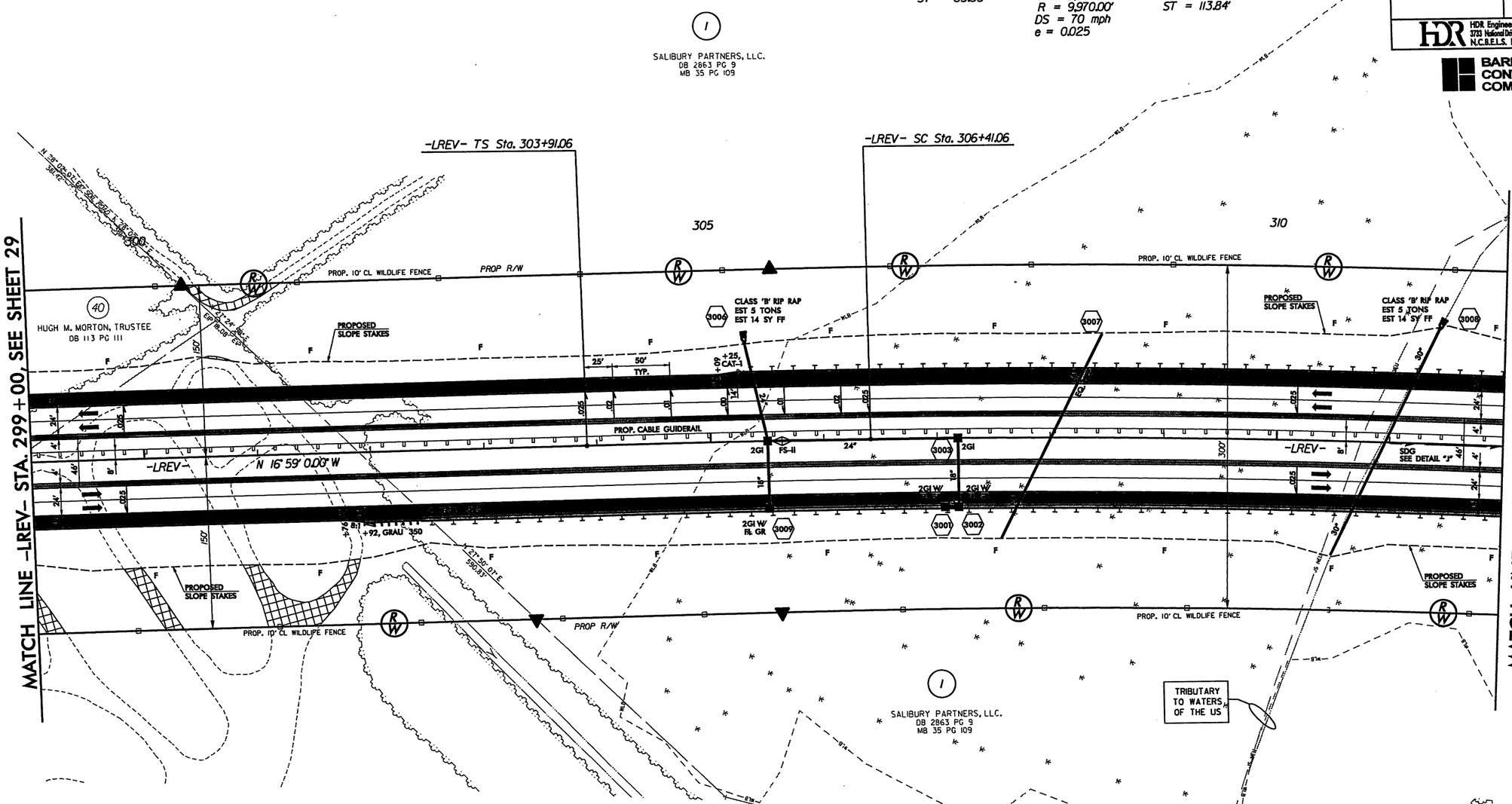
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

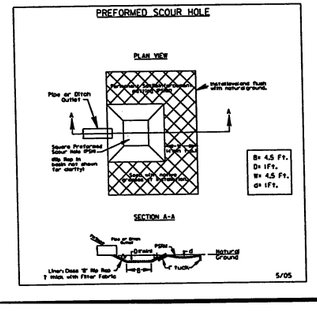
BARNHILL CONTRACTING COMPANY

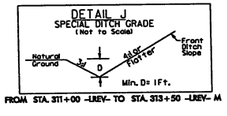
NAD 83

-LREV-

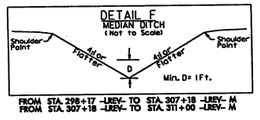
Pls Sta 305+57.73	PI Sta 341+99.51	Pls Sta 376+13.11
Θs = 0° 43' 06.1"	Δ = 39° 17' 04.2" (RT)	Θs = 0° 43' 06.1"
Ls = 250.00'	D = 0° 34' 28.9"	Θs = 1° 14' 40.1"
LT = 166.67'	L = 6,835.87'	Ls = 250.00'
ST = 83.33'	T = 3,558.44'	LT = 136.18'
	R = 9,970.00'	ST = 113.84'
	DS = 70 mph	
	e = 0.025	





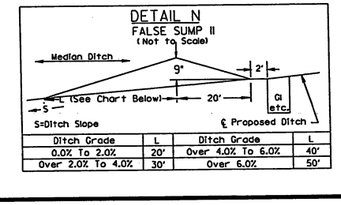


FROM STA. 311+00 -LREV- TO STA. 313+50 -LREV- M



FROM STA. 298+17 -LREV- TO STA. 307+18 -LREV- M
FROM STA. 307+18 -LREV- TO STA. 311+00 -LREV- M

41
GENERAL WOOD PRESERVING COMPANY, INC.
DB 572 PG 949
MB 9 PG 11



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'

SEE SHEET NO. 51 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

8/17/99

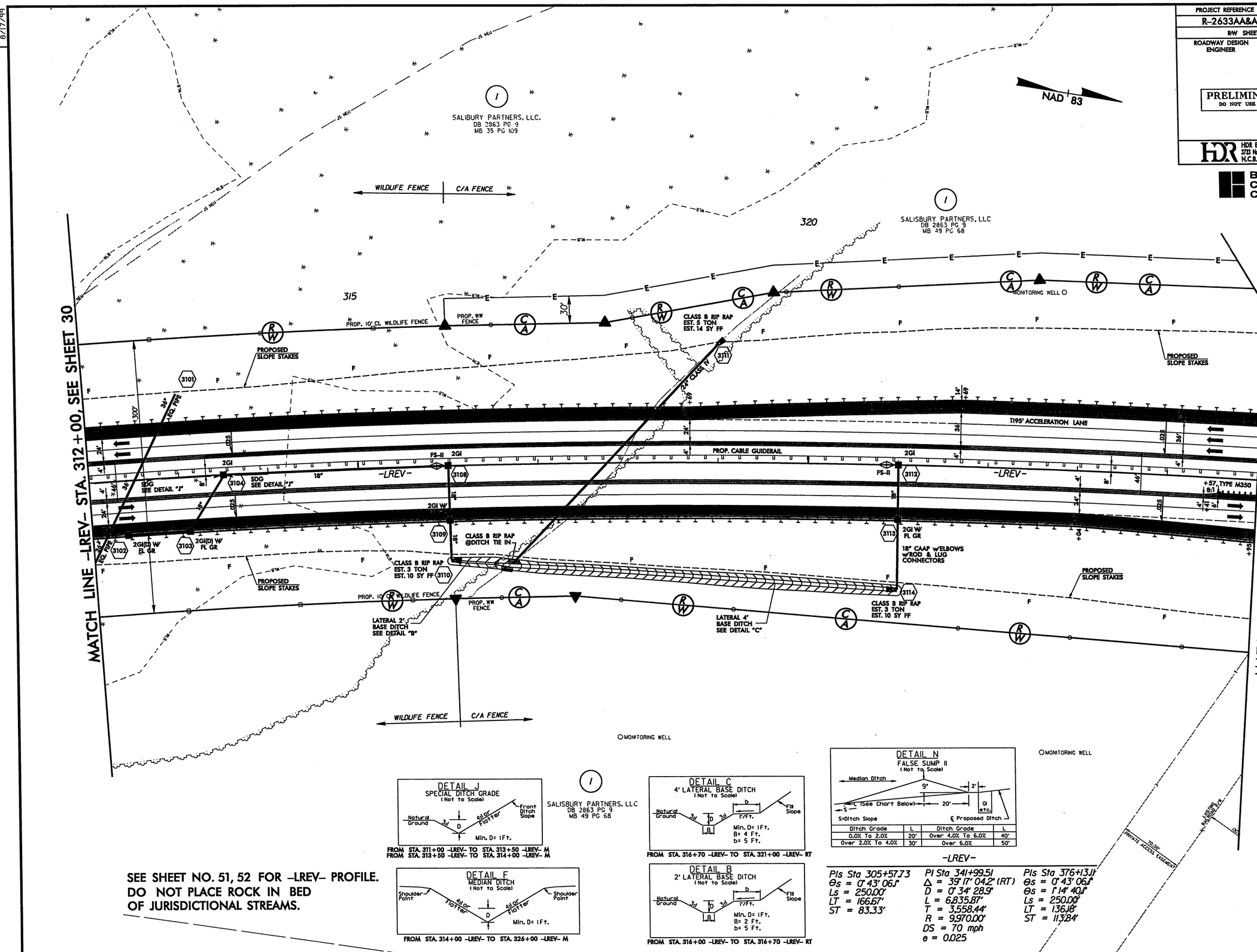
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl.tbl
USER: dwalnwrl DATE: 9/13/2010 TIME: 11:09:20 AM SCALE: 1:50
TILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 51, 52 FOR -LREV- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpf1.tbl
TIME: 11:09:32 AM SCALE: 1:50
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr1 DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

REVISIONS

MATCH LINE -Y5EBL- STA. 20+50, SEE SHEET 37

MATCH LINE -LREV- STA. 325+00, SEE SHEET 31

MATCH LINE -LREV- STA. 351+00, SEE SHEET 33

MATCH LINE -Y5EBL- STA. 36+00, SEE SHEET 38

SEE SHEET NO. 52, 53 FOR -LREV- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5EBL- PROFILE.
SEE SHEET NO. 64, 65 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 72 FOR -RP_A1REV- PROFILE.
SEE SHEET NO. 73 FOR -RP_D1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_A1REV- PROFILE.
SEE SHEET NO. 74 FOR -LP_D1REV- PROFILE.
SEE SHEET NO. 2-N FOR STRUCTURE DETAIL.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-2633AA&AB	32

R/W SHEET NO.

STRUCTURE DESIGN ENGINEER | HYDRAULIC ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

HDR Engineering, Inc. of the Carolinas
343 Commerce Blvd. Tel. (910) 452-4200
Statesville, Florida Number P-0483

BARNHILL CONTRACTING COMPANY

LOCATION:
TIP NO.: COUNTY:
DESIGNED BY:
CHECKED BY: DATE:

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

-RP_AIREV-

PIs Sta 14+00.09
Θs = 5° 22' 17.3"
Ls = 300.00'
LT = 200.09'
ST = 100.08'

PI Sta 17+44.57
Δ = 17° 22' 54.0" (RT)
D = 3° 34' 51.6"
L = 485.39'
T = 244.57'
R = 1,600.00'
DS = 60 mph
e = 0.08

PIs Sta 20+58.75
Θs = 3° 56' 20.7"
Ls = 220.00'
LT = 146.70'
ST = 73.37'

-RP_DIREV-

PIs Sta 12+51.69
Θs = 1° 09' 05.9"
Θs = 8° 49' 04.4"
Ls = 400.00'
LT = 251.69'
ST = 149.20'

PI Sta 16+90.97
Δ = 25° 13' 55.8" (LT)
D = 4° 24' 26.5"
L = 572.50'
T = 290.97'
R = 1,300.00'
DS = 60 mph
e = 0.08

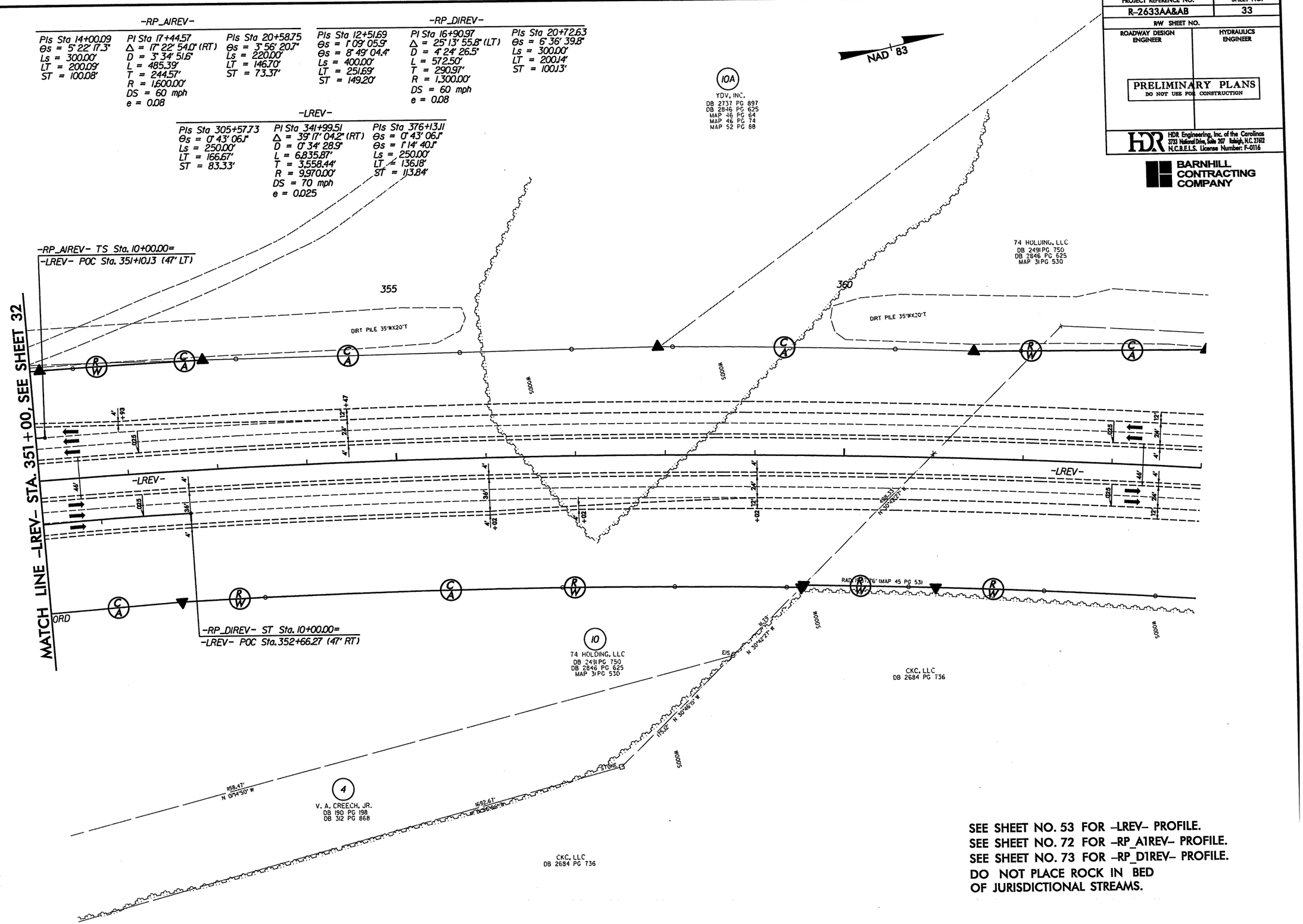
PIs Sta 20+72.63
Θs = 6° 36' 39.8"
Ls = 300.00'
LT = 200.14'
ST = 100.13'

-LREV-

PIs Sta 305+57.73
Θs = 0° 43' 06.1"
Ls = 250.00'
LT = 166.67'
ST = 83.33'

PI Sta 341+99.51
Δ = 39° 17' 04.2" (RT)
D = 0° 34' 28.9"
L = 6,835.87'
T = 3,558.44'
R = 9,970.00'
DS = 70 mph
e = 0.025

PIs Sta 376+13.11
Θs = 0° 43' 06.1"
Θs = 1° 14' 40.1"
Ls = 250.00'
LT = 136.18'
ST = 113.84'



SEE SHEET NO. 53 FOR -LREV- PROFILE.
SEE SHEET NO. 72 FOR -RP_A1REV- PROFILE.
SEE SHEET NO. 73 FOR -RP_D1REV- PROFILE.
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr1 DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:09:40 AM SCALE: 1:50

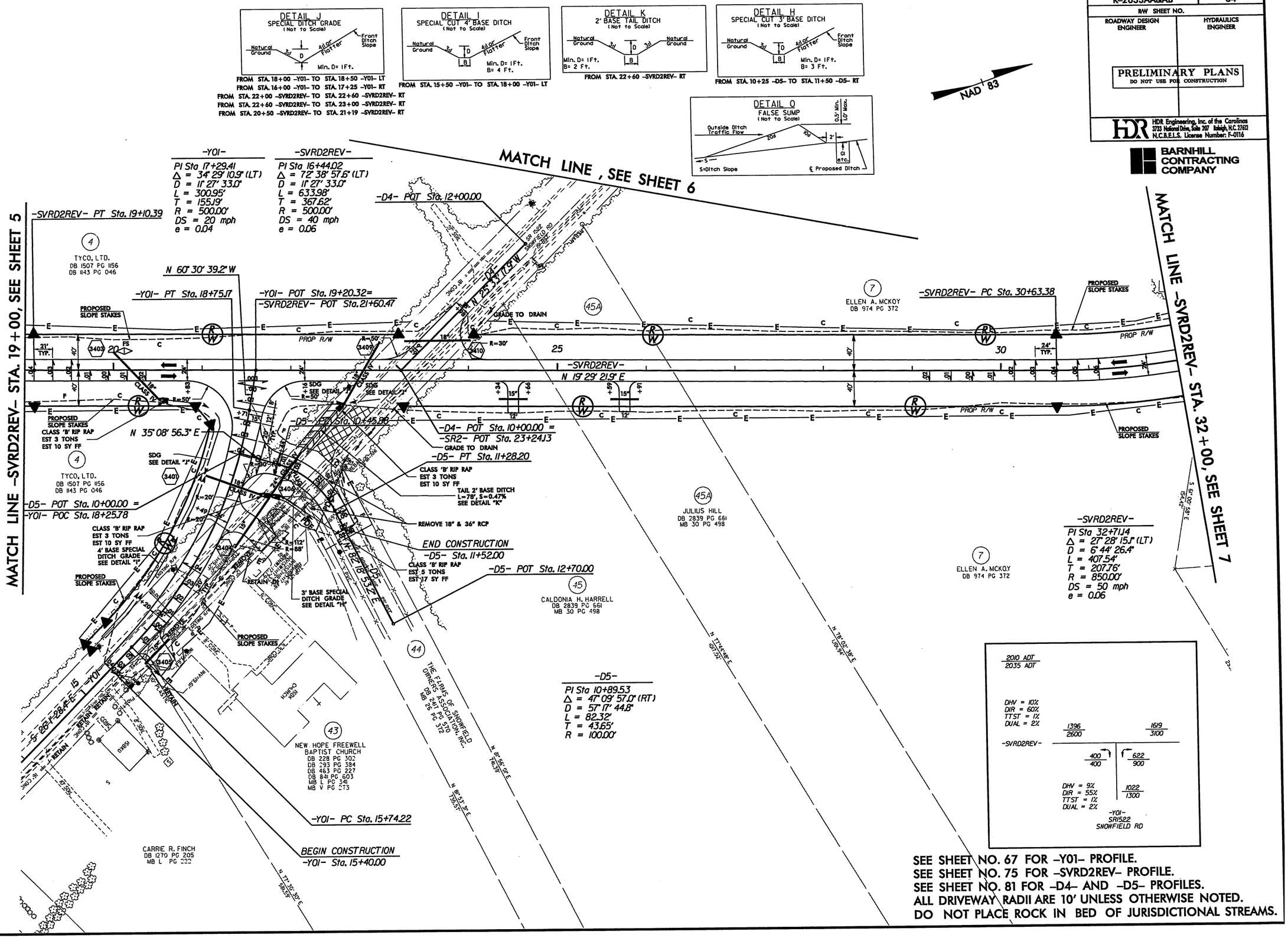
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



SEE SHEET NO. 67 FOR -Y01- PROFILE.
SEE SHEET NO. 75 FOR -SVRD2REV- PROFILE.
SEE SHEET NO. 81 FOR -D4- AND -D5- PROFILES.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Wktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PENTABLE: NCDOT_pshp-fl.tbl
TIME: 11:09:47 AM
DATE: 9/13/2010
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

-Y04REV-

PIs Sta 12+17.14
Θs = 9° 42' 40.1"
Ls = 200.00'
LT = 133.53'
ST = 66.85'

PI Sta 15+71.10
Δ = 51° 57' 28.5" (RT)
D = 9° 42' 40.1"
L = 535.03'
T = 287.49'
R = 590.00'
DS = 45 mph
e = 0.08

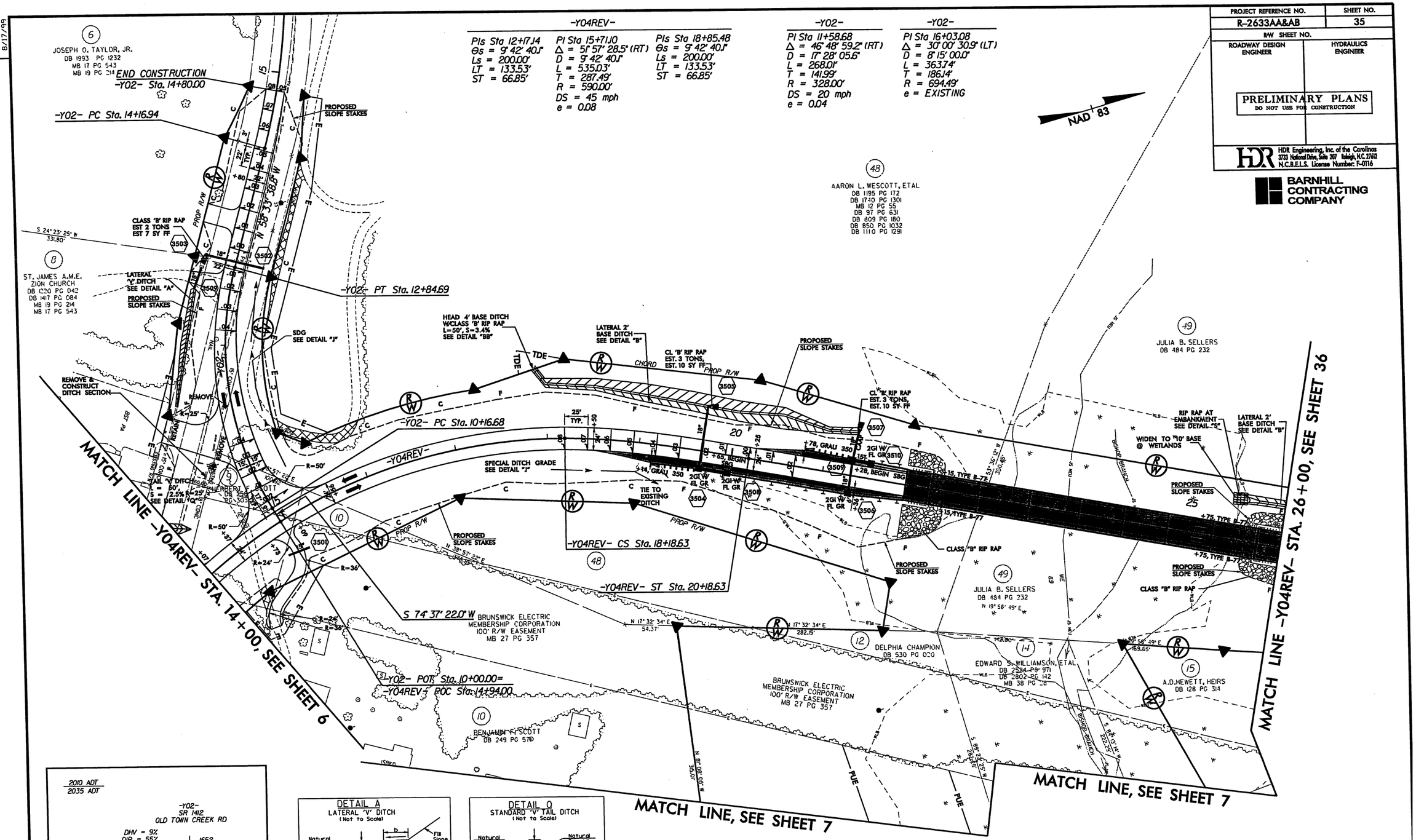
PIs Sta 18+85.48
Θs = 9° 42' 40.1"
Ls = 200.00'
LT = 133.53'
ST = 66.85'

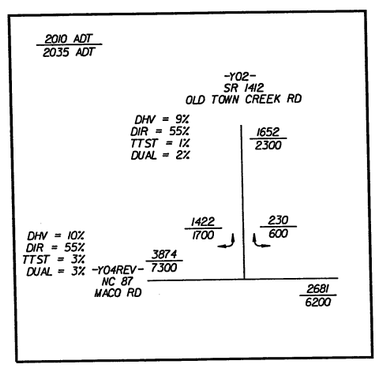
-Y02-

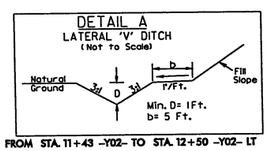
PI Sta 11+58.68
Δ = 46° 48' 59.2" (RT)
D = 17° 28' 05.6"
L = 268.01'
T = 141.99'
R = 328.00'
DS = 20 mph
e = 0.04

-Y02-

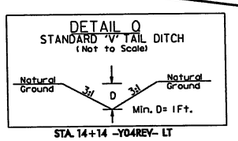
PI Sta 16+03.08
Δ = 30° 00' 30.9" (LT)
D = 8° 15' 00.0"
L = 363.74'
T = 186.14'
R = 694.49'
e = EXISTING



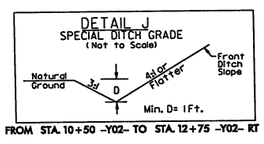




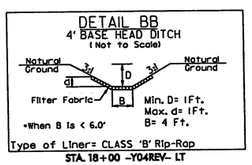
FROM STA. 11+43 -Y02- TO STA. 12+50 -Y02- LT



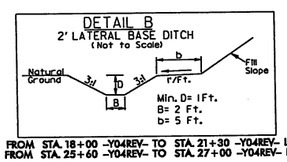
STA. 14+14 -Y04REV- LT



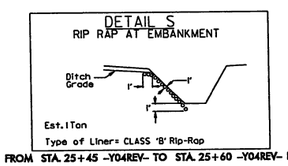
FROM STA. 10+50 -Y02- TO STA. 12+75 -Y02- RT



STA. 18+00 -Y04REV- LT



FROM STA. 18+00 -Y04REV- TO STA. 21+30 -Y04REV- LT
FROM STA. 25+60 -Y04REV- TO STA. 27+00 -Y04REV- LT



FROM STA. 25+45 -Y04REV- TO STA. 25+60 -Y04REV- LT

SEE SHEET NO. 68 FOR -Y04REV- PROFILE.
SEE SHEET NO. 67 FOR -Y02- PROFILE.
SEE SHEET NO. 2-M FOR STRUCTURE DETAIL.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwr1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
PENTABLE: NCDOT_pshpfl.tbl
DATE: 9/13/2010
TIME: 11:09:58 AM
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

-DIREV-
PI Sta 10+67.66
Δ = 85° 45' 21.0" (LT)
D = 229° 10' 59.2"
L = 37.42'
T = 23.21'
R = 25.00'

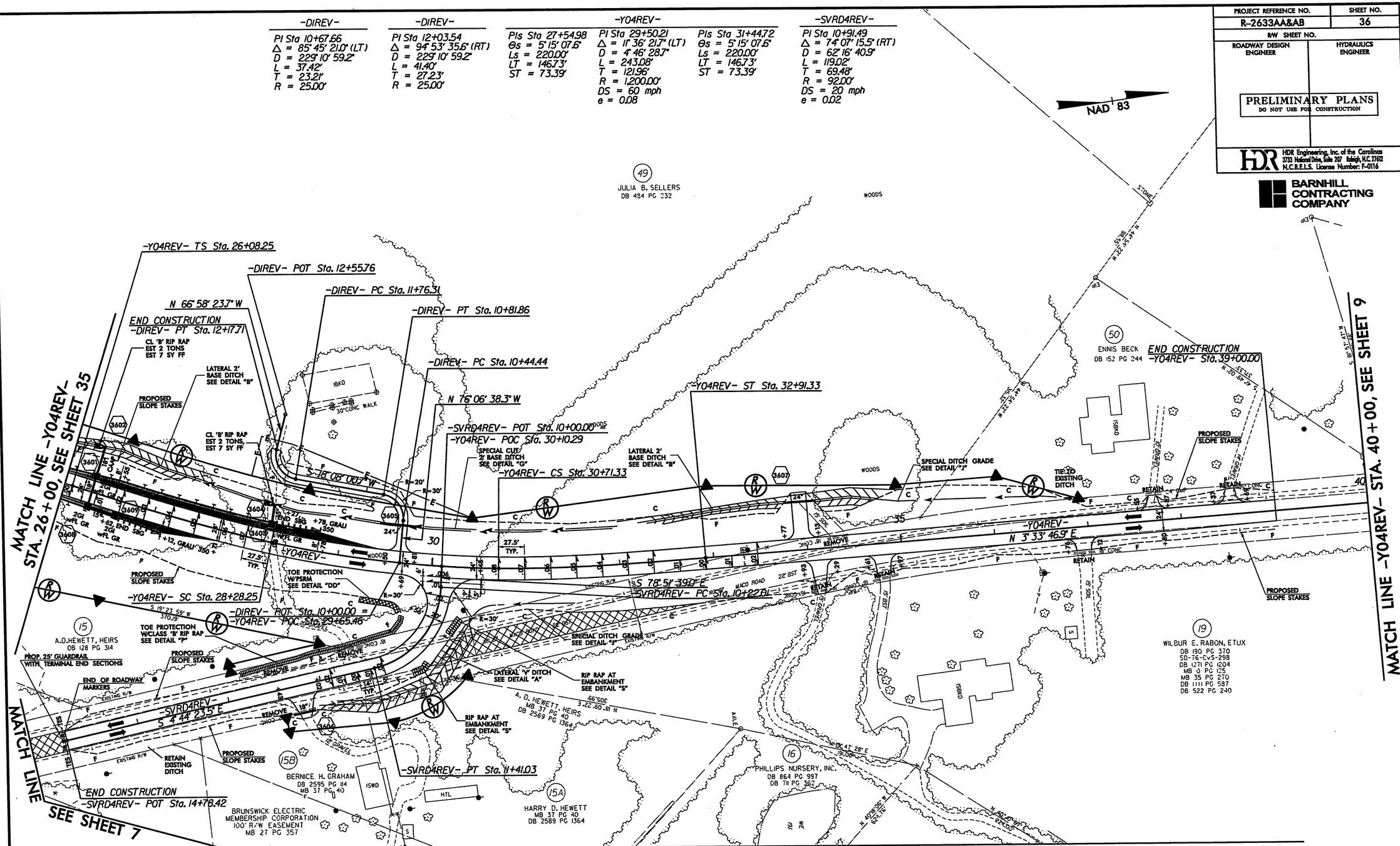
-DIREV-
PI Sta 12+03.54
Δ = 94° 53' 35.6" (RT)
D = 229° 10' 59.2"
L = 41.40'
T = 27.23'
R = 25.00'

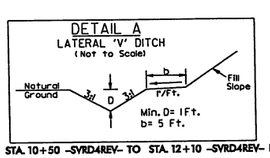
-Y04REV-
PIs Sta 27+54.98
Θs = 5° 15' 07.6"
Ls = 220.00'
LT = 146.73'
ST = 73.39'

PI Sta 29+50.21
Δ = 11° 36' 21.7" (LT)
D = 4° 46' 28.7"
L = 243.08'
T = 121.96'
R = 1,200.00'
DS = 60 mph
e = 0.08

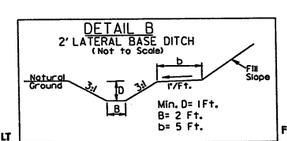
PIs Sta 31+44.72
Θs = 5° 15' 07.6"
Ls = 220.00'
LT = 146.73'
ST = 73.39'

-SVRD4REV-
PI Sta 10+91.49
Δ = 74° 07' 15.5" (RT)
D = 62° 16' 40.9"
L = 119.02'
T = 69.48'
R = 92.00'
DS = 20 mph
e = 0.02

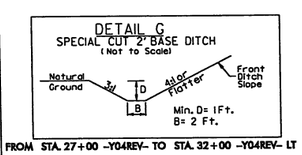




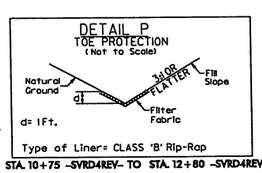
FROM STA. 10+50 -SVRD4REV- TO STA. 12+10 -SVRD4REV- LT



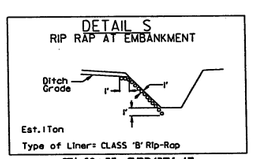
FROM STA. 25+60 -Y04REV- TO STA. 27+00 -Y04REV- LT
FROM STA. 32+00 -Y04REV- TO STA. 34+50 -Y04REV- LT



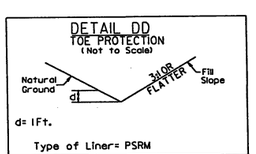
FROM STA. 27+00 -Y04REV- TO STA. 32+00 -Y04REV- LT



FROM STA. 10+75 -SVRD4REV- TO STA. 12+80 -SVRD4REV- RT



STA. 10+55 -SVRD4REV- LT
STA. 11+00 -SVRD4REV- LT



FROM STA. 29+30 -Y04REV- TO STA. 29+70 -Y04REV- RT

SEE SHEET NO. 80 FOR -SVRD4REV- PROFILE.
SEE SHEET NO. 68, 69 FOR -Y04REV- PROFILE.
SEE SHEET NO. 80 FOR -D1REV- PROFILE.
ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:10:08 AM SCALE: 1:50
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwolnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY

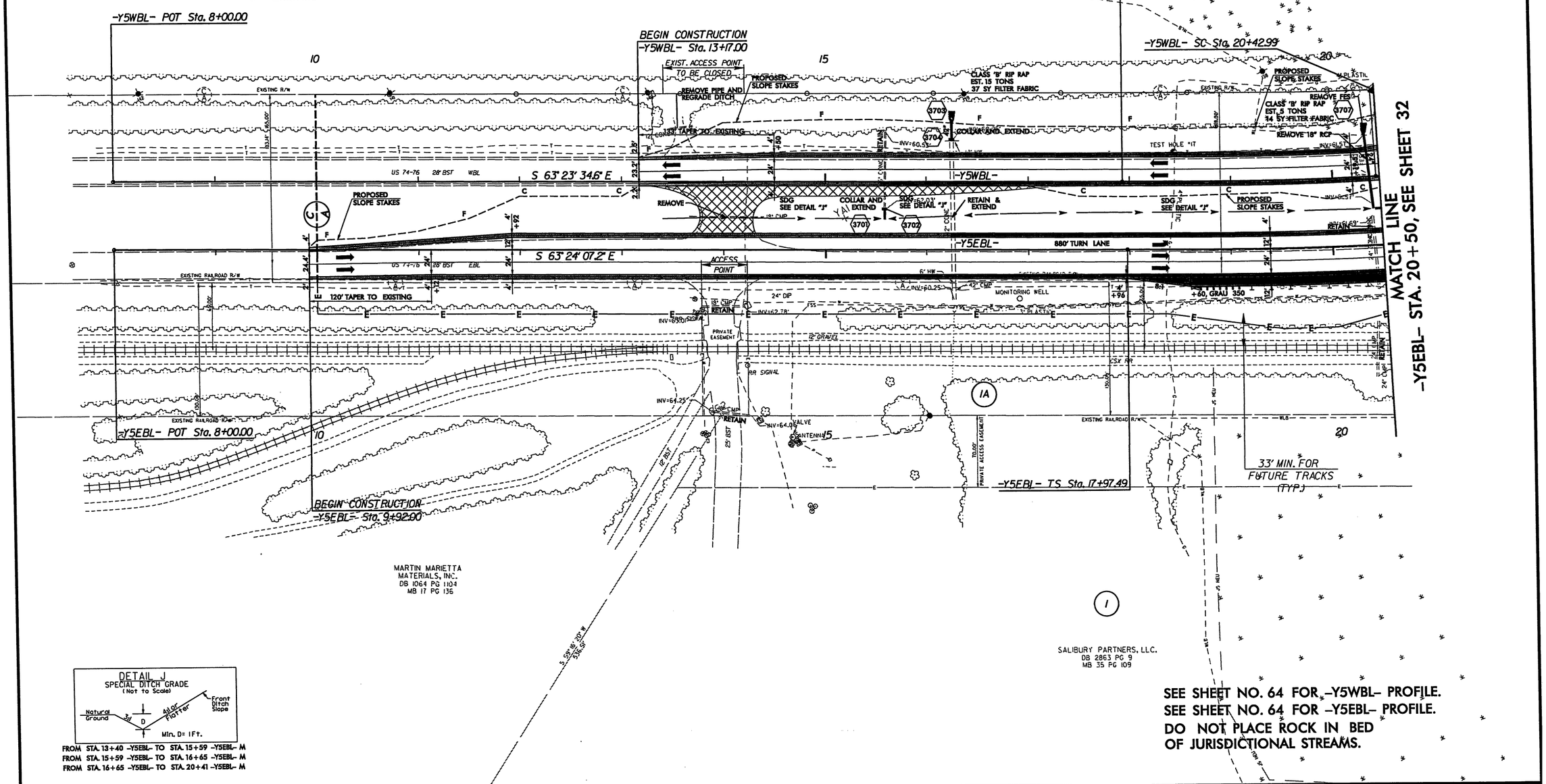
NAD 83

-Y5WBL-

PIs Sta 19+59.69	PI Sta 22+96.43	PIs Sta 26+57.31
Θs = 3° 32' 43.9"	Δ = 14° 18' 10.0" (LT)	Θs = 4° 40' 48.4"
Ls = 250.00'	D = 2° 50' 11.1"	Ls = 330.00'
LT = 166.70'	L = 504.25'	LT = 220.08'
ST = 83.36'	T = 253.44'	ST = 110.07'
	R = 2,020.00'	
	DS = 60 mph	
	e = EXISTING	

-Y5EBL-

PIs Sta 19+97.55	PI Sta 23+32.09	PIs Sta 26+64.51
Θs = 4° 24' 26.5"	Δ = 13° 43' 14.1" (LT)	Θs = 4° 24' 26.5"
Ls = 300.00'	D = 2° 56' 17.7"	Ls = 300.00'
LT = 200.06'	L = 466.97'	LT = 200.06'
ST = 100.06'	T = 234.61'	ST = 100.06'
	R = 1,950.00'	
	DS = 60 mph	
	e = EXISTING	



DETAIL J
SPECIAL DITCH GRADE
(Not to Scale)

FROM STA. 13+40 -Y5EBL- TO STA. 15+59 -Y5EBL- M
FROM STA. 15+59 -Y5EBL- TO STA. 16+65 -Y5EBL- M
FROM STA. 16+65 -Y5EBL- TO STA. 20+41 -Y5EBL- M

SEE SHEET NO. 64 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 64 FOR -Y5EBL- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

8/17/99

REVISIONS

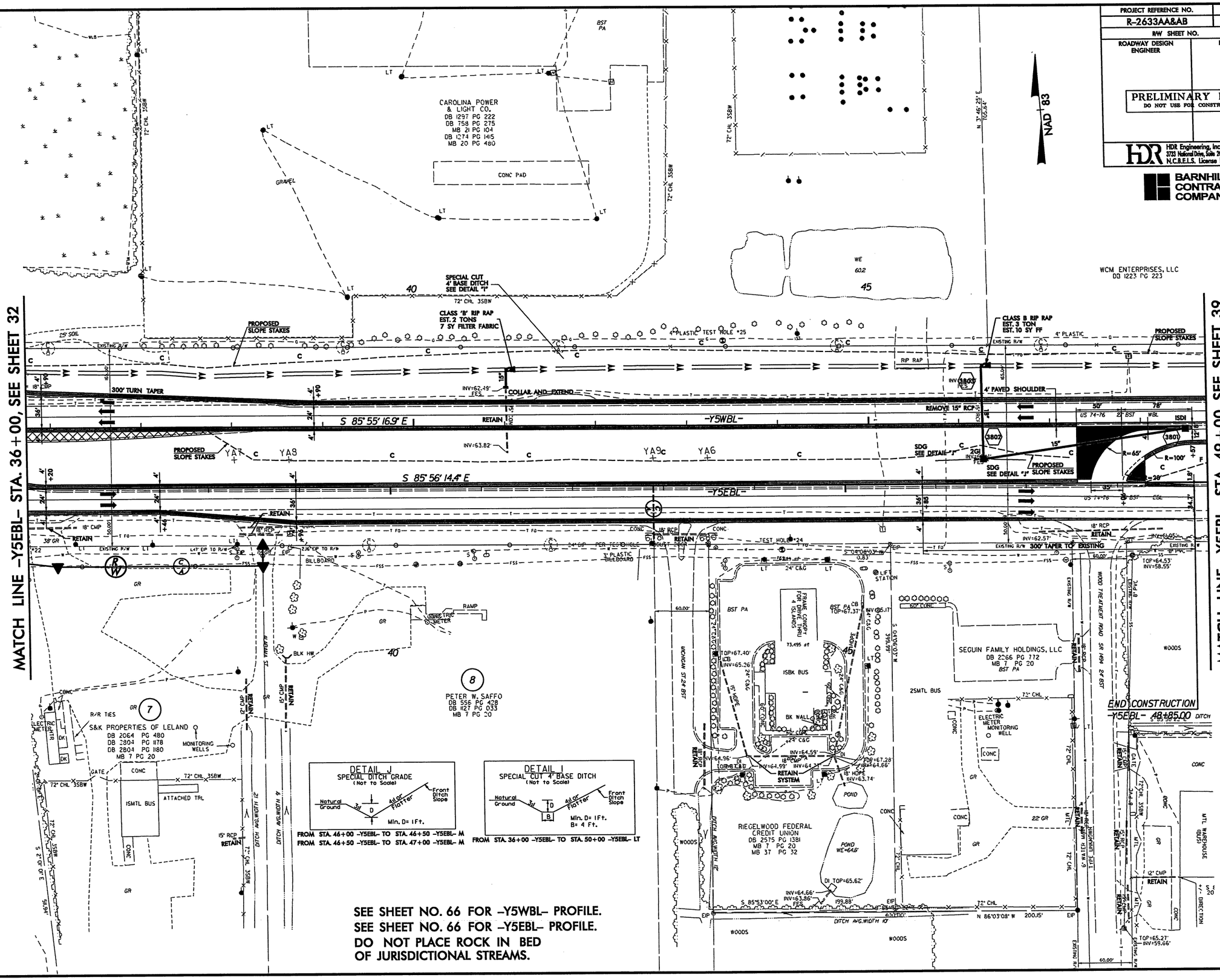
PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn
DATE: 9/13/2010
TIME: 11:10:23 AM
PENTABLE: NCDOT_pshpfl.tbl
SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BARNHILL CONTRACTING COMPANY



8/17/99

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
USER: dwalnwrl DATE: 9/13/2010
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

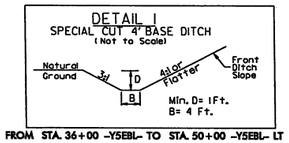
PENTABLE: NCDOT_pshpfl.tbl
TIME: 11:10:31 AM SCALE: 1:50

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

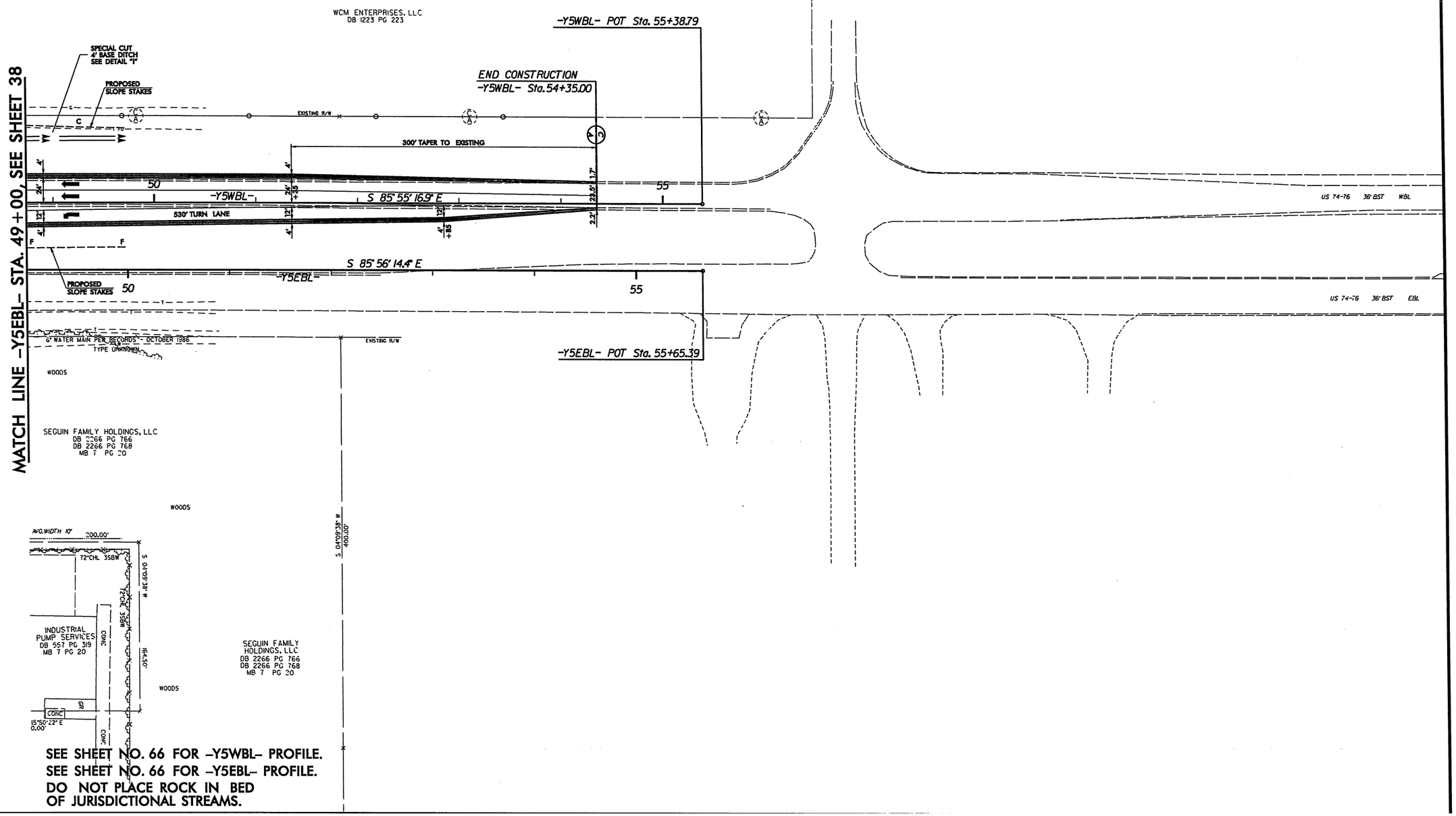
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

BARNHILL CONTRACTING COMPANY



FROM STA. 36+00 -Y5EBL- TO STA. 50+00 -Y5EBL- LT



SEE SHEET NO. 66 FOR -Y5WBL- PROFILE.
SEE SHEET NO. 66 FOR -Y5EBL- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

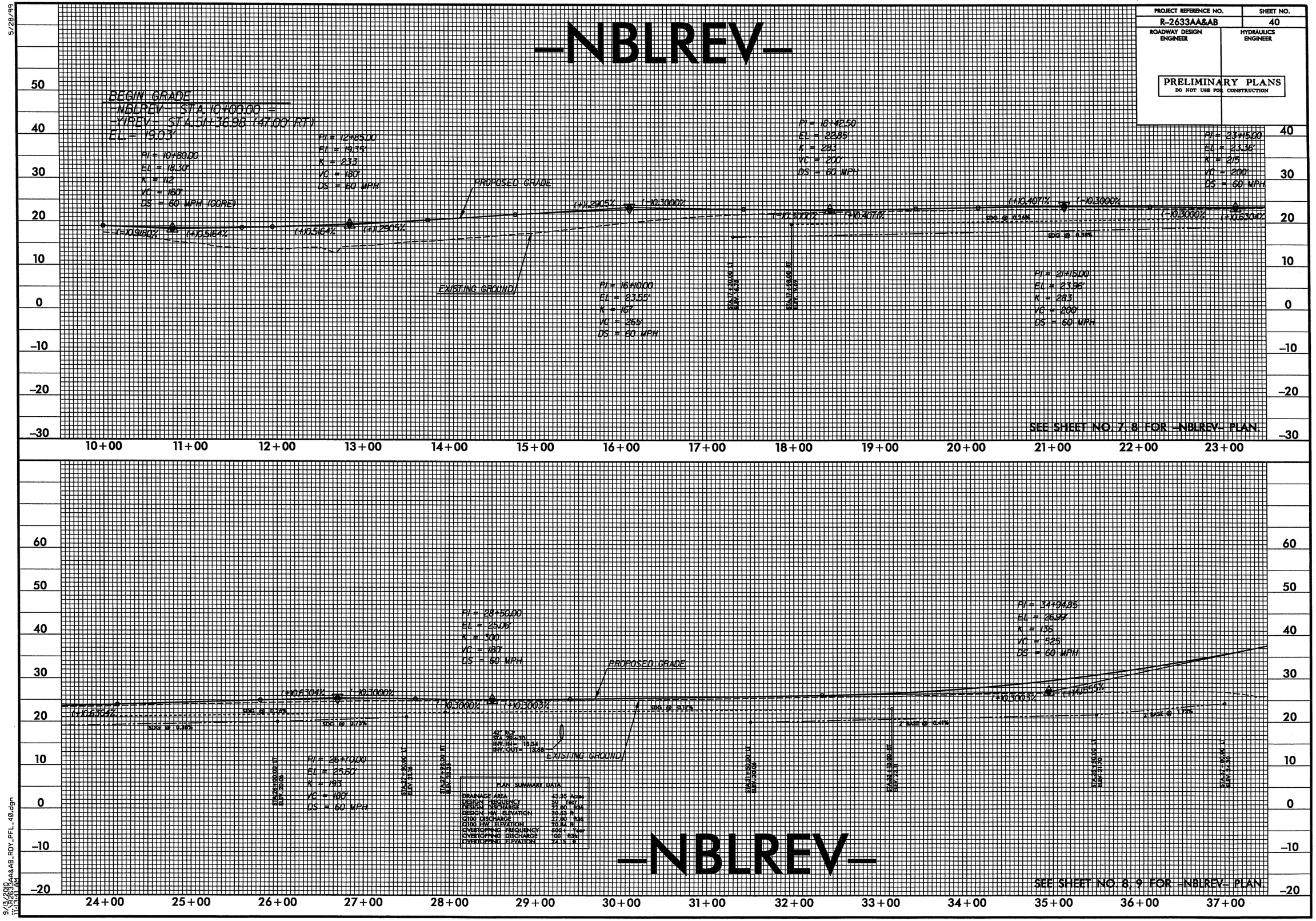
8/17/99

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl.tbl
USER: dwalnwrl DATE: 9/13/2010 TIME: 11:10:39 AM SCALE: 1:50
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Barnhill_Wilmington_Bypass\R-2633AA & AB\Roadway\Proj\R2633AA&AB_RDY_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-NBLREV-



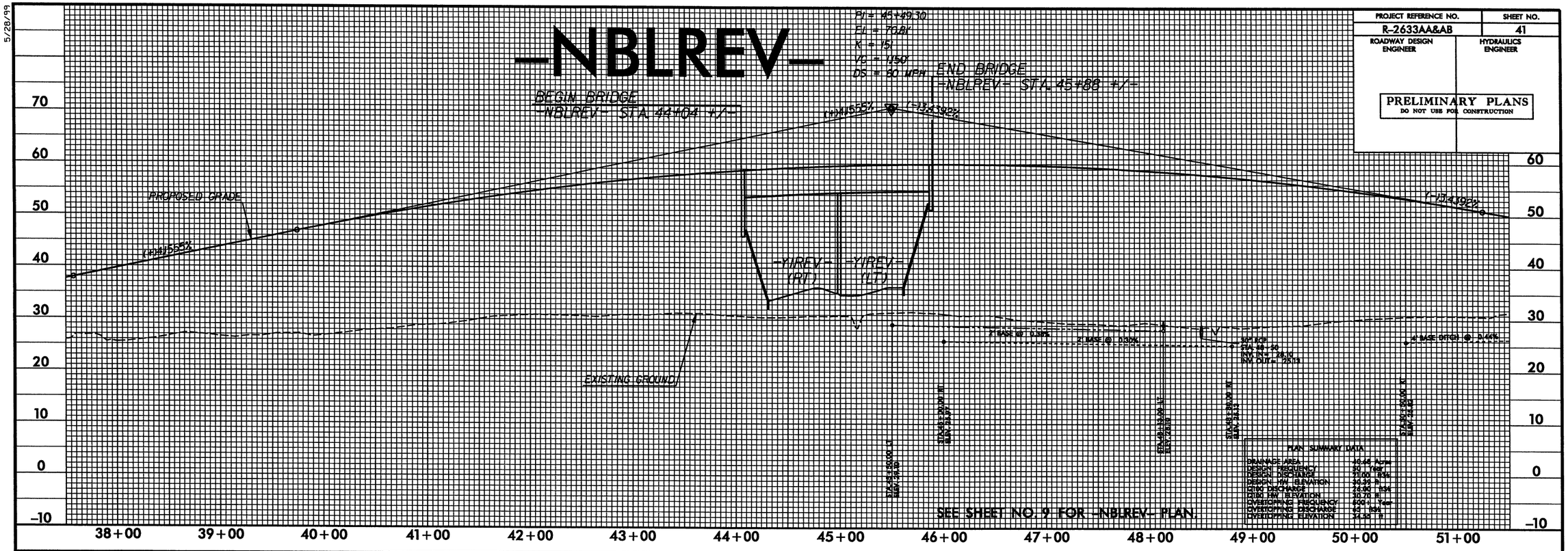
5/28/99

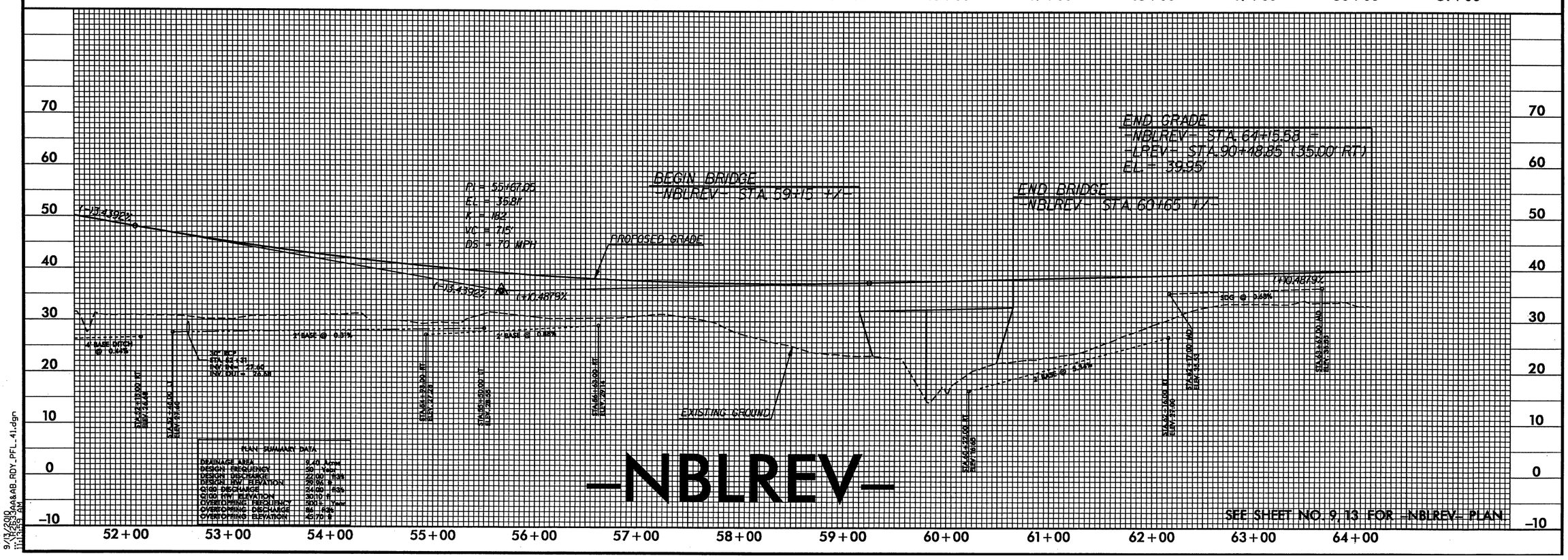
9/13/2010
R2633aa&ab_RDY_PFL_40.dgn
11:19:21 AM

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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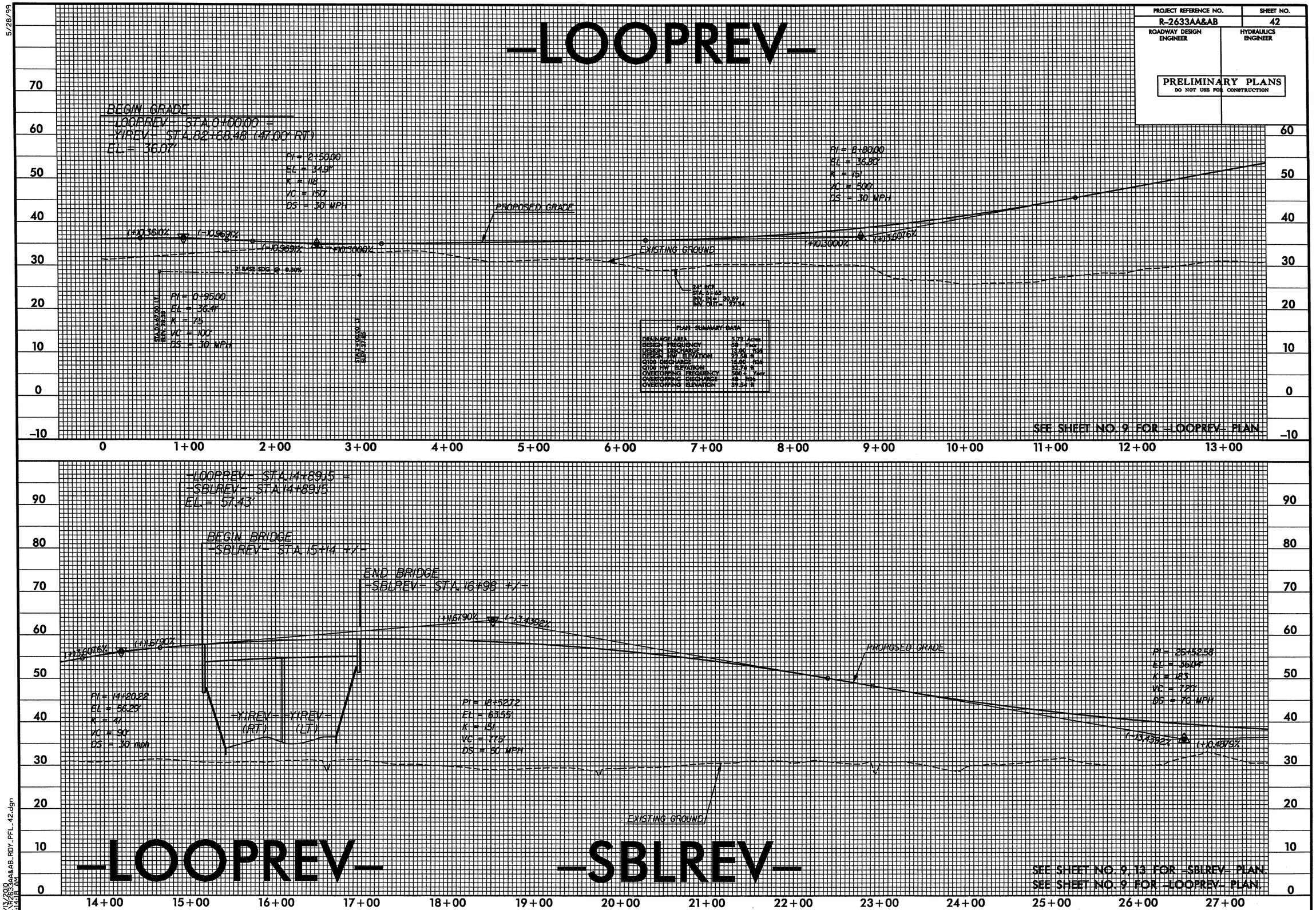
11:13:59 AM
R2633AA&AB_RDY_PFL_41.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-LOOPREV-



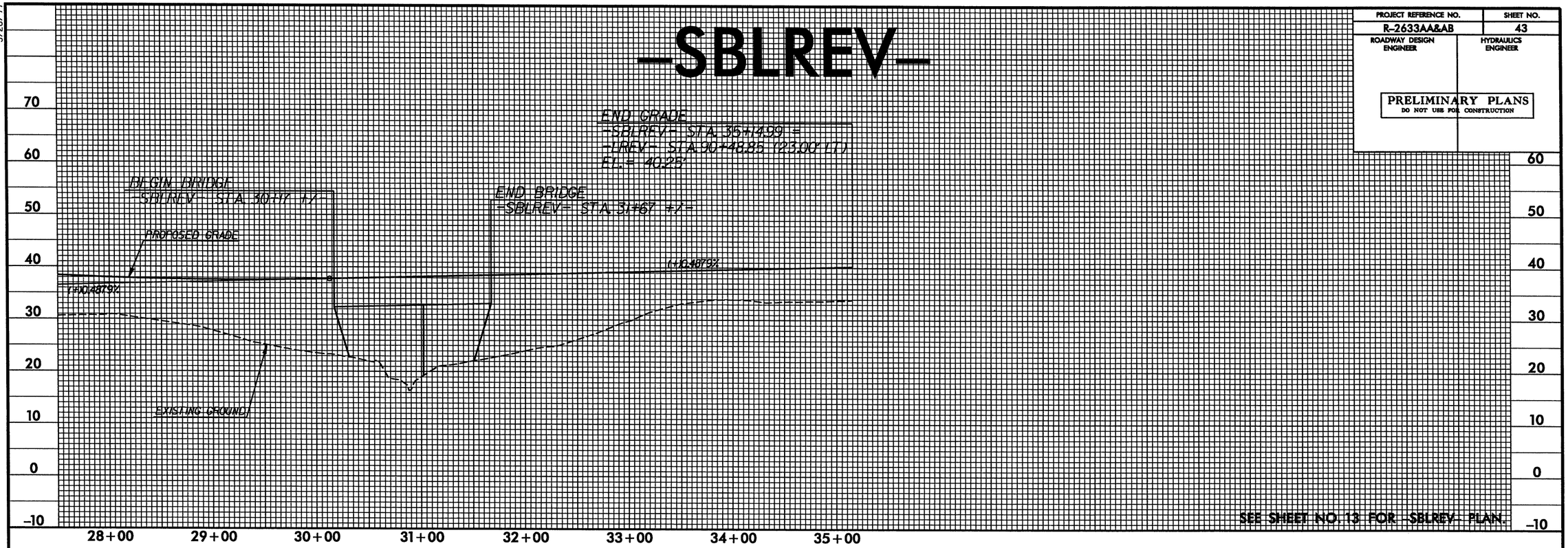
9/13/2010
11:41:18 AM
R2633AA&AB_RDY_PFL_42.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SBLREV-



SEE SHEET NO. 13 FOR -SBLREV- PLAN.

