



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

August 31, 2010

U. S. Army Corps of Engineers
Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. Andrew Williams
NCDOT Division 7 Coordinator

SUBJECT: **Application for Section 404 Individual Permit and Section 401 Individual Water Quality Certification** for the proposed widening of U.S. 29 Business (Freeway Drive) from SR 2670 (South Scales Street) to NC 14 in Reidsville, Rockingham County, Division 7. Federal Aid Project No. STP-29B (1), State Project No. 8.1511901, WBS Element No. 34924.1.1, T.I.P. Project No. U-3326 A and B.

Debit \$570.00 from WBS Element No. 34924.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to widen and improve U.S. 29 Business (Freeway Drive) from a two-lane facility to a multi-lane facility from SR 2670 (South Scales Street) to NC 14 in Reidsville, Rockingham County, North Carolina. Section A of this project begins at South Scales Street and terminates at SR 2686 (Richardson Drive). Section B begins at Richardson Drive and ends at NC 14. Sections A and B have been combined and will let as a single project. This project is in final design. In addition to this cover letter, the application package for this project consists of the ENG Form 4345, North Carolina Ecosystem Enhancement Program (NCEEP) acceptance letter, Stormwater Management Plan, Interagency Hydraulic Design Review meeting minutes for Concurrence Points 4B and 4C, Final Indirect and Cumulative Impact Assessment (September 2005), Roanoke logperch survey report, permit drawings, and half-size roadway plan sheets.

Project Schedule

This project calls for a review date of August 2, 2011 and a letting date of September 20, 2011. However, these let dates may advance as additional funds become available.

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

TELEPHONE: 919-431-2000
FAX: 919-431-2001
WEBSITE: WWW.NCDOT.ORG

PHYSICAL ADDRESS:
4701 ATLANTIC AVE.
SUITE 116
RALEIGH, NC 27604

Purpose and Need

The purpose of this project is to increase the traffic carrying capacity and level of service for U.S. 29 Business.

Summary of Impacts

This project lies within the Piedmont Physiographic Province in both the Cape Fear River Basin (Hydrologic Unit Code [HUC] 03030002, Sub-Basin 03-06-01) and the Roanoke River Basin (HUC 03010103, Sub-Basin 03-02-03). This project will result in 2,610 linear feet of permanent stream impacts, with 854 linear feet located in HUC 03030002 and 1,756 linear feet located in HUC 03010103. Of the 2,610 feet of permanent stream impacts, 228 linear feet will result from bank stabilization activities (40 feet in HUC 03030002, 188 feet in HUC 03010103). Additionally, a total of 493 linear feet (0.08 acres) of temporary stream impacts will result from this project, with 188 linear feet in HUC 03030002 and 305 linear feet in HUC 03010103. There will be also be less than 0.01 acres of riparian wetland impacts due to permanent fill (in HUC 03030002) and less than 0.01 acres of riparian wetland impacts resulting from mechanized clearing (0.002 acres in HUC 03030002 and 0.004 acres in HUC 03010103). No impacts to jurisdictional resources will occur due to the relocation or installation of utilities in the project area.

Summary of Mitigation

Throughout the design and National Environmental Policy Act (NEPA) process, this project has been designed to avoid and minimize impacts to jurisdictional areas. NCEEP will provide mitigation as required for 2,242 linear feet of permanent stream impacts resulting from the proposed project (535 linear feet in HUC 03030002, 1,707 linear feet in HUC 03010103). Of the remaining 368 linear feet of permanent stream impacts, 279 linear feet occur in streams deemed Unimportant by the U.S. Army Corps of Engineers (USACE) and require no mitigation (all in HUC 03030002). The remaining 89 linear feet not being mitigated for are comprised of bank stabilization activities that occur in streams where total impacts (permanent impacts plus bank stabilization) do not exceed 150 linear feet (40 feet in HUC 03030002, 49 feet in HUC 03010103). No mitigation is proposed for bank stabilization impacts in these instances. Due to the minimal amount of permanent (and overall) impact, NCDOT does not propose mitigation for either the less than 0.01 acres of permanent riparian wetland impacts resulting from roadway fill or the less than 0.01 acres of permanent riparian wetland impacts resulting from mechanized clearing.

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was approved in February 2006. A Finding of No Significant Impact (FONSI) was approved in July 2007. A Right of Way (ROW) Consultation was completed and distributed in June 2008. All documents have been provided to regulatory review agencies. Additional copies will be provided upon request.

INDEPENDENT UTILITY

The subject project is in compliance 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 delineations within the U-3326 A and B construction footprint followed the field delineation method outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987). Stream identification and classification followed the *Identification Methods for the Origins of Intermittent and Perennial Streams* (North Carolina Division of Water Quality [NCDWQ]).

Within the U-3326 A and B construction footprint, 19 streams and three wetlands were identified. Jurisdictional areas were initially verified by USACE Regulatory Specialist John Thomas on January 5, 2004 (USACE Action ID No. 200420400). Jurisdictional features were re-verified by USACE Regulatory Specialist Andy Williams and NCDWQ representative Amy Euliss on December 10, 2008. Written verification was received from Ms. Euliss on December 11, 2008. A request packet for an Approved Jurisdictional Determination (JD) was submitted to Mr. Williams on August 5, 2010.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in both the Cape Fear and Roanoke River Basins in Rockingham County. The portion in the Cape Fear Basin is within HUC 03030002, while the portion in the Roanoke Basin is part of HUC 03010103. A total of 18 jurisdictional streams will be impacted by this project. These include three unnamed tributaries (UT) to Troublesome Creek – Lake Reidsville, Little Troublesome Creek and one UT, and thirteen UTs to Wolf Island Creek. Additionally, three riparian wetlands will be impacted by the project.

There are no designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply II (WS-II) waters within 1.0 mile of the project area. One stream within 1.0 mile of the project, Little Troublesome Creek (Stream 13), is listed on the 2010 Draft 303(d) List of Impaired Waters. This stream flows through the construction footprint and is listed for impairment to biological integrity.

Surface Waters

Surface water impacts for U-3326 A and B include 2,610 linear feet of permanent stream impacts, with 854 linear feet located in HUC 03030002 and 1,756 linear feet located in HUC 03010103. Additionally, 493 linear feet of temporary stream impacts will result from this project, with 188 linear feet in HUC 03030002 and 305 linear feet in HUC 03010103. Jurisdictional stream impacts are summarized below in Tables 1 and 2.

Table 1. Impacts to jurisdictional streams in HUC 03030002, Cape Fear River Basin

Site No.	Stream ID ^a	Stream Name	NCDWQ Classification	NCDWQ Index No.	Stream Designation	Impact Type	Impact Length (lin. ft.)	Proposed Mitigation Ratio	Mitigation Required (lin. ft.)
1	Stream (Str.)15	UT to TC-LR ^b	WS-III NSW CA	16-6-(0.7)	P ^d	Perm. Fill	74	2:1	148
						Bank Stabilization	23	N/A ^f	0
						Temp. Fill	67	--	--
1A	Str. 16	UT to TC-LR	WS-III NSW CA	16-6-(0.7)	I ^e	Perm. Fill	43	0 ^g	0
2	Str. 18	UT to TC-LR	WS-III NSW CA	16-6-(0.7)	I	Perm. Fill	71	0 ^g	0
						Temp. Fill	12	--	--
3	Str. 18	UT to TC-LR	WS-III NSW CA	16-6-(0.7)	I	Perm. Fill	51	0 ^g	0
4	Str. 18	UT to TC-LR	WS-III NSW CA	16-6-(0.7)	I	Perm. Fill	114	0 ^g	0
						Temp. Fill	18	--	--
5	Str. 14	UT to LTC ^c	C NSW	16-7	P	Perm. Fill	406	2:1	812
						Temp. Fill	64	--	--
6	Str. 13	LTC	C NSW	16-7	P	Perm. Fill	55	2:1	110
						Bank Stabilization	17	N/A ^f	0
						Temp. Fill	27	--	--
Permanent Impacts at 2:1 mitigation:							535		1,070
Permanent Impacts at 1:1 mitigation (per USACE):							0		0
Permanent Impacts at 1:1 mitigation (bank stabilization):							0		0
Permanent Impacts at no mitigation (bank stabilization):							40		0
Permanent Impacts at no mitigation (per USACE):							279		0
Total Permanent Impacts:							854		1,070
Total Temporary Impacts:							188		--

^a All stream IDs were initially used in the EA and have stayed consistent throughout the life of the project.

^b TC-LR –Troublesome Creek – Lake Reidsville

^c LTC – Little Troublesome Creek

^d P – Perennial

^e I – Intermittent

^f Bank stabilization impacts listed as “N/A” occur on streams where the total impact (permanent stream impacts plus bank stabilization impact) does not equal or exceed 150 linear feet. No mitigation is required in these instances.

^g Streams with a mitigation ratio of “0” were deemed unimportant by the USACE and do not require mitigation.

Table 2. Impacts to jurisdictional streams in HUC 03010103, Roanoke River Basin

Site No.	Stream ID ^a	Stream Name	NCDWQ Classification	NCDWQ Index No.	Stream Designation	Impact Type	Impact Length (lin. ft.)	Proposed Mitigation Ratio	Mitigation Required (lin. ft.)
7	Str. 12	UT to WIC ^b	C	22-48	P ^c	Perm. Fill	202	2:1	404
						Bank Stabilization	10	1:1 ^e	10
						Temp. Fill	7	--	--
8	Str. 11	UT to WIC	C	22-48	I ^d	Perm. Fill	45	1:1 ^f	45
						Bank Stabilization	11	N/A ^g	0
						Temp. Fill	31	--	--
9	Str. 10	UT to WIC	C	22-48	P	Perm. Fill	117	2:1	234
						Temp. Fill	20	--	--
10	Str. 8	UT to WIC	C	22-48	P	Perm. Fill	117	2:1	234
						Bank Stabilization	44	1:1 ^e	44
						Temp. Fill	56	--	--
11	Str. 9	UT to WIC	C	22-48	P	Perm. Fill	75	2:1	150
						Temp. Fill	11	--	--
12	Str. 7	UT to WIC	C	22-48	P	Perm. Fill	90	2:1	180
						Bank Stabilization	85	1:1 ^e	85
						Temp. Fill	33	--	--
13	Str. 6	UT to WIC	C	22-48	I	Perm. Fill	194	1:1 ^f	194
						Temp. Fill	21	--	--
14	Str. 4	UT to WIC	C	22-48	P	Perm. Fill	165	2:1	330
						Temp. Fill	12	--	--
15A	Str. 5 (Upstr of Culvert)	UT to WIC	C	22-48	I	Perm. Fill	66	1:1 ^f	66
						Temp. Fill	7	--	--
15B	Str. 5 (Downstr of Culvert)	UT to WIC	C	22-48	P	Perm. Fill	207	2:1	414
						Temp. Fill	17	--	--
15C	Str. 17	UT to WIC	C	22-48	I	Perm. Fill	90	1:1 ^f	90
16	Str. 3	UT to WIC	C	22-48	I	Perm. Fill	4	1:1 ^f	4
						Temp. Fill	10	--	--

Table 2 (cont'd.)

Site No.	Stream ID	Stream Name	NCDWQ Classification	NCDWQ Index No.	Stream Designation	Impact Type	Impact Length (lin. ft.)	Proposed Mitigation Ratio	Mitigation Required (lin. ft.)
17	Str. 2	UT to WIC	C	22-48	P	Perm. Fill	75	2:1	150
						Bank Stabilization	20	N/A ^g	0
						Temp. Fill	38	--	--
18	Str. 1	UT to WIC	C	22-48	P	Perm. Fill	121	2:1	242
						Bank Stabilization	18	N/A ^g	0
						Temp. Fill	42	--	--
Permanent Impacts at 2:1 mitigation:							1,169		2,338
Permanent Impacts at 1:1 mitigation (per USACE):							399		399
Permanent Impacts at 1:1 mitigation (bank stabilization):							139		139
Permanent Impacts at no mitigation (bank stabilization):							49		0
Permanent Impacts at no mitigation (per USACE):							0		0
Total Permanent Impacts:							1,756		2,876
Total Temporary Impacts:							305		--

^a All stream IDs were initially used in the EA and have stayed consistent throughout the life of the project.

^b WIC – Wolf Island Creek

^c P – Perennial

^d I – Intermittent

^e 1:1 mitigation for bank stabilization is required by NCDWQ for all sites where total permanent impact (permanent stream impacts plus bank stabilization) equals or exceeds 150 linear feet.

^f A 1:1 mitigation ratio was assigned to these features by the USACE.

^g Bank stabilization impacts listed as “N/A” occur on streams where the total impact (permanent stream impacts plus bank stabilization impact) does not equal or exceed 150 linear feet. No mitigation is required in these instances.

Wetlands

There will be a total of 0.001 acres of riparian wetland impacts due to permanent fill (in HUC 03030002) and 0.006 acres of riparian wetland impacts resulting from mechanized clearing (0.002 acres in HUC 03030002 and 0.004 acres in HUC 03010103). Wetland impacts are summarized below in Table 3.

Table 3. Permanent impacts to jurisdictional wetlands for U-3326 A and B

Site	Wetland ID	HUC	Impact Type	Permanent Impacts (acres)	Proposed Mitigation Ratio	Mitigation Required (acres)
6	Wetlands 2 and 3	03030002	Permanent Fill	0.001	0	0
			Mechanized Clearing	0.002		
9	Wetland 1	03010103	Mechanized Clearing	0.004	0	0
Total:				0.007		0

FEDERALLY PROTECTED SPECIES

Plants and animals with a Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended. As of January 31, 2008 the U.S. Fish and Wildlife Service (USFWS) lists three federally protected species for Rockingham County: Roanoke logperch (*Percina rex*), James spinymussel (*Pleurobema collina*), and smooth coneflower (*Echinacea laevigata*). A biological conclusion of "No Effect" was stated in the EA for both the James spinymussel and smooth coneflower and remains valid. A species description and biological conclusion for the Roanoke logperch were not stated in either the EA or FONSI because the species was not added to the USFWS county list of protected species until after both documents were completed. A survey by NCDOT biologists Neil Medlin, Jared Gray, Heather Renninger, and Matt Haney was performed on May 1, 2008 and a biological conclusion of "No Effect" was rendered. See attached survey report. A search of the North Carolina Natural Heritage Database (NCNHP; updated July 2010) revealed no known occurrences of any federally protected species within 1.0 mile of the project limits.

CULTURAL RESOURCES

The North Carolina Department of Cultural Resources, State Historic Preservation Office (HPO) conducted a review of the project and, in a letter dated December 13, 2001, stated that no archaeological investigation would be required for this project. This letter can be found in Appendix 3 of the EA.

A Historic Effects Meeting between NCDOT, HPO, and FHWA was held on September 13, 2005 concerning properties in the project vicinity that are either 1) listed on or 2) eligible to be nominated for listing to the National Register of Historic Places (NRHP). It was concluded that this project would either have no effect or no adverse effect on any of the applicable properties within the project vicinity. Subsequent to this meeting, it was reported that a mostly unmarked cemetery was identified within the project vicinity near the interchange between South Scales Street and U.S 29 Business. However, it has since been determined that this site will not be impacted by the project.

FEMA COMPLIANCE

There are streams within the project limits that are within Federal Emergency Management Agency (FEMA)-designated flood zones. Coordination between the NCDOT Hydraulics Unit and FEMA will occur prior to Let to ensure that NCDOT is in full compliance with applicable floodplain ordinances.

UTILITY IMPACTS

No jurisdictional impacts will occur due to the removal or relocation of utilities.

INDIRECT AND CUMULATIVE EFFECTS

A Final Indirect and Cumulative Impact (ICI) Assessment report was completed in September 2005. Additional copies of the report will be provided upon request. The findings of this report are summarized below:

“The purpose of this project is to increase the traffic carrying capacity and level of service for US 29 Business (Freeway Drive). The need is based on the current facility operating near capacity. It is anticipated that the facility’s current capacity will be exceeded by 18,000 vehicles in the 2025 design year.”

The Freedom Drive Corridor Plan indicates that the roadway will inevitably continue to experience commercial and, to a lesser degree, industrial development in the future, with or without the proposed project. The ability to add additional capacity to Freeway Drive will be paramount in effectively moving traffic and in supporting not only the current development trends but anticipated development along this roadway.

Other projects within a portion of or in close proximity to the ICI Study Area, including the development of the Reidsville Industrial Park and the Southern Connector, have contributed to the traffic congestion as well as the increase of heavy duty trucks along Freeway Drive and the need for improved transportation capacity.