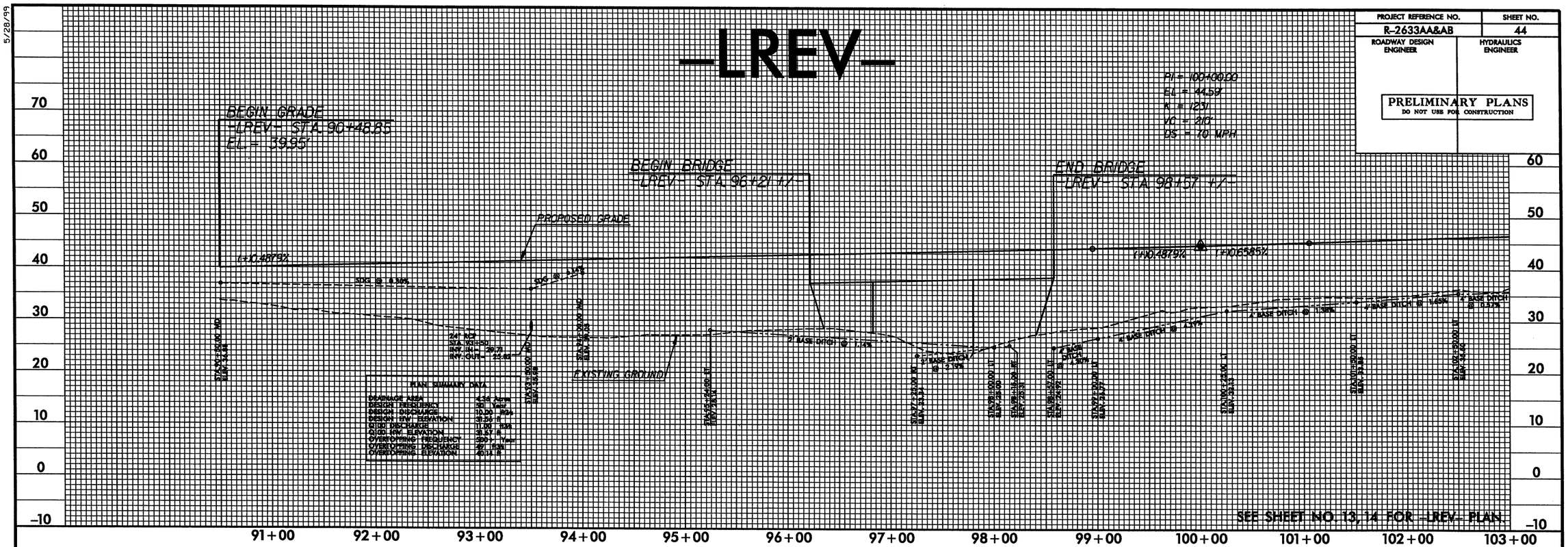
9/13/2019
R-2633AA&AB_RDY_PFL_43.dgn
11:14:35 AM

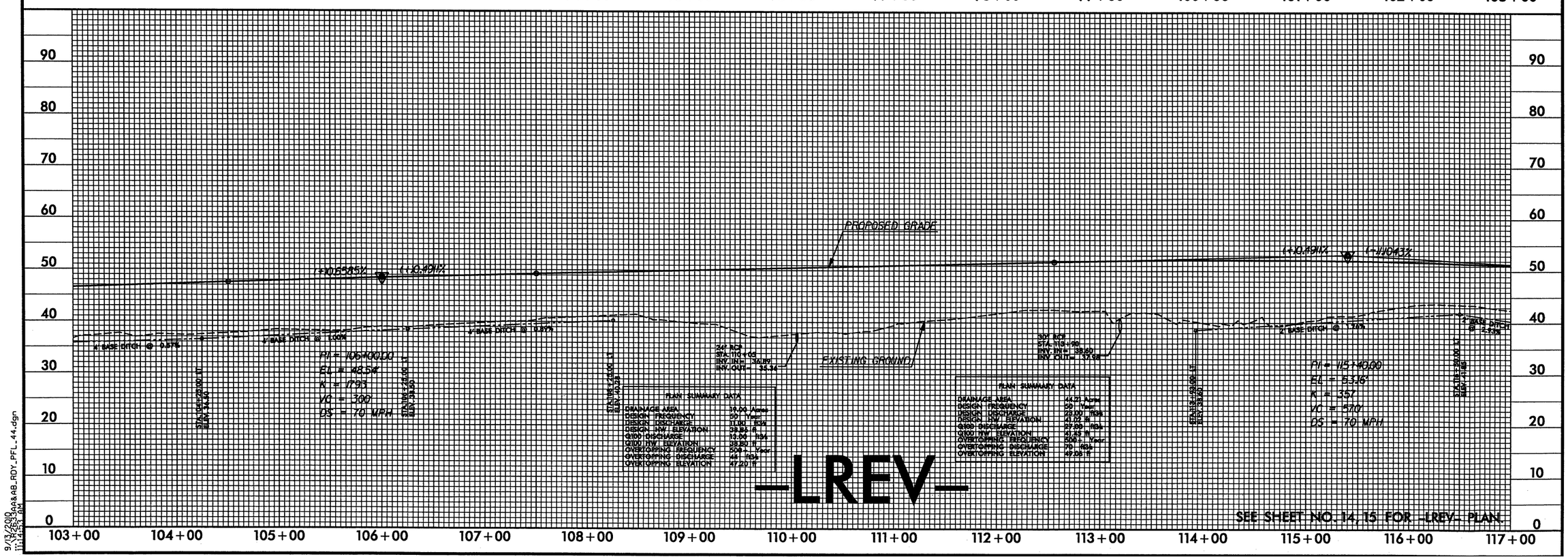
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-LREV-





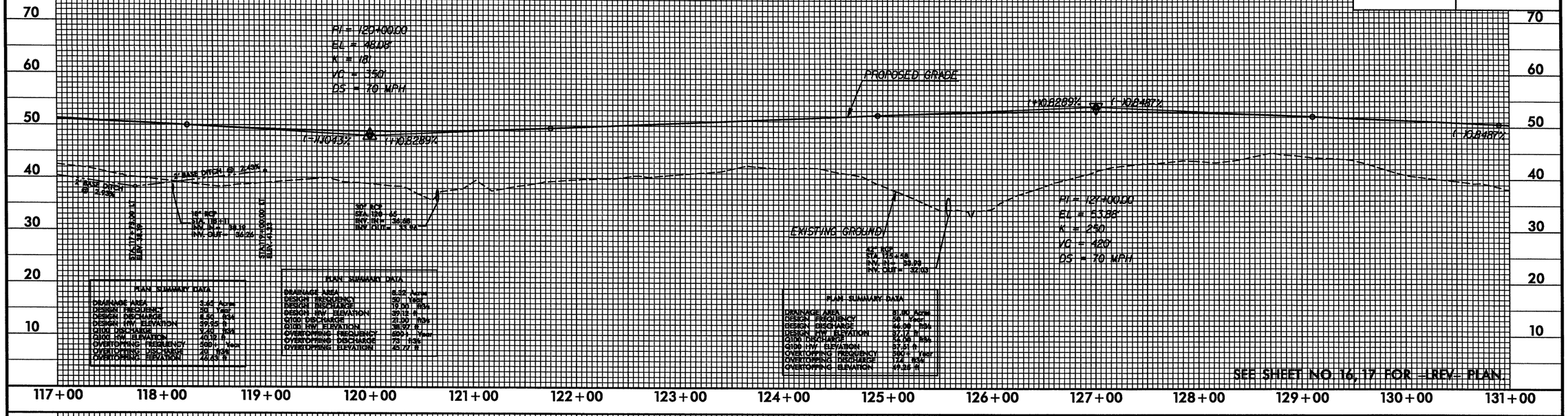
9/13/2016
11:14:53 AM
R-2633AA&AB_RDY_PFL_44.dgn

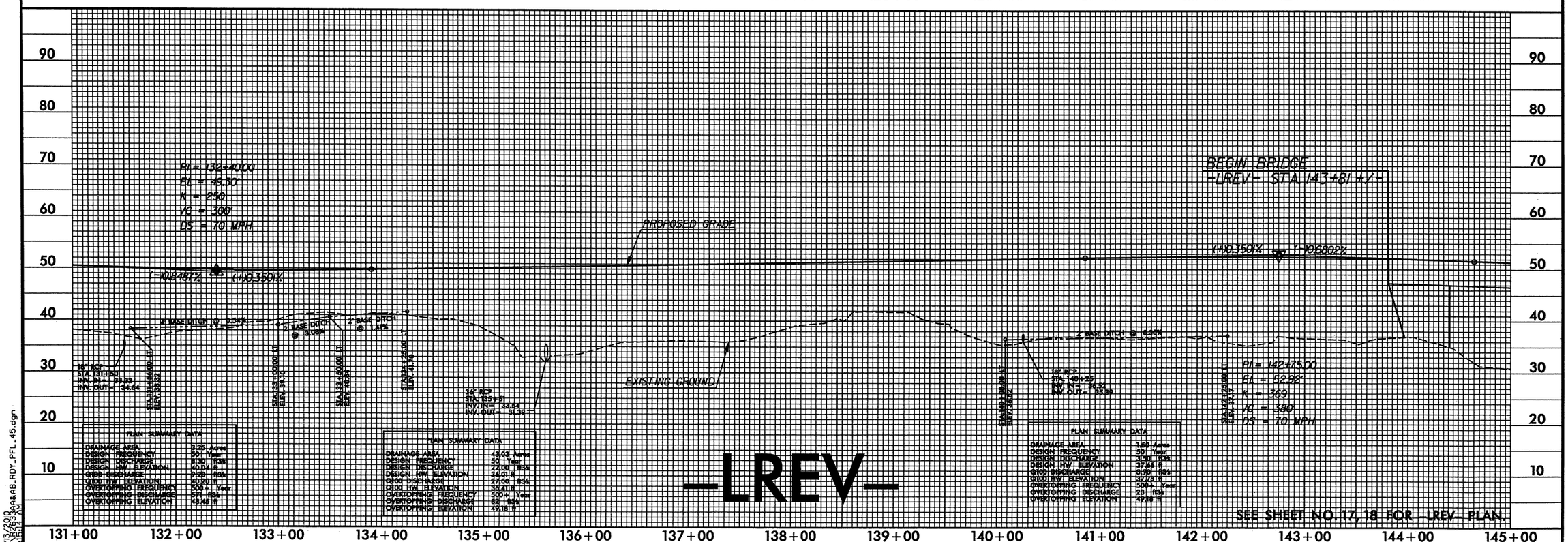
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-LREV-





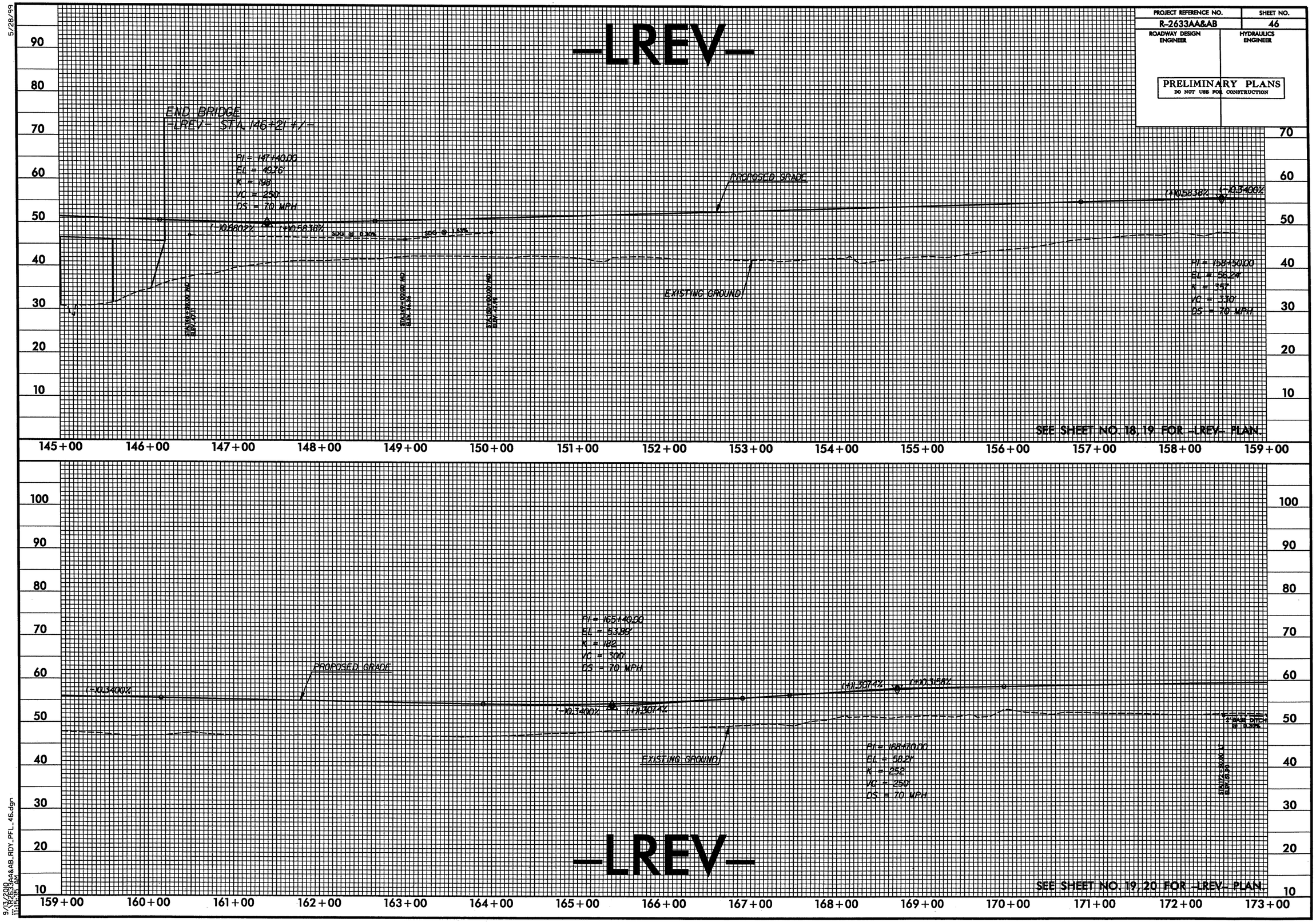
-LREV-

9/13/2010
12:03:03 PM
11:15:14 AM
R-2633AA&AB_RDY_PFL_45.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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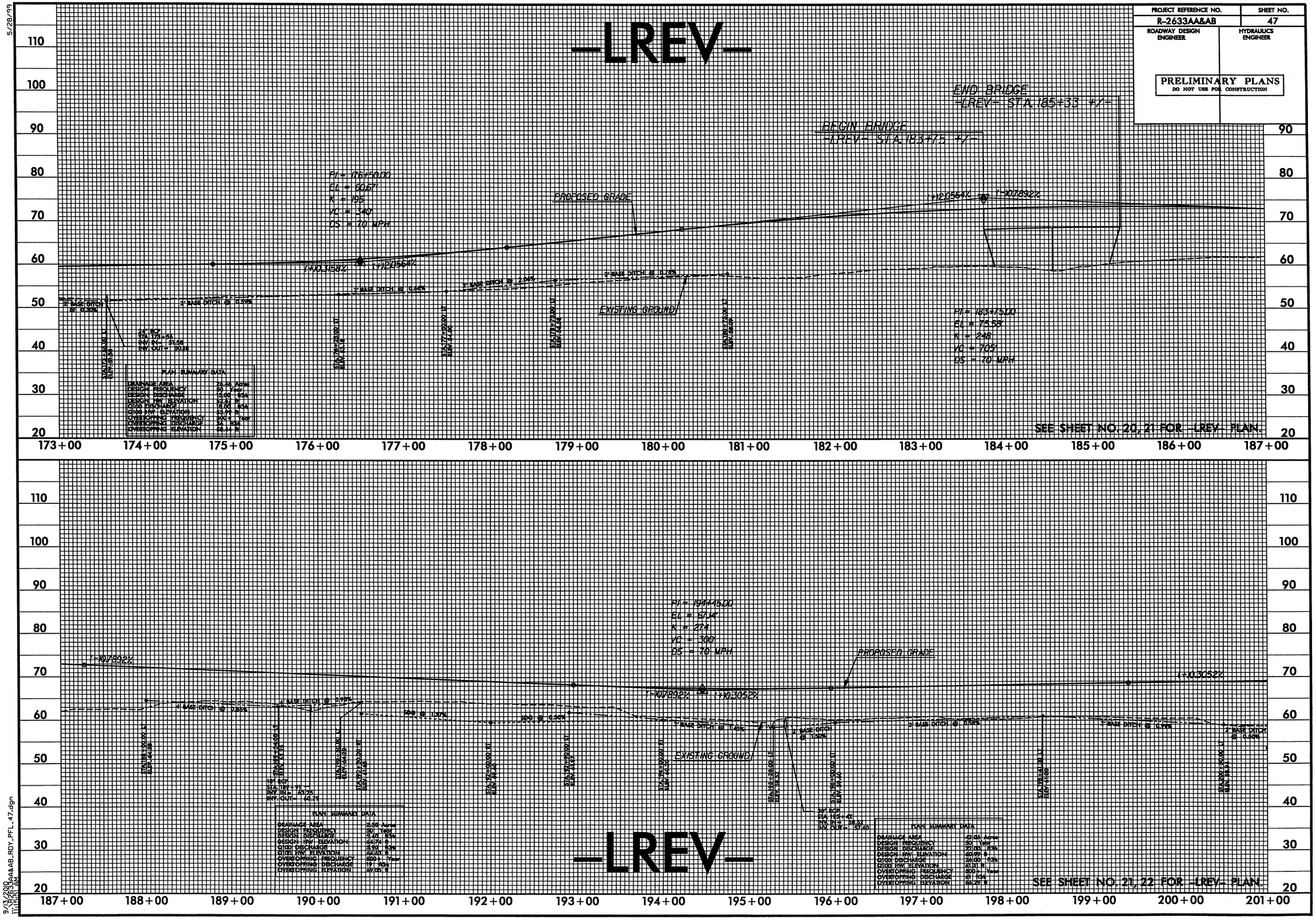
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



9/13/2018
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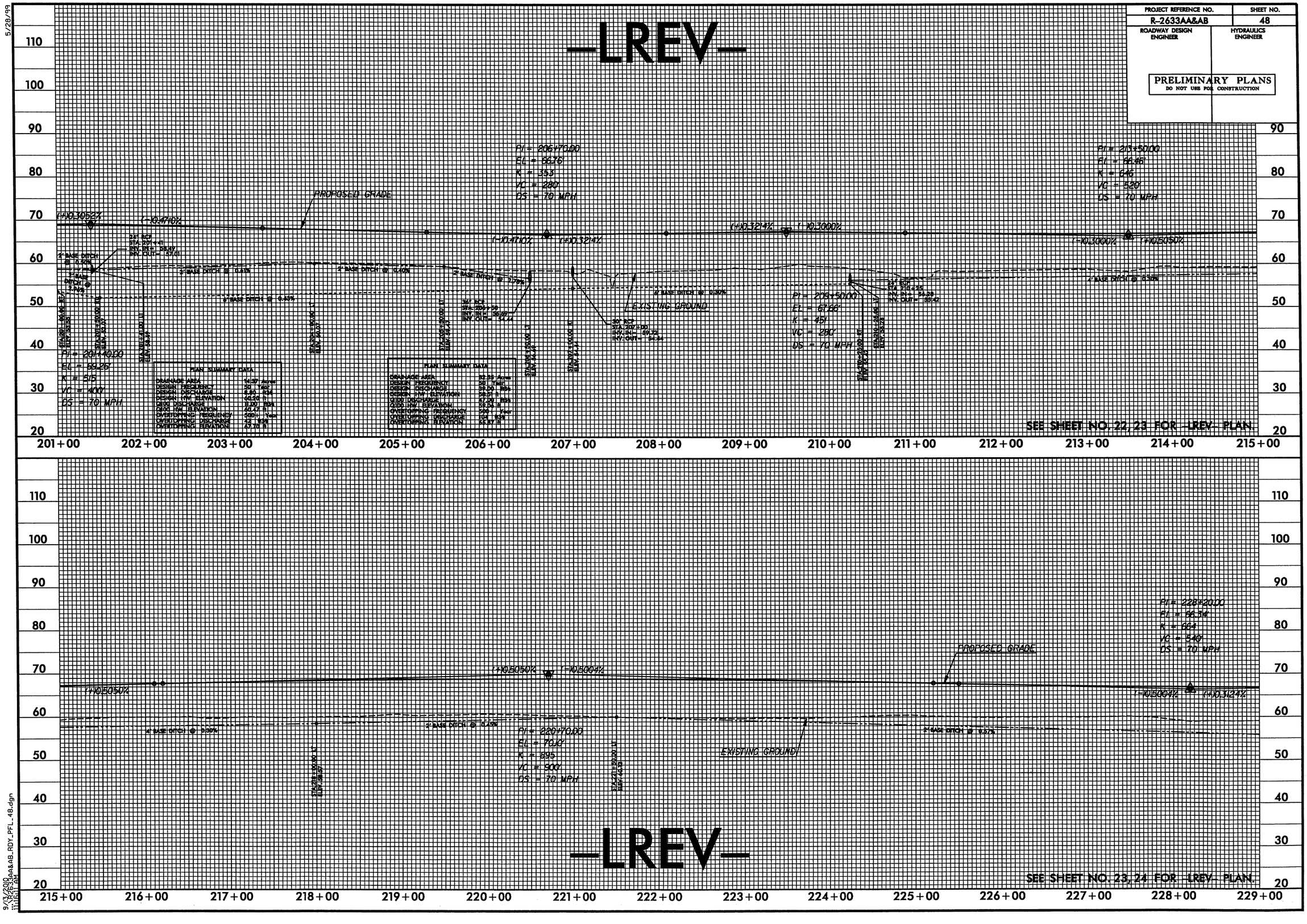
11:15:51 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	48
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



5/28/99

9/13/2010
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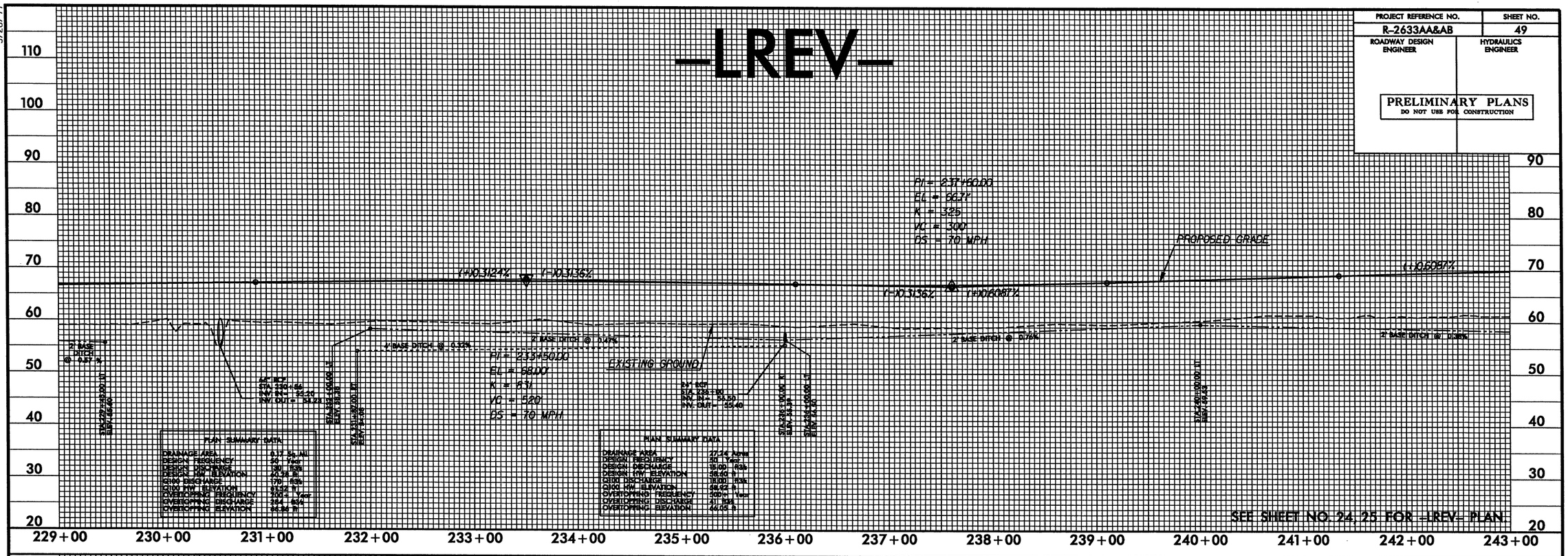
11:16:11 AM

5/28/99

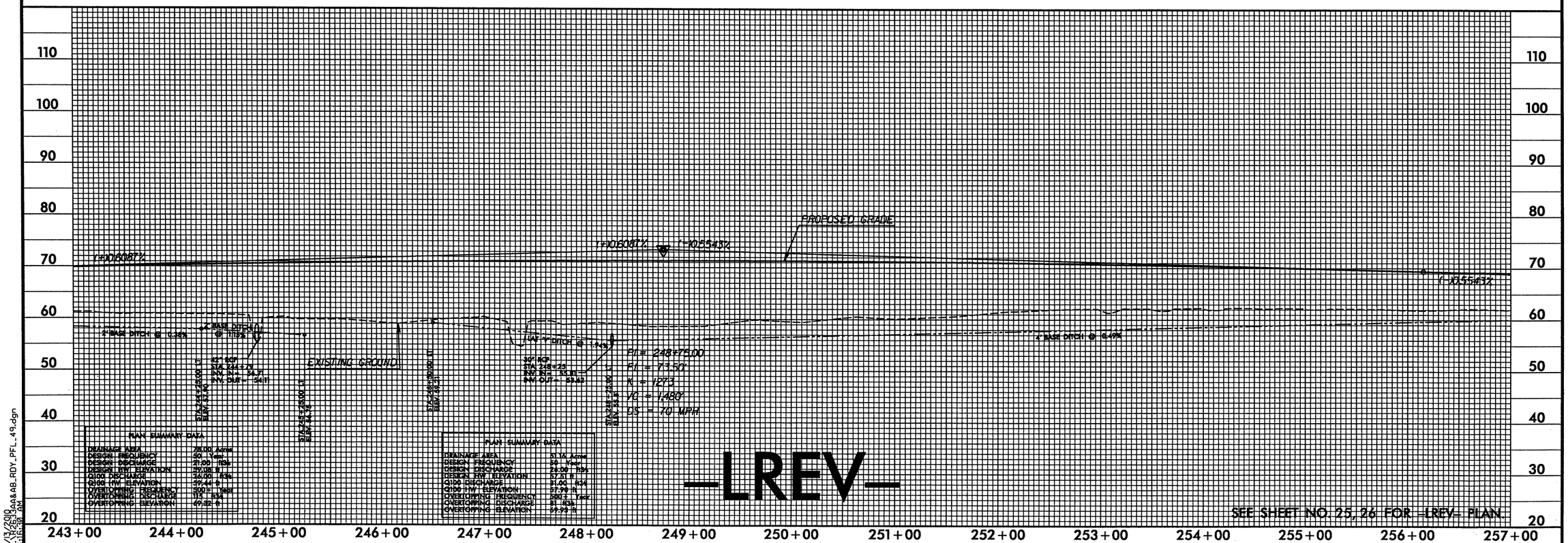
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	49
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

—LREV—



—LREV—



—LREV—

9/13/2010
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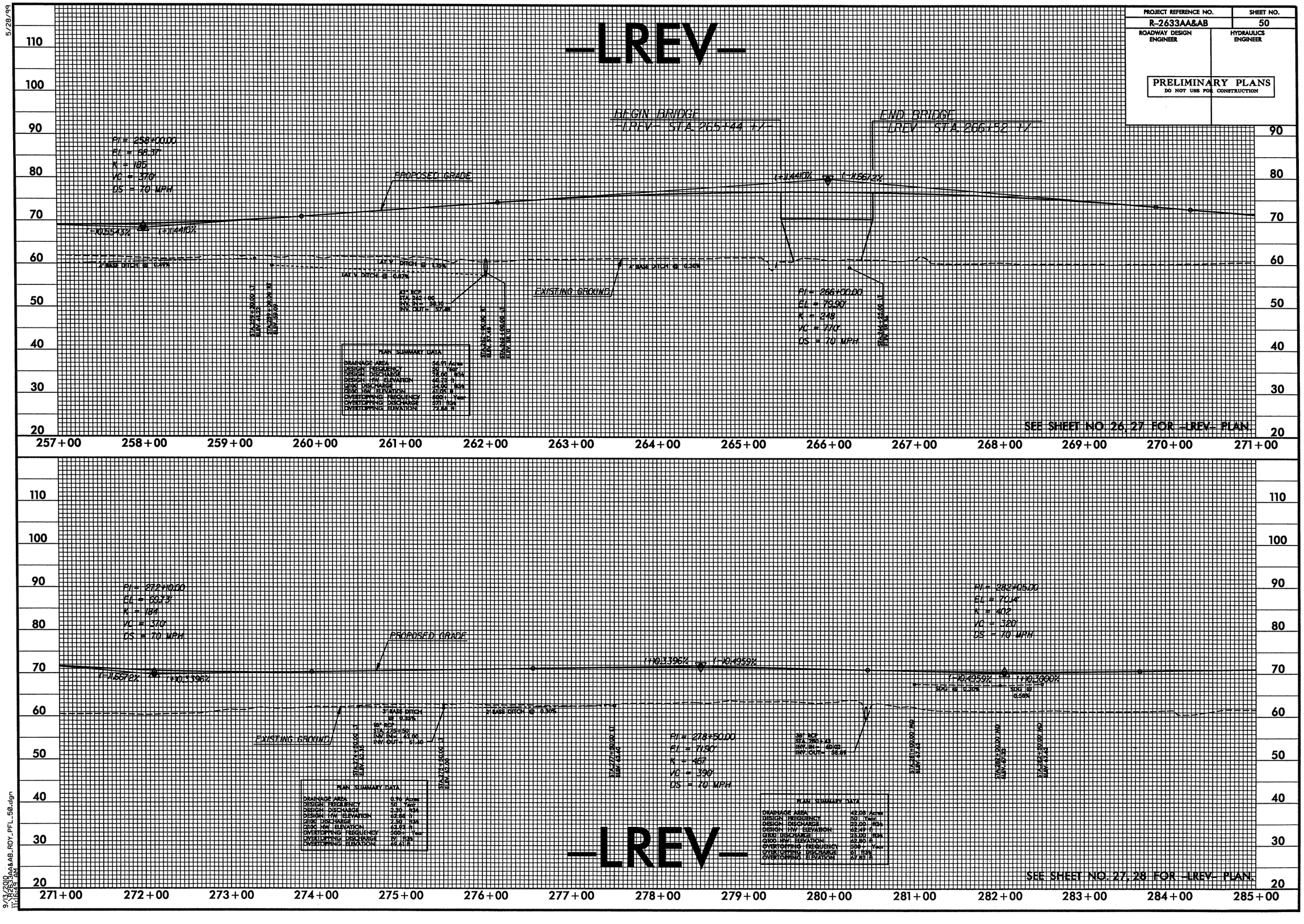
11:16:30 AM

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

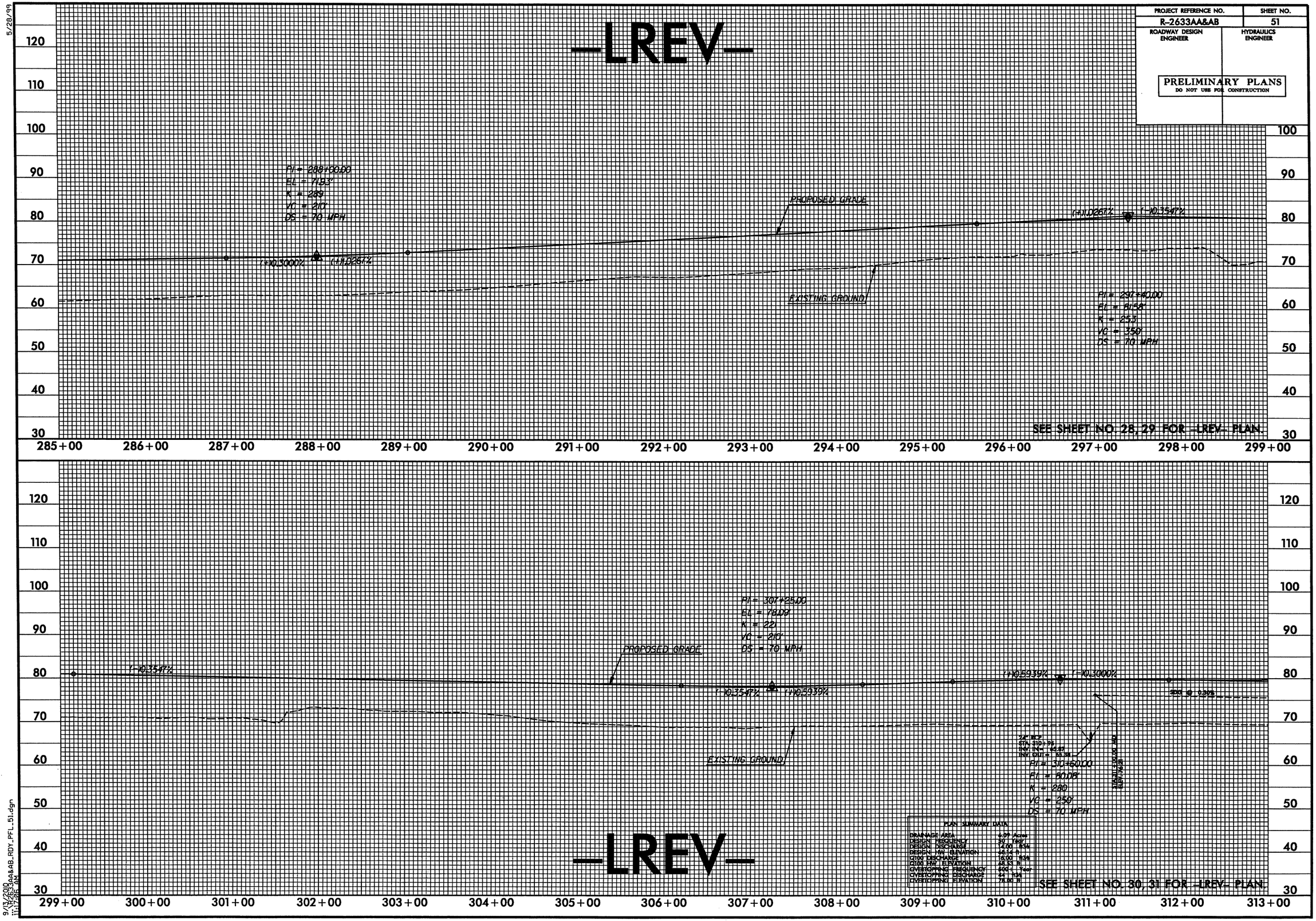


9/13/2010
11:26:49 AM
R2633AA&AB_RDY_PFL_50.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	51
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

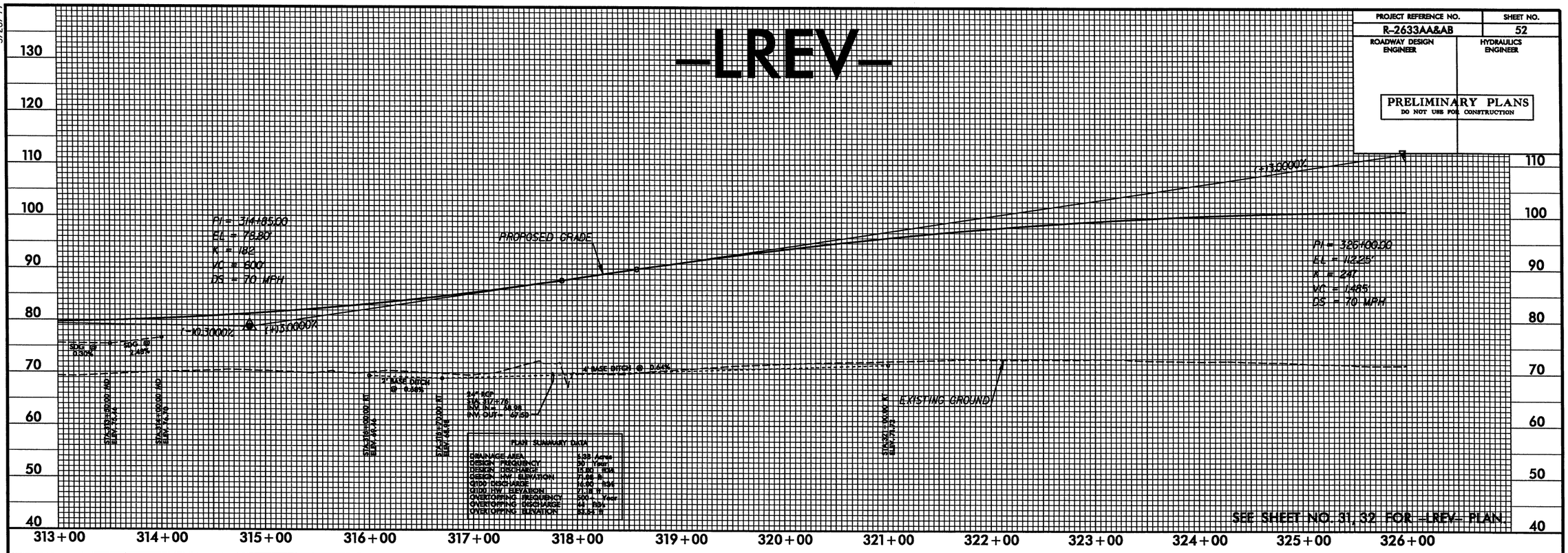


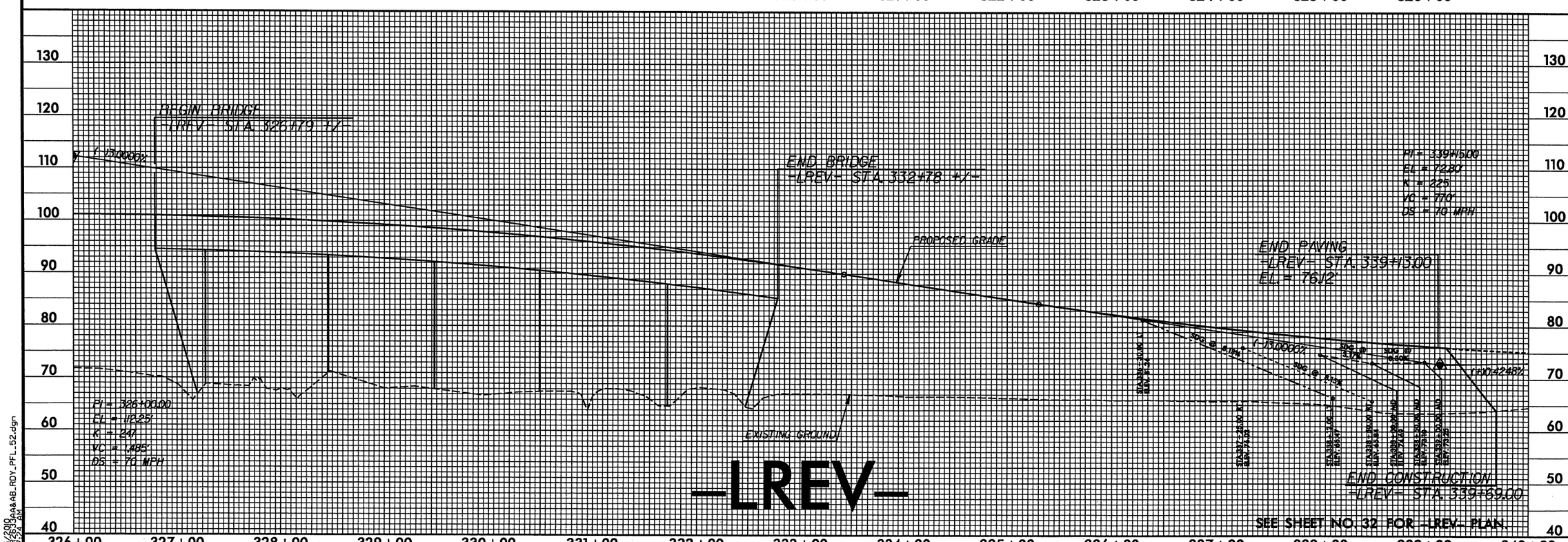
9/13/2010
11:17:26 AM
R2633AA&AB_RDY_PFL_51.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	52
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



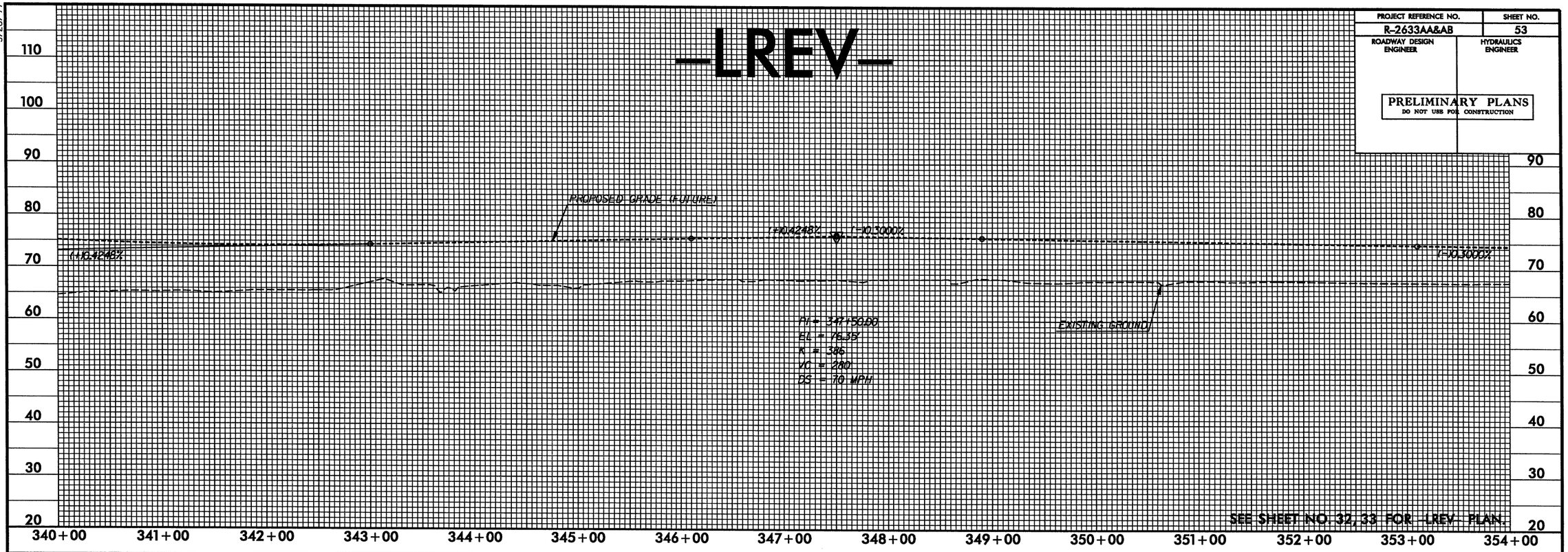


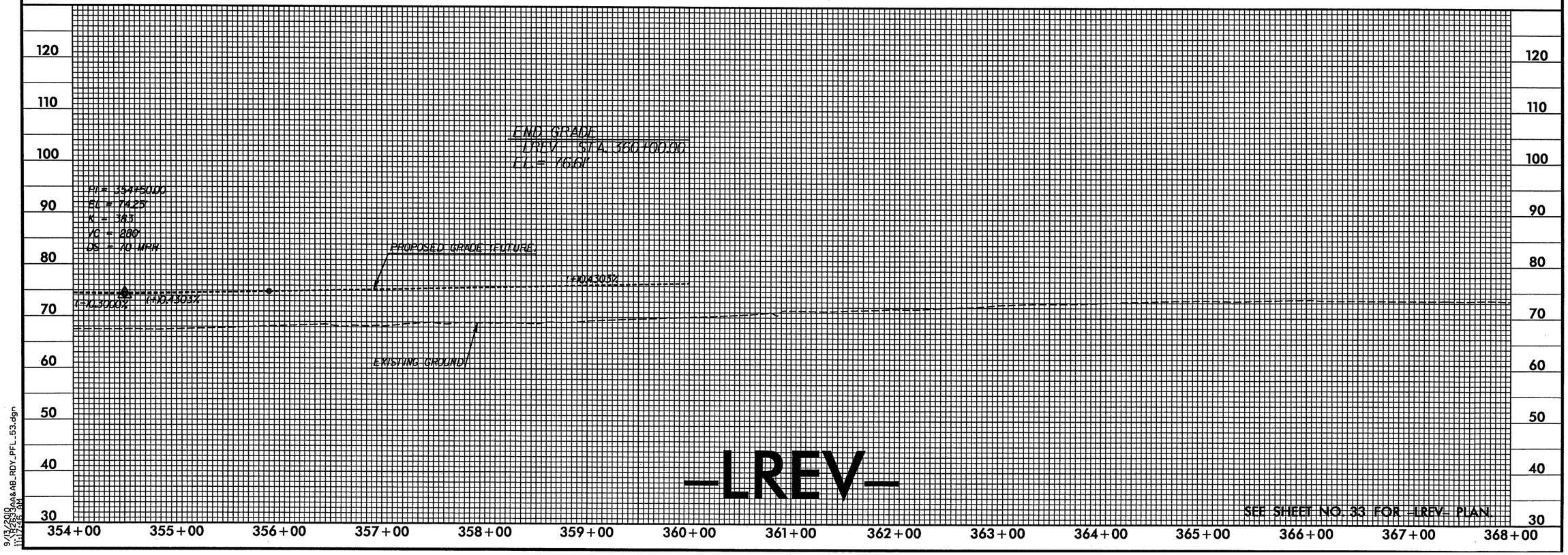
9/13/2010
11:26:53 AM
R2633AA&AB_RDY_PFL_52.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





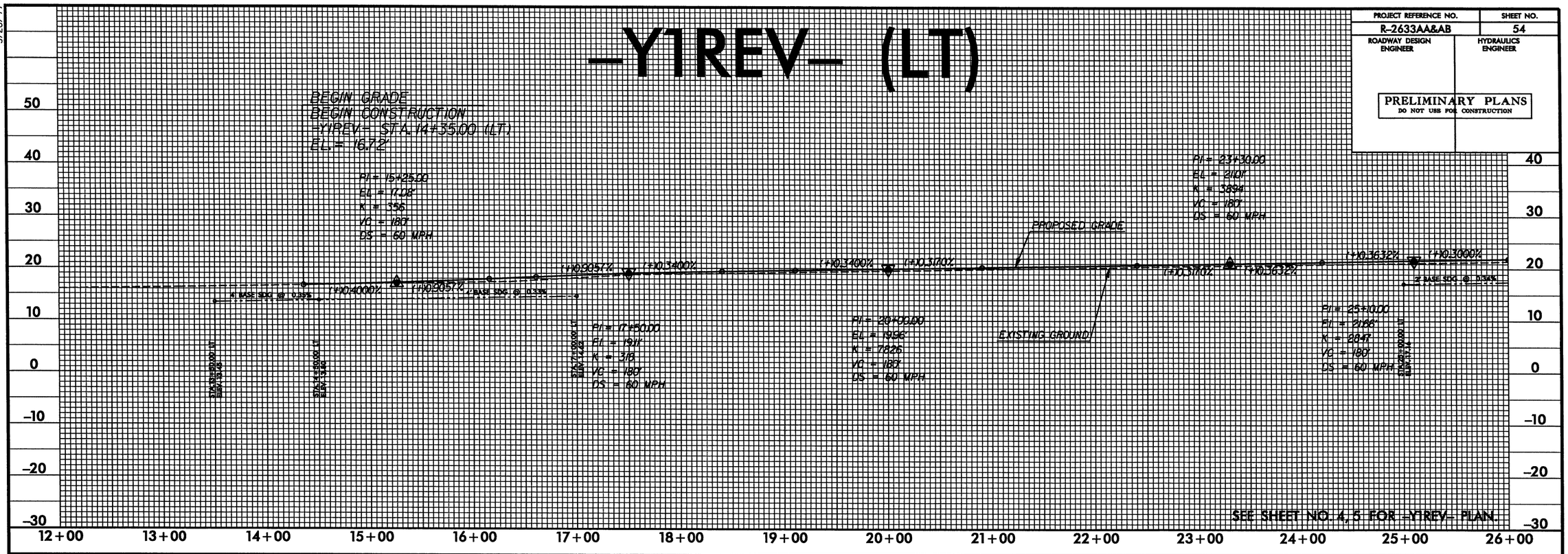
9/13/2010
R2633aa&AB_RDY_PFL_53.dgn
11:17:46 AM

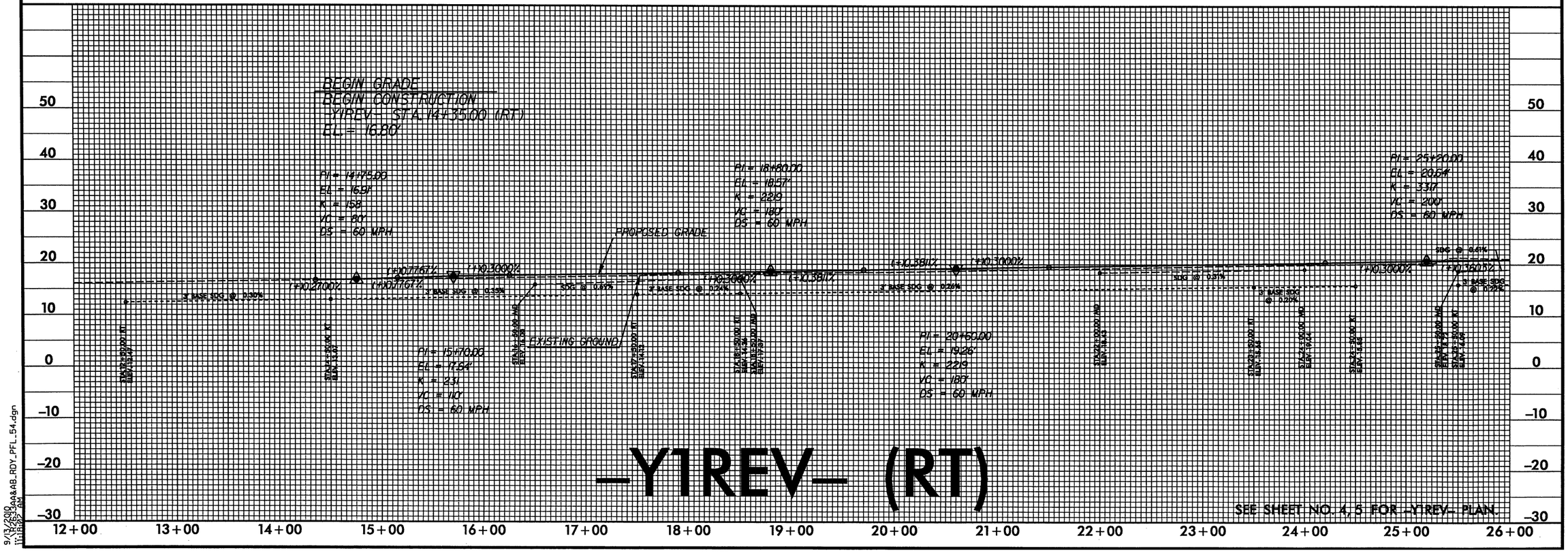
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)





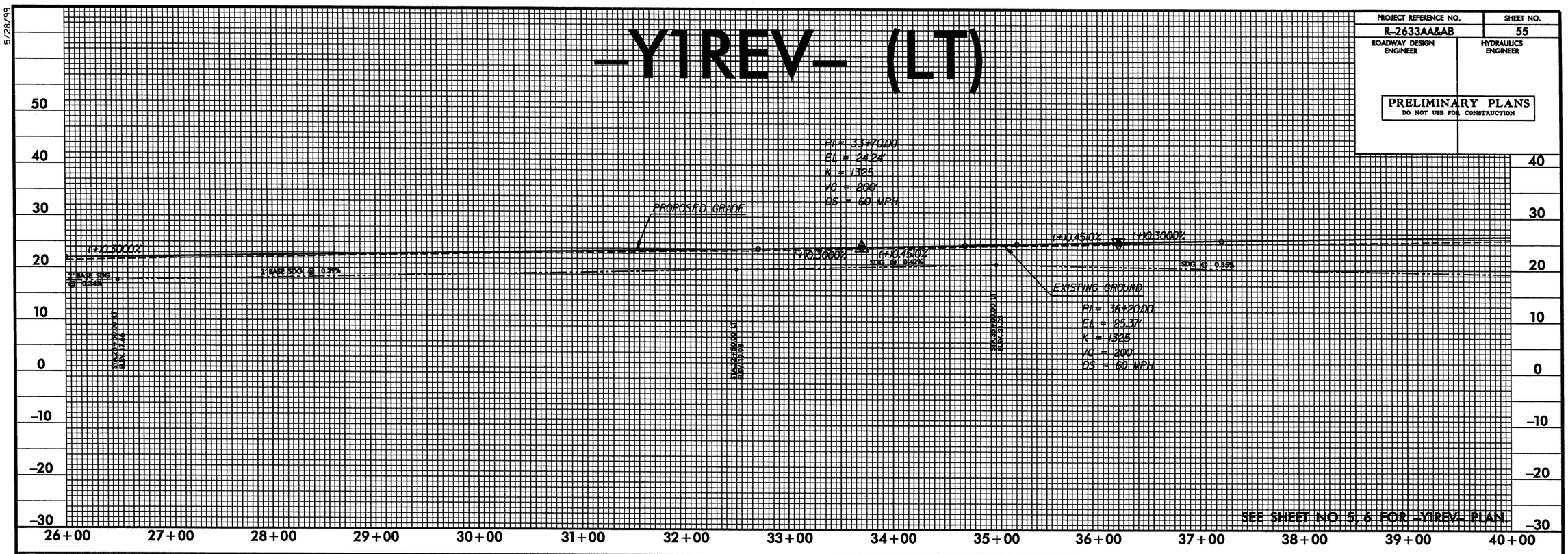
9/13/2010
R-2633AA&AB_RDY_PFL_54.dgn
11:18:27 AM

5/28/99

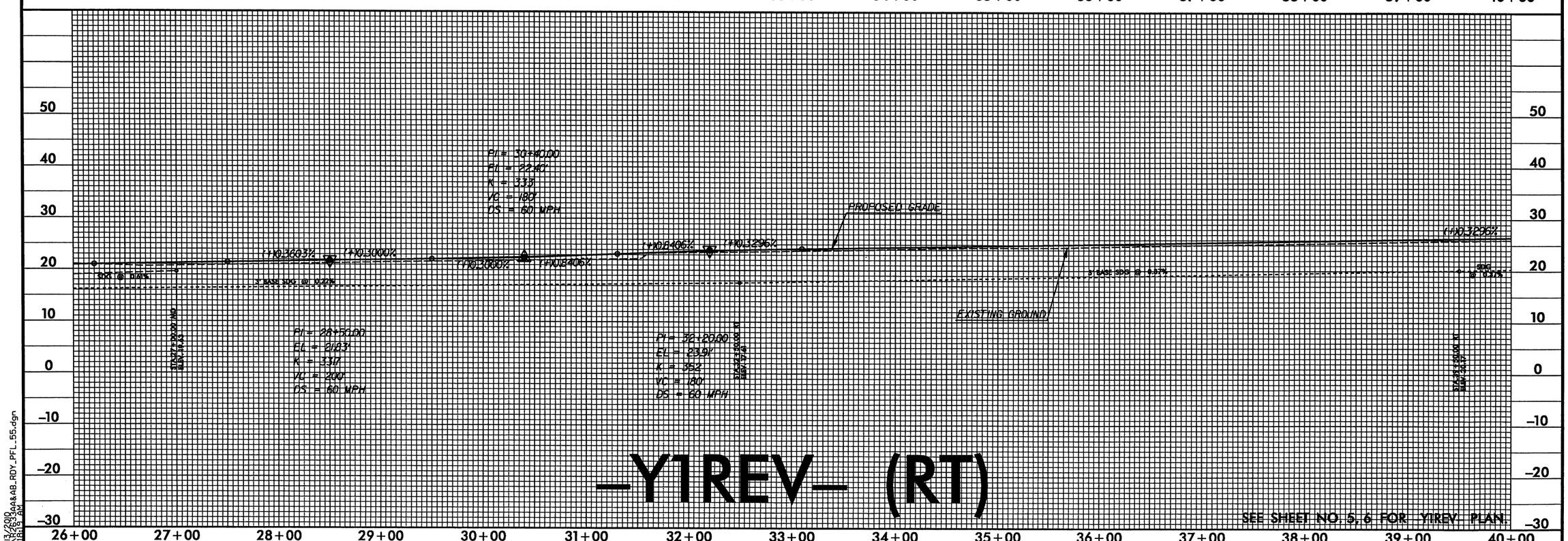
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)