Potential water quality impacts from anticipated development or redevelopment will be limited through the application of permitting requirements, zoning ordinances, and water supply watershed protection ordinances, as well as Best Management Practices (BMPs) as required and enforced by the City of Reidsville. The majority of Freeway Drive south of US 158 is in the Troublesome Creek watershed. Development in this watershed has increased impervious surface limits and requires a Watershed Control Plan.

WILD AND SCENIC RIVERS

This project will not impact any designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended) or North Carolina Natural and Scenic Rivers.

ESSENTIAL FISH HABITAT

The project will not impact any essential fish habitat afforded protection under the Magnuson-Stevens Act of 1996 (16 U.S.C 1801 *et seq.*).

MITIGATION OPTIONS

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the waters of the United States. CEQ has defined

mitigation of wetland and surface water impacts to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20).

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning phase and minimization measures were incorporated as part of the project design. Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts.

Avoidance and Minimization

Avoidance and minimization has been employed in the project area to the maximum extent practicable. The following measures were implemented for the project:

- NCDOT's BMPs for the Protection of Surface Waters will be enforced
- Jurisdictional impacts associated with this project are lower than what was estimated in both the EA and FONSI (see FONSI, page 12, Table 2). The EA estimated 2,744 linear feet of stream impact and the FONSI estimated 3,074 linear feet. The current permanent impact total is 2,610 linear feet. Additionally, both the EA and FONSI estimated 0.02 acres of permanent wetland impacts. The project will only impact less than 0.01 acres
- As stated in the FONSI (page 8, last paragraph), prior to Concurrence Point (CP) 4A, interchange ramp and loop footprints were reduced to minimize jurisdictional impacts. Additional avoidance and minimization efforts prior to CP 4A included the refining of roadway alignments, increasing of slopes in some areas, and using improved mapping for quantifying impacts
- Grassed roadway shoulders and roadside ditches will be constructed along Section A to convey and filter storm water. As stated in the FONSI (page 2, 2nd paragraph), the earthen shoulders are recommended in Section A to avoid single-point discharges into the streams within the Water Supply Watershed Protected Area of Lake Reidsville and Troublesome Creek
- Grassed roadside ditches will also be constructed along Section B to convey and filter storm water. They will be constructed behind curb and gutter where practicable
- Grassed swales will be employed at three locations along Section B (–L– Station 49+50 to 50+50 Rt., –L– Station 160+65 to 163+50 –L– Lt., and –L– Station 160+50 to 163+50 –L– Rt.) to convey and filter storm water
- Where possible, drainage systems were designed to outlet away from surface waters to allow time for infiltration in ditches or natural areas
- Rip-rapped ditches and rip rap along stream banks will be used where warranted to control erosion

- Bank stabilization activities will not place rip rap on the stream bottom
- Rip rap energy dissipater basins will be constructed at two locations (–Y8A– Station 12+24 Lt. and –L– Station 292+35 Lt.) to dissipate stream flow velocities
- One Hazardous Spill Basin (at –L– Station 33+60 to 34+50 Lt.) will be constructed at the lone stream crossing (Site 1) that is located within 0.5 miles of the Lake Reidsville Critical Area
- Pre-formed scour holes will be constructed at eight locations (–Y10– Station 28+00 Lt., –L– Station 118+50 Rt., –L– Station 119+50 Rt., –L– Station 128+50 Rt., –L– Station 147+90 Lt., –L– Station 157+00 Rt., –L– Station 158+64 Rt., and –L– Station 265+50 Lt.)

Compensatory Mitigation

Mitigation requirements for U-3326 A and B are summarized below in Tables 4 and 5. NCDOT proposes mitigation for 2,242 linear feet of permanent stream impacts. This includes 399 linear feet of impacts on streams that USACE determined would only require 1:1 mitigation (Sites 8, 13, 15A, 15C, and 16). It also includes 139 linear feet of bank stabilization impacts on streams where the total amount of impact (permanent stream impact plus bank stabilization) equals to or exceeds 150 linear feet (Sites 7, 10, 12). Mitigation for these bank stabilization impacts is required by NCDWQ at a compensatory ratio of 1:1. Compensatory mitigation will be provided by NCEEP.

The NCDOT does not propose mitigation for stream bank stabilization activities that occur on streams where the total amount of impact does not equal or exceed 150 linear feet. This includes a total of 89 linear feet (Sites 1, 6, 8, 17, 18). NCDOT feels that stabilizing the bank of a stream does not constitute Loss of Waters of the U.S. and reduces sedimentation. As stated above, in cases where total impacts equal to or exceed 150 linear feet, NCDOT concedes to NCDWQ's request to mitigate for bank stabilization impacts under Section 401.

Additionally, due to the minimal amount of permanent (and overall) wetland impacts and the quality of the wetlands, NCDOT does not propose mitigation for the 0.007 acres of permanent wetland impacts associated with the project. Wetland 1 is small in size and only received a 35 on the NCDWQ Wetland Rating Form. Wetlands 2 and 3 are small in size and, although adjacent to Little Troublesome Creek, they are located in a heavily disturbed area (the scrub-shrub stream buffer in a large, open field) and are altered by a sanitary sewer line that cuts through them. These two wetlands appear to have been created as a result of the sewer line installation. Wetlands 2 and 3 received an NCDWQ rating of 38.

Table 4. U-3326 A and B Stream Mitigation Summary

HUC	Impact Type	Proposed Mitigation Ratio	Impact Total (lin. ft.)	Mitigation Required (lin. ft.)
03030002	Permanent Fill	2:1	535	1,070
	Permanent Fill	1:1	0	0
	Permanent Fill	0	279	0
	Bank Stabilization	1:1	0	0*
	Bank Stabilization	0	40	0
03010103	Permanent Fill	2:1	1,169	2,338
	Permanent Fill	1:1	399	399
	Permanent Fill	0	0	0
	Bank Stabilization	1:1	139	139*
	Bank Stabilization	0	49	0
Total (HUC 03030002):			854	1,070
Total (HUC 03010103):			1,756	2,876
Total (Entire Project):			2,610	3,946

* Required by NCDWQ.

Table 5. U-3326 A and B Wetland Mitigation Summary

HUC	Impact Type	Proposed Mitigation Ratio	Impact Total (acres)	Mitigation Required (acres)
03030002	Permanent Fill	0	0.001	0
	Mechanized Clearing	0	0.002	0
03010103	Mechanized Clearing	0	0.004	0
Total:			0.007	0

REGULATORY APPROVALS

Application is hereby made for a Department of the Army Section 404 Individual Permit as required for the above-described activities for the proposed T.I.P. Project No. U-3326 A and B. We are also requesting a Section 401 Individual Water Quality Certification from NCDWQ. In compliance with Section 143-215.3D(e) of the NCAC, we will provide \$570.00 to act as payment for processing the Section 401 permit. We are providing five copies of this application to NCDWQ for their review and approval.

This project falls within the Jordan Lake Water Supply Watershed. However, NCDOT is not requesting a Jordan Buffer Authorization because an approved FONSI was issued for this project in July 2007, which is prior to the adoption of the Jordan Lake Riparian

Buffer Rules. Please see the memorandum submitted to NCDWQ regarding this subject, dated August 20, 2010.

A copy of this application will be posted on the NCDOT website at <http://www.ncdot.org/doh/preconstruct/pe/neu/Permit.html>. Thank you for your time and assistance with this project. Please contact Jim Mason at either jsmason@ncdot.gov or (919) 431-1593 if you have any questions or need additional information.

Sincerely,



Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

Cc w/attachment:

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

Cc w/o attachment (see website for attachments):

Dr. David Chang, P.E., Hydraulics Unit
Mr. Greg Perfetti, P.E., Structure Design Unit
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental Unit
Mr. J. M. Mills, P.E., Division 7 Engineer
Mr. Jerry Parker, Division 7 DEO
Mr. Jay Bennett, P.E., Roadway Design Unit
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design Unit
Ms. Karen Reynolds, PDEA Project Planning Engineer
Mr. Scott McLendon, USACE, Wilmington
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
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

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-003
Expires December 31, 2004

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes 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 Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. 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

Authority: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. 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. 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 COMPLETED
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME North Carolina Department of Transportation Project Development & Environmental Analysis	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS 1598 Mail Service Center Raleigh, NC 27699-1598	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business 919-431-1593	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

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 OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) U-3326 A/B, US 29 Business (Freeway Drive) from SR 2670 (South Scales Street) to NC 14 in Reidsville	14. PROJECT STREET ADDRESS (if applicable)
13. NAME OF WATERBODY, IF KNOWN (if applicable) UTs to Wolf Island Creek, Little Troublesome Creek and a UT, UTs to Troublesome Creek-Lake Reidsville	
15. LOCATION OF PROJECT Rockingham COUNTY NC STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.

17. DIRECTIONS TO THE SITE

Please see attached vicinity map and cover letter.

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

The project involves roadway improvements to US 29 Business, specifically widening the current two-lane facility to a multi-lane facility.

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

The purpose of this project is to increase traffic carrying capacity and level of service for US 29 Business.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Impacts will result from the widening of the existing roadway and the extension and/or upgrading of existing pipe and culvert crossings.

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

See attached cover letter and permit drawing package.

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

See attached cover letter and permit drawing package.

23. Is Any Portion of the Work Already Complete? Yes ___ No X IF YES, DESCRIBE THE COMPLETED WORK

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

Please see list of adjacent property landowners included with the permit drawing package.

25. 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
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* Would include but is not restricted to zoning, building, and flood plain permits

26. 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.



SIGNATURE OF APPLICANT

9.1.10

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.



May 11, 2010

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

Dear Mr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

U-3326A/B, US 29 Business Widening from South Scales Street to NC 14, Rockingham County; Cape Fear and Roanoke River Basins

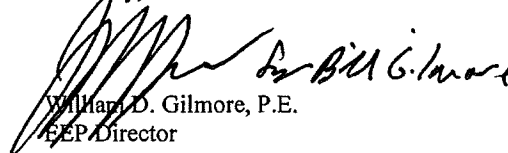
The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the unavoidable impact associated with the above referenced project. Based on the information supplied by you on May 6, 2010, the impacts are located in CU 03030002 of the Cape Fear River Basin and 03010103 of the Roanoke River Basin in the Central Piedmont (CP) Eco-Region, and are as follows.

IMPACTS / MITIGATION UNITS	Stream			Wetlands			Buffer	
	Cold	Cool	Warm	RW	NRW	CM	Zone 1	Zone 2
Impacts – Cape Fear 03030002 (CP)			535					
Mitigation Units – Cape Fear 03030002 (2:1)			1,070					
Impacts – Roanoke 03010103 (CP)			1,708					
Mitigation Units – Roanoke 03010103 (at 2:1)			2,338					
Mitigation Units – Roanoke 03010103 (at 1:1)			539					
Impacts – Total Project			2,243					
Mitigation Units – Total Project			3,947					

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

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

Sincerely,


William D. Gilmore, P.E.
EEP Director

cc: Mr. Andy Williams, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-3326A/B

Restoring... Enhancing... Protecting Our State



North Carolina Ecosystem Enhancement Program, 1652 Mail Service Center, Raleigh, NC 27699-1652 / 919-715-0476 / www.nceep.net



May 11, 2010

Mr. Andy Williams
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

Dear Mr. Williams:

Subject: EEP Mitigation Acceptance Letter:

U-3326A/B, US 29 Business Widening from South Scales Street to NC 14, Rockingham County; Cape Fear and Roanoke River Basins (Cataloging Units 03030002 and 03010103); Central Piedmont (CP) Eco-Region

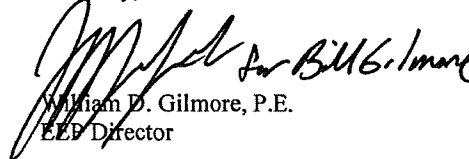
The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request received on May 6, 2010, stream mitigation from EEP is required for 2,243 feet of warm stream impact (535 feet in Cape Fear 03030002 and 1,708 feet in Roanoke 03010103).

IMPACTS / MITIGATION UNITS	Stream			Wetlands			Buffer	
	Cold	Cool	Warm	RW	NRW	CM	Zone 1	Zone 2
Impacts – Cape Fear 03030002 (CP)			535					
Mitigation Units – Cape Fear 03030002 (2:1)			1,070					
Impacts – Roanoke 03010103 (CP)			1,708					
Mitigation Units – Roanoke 03010103 (at 2:1)			2,338					
Mitigation Units – Roanoke 03010103 (at 1:1)			539					
Impacts – Total Project			2,243					
Mitigation Units – Total Project			3,947					

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

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

Sincerely,


William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: U-3326A/B

Restoring... Enhancing... Protecting Our State



STORMWATER MANAGEMENT PLAN

U-3326A/B, WBS No.: 34924.1.1

Date: 07/07/09

Rockingham County

Hydraulics Project Manager: Andrew Nottingham, PE

ROADWAY DESCRIPTION

The project involves roadway improvements to US 29 Business (Freeway Drive) from SR 2670 (South Scales Street) to NC 14 in Reidsville. The project's purpose is to increase the traffic carrying capacity and level of service for US 29 Business (Freeway Drive) by widening the current two-lane facility to a multilane divided facility. The project is divided into two sections, U-3326A and U-3326B. U-3326A begins at SR 2670 (South Scales Street), ends at US 158 (Richardson Drive). U-3326B begins at US 158 (Richardson Drive) and ends at NC 14.

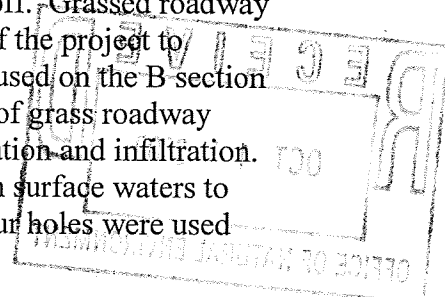
The existing roadway is a two-lane facility, with sections of three lanes in the developed commercial areas. Travel lanes are 12' wide and shoulder widths vary. Section A of the proposed roadway will provide two 12' travel lanes in each direction, a raised 17.5' wide curb & guttered median and 8' shoulders, four feet of which is paved. Section B of the proposed roadway will provide two 12' travel lanes in each direction, a raised 17.5' wide curb & guttered median and outside curb & gutter.

ENVIRONMENTAL DESCRIPTION AND IMPACTS

The project is located in the Cape Fear and Roanoke River Basins. The streams impacted in the Cape Fear River Basin are UT's To Lake Reidsville (Troublesome Creek), UT to Little Troublesome Creek and Little Troublesome Creek. The UT's to Lake Reidsville are classified WS III NSW. UT to Little Troublesome Creek and Little Troublesome Creek are classified C NSW. Little Troublesome creek is on the 2006 303d list for impaired biological integrity due to impervious surface. The streams impacted in the Roanoke River Basin are all UT's to Wolf Island Creek and they are all classified as class C waters. Two small wetland sites will be impacted. Stream impacts are due to widening of the roadway and will consist of extending and upgrading existing pipe crossings along the project. Wetland impacts are due to roadway fill from the proposed roadway widening.

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) and measures will be used on the project to reduce storm water impacts to the receiving streams due to erosion and runoff. Grassed roadway shoulders and roadside ditches have been used along the A section of the project to convey storm water. Grassed swales and roadside ditches were also used on the B-section of the project behind the curb and gutter where practicable. The use of grass roadway ditches and swales aids in pollutant removal through vegetative filtration and infiltration. Where possible, drainage systems were designed to outlet away from surface waters to allow time for infiltration in ditches or natural areas. Preformed scour holes were used



where practicable. Rip rapped ditches and riprap along stream banks were used where warranted to control erosion. One Hazardous spill basin was used at the only stream crossing located within one half mile of the critical area of the water supply water shed of Lake Reidsville. Rip rapped energy dissipater basins were used to dissipate stream flow velocities at two stream crossing outlets.

Grass swale locations:

- -L- Station 49+50 to 50+50 Rt.
- -L- Station 160+65 to 163+50 -L- Lt.
- -L- Station 160+50 to 163+50 -L- Rt.

Preformed scour hole locations:

- -Y10- Station 28+00 Lt.
- -L- Station 118+50 Rt.
- -L- Station 119+50 Rt.
- -L- Station 128+50 Rt.
- -L- Station 147+90 Lt.
- -L- Station 157+00 Rt.
- -L- Station 158+64 Rt.
- -L- Station 265+50 Lt.

Hazardous spill basin locations:

- -L- Station 33+60 to 34+50 Lt.

Energy dissipater basins locations:

- -Y8A- Station 12+24 Lt.
- -L- Station 292+35 Lt.

Culverts

- -L- Station 225+82.25: Extend existing 7' x 7' Reinforced Concrete Box Culvert (RCBC) upstream as a 7' x 7' RCBC and downstream as a 7' x 8' RCBC.
- -L- Station 250+30.41: Extend existing 2 @ 8' x 8' RCBC upstream as an 8' x 8' RCBC and downstream as an 8' x 8' RCBC.
- -L- Station 311+30.62: Extend existing 6' x 6' RCBC upstream as a 6' x 6' RCBC and downstream as a 6' x 7' RCBC.
- -L- Station 324+72.83: Extend existing 5' x 6' RCBC upstream as a 5' x 6' RCBC with side tapered inlet and downstream as a 5' x 6' RCBC.

**FINAL MINUTES OF INTERAGENCY 4B MEETING
MEETING FOR PROJECT U-3326 A&B, ROCKINGHAM COUNTY
HELD ON 03/12/2008**

Team Members:

Andrew Nottingham	NCDOT Hydraulics Unit (Present)
Andrew Williams	USACE (Present)
Gary Jordan	USFWS (Absent)
Travis Wilson	NCWRC (Absent)
David Wainwright	NCDWQ (Present)
Chris Militscher	EPA (Absent)
Kathy Matthews	EPA (Present)
Donnie Brew	FHWA (Present)
David Harris	REU (Absent)
Jim Speer	Roadway (Present)
Quang Nguyen	Structures (Present)
D. Linwood Stone	PDEA (Absent)
Rachelle Beauregard	NEU (Present)
Patty Eason	Division 7 (Present)

Participants:

Karen Gulledege	NCDOT Hydraulics Unit
Jim Mason	NEU
Karen Reynolds	PDEA
Danny Gardner	Roadway
Piotr Stojda	Roadway

DOT began the meeting at 1:30 P.M. with an overview of the project.

Sheet 4:

No comments

Sheet 5:

Hydraulics noted that there were two jurisdictional streams on this sheet, both being Unnamed Tributaries to Lake Reidsville. NEU noted that the label for stream 15 & 16 were incorrect. Stream 15 is the longer section of stream shown on the plans and stream 16 the shorter section. Hydraulics discussed that the existing 36" rcp was not adequately sized for the drainage area and that NCDOT would bore/jack a supplemental 42" steel pipe alongside the 36" pipe.

Hydraulics discussed the location and size (left of -L- station 34+00, long and rectangular) of the Hazardous Spill Basin. Hydraulics noted that all of the roadway drainage would be taken to the basin except for a very short section between -L- station 36+00 to 38+00 Rt. This section of roadway drainage will go to a roadway ditch, which will transition into a 2.0' Lateral Base ditch from -L- station 34+50 to 36+00 Rt. DWQ questioned that the Lateral Base ditch appeared to just stop at the Match Line.

Hydraulics stated that there would be a transition from the Lateral Base ditch to the roadway ditch and would be shown on the final plans.

PDEA inquired about the length of the pipe(s), and Hydraulics replied that the existing 36" pipe would be extended on both ends to the fill slope.

Sheet 6:

No comments

Sheet 7:

No comments

Sheet 8:

No comments

Sheet 9:

No comments

Sheet 10:

Hydraulics discussed Stream 18 – Unnamed Tributary to Lake Reidsville and that it is basically being piped to the outlet as it is now, with only a few short areas where it is not piped. The stream starts on Sheet 11 near -L- station 105+00 and flows in an excavated channel and through several pipes before crossing the Main line.

USACE inquired about the amount of stream impacts – approximately 248' of linear impacts due to the project design. Hydraulics states that the proposed drainage system from -L- station 91+00 to 95+00 Rt. will take the roadway drainage around and down -Y8- to outlet into a Lateral Base ditch running parallel to -Y8A-. USACE asks whether NCDOT is diverting water from Stream 18. Hydraulics says, no, because this is mostly roadway drainage and not really feeding Stream 18. The main flow for Stream 18 comes from the right (from Sheet 11).

The existing pipe system will be retained and there will be a 42" rcp pipe that outlets to a energy dissipater (not shown on plans).

Sheet 11:

No comments

Sheet 12:

DWQ inquired about the detention ponds on this sheet and whether NCDOT will be affecting them. Hydraulics states that the ponds will remain undisturbed by the proposed drainage systems.

Sheet 13:

Hydraulics discusses Stream 14 -- Unnamed Tributary to Little Troublesome Creek. There is currently a 66" rcp pipe located there. NCDOT proposes to extend the pipe on both the inlet/outlet and to relocate the channel on the inlet side and outlet side.

USACE inquired about the proposed stream relocation, other possible designs, and the possible use of retaining walls. USACE also questions whether there is going to be a pedestrian pathway/greenway along the fill slope. Hydraulics says that alternative is no longer being used and that there is room on the berm for a sidewalk.

Hydraulics states that the current topography is very steep on the outlet side and there are concerns about the stability of the fill slope. NCDOT looked at the possible use of 1.5:1 fill slopes but due to the topography and stability concerns decided to use 2:1 fill slopes. A retaining wall is not a good alternative because it would cost a lot more money to build and there would still be issues concerning stability.

Hydraulics discusses the other possible design option would be to add a JB at the existing outlet and then pipe to the existing stream. USACE, EPA, and DWQ prefer leaving the stream as open as practicable instead of piping it. Hydraulics states that, as far as R/W is concerned, that it might be less costly to pipe it because of the amount of R/W that would need to be purchased to construct/maintain the outlet channel.

USACE states that at this site, the most practical means possible should be used for avoidance/minimization and notes that this stream is listed as having impacts over 300'. Impacts over 300' will require an Individual Permit.

EPA has concerns about the drainage system that is being discharged at the inlet of the pipe without any kind of treatment. The current system appears to outlet further away from the inlet and some treatment is available before reaching the stream. EPA would like to know if the pipe outlet can be moved away from the inlet. Hydraulics says that it will be hard to discharge elsewhere, but that NCDOT will look into other possibilities.

USACE, EPA, and DWQ question whether there will be some sort of armoring/rip rap in the proposed outlet channel due to the sharp angle of the stub-out pipe. Hydraulics says that there will be rip rap on the banks of the channel. USACE, EPA, and DWQ want to make sure that the channel remains stable during & after construction.

Sheet 14:

Hydraulics discusses Stream 13 -- Little Troublesome Creek (LTC), noting that it is in a Detailed Flood study. Hydraulics discusses that our proposed drainage system to the north of LTC will outlet to grass swales before discharging into LTC. The system on the west side of the Main line will discharge to a grass swale and then be picked up by a pipe and discharged into the existing 54" rcp. The system on the east side of the Main line will discharge to a grass swale as well and then to a rip rap lined ditch (not shown on the plans) to the creek.

The drainage system on the south side of LTC and the east side of the Main line will discharge to PSH's (not shown on the plans). The system on the west side of the Main line will discharge directly into the 54" rcp.

EPA wants to know how much drainage is coming to LTC from the north. Hydraulics states that it starts from about the middle of Sheet 15. EPA asks if it would be possible to continue the grass swale (north side of LTC, west of Main line) to the creek to allow for further treatment. Hydraulics says that NCDOT will look into this, but if this is done, the wetlands will be impacted. EPA also wants to know if there is possibly an option to create a retention basin for the discharge or any other way to treat the discharge besides these small swales.

EPA states that LTC is listed on the 303d list and asks what the impairments are. Hydraulics states it is on the 303d list for impaired biological integrity due to impervious surfaces. EPA does not like the proposed system (on south side of LTC, west of Main line) going directly into pipe because it receives no treatment. Prefers that some of the discharge is taken across the road and outlets to the PSH's. NCDOT will look into this option.

Sheet 15:

No comments

Sheet 16:

Hydraulics discusses Stream 12 – Unnamed Tributary to Wolf Island Creek and the steep topography around the existing stream. This steep topography makes it very difficult to relocate the stream. NCDOT proposes to pipe the stream through a series of man holes/pipes and then a stub-out at the outlet tying into the existing stream. Bedrock is present in the streambed.

NEU states that the labeling of the streams on the plans is incorrect. There is a short section of stream on the east side of the Main line that is intermittent and at the outlet of the 24" pipe, the stream becomes perennial. This is also where Stream 12 begins. The other feature depicted as a stream to the south of the 24" pipe is just a drainage ditch picked up by the Location & Surveys Unit.

DWQ inquired as to the length of stream impacted via the pipe system. Hydraulics states that from the end of the existing 24" rcp, there are approximately 185' of stream impacts due to the proposed design.

USACE inquired as to whether there will be any rip rap or energy dissipation at the outlet of the proposed 30" pipe. Hydraulics states, yes there will be rip rap at the outlet and there is bedrock in the streambed downstream.

Sheet 17:

Hydraulics discusses Streams 10 & 11 – Unnamed Tributary to Wolf Island Creek. The NCDOT will be extending the 42" rcp on -Y13- with a 54" rcp. The 54" rcp crossing the Main line will be extended via Junction Boxes in order to align more with existing stream.

NEU states that Stream 11 is intermittent between -Y13- and the 54" cross pipe and Stream 10 is perennial from the outlet of the existing 54" pipe.

Sheet 18:

Hydraulics discusses the 7' x 7' RCBC and Stream 8 – Unnamed Tributary to Wolf Island Creek. The existing RCBC will be extended on the upstream & downstream sides. The slope of the channel downstream is fairly steep. The existing culvert is on a 1.32% grade.

USACE inquires about headcuts due to the steepness of the downstream channel. Hydraulics states that there is bedrock in the channel downstream, which should eliminate any headcuts. USACE inquires about stream impacts to Stream 9 – Unnamed Tributary to Wolf Island Creek, which is intermittent. Hydraulics states that it isn't possible to relocate due to steep topography.

EPA inquired about rip rap at the pipe outlets. Hydraulics states that there will be rip rap and ditches from the outlets to the stream.

Sheet 19:

No comments

Sheet 20:

Hydraulics discusses the 2@8' x 8' RCBC and Stream 7 – Unnamed Tributary to Wolf Island Creek. The existing RCBC will be extended on the upstream & downstream sides. The fill slopes are proposed to be 1.5:1 in order to reduce the stream impacts and to shorten the amount of culvert extension needed. The existing culvert is on a 0.34% grade.

USACE noted that previous stream impacts were listed at 215'. Hydraulics states that because NCDOT is using 1.5:1 slopes, the impacts will be reduced to approximately 80'.

EPA inquired about the pipe outlets – will they have rip rap and/or ditches. Hydraulics states that there will be rip rap and ditches from the outlets to the creek and will be shown on the final plans.

Roadway also inquired about what was happening at the outlet of Stream 6 – Unnamed Tributary to Wolf Island Creek (Sheet 20/21). Hydraulics states that the existing 24" rcp is going to be extended and relocated in a rip rap lined lateral base channel from the pipe outlet to the existing stream.

Sheet 21:

No comments

Sheet 22:

No comments

Sheet 23:

Hydraulics discusses the 2-60" structural plate pipes extensions on streams 4 & 5, both Unnamed Tributaries to Wolf Island Creek. Streams 4 & 5 come together downstream of the existing pipe outlets at a nick point. There is sporadic bedrock located in the streambed downstream of the nick point.

The pipes will be extended via Junction Boxes into an endwall at the outlet. There will also be a rock energy dissipater located at the outlet.

NEU states that the labeling for Stream 17 – Unnamed Tributary to Unnamed Tributary 4 to Wolf Island Creek is incorrect. The label should point to a small section of stream that runs across -Y20B- near station 14+00. NEU also notes that the label for Stream 3 – Unnamed Tributary to Wolf Island Creek is incorrect. It should point towards the feature left of -Y21RpB- station 11+00.

Sheet 24:

Hydraulics discusses the 6' x 6' RCBC and Stream 3 – Unnamed Tributary to Wolf Island Creek. The culvert will be extended on the upstream and downstream sides. The existing culvert is on a 2.7% grade.

EPA inquired if there is any rip rap at the outlets of the pipes to either side of the culvert. Hydraulics states that there will be rip rap and short sections of ditches down to the creek.

Sheet 25:

Hydraulics discusses the 5' x 6' RCBC and Stream 1 – Unnamed Tributary to Wolf Island Creek. The culvert will be extended on the upstream and downstream sides. The existing culvert is on a 1.34% grade.

EPA inquired about rip rap at pipe outlets. Hydraulics states that there will be rip rap and short sections of ditches to the creek at all the pipe outlets shown on the final plans.

Sheet 26:

No comments on this sheet other than to verify the stream that crosses -Y10- near station 13+00. This stream is not shown on any of the alternatives. There is also a pond located upstream of the creek.

Sheet 27 thru 29:

No comments

The meeting adjourned at 3:00 P.M.

**DRAFT MINUTES OF INTERAGENCY 4C MEETING
FOR PROJECT U-3326 A&B, ROCKINGHAM COUNTY
HELD ON 07/22/2009**

Team Members:

Andrew Nottingham	NCDOT Hydraulics Unit (Present)
Andrew Williams	USACE (Present)
Gary Jordan	USFWS (Absent)
Travis Wilson	NCWRC (Absent)
Amy Euliss	NCDWQ (Present)
Kathy Matthews	EPA (Present)
Felix Davila	FHWA (Present)
David Harris	REU (Absent)
Jim Speer	Roadway (Present)
Roy Girolami	Structures (Present)
D. Linwood Stone	PDEA (Present)
Rachelle Beauregard	NEU (Present)
Patty Eason	Division 7 (Absent)

Participants:

Karen Gullede	NCDOT Hydraulics Unit
Jim Mason	NEU
Karen Reynolds	PDEA
Laura Sutton	Structures
Mark Staley	REU
Piotr Stojda	Roadway

DOT began the meeting at 9AM with an overview of the project.

EPA commented on the Stormwater Management Plan prior to the discussion of the permit sites, stating that Little Troublesome Creek was on the 303d list and that they had asked for more stormwater treatment at the 4b meeting on March 12, 2008.

Site 1:

USACE asked if the rip rap impacts vs. the culvert impacts could be broken out separately. Hydraulics stated that they were separated with the Bank Stabilization value noted in the Wetland Impact Summary Table.

Site2:

NCDWQ stated that the stream feature on Site 2 & 3 was the same stream. NCDWQ also inquired whether the energy dissipater at the outlet of the 42" pipe could be aligned with the stream. Hydraulics stated that it would be aligned with the stream.

Site 3:

No comments

Site 4:

EPA inquired whether the stream is Jurisdictional at the location where the existing pipes are being removed. Hydraulics stated that the stream was Jurisdictional in those locations.

Site 5:

Hydraulics stated that the stream at this location was an Un-named Tributary to Little Troublesome Creek and therefore, it was also a 303d stream. EPA inquired if the business at this location had any stormwater treatment facilities. Hydraulics stated that the discharge currently runs down the grassed slope. EPA stated that Little Troublesome Creek was on the 303d list due to impervious surface impacts and that NCDOT was increasing this impact by directly discharging into the UT. EPA would like to see more treatment to offset this impact and inquired as to how this could be accomplished. Hydraulics stated, that due to the topography, it was not feasible to use grass swales in the area, but could pipe the discharge from structure #187 back to structure #178 and outlet to the PSH. After further review NCDOT will also pipe the drainage from structure #189 back to the PSH.

Site 6:

Hydraulics stated that the stream at this location was Little Troublesome Creek, a 303d stream. EPA inquired if the stormwater was discharged directly into the stream and Hydraulics replied that it was on the upstream section. EPA asked what the area to the North of LTC was composed of and could it be used for treatment options. Hydraulics replied that the area was an open grassy field. EPA asked if the discharge could be piped across the 54" pipe and discharged into the proposed grass swale or if the use of pocket wetlands/infiltration basins could be used in this grassed field. Hydraulics stated that the discharge could not be taken all the way to structure #180 and discharged into the proposed grass swale. Hydraulics stated that they would take as much of the discharge that is not being treated across the road and outlet to the proposed PSH's or outfalls that are not draining directly into the creek. A preliminary sketch of the revised drainage is included with these minutes. NCDWQ inquired about rip rap at the outlet of the 54" pipe and whether it was on the banks only. Hydraulics stated that it was only on the banks of the stream.

Site 7:

Hydraulics stated that this stream was an Un-named Tributary to Wolf Island Creek. Hydraulics stated that there would be rip rap on the banks only at the outlet of the 30" pipe and that there was bedrock in the streambed at the outlet and downstream. NCDWQ asked why there was rip rap shown over the pipe system. Hydraulics stated that this was toe protection for the fill slope.