-Y1REV- (RT)



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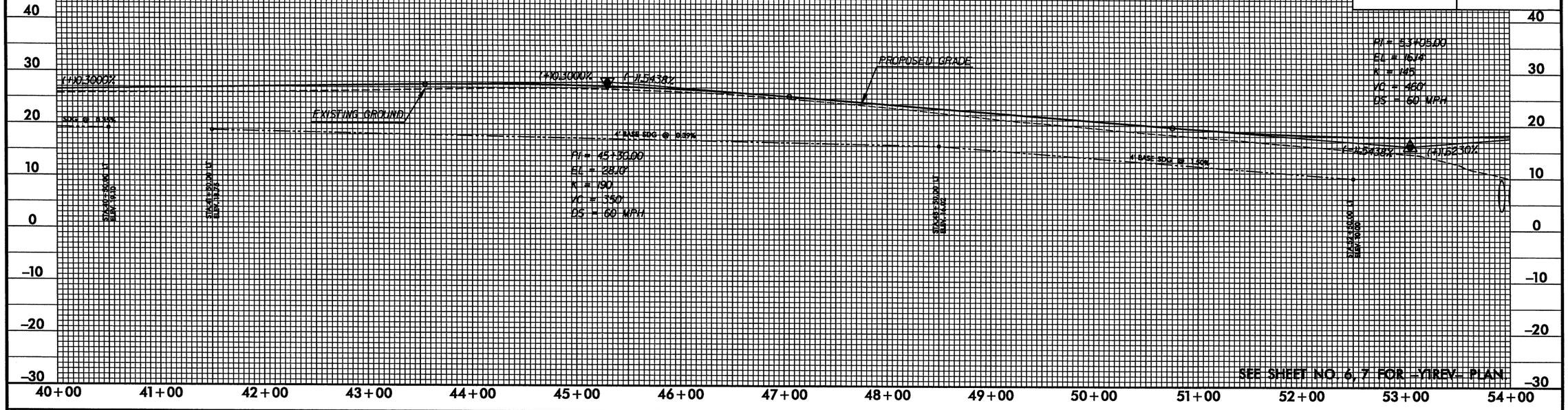
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

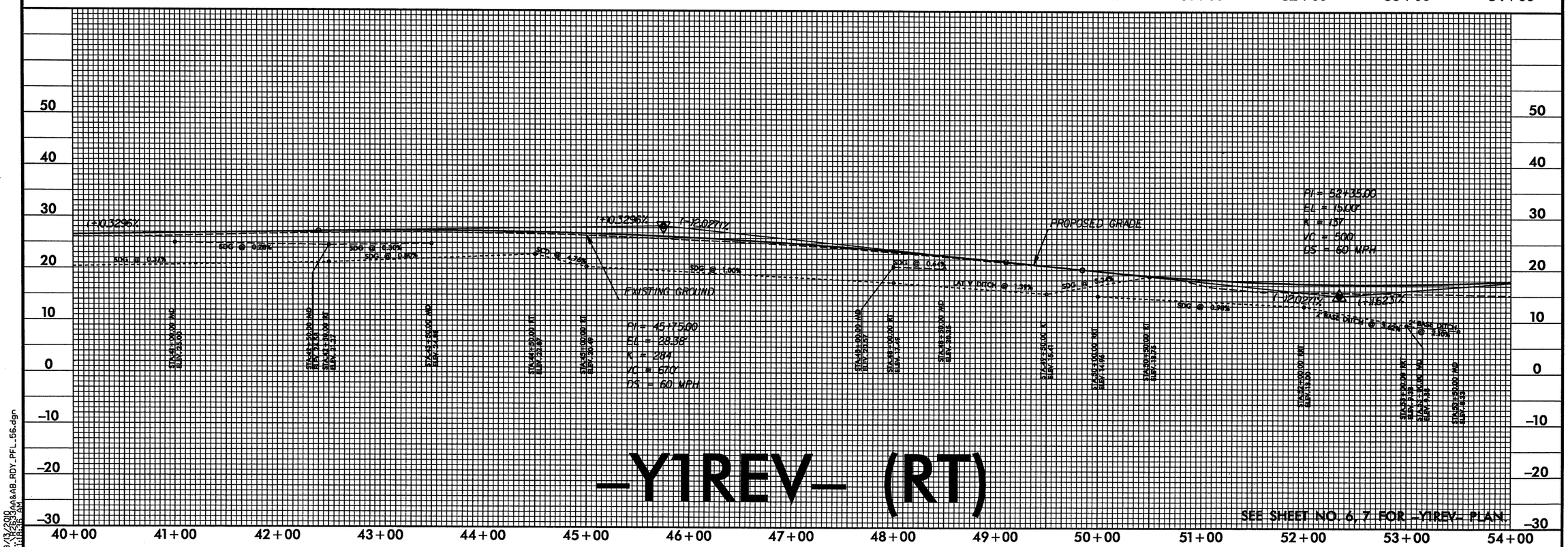
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)



SEE SHEET NO. 6, 7 FOR -Y1REV- PLAN

-Y1REV- (RT)



SEE SHEET NO. 6, 7 FOR -Y1REV- PLAN

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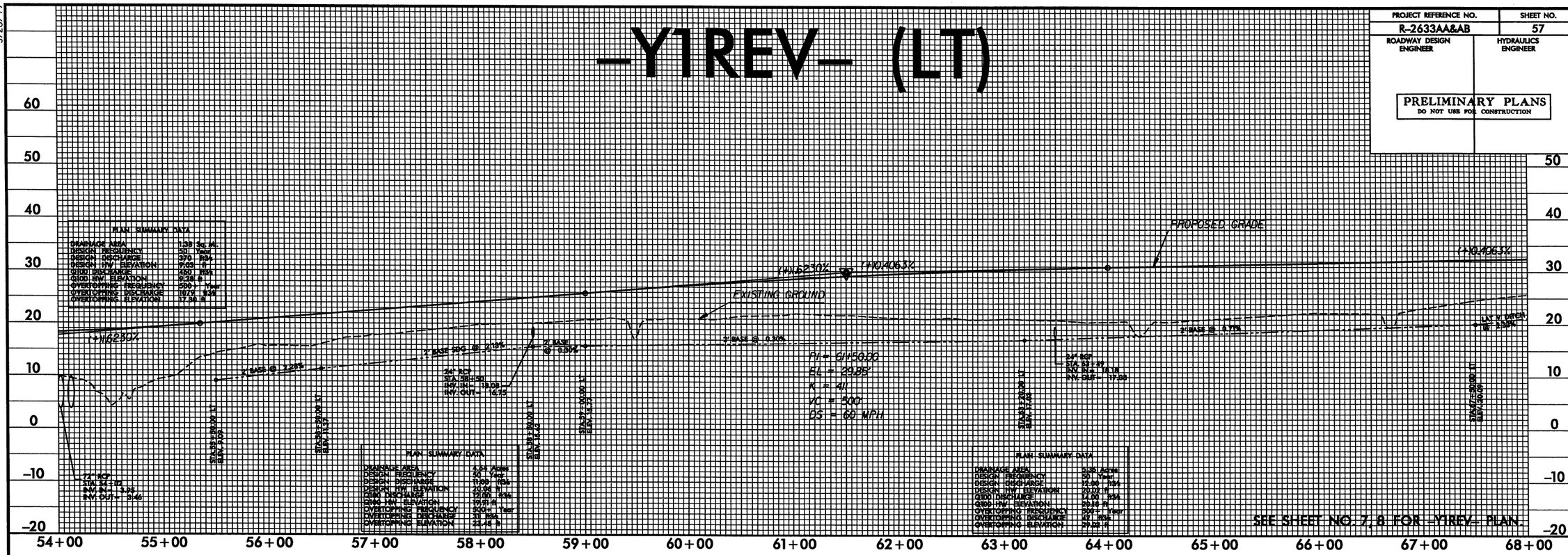
5/28/99

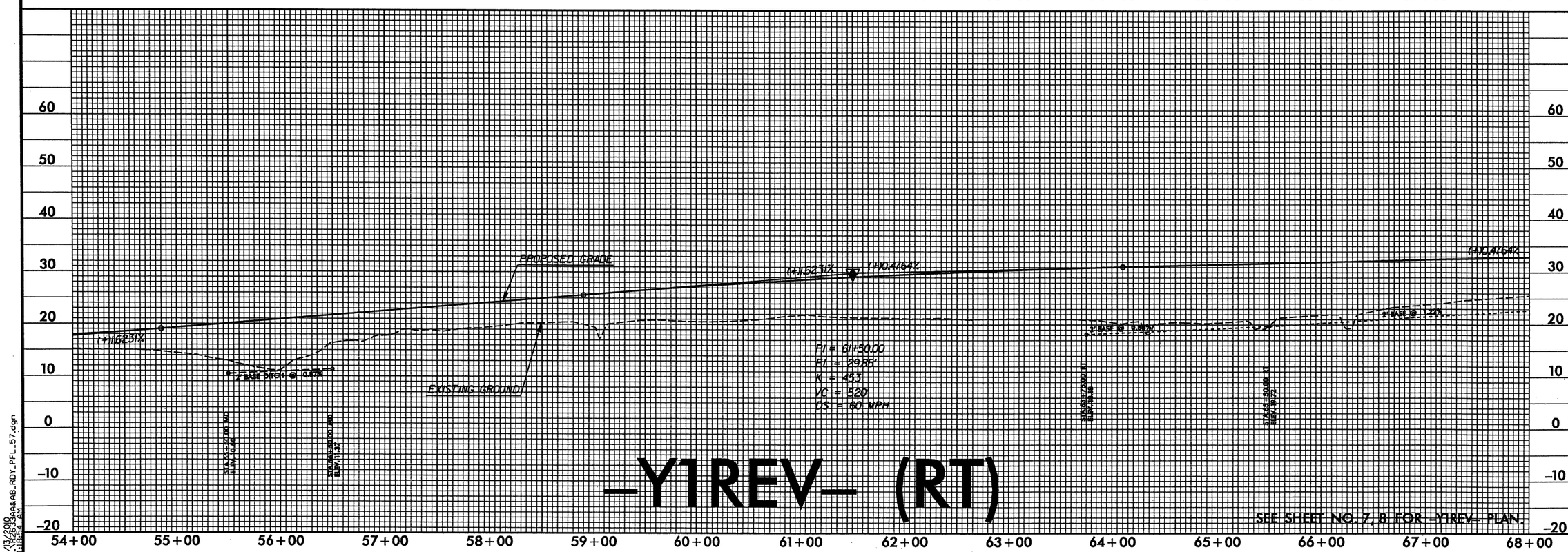
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	57
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)



-Y1REV- (RT)



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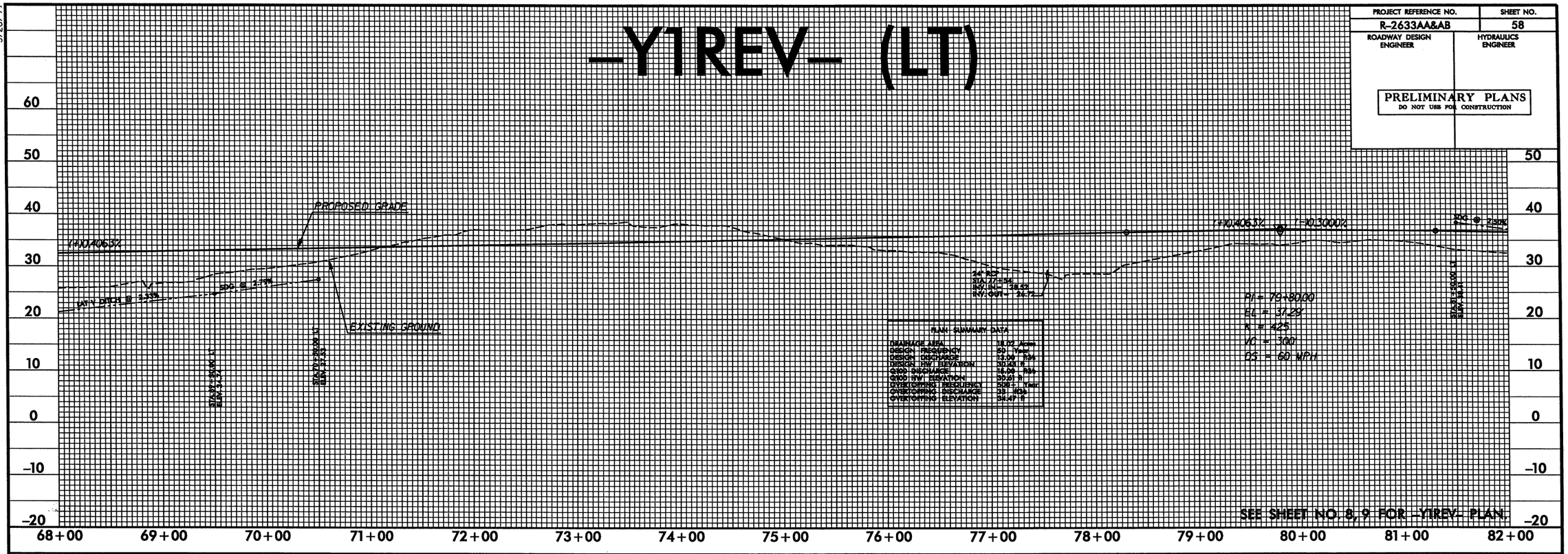
5/28/99

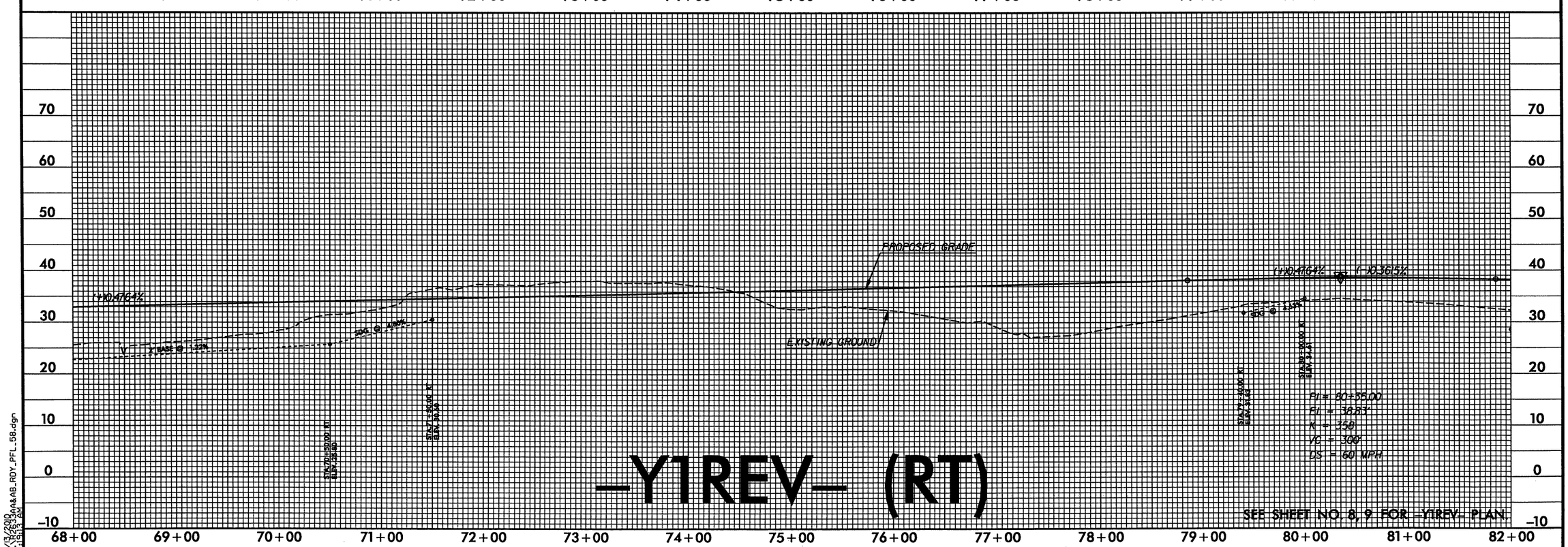
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	58
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)



-Y1REV- (RT)



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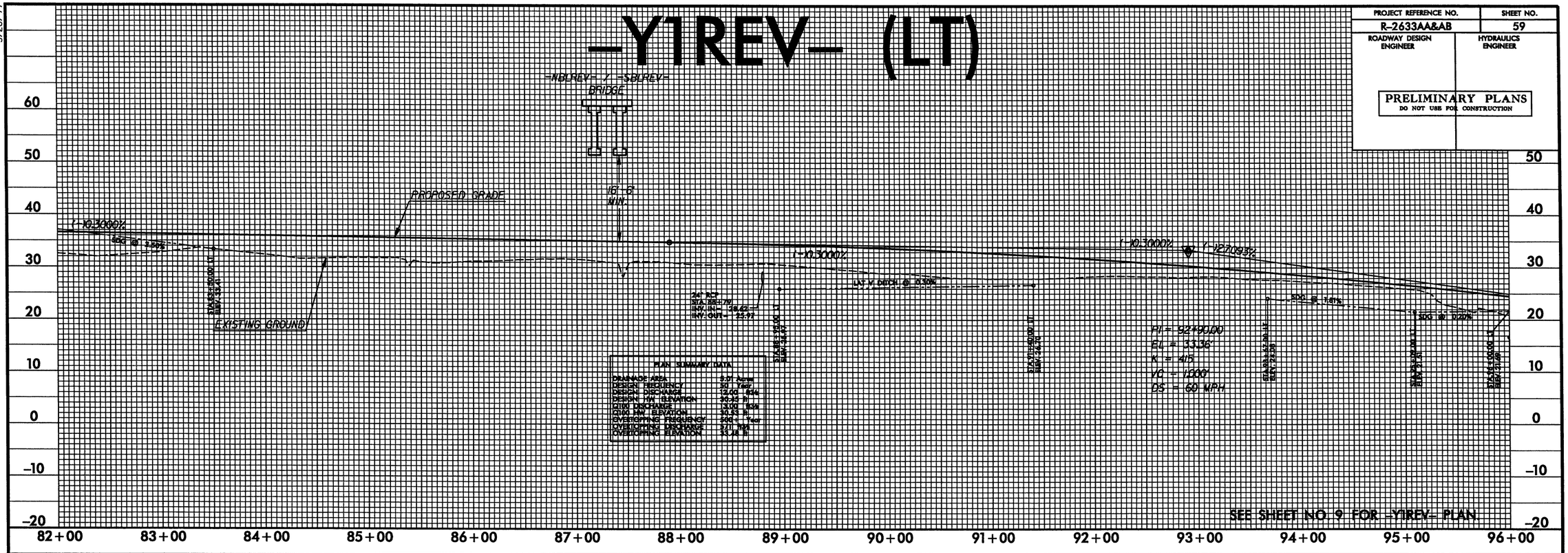
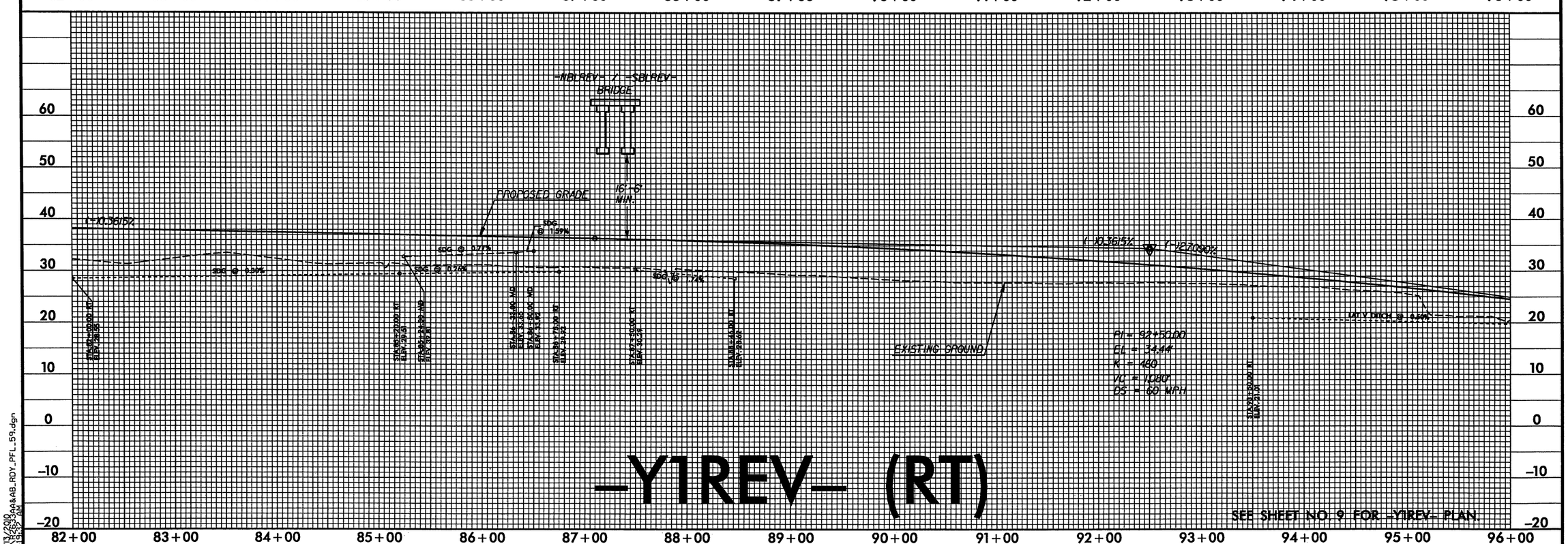
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	59
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	60
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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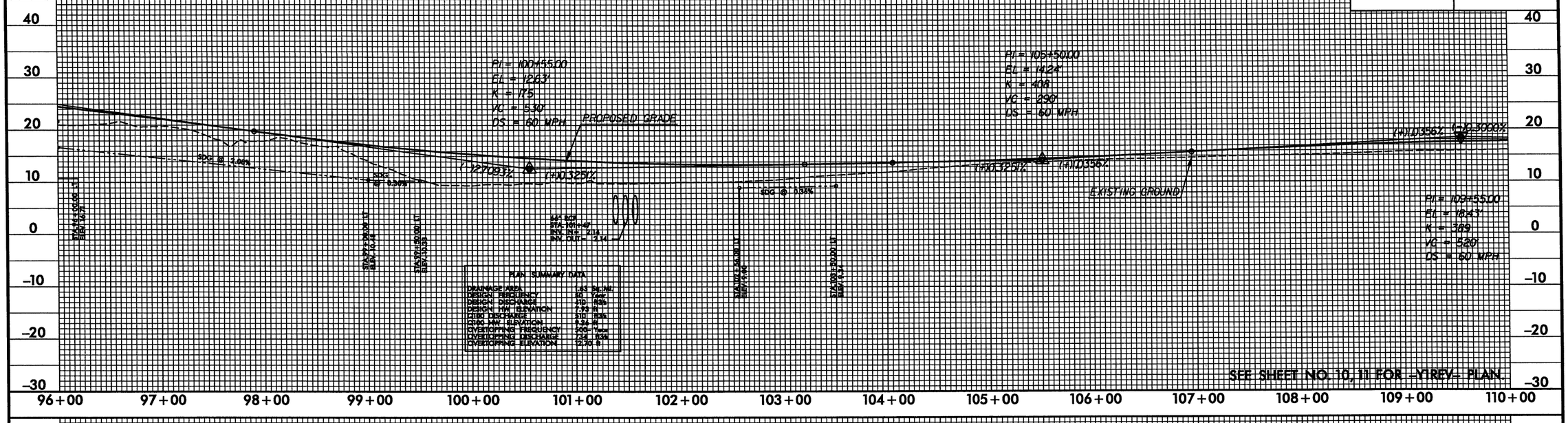

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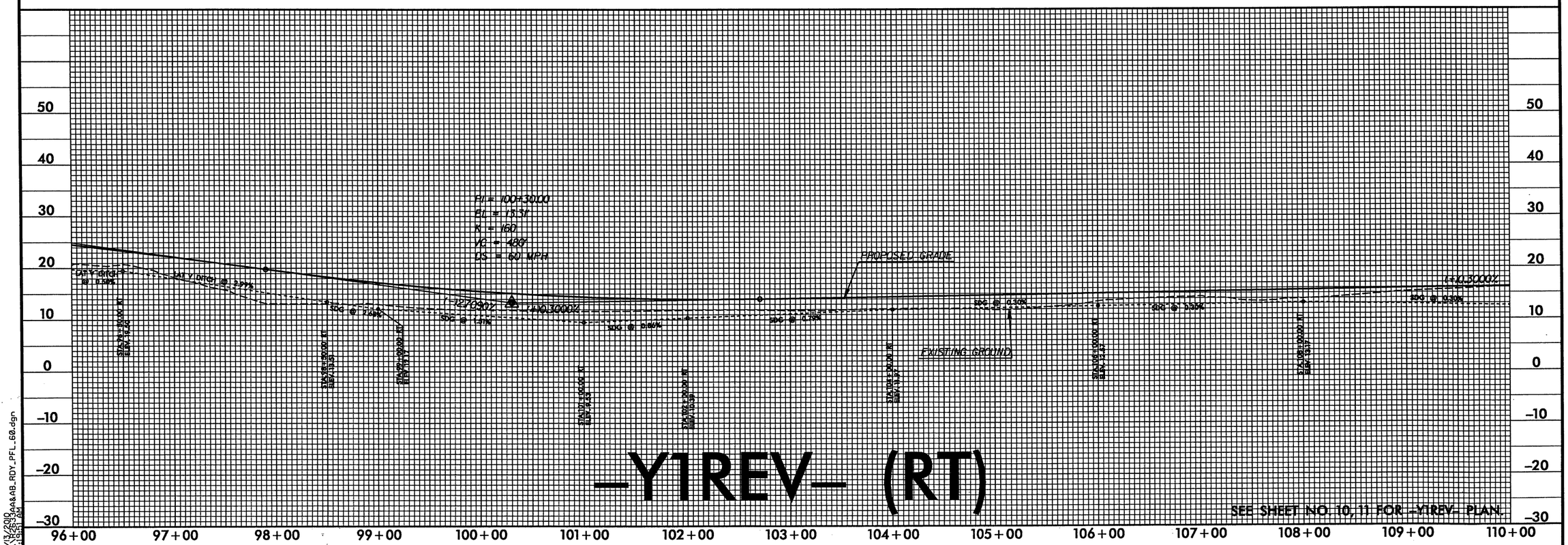

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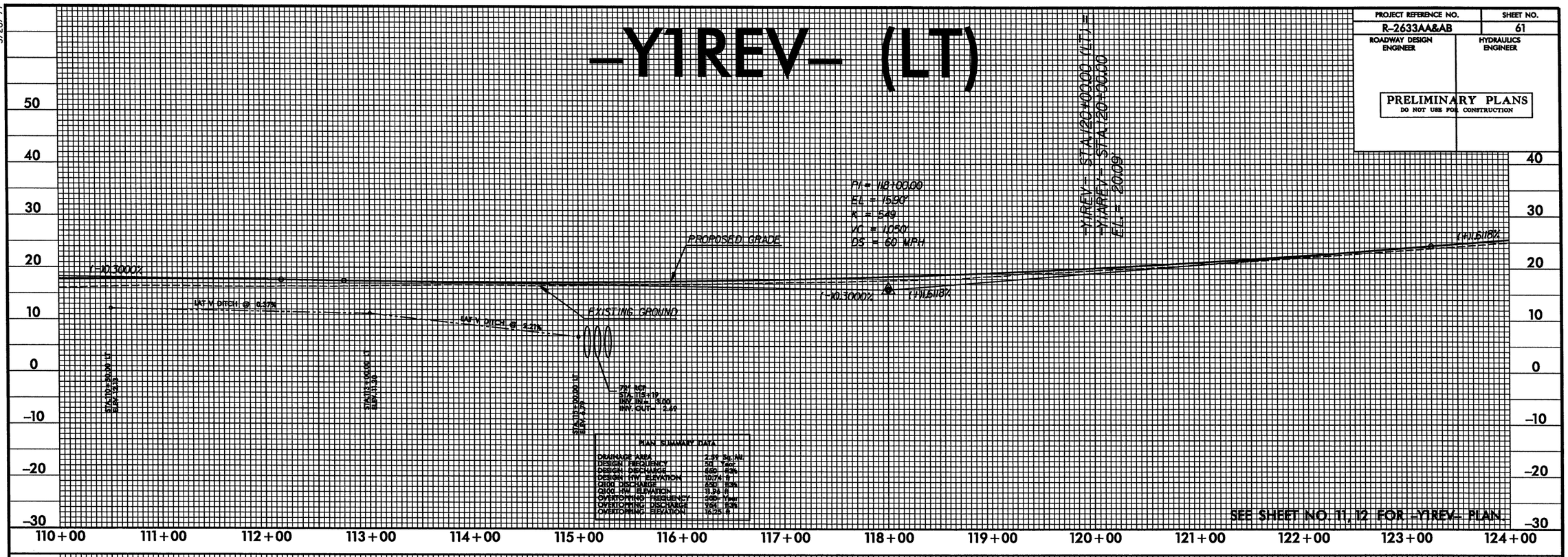
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)



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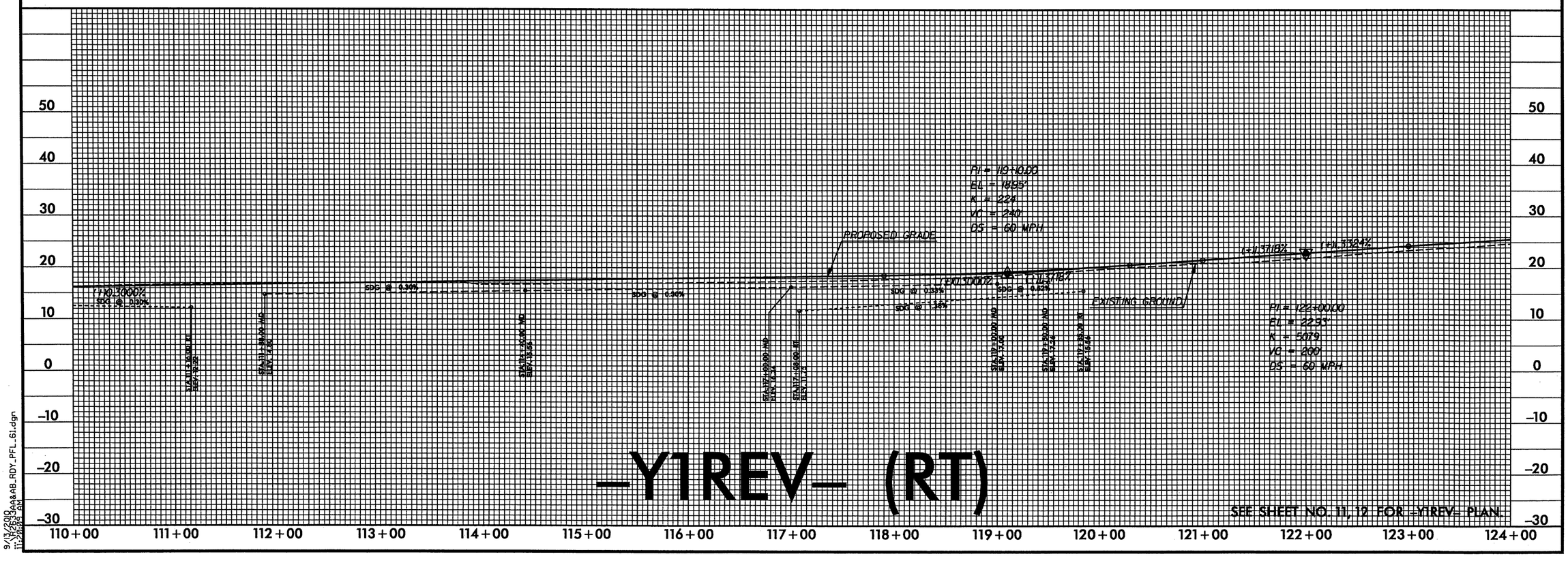

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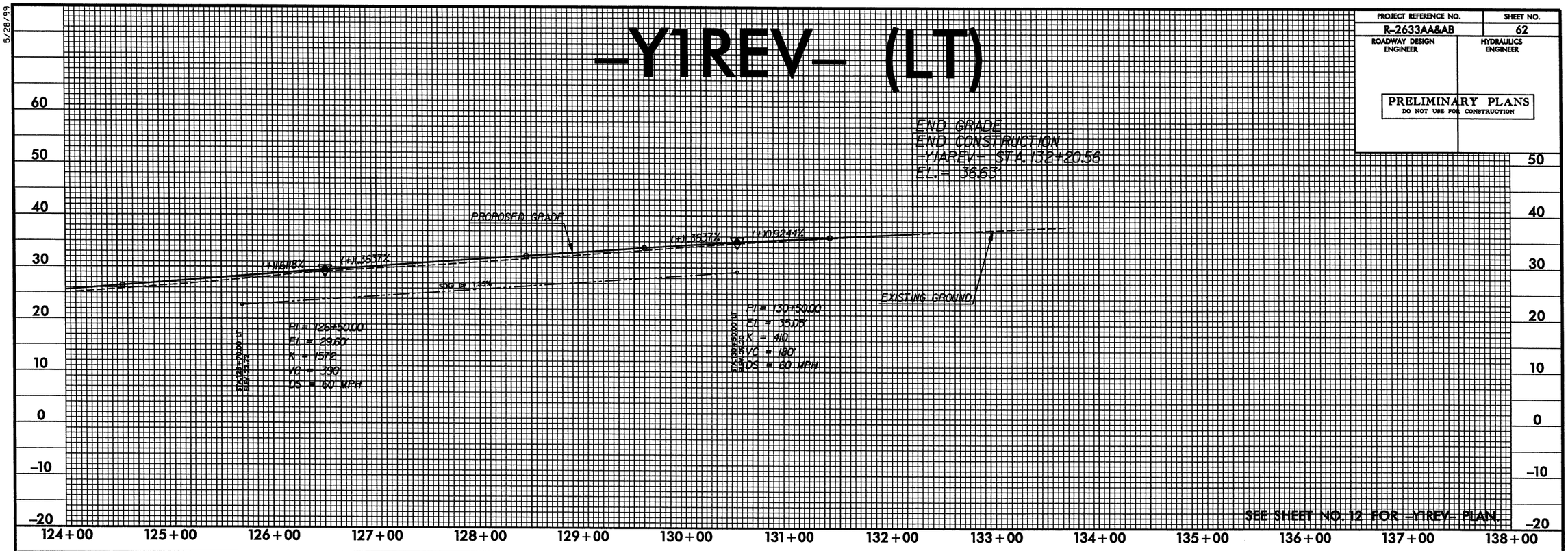
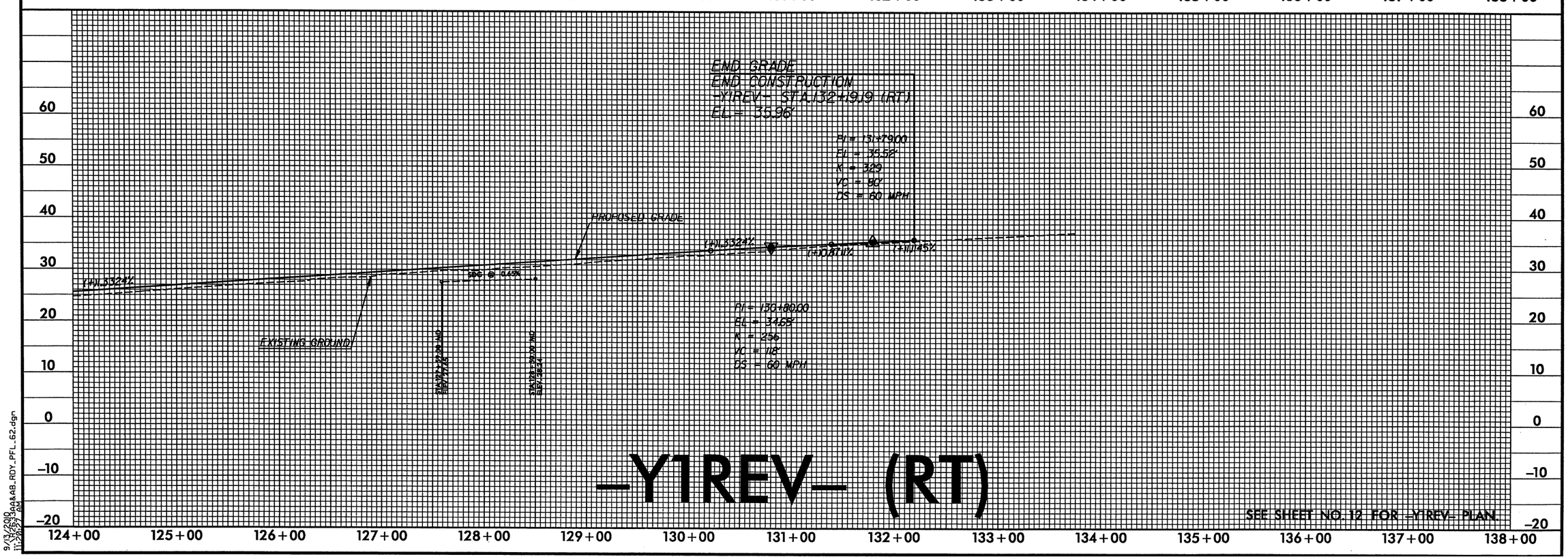
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	62
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1REV- (LT)





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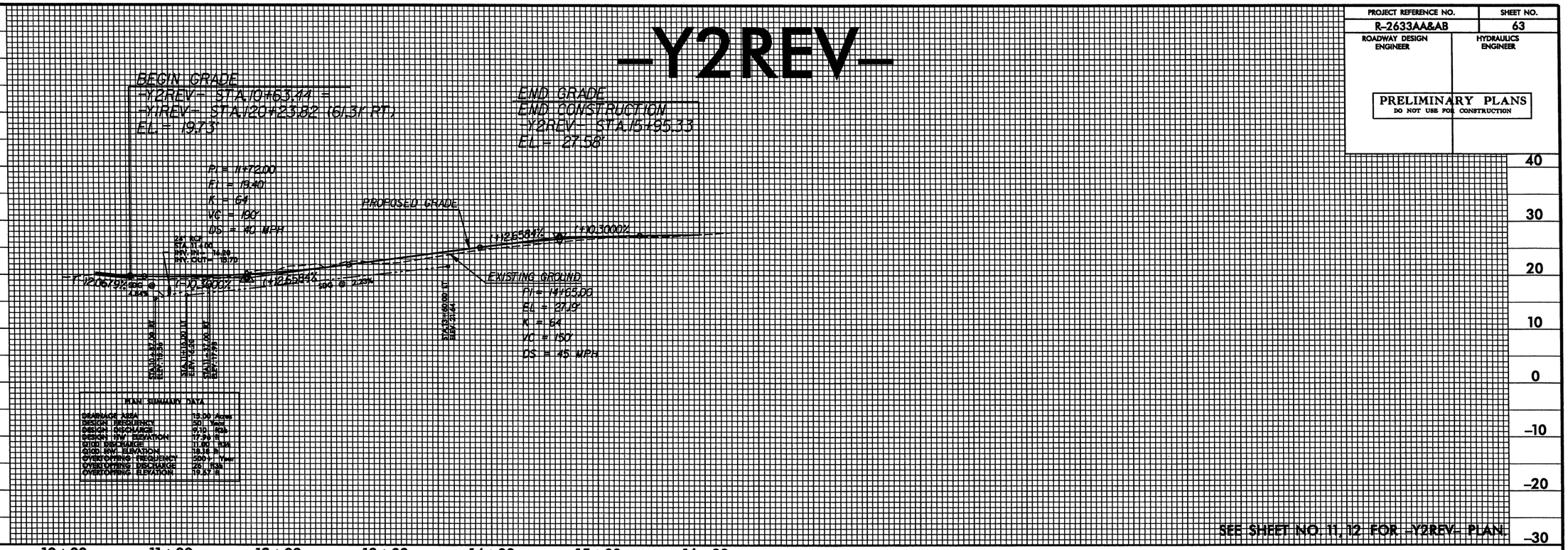
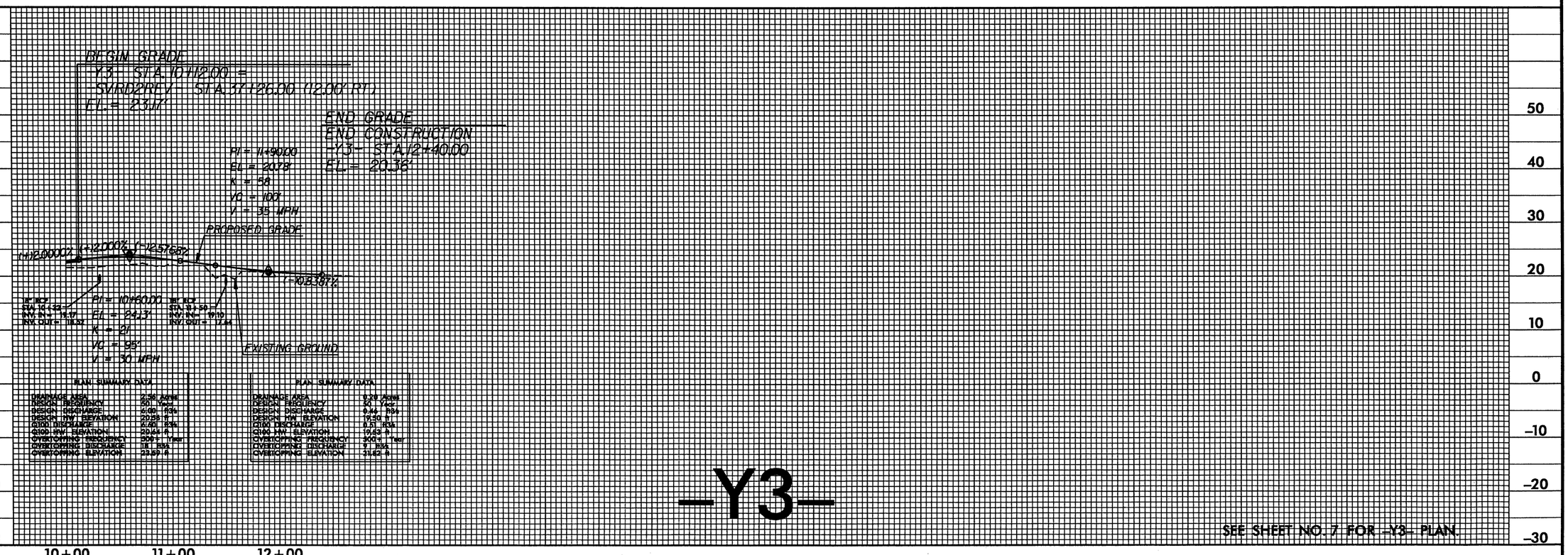
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	63
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y2REV-





-Y3-

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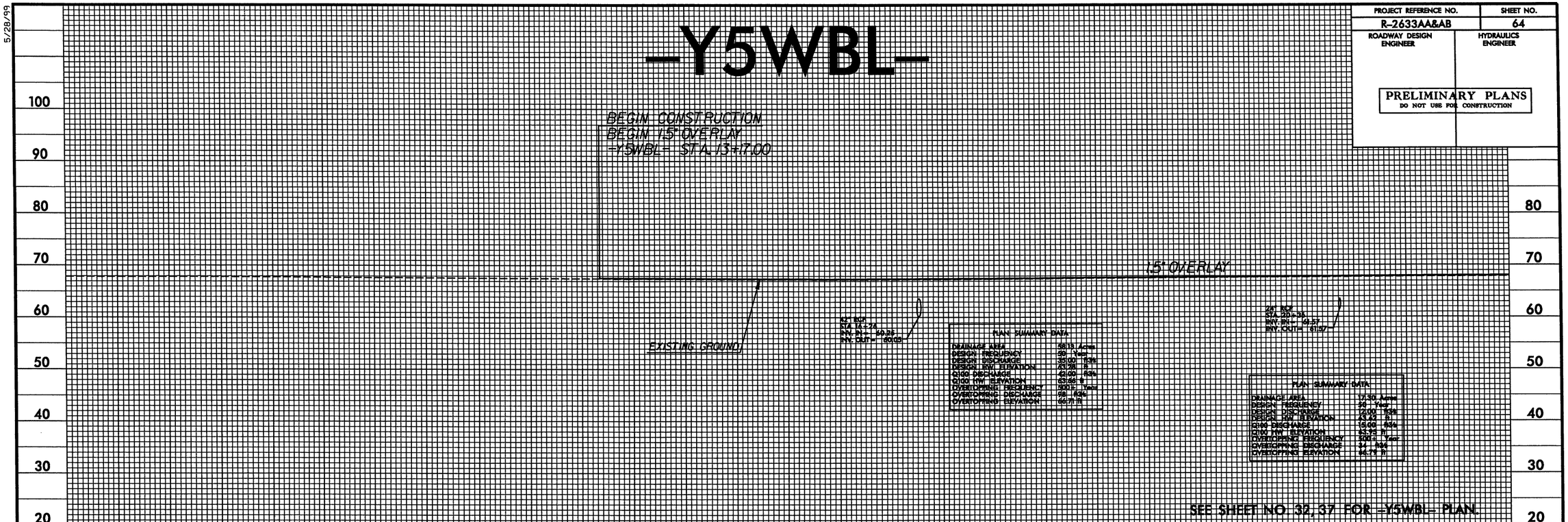
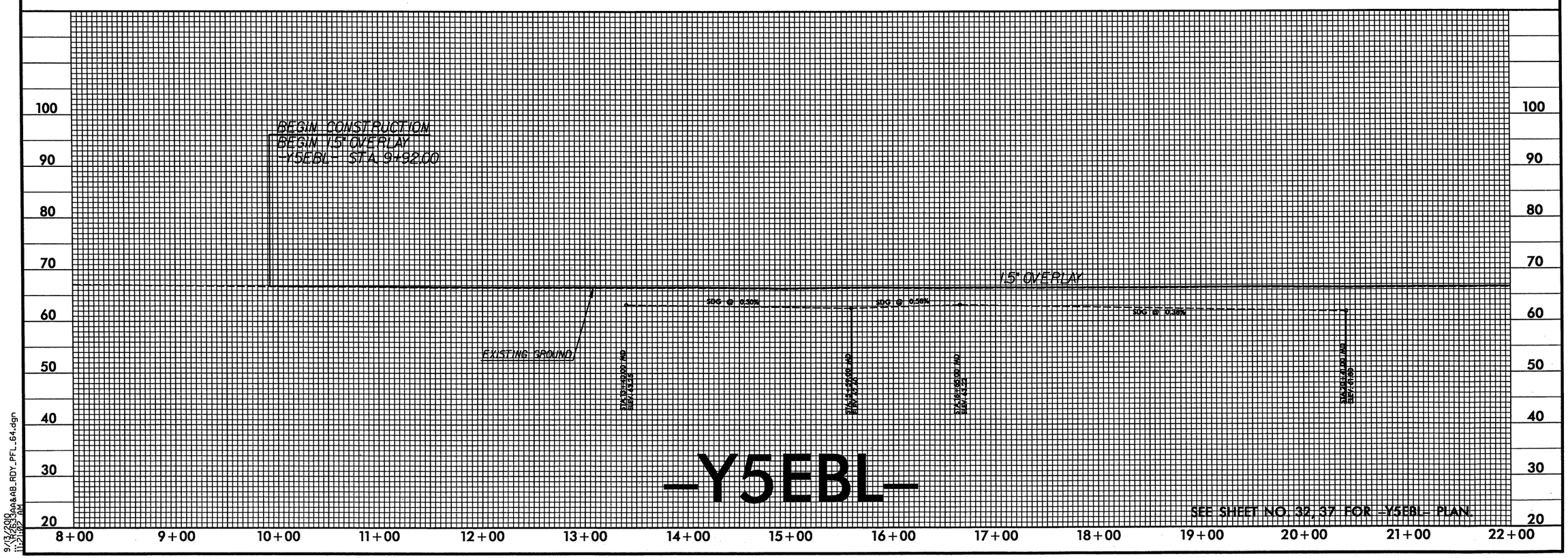
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	64
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y5WBL-





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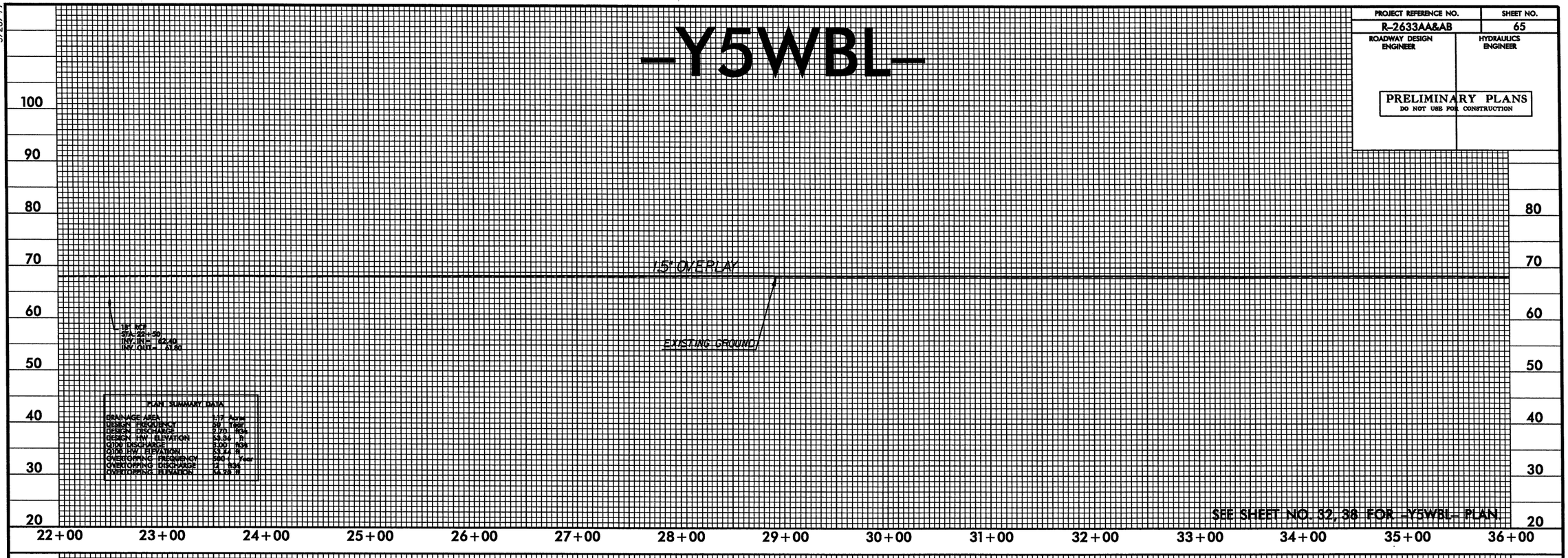
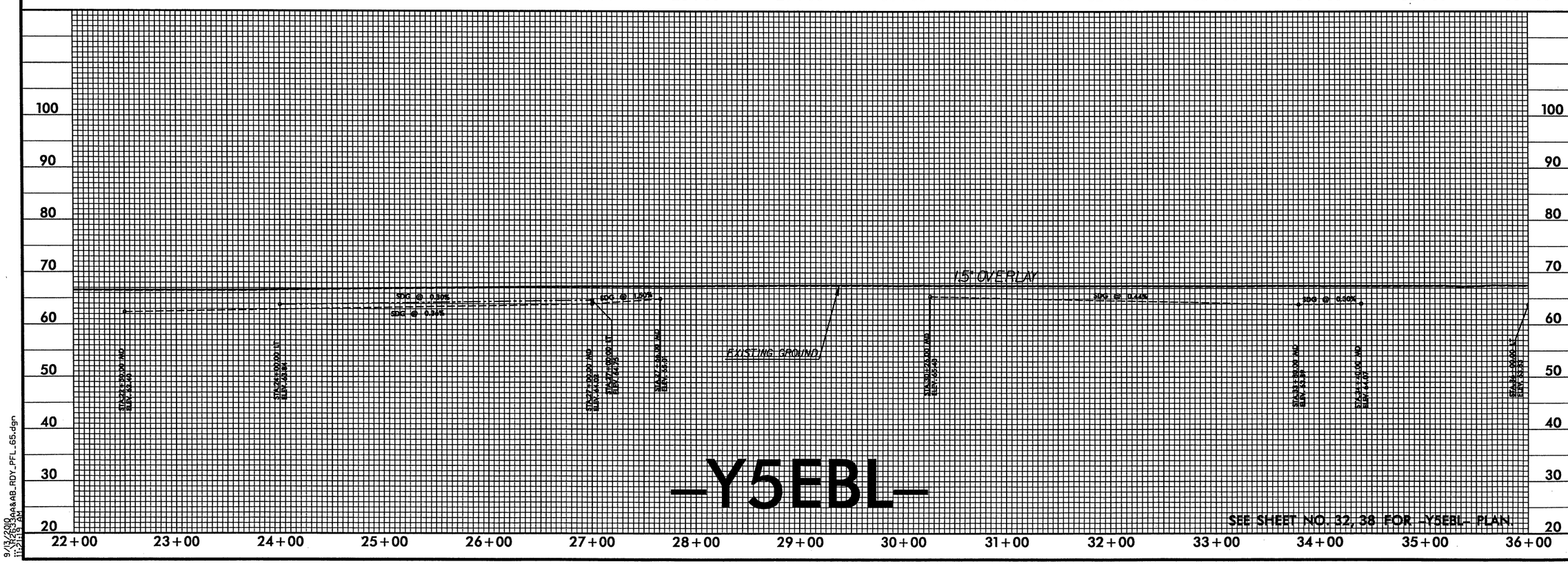
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	65
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y5WBL-



-Y5EBL-



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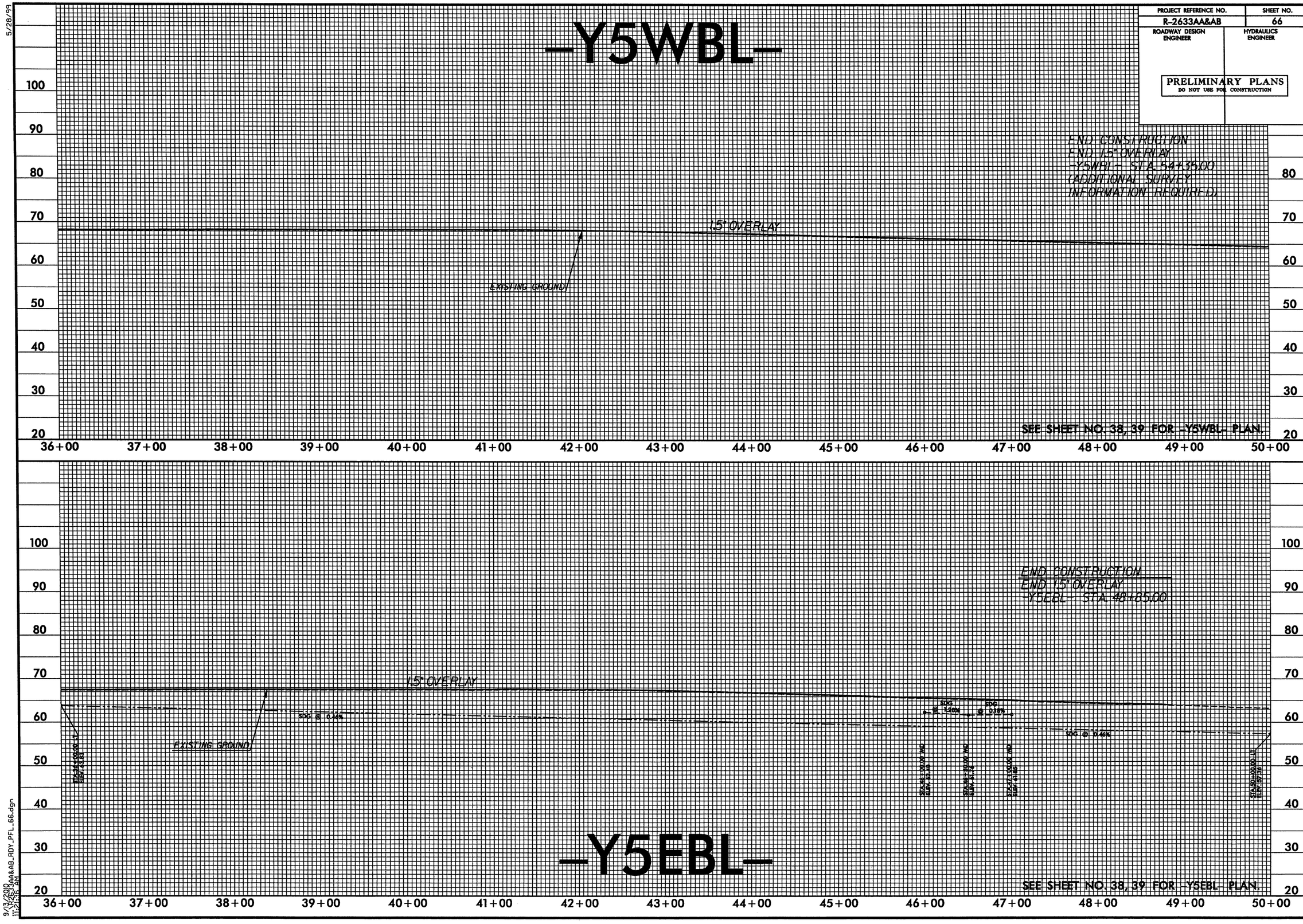
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	66
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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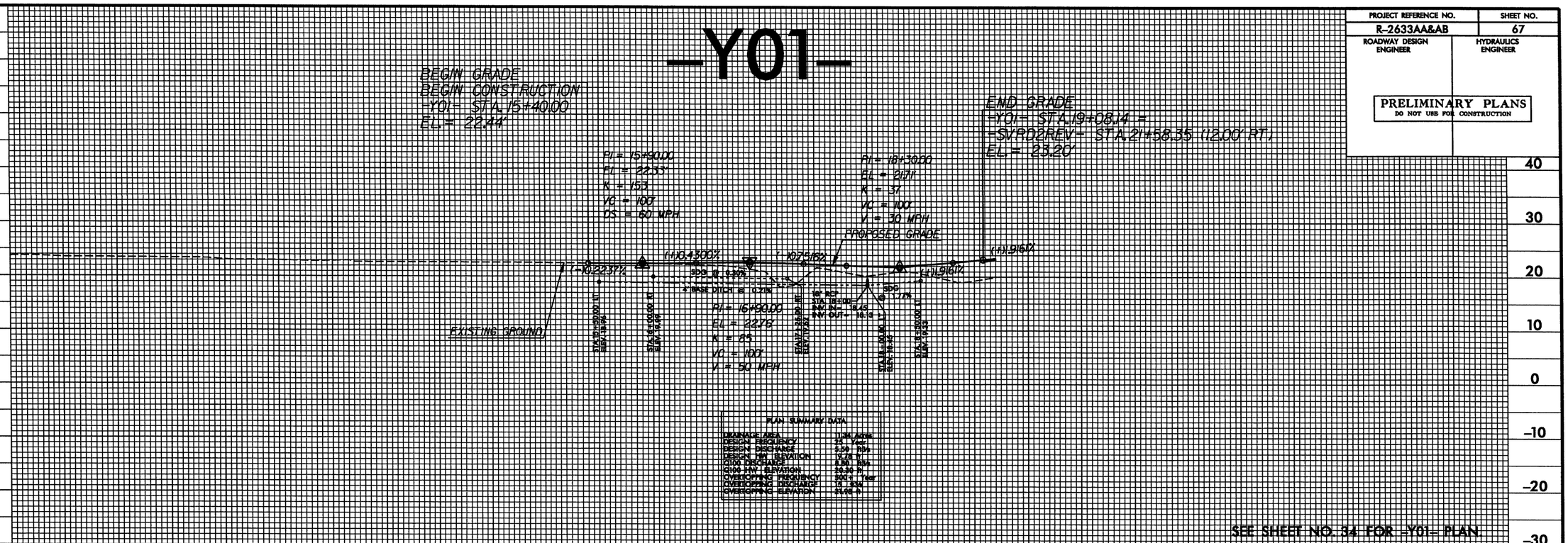
11:21:36 AM

5/28/99

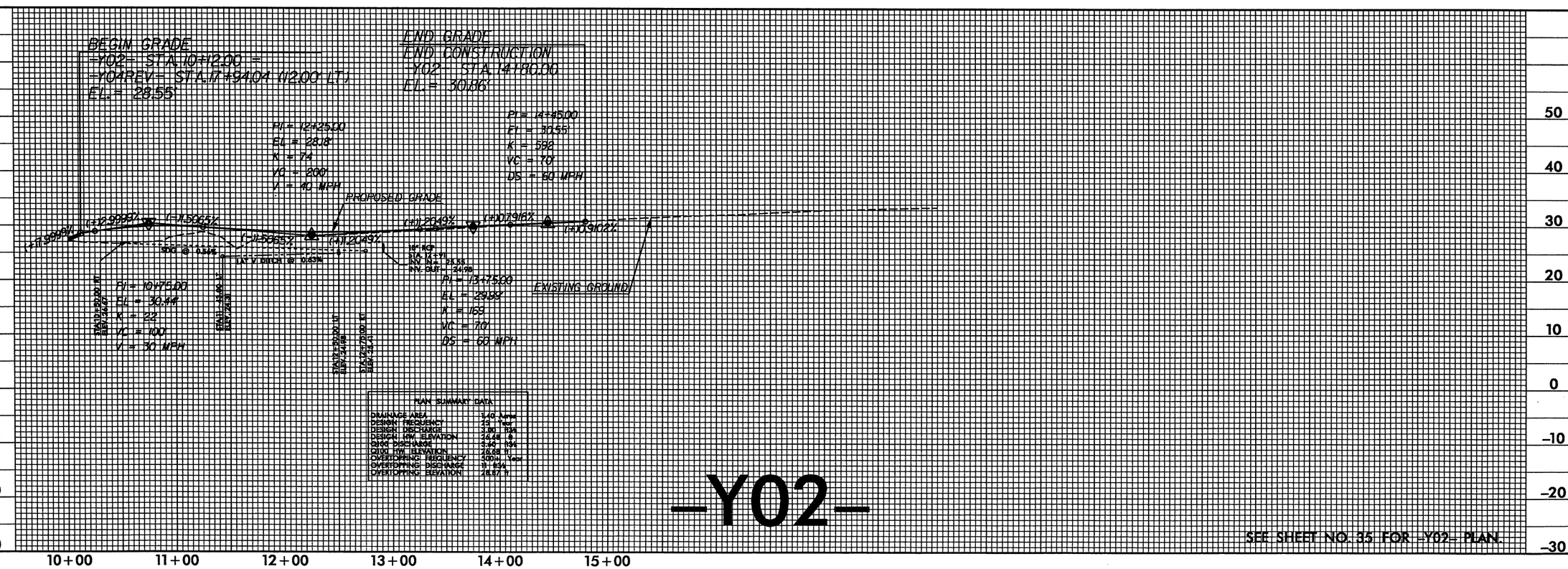
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	67
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y01-



-Y02-



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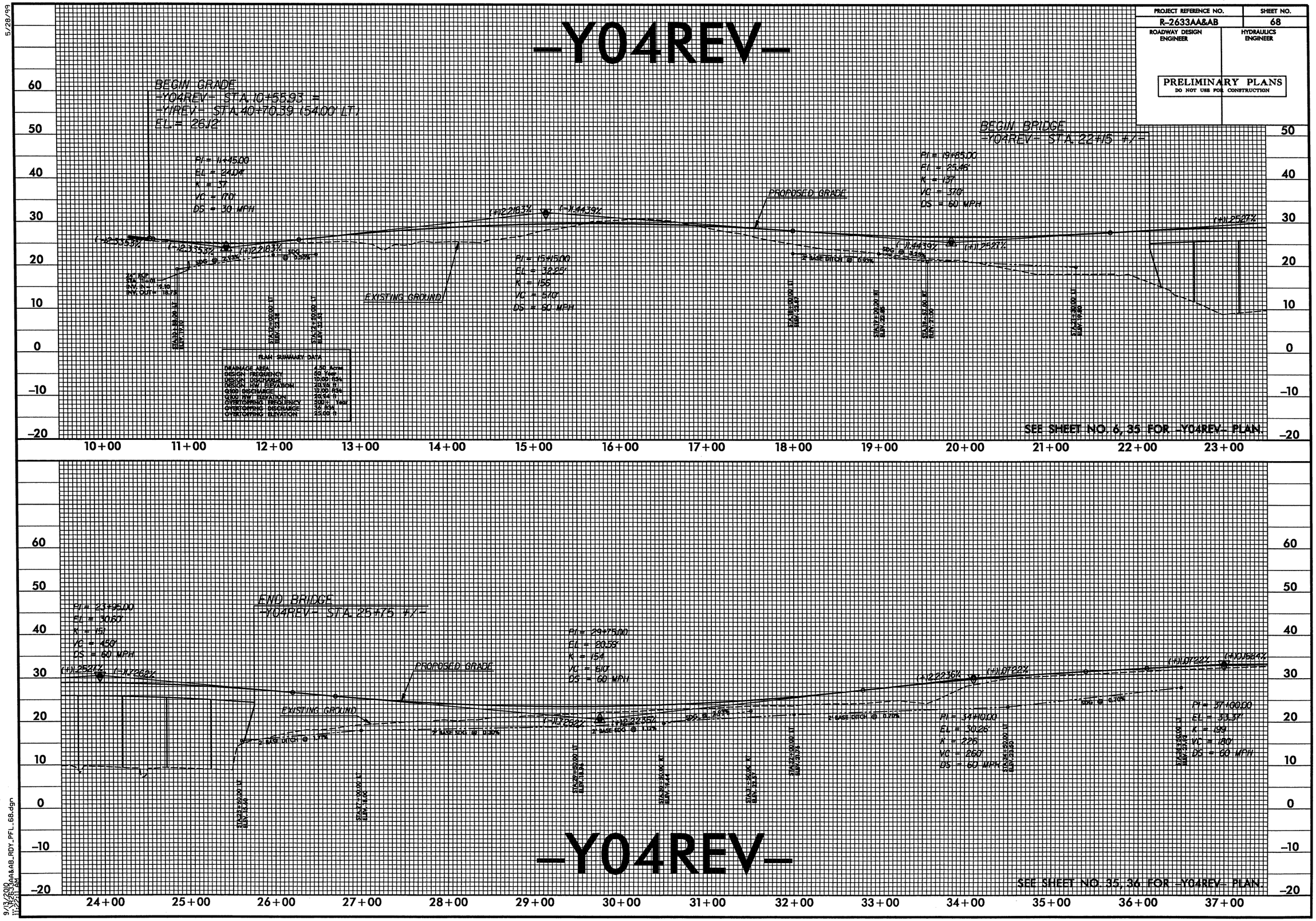
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



9/13/2010
11:25:51 AM
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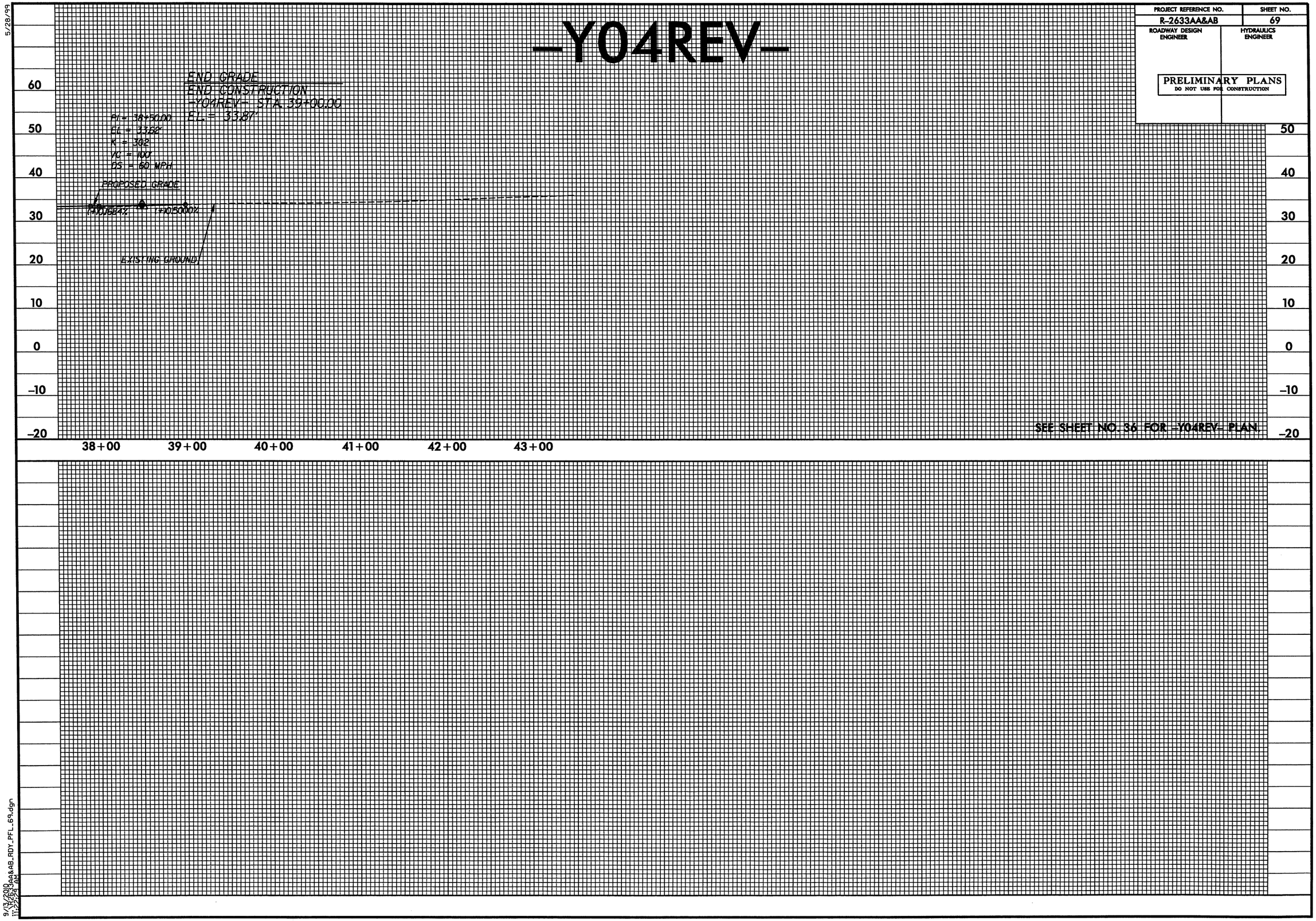
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	69
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y04REV-



SEE SHEET NO. 36 FOR -Y04REV- PLAN

9/13/2000
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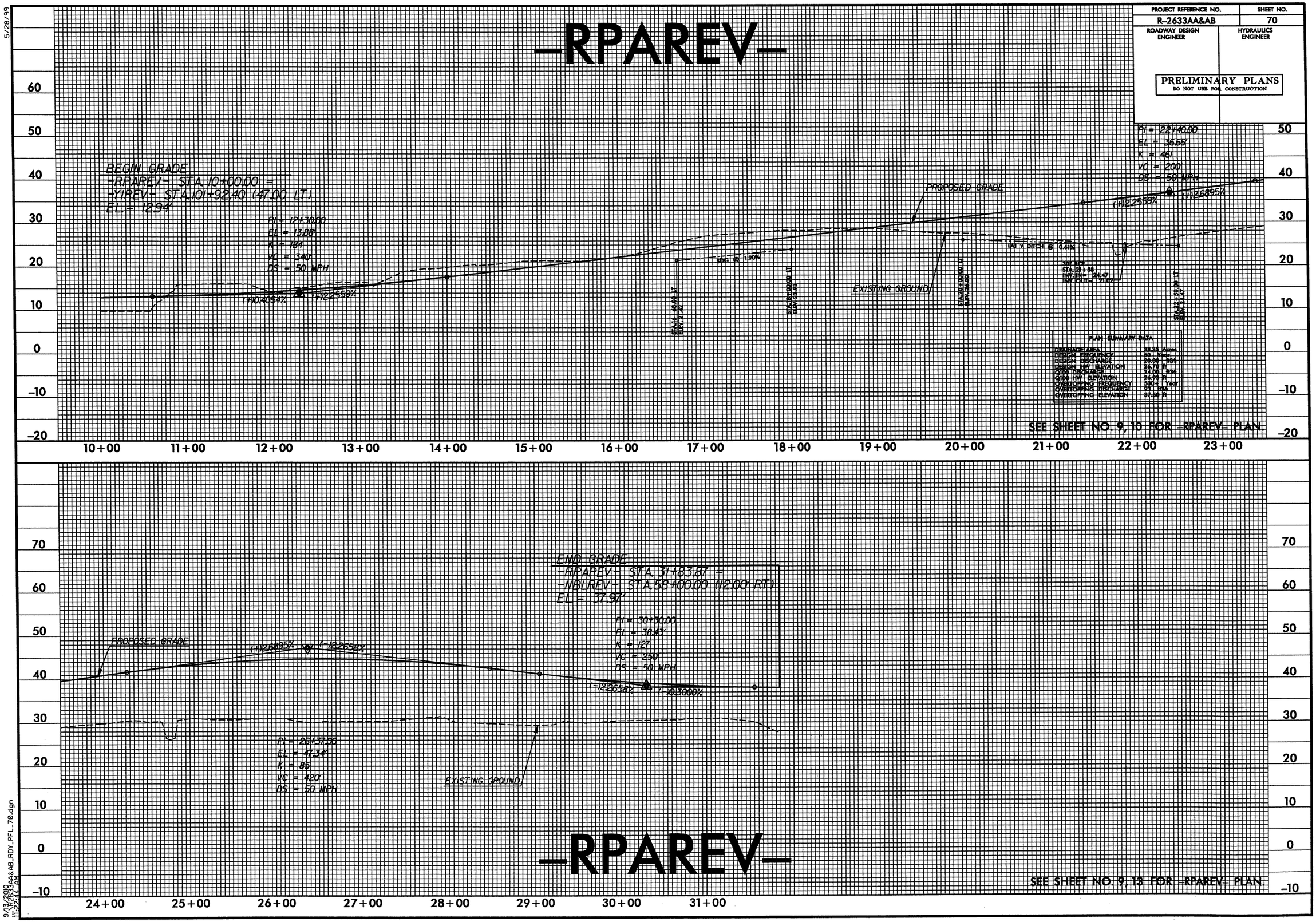
11:22:59 AM

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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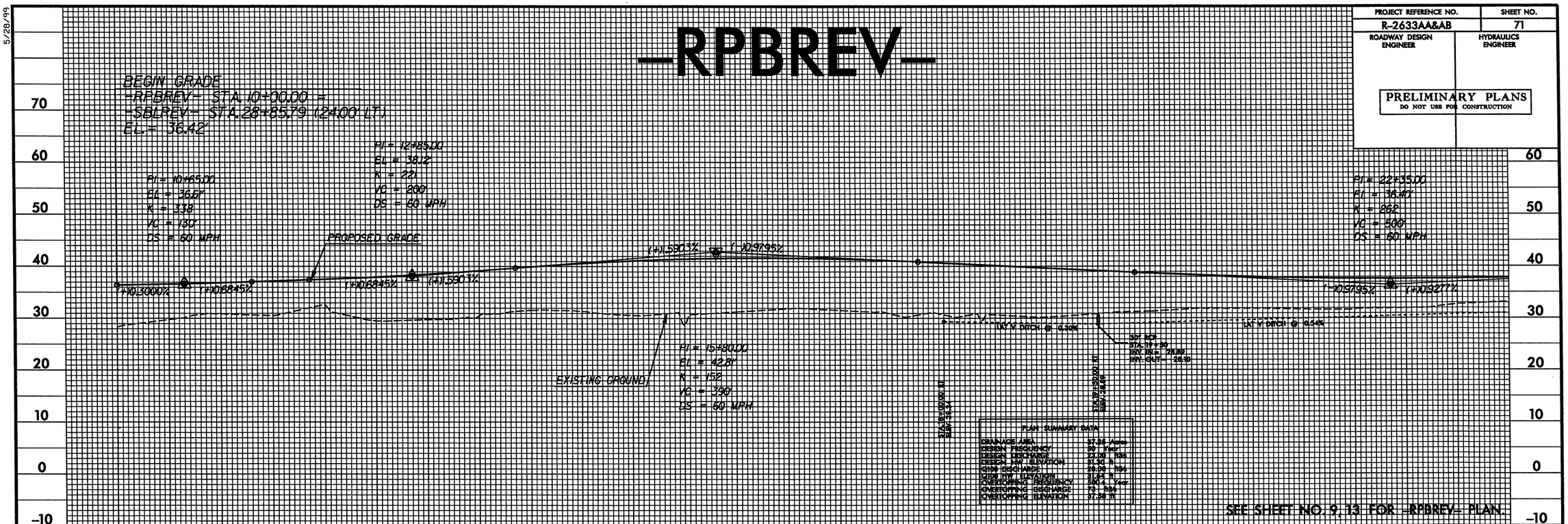
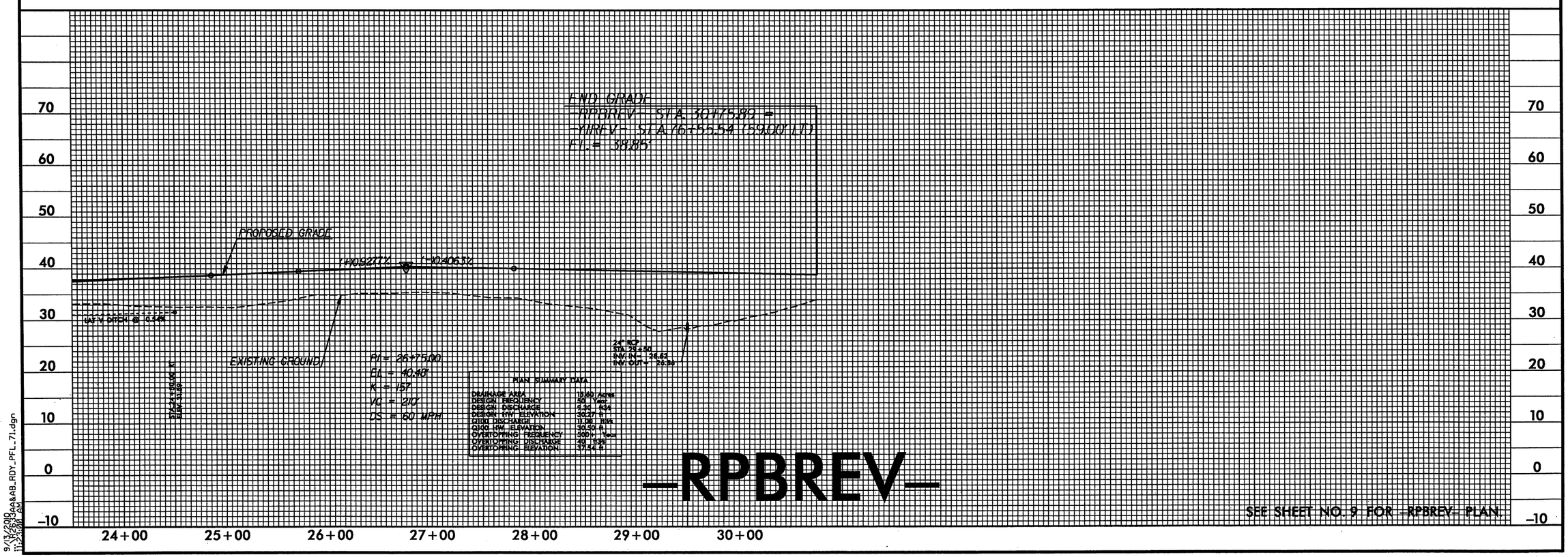
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	71
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-RPBREV-





-RPBREV-

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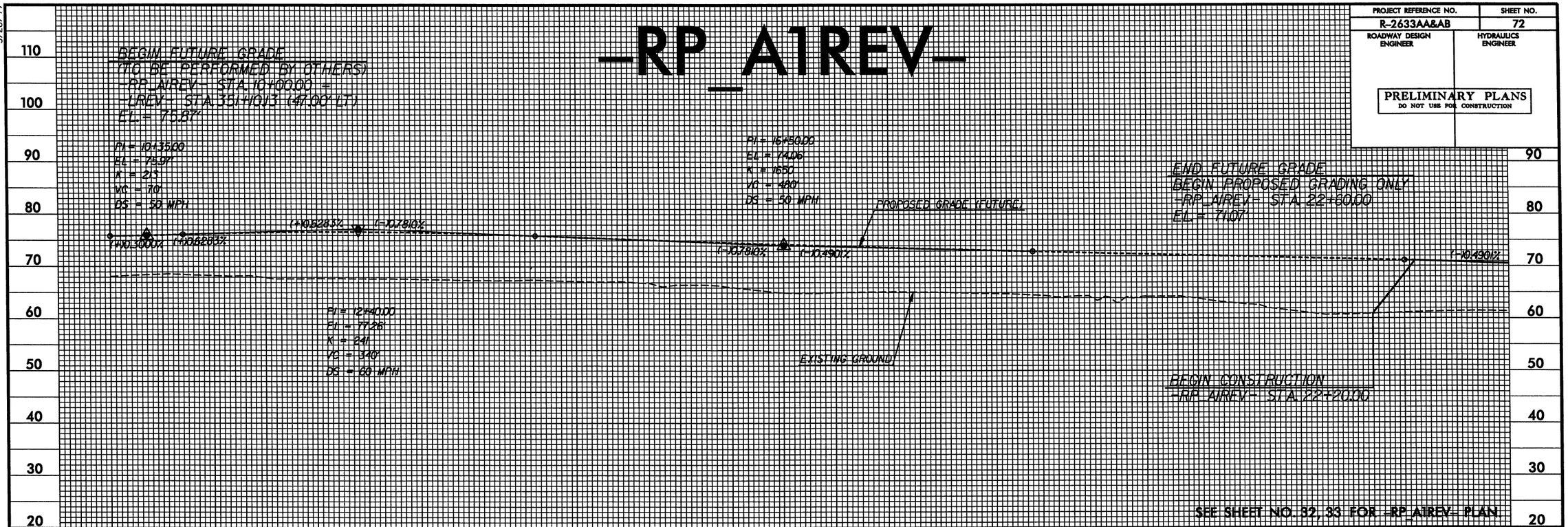
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	72
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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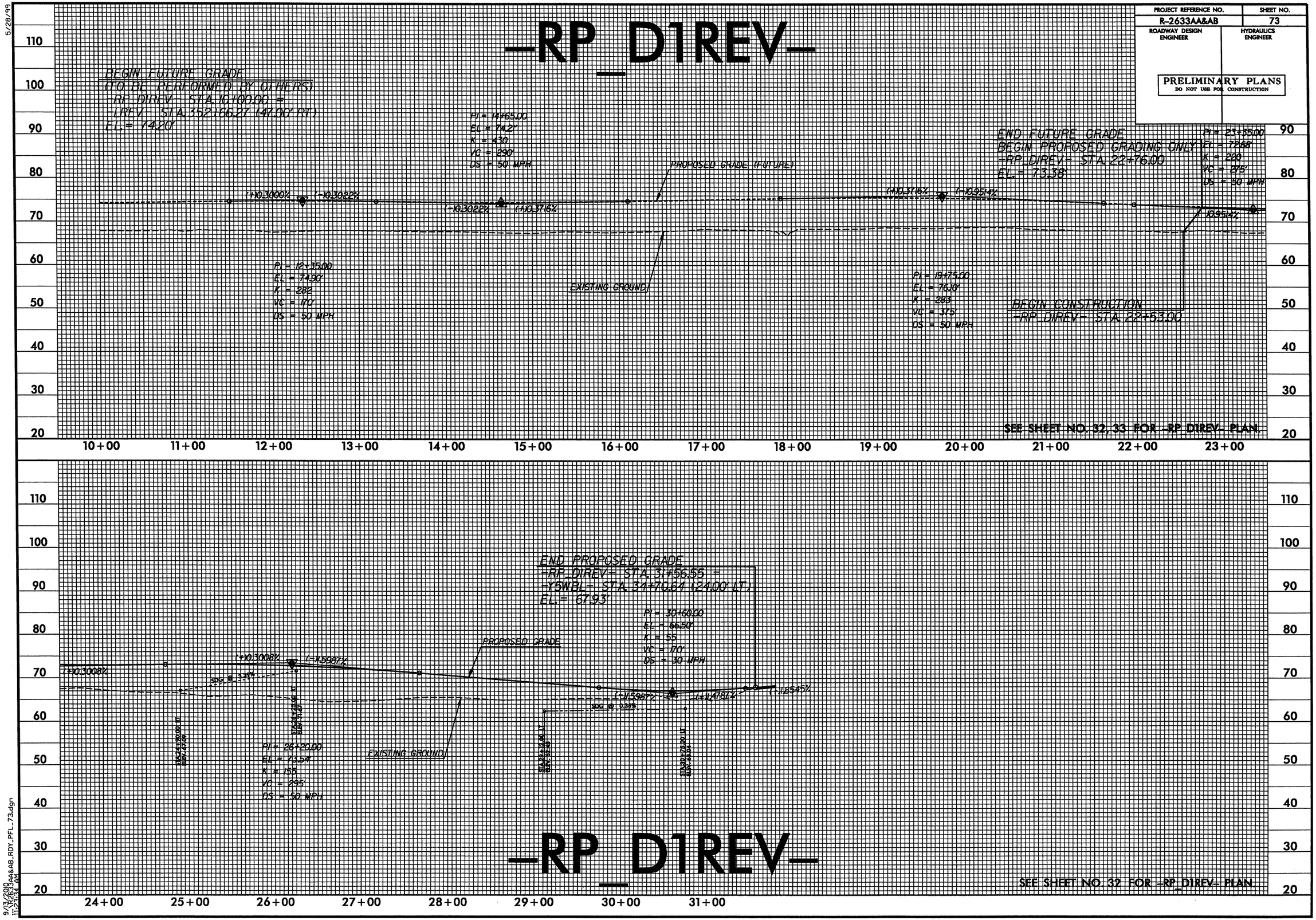
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	73
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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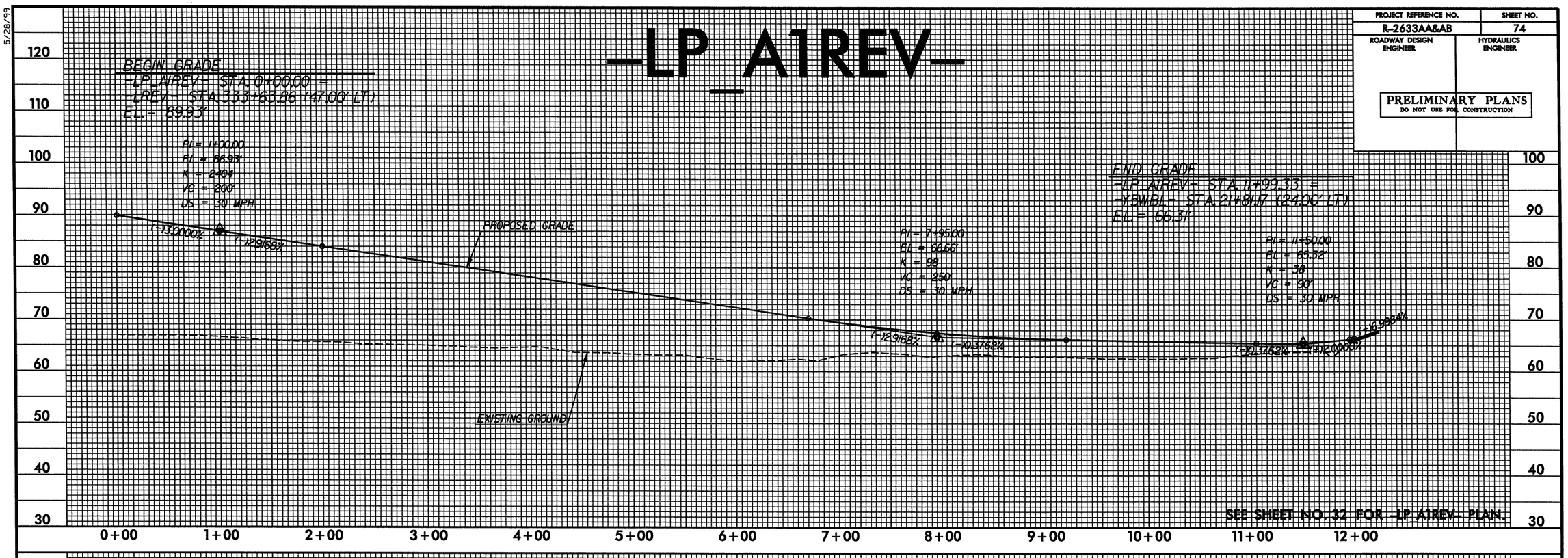
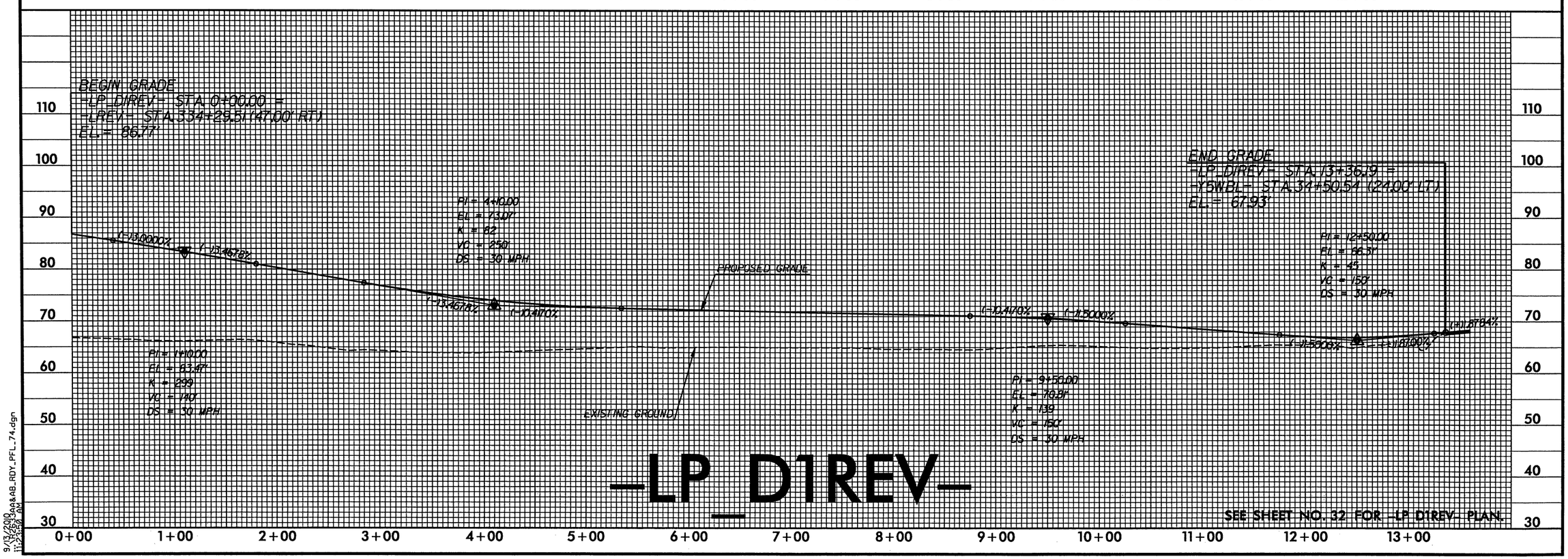
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	74
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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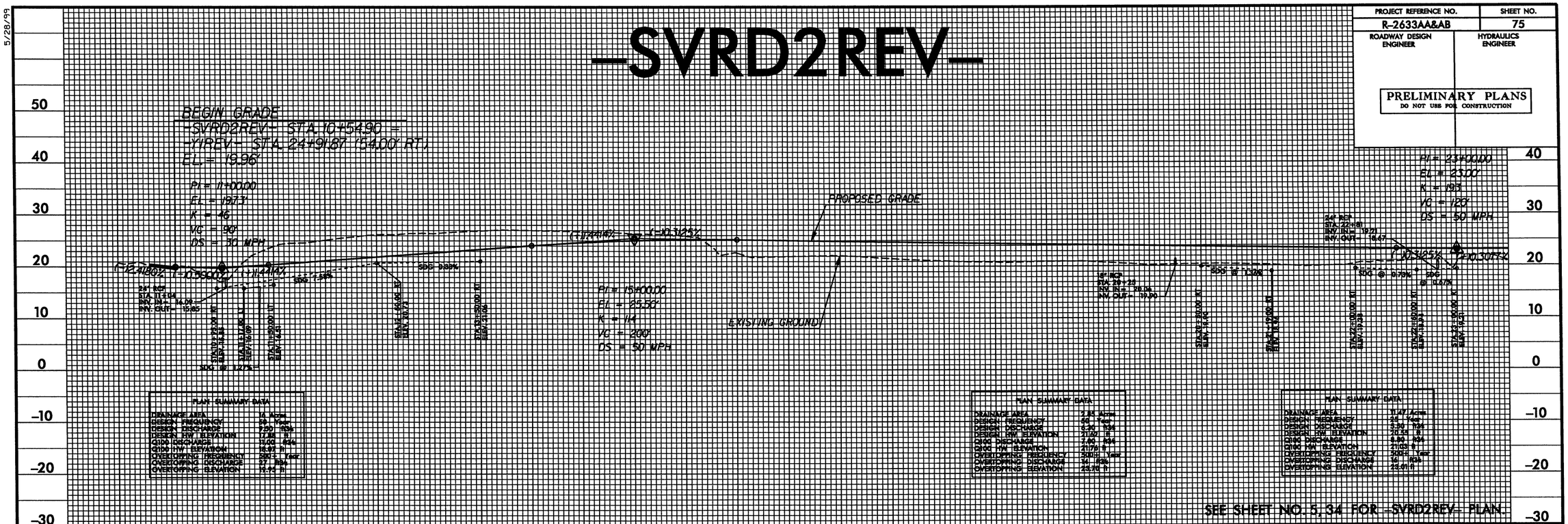
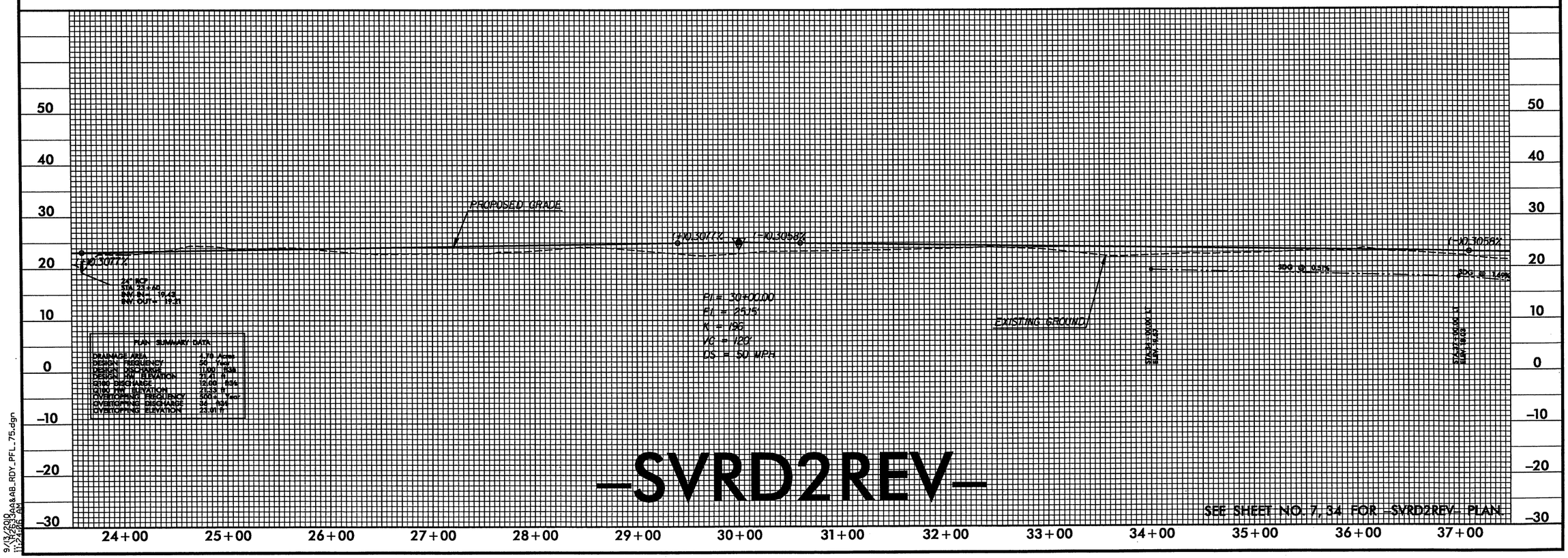
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	75
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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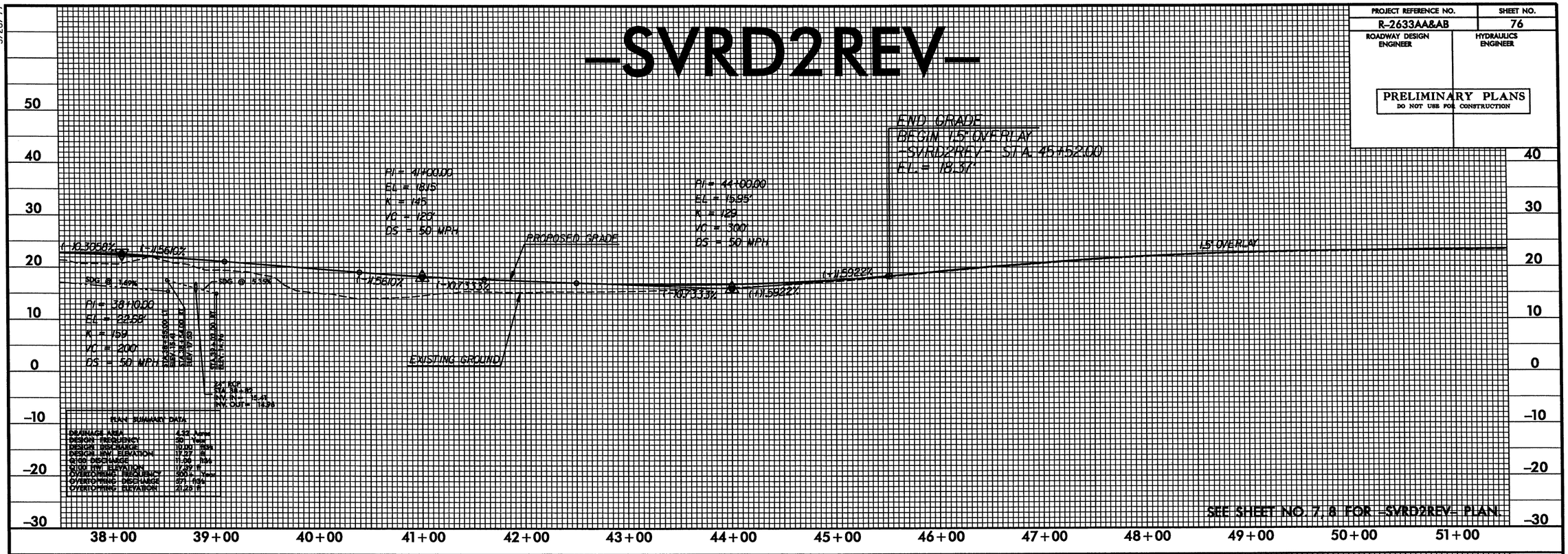
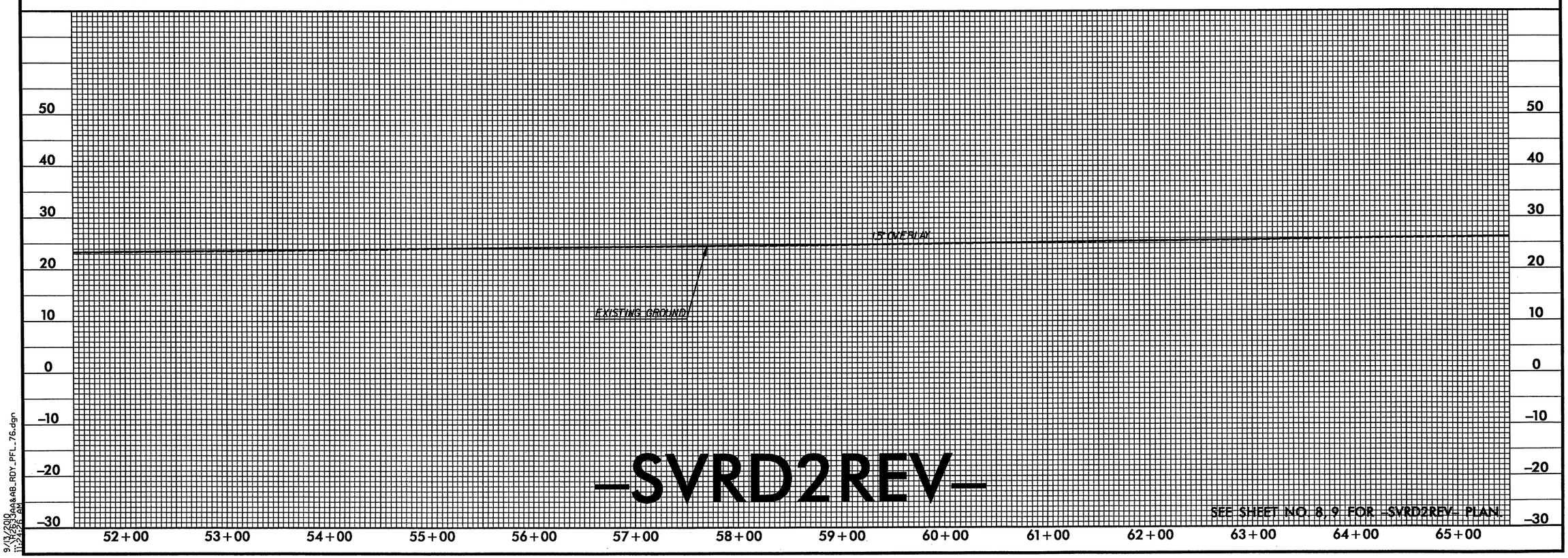
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	76
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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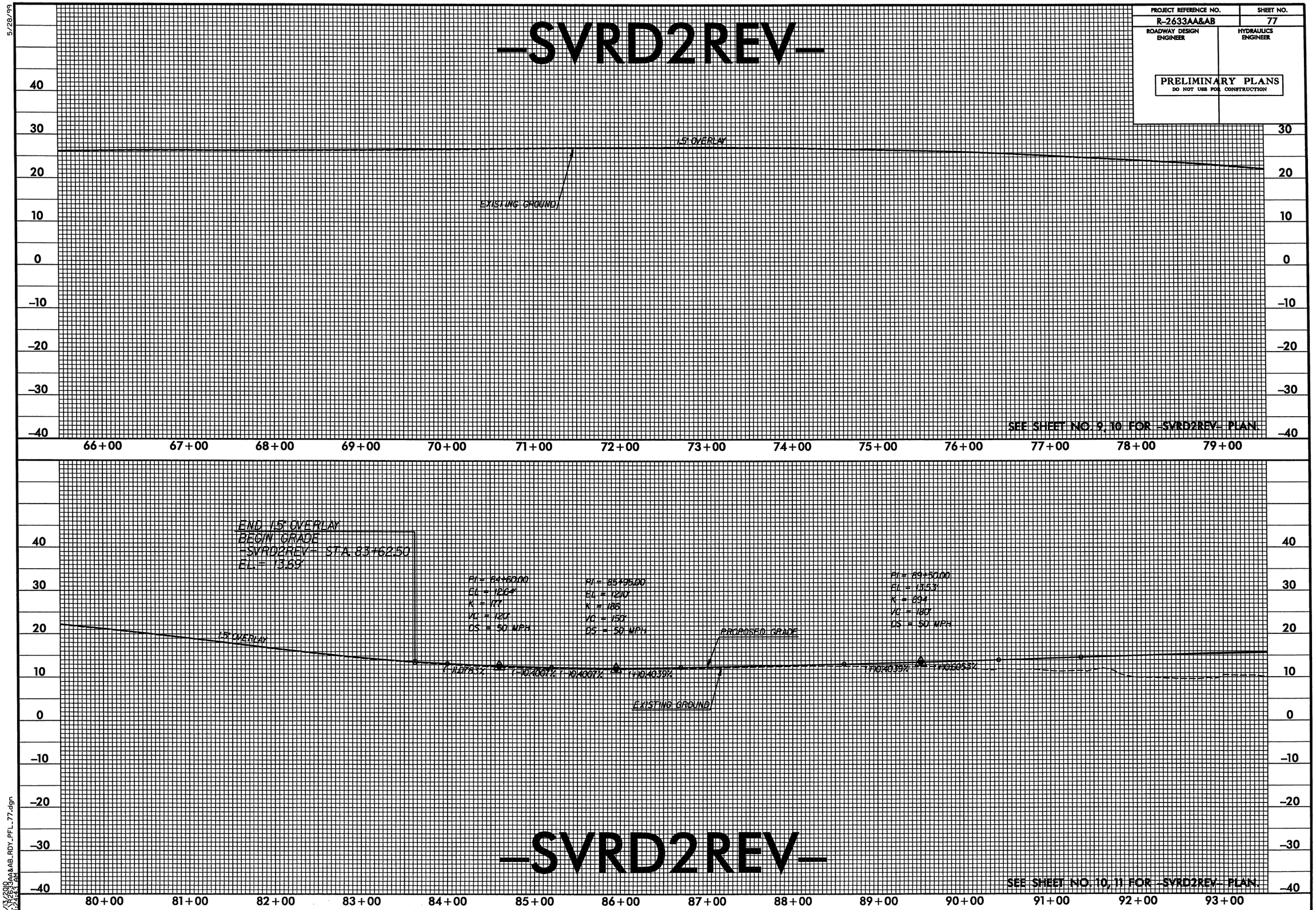
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	77
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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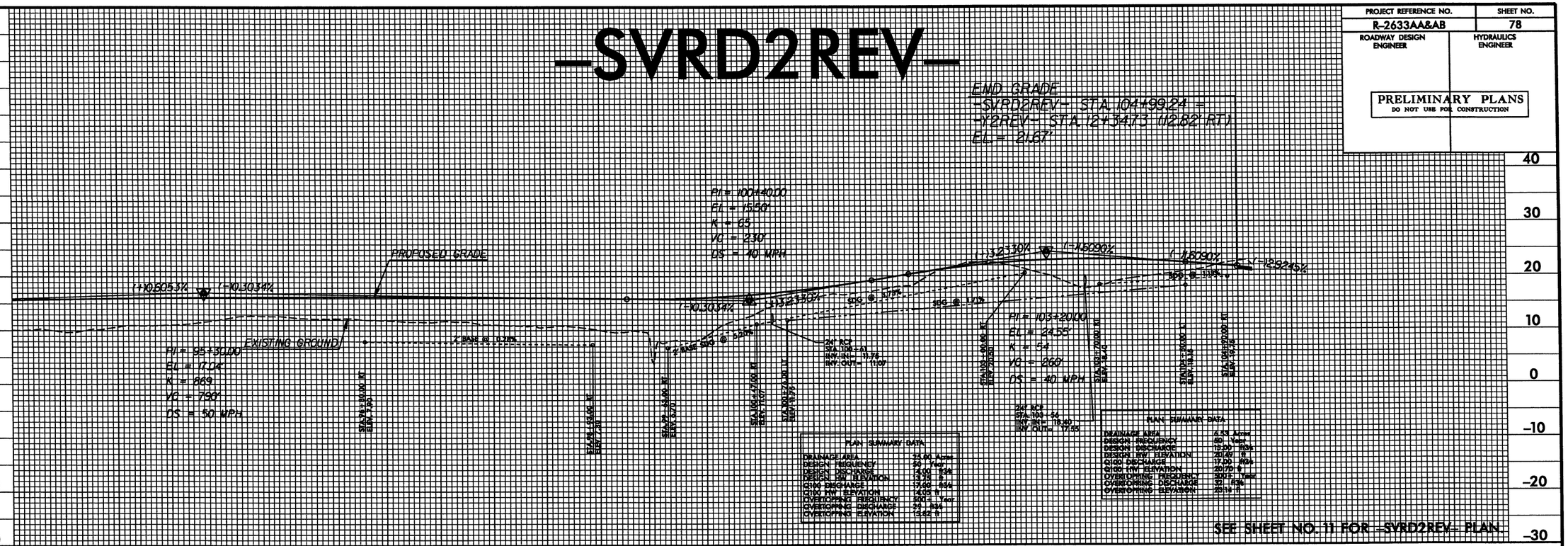
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	78
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SVRD2REV-



SEE SHEET NO. 11 FOR -SVRD2REV- PLAN.

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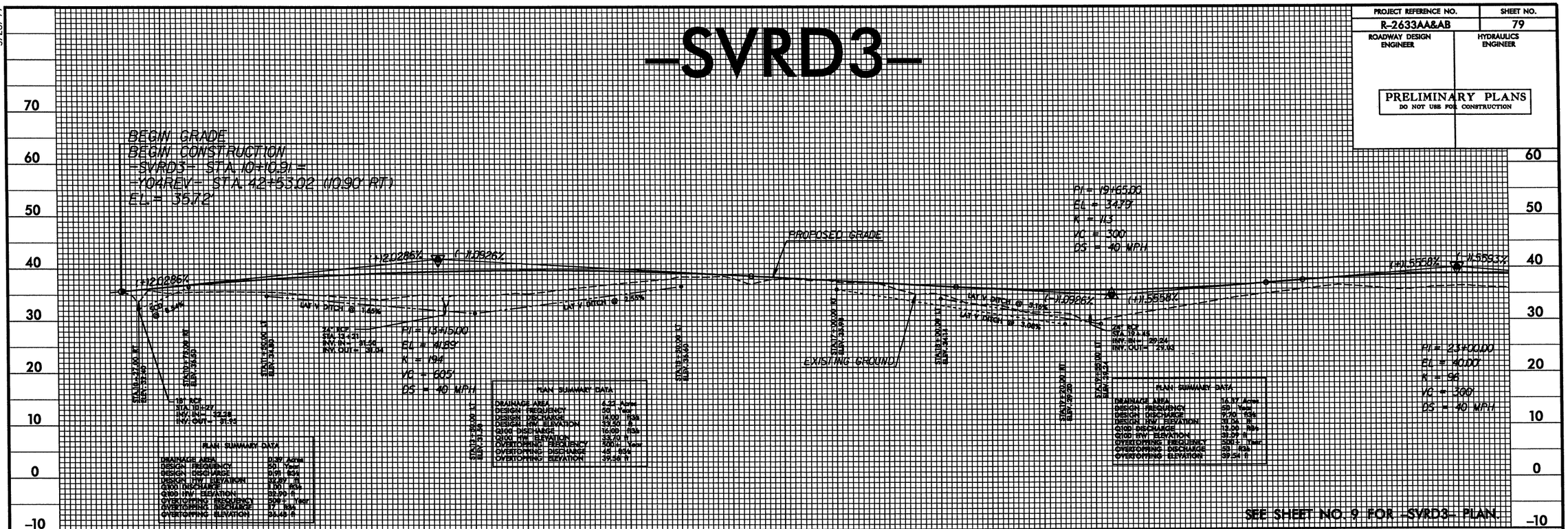
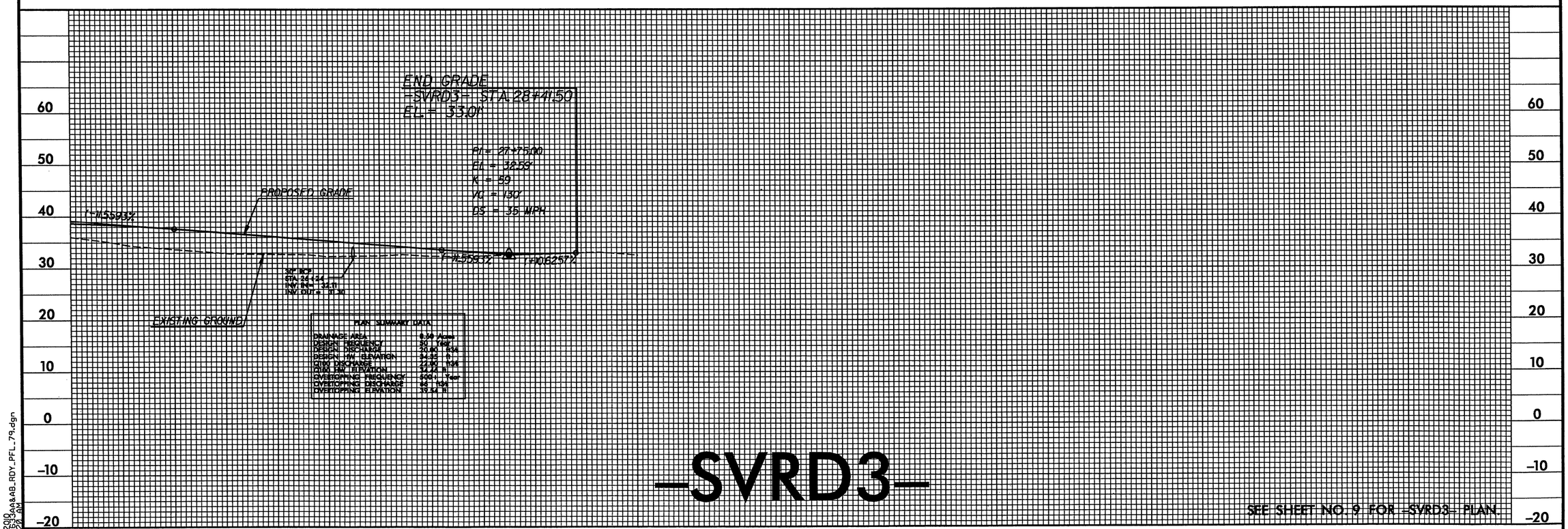
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	79
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SVRD3-





-SVRD3-

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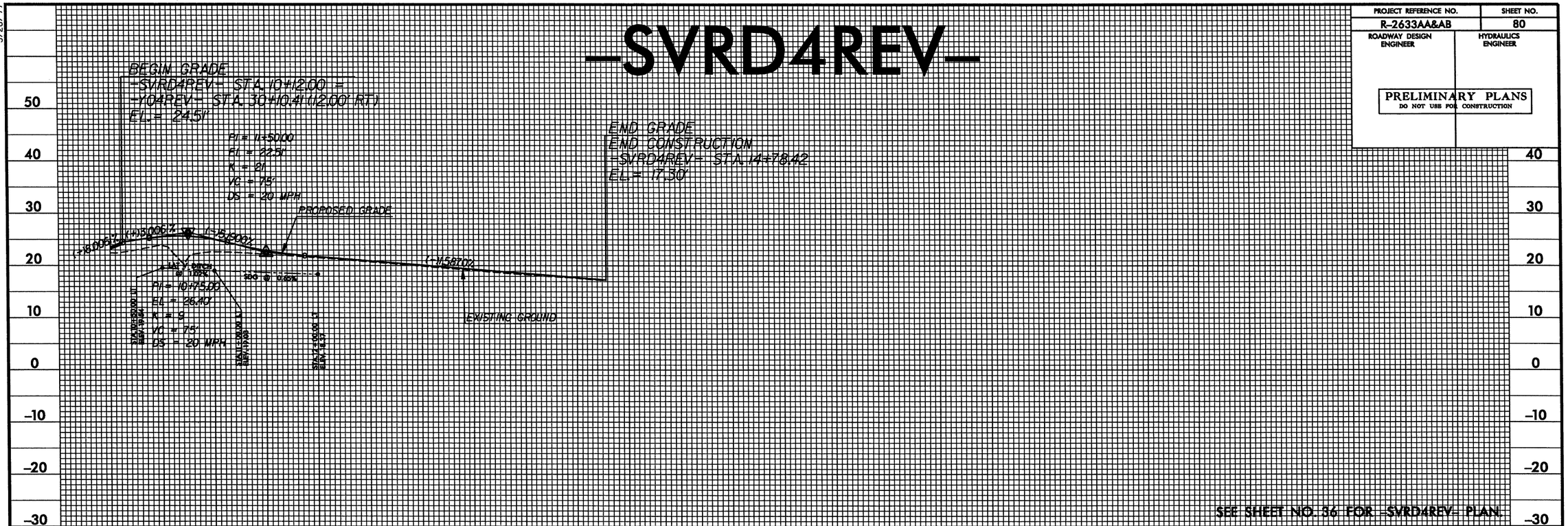
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	80
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

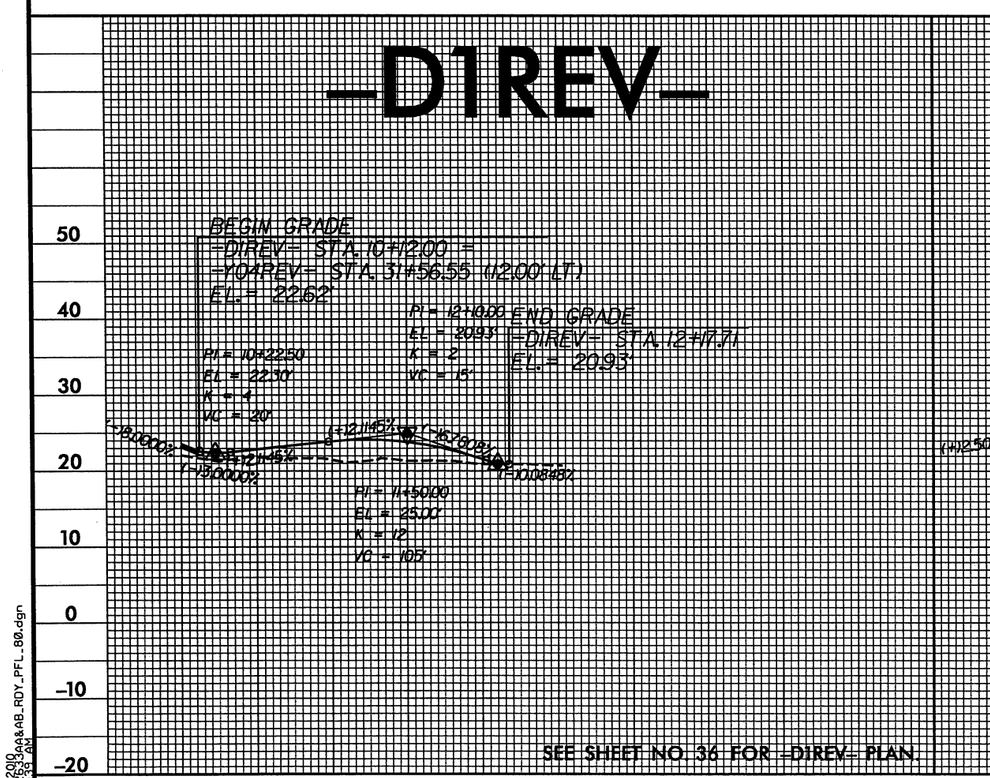
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SVRD4REV-



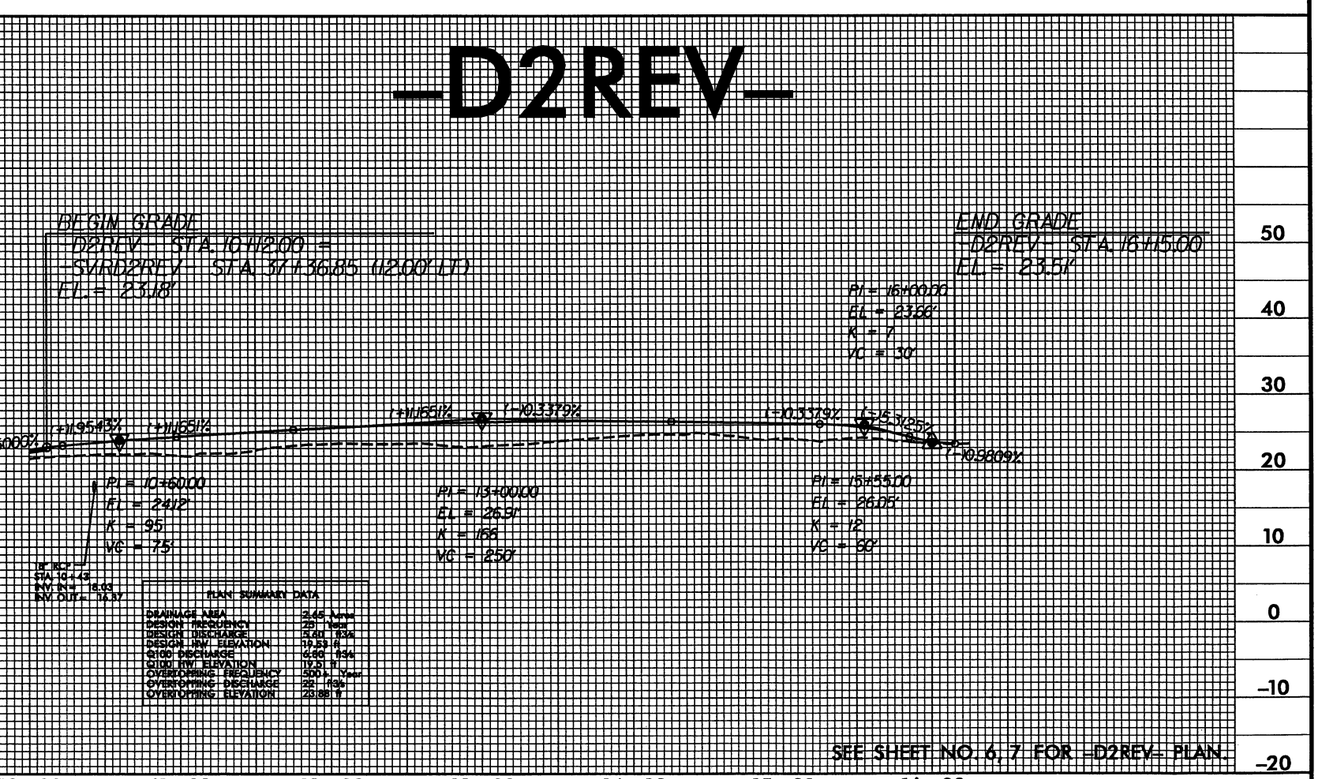
SEE SHEET NO. 36 FOR -SVRD4REV- PLAN.