Site 8:

No comments

Site 9:

Roadside Environmental inquired about the Mechanized Clearing that was shown on the Wetland Impact Summary Table for Site 10. Roadside Environmental asked if it should be shown as an impact at Site 9 instead. Hydraulics stated that it should be shown at Site 9 and provided Roadside Environmental with an updated Wetland Impact Summary Table.

Site 10 & Site 11:

Labeling for the culvert needs to be updated by Location & Surveys to show the correct dimensions. NEU requested that Site 10 & 11 be labeled individually on the blow up. Hydraulics stated that this would be fixed. NCDWQ asked if the stream had to make a 90 turn in order to get into the proposed pipe. Hydraulics stated that a Junction Box and pipe could be added to align the pipe more with the stream. USACE inquired as to which stream was associated with which site. Hydraulics stated that Stream 8 was associated with Site 10 and Stream 9 with Site 11.

Site 12:

NCDWQ inquires about using sills in one barrel of the culvert. Hydraulics states that due to FEMA, sills really can't be used in the culvert because they will most likely cause an increase in the water surface elevation. USACE stated that the low flow must be maintained through the culvert as a condition of the permit. Hydraulics stated that a rock sill could be added at the inlet/outlet of the culvert to ensure the low flow was maintained through the culvert. Hydraulics inquired whether any rip rap used for armoring the fill slope should be shown on the permit drawings. USACE stated that it was not necessary as long as the rip rap was not impacting the stream.

Site 13:

No comments

Site 14 & Site 15:

NEU stated that there is a small stream that comes in from the left to Stream 4/5 and this should be labeled Stream 17. Hydraulics stated that they would get this corrected and add a permit site for the stream. NCDWQ asks about the energy dissipater and if it tapers back down to the existing stream channel width. Hydraulics replied that it does taper down, but that the stream is fairly wide. USACE inquired about a detail for the dissipater. Hydraulics replied that the detail is in the Roadway plans. NCDWQ says that they usually see a plunge pool to riffle section on large energy dissipater. Hydraulics shows the detail of the dissipater indicating the rock weir at the end of the plunge pool and says this should be sufficient.

NEU states that Stream 5 has different mitigation ratios than Stream 4 and would like for this to be shown as a separate permit site. Hydraulics states that they will add another permit site for Stream 5. NCDWQ asks if the stormwater is discharged directly into the energy dissipater and if there was any way to dissipate prior to the energy dissipater. Hydraulics replied that the topography is fairly steep and no other option was available.

Site 16:

NCDWQ asks if the stream feature to the right is a Jurisdictional stream. NEU states that it is not Jurisdictional.

Site 17:

NEU states that there is no value listed for Bank Stabilization in the Wetland Impact Summary Table. Hydraulics replies that this will be corrected. Roadside Environmental inquires why the outlet of the proposed culvert appears to be larger than the existing culvert. Hydraulics states that the existing culvert outlet is perched and used a larger size extension to help dissipate energy. Hydraulics stated that a label would also be added to the profile plot of the culvert indicating the size.

Site 18:

Culvert is labeled incorrectly on the plans. Hydraulics stated that Location & Surveys would change to the correct dimensions.

The meeting adjourned at 10:10 A.M.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 23, 2008

Memorandum To: Karen Reynolds, P.E., Central Project Development Engineer,
In-House Group
James Mason, Central Environmental Specialist,
Project Management Group

From: Jared Gray, Environmental Program Consultant
Biological Surveys Group

Subject: Federally protected Roanoke logperch species survey report for the
proposed widening of US 29 Business to a multi-lane facility from SR
2670 (South Scales Street) to NC 14, Rockingham County, Federal Aid
Project No. STP-29B (1); WBS Element 34924.1.1; TIP Project No. U-
3326A&B.

The proposed project calls for the widening of US 29 Business to a multi-lane facility from SR 2670 (South Scales Street) to NC 14 in Rockingham County. The project study area is split into two river basins the Roanoke and the Cape Fear. The dividing line between the two river basins seems to be somewhere near SR 2525 (Vance Street) and anything south including UT'S Troublesome and Little Troublesome were in the Cape Fear River Basin and would not require a survey based on the fact that the Roanoke logperch is only found in North Carolina in the Roanoke River Basin. From SR 2525 north the UT'S Wolf Island Creek were in the Roanoke River Basin and would at least require a habitat assessment and or a survey depending on the size of the stream. Wolf Island Creek at the northern most end of the project is approximately 19.8 miles away from the confluence with the Dan River. **A map of the project site is attached.**

The Roanoke logperch (*Percinia rex*) is listed by the United States Fish and Wildlife Service (USFWS) as endangered and potentially occurring in Rockingham County (USFWS, 2008). Therefore, surveys of the project area were conducted to document the presence/absence of this species. In North Carolina, the logperch is known from the upper Roanoke River basin. The fish typically inhabits warm, usually clear, small to medium-sized rivers. These waterways have a moderate to low gradient, and the fish usually inhabit riffles and runs, with silt-free sandy to boulder-strewn bottoms. Young are usually found in slow runs and pools with clean sandy bottoms. In winter, logperch may be more tolerant of silty substrates, and may also inhabit pools. Spawning occurs in April or May in deep runs over gravel and small cobble. Males are associated with shallow riffles during the reproductive period; females are common in deep runs over gravel and small cobble, where they spawn.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-715-3141
FAX: 919-715-1522

WEBSITE: www.NCDOT.ORG

LOCATION:
PARKER LINCOLN BUILDING
2728 CAPITAL BOULEVARD
RALEIGH NC

Prior to conducting in-stream surveys, a review of the North Carolina Natural Heritage Program (NHP) database was conducted (April 30, 2008) to determine if there were any records of rare fish within the proposed project study area or receiving waters. This review indicated that there are no known occurrences of the federally protected Roanoke Logperch within the project study area. **There are only two records of the Roanoke logperch in North Carolina; the closest coming from an area near the confluence of the Dan and Smith Rivers approximately 37 river miles downstream from the nearest UT Wolf Island Creek.**

The section of Dan River at the confluence with Wolf Island Creek 19.8 miles downstream from the project site appears on Division of Water Quality's (DWQ) 2008 Draft Impaired Waters List as impaired for recreation because the fecal coliform bacteria standard was exceeded and the standard for turbidity was also exceeded.

NCDOT biologists Neil Medlin (Permit Number NC.2008.ES.30), Jared Gray, Heather Renninger, Anne Burroughs, and Matt Haney conducted a fish surveys at the project study area on May 1, 2008. The first survey on Wolf Island Creek, the receiving waters from the project study area, was conducted using two Smith-Root model LR-24 backpack electrofishing units and dip nets. The stream was sampled with two biologists operating the electrofishing units while the other biologists collected the stunned fish with dip nets. All stunned fish were collected and temporarily placed in five gallon buckets, where they were identified and released onsite. The fish survey was conducted downstream of the project at SR 1982 (Wolf Island Creek Road) from a point approximately 400 meters downstream of the bridge crossing to a point approximately 100 meters upstream of the bridge crossing and totaled 2430 shocking seconds. NCDOT spent 12.5 man-hours surveying for Roanoke logperch.

Within in the downstream bridge crossing, Wolf Island Creek is roughly five meters wide, and had some undercutting and erosion of the banks. The stream banks were two meters high. On the day of the site visit, the overall water depth was very shallow; with 90% of the stream reach less than 2 feet in depth. The creek contained runs and riffles with normal substrate compactness. The substrate above and below the bridge was generally dominated by sand, with some silt, clay and a considerable amount of gravel. The riparian buffer width is generally wide, with surrounding land use of natural woodland and rural. In general, due to stream size in-stream habitat in Wolf Island Creek is not typical for Roanoke logperch. All fish species that were collected during the survey are summarized in the table below. **No Roanoke logperch were observed during the site visit on May 1, 2008.**

Table 1. Fish Species and Number of Individuals collected at the bridge on SR 1982 over Wolf Island Creek, Rockingham County, on May 1, 2008.

Common Name	Species Name	Number of Individuals
Roanoke darter	<i>Percina roanoka</i>	2
Johnny darter	<i>Etheostoma nigrum</i>	19
Fantail darter	<i>Etheostoma flabellare</i>	131
Redbreast sunfish	<i>Lepomis auritus</i>	14
Creek chub	<i>Semotilus atromaculatus</i>	1
Redlip shiner	<i>Notropis chiliticus</i>	50
Crescent shiner	<i>Notropis cerasinus</i>	9
Bluehead chub	<i>Nocomis leptcephalus</i>	67
White sucker	<i>Catostomus commersonii</i>	5
Roanoke hogsucker	<i>Hypentelium roanokense</i>	34
Central stoneroller	<i>Camptostoma anomalum</i>	3
Bluegill	<i>Lepomis macrochirus</i>	9
Green sunfish	<i>Lepomis cyanellus</i>	1
Largemouth bass	<i>Micropterus salmoides</i>	2
Warmouth	<i>Lepomis gulosus</i>	1

A second survey was done below one of the crossing off of US 29 Business on one of the larger UT's Wolf Island Creek. The survey was conducted by NCDOT biologists Neil Medlin (Permit Number NC.2008.ES.30), Jared Gray, Heather Renninger, Anne Burroughs, and Matt Haney at the project site on May 1, 2008. This survey on UT Wolf Island Creek was conducted using one Smith-Root model LR-24 backpack electrofishing units and dip nets. The stream was sampled with one biologist operating the electrofishing units while the other biologists collected the stunned fish with dip nets. All stunned fish were collected and temporarily placed in five gallon buckets, where they were identified and released onsite. The Fish survey was conducted 400 meters downstream of the project to the actual crossing of US 29 Business and totaled 506 shocking seconds. NCDOT spent 5.0 man-hours surveying for Roanoke logperch.

Within in the downstream crossing of US 29 Business, UT Wolf Island Creek is roughly three meters wide, and had some undercutting and erosion of the banks. The stream banks were one meter high. On the day of the site visit, the overall water depth was very shallow; with 100% of the stream reach less than 2 feet in depth. The creek contained riffles and pool areas with normal substrate compactness. The substrate below the US 29 Business crossing was generally dominated by gravel, with some sand, cobble, boulders and a considerable amount of bedrock. The riparian buffer width is generally variable, but overall moderate. The surrounding land use was natural, urban and rural. In general, due to stream size in-stream habitat in UT Wolf Island Creek is not typical for Roanoke logperch. All fish species that were collected during the survey are summarized in the table 2. below. **No Roanoke logperch were observed during the site visit on May 1, 2008.**

Table2. Fish Species and Number of Individuals collected at the downstream site off of US 29 Business on UT Wolf Island Creek

Common Name	Scientific Name	Number of Individuals
Bluehead chub	<i>Nocomis leptcephalus</i>	62
Creek Chub	<i>Semotilus atromaculatus</i>	34
Fantail darter	<i>Etheostoma flabellare</i>	1
Rosyside dace	<i>Clinostomus funduloides</i>	23
Mountain redbelly dace	<i>Phoxinus oreas</i>	41

As a result of these surveys, as well as the physical characteristics of the streams, and a review of GIS and NHP data, it appears that the Roanoke logperch does not exist in the project vicinity. The UT's Wolf Island Creek and Wolf Island Creek are comparatively smaller than other waterways where the Roanoke logperch are known to live. Furthermore, the project study area is over 37 miles away from the known population of the Roanoke logperch in North Carolina. **In summary, the Biological Conclusion for the Roanoke logperch for the proposed widening of US 29 Business to multi-lane facility from SR 2670 to NC 14 is "No Effect."**

References:

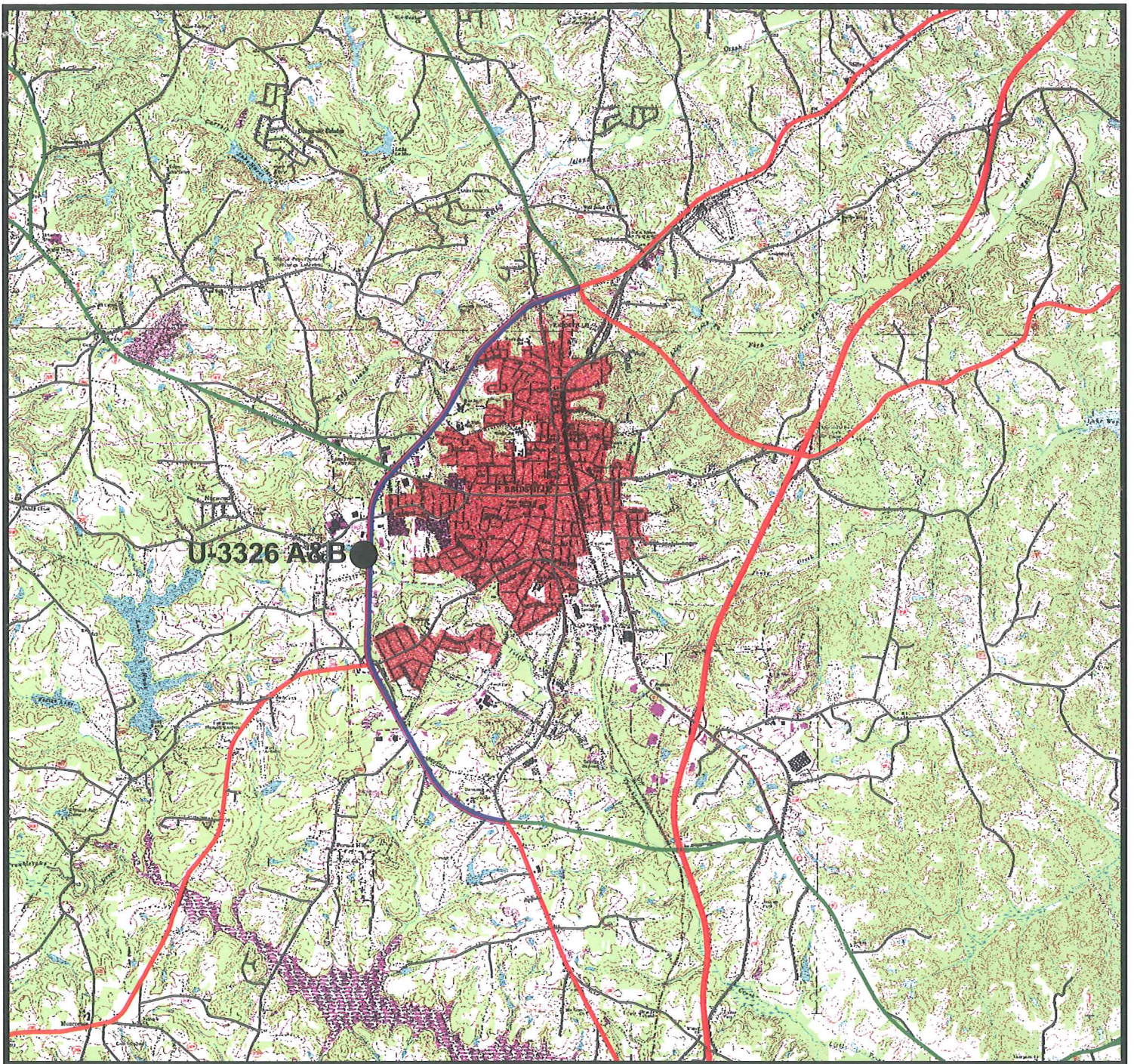
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website <http://www.fws.gov/nc-es/es/countyfr.html>.