-D1REV-



SEE SHEET NO. 36 FOR -D1REV- PLAN.

-D2REV-



SEE SHEET NO. 6, 7 FOR -D2REV- PLAN.

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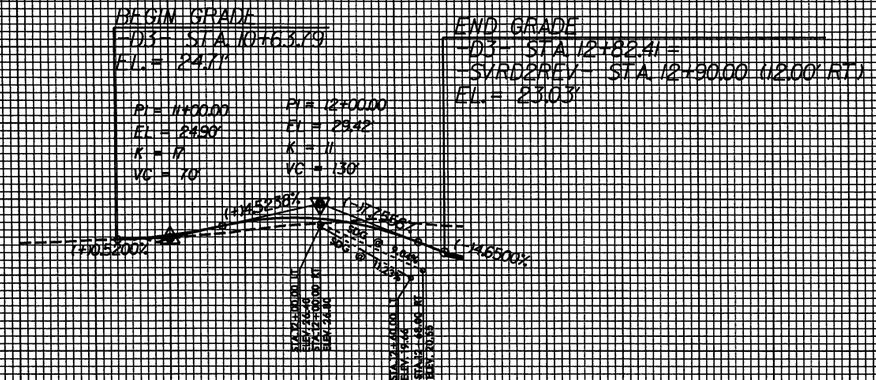
PROJECT REFERENCE NO.	SHEET NO.
R-2633AA&AB	81
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

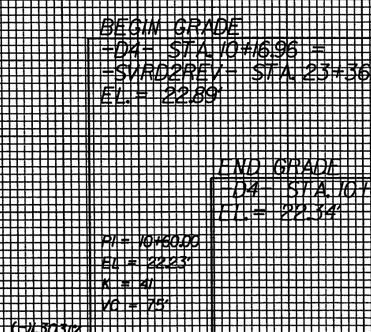
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-D3-



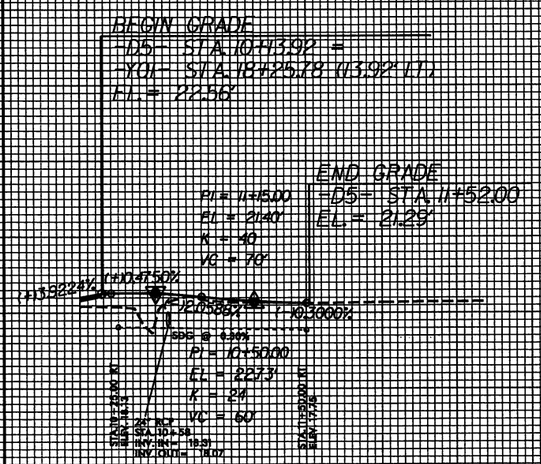
SEE SHEET NO. 5 FOR -D3- PLAN.

-D4-



SEE SHEET NO. 34 FOR -D4- PLAN.

-D5-



PLAN SUMMARY DATA	
DRAINAGE AREA	11.57 Acres
DESIGN FREQUENCY	25 Year
DESIGN DISCHARGE	9.40 cfs
DESIGN HW ELEVATION	19.60 ft
0100 DISCHARGE	9.40 cfs
0100 HW ELEVATION	20.00 ft
OVERTOPPING FREQUENCY	500 Year
OVERTOPPING DISCHARGE	99 cfs
OVERTOPPING ELEVATION	22.54 ft

SEE SHEET NO. 34 FOR -D5- PLAN.

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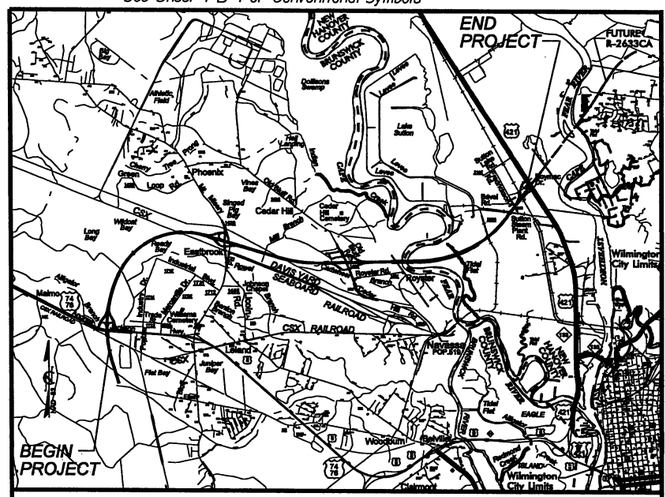
09/08/99

TIP PROJECT: R-2633B

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



VICINITY MAP FOR STATE PROJECT R-2633B

RW SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

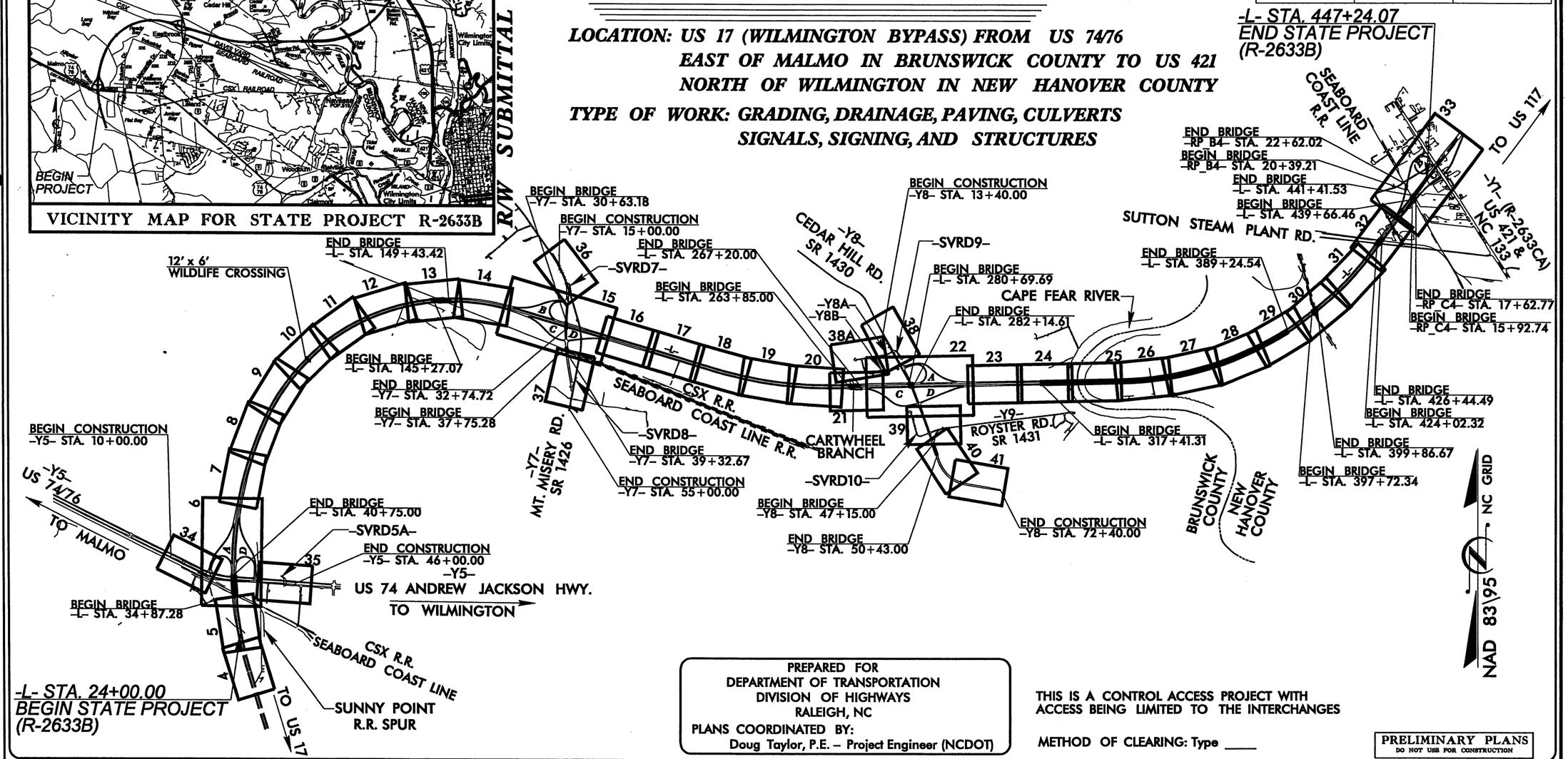
BRUNSWICK & NEW HANOVER COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34491.1.2	STPNHF-17(1)	P.E.
34491.2.3		R/W

LOCATION: US 17 (WILMINGTON BYPASS) FROM US 74/76 EAST OF MALMO IN BRUNSWICK COUNTY TO US 421 NORTH OF WILMINGTON IN NEW HANOVER COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS SIGNALS, SIGNING, AND STRUCTURES



PREPARED FOR
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC
PLANS COORDINATED BY:
Doug Taylor, P.E. – Project Engineer (NCDOT)

THIS IS A CONTROL ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGES

METHOD OF CLEARING: Type ____

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

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 2009 = 16,400
ADT 2025 = 24,900
DHV = 12 %
D = 60 %
T = 15 % *
V = 70 MPH
* TTST 10% DUAL 5%
FUNC. CLASS. = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2633B = 6.26 Miles
LENGTH STRUCTURES TIP PROJECT R-2633B = 1.76 Miles
TOTAL LENGTH STATE TIP PROJECT R-2633B = 8.02 Miles

THIS IS A FULL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

Prepared In the Office of:
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: June 20, 2008

LETTING DATE: July 19, 2011

Brian K. Eason, P.E.
PROJECT ENGINEER

Jeffrey R. Hext
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

9/28/2010
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PROJECT REFERENCE NO.	SHEET NO.
R-2633B	1-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:

- 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 High Quality Wetland Boundary — HQ WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- 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
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — G
- Designated U/G Gas Line (S.U.E.*) — G
- 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 — S
- 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.

6/2/99

PRELIMINARY PAVEMENT DESIGN SCHEDULE

C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	E2	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 4" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J1	PROP. 8" AGGREGATE BASE COURSE.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	PROP. 10" AGGREGATE BASE COURSE.
C4	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.	R1	2'-6" CONCRETE CURB AND GUTTER.
C5	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.	R2	5" MONOLITHIC CONCRETE ISLAND.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R3	CONCRETE MEDIAN BARRIER, TYPE IV
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	SHOULDER BERM GUTTER
D3	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D4	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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
D5	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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 1, SHEET 2-A)
E1	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 2, SHEET 2-B)

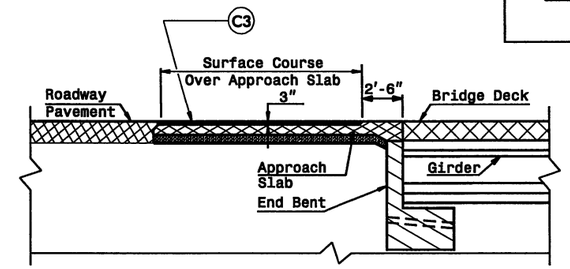
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

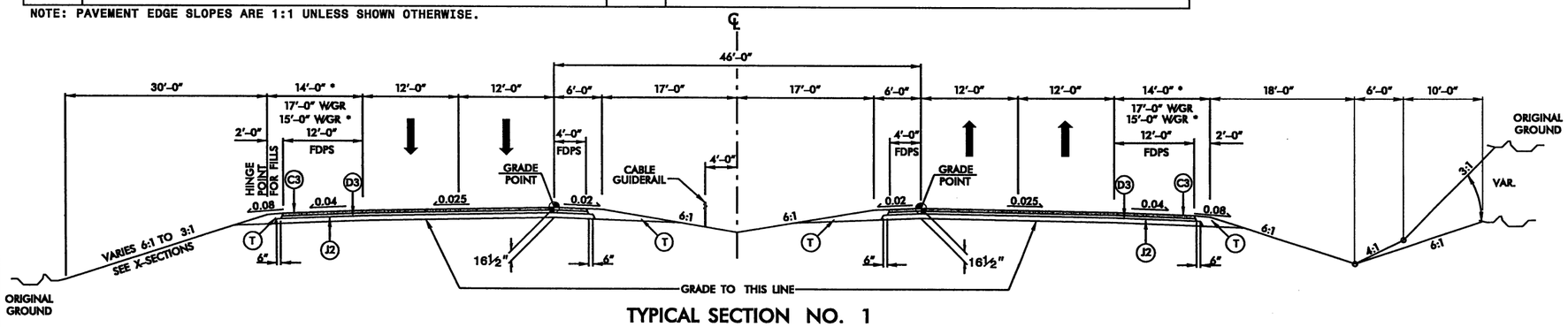


DETAIL OF ASPHALT SURFACE ON APPROACH SLAB

SEE PLANS FOR APPROACH SLAB LOCATIONS

USE TYPICAL SECTION NO. 1 AS FOLLOWS

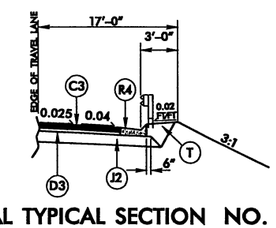
* -L- STA. 24+00.00 TO STA. 25+00.00 [TAPER 12' SHOULDER (10' FDPS) TO 14' SHOULDER (12' FDPS)]
-L- STA. 25+00.00 TO STA. 34+87.28 (BEGIN BRIDGE)
-L- STA. 40+75.00 (END BRIDGE) TO STA. 145+27.07 (BEGIN BRIDGE)
-L- STA. 149+43.42 (END BRIDGE) TO STA. 263+85.00 (BEGIN BRIDGE)
-L- STA. 267+20.00 (END BRIDGE) TO STA. 280+69.69 (BEGIN BRIDGE)
-L- STA. 282+14.61 (END BRIDGE) TO STA. 317+41.31 +/- (BEGIN BRIDGE)
-L- STA. 389+24.54 +/- (END BRIDGE) TO STA. 397+72.34 (BEGIN BRIDGE)
-L- STA. 399+86.67 (END BRIDGE) TO STA. 424+02.32 (BEGIN BRIDGE)
-L- STA. 426+44.49 (END BRIDGE) TO STA. 430+26.77 (BEGIN BRIDGE)
-L- STA. 431+80.18 (END BRIDGE) TO STA. 436+28.39



TYPICAL SECTION NO. 1

-L- US 17

DETAIL OF SHOULDER BERM GUTTER

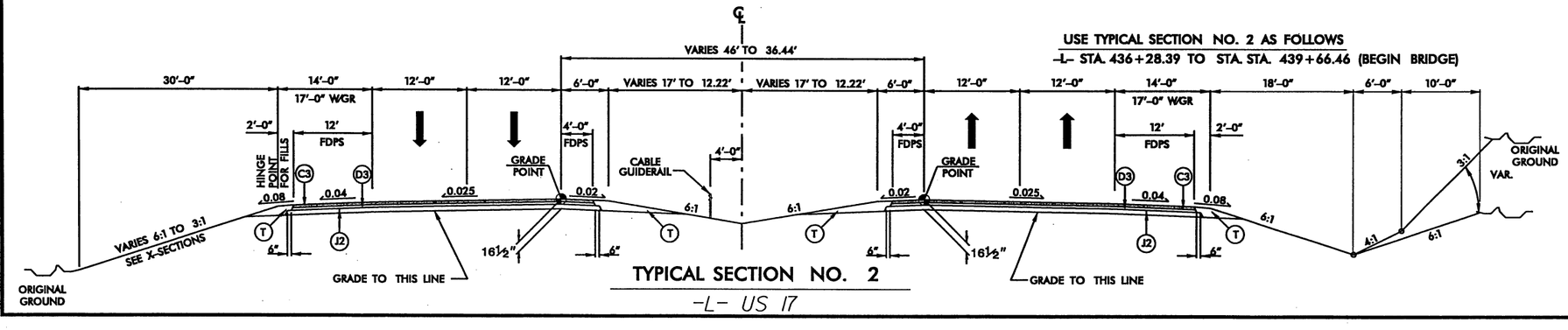


PARTIAL TYPICAL SECTION NO. 1A

USE PARTIAL TYPICAL 1A IN CONJUNCTION WITH TYPICAL 1 & 2 AT:

-L- STA. 24+00 RT. TO 34+23 RT.
-L- STA. 101+24 RT. TO 106+15 RT.
-L- STA. 137+50 RT. TO 145+81 RT.
-L- STA. 151+18 RT. TO 163+44 RT.
-L- STA. 255+59 LT. TO 263+25 LT
-L- STA. 260+93 RT. TO 263+70 RT.
-L- STA. 267+35 LT. TO 280+19 LT.
-L- STA. 278+47 LT. TO 280+52 RT.
-L- STA. 282+63 LT. TO 282+95 RT.
-L- STA. 302+50 RT. TO 313+20 RT.
-L- STA. 304+56 RT. TO 317+16 RT.
-L- STA. 389+50 LT. TO 397+54 LT.
-L- STA. 400+37 LT. TO 404+00 LT.
-L- STA. 422+00 RT. TO 424+12 RT.
-L- STA. 423+10 LT. TO 423+40 LT.
-L- STA. 426+32 LT. TO 430+83.34 LT.
-L- STA. 427+05 RT. TO 430+83.34 RT.

USE TYPICAL SECTION NO. 2 AS FOLLOWS
-L- STA. 436+28.39 TO STA. STA. 439+66.46 (BEGIN BRIDGE)



TYPICAL SECTION NO. 2

-L- US 17

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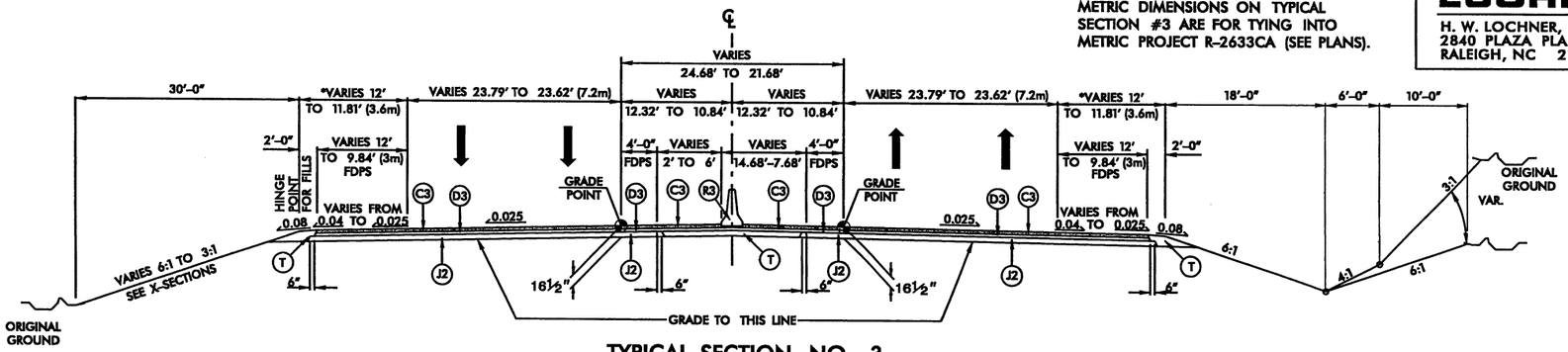
NOTE:
METRIC DIMENSIONS ON TYPICAL SECTION #3 ARE FOR TYING INTO METRIC PROJECT R-2633CA (SEE PLANS).

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

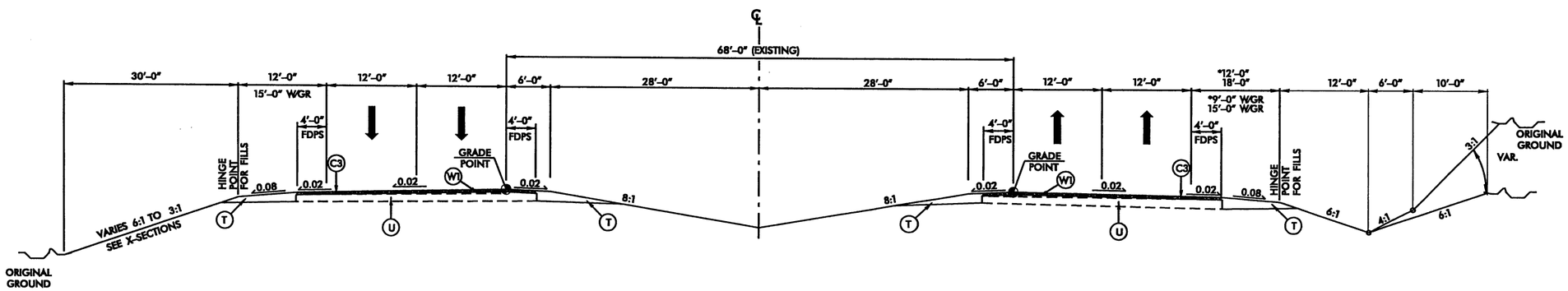


* – ADD 3' FOR GUARDRAIL

TYPICAL SECTION NO. 3

-L- US 17

USE TYPICAL SECTION NO. 3 AS FOLLOWS
-L- STA. 441+41.53 (END BRIDGE) TO STA. 447+24.07 (TIE TO EXISTING)

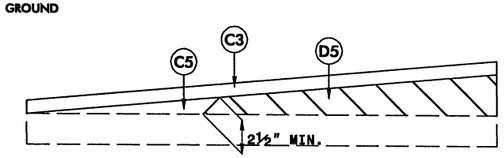


TYPICAL SECTION NO. 4

-Y5- US 74 / 76

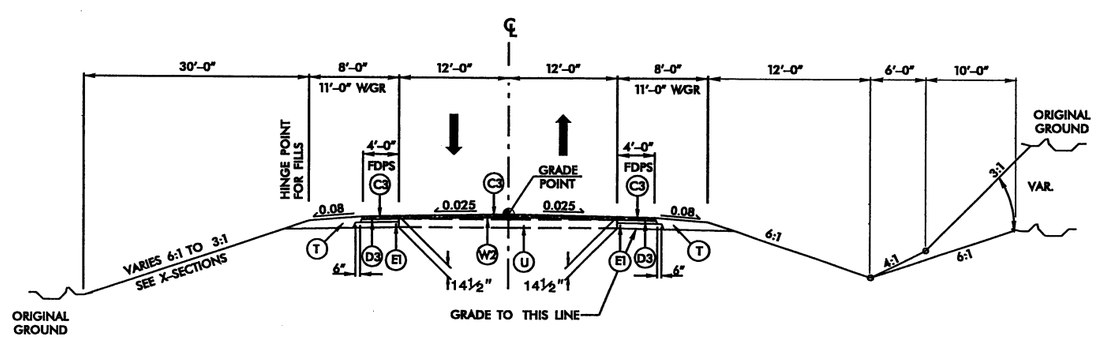
*USE WITHIN RAILROAD RIGHT OF WAY

USE TYPICAL SECTION NO. 4 AS FOLLOWS
* -Y5- STA. 10+00.00 TO STA. 23+50.00
-Y5- STA. 23+50.00 TO STA. 46+00.00



WEDGING DETAIL 1

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 4



TYPICAL SECTION NO. 5

-Y7- MT. MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 5 AS FOLLOWS
-Y7- STA. 15+00.00 TO STA. 18+68.00

TRANSITION FROM TYPICAL SECTION NO. 5 TO TYPICAL SECTION NO. 6 -Y7- STA 18+68.00 TO 23+68.00

PRELIM. PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	VAR. TYPE S9.5B
C5	VAR. TYPE S9.5C
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3½" TYPE I19.0C
D4	VAR. TYPE I19.0B
D5	VAR. TYPE I19.0C
E1	8" TYPE B25.0C
E2	VAR. TYPE B25.0C
J1	8" ABC
J2	10" ABC
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2

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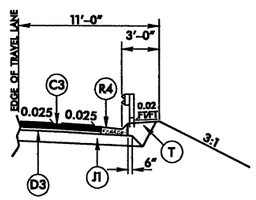
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

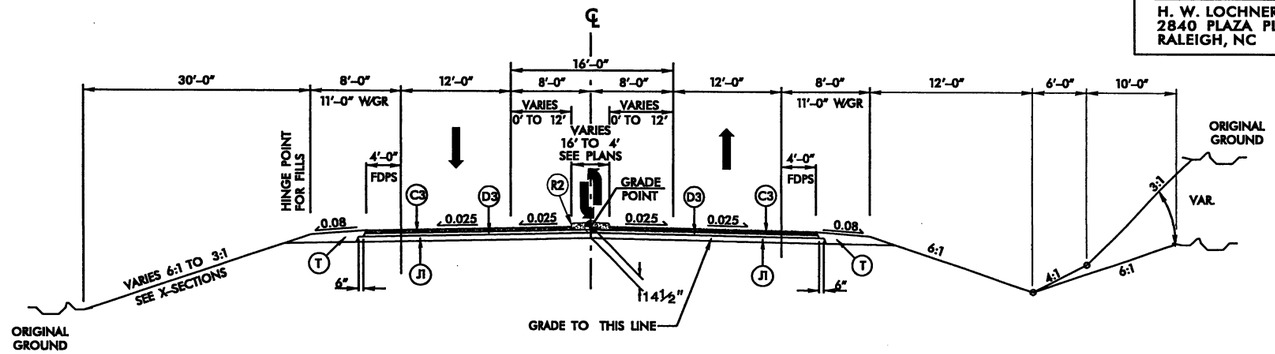
DETAIL OF SHOULDER BERM GUTTER



PARTIAL TYPICAL SECTION NO. 6A

USE PARTIAL TYPICAL 6A IN CONJUNCTION WITH TYPICAL 6 & 7 AT:

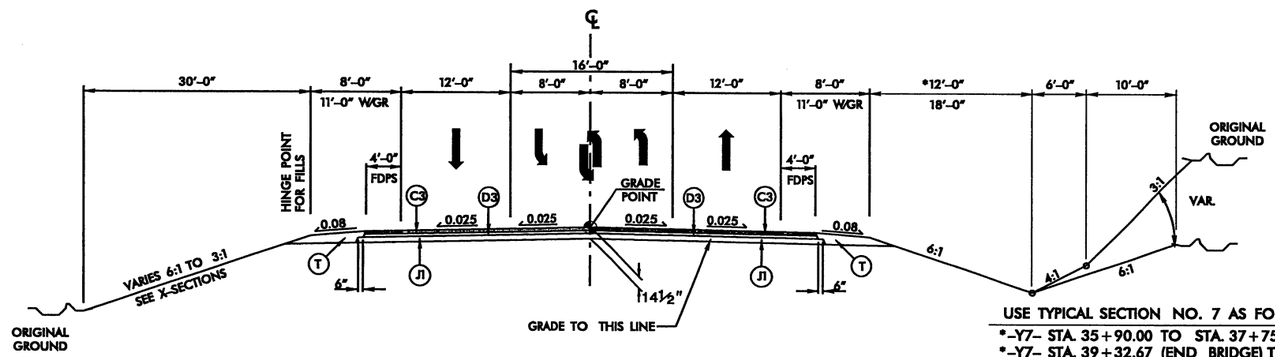
-Y7- STA. 26+75 RT. TO 28+85 RT.
-Y7- STA. 27+00 LT. TO 30+33 LT.
-Y7- STA. 33+07 LT. TO 35+40 LT.
-Y7- STA. 36+23 LT. TO 37+37 LT.
-Y7- STA. 39+78 LT. TO 45+50 LT
-Y7- STA. 43+55 RT. TO 45+50 RT.
-Y7- STA. 51+25 RT. TO 52+92 RT.
-Y8- STA. 50+73 RT. TO 53+00 RT.



TYPICAL SECTION NO. 6

-Y7- MT.MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 6 AS FOLLOWS
-Y7- STA. 23+68.00 TO STA. 30+63.18 (BEGIN BRIDGE)
-Y7- STA. 32+74.72 (END BRIDGE) TO STA. 35+90.00



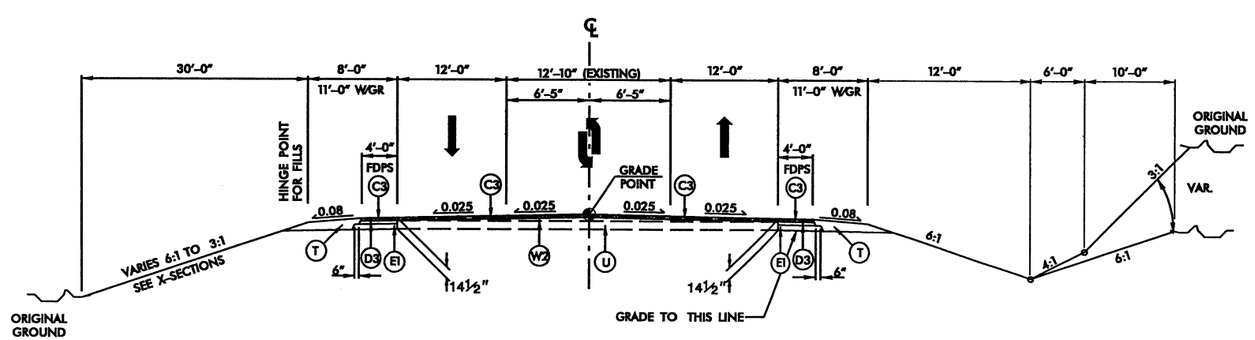
TYPICAL SECTION NO. 7

-Y7- MT.MISERY RD. (SR 1426)
-Y8- CEDAR HILL RD.(SR 1430)

USE TYPICAL SECTION NO. 7 AS FOLLOWS
*-Y7- STA. 35+90.00 TO STA. 37+75.28 (BEGIN BRIDGE)
*-Y7- STA. 39+32.67 (END BRIDGE) TO STA. 50+00.00
-Y8- STA. 43+82.30 TO STA. 47+15.00 (BEGIN BRIDGE)
-Y8- STA. 50+43.00 (END BRIDGE) TO STA. 66+00.00

TRANSITION FROM TYPICAL SECTION NO. 7 TO TYPICAL SECTION NO. 8 -Y7- STA 50+00.00 TO 52+00.00

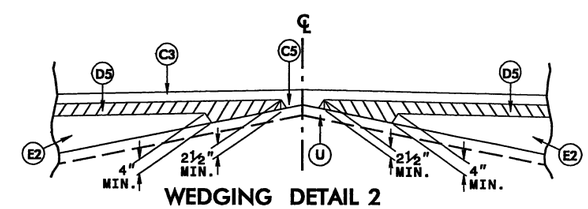
PRELIM. PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	VAR. TYPE S9.5B
C5	VAR. TYPE S9.5C
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3½" TYPE I19.0C
D4	VAR. TYPE I19.0B
D5	VAR. TYPE I19.0C
E1	8" TYPE B25.0C
E2	VAR. TYPE B25.0C
J1	8" ABC
J2	10" ABC
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2



TYPICAL SECTION NO. 8

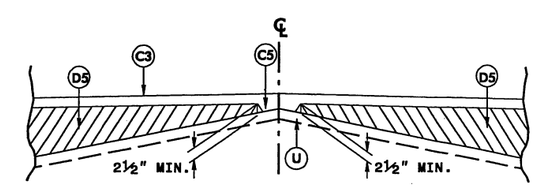
-Y7- MT.MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 8 AS FOLLOWS
-Y7- STA. 52+00.00 TO STA. 55+00.00



WEDGING DETAIL 2

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO.'s 5 & 8



WEDGING DETAIL 3

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO.'s 9 & 10

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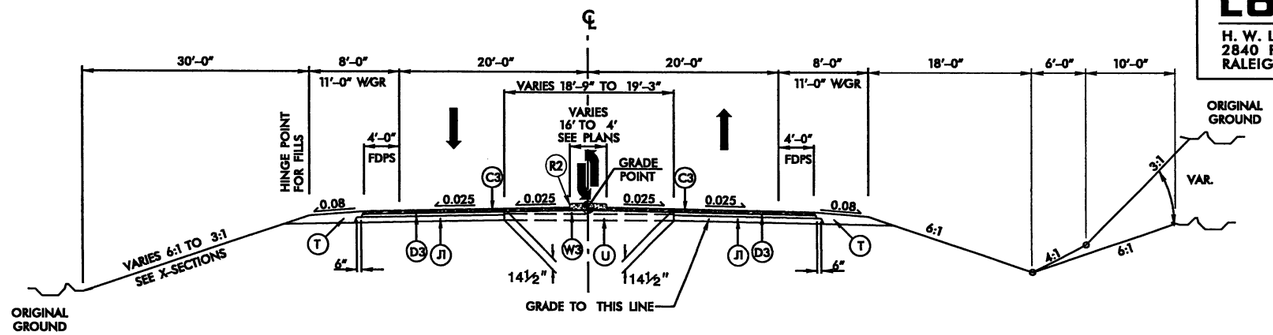
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIM. PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	VAR. TYPE S9.5B
C5	VAR. TYPE S9.5C
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3½" TYPE I19.0C
D4	VAR. TYPE I19.0B
D5	VAR. TYPE I19.0C
E1	8" TYPE B25.0C
E2	VAR. TYPE B25.0C
J1	8" ABC
J2	10" ABC
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2

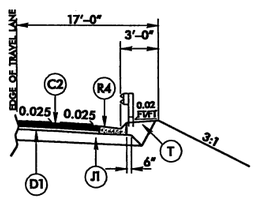


TYPICAL SECTION NO. 9

-Y8- CEDAR HILL RD. (SR 1430)

USE TYPICAL SECTION NO. 9 AS FOLLOWS
-Y8- STA. 18+80.00 TO STA. 43+82.30
TRANSITION FROM EXISTING TO
TYPICAL SECTION NO. 9 -Y8- STA 13+40.00 TO 18+80.00

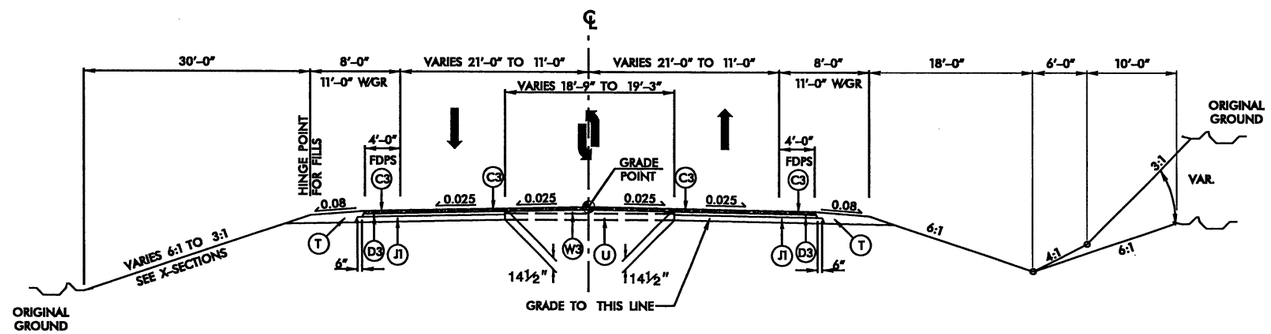
DETAIL OF SHOULDER BERM GUTTER



PARTIAL TYPICAL SECTION NO. 11A

USE PARTIAL TYPICAL 11A IN CONJUNCTION WITH TYPICAL 11 & 12 AT:

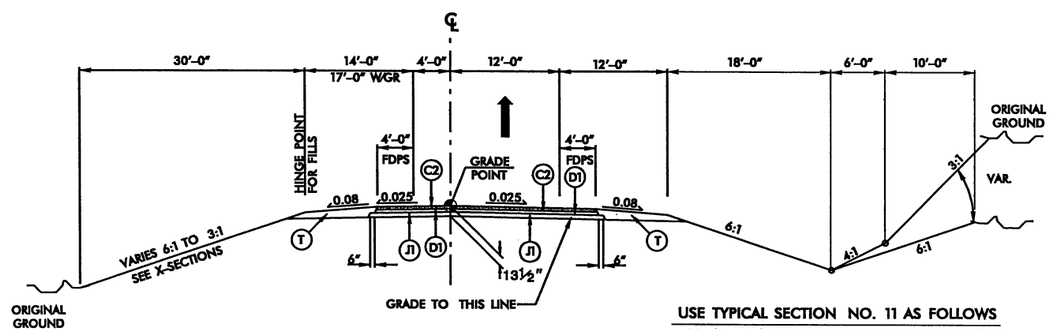
-RP_C2- STA. 18+00 RT. TO 19+50 RT.
-RP_D2- STA. 19+50 LT. TO 23+78.5 LT.
-RP_C3- STA. 13+45 RT. TO 19+50 RT.
-RP_B4- STA. 10+00 LT. TO 20+19 LT.
-RP_B4- STA. 22+89 LT. TO 26+04 LT
-RP_C4- STA. 10+00 RT. TO15+61 RT.
-RP_C4- STA. 17+91 RT. TO 20+13 RT.



TYPICAL SECTION NO. 10

-Y8- CEDAR HILL RD. (SR 1430)

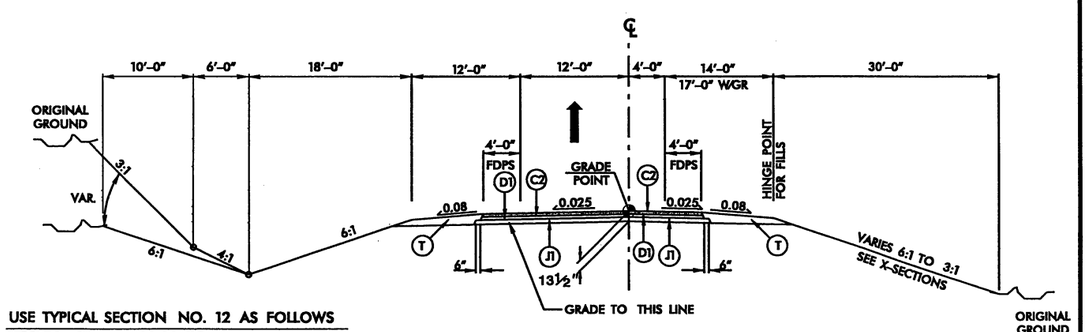
USE TYPICAL SECTION NO. 10 AS FOLLOWS
-Y8- STA. 66+00.00 TO STA. 72+40.00



USE TYPICAL SECTION NO. 11 AS FOLLOWS
-RP_A1- STA. 10+00.00 TO STA. 29+45.81
-RP_C2- STA. 10+00.00 TO STA. 26+35.42
-RP_A3- STA. 10+00.00 TO STA. 31+34.16
-RP_C3- STA. 10+00.00 TO STA. 30+06.10
-RP_C4- STA. 10+00.00 TO STA. 15+92.74 (BEGIN BRIDGE)
-RP_C4- STA. 17+62.77 (END BRIDGE) TO STA. 27+05.63

TYPICAL SECTION NO. 11

-RP_A1-
-RP_C2-
-RP_A3-
-RP_C3-
-RP_C4-



USE TYPICAL SECTION NO. 12 AS FOLLOWS
-RP_D1- STA. 10+00.00 TO STA. 31+70.20
-RP_B2- STA. 10+00.00 TO STA. 29+58.64
-RP_D2- STA. 10+00.00 TO STA. 23+99.13
-RP_D3- STA. 10+00.00 TO STA. 26+39.30
-RP_B4- STA. 10+00.00 TO STA. 20+39.21 (BEGIN BRIDGE)
-RP_B4- STA. 22+62.02 (END BRIDGE) TO STA. 33+41.66

TYPICAL SECTION NO. 12

-RP_D1-
-RP_B2-
RP_D2-
RP_D3-
RP_B4-

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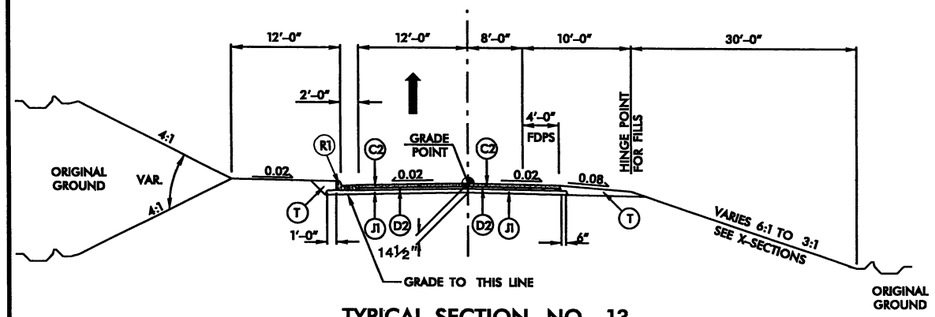
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

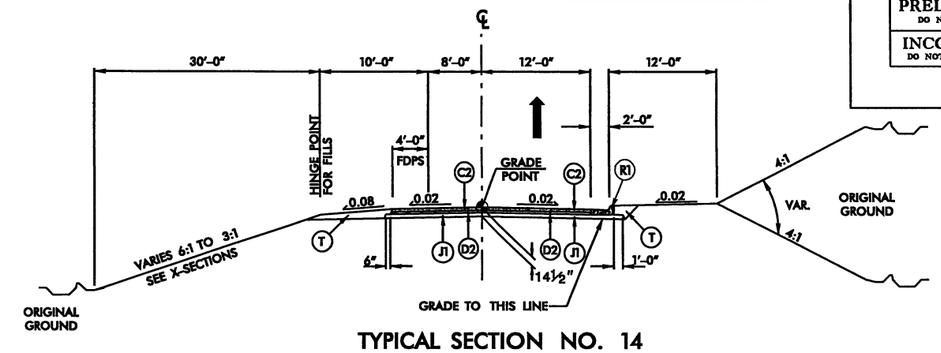
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



TYPICAL SECTION NO. 13

-LP_A1-
-LP_A3-

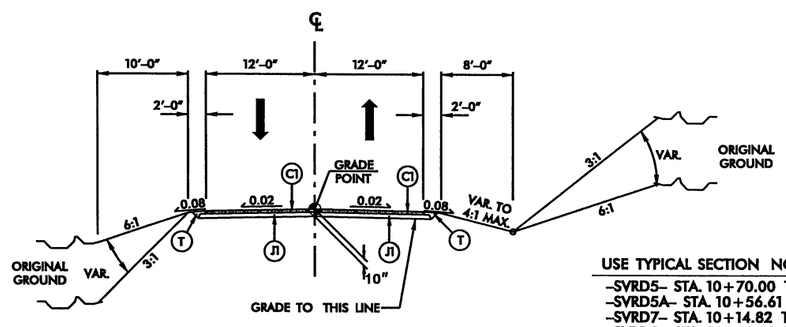
USE TYPICAL SECTION NO. 13 AS FOLLOWS
-LP_A1- STA. 10+00.00 TO STA. 21+96.89
-LP_A3- STA. 10+00.00 TO STA. 23+17.12



TYPICAL SECTION NO. 14

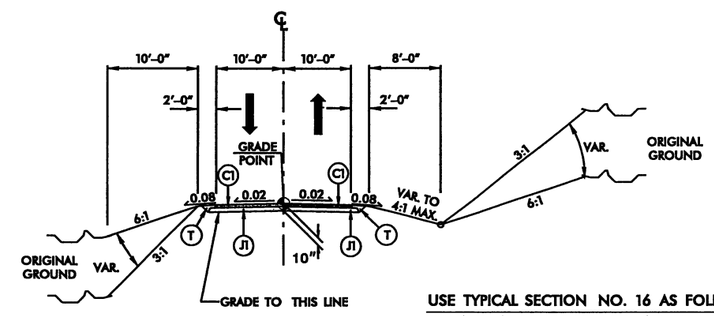
-LP_D1-
-LP_B2-

USE TYPICAL SECTION NO. 14 AS FOLLOWS
-LP_D1- STA. 10+00.00 TO STA. 23+09.45
-LP_B2- STA. 10+00.00 TO STA. 21+13.89



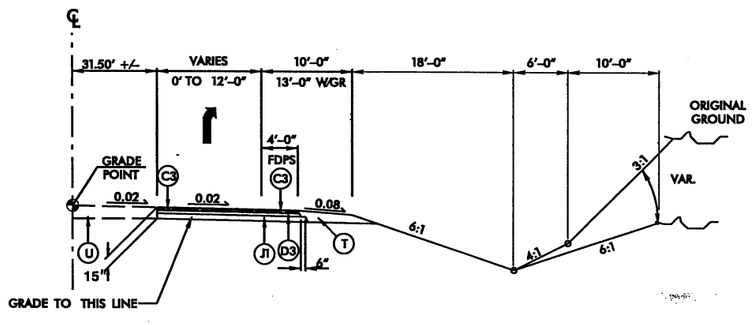
TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15 AS FOLLOWS
-SVRD5- STA. 10+70.00 TO STA. 18+00.00
-SVRD5A- STA. 10+56.61 TO STA. 12+13.48
-SVRD7- STA. 10+14.82 TO STA. 15+40.00
-SVRD8- STA. 31+50.00 TO STA. 39+44.06
-SVRD9- STA. 10+21.74 TO STA. 14+03.10
-SVRD10- STA. 10+21.00 TO STA. 20+67.64
-Y9- STA. 10+21.00 TO STA. 18+50.00



TYPICAL SECTION NO. 16

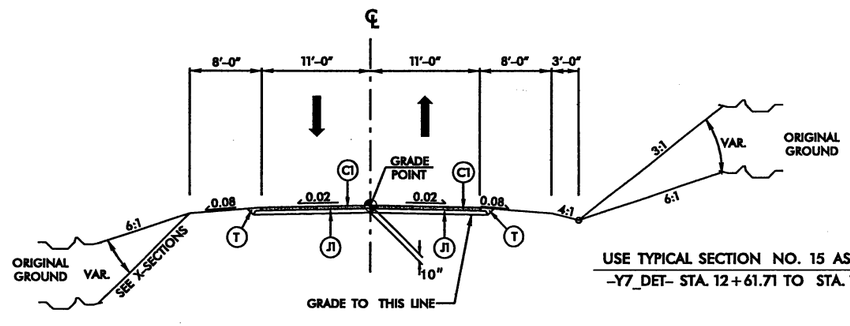
USE TYPICAL SECTION NO. 16 AS FOLLOWS
-Y8A- STA. 10+20.00 TO STA. 21+39.94
-Y8B- STA. 10+10.00 TO STA. 23+64.09



TYPICAL SECTION NO. 17

-Y1-
(FROM R-2633CA)

USE TYPICAL SECTION NO. 17 AS FOLLOWS
-Y1- STA. 37+24.29 TO STA. 40+24.29



TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 15 AS FOLLOWS
-Y7_DET- STA. 12+61.71 TO STA. 18+42.96

PRELIM. PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	VAR. TYPE S9.5B
C5	VAR. TYPE S9.5C
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3½" TYPE I19.0C
D4	VAR. TYPE I19.0B
D5	VAR. TYPE I19.0C
E1	8" TYPE B25.0C
E2	VAR. TYPE B25.0C
J1	8" ABC
J2	10" ABC
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	CONCRETE MEDIAN BARRIER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2

9/28/2000
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X-SECTION LAYOUT & SHEAR POINT DIAGRAM @ -Y5- INTERCHANGE

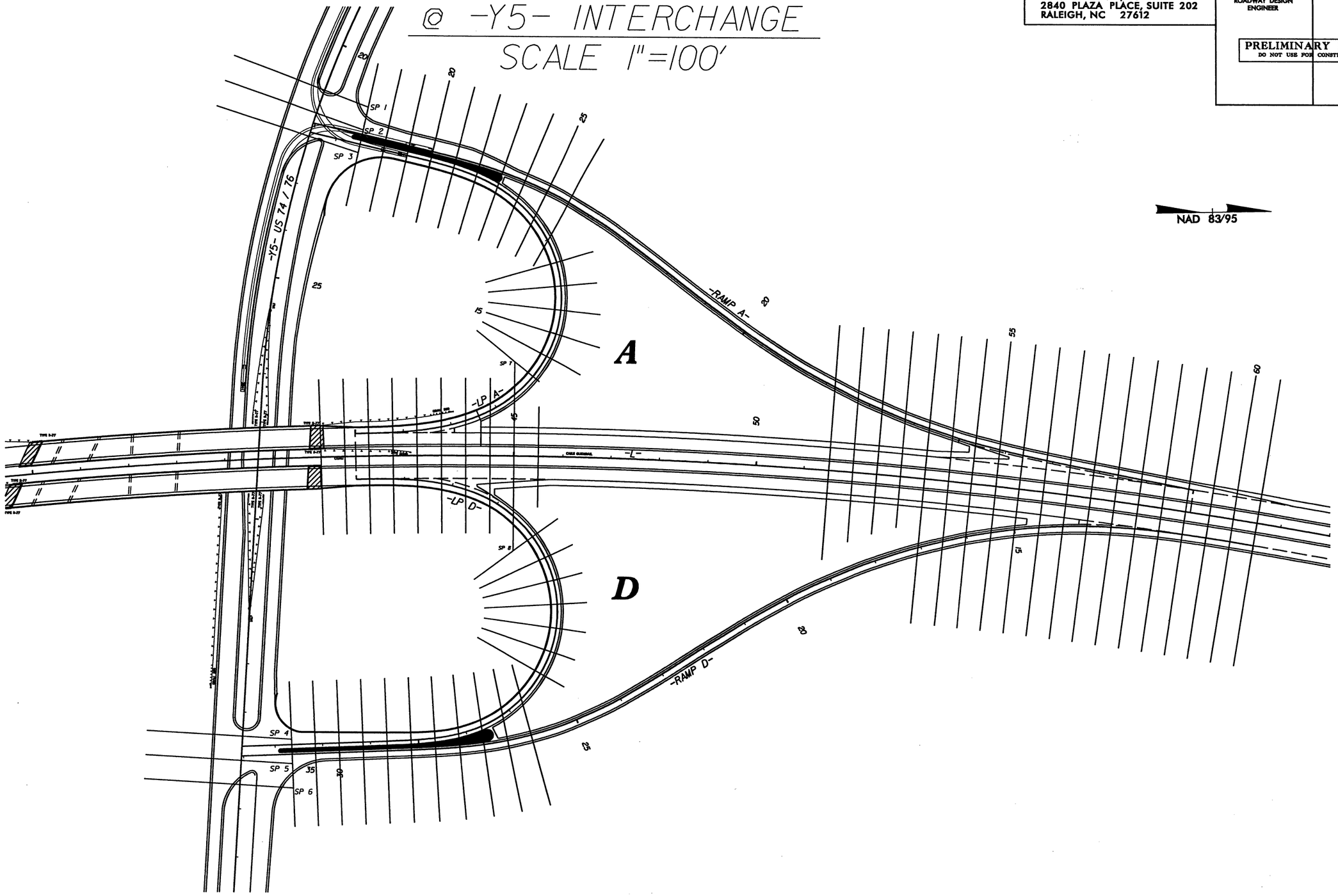
SCALE 1"=100'

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-E
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