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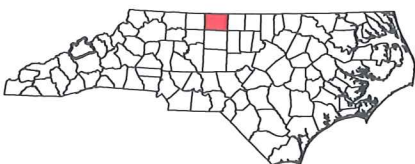


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TIP U-3326 A&B

**Road Widening of US 29 Business to a Multi-Lane
Facility from SR 2670 (South Scales Street) to NC 14
Rockingham County**

N



Site No.	Parcel No.	Property Owner Name	Property Owner Address
1	3	Richard W. Wikle & wife Claudine P. Wikle	911 Oakcrest Drive, Reidsville, NC 27320
	5	Claudine P. Wikle	911 Oakcrest Drive, Reidsville, NC 27320
	6	Holy Infant Catholic Church	P.O. Box 1197, Reidsville, NC 27323
1A	5	Claudine P. Wikle	911 Oakcrest Drive, Reidsville, NC 27320
2	36	B & S Services, Inc. of NC	P.O. Box 567, Reidsville, NC 27323
3	43	Hugh W. Cobb & wife Judith T. Cobb	1309 Ridgewood Ave., Reidsville, NC 27320
	44	North Carolina Farm Credit, ACA	P.O. Box 1827, Statesville, NC 28687
4	46	Elizabeth Hobbs Hux & husband Kenneth Jefferson Hux	1422 Freeway Drive, Reidsville, NC 27320
	47	Rendal Clayton Putnam & wife Cynthia Gentry Putnam	2403 Pine Lane, Reidsville, NC 27320
5	71	Danny W. Trent	1561 Freeway Drive, Reidsville, NC 27320
	72	Charles W. Trent, Jr., & wife Betty P. Trent	2623 Reid School Rd., Reidsville, NC 27320
	73	Stephen E. Smith	580 Boyd Rd., Reidsville, NC 27320
6	73	Stephen E. Smith	580 Boyd Rd., Reidsville, NC 27320
	75	State Employees' Credit Union	P.O. Box 26807, Raleigh, NC 27611
	76	Reidsville Centre, LLC	364 Lowes Drive, Suite Q, Danville, VA 24540
7	88	Nellie K. Loftis Crouch	
8	101	Cardinal Holdings, LLC	P.O. Box 2883, Reidsville, NC 27323
	170	James K. Festerman & Priscilla Festerman	1201 Benton Lane, Reidsville, NC 27320
	105	Adola Investments, LLC	1828 Trentwood Circle, Reidsville, NC 27320
	104	William Harmon, Judy Harmon, et al	1267 Towncreek Rd., Eden, NC 27288
9	106	Jared Russell Cox	1509 Independence Rd., Greensboro, NC 27408
	103	Smothers Warehouse, Inc.	1007 Oakcrest Drive, Reidsville, NC 27320

List of Property Owners

NC Dept. of Transportation
Division of Highways
Rockingham County
WBS - 34924.1.1 (U-3326A/B)

Revised January 25, 2010; Added Site 1A

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07/01/09

Site No.	Parcel No.	Property Owner Name	Property Owner Address
10	114	Irving K. Bass & wife Mae P. Bass	817 Hilltop Blvd., Reidsville, NC 27320
	113	Carol Ann Adams	1502 Rosedale Blvd., Reidsville, NC 27320
	115	Scott Cook, LLC	2019 Freeway Drive, Reidsville, NC 27320
11	114	Irving K. Bass & wife Mae P. Bass	817 Hilltop Blvd., Reidsville, NC 27320
12	122	Reidsville Insurance Company	1206 Cypress Drive, Reidsville, NC 27320
	123	Veita J. Bland	1317 N. Elm Street, Ste 7, Greensboro, NC 27401
13	123	Veita J. Bland	1317 N. Elm Street, Ste 7, Greensboro, NC 27401 P.O. Box 98, Eden, NC 27289
		Robert G. Simyon	
14	141	Pauline R. Tillotson	230 West Morehead Street, Reidsville, NC 27320 P.O. Box 1106, Reidsville, NC 27323 P.O. Box 2363, Reidsville, NC 27323
	140	City of Reidsville, A Municipal Corp.	
	142	Ronald E. Harris & wife Barbara W. Harris	
	139	Barbara C. Loy	
15	139	Barbara C. Loy	P.O. Box 2363, Reidsville, NC 27323
	141	Pauline R. Tillotson	P.O. Box 1106, Reidsville, NC 27323
	142	Ronald E. Harris & wife Barbara W. Harris	
16	144	Tank Land, A North Carolina General Partnership	P.O. Box 660, Reidsville, NC 27323
17	160	Lowe's Home Centers, Inc.	P.O. Box 1000-2ETA, Mooresville, NC 28115
	161	Lima Holdings, LLC	P.O. Box 843, Wilkesboro, NC 28697
18	163	Michael W. Apple	P.O. Box 629, Reidsville, NC 28323

List of Property Owners

NC Dept. of Transportation
Division of Highways
Rockingham County
WBS - 34924.1.1 (U-3326A/B)

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- 32+83 - 35+32	36" rcp/42"wsp						0.01	0.01	74	67		
	Bank Stabilization									23			
1A	-L- 32+83 - 35+32	36" rcp/42"wsp						0.005		43			
2	-Y8A- 12+16 - 12+44	42" rcp						0.01	0.01	71	12		
3	-L- 98+70 - 99+07	30" rcp						0.004		51			
4	-Y10RpC- 10+71 - 12+12	N/A						0.01	0.003	114	18		
5	-L- 147+82 - 152+15	66" rcp						0.05	0.01	406	64		
6	-L- 158+75 - 159+12	54" rcp/48" ws/rcp	0.001			0.002		0.004	0.001	55	27		
	Bank Stabilization									17			
7	-L- 184+35 - 186+37	30" csp						0.03	0.003	202	7		
	Bank Stabilization									10			
8	-Y13- 31+38 - 31+60	42" & 54" rcp						0.004	0.003	45	31		
	Bank Stabilization									11			
9	-L- 209+00 - 210+08	54" rcp				0.004		0.01	0.003	117	20		
10	-L- 224+86 - 227+09	7'x7' rcbc						0.03	0.01	117	56		
	Bank Stabilization									44			
11	-L- 225+50 - 226+20	18" rcp						0.004	0.001	75	11		
12	-L- 249+14 - 251+50	2 @ 8'x8' rcbc						0.05	0.01	90	33		
TOTALS:			0.00			0.01		0.22	0.06	1565	346		

Revised January 25, 2010. Added Site 1A
Revised August 4, 2010. Sites 8 (Bank Stabilization)

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY
WBS - 34924.1.1 (U-3326A/B)

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WETLAND PERMIT IMPACT SUMMARY

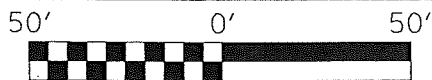
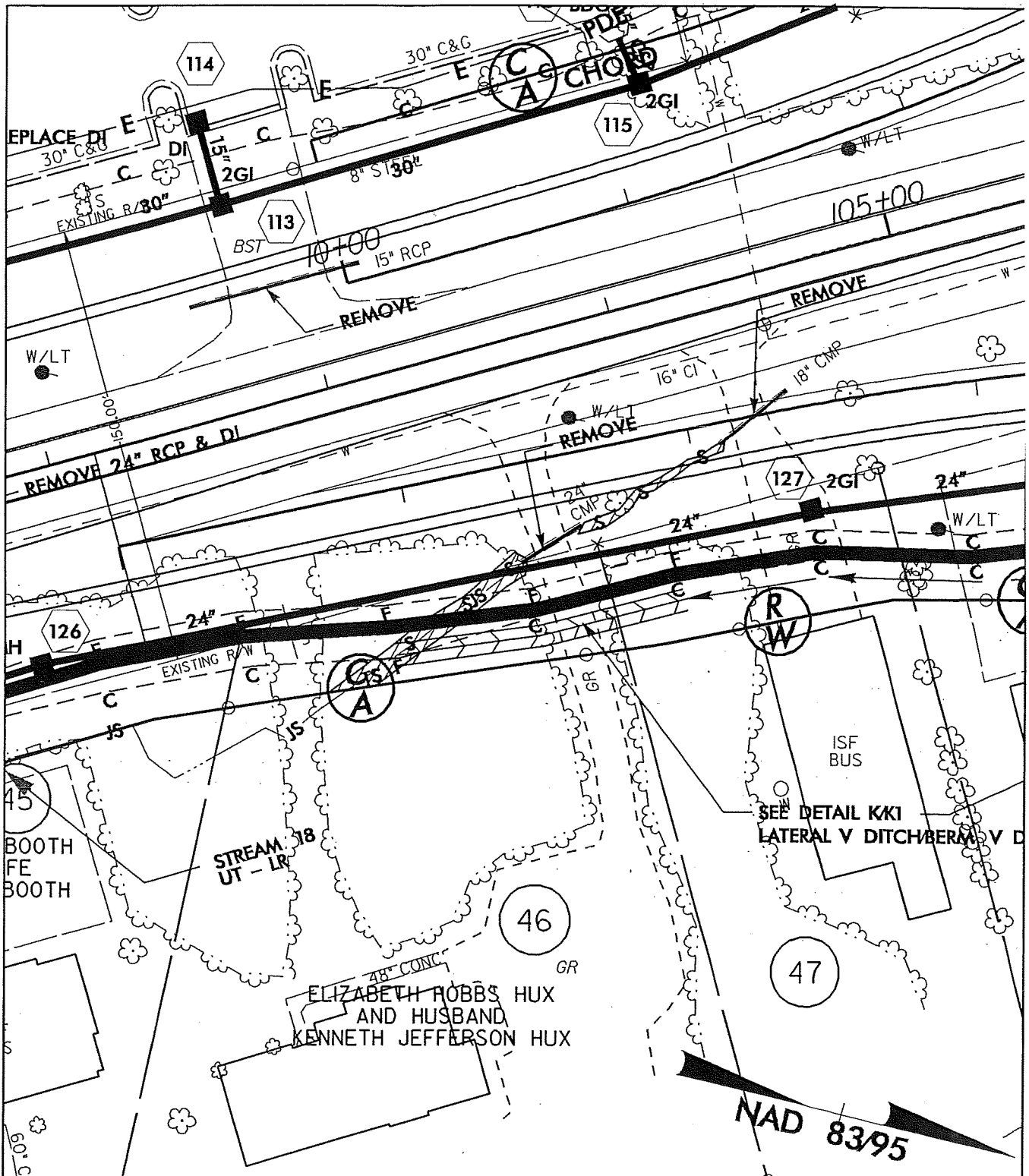
			WETLAND IMPACTS						SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)	
	Bank Stabilization									85			
13	-L- 255+70 - 258+55	24" rcp						0.02	0.002	194	21		
14	-L- 290+21 - 292+59	60" ssp						0.01	0.001	165	12		
15A	-L- 290+21 - 292+59	60" ssp						0.01	0.001	66	7		
15B	-L- 290+21 - 292+59	60" ssp						0.03	0.004	207	17		
15C	-Y20B- 13+45 - 14+32	Fill						0.01		90			
16	-Y21RpB- 10+47 - 10+64	Fill						0.000	0.001	4	10		
17	-L- 310+86 - 311+63	6'x6' rcbc						0.01	0.01	75	38		
	Bank Stabilization									20			
18	-L- 324+72 - 325+25	5'x6' rcbc						0.02	0.01	121	42		
	Bank Stabilization									18			

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY
WBS - 34924.1.1 (U-3326A/B)

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8/6/2010

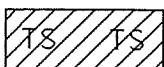


SITE 4

SURFACE WATER IMPACTS



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

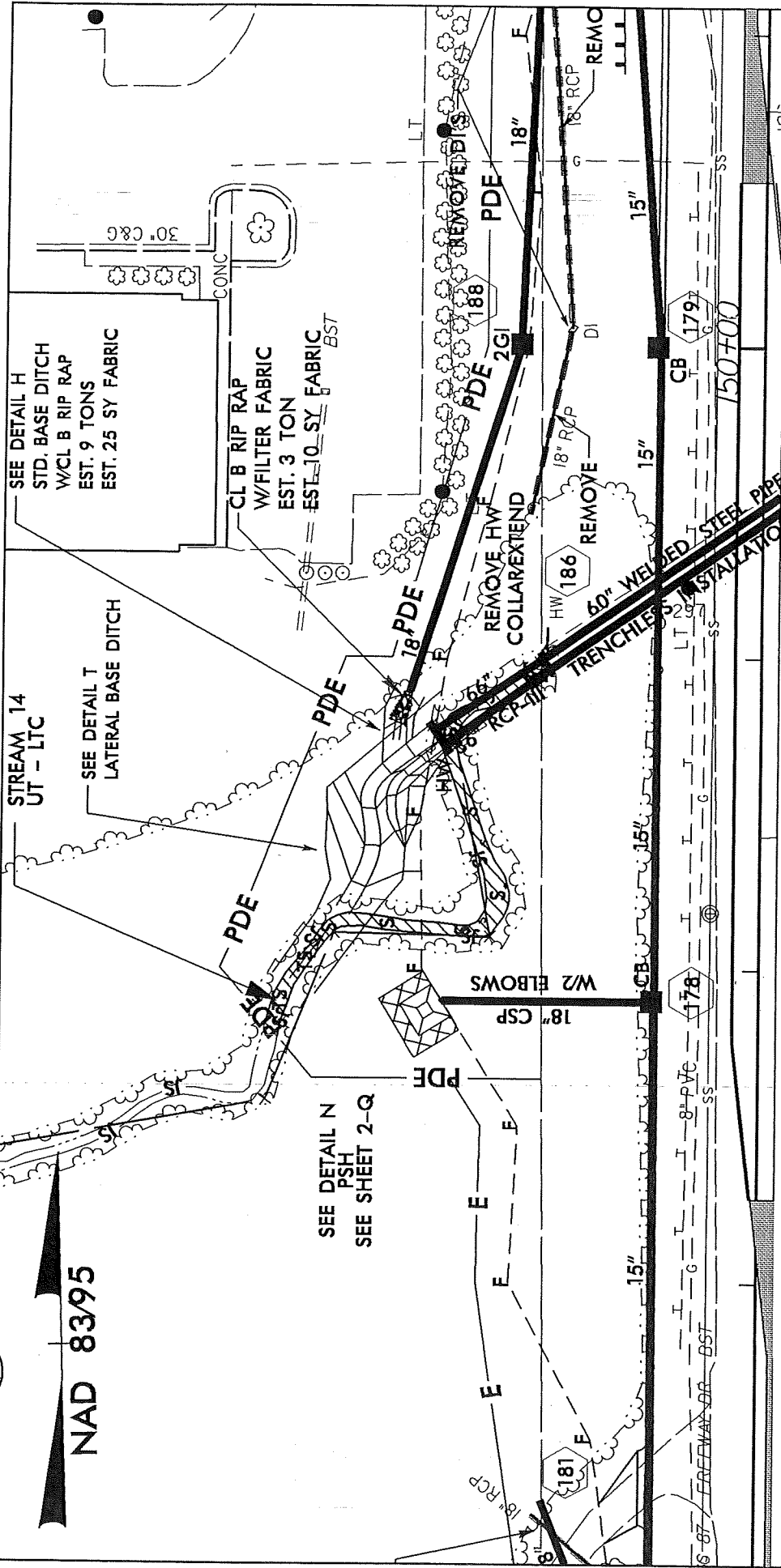
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ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A/B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

SHEET

8 OF 58

07 / 02 / 09

NAD 83/95



SITE 5

SURFACE WATER IMPACTS

DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

PROJECT: 349241.1 (U-3326A-B)

US 29 BUSINESS FROM

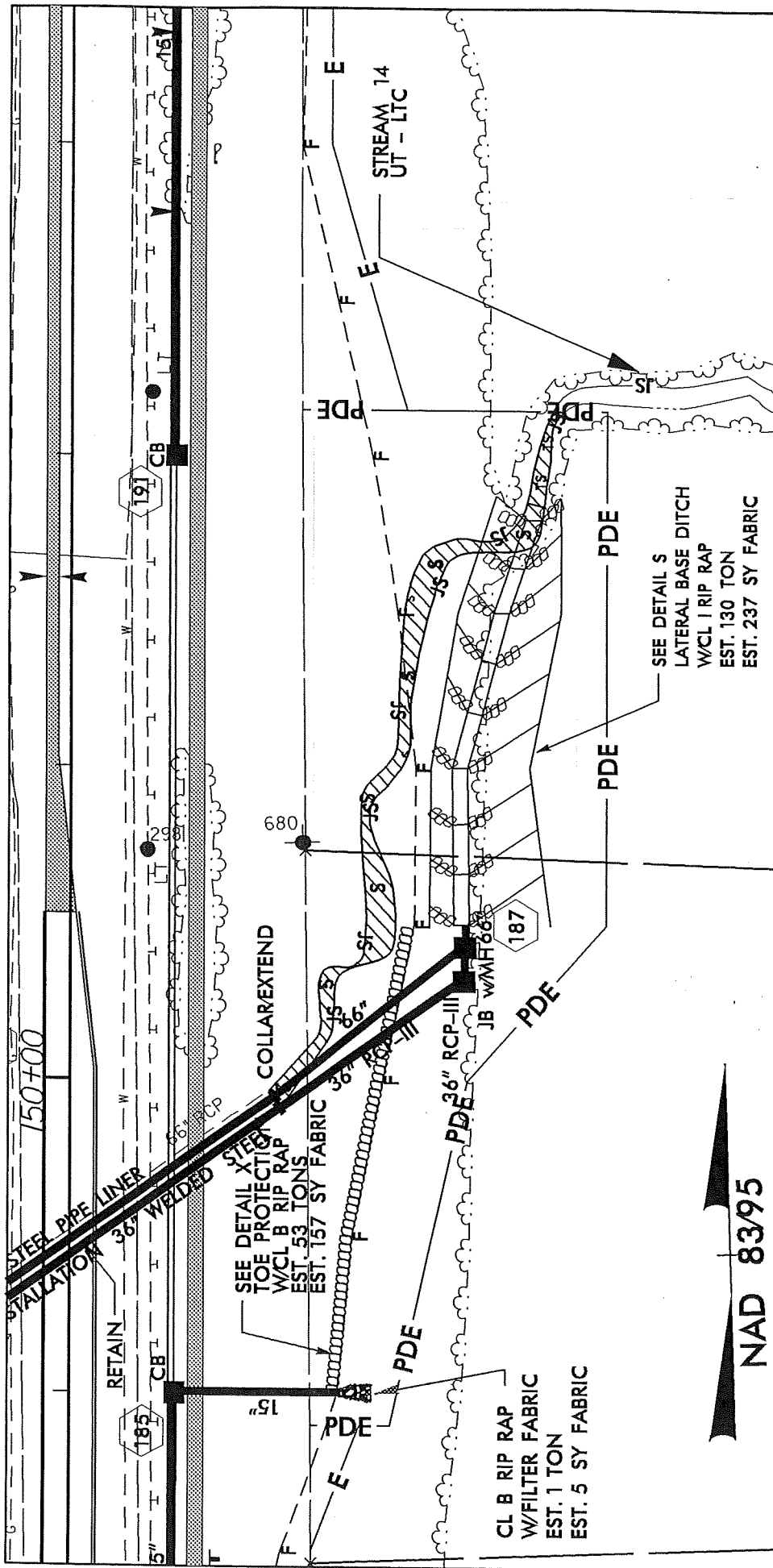
SR 2670 (SOUTH SCALES ST.)