8/17/99

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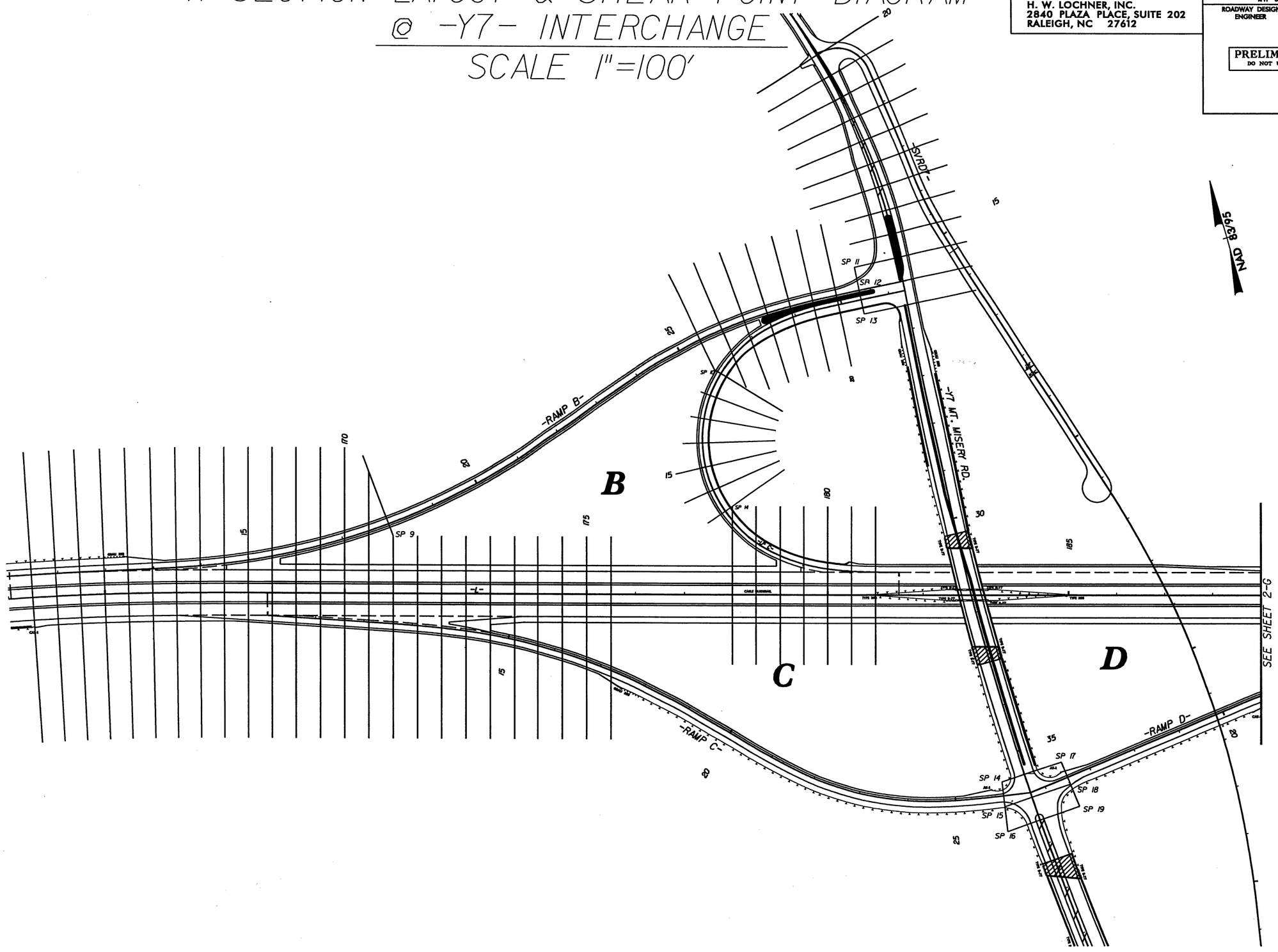
X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y7- INTERCHANGE
SCALE 1"=100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-F
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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9/29/2000
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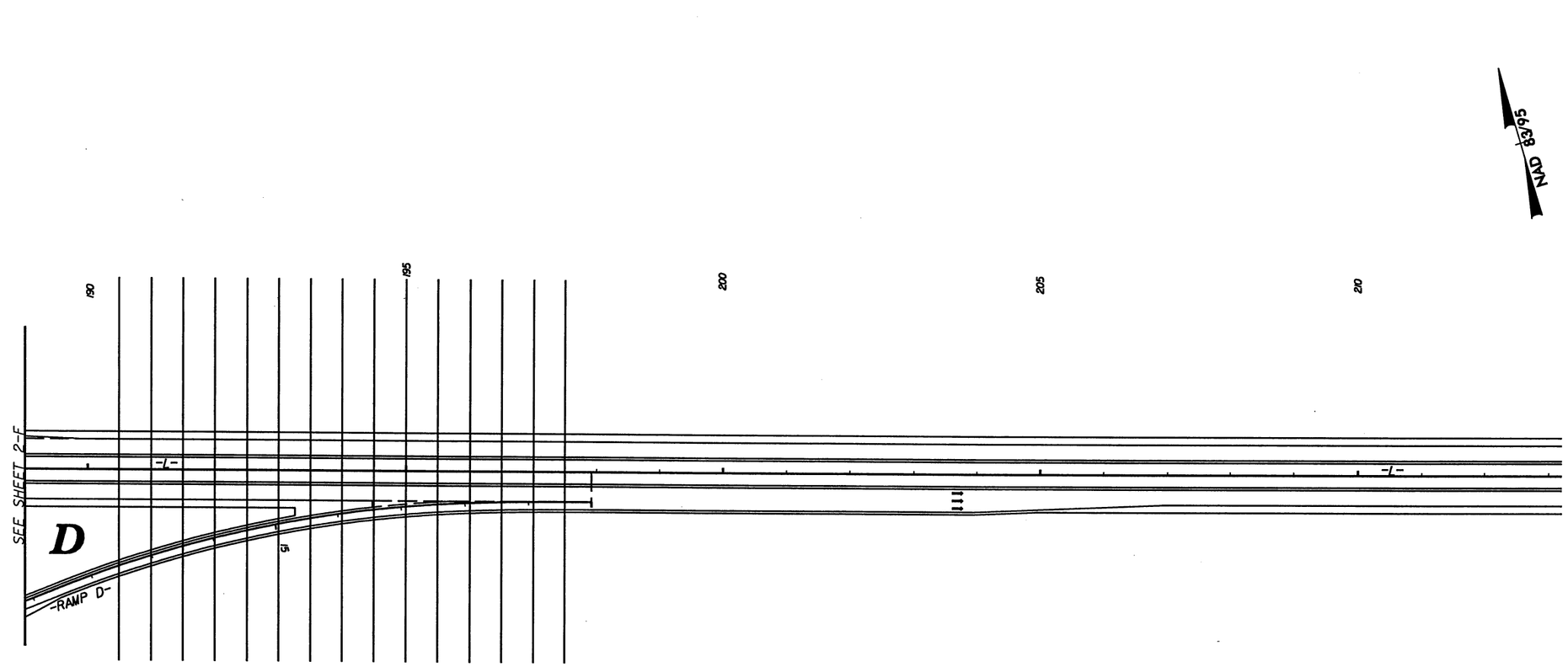
X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y7- INTERCHANGE
SCALE 1"=100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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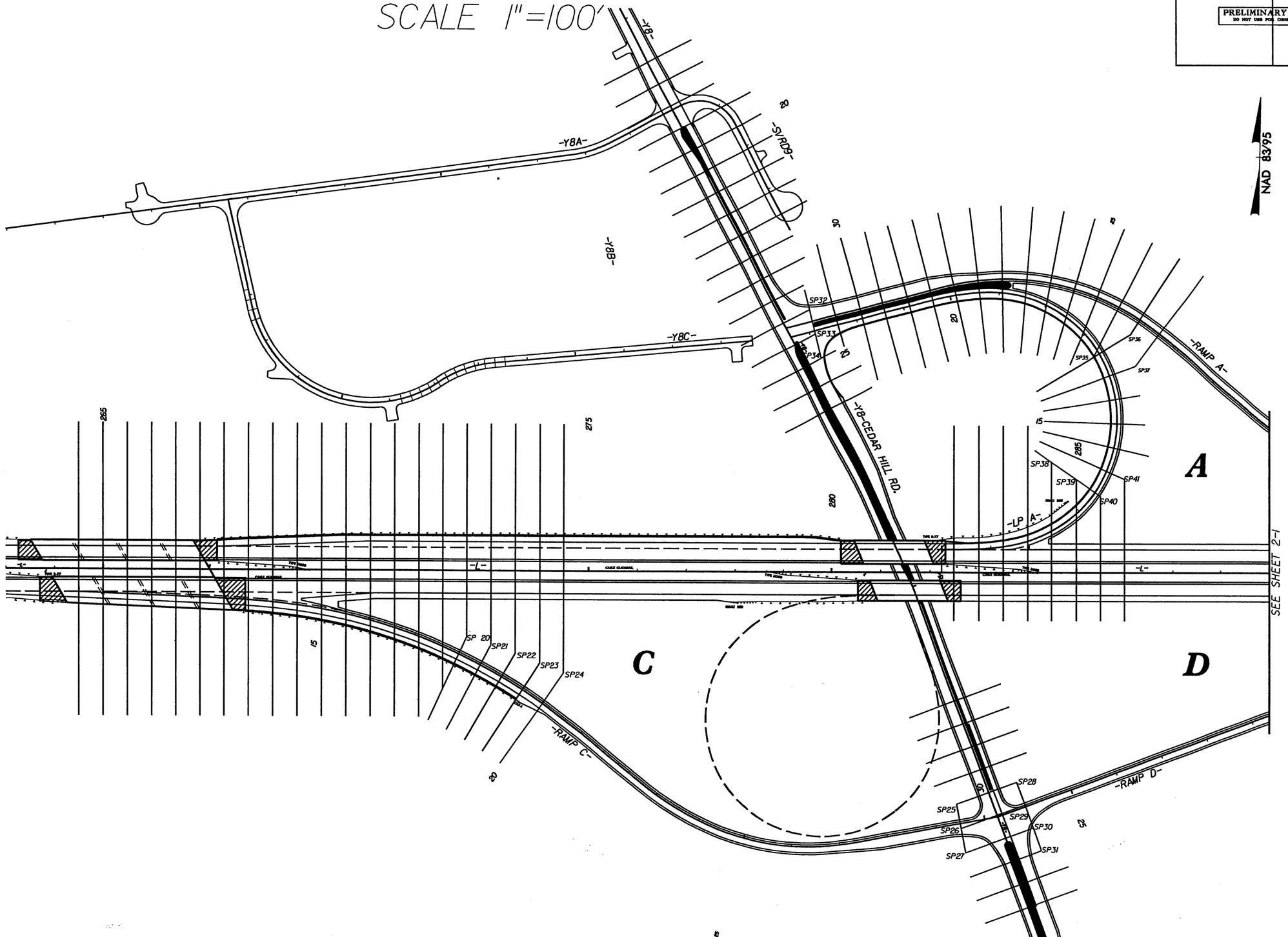
X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y8- INTERCHANGE
SCALE 1"=100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-H
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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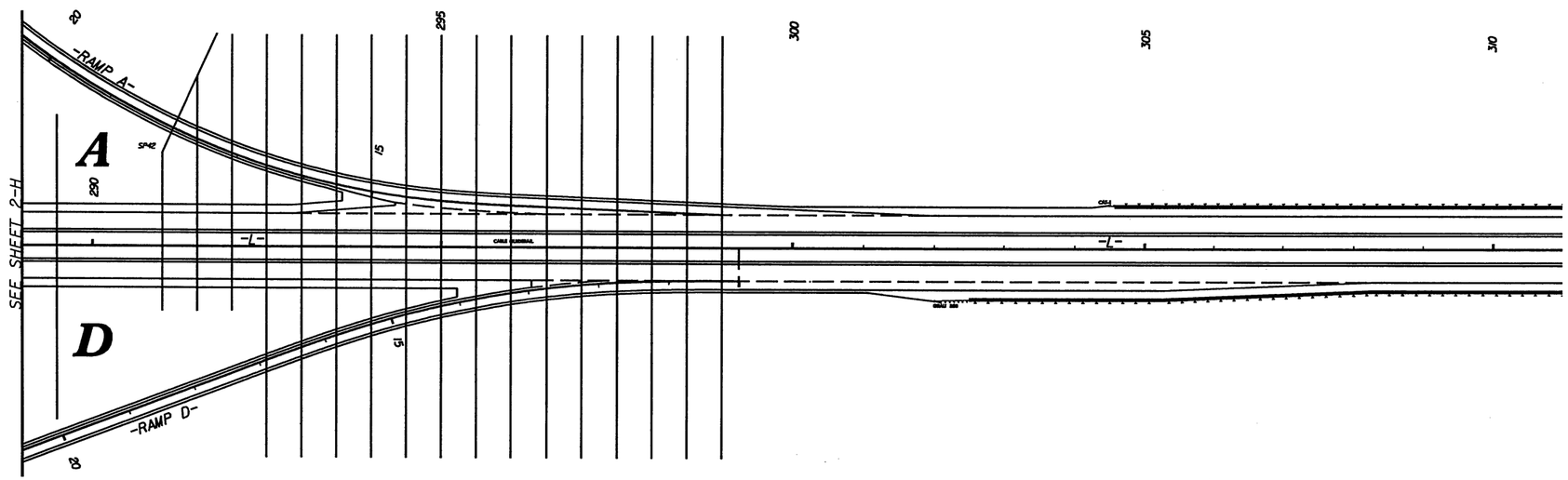
X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y8- INTERCHANGE
SCALE 1"=100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95



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9/28/2010
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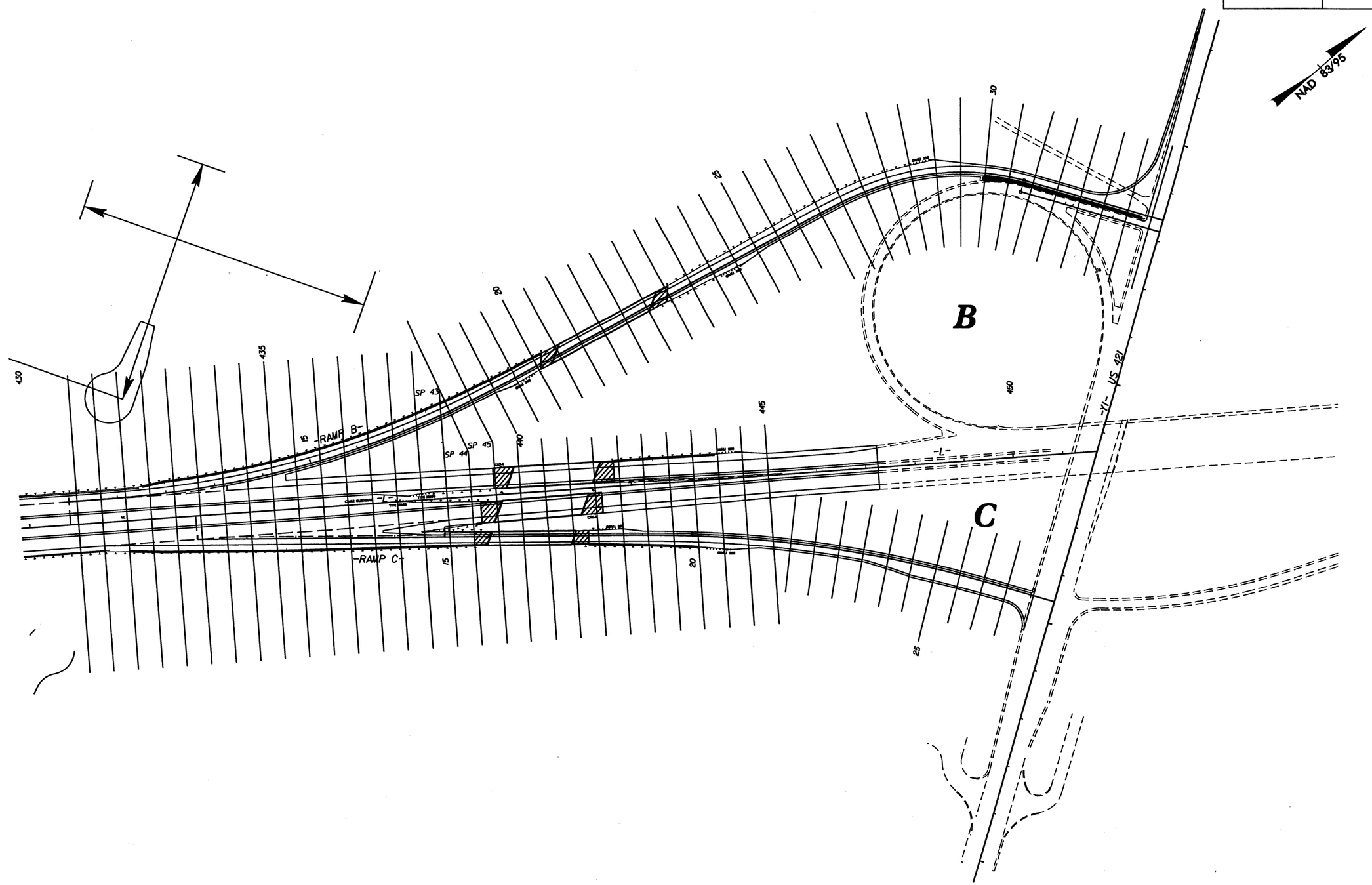
X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y1- INTERCHANGE
SCALE 1"=100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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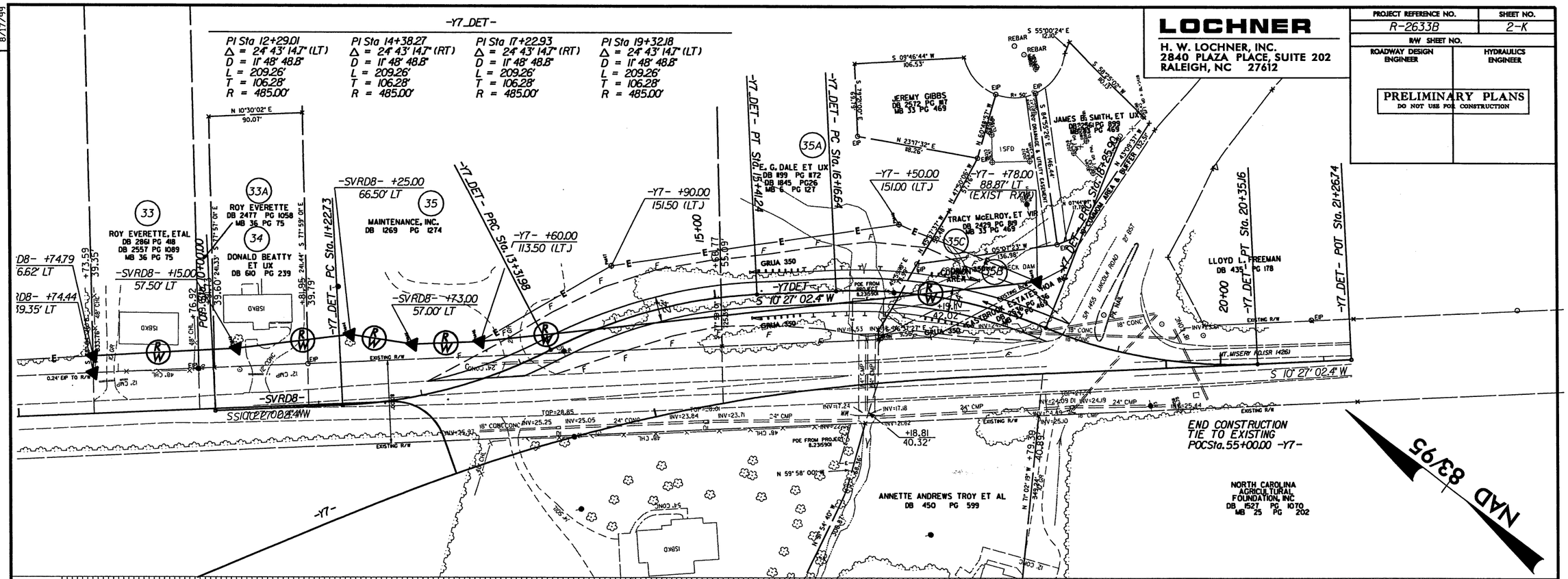
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	2-K
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

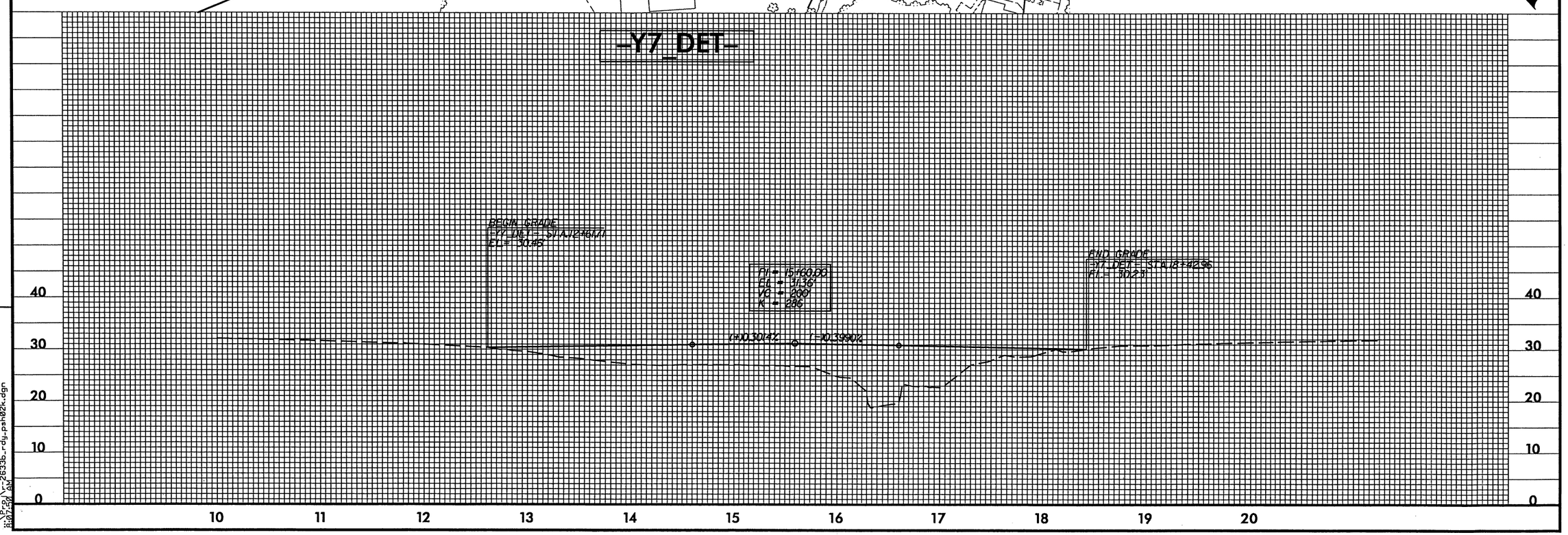
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS





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COMPUTED BY: J. HEXT DATE: 02-16-08
CHECKED BY: B. EASON DATE: 02-17-08

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	3-A

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY 1					
-L- US 17 24+00 TO 34+87.28 (BEGIN BRIDGE)	-	-	268,716	268,716	-
-L- US 17 40+75.00 (END BRIDGE) TO 54+00	-	-	199,284	199,284	-
-Y5- US 74 / 76 10+50 TO 45+00	14,232	-	2,854	-	11,378
-RP_A1- 18+50 TO 29+45.81	14	-	29,681	29,667	-
-LP_A1- 14+00 TO 16+50	-	-	11,086	11,086	-
-RP_D1- 17+50 TO 31+46.09	18	-	17,278	17,260	-
-LP_D1- 14+00 TO 17+00	-	-	7,155	7,155	-
-SVRD5A- 10+56.61 TO 12+13.48	278	-	64	-	214
TOTAL SUMMARY	14,542	-	536,118	533,168	11,592
SUMMARY 2					
-L- US 17 54+00 TO 84+00	-	-	190,926	190,926	-
SUMMARY 3					
-L- US 17 84+00 TO 114+00	-	-	177,677	177,677	-
SUMMARY 4					
-L- US 17 114+00 TO 144+44.13 (BEGIN BRIDGE)	-	-	273,415	273,415	-
SUMMARY 5					
-L- US 17 150+21.72 (END BRIDGE) TO 198+00	1,211	-	473,696	473,422	-
-Y7- SR 1462 15+00 TO 30+63.18 (BEGIN BRIDGE)	970	-	62,392	61,500	-
-Y7- SR 1462 32+74.72 (END BRIDGE) TO 37+81.34 (BEG. BRIDGE)	-	-	110,009	110,009	-
-Y7- SR 1462 39+28.74 (END BRIDGE) TO 55+00	471	-	123,447	123,240	-
-RP_B2- 18+00 TO 29+58.64	1,313	-	7,572	4,489	-
-LP_B2- 14+00 TO 17+00	-	-	2,398	2,398	-
-RP_C2- 17+50 TO 26+35.42	116	-	138,221	138,221	-
-RP_D2- 18+00 TO 23+99.13	-	-	48,738	48,738	-
SUMMARY TOTAL	4,081	-	1,001,844	997,803	-
SUMMARY 6					
-L- US 17 198+00 TO 228+00	-	-	180,299	180,299	-
SUMMARY 7					
-L- US 17 228+00 TO 258+00	-	-	196,930	196,930	-

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY 8					
-L- US 17 258+00 TO 263+89.28 (BEGIN BRIDGE)	-	-	60,102	60,102	-
-L- US 17 267+12.50 (END BRIDGE) TO 280+69.69 (BEG. BRIDGE)	-	-	285,008	285,008	-
-L- US 17 282+14.61 (END BRIDGE) TO 299+00	595	-	222,807	222,212	-
-Y8- SR 1430 13+50 TO 47+20 (BEGIN BRIDGE)	8,870	-	7,132	-	1,738
-Y8- SR 1430 50+40.00 (END BRIDGE) TO 72+00	7,455	-	8,719	1,264	-
-Y8A- 10+20.00 TO 21+39.94	634	-	125	-	509
-Y8B- 10+10.00 TO 23+64.09	725	-	739	14	-
-Y9- 10+21.00 TO 16+50	1,616	-	399	-	1,217
-SVRD8- 10+21.00 TO 20+67.64	261	-	1,727	1,466	-
-RP_A3- 18+00 TO 31+34.16	574	-	26,056	25,482	-
-LP_A3- 13+50 TO 16+50	-	-	16,517	16,517	-
-RP_C3- 18+00 TO 30+06.10	3,779	-	21,235	17,456	-
-RP_D3- 17+50 TO 26+39.30	178	-	13,279	13,101	-
-SVRD10- 10+50.00 TO 20+50	1,426	-	233	-	1,193
TOTAL SUMMARY	26,113	-	664,078	642,622	4,657
SUMMARY 9					
-L- US 17 299+00 TO 317+41.31 (BEGIN BRIDGE)	-	-	403,958	403,958	-
SUMMARY 10					
-L- US 17 389+24.55 (END BDG) TO 397+91.42 (BEG. BDG)	-	-	211,950	211,950	-
-L- US 17 399+90.59 (END BRIDGE) TO 419+50	-	-	515,262	515,262	-
TOTAL SUMMARY	-	-	727,212	727,212	-
SUMMARY 11					
-L- US 17 419+50 TO 424+02.32 (BEGIN BRIDGE)	-	-	111,257	111,257	-
-L- US 17 426+37.21 (END BDG) TO 430+26.77 (BEG. BDG)	-	-	121,846	121,846	-
-L- US 17 431+80.18 (END BDG) TO 439+82.52 BEG. BDG)	-	-	379,967	379,967	-
-L- US 17 441+25.90 (END BRIDGE) TO 445+28.39	-	-	111,113	111,113	-
-Y1- (R-2633CA) US 421 37+50 TO 41+00	160	-	491	331	-
-RP_B4- 18+00 TO 20+54.95 (BEGIN BRIDGE)	-	-	64,681	64,681	-
-RP_B4- 22+40.27 (END BRIDGE) TO 33+41.66	914	-	76,001	75,087	-
-RP_C4- 22+00 TO 27+05.63	240	-	2,873	2,633	-
TOTAL SUMMARY	1,314	-	868,249	866,935	-
SUBTOTAL (SUMMARIES 1 - 11)	46,050	-	5,220,706	5,192,259	16,249
EST. LOSS DUE TO CLEAR. & GRUBBING				815	-815
WASTE IN LIEU OF BORROW				-15,434	-15,434
PROJECT TOTAL	46,050			5,177,640	0
SAY:	46,500			5,200,000	

6/4/99

9/29/2010
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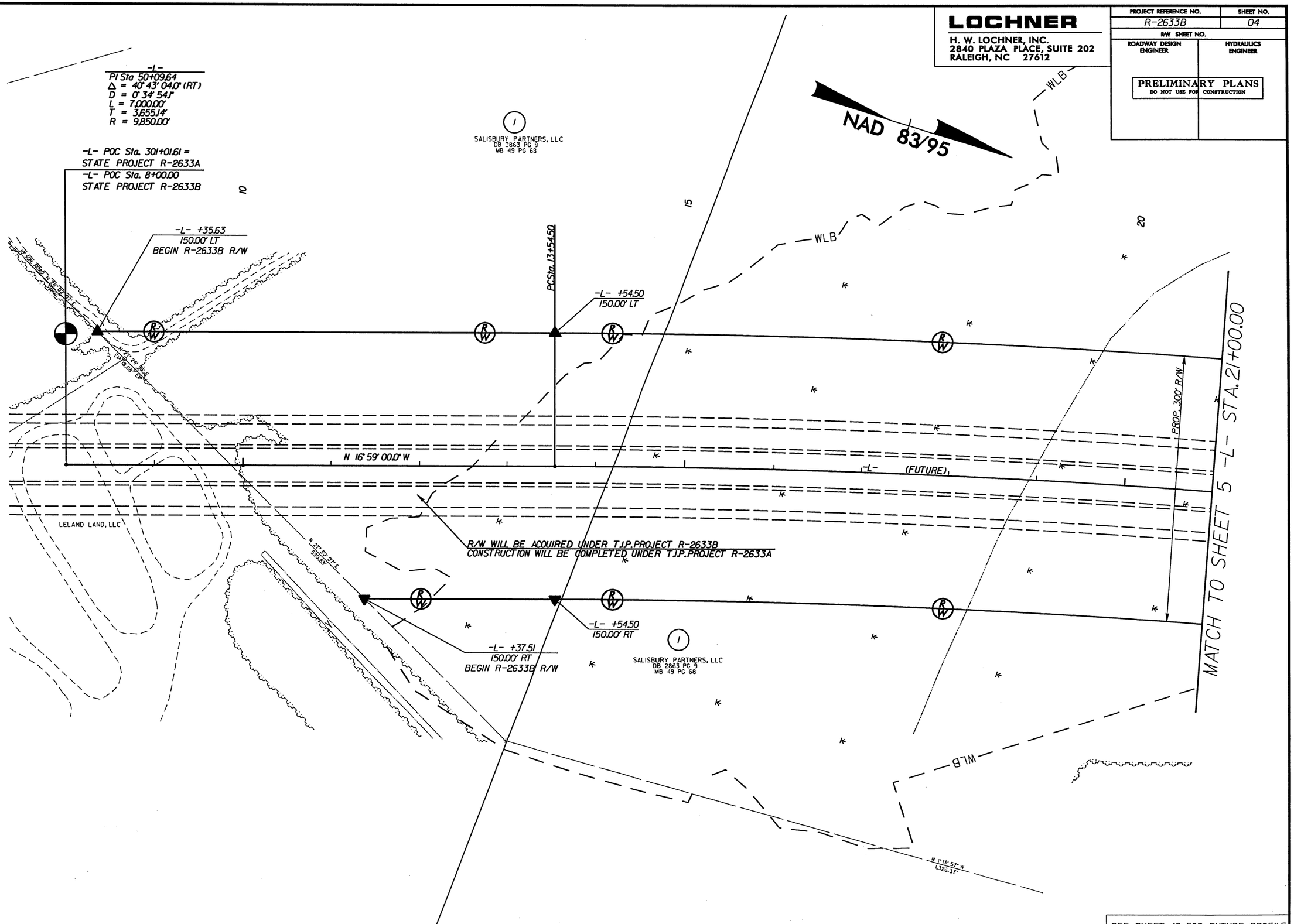
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 42 FOR FUTURE PROFILE

REVISIONS

R/W REVISION 10/ /09 - NAME AND DEED CHANGE ON PARCEL 1, ADDED PARCEL 1A CSX

8/17/99

9/29/2010
R:\Roadway\R-2633B_Rdy_psh04.dgn
8:25:30 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

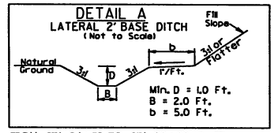
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

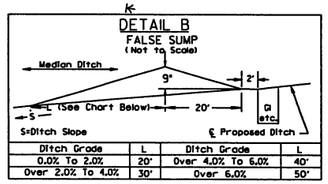
-L-
PI Sta 50+09.64
Δ = 40° 43' 04.0" (RT)
D = 0° 34' 54.1"
L = 7,000.00'
T = 3,865.14'
R = 9,850.00'
e = 2.5%

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



FROM STA. 24+50 TO STA. 29+00 -L- RT.

DETAIL B
FALSE SUMP
(Not to Scale)



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'

STA. 29+00 +/-

-L- POC STA. 24+00.00 =
BEGIN STATE PROJECT R-2633B
-L- POC STA. 316+10.60
END STATE PROJECT R-2633A
BEGIN CONSTRUCTION

NAD 83/95

25

30

-L- +00.00
150.00' LT
BEG. C/A FENCE R-2633B
END C/A FENCE R-2633A

-L- +75.00
180.00' LT

-L- +00.00
180.00' LT

-L- +75.00
150.00' LT

-L- +60.00
213.00' LT

-L- +60.00
183.00' LT

SALISBURY PARTNERS, LLC
DB 2863 PG 9
MB 49 PG 68

-L- +50.00
233.00' LT

-L- +50.00
203.00' LT

CLASS B RIP RAP
EST. 8 TON
EST. 21 SY FF

MONITORING WELL

30'

300' TAPER

100' TRANSITION
10' P/S TO 14' P/S

18"

2Gl

14'

+42.50

30' CLASS V

PROPOSED GUARDRAIL

36'

24'

46'

4'

025

-L-

FS CABLE GUIDERAIL

2Gl

CGAU

TYPE M350

PROPOSED GUARDRAIL

PROPOSED GUARDRAIL

18" CSP w/ELBOWS
w/ROD & LUG
CONNECTORS

+22.23

11.67'

300' TAPER

MATCH TO SHEET 4 -L- STA. 21+00.00

PROP. 300' R/W

WLB

-L- (FUTURE)

FUTURE CONSTRUCTION
R-2633A

100' TRANSITION
10' P/S TO 14' P/S

-L- +35.00
150.00' RT

-L- +00.00
150.00' RT
BEG. C/A FENCE R-2633B
END C/A FENCE R-2633A

2' LATERAL BASE DITCH
SEE DETAIL A

CLASS B RIP RAP
EST. 3 TON
EST. 10 SY FF

-L- +81.48
197.46' RT

30" RCP
CLASS IV

MATCH TO SHEET 6 -L- STA. 34+00.00

MONITORING WELL

MONITORING WELL

SALISBURY PARTNERS, LLC
DB 2863 PG 9
MB 49 PG 68

CSX
1A

MONITORING WELL

SEE SHEET 42 FOR -L- PROFILE

REVISIONS

R/W REVISION 10/ /09 - UPDATED PARCEL NAME ON PARCEL 1. ADDED PARCEL 1A CSX.

8/17/99

9/29/2009
8:12:05 AM
R-2633B_Rdy_psh05.dgn

REVISIONS

NEW Revision September 17, 2008; Extended focus and viz movement of -RP_A- Sta. 10+04.54 from 100' RT to 100.00' RT.

LOCHNER

H. W. LOCHNER, INC.
3840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	06

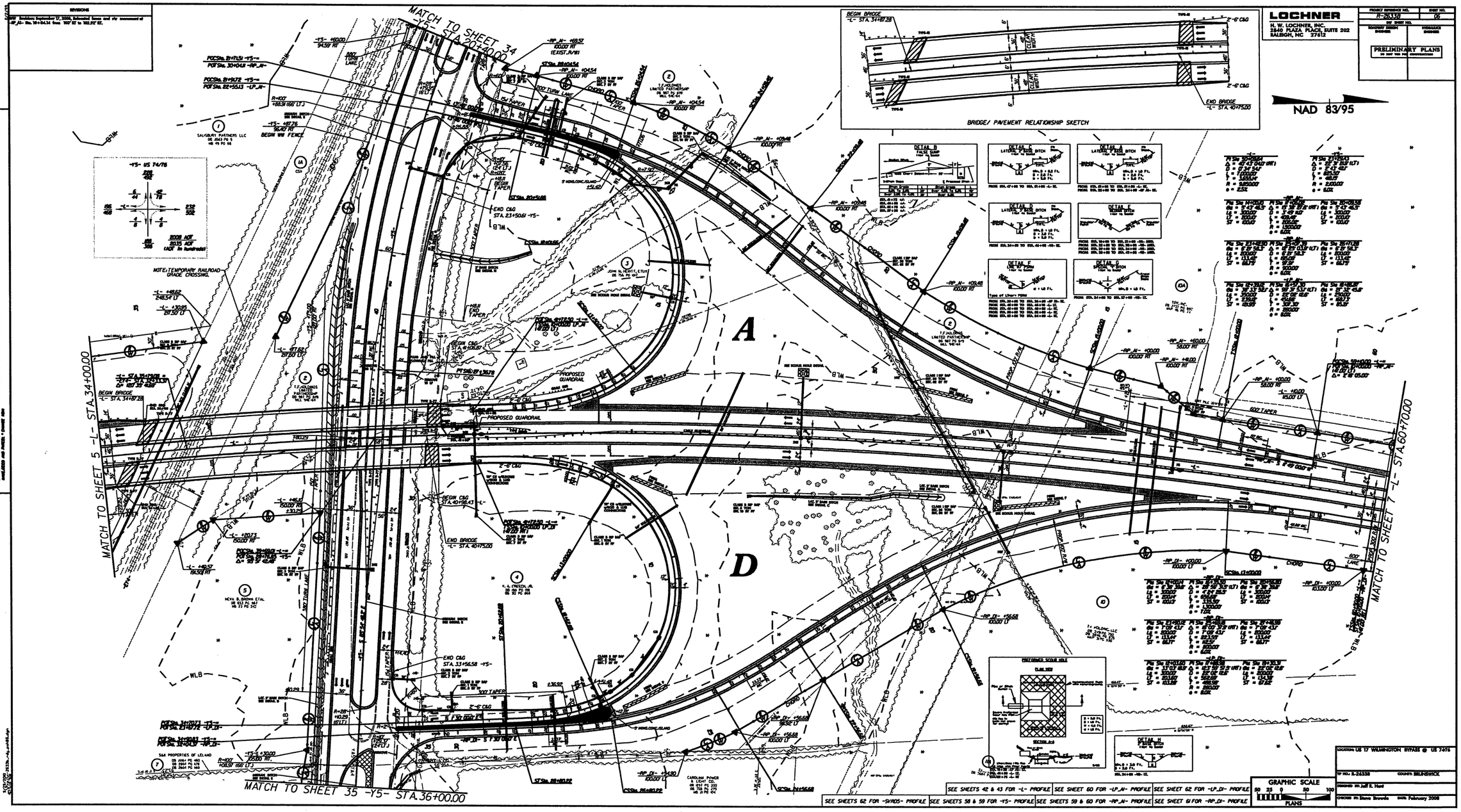
R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS

DO NOT USE FOR CONSTRUCTION

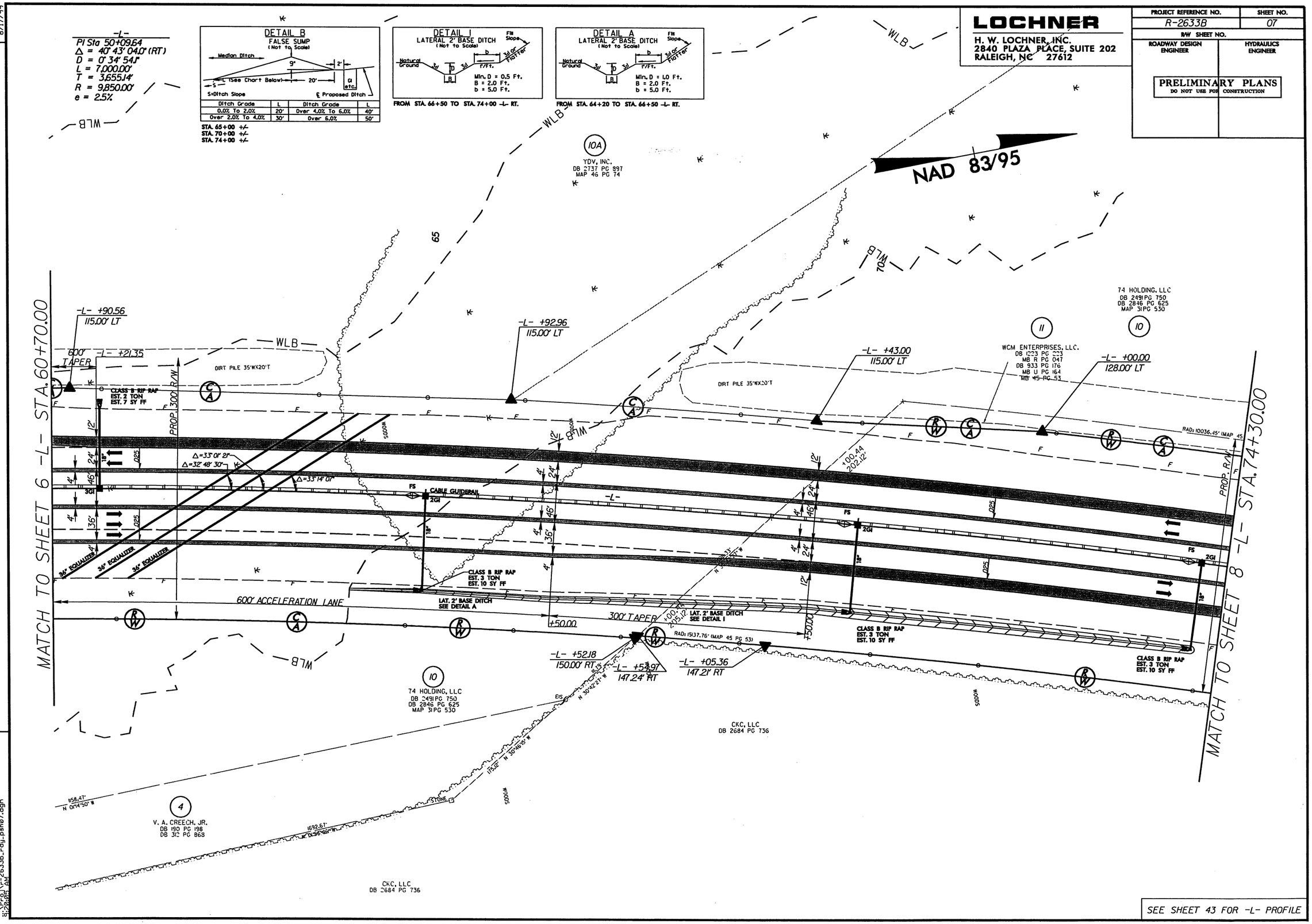


LOCATION: US 17 WILMINGTON BYPASS @ US 74/76

TIP NO. R-2633B — COUNTY: BRUNSWICK

DESIGNED: Mr. Jeff E. Hunt

CHECKED: Mr. Steve Brooks — DATE: February 2008



REVISIONS

R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10. PROPERTY OWNER NAME CHANGE FROM WCM ENTERPRISES, LLC TO CKC, LLC

8/17/99

9/29/2010
R:\Roadway\Proj\2633b_rdy_psh07.dgn
11:20:05 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

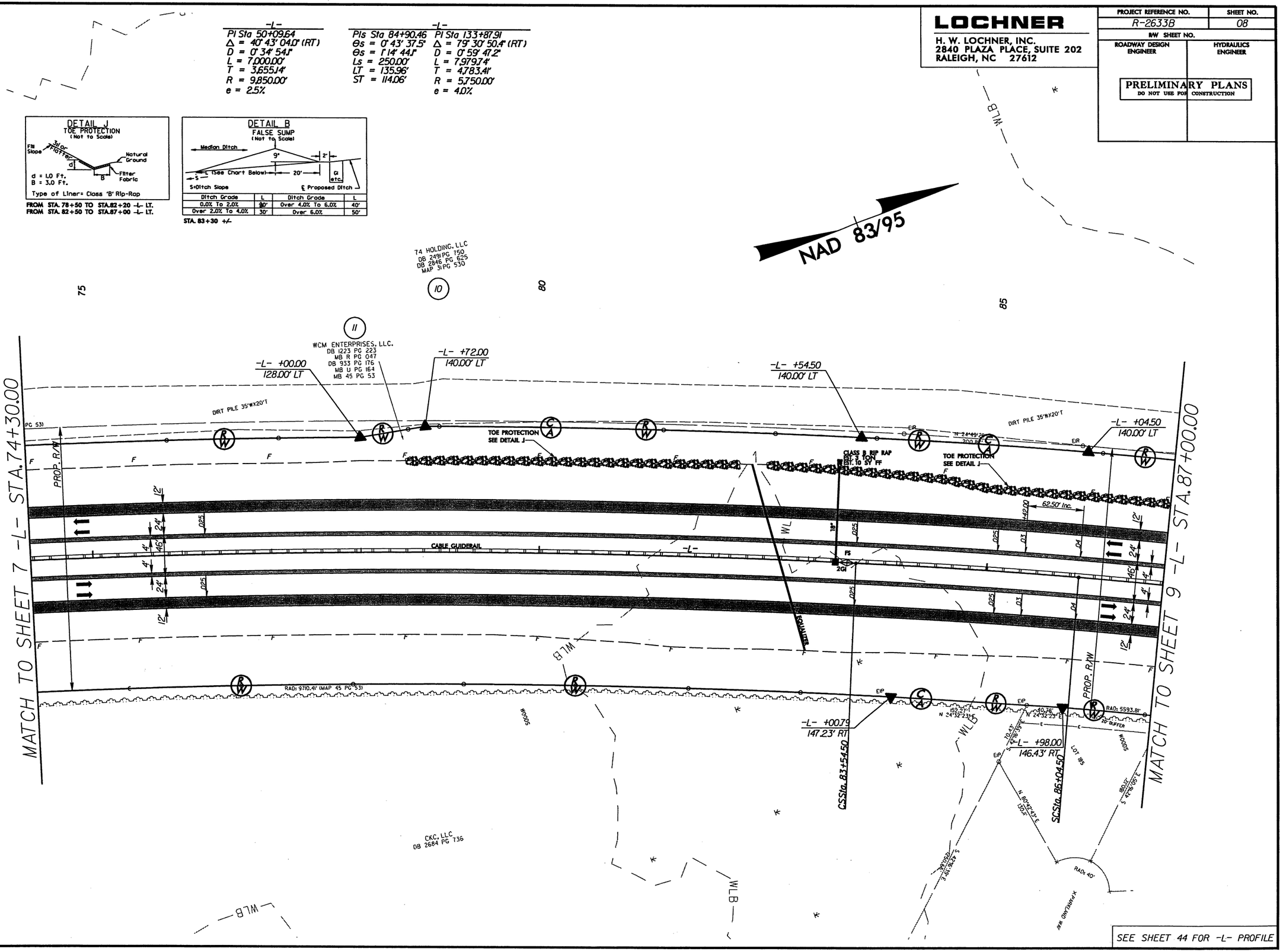
-L-
PI Sta 50+09.64
Δ = 40° 43' 04.0" (RT)
D = 0° 34' 54.1"
L = 7,000.00'
T = 3,655.14'
R = 9,850.00'
e = 2.5%

-L-
PIs Sta 84+90.46 PI Sta 133+87.91
θs = 0° 43' 37.5' Δ = 79° 30' 50.4" (RT)
θs = 1° 14' 44.1" D = 0° 59' 41.2"
Ls = 250.00' L = 7,979.74'
LT = 135.96' T = 4,783.41'
ST = 114.06' R = 5,750.00'
e = 4.0%

FROM STA. 78+50 TO STA.82+20 -L- LT.
FROM STA. 82+50 TO STA.87+00 -L- LT.

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'

STA. 83+30 +/-



REVISIONS
R/W REVISION:10/ /09 - NAME AND DEED CHANGE PARCEL 10.

8/17/99

9/28/2010
8:21:03 AM 2633b_rdy_psh08.dgn

8/17/99

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	09
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

PREFORMED SCOUR HOLE

PLAN VIEW

Pipe or Ditch Outlet
Permanent Soil Reinforcement matting (typical)
Install level and flush with natural ground.
Square Preformed Scour Hole (PSH)
(Rip Rap in basin not shown for clarity)
Seed with native grasses (or perennials)
B = 5.0 Ft.
D = 1.0 Ft.
W = 4.0 Ft.
d = 0.5 Ft.

SECTION A-A

Pipe or Ditch outlet
PSRM
D'min
d
Natural Ground
B
1' tuck
Liner: Class 'I' Rip Rap
15 thick with Filter Fabric
5/05

STA. 89+00 -L- RT.
STA. 94+70 -L- RT.

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)
Natural Ground
3:1
D
3:1
B
b
3:1 or Flatter
FM Slope
f/Ft.
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

FROM STA. 88+00 TO STA. 98+00 -L- LT.

DETAIL K
LATERAL 10' BASE DITCH
(Not to Scale)
Natural Ground
3:1
D
3:1
B
b
3:1 or Flatter
FM Slope
f/Ft.
Min. D = 1.0 Ft.
B = 10.0 Ft.
b = 5.0 Ft.

FROM STA. 98+00 TO STA. 99+50 -L- LT.

NAD 83/95

90

95

TA HOLDING, LLC
DB 2491 PG 750
DB 2846 PG 625
MAP 31 PG 530

10

-L- +10.00
146.97' LT

11

WCM ENTERPRISES, LLC.
DB 1223 PG 223
DB 933 PG 176
MB U PG 164
MB 45 PG 53
MB R PG 047

-L- +00.00
140.00' LT

DIRT PILE 35'WX20'T

RAD: 5883.92' (MAP 45 PG 53)

LAT. 2' BASE DITCH
SEE DETAIL A

-L- +92.74
147.73' LT

11B

MEBANE W. CARTER III
DB 403 PG 416
MAP 45 PG 53

LAT. 10' BASE DITCH
SEE DETAIL K

MATCH TO SHEET 8 -L- STA. 87+00.00

MATCH TO SHEET 10 -L- STA. 100+00.00

PROP. R/W

CABLE GUIDERAIL

2GI

-L- 2GI

FS

18"

SEE SCOUR HOLE DETAIL

SEE SCOUR HOLE DETAIL

12'
24'
4'
46'
04

RAD: 5593.81'
20' BUFFER
RAD: 5593.81'
20' BUFFER
RAD: 5593.81'
20' BUFFER
20' BUFFER

WOODS

LOT 196
LOT 202
LOT 203
LOT 204
LOT 205
LOT 206
LOT 225
LOT 226
LOT 227
LOT 228

S 18°45'45" W
126.26'
S 42°29'29" E
S 47°47'31" W
122.31'
RAD: 25'
RAD: 40'
S 47°47'31" W
108.80'
RAD: 40'
S 42°12'02" E
164.97'
S 63°20'39" E
182.00'
S 01°22'40" E
209.15'
S 01°24'07" E
214.18'
S 42°12'02" E
27.89'

SPRING PINE COURT

PINE HARBOR WAY

DXC, LLC
DB 2084 PG 736

BASINE WOODS

LB

SEE SHEET 44 FOR -L- PROFILE

REVISIONS

R/W REVISION: 10/ /09 - NAME AND DEED CHANGE PARCEL 10.

9/29/2010
10:25:01 \\r-2633b_rdy_psh09.dgn
10/22/2010 AM

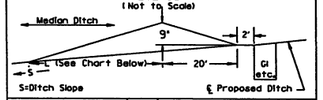
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

DETAIL B
FALSE SUMP
(Not To Scale)



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'

STA. 100+55+/-
STA. 106+28+/-
STA. 112+00+/-

NAD 83/95

MATCH TO SHEET 9 -L- STA. 100+00.00

MATCH TO SHEET 11 -L- STA. 112+00.00

10
74 HOLDING, LLC
DB 2491 PG 750
DB 2846 PG 625
MAP 31 PG 530

12' X 6' RCBC
WILDLIFE CROSSING

-L- +33.53
133.27' LT.

-L- +25.98
132.75' LT.

RAD: 9210.63' (MAP 45 PG 53)

-L- +68.45
97.28' LT.
END C/A FENCE
~~(TIE TO WINGWALL)~~
BEG. WILDLIFE X-ING
-L- STA. 105+74.00

-L- +91.55
97.28' LT.
BEGIN C/A FENCE
~~(TIE TO WINGWALL)~~
END WILDLIFE X-ING
-L- STA. 105+86.00

MEBANE W. CARTER III
DB 403 PG 416
MAP 45 PG 53

11B

PROPOSED GUARDRAIL

CABLE GUIDERAIL

-L-

CAT-1

2GI

FS

GRAU 350

BEGIN SBG
STA. 101+24

END SBG
STA. 106+15

18" CSP w/ELBOWS
w/ROD & LUG
CONNECTORS

CLASS B RIP RAP
EST. 2 TON
EST. 7 SY FF

PROP. R/W

EQUALIZER

-L- +68.06
96.76' RT.
END C/A FENCE
(TIE TO WINGWALL)

RAD: 5593.84' (MAP 45 PG 53)

-L- +17.95
145.19' RT.

-L- +91.94
96.76' RT.
BEGIN C/A FENCE
(TIE TO WINGWALL)

-L- +41.95
145.09' RT.

-L- +45.64
145.62' RT

11
WCM ENTERPRISES, LLC.
DB 1223 PG 223
DB 933 PG 176
MB U PG 164
MB 45 PG 53
MB R PG 047

NOTE: CHECK COVER

SOUTHWOOD DEVELOPERS, INC
DB 2623 PG 109
MAP 34 PG 359

-L- +59.10
150.00' RT

-L- +67.45
144.78' RT

13
CHADWICK-ONE, LLC.
DB 1009 PG 192
MB R PG 047

CKC, LLC
DB 2684 PG 736

S 17°30'55" W
96.07'

SEE SHEET 45 FOR -L- PROFILE

REVISIONS
R/W REVISION 10/ /09 - NAME AND DEED CHANGE PARCEL 10, ELIMINATED PARCEL 12 NO CLAIM. ADDED PARCEL 11B.

8/17/99

9/29/2010
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8:32:07 AM

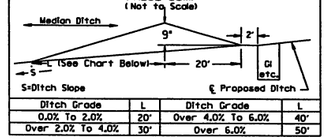
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

DETAIL B
FALSE SUMP
(Not to Scale)



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'

STA. 117+74+/-
STA. 123+50+/-

NAD 83/95

(13) CHADWICK-ONE, LLC.
DB 1009 PG 192
MB R PG 047

(10) 74 HOLDING, LLC
DB 2491 PG 750
DB 2846 PG 625
MAP 31 PG 530

-L- +64.43
150.00' LT

-L- +63.83
148.34' LT

-L- 116+00.00
150.00' LT

(11B) MEBANE W. CARTER III
DB 403 PG 416
MAP 45 PG 53

+86.25
36.9'

PROPOSED GUARDRAIL

PROP. 300' R/W

CLASS B RIP RAP
EST. 2 TON
EST. 7 SY FF

GRAU 350

2GI FS

CABLE GUIDERAIL

-L-

-L- 116+00.00
150.00' RT

(13) CHADWICK-ONE, LLC.
DB 1009 PG 192
MB R PG 047

(11A) WCM ENTERPRISES, LLC.
DB 1223 PG 223
MB R PG 047
DB 933 PG 176
MB U PG 164

N 22° 16' 30" E
2,432.78'

MATCH TO SHEET 10 -L- STA. 112+00.00

MATCH TO SHEET 12 -L- STA. 125+00.00

SEE SHEET 45 FOR -L- PROFILE

REVISIONS
R/W REVISION: 10/ /09 - ADDED PARCEL 11B. CHANGED PARCEL 11 TO 11A.

8/17/99

9/29/2010
R:\Proj\R-2633B_Rdy_psh11.dgn

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

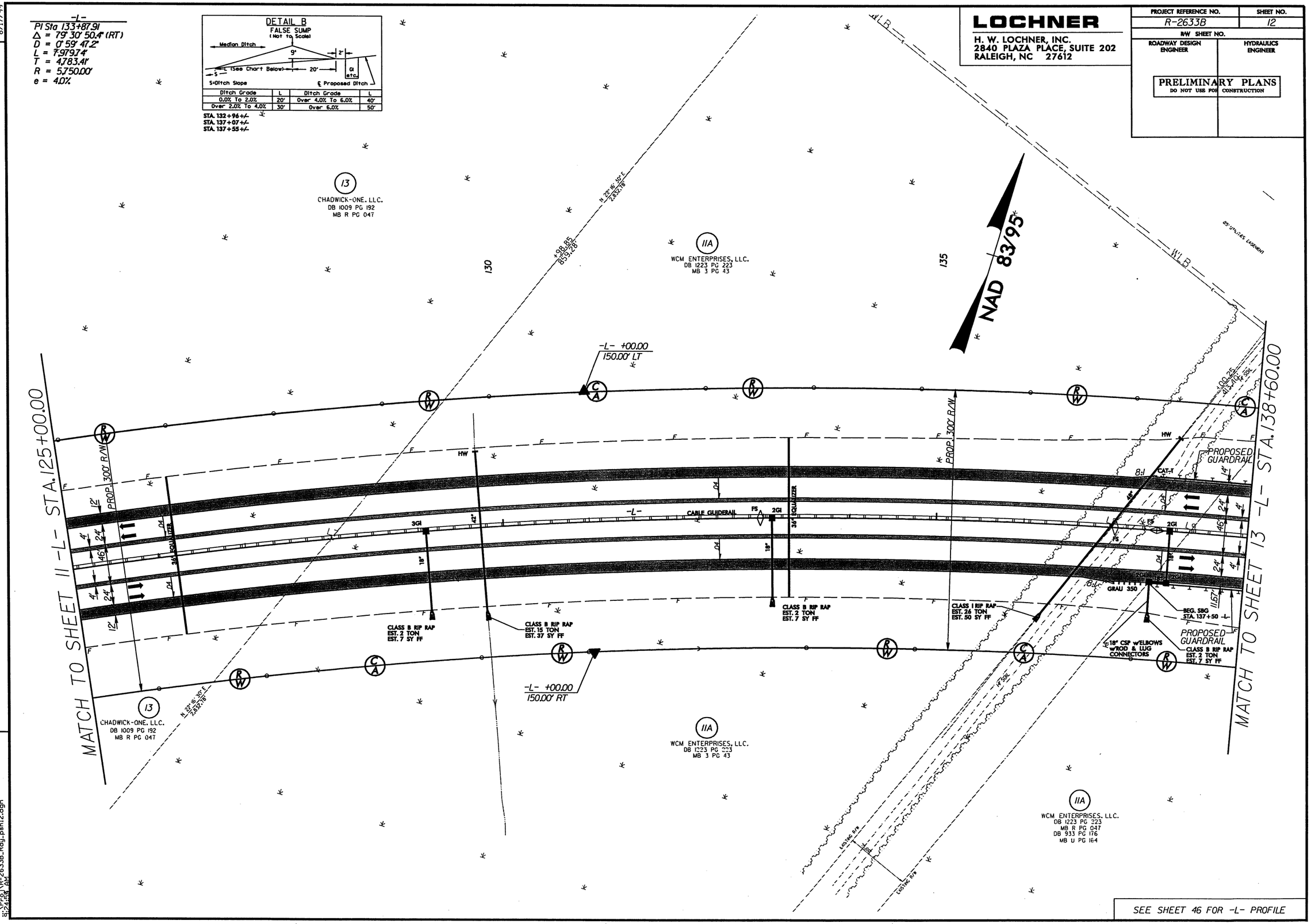
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

DETAIL B
FALSE SUMP
(Not To Scale)

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'

STA. 132+96 +/-
STA. 137+07 +/-
STA. 137+55 +/-



SEE SHEET 46 FOR -L- PROFILE

REVISIONS

R/W REVISION: 10/ /09 - CHANGE PARCEL # 11 TO 11A

8/17/99

9/29/2000
12:24:34 PM
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8/17/99

REVISIONS

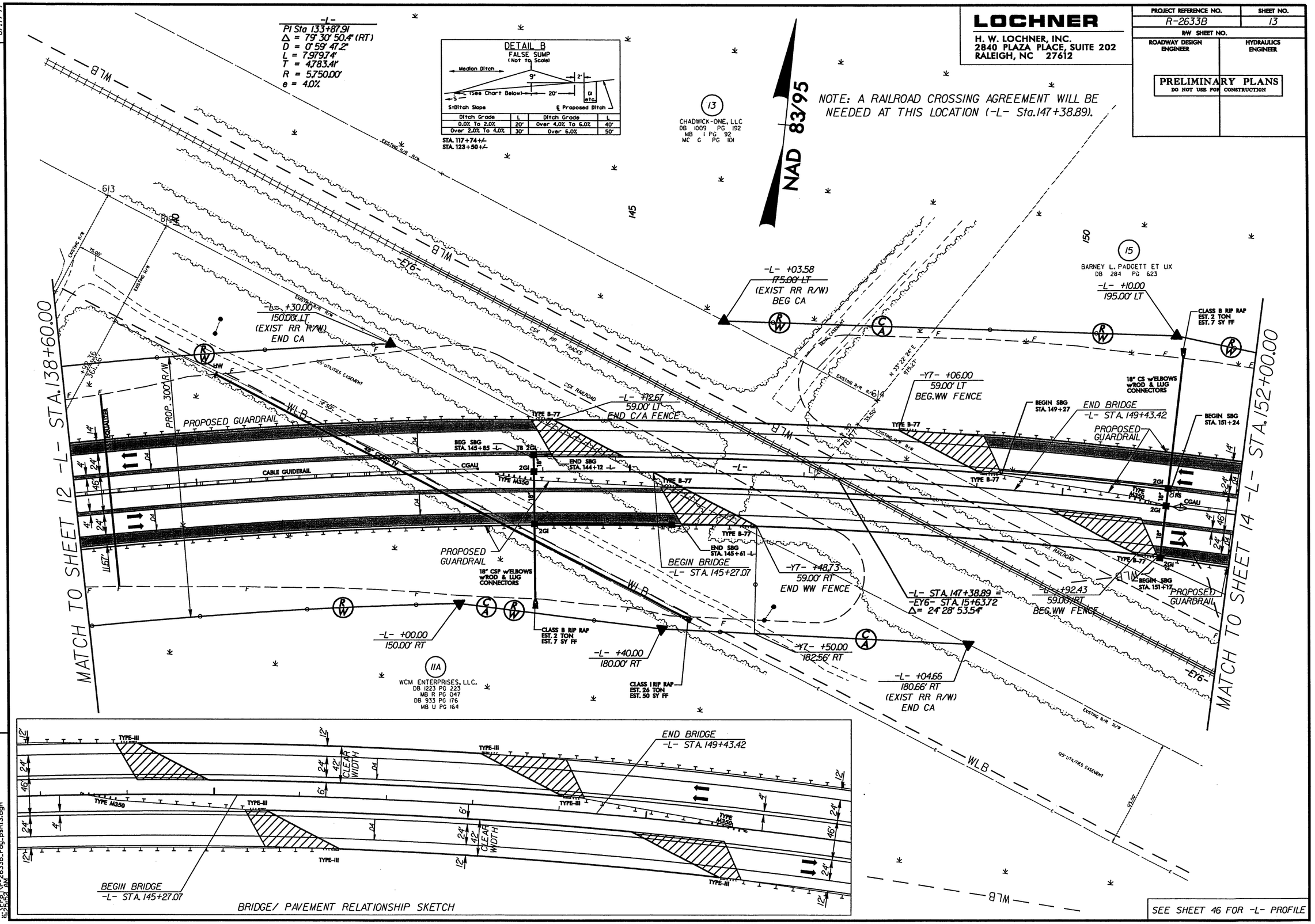
10/ /09 - CHANGED PARCEL #11 TO 11A COMBINED PARCEL 13 AND 14 AND ELIMINATED 14. CORRECTED PROPERTY LINES AND RAILROAD R/W LINE ON PARCEL 15.

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 46 FOR -L- PROFILE

9/29/2010
R:\25-52\2633b_rdy_psh13.dgn
8:25:52 AM

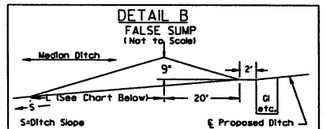
8/17/99

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

-RP_B2-
PI Sta 1+62.31
Δ = 3° 12' 27.2" (RT)
D = 0° 59' 18.1"
L = 324.53'
T = 162.31'
R = 5,797.00'
e = 4.0%

PIs Sta 4+07.87
θs = 1° 14' 07.7"
Ls = 250.00'
LT = 166.67'
ST = 83.34'

DETAIL B
FALSE SUMP
(Not To Scale)



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'

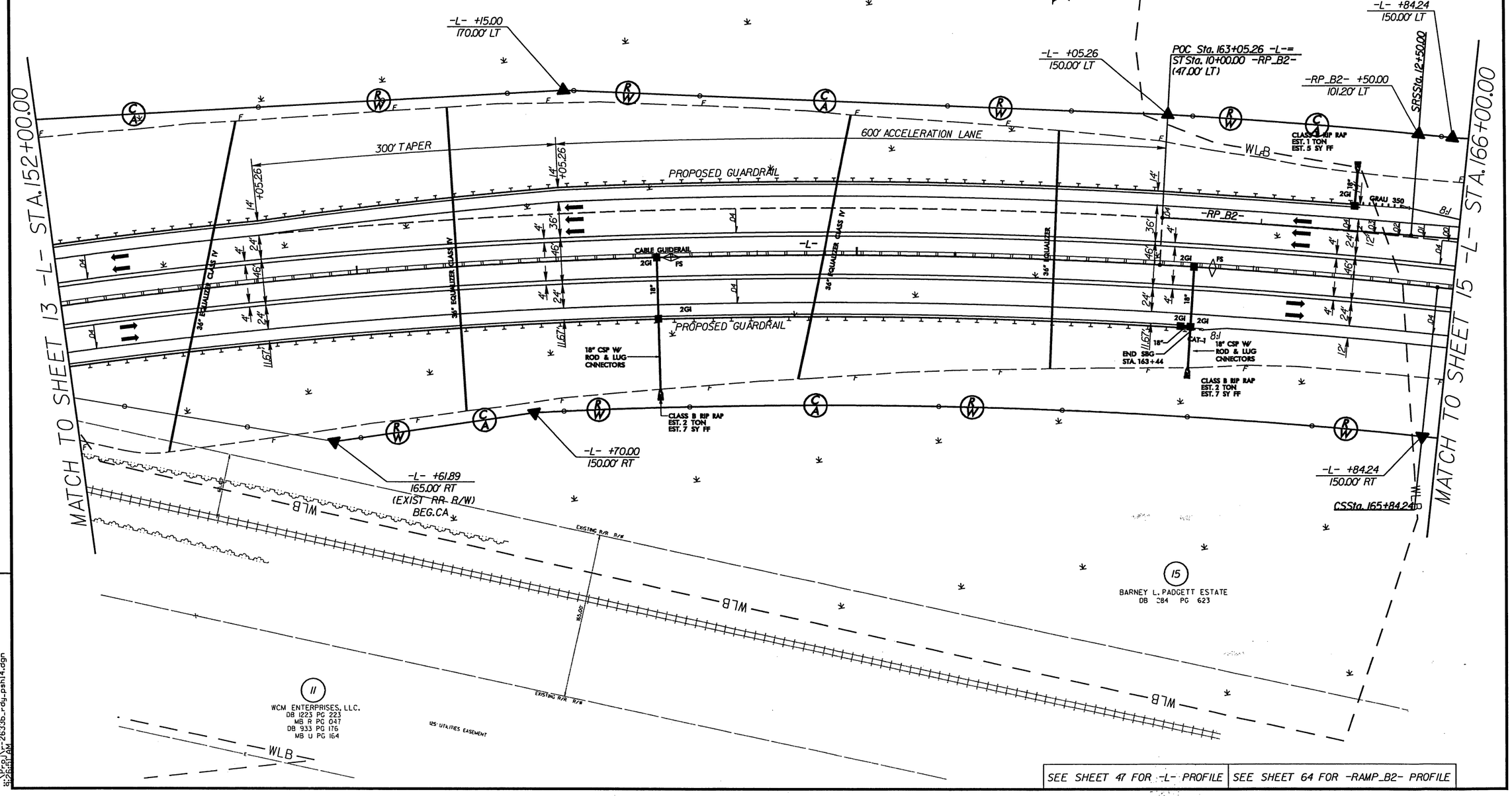
STA. 158+15+/-
STA. 163+58+/-

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95



SEE SHEET 47 FOR -L- PROFILE | SEE SHEET 64 FOR -RAMP_B2- PROFILE

REVISIONS
10/ /09 - CORRECTED PROPERTY LINES AND RAILROAD R/W LINE ON PARCEL 15.

9/29/2010
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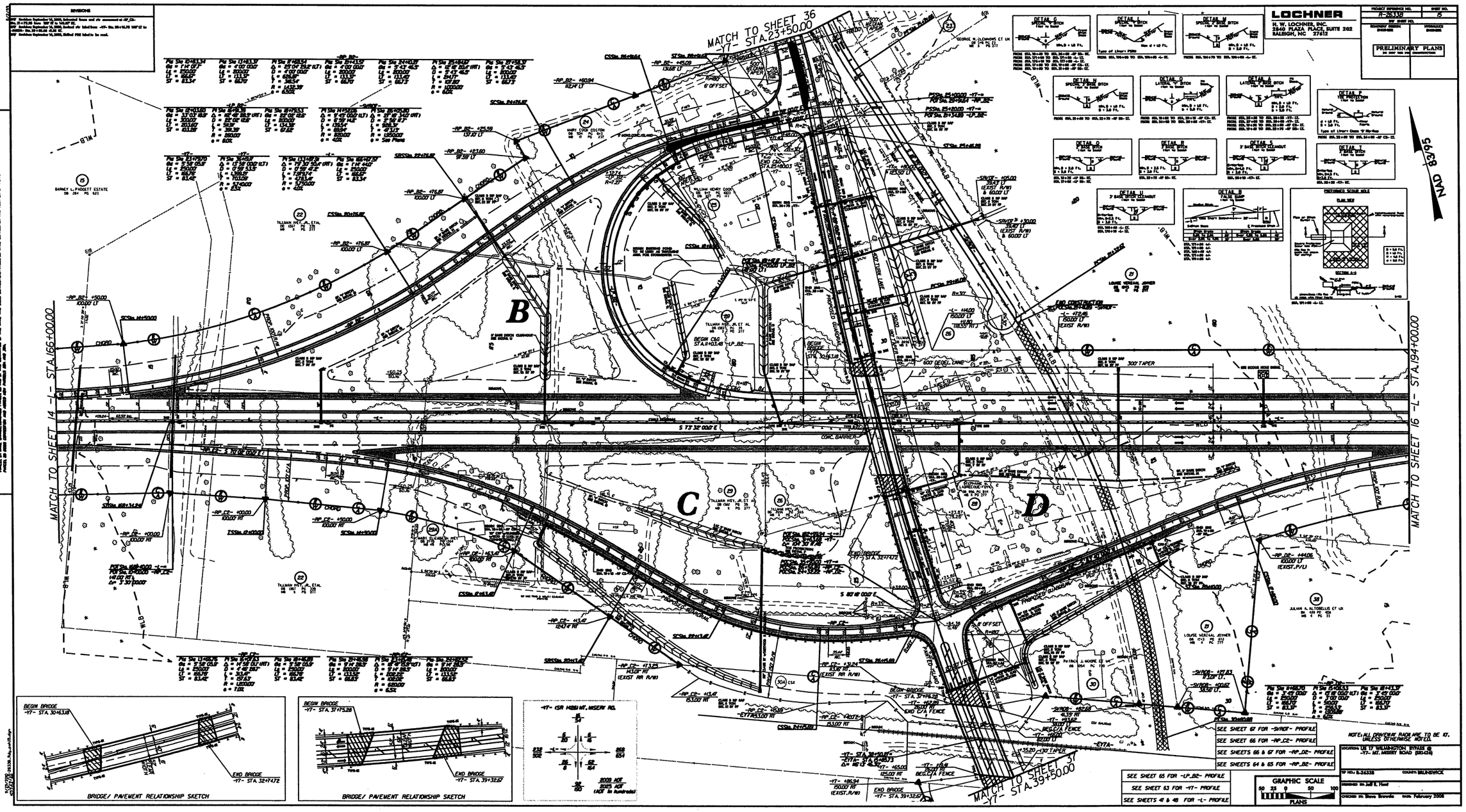
REVISIONS

1/31/07	Revision September 16, 2006, Submitted from and site assessment of -RP_C2- Sta. 21+72.38 from 160' RT to 140.00' RT.
1/31/07	Revision September 16, 2006, Revised site listed from -RT- Sta. 20+10.70 160' LT to -RP2B- Sta. 12+10.00 -0.00 LT.
1/31/07	Revision September 16, 2006, Shifted PDE listed to be read.

WRIGHT

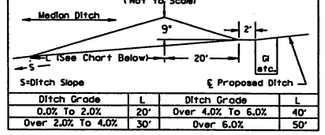


8/17/99

REVISIONS

-RP_D2-		
PIs Sta 11+66.70	PI Sta 15+06.53	PIs Sta 18+43.37
Θs = 3° 45' 00.0"	Δ = 15° 18' 00.0" (LT)	Θs = 3° 45' 00.0"
Ls = 250.00'	D = 3° 00' 00.0"	Ls = 250.00'
LT = 166.70'	L = 510.00'	LT = 166.70'
ST = 83.37'	T = 256.53'	ST = 83.37'
	R = 1,909.86'	
	e = 6.0%	

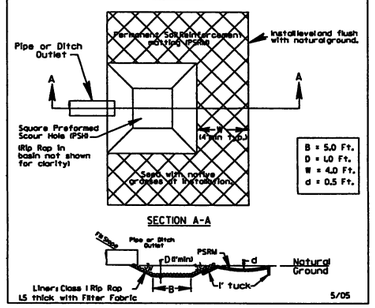
DETAIL B
FALSE SUMP
(Not to Scale)



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'

STA. 194+23 +/-
STA. 205+06 +/-

PREFORMED SCOUR HOLE



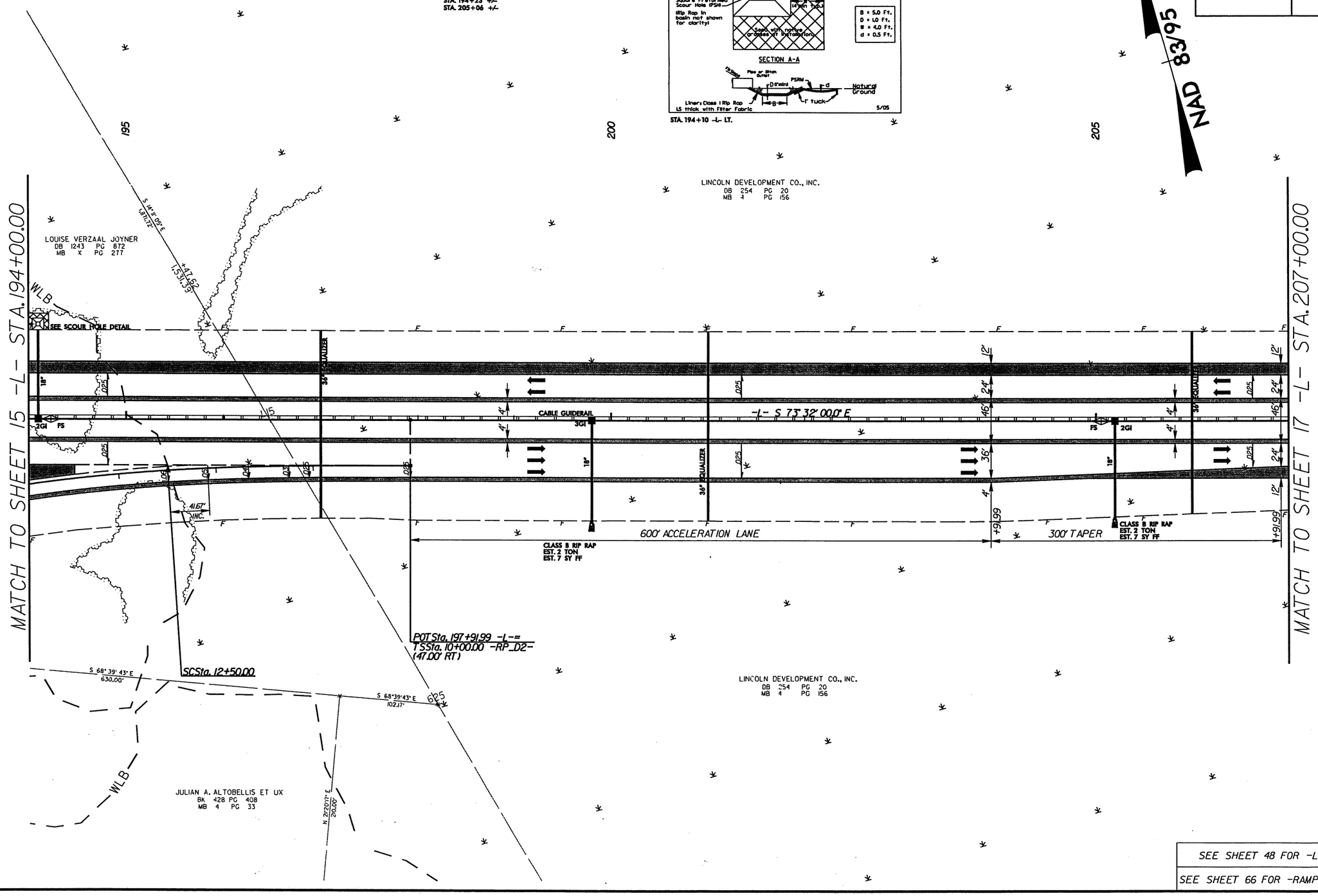
STA. 194+10 -L- LT.

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95



SEE SHEET 48 FOR -L- PROFILE

SEE SHEET 66 FOR -RAMP_D2- PROFILE

9/29/2010
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8:20:04 AM

8/17/99

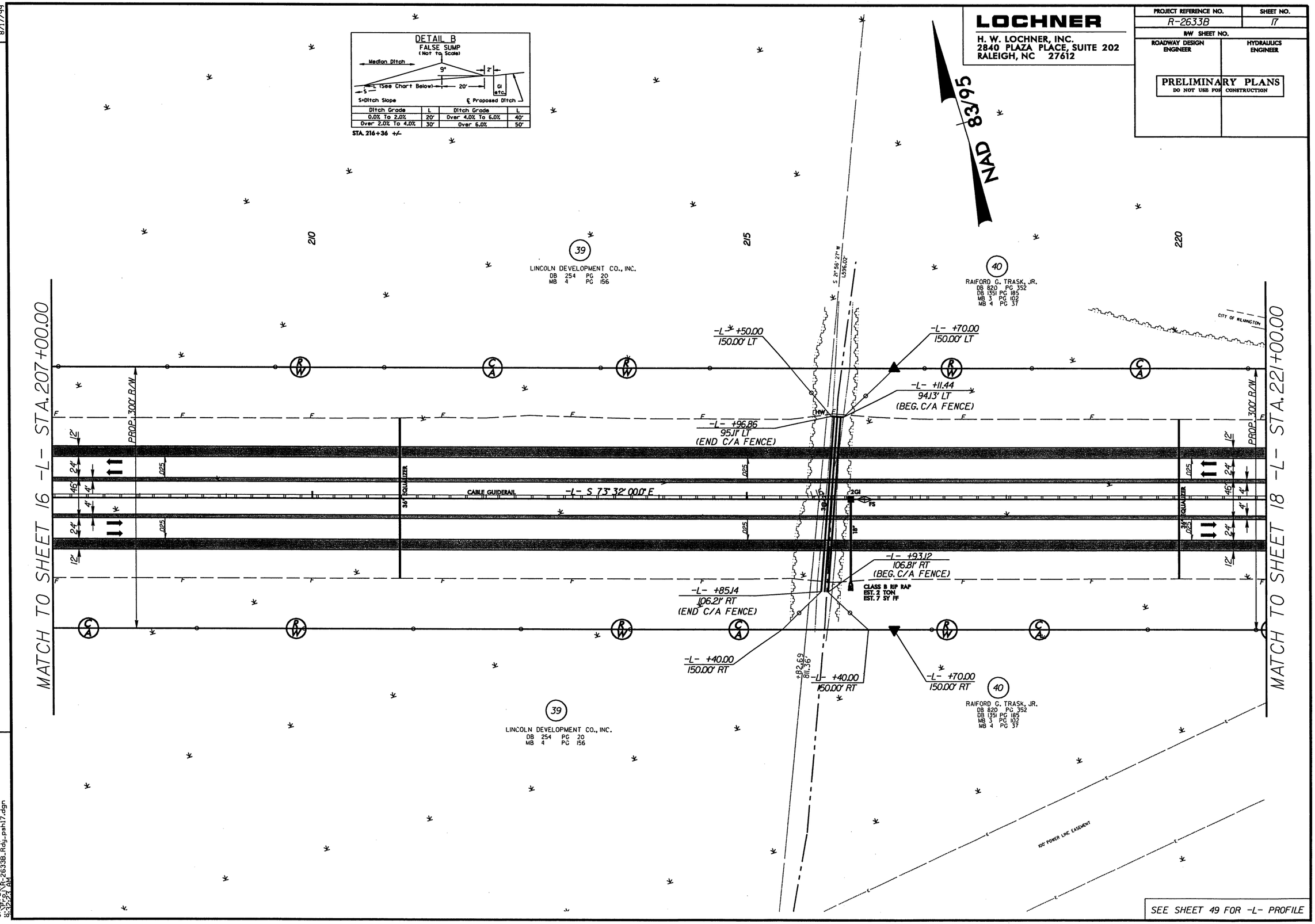
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 49 FOR -L- PROFILE

9/29/2000
R-2633B_Rdy_psh17.dgn
9:32:29 AM

8/17/99

REVISIONS

LOCHNER

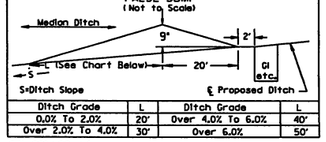
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 243+38.67
Δ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%

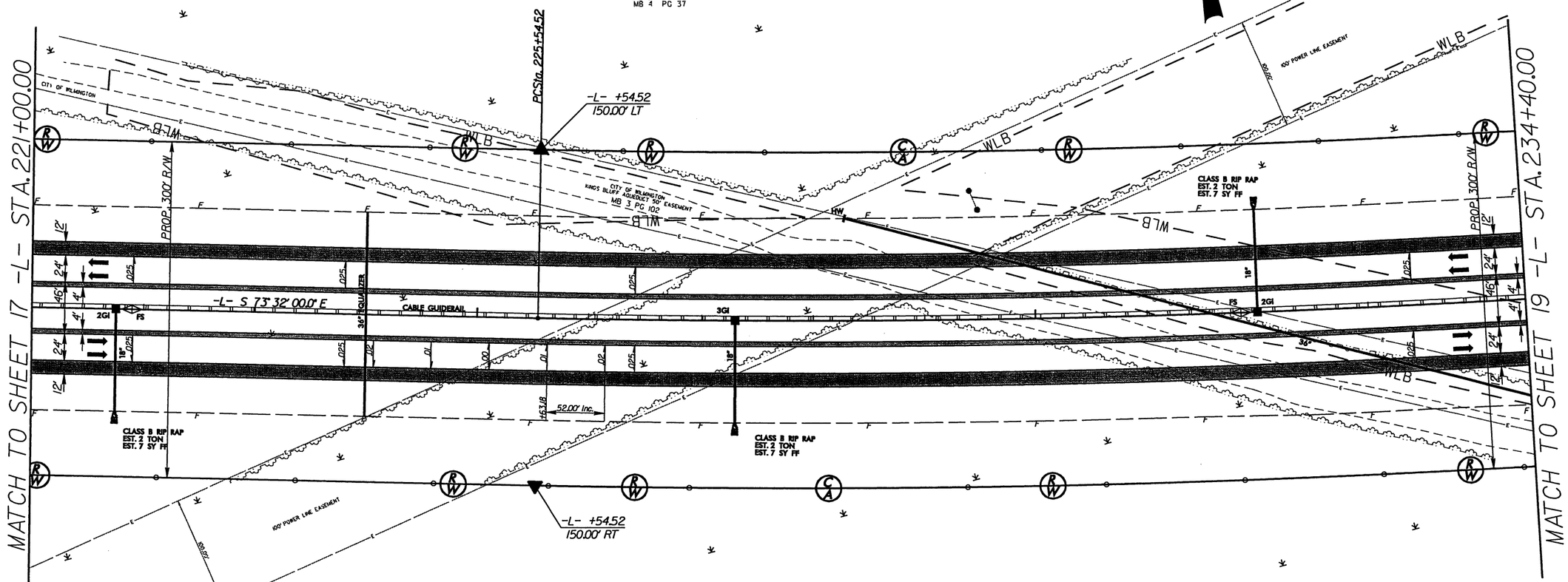
DETAIL B
FALSE SUMP
(Not to Scale)



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'

STA. 221+89 +/-
STA. 231+85 +/-

NAD 83/95



SEE SHEET 49 FOR -L- PROFILE

9/29/2010
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8/17/99

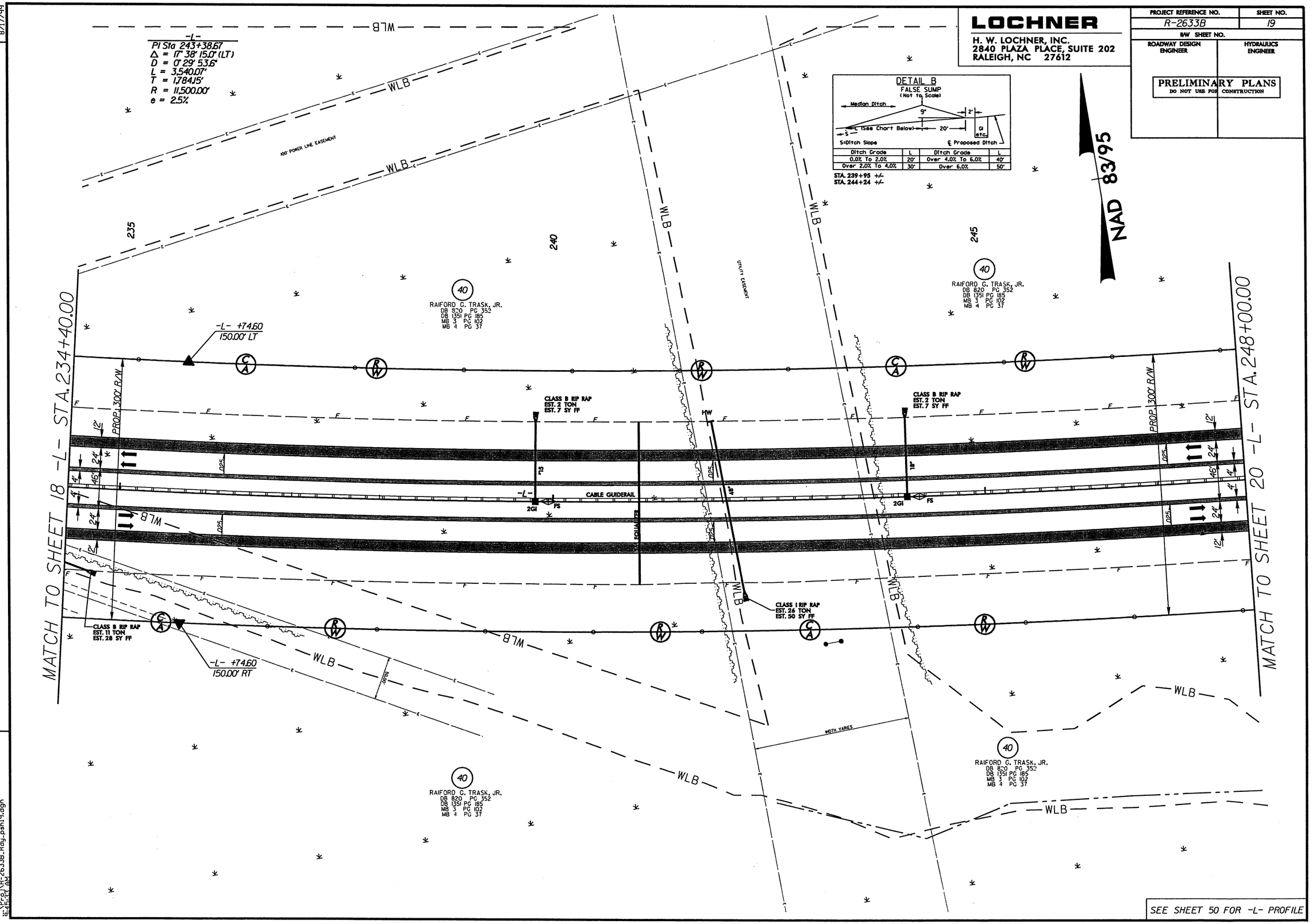
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



9/29/2010
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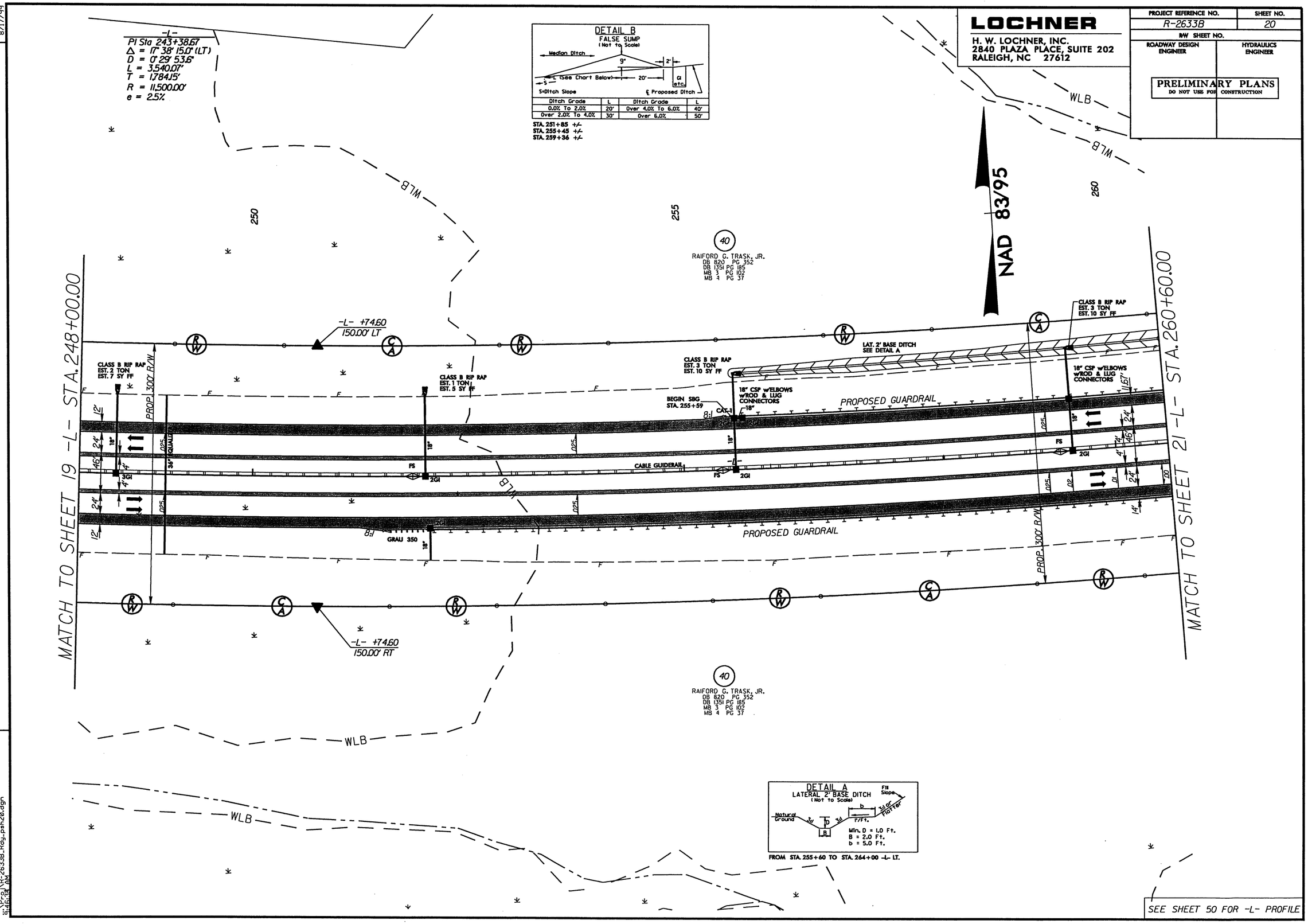
10:25:33 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 50 FOR -L- PROFILE

REVISIONS

8/17/99

9/29/2010
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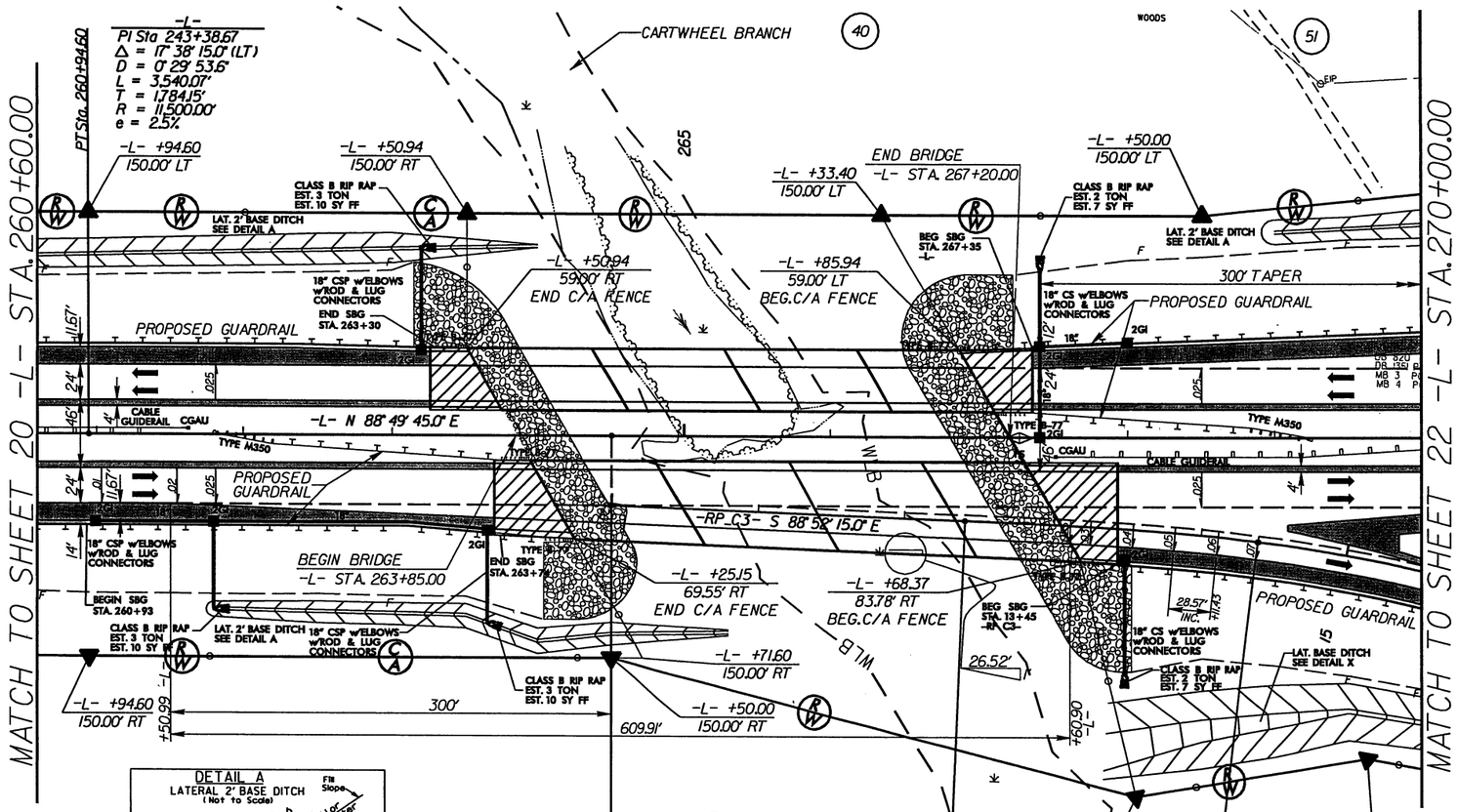
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

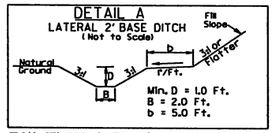
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99



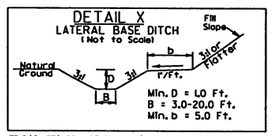
DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

FROM STA. 255+60 TO STA. 264+00 -L- LT.
FROM STA. 261+80 TO STA. 265+30 -L- RT.
FROM STA. 269+00 TO STA. 280+25 -L- LT.

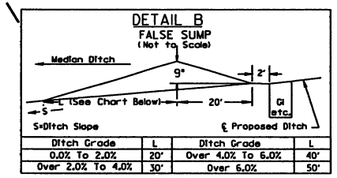
DETAIL X
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 3.0-20.0 Ft.
Min. b = 5.0 Ft.

FROM STA. 13+45 TO STA. 15+75 -RP C3- RT.

DETAIL B
FALSE SUMP
(Not to Scale)

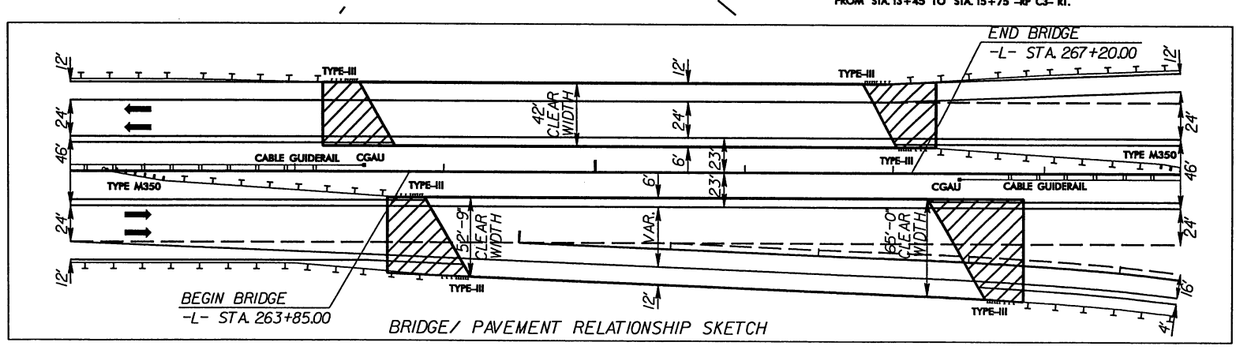


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 267+22 +/-

-RP_C3-

PIs Sta 13+73.39	PI Sta 17+18.94
Θs = 5° 00' 00.0"	Δ = 27° 21' 43.5" (RT)
Ls = 200.00'	D = 5° 00' 00.0"
LT = 133.39'	L = 547.24'
ST = 66.72'	T = 278.94'
	R = 1,145.92'
	e = 7.0%



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEETS 72 FOR -RP_C3- PROFILE

SEE SHEET 51 FOR -L- PROFILE

9/29/2000
8:47:32 AM
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REVISIONS

NW Revision September 17, 2008, Revised sty label from -RP_C1- to -RP_C3-

NW Revision September 17, 2008, Revised sty label at -RP_C3- Sta. 38+02.84 to Sta. 38+04.88.

NW Revision September 17, 2008, Revised sty Redis & labels at -YB8- due to new drainage design.

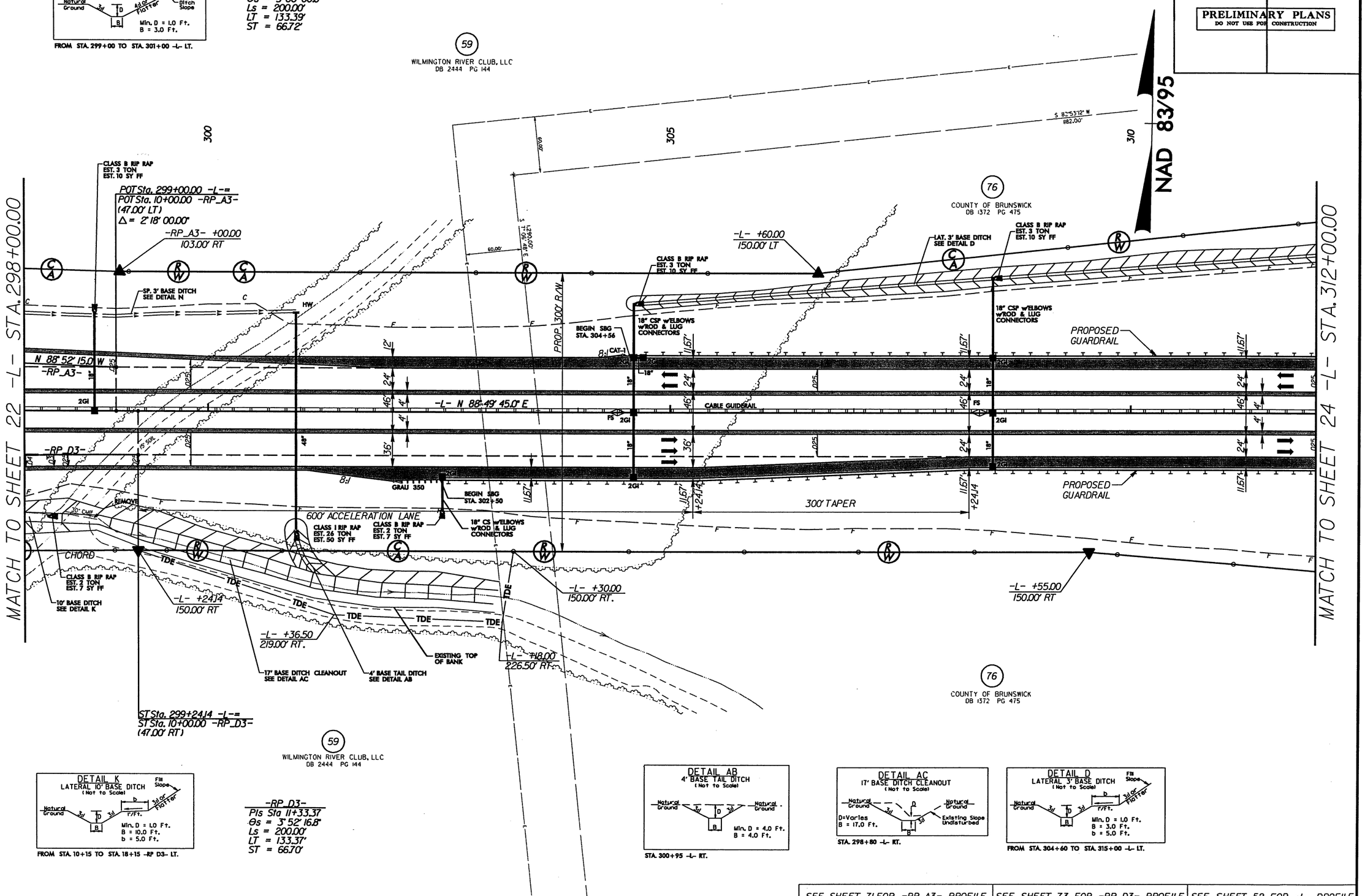
NW Revision October 30, 2008, Added permanent utility Redis & labels at -YB- Sta. 36+07.99 to Sta. 43+19.80.

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612	R-2633B	23
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

8/17/99

REVISIONS

10/ /09 - NAME AND DEED CHANGE ON PARCEL 59. ADDED NEW PARCEL 59A AND ADDED EASEMENT.



SEE SHEET 71 FOR -RP_A3- PROFILE	SEE SHEET 73 FOR -RP_D3- PROFILE	SEE SHEET 52 FOR -L- PROFILE

9/23/2010
R-2633B_Rdy_psh23.dgn
8:50:03 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

REVISIONS
10/ /09 - NAME AND DEED CHANGE ON PARCEL 59, ADDED PARCEL 59A AND EASEMENT.

8/17/99

MATCH TO SHEET 23 -L- STA. 312+00.00

MATCH TO SHEET 25 -L- STA. 326+00.00

59A D&G PROPERTIES OF WILMINGTON, LLC
DB 2444 PG 136

76 COUNTY OF BRUNSWICK
DB 1372 PG 475

59 WILMINGTON RIVER CLUB, LLC
DB 2444 PG 144

77 HIGH RISE SERVICE CO., INC
DB 547 PG 800

CLASS B RIP RAP
EST. 3 TON
EST. 10 SY FF

LAT. 3' BASE DITCH
SEE DETAIL D

LAT. 4' BASE DITCH
SEE DETAIL AD

LAT. 4' BASE DITCH
SEE DETAIL F

18" CSP w/ELBOWS
w/ROD & LUG
CONNECTORS

PROPOSED GUARDRAIL

CABLE GUIDERAIL

PAVED DITCH

TYPE M350

TYPE B-77

END SBG
STA. 313+20

END SBG
STA. 317+16

BEG. SBG
STA. 316+45 -L-
END SBG
@ APP. SLAB

BEGIN BRIDGE
-L- STA. 317+41.31

-L- N 88° 49' 45.0" E

-L- +60.00
END C/A FENCE

-L- +60.00
275.00' LT

-L- +60.00
150.00' LT

-L- +60.00
150.00' RT

-L- +50.00
216.00' RT

RETAIN

PROP. 300' R/W

WLB

BEGIN BRIDGE
-L- STA. 317+41.31 +/-

TYPE-III

42' CLEAR WIDTH

DETAIL B
FALSE SUMP
(Not to Scale)

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'

STA. 312+50 +/-

DETAIL D
LATERAL 3' BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
B = 3.0 Ft.
b = 5.0 Ft.
FROM STA. 304+60 TO STA. 315+00 -L- LT.

DETAIL AD
LATERAL 4' BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
B = 4.0 Ft.
b = 5.0 Ft.
FROM STA. 315+00 TO STA. 318+45 -L- LT.

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEET 53 FOR -L- PROFILE

9/29/2010
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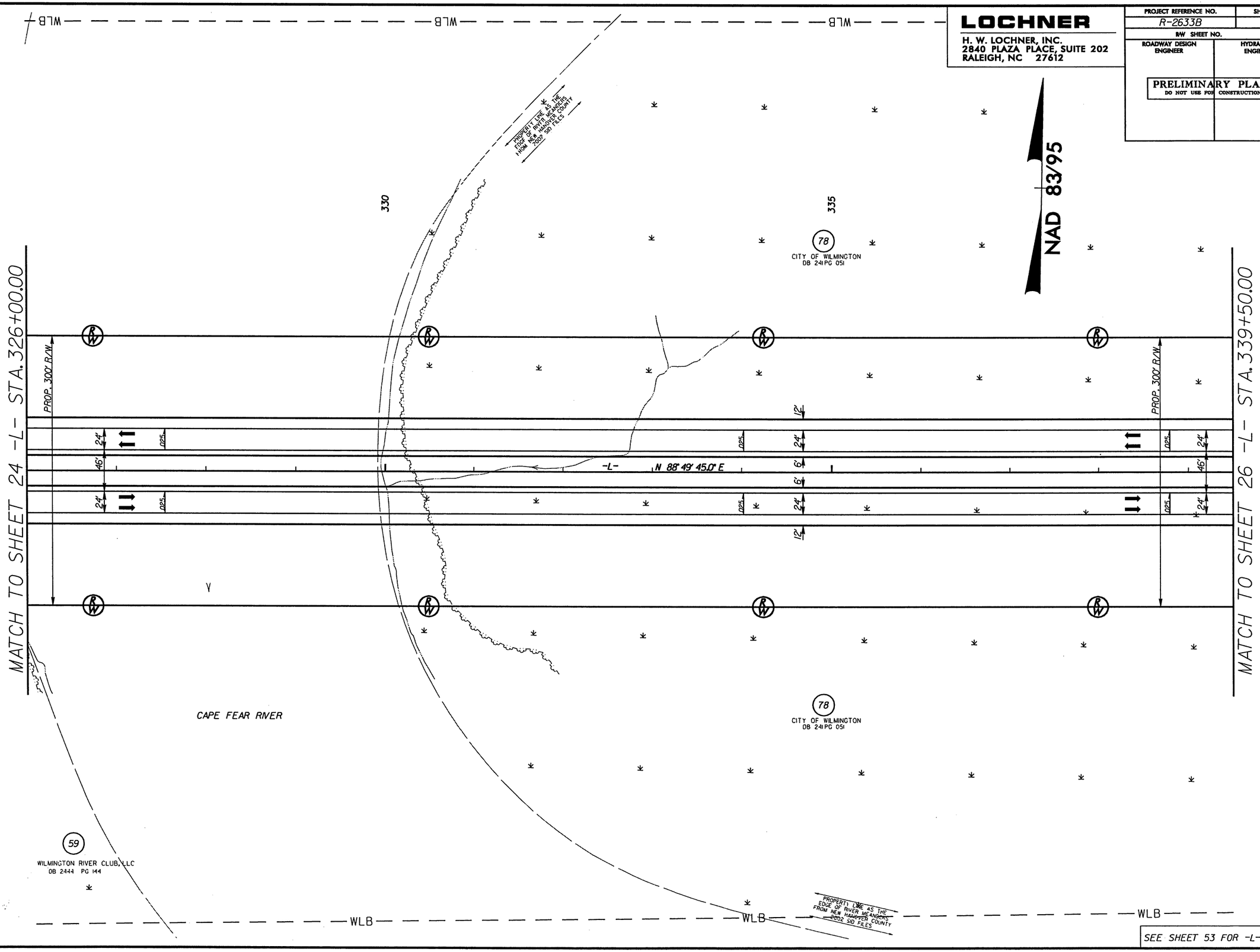
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612



REVISIONS

10/ /09 - NAME AND DEED CHANGE ON PARCEL 59.

8/17/99

9/29/2009
R-2633B_Rdy_psh25.dgn
8:53:06 AM

8/17/99

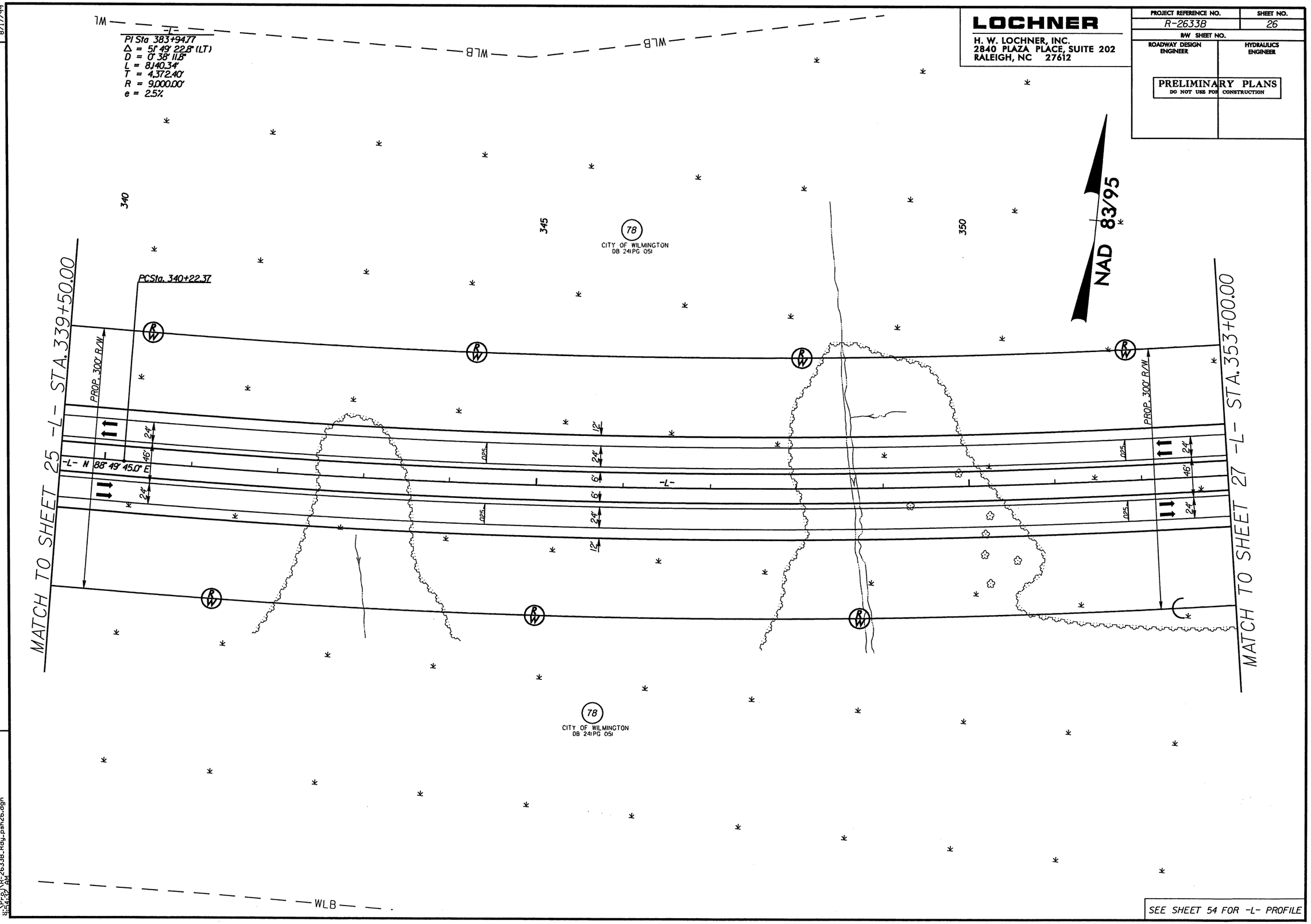
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



9/28/2010
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8/17/99

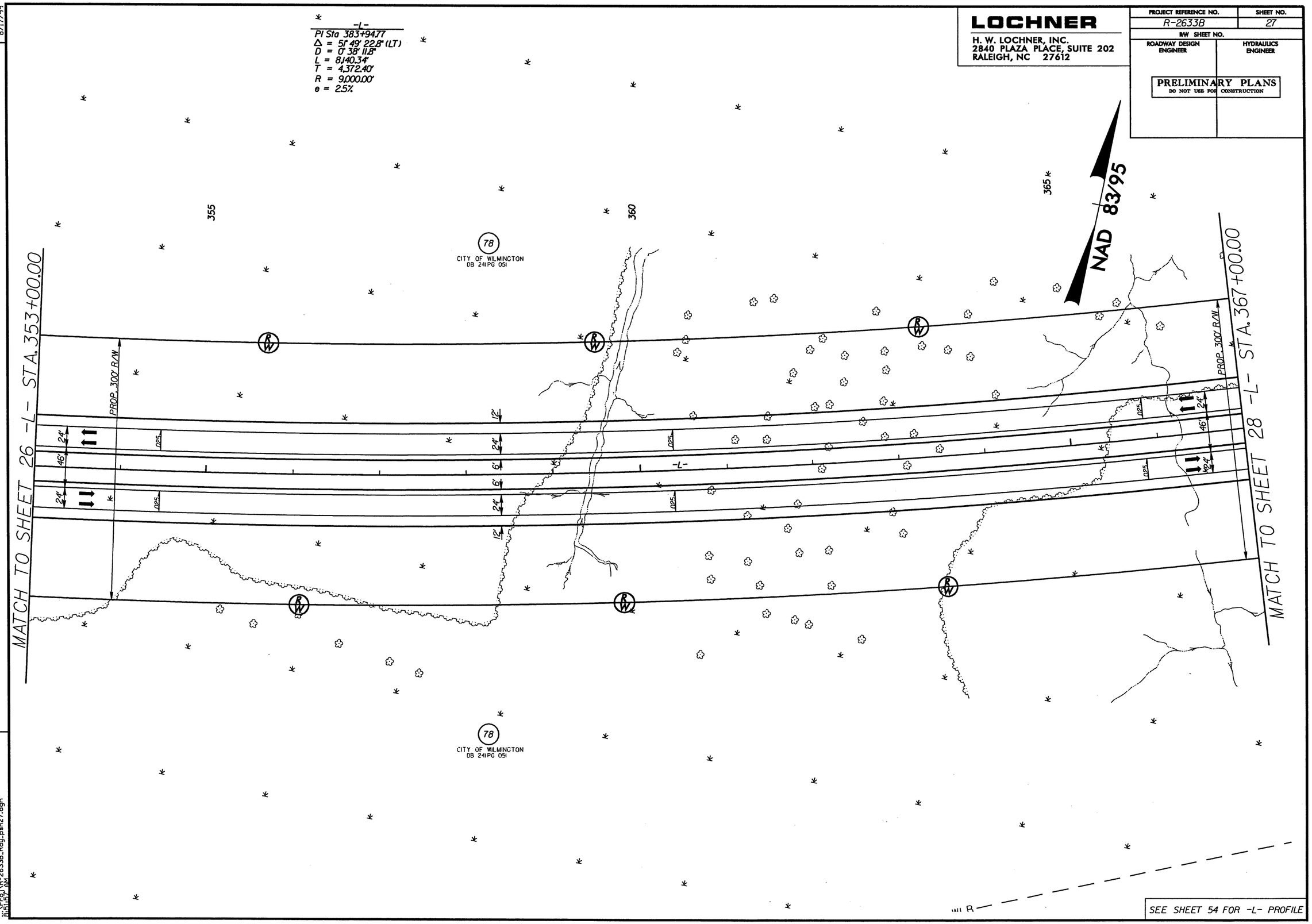
REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



9/29/2010
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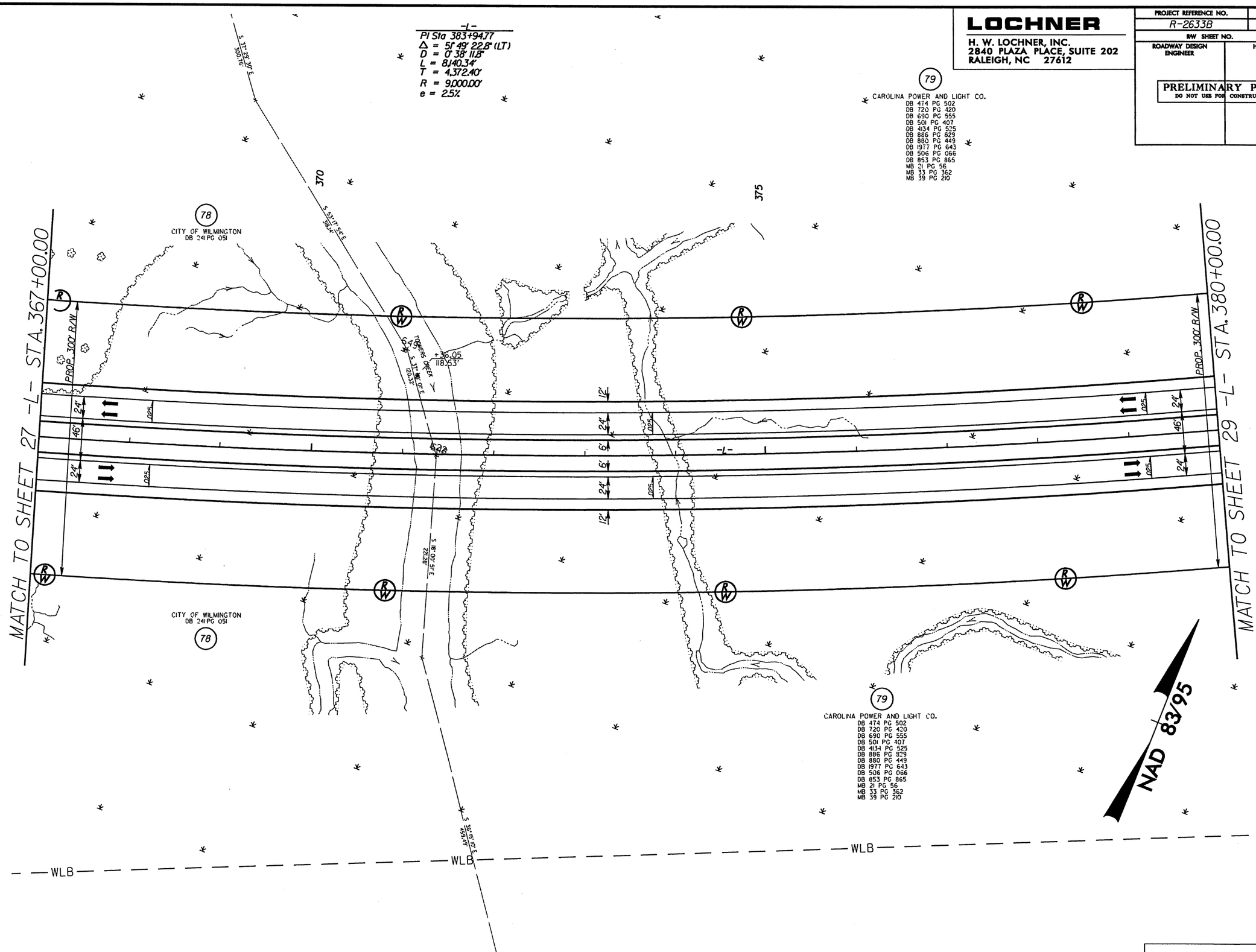
8:51:07 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 55 FOR -L- PROFILE

REVISIONS

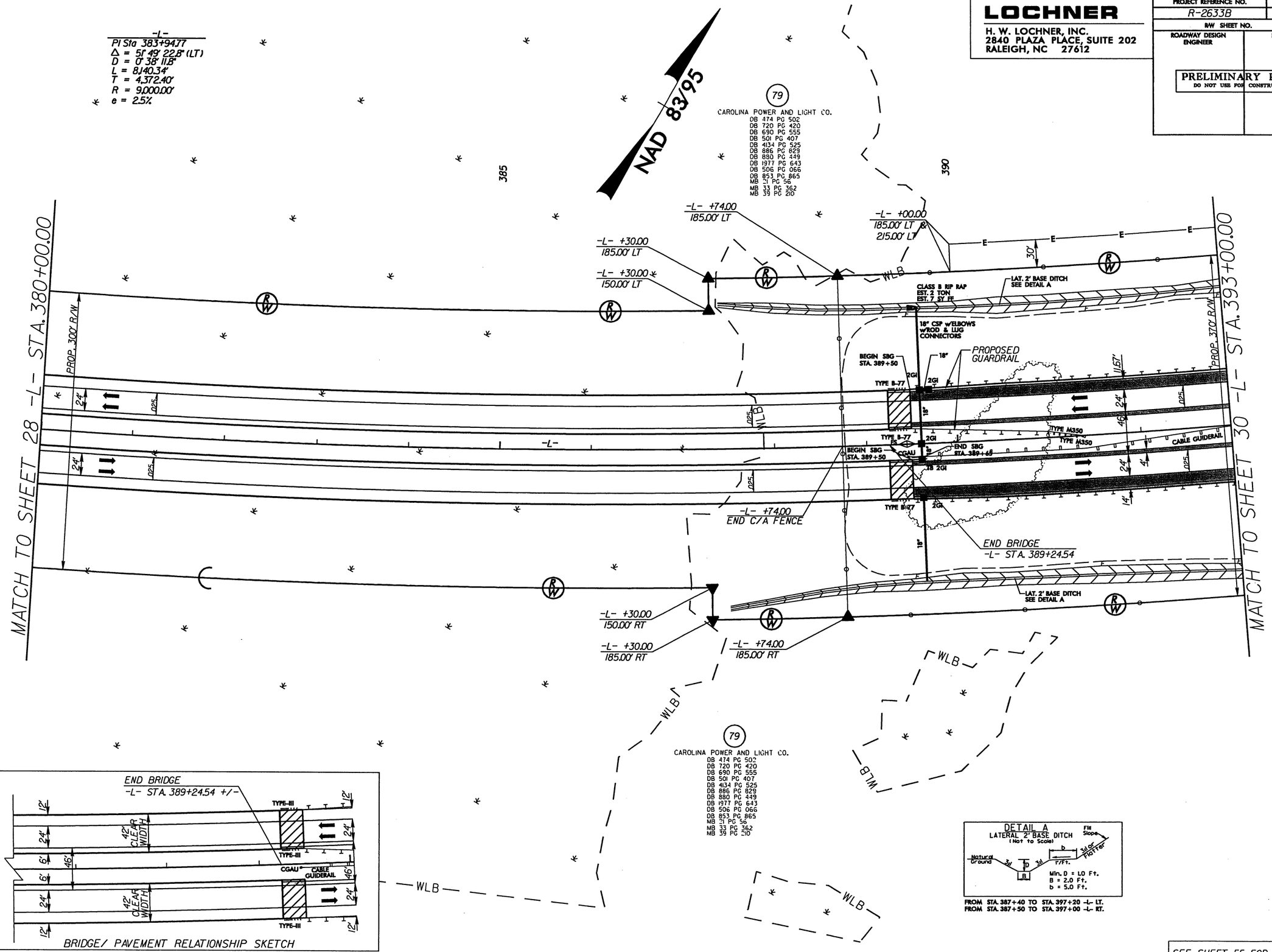
8/17/99

9/29/2010
s:\Proj\R-2633B_Rdy_psh28.dgn
s:\R2633.dgn

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 55 FOR -L- PROFILE

REVISIONS

8/17/99

9/29/2008
R-2633B_Rdy_psh29.dgn
8:50:49 AM

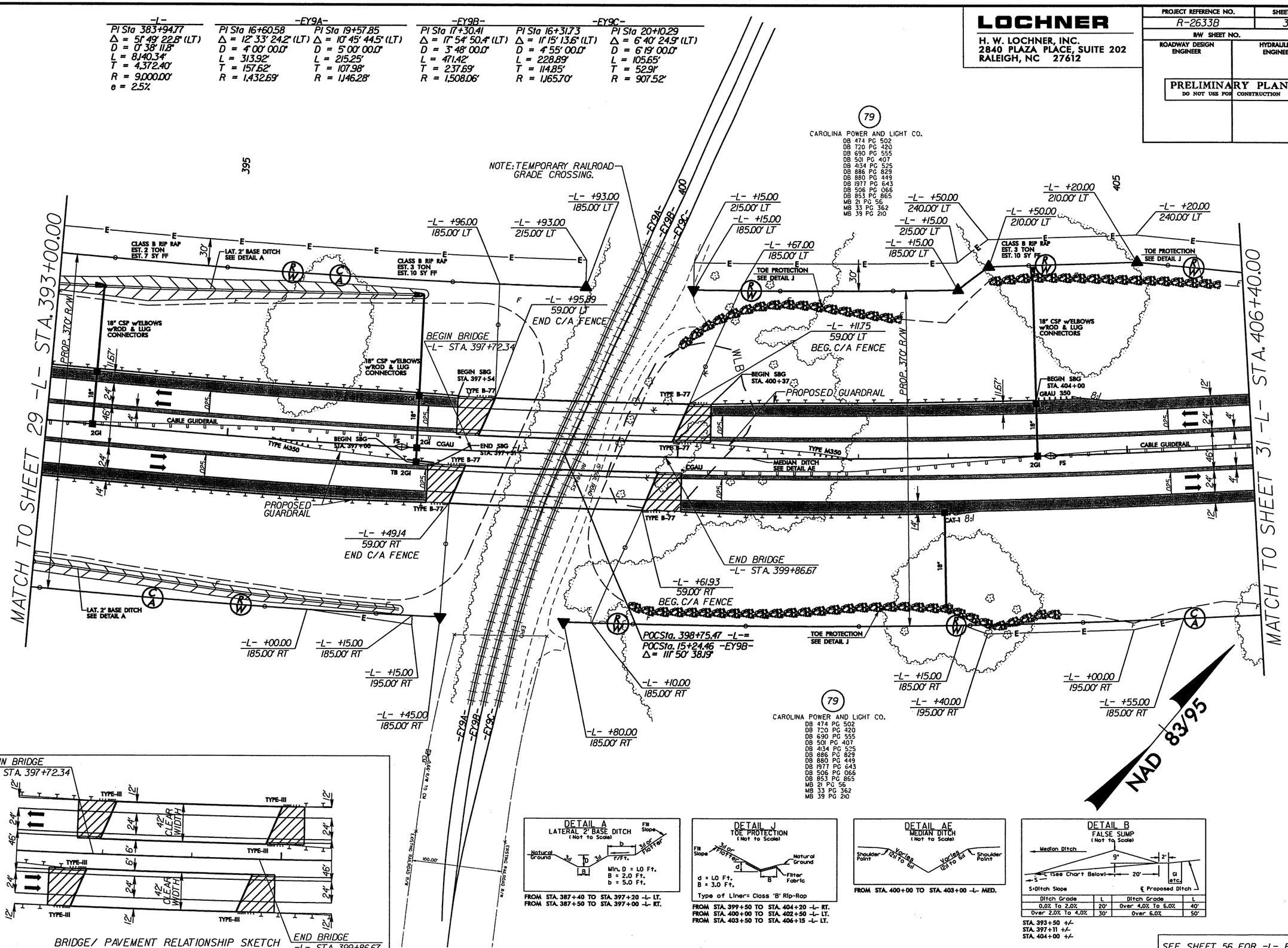
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-	-EY9A-		-EY9B-		-EY9C-	
PI Sta 383+94.77	PI Sta 16+60.58	PI Sta 19+57.85	PI Sta 17+30.41	PI Sta 16+31.73	PI Sta 20+10.29	
Δ = 51° 49' 22.8" (LT)	Δ = 12° 33' 24.2" (LT)	Δ = 10° 45' 44.5" (LT)	Δ = 17° 54' 50.4" (LT)	Δ = 11° 15' 13.6" (LT)	Δ = 6° 40' 24.9" (LT)	
D = 0° 38' 11.8"	D = 4° 00' 00.0"	D = 5° 00' 00.0"	D = 3° 48' 00.0"	D = 4° 55' 00.0"	D = 6° 19' 00.0"	
L = 8,140.34'	L = 313.92'	L = 215.25'	L = 471.42'	L = 228.89'	L = 105.65'	
T = 4,372.40'	T = 157.62'	T = 107.98'	T = 237.69'	T = 114.85'	T = 52.91'	
R = 9,000.00'	R = 1,432.69'	R = 1,146.28'	R = 1,508.06'	R = 1,165.70'	R = 907.52'	
e = 2.5%						



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)

FROM STA. 387+40 TO STA. 397+20 -L- LT.
FROM STA. 387+50 TO STA. 397+00 -L- RT.