TO NC 14 IN REIDSVILLE

SHEET **9** OF **58**

REVISED 08/04/2010

07/02/09



SITE 5 SURFACE WATER IMPACTS

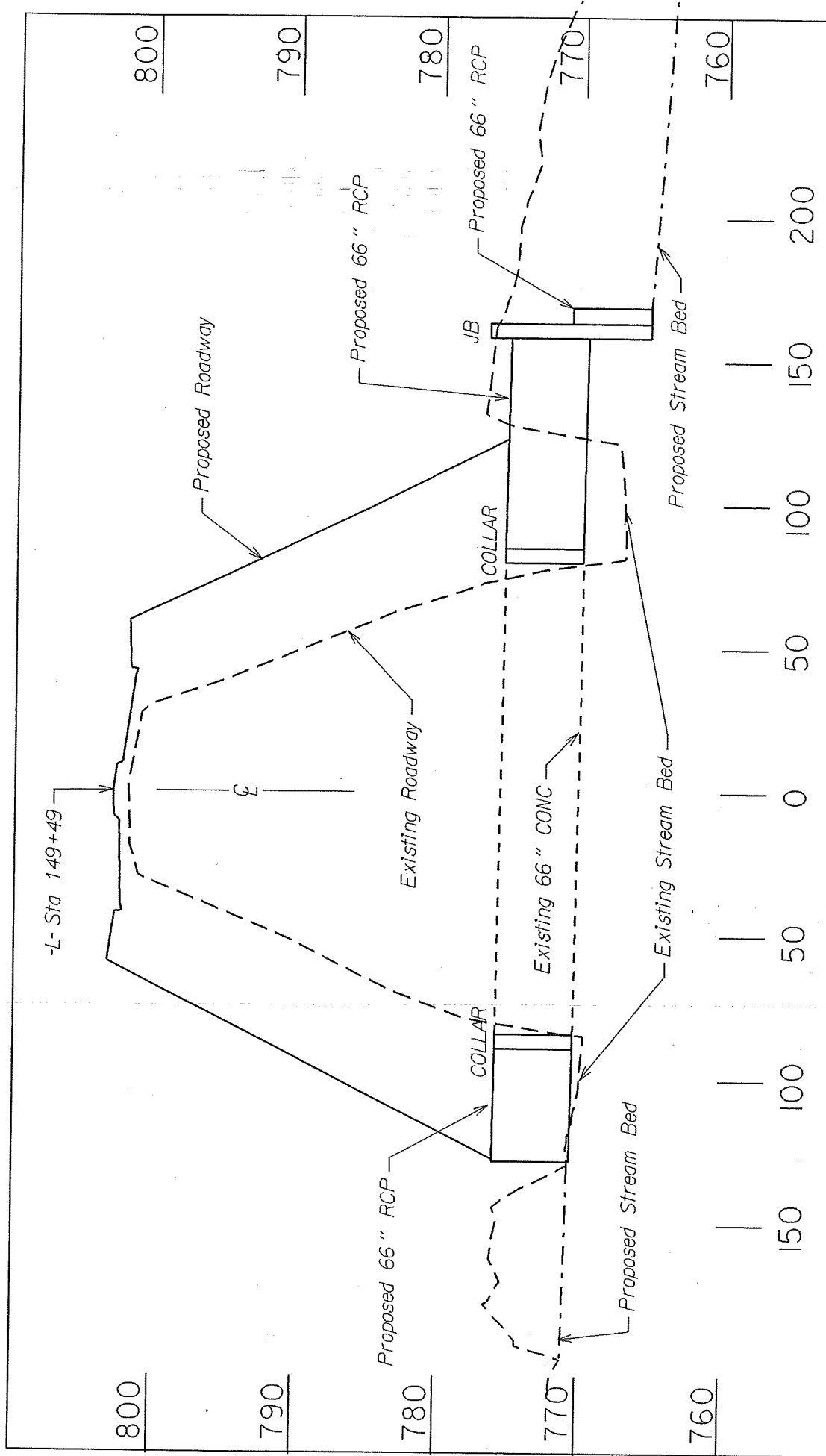
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DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A / B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

SHEET 10 OF 58
REVISED 08/04/2010
07/02/09

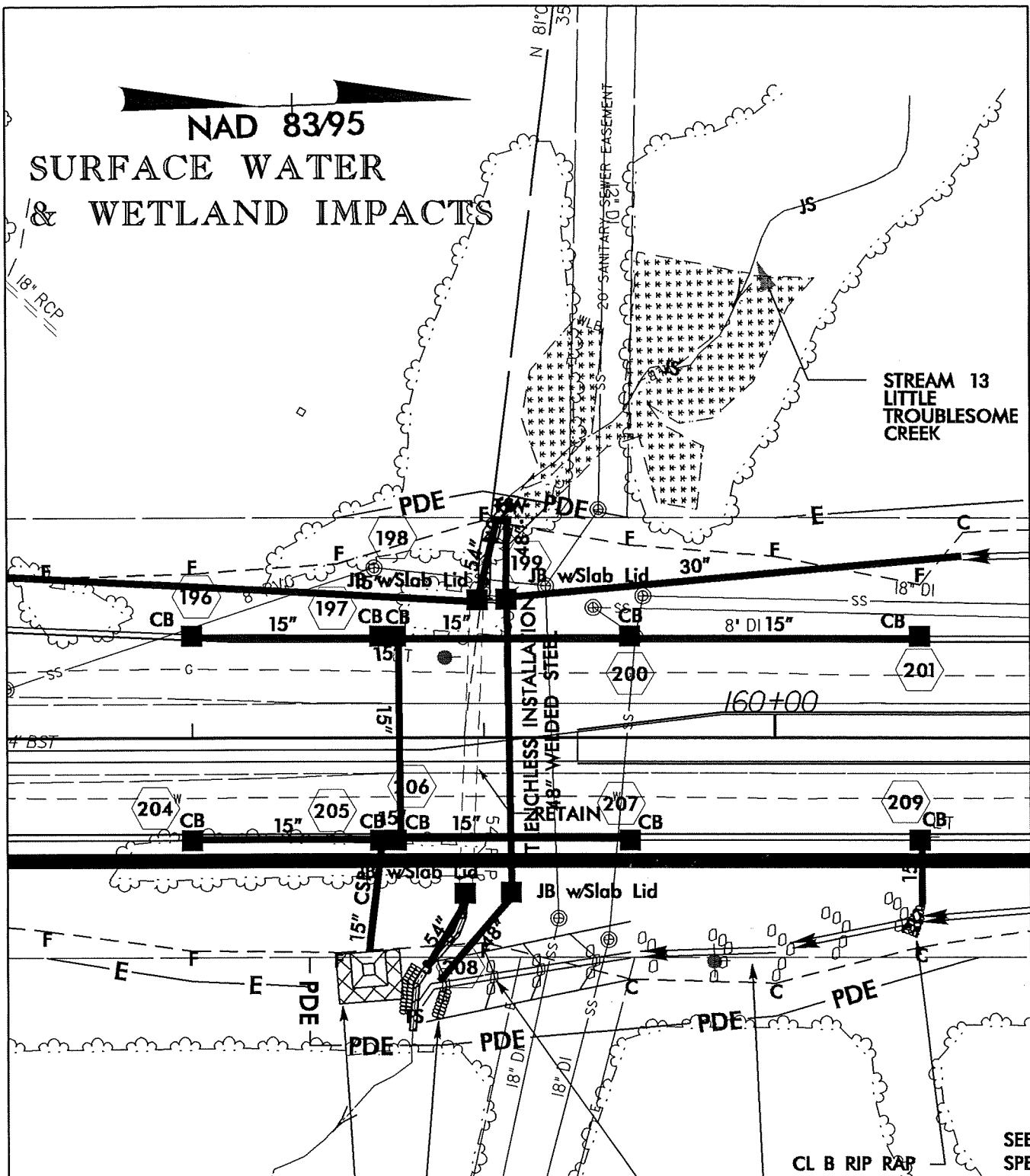


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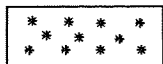
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 ROCKINGHAM COUNTY
 PROJECT: 34924.11 (U-3326)
 US 29 IN REIDSVILLE

SHEET 11 OF 58 07/02/09

NAD 83/95
SURFACE WATER
& WETLAND IMPACTS



SITE 6



DENOTES MECHANIZED
CLEARING



DENOTES FILL IN
WETLAND



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A/B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST)
TO NC 14 IN REIDSVILLE

SHEET 12 OF 58

REVISED 10/08/09
07/02/09

NAD 83/95

88

SIC K. LOFTIS CROUCH

SEE DETAIL X
TOE PROTECTION
W/CL B RIP RAP
EST. 61 TONS
EST. 184 SY FABRIC

STREAM 12
UT - WOLF ISLAND CREEK

CL B RIP RAP

REMOVE FES
COLLAR/EXTEND

RETAIN



SITE 7 SURFACE WATER IMPACTS

DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

PROJECT: 34924.1.1 (U-3326A / B)

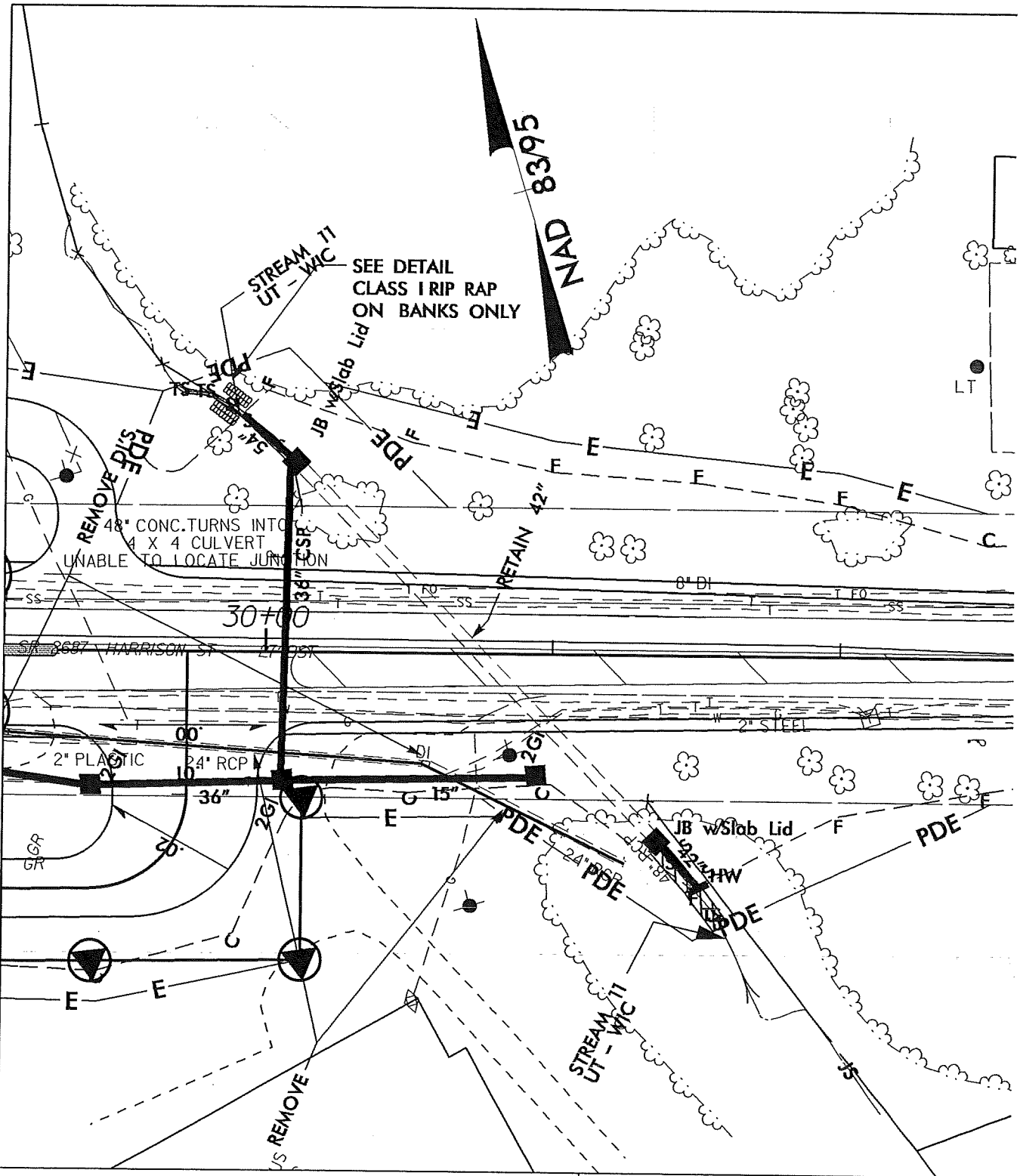
US 29 BUSINESS FROM

SR 2670 (SOUTH SCALES ST.)