DETAIL J
TOE PROTECTION
(Not to Scale)

d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner= Class 'B' Rip-Rap

FROM STA. 399+50 TO STA. 404+20 -L- RT.
FROM STA. 400+00 TO STA. 402+50 -L- LT.
FROM STA. 403+50 TO STA. 406+15 -L- LT.

DETAIL AE
MEDIAN DITCH
(Not to Scale)

FROM STA. 400+00 TO STA. 403+00 -L- MED.

DETAIL B
FALSE SUMP
(Not to Scale)

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'

STA. 393+50 +/-
STA. 397+11 +/-
STA. 404+00 +/-

SEE SHEET 56 FOR -L- PROFILE

REVISIONS
R/W Revision: September 17, 2008, Revised r/w label -L- Sta. 397+15 from 205' RT to 195' RT.

8/17/99

9/29/2010
8:56:29 AM
R-2633B_Rdy_psh30.dgn

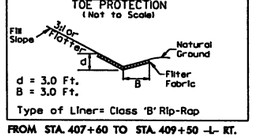
8/17/99

REVISIONS

10/ /09 - ADDED DB,PG,AND MB TO PARCEL 80.

-L-
PI Sta 383+94.77
Δ = 51° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%

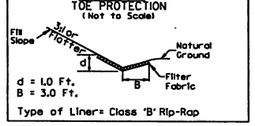
DETAIL AF
TOE PROTECTION
(Not to Scale)



d = 3.0 Ft.
B = 3.0 Ft.
Type of Liner= Class 'B' Rip-Rap

FROM STA. 407+60 TO STA. 409+50 -L- RT.

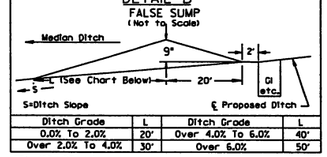
DETAIL J
TOE PROTECTION
(Not to Scale)



d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner= Class 'B' Rip-Rap

FROM STA. 414+85 TO STA. 415+80 -L- RT.

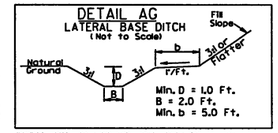
DETAIL B
FALSE SUMP
(Not to Scale)



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'

STA. 418+35 +/-

DETAIL AG
LATERAL BASE DITCH
(Not to Scale)



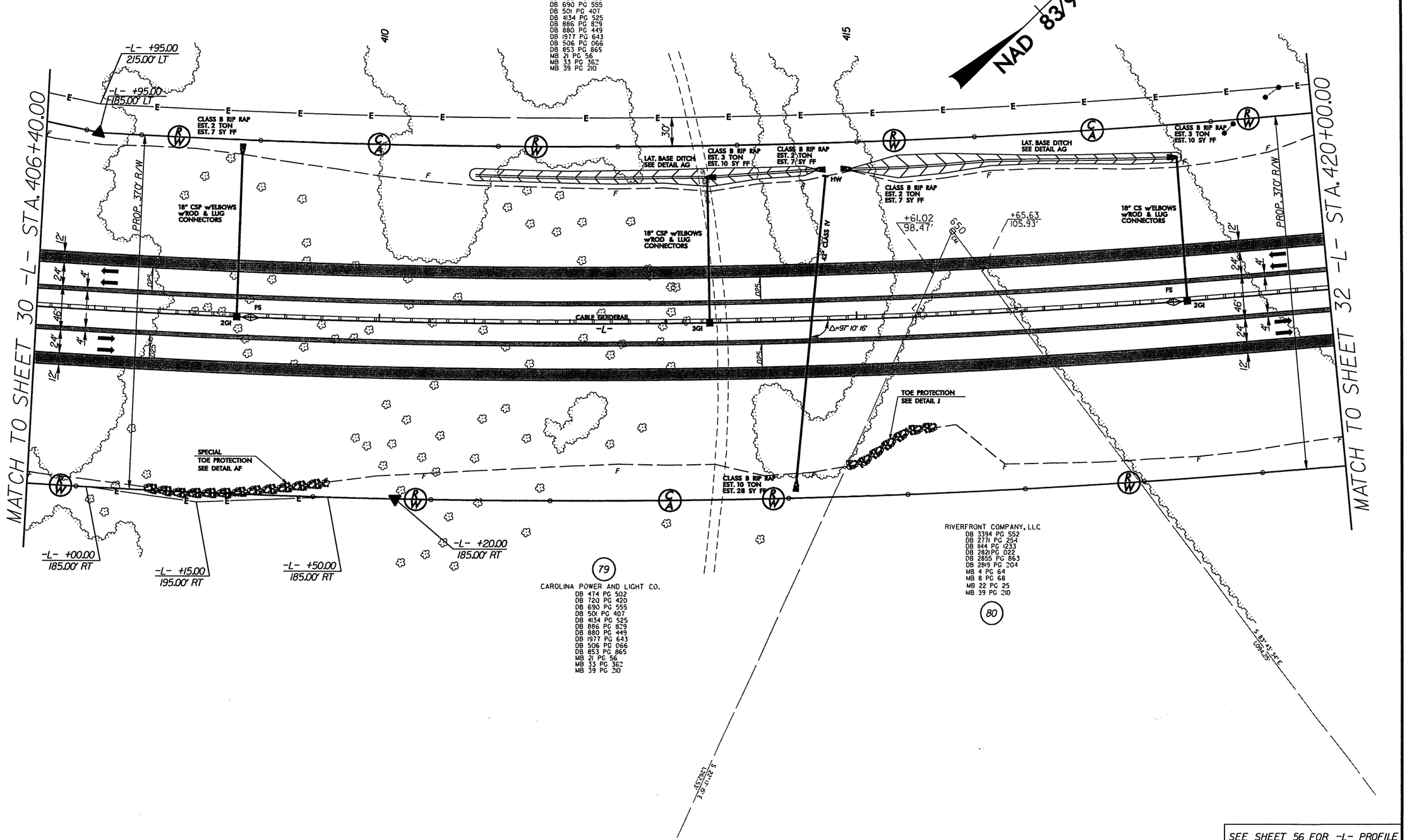
Min. D = 1.0 Ft.
B = 2.0 Ft.
Min. b = 5.0 Ft.

FROM STA. 411+00 TO STA. 414+62 -L- LT.
FROM STA. 415+00 TO STA. 418+50 -L- LT.

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 56 FOR -L- PROFILE

9/29/2010
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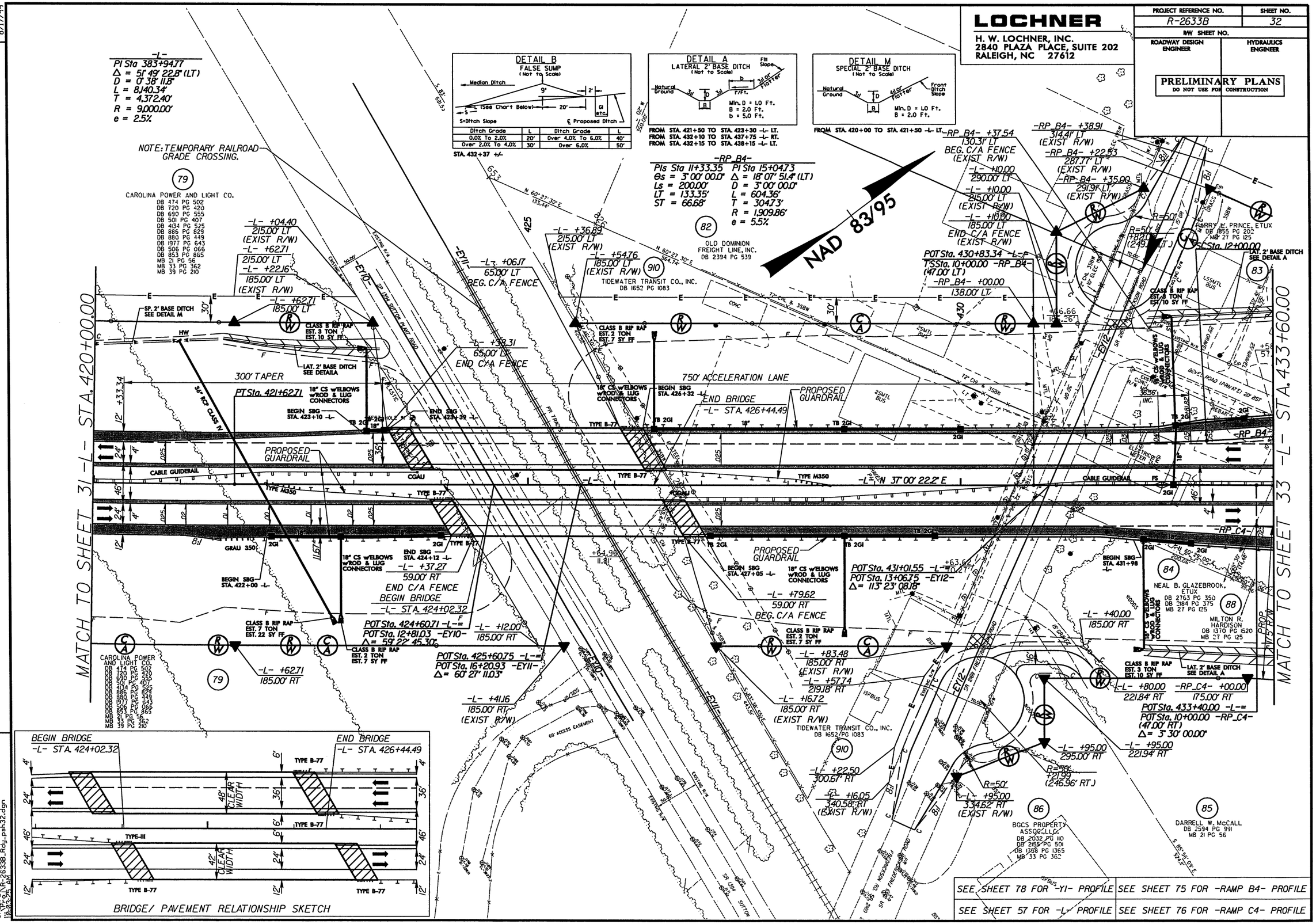
10:00:52 AM

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

R/W Revision: September 17, 2008. Revised r/w label -L- Sta. 431+10 from 205' RT to 195' RT.
R/W Revision: 10/ /09 - ADDED BUILDING TOPO TO PARCEL 82. ADDED TOPO TO PARCEL 86. CHANGED PARCEL 81 TO 910.

8/17/99

9/29/2010
12:05:24 AM
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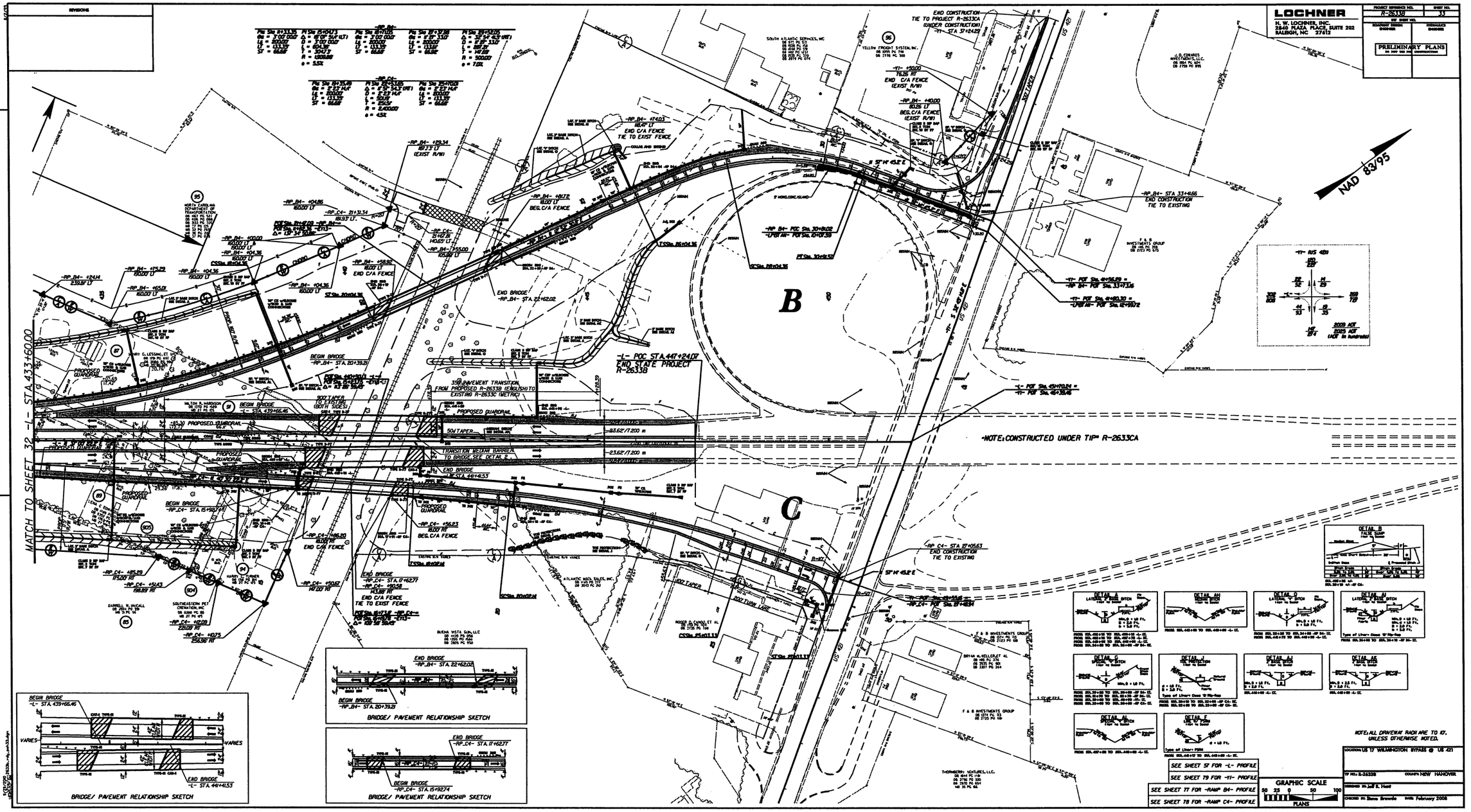
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO. R-2633B
SHEET NO. 33
RW SHEET NO.
ROADWAY DESIGN ENGINEER
STRUCTURE DESIGN ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

REVISIONS



LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

-Y5-
PI Sta 23+29.43
Δ = 22° 31' 21.9" (LT)
D = 2° 43' 42.1"
L = 825.50'
T = 418.15'
R = 2,100.00'
e = 6.0%

T.F. HOLDINGS
LIMITED PARTNERSHIP
DB 987 PG 849
WILL 94E-64

PC Sta. 19+11.28

BEGIN CONSTRUCTION
POT Sta. 10+00.00 -Y5-
-Y5- +00.00
BEGIN WW FENCE
(EXIST R/W)

50' TAPER TO EXIST.

REMOVE

COLLAR AND EXTEND

COLLAR AND EXTEND
REMOVE FES

15:1 TAPER
F+04.43
BEG. TAPER

RETAIN

RETAIN & EXTEND

MEDIAN DITCH
SEE DETAIL E

RETAIN AND EXTEND

COLLAR AND EXTEND
RETAIN AND EXTEND

-Y5- S 63° 23' 26.3" E

US 74-76 28' BST WBL

US 74-76 28' BST EBL

EXIST. 23.21'

EXIST. 26.44'

68' EXISTING

ACCESS POINT

R=35'

RR SIGNAL

18" CMP RETAIN

REMOVE HEADWALL

42" CMP

MONITORING WELL

SP. CUT BASE DITCH
SEE DETAIL AM

REMOVE 16 LF OF 42"

12" GRAVEL

150' TAPER

+50.00

+00.00

880' TURN LANE

CSX RR

CSX

-Y5- +37.00
93.00' RT

-Y5- +00.00
108.00' RT
-Y5- +50.00
108.00' RT

-Y5- +00.00
62.52' RT (EXIST R/W)
& 93.00' RT.

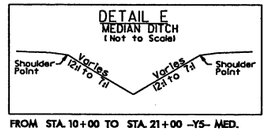
33' MIN. FOR
FUTURE TRACKS
(TYP.)

MATCH TO SHEET 6
-Y5- STA. 20+40.00

MARTIN MARIETTA
MATERIALS, INC.
DB 1064 PG 1104
MB 17 PG 136

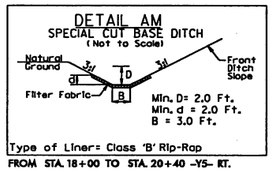
SALISBURY PARTNERS, LLC
DB 2863 PG 9
MB 49 PG 68

DETAIL E
MEDIAN DITCH
(Not to Scale)



FROM STA. 10+00 TO STA. 21+00 -Y5- MED.

DETAIL AM
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

FROM STA. 18+00 TO STA. 20+40 -Y5- RT.

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

SEE SHEETS 58 & 59 FOR -Y5- PROFILE

REVISIONS

R/W REVISION: 10/ /09 - NAME AND DEED CHANGE ON PARCEL 1. ADDED PARCEL 1A

8/17/99

9/29/2009
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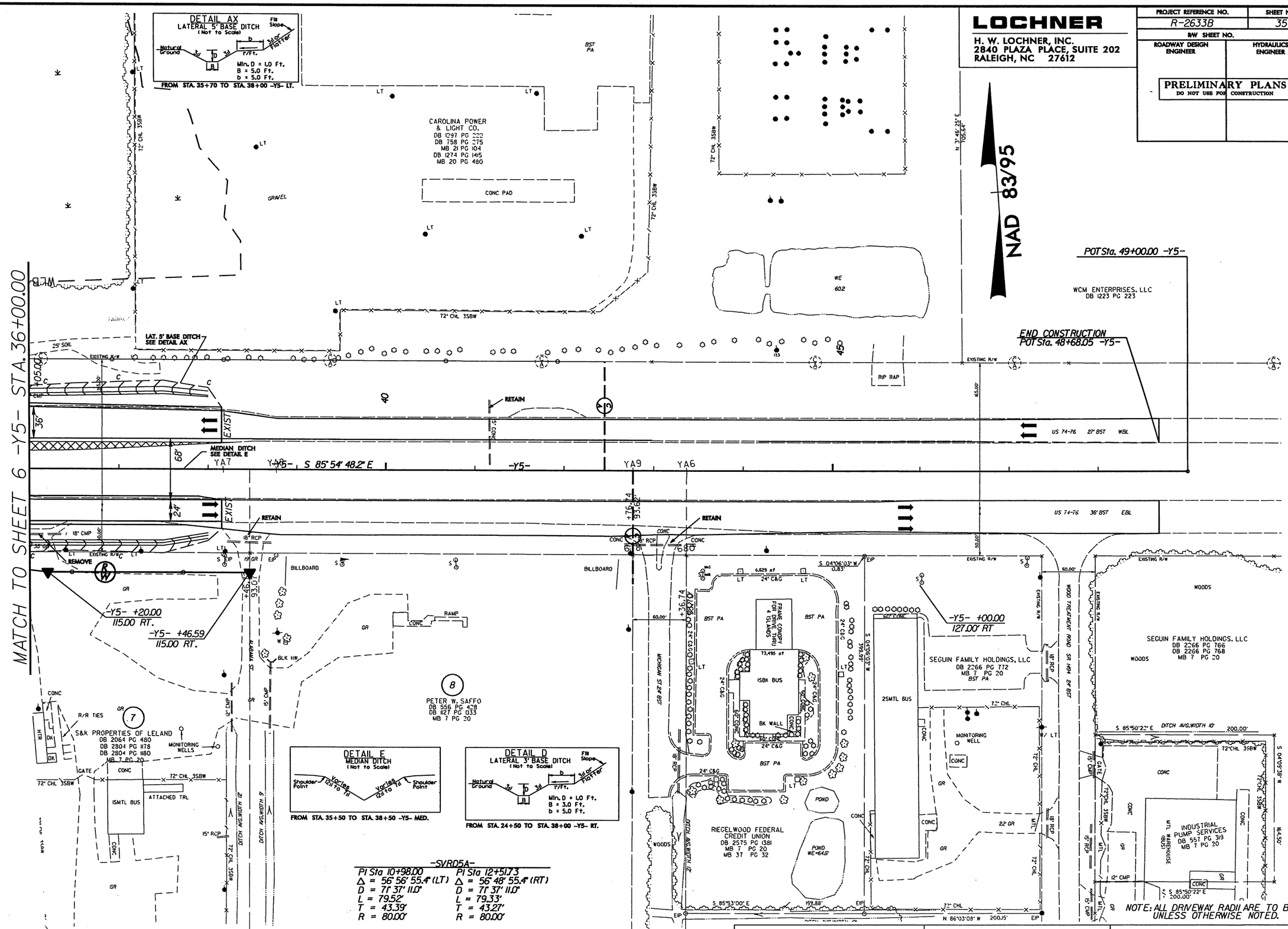
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95



SEE SHEET 62 FOR -SVRD5A- PROFILE | SEE SHEET 62 FOR -SVRD5- PROFILE | SEE SHEETS 58 & 59 FOR -Y5- PROFILE

REVISIONS

R/W REVISION: 10/ 09 - ELIMINATED PARCEL 6 AND TCE. NAME AND DDED CHANGE ON PARCEL 7. ELIMINATED ALABAMA ST. AND CHANGED PROPERTY LINE.
ELIMINATED PARCELS 9 AND 9A.

8/17/99

9/29/2010
10:10:51 AM
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LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

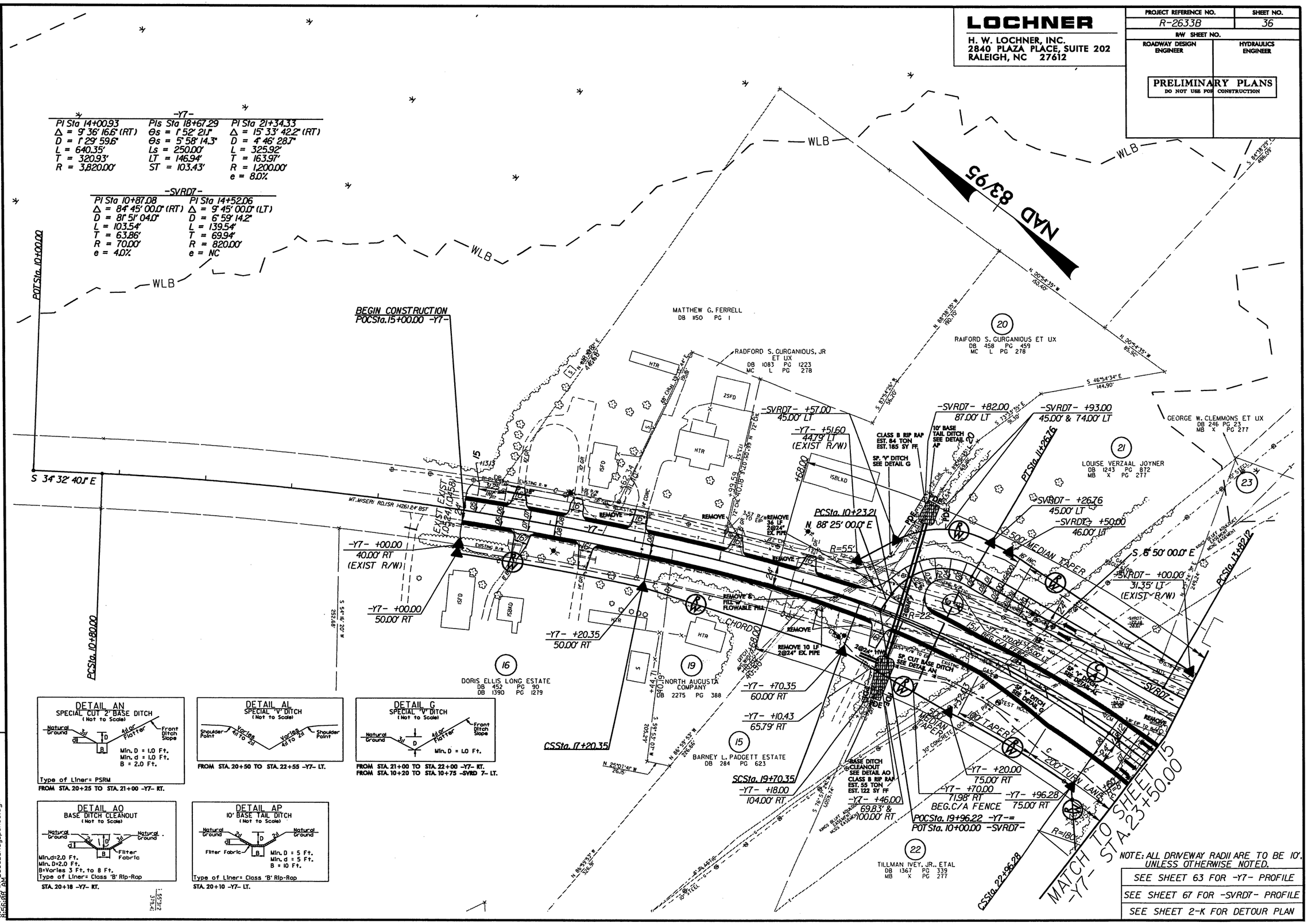
R/W Revision: September 11, 2008. Revised R/W on Parcels 15, 19, & 23 to cover driveway pipes. -Y7- Sta. 17+20.35 (Rt) to 21+20 (Rt).
R/W Revision: September 17, 2008. Added r/w offset label at -Y7- Sta. 20+46 69.83' RT.
R/W REVISION: 10/ /09 NAME AND DEED CORRECTION ON PARCEL 22. EXTENDED PDE TO INCLUDE PIPE ON PARCEL 15. CHANGED NAME ON PARCEL 16.
R/W REVISION: 10/ /09 REMOVED PARCELS 17 AND 18 - NO CLAIM. NAME AND DEED CHANGE ON PARCEL 19.

-Y7-

PI Sta 14+00.93	Pls Sta 18+67.29	PI Sta 21+34.33
Δ = 9° 36' 16.6" (RT)	Θs = 1° 52' 21.1"	Δ = 15° 33' 42.2" (RT)
D = 1° 29' 59.6"	Θs = 5° 58' 14.3"	D = 4° 46' 28.7"
L = 640.35'	Ls = 250.00'	L = 325.92'
T = 320.93'	LT = 146.94'	T = 163.97'
R = 3,820.00'	ST = 103.43'	R = 1,200.00'
		e = 8.0%

-SVRD7-

PI Sta 10+87.08	PI Sta 14+52.06
Δ = 84° 45' 00.0" (RT)	Δ = 9° 45' 00.0" (LT)
D = 81° 51' 04.0"	D = 6° 59' 14.2"
L = 103.54'	L = 139.54'
T = 63.86'	T = 69.94'
R = 70.00'	R = 820.00'
e = 4.0%	e = NC



DETAIL AN
SPECIAL CUT 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, d, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D = 1.0 Ft.
Min. d = 1.0 Ft.
B = 2.0 Ft.
Type of Liner= PSRM
FROM STA. 20+25 TO STA. 21+00 -Y7- RT.

DETAIL AL
SPECIAL "V" DITCH
(Not to Scale)
Shoulder Point, Varies 4:1 to 2:1, Varies 4:1 to 2:1, Shoulder Point
FROM STA. 20+50 TO STA. 22+55 -Y7- LT.

DETAIL G
SPECIAL "V" DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D = 1.0 Ft.
FROM STA. 21+00 TO STA. 22+00 -Y7- RT.
FROM STA. 10+20 TO STA. 10+75 -SVRD 7- LT.

DETAIL AO
BASE DITCH CLEANOUT
(Not to Scale)
Natural Ground, 2:1, d, D, B, 3:1, Natural Ground, Filter Fabric
Min. d=2.0 Ft.
Min. D=2.0 Ft.
B=Varies 3 Ft. to 8 Ft.
Type of Liner= Class 'B' Rip-Rap
STA. 20+18 -Y7- RT.

DETAIL AP
10' BASE TAIL DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, B, 2:1, Natural Ground, Filter Fabric
Min. D = 5 Ft.
Min. d = 5 Ft.
B = 10 Ft.
Type of Liner= Class 'B' Rip-Rap
STA. 20+10 -Y7- LT.

9/29/2010
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8/17/99

REVISIONS

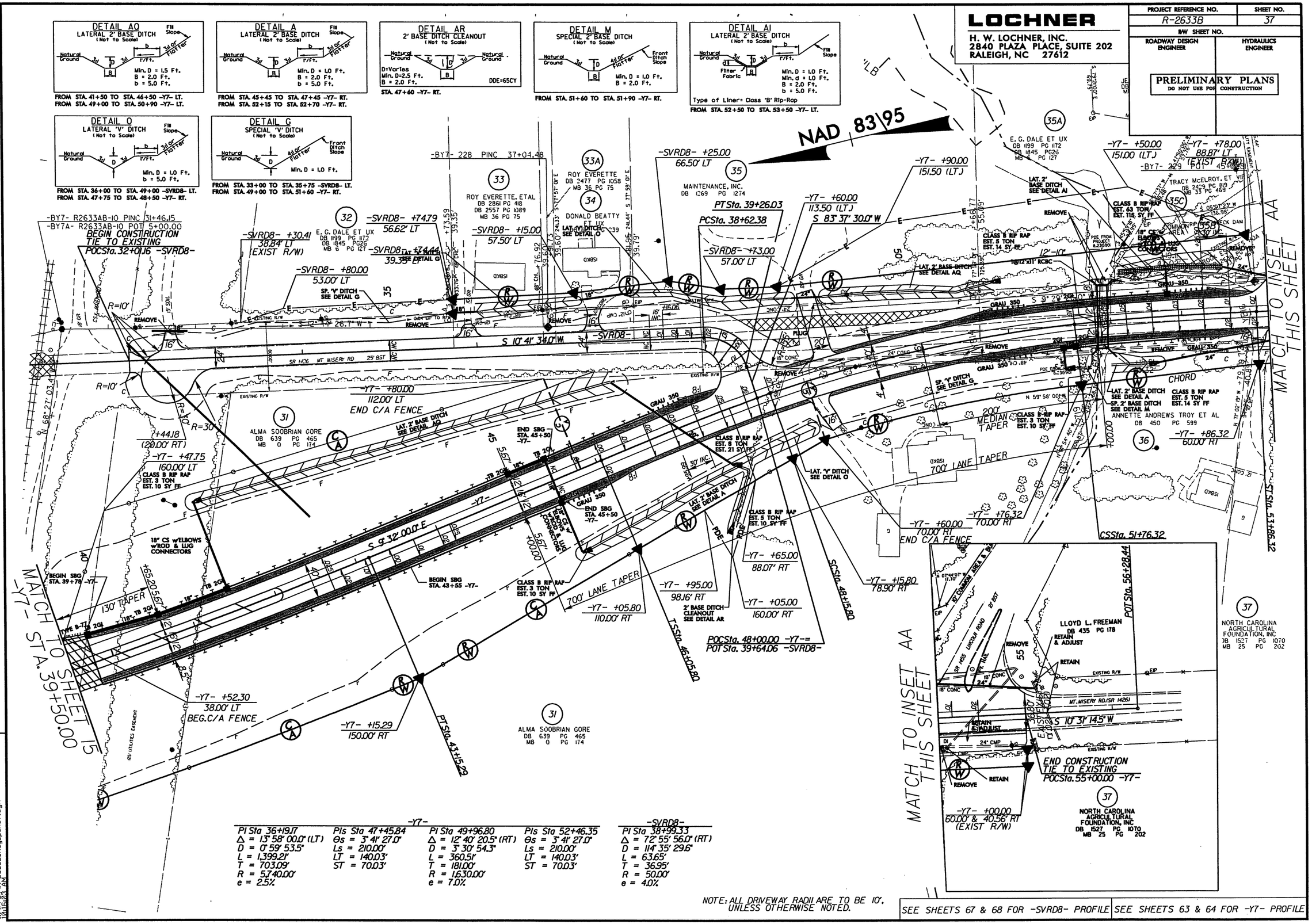
R/W REVISION:10/ /09 - LABELED PDE ON PARCEL 31. NAME AND DEED CHANGE ON PARCEL 33. ADDED NEW PARCEL 33A. ADDED NEW PARCEL AND PROPERTY LINE PARCEL 33A,35B,AND 35C. MOVED CLU-DE-SAC FROM STA 31+50 TO 32+44.8 -SRVD8-

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y7-			
PI Sta 36+19.17	PIs Sta 47+45.84	PI Sta 49+96.80	PIs Sta 52+46.35
Δ = 13° 58' 00.0" (LT)	θs = 3° 41' 27.0"	Δ = 12° 40' 20.5" (RT)	θs = 3° 41' 27.0"
D = 0° 59' 53.5"	Ls = 210.00'	D = 3° 30' 54.3"	Ls = 210.00'
L = 1,399.21'	LT = 140.03'	L = 360.51'	LT = 140.03'
T = 703.09'	ST = 70.03'	T = 181.00'	ST = 70.03'
R = 5,740.00'		R = 1,630.00'	
e = 2.5%		e = 7.0%	

-SVRD8-
PI Sta 38+99.33
Δ = 72° 55' 56.0" (RT)
D = 114° 35' 29.6"
L = 63.65'
T = 36.95'
R = 50.00'
e = 4.0%

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

SEE SHEETS 67 & 68 FOR -SVRD8- PROFILE

SEE SHEETS 63 & 64 FOR -Y7- PROFILE

9/29/2010
10:16:21 AM
R-2633B_Rdy_psh37.dgn

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

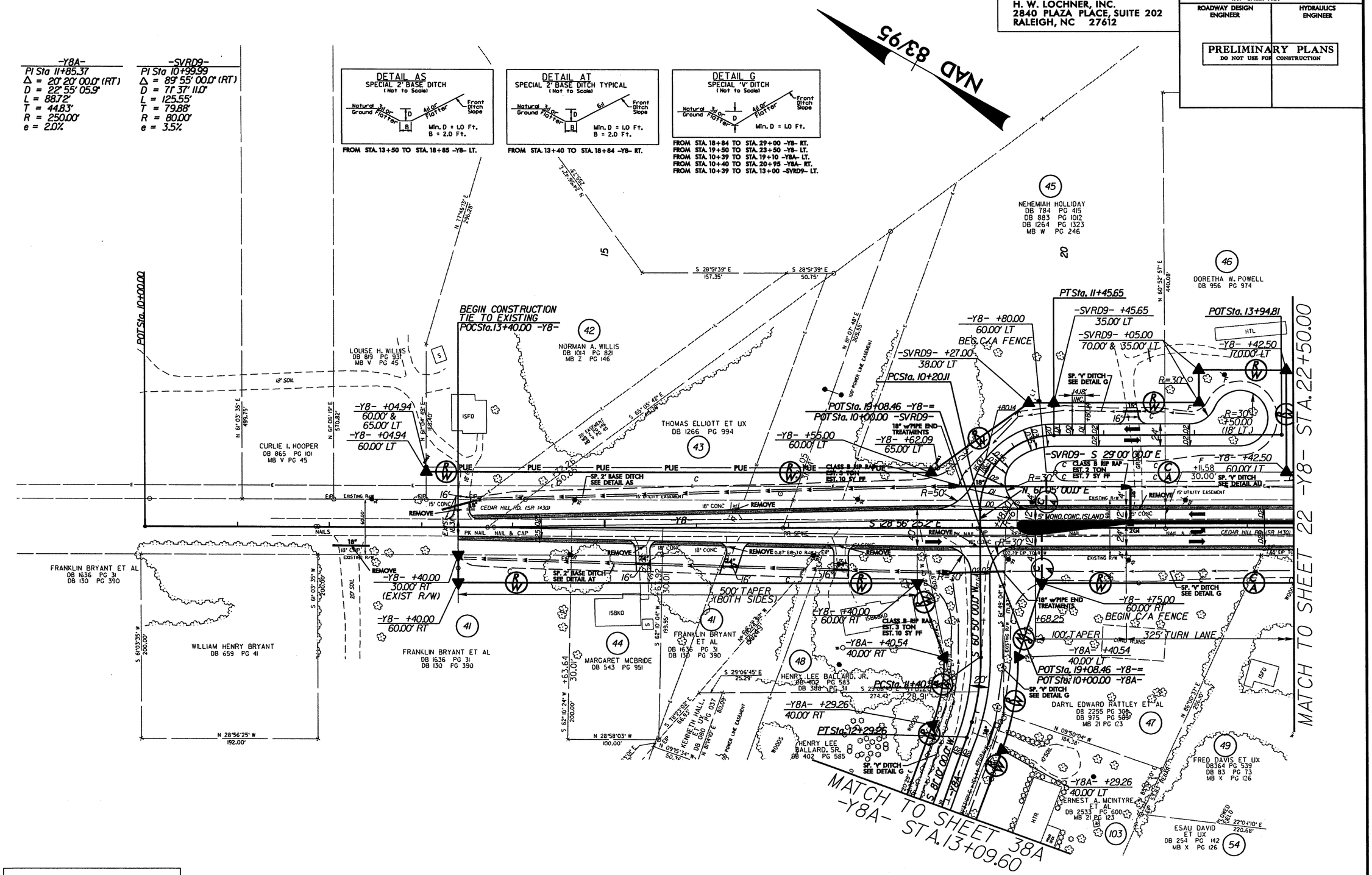
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

R/W Revision: September 17, 2008, Removed r/w label at -Y8- Sta. 13+60 60' LT.
R/W Revision: September 17, 2008, Revised r/w limits & labels at -Y8A- due to new drainage ditches.
R/W Revision: November 10, 2008, Added permanent utility limits & labels at -Y8- Sta. 18+62.09.



SEE SHEET 68 FOR -Y8- PROFILE
SEE SHEET 76 FOR -Y8A- PROFILE
SEE SHEET 75 FOR -SVRD9- PROFILE

NOTE: ALL DRIVEWAY RADII ARE TO 10', UNLESS OTHERWISE NOTED.

9/29/2010
10:17:19 AM
r2633b_r-dy_psh38.dgn

8/17/99

REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	38A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

DETAIL G
SPECIAL 'V' DITCH
(Not to Scale)

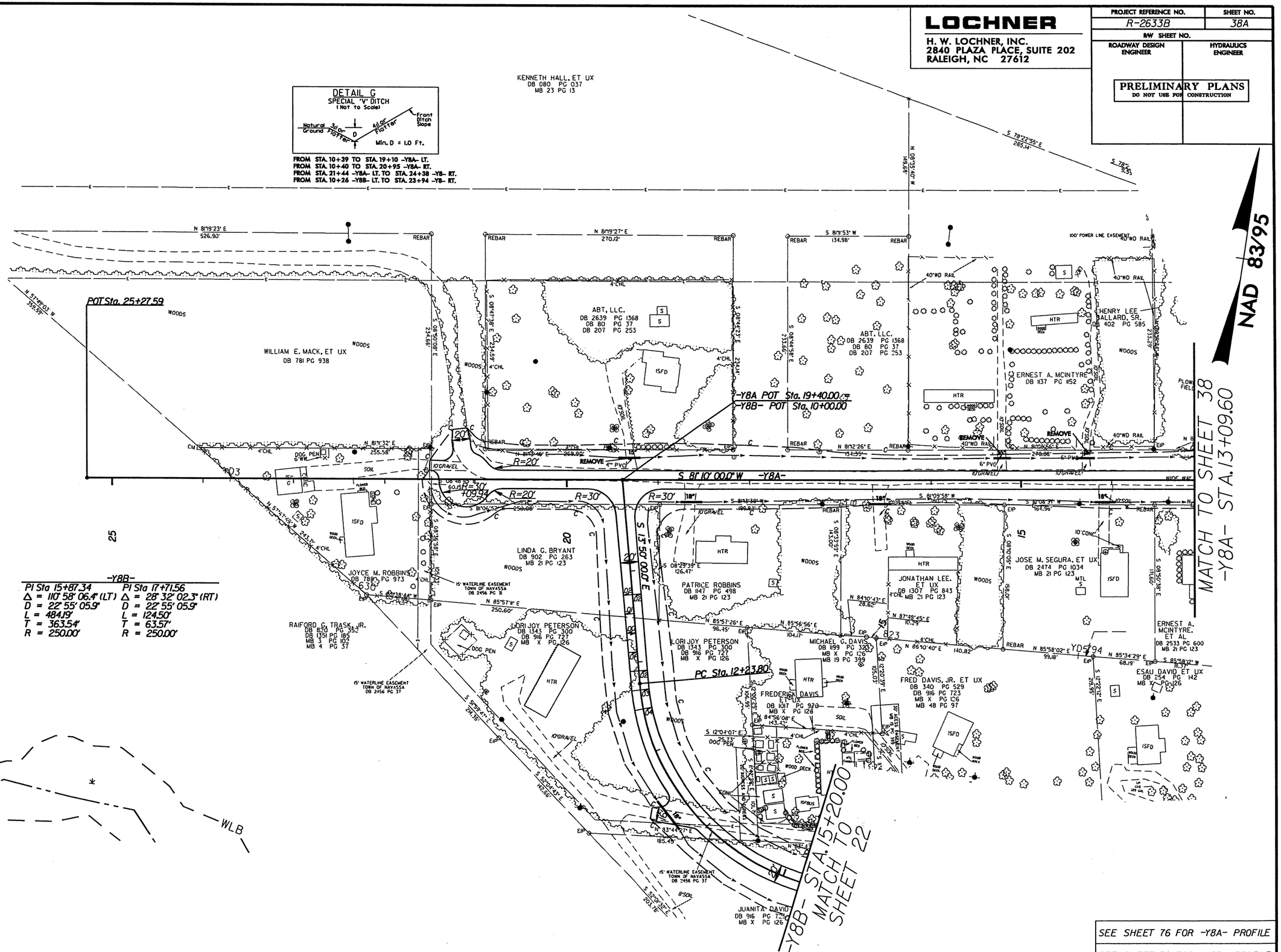
Natural Ground, Slope Flatter, D, 4:1 or Flatter, Front Ditch Slope

Min. D = 1.0 Ft.

FROM STA. 10+39 TO STA. 19+10 -Y8A- LT.
FROM STA. 10+40 TO STA. 20+95 -Y8A- RT.
FROM STA. 21+44 -Y8A- LT. TO STA. 24+38 -Y8- RT.
FROM STA. 10+26 -Y8B- LT. TO STA. 23+94 -Y8- RT.

-Y8B-

PI Sta 15+87.34	PI Sta 17+71.56
Δ = 110° 58' 06.4" (LT)	Δ = 28° 32' 02.3" (RT)
D = 22° 55' 05.9"	D = 22° 55' 05.9"
L = 484.19'	L = 124.50'
T = 363.54'	T = 63.57'
R = 250.00'	R = 250.00'



SEE SHEET 76 FOR -Y8A- PROFILE

SEE SHEET 76 FOR -Y8B- PROFILE

9/28/2000
10:13:31 AM
r2633b_rdy_psh38a.dgn

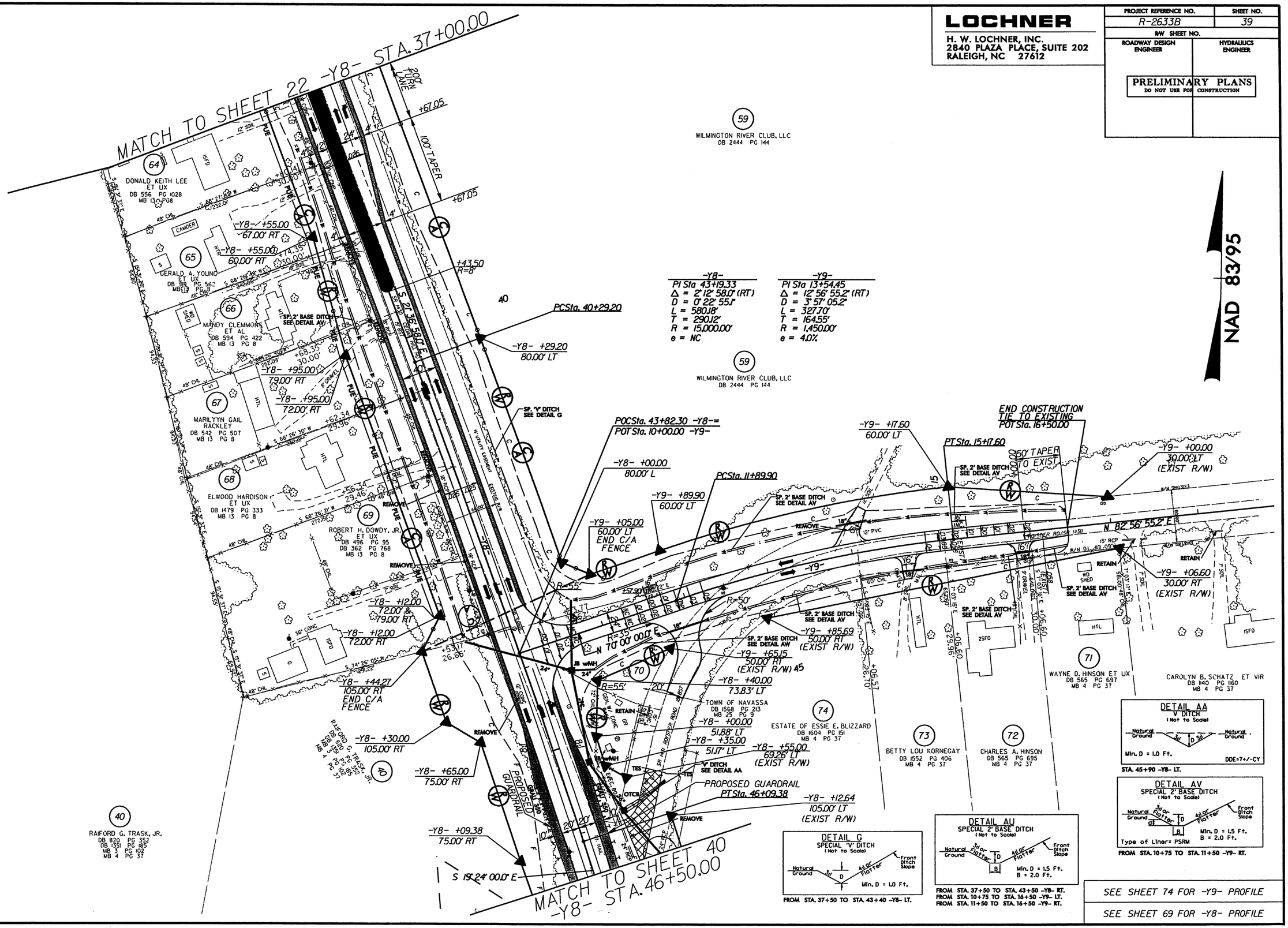
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

REVISIONS
8/17/99
R/W Revision September 17, 2008. Revised r/w label from -Y6- to -Y9- at Sta.12+85.69 50' RT & Sta.17+06.60 30' RT.
R/W Revision September 17, 2008. Removed -SVRDIO- along with the r/w and monuments for the alignment.
R/W Revision October 28, 2008. Added permanent utility limits & labels at -Y8- Sta.36+07.99 to Sta.43+19.00.
R/W REVISION 10/ /09 - ON PARCEL 69 MOVED MONUMENT TO +12.00. ENDED PUE AT INTERSECTION OF NEW R/W LINE. MOVED C/A TO PROPERTY LINE MONUMENT.



9/29/2010
11:37:29 AM R-2633b_rdy_psh39.dgn

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

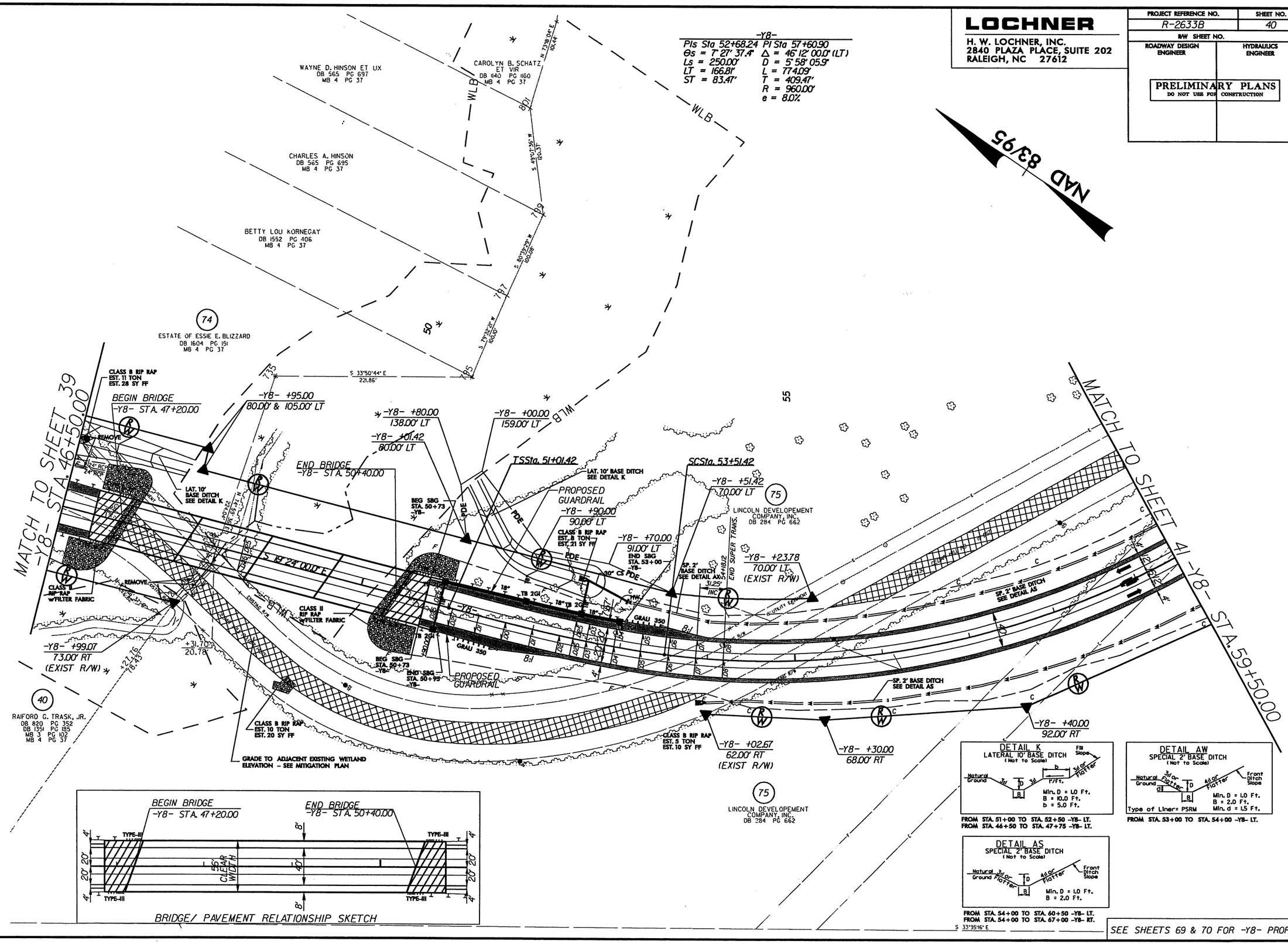
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

R/W REVISION: 10/30/09 - ADDED PARCEL 75 LINCOLN DEVELOPMENT.
R/W REVISION: 02/11/10 - REVISED R/W ON PARCELS 74 AND 75 TO ACCOMIDATE WORK BRIDGE ALONG PROPOSED STRUCTURE.

8/17/99



SEE SHEETS 69 & 70 FOR -Y8- PROFILE

9/29/2010
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8/17/99

REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

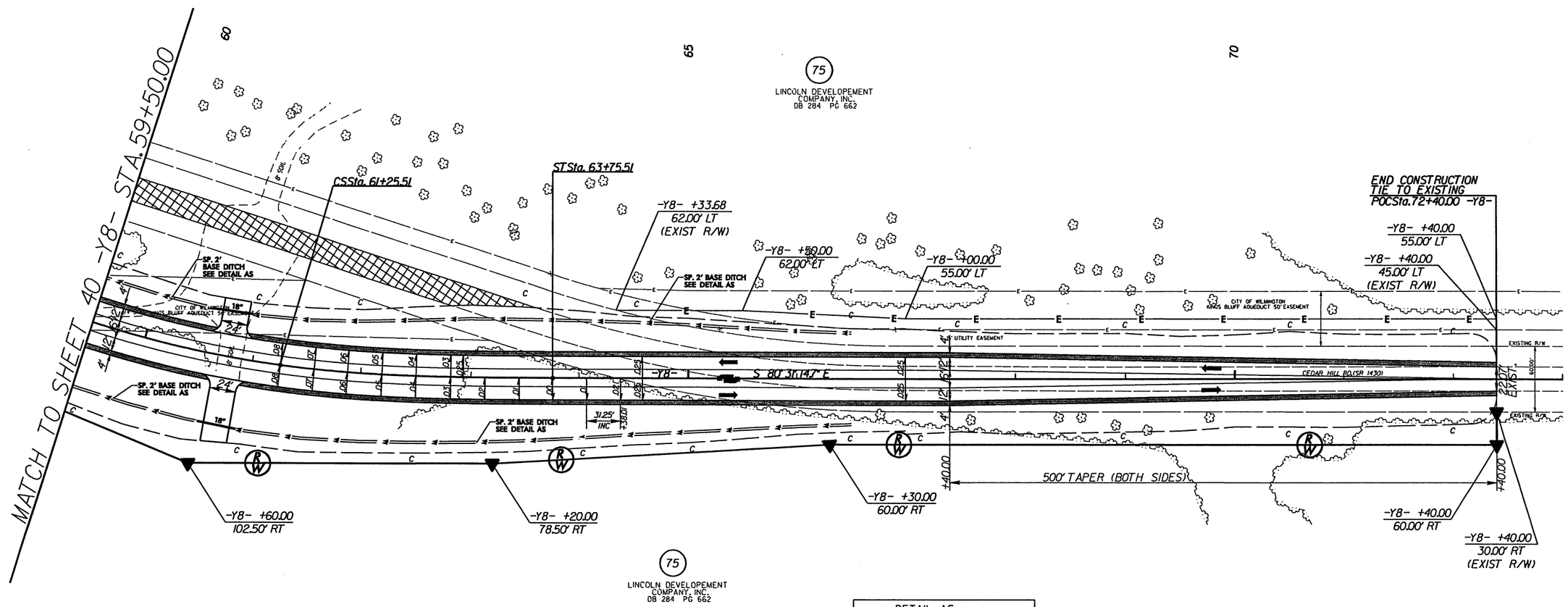
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

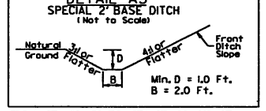
NAD 83/95

-Y8-

PI Sta 57+60.90	PIs Sta 62+08.98
Δ = 46° 12' 00.0" (LT)	Θs = 7° 27' 37.4"
D = 5° 58' 05.9"	Ls = 250.00'
L = 774.09'	LT = 166.81'
T = 409.47'	ST = 83.47'
R = 960.00'	



DETAIL AS
SPECIAL 2' BASE DITCH
(Not to Scale)



FROM STA. 60+50 TO STA. 67+00 -Y8- LT.
FROM STA. 54+00 TO STA. 67+00 -Y8- RT.

SEE SHEET 70 FOR -Y8- PROFILE

9/28/2010
kfr:SUR-26338_Rdy_psh41.dgn
10:26:00 AM