STO NC 14 IN REIDSVILLE

SHEET 13 OF 58

07 / 02 / 09

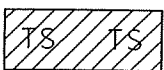


SITE 8

SURFACE WATER IMPACTS



DENOTES IMPACTS IN
SURFACE WATER



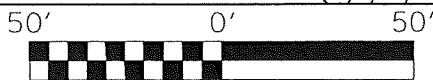
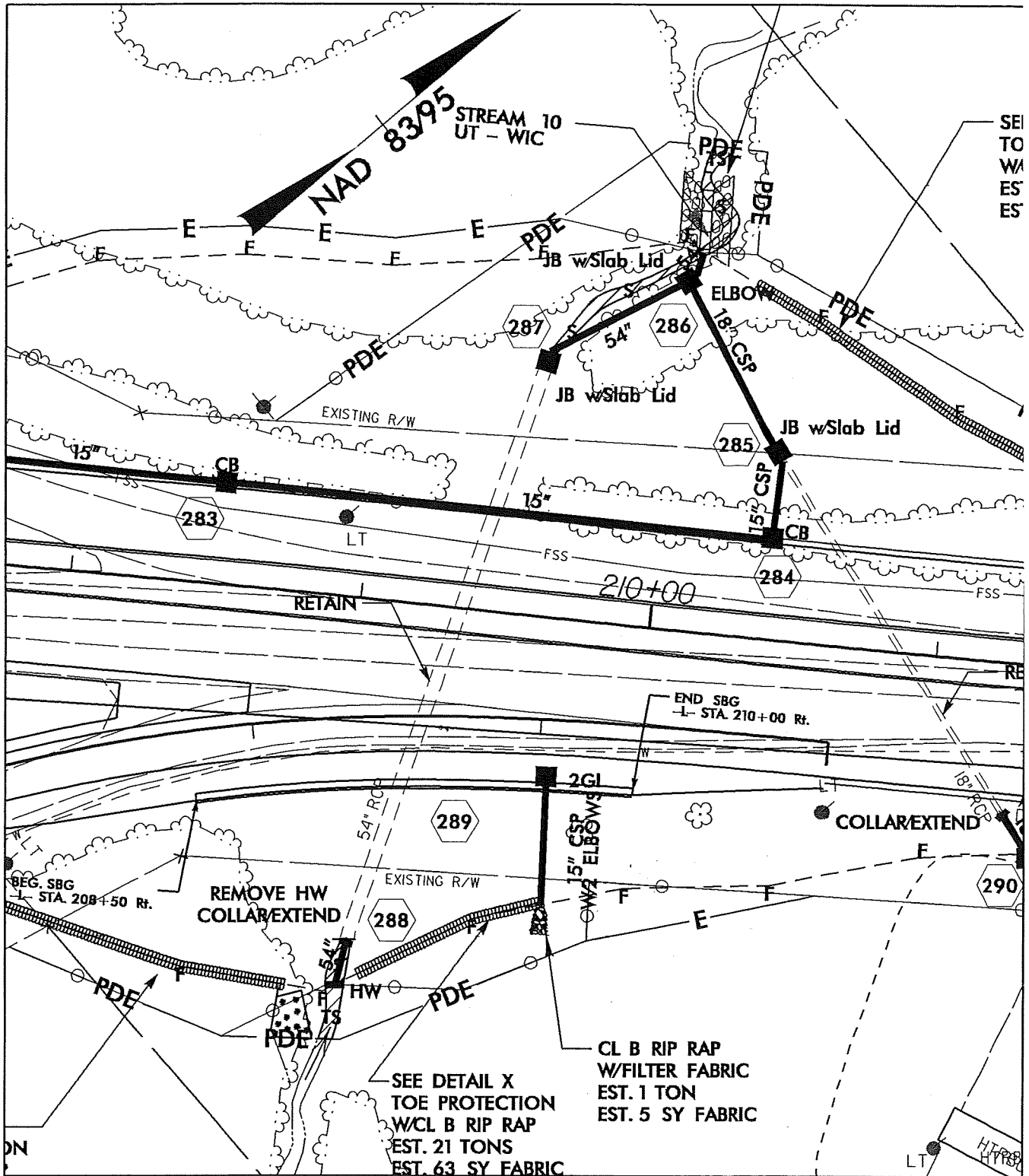
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 349241.1.1 (U-3326A / B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

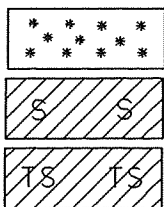
SHEET 14 OF 58

REVISED 08 / 04 / 2010
07 / 02 / 09



SITE 9

SURFACE WATER & WETLAND IMPACTS



DENOTES MECHANIZED
CLEARING

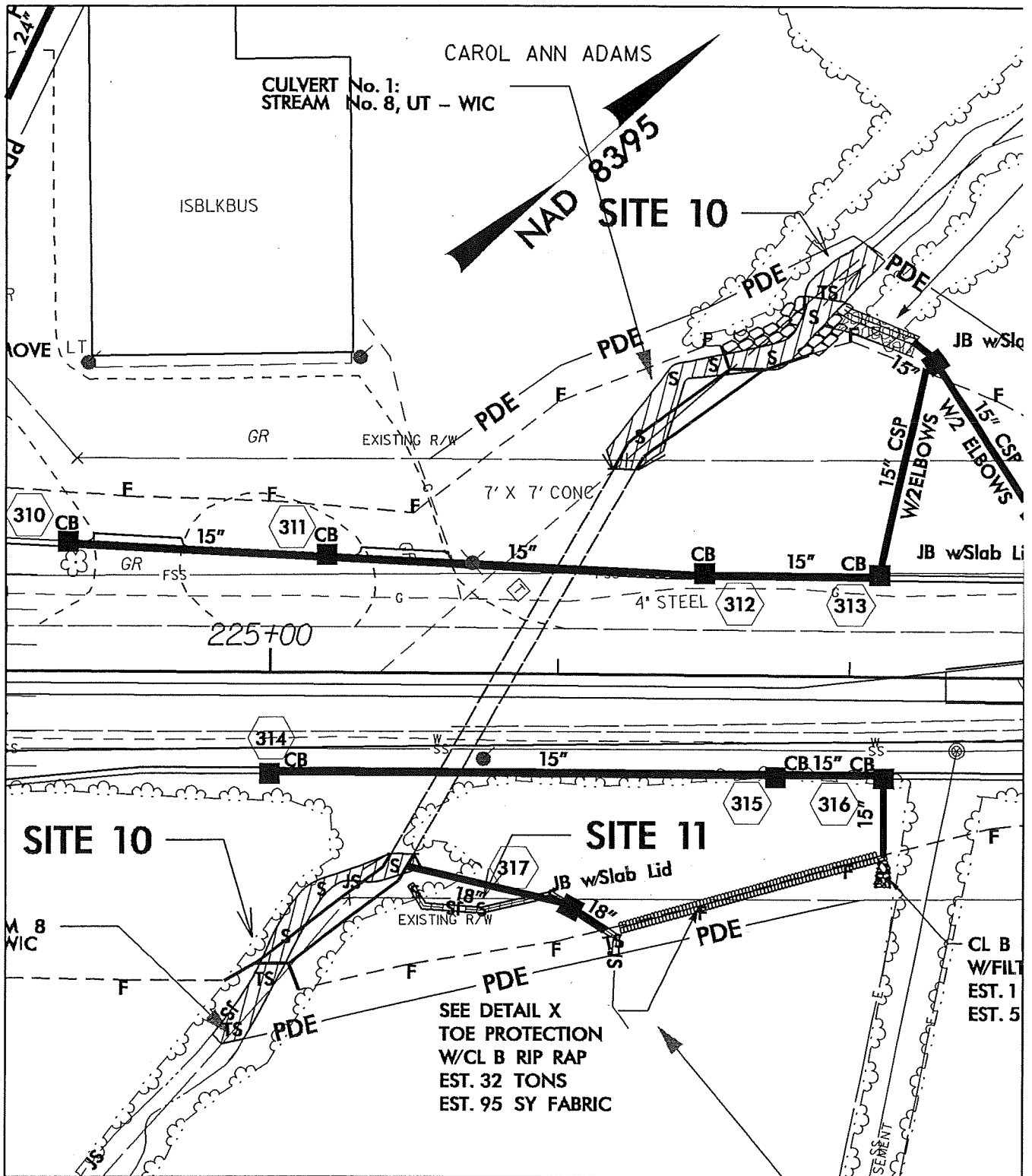
DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A / B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

SHEET 15 OF 58

07 / 02 / 09



SITES 10 & 11

SURFACE WATER IMPACTS



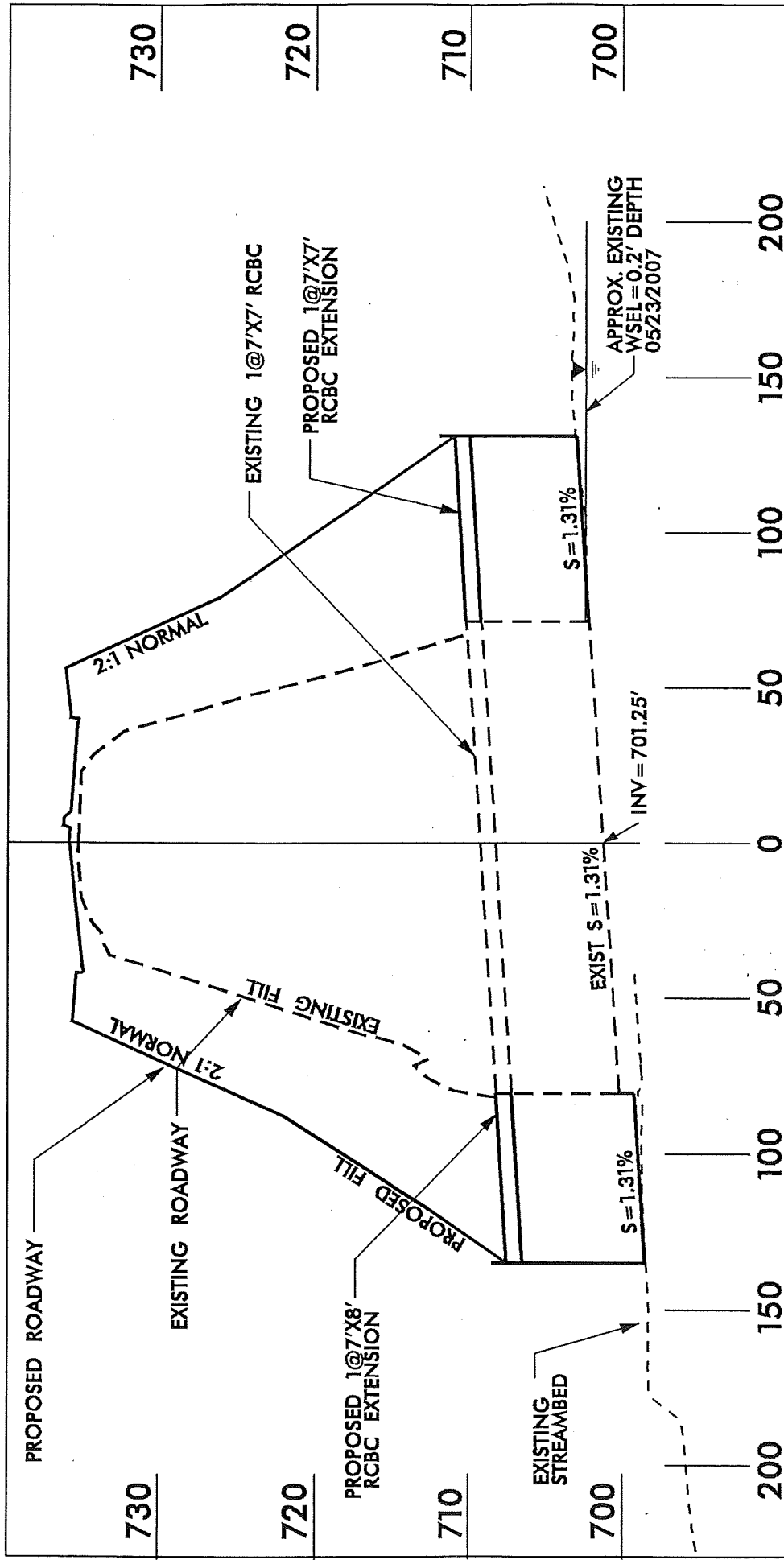
DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

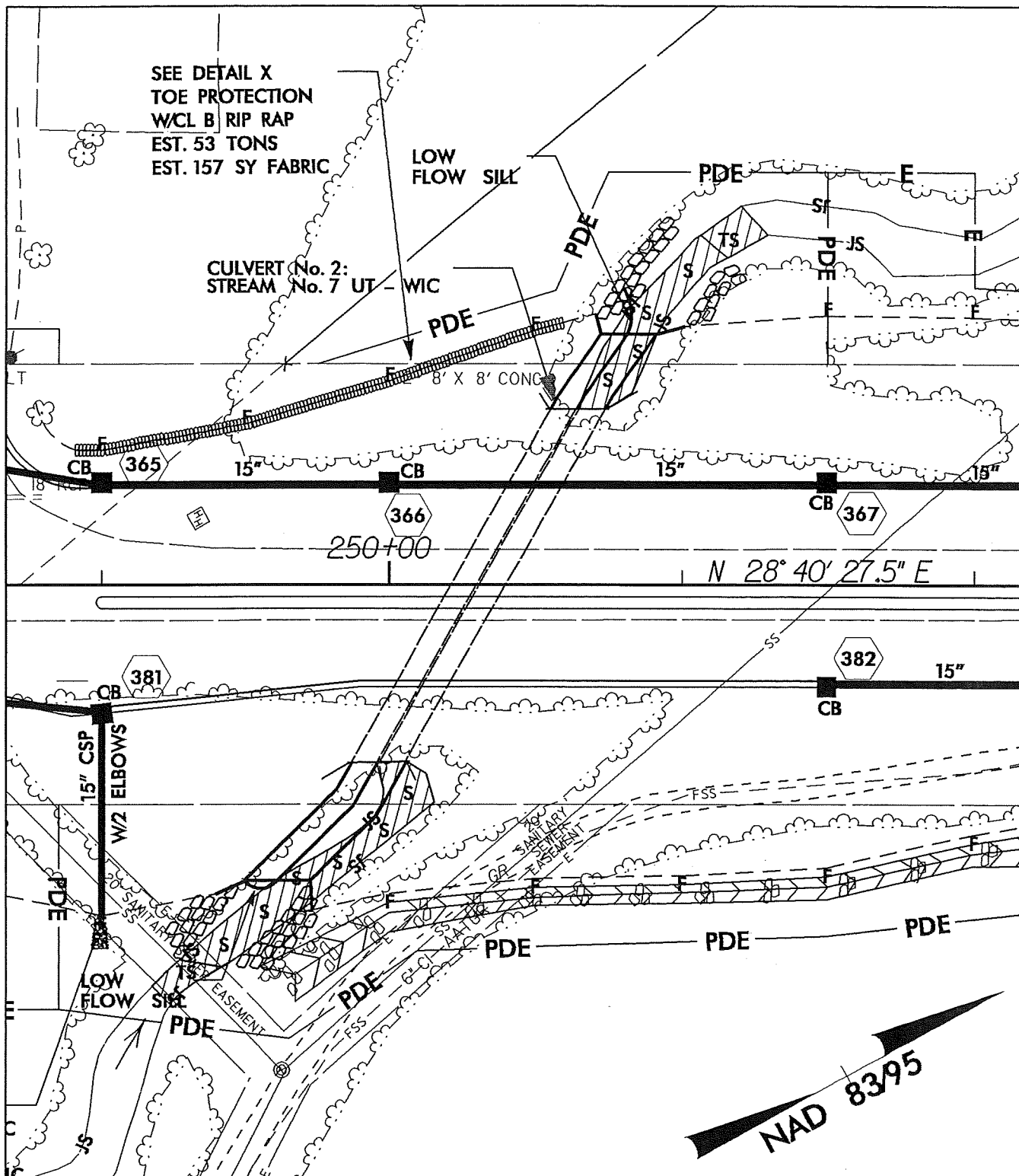
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A / B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE



NCDOT
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 34924.1.1 (U-3326A/B)
 US 29 BUSINESS FROM
 SR 2670 (SOUTH SCALES ST.)
 TO NC 14 IN REIDSVILLE

SHEET 17 OF 58
 07/01/09

PROFILE
 SITE 10

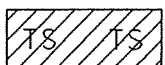


SITE 12

SURFACE WATER IMPACTS



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

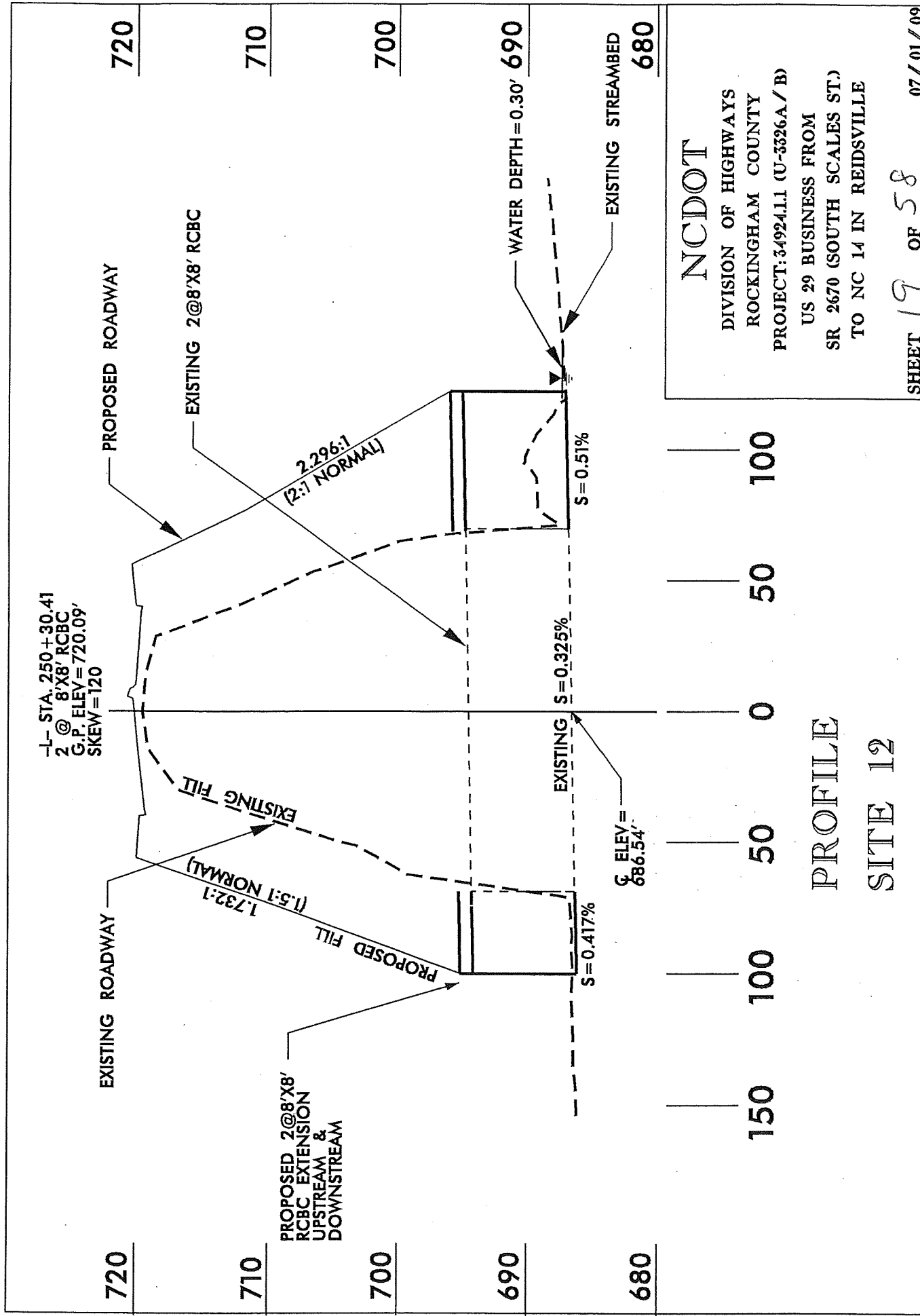
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY

PROJECT: 34924.1.1 (U-3326A / B)

US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

SHEET 18 OF 58

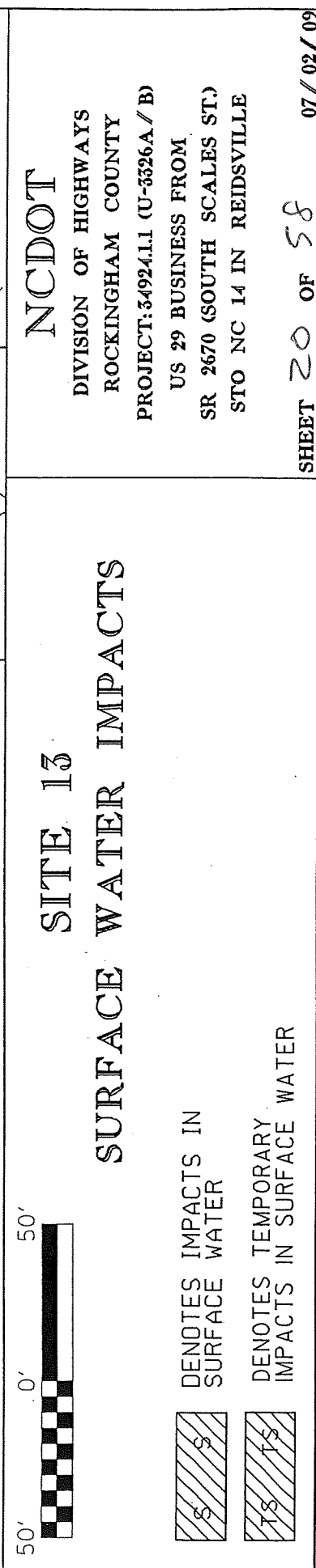
07/02/09



NCDOT
 DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 34924.1.1 (U-3326A/B)
 US 29 BUSINESS FROM
 SR 2670 (SOUTH SCALES ST.)
 TO NC 14 IN REIDSVILLE

SHEET 19 OF 58 07/01/09

**PROFILE
SITE 12**

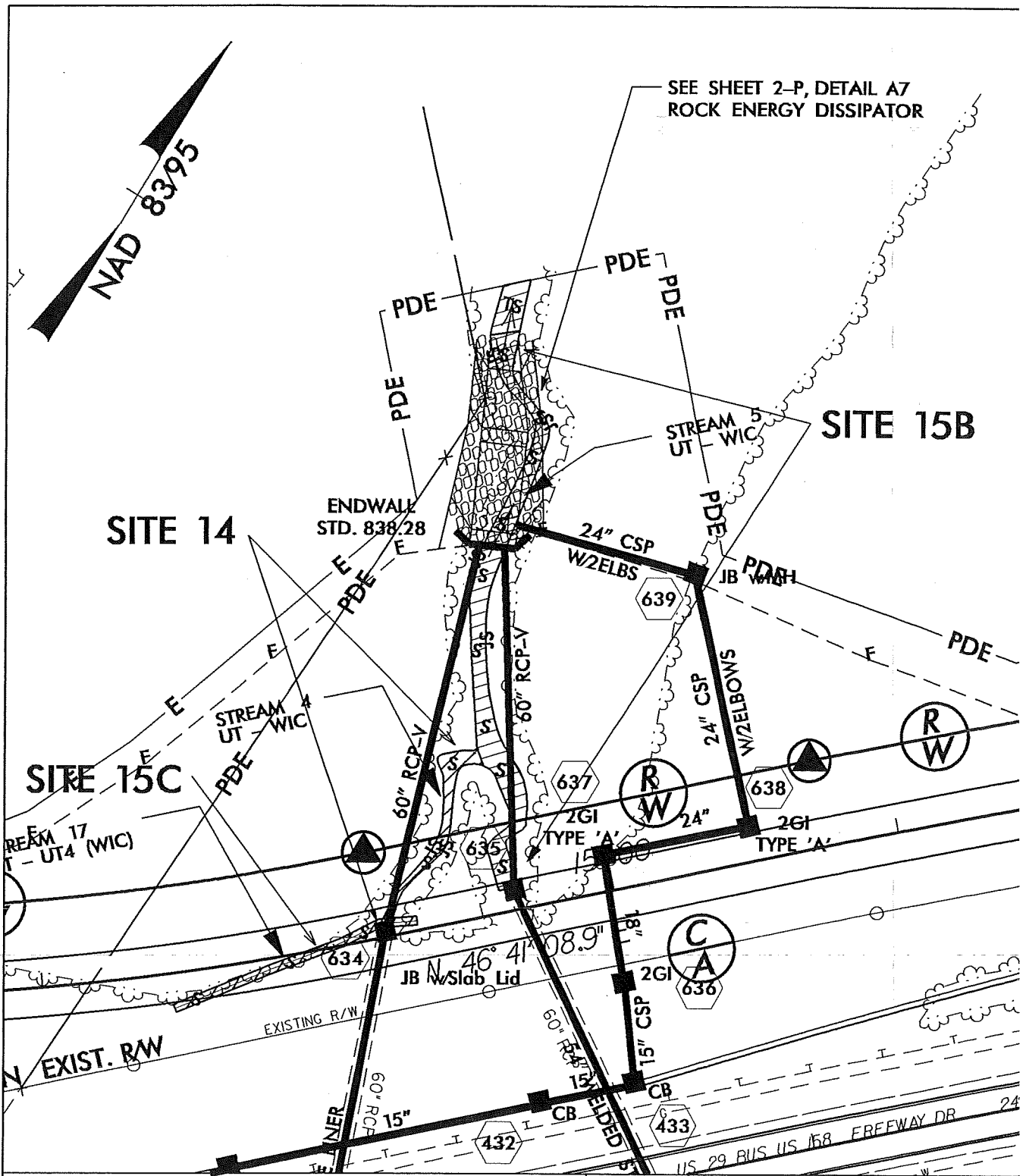


SHEET 20 OF 58

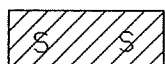
SITE 13 SURFACE WATER IMPACTS

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

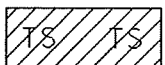
07 // 02 / 09



SITES 14, 15A, 15B, & 15C SURFACE WATER IMPACTS

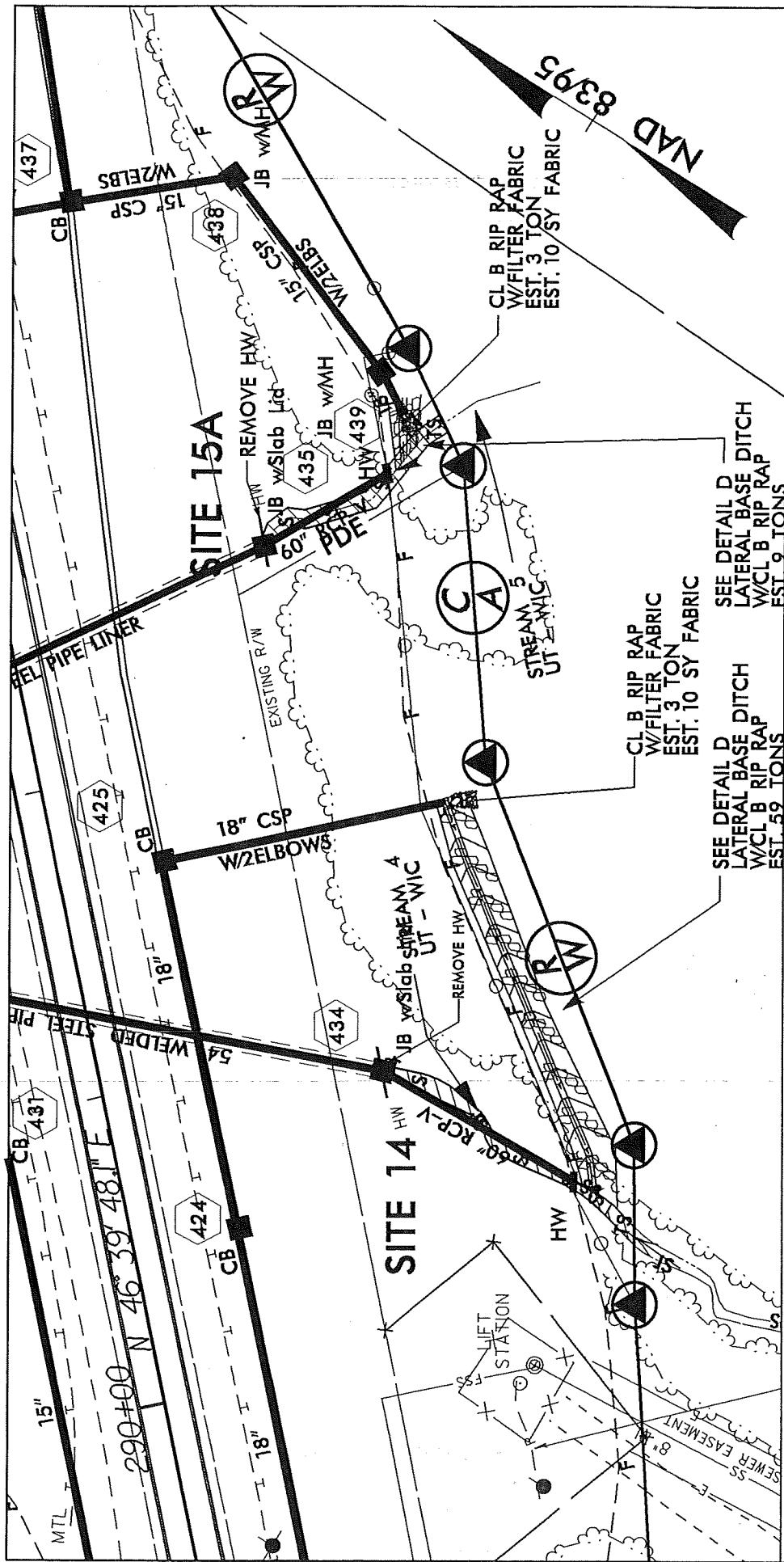


DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A / B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE



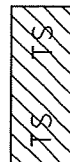
NCDOT

DIVISION OF HIGHWAYS
 ROCKINGHAM COUNTY
 PROJECT: 349241.1 (U-3326A/B)
 US 29 BUSINESS FROM
 SR 2670 (SOUTH SCALES ST.)
 TO NC14 IN REIDSVILLE

SHEET 22 OF 58
 REVISED 08/04/2010
 07/02/09

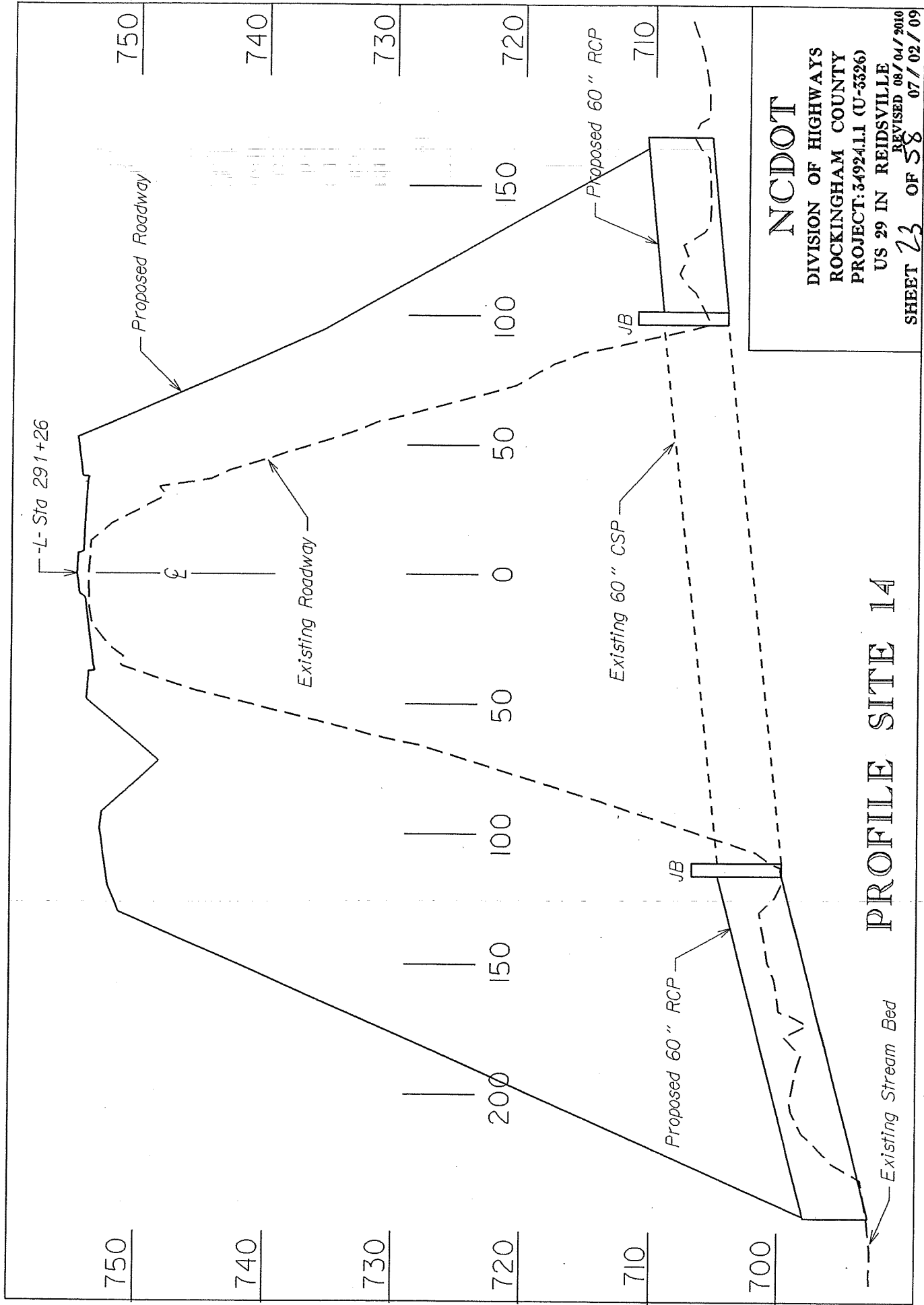
SITES 14, 15A, 15B, & 15C SURFACE WATER IMPACTS

DENOTES IMPACTS IN
 SURFACE WATER



DENOTES TEMPORARY
 IMPACTS IN SURFACE WATER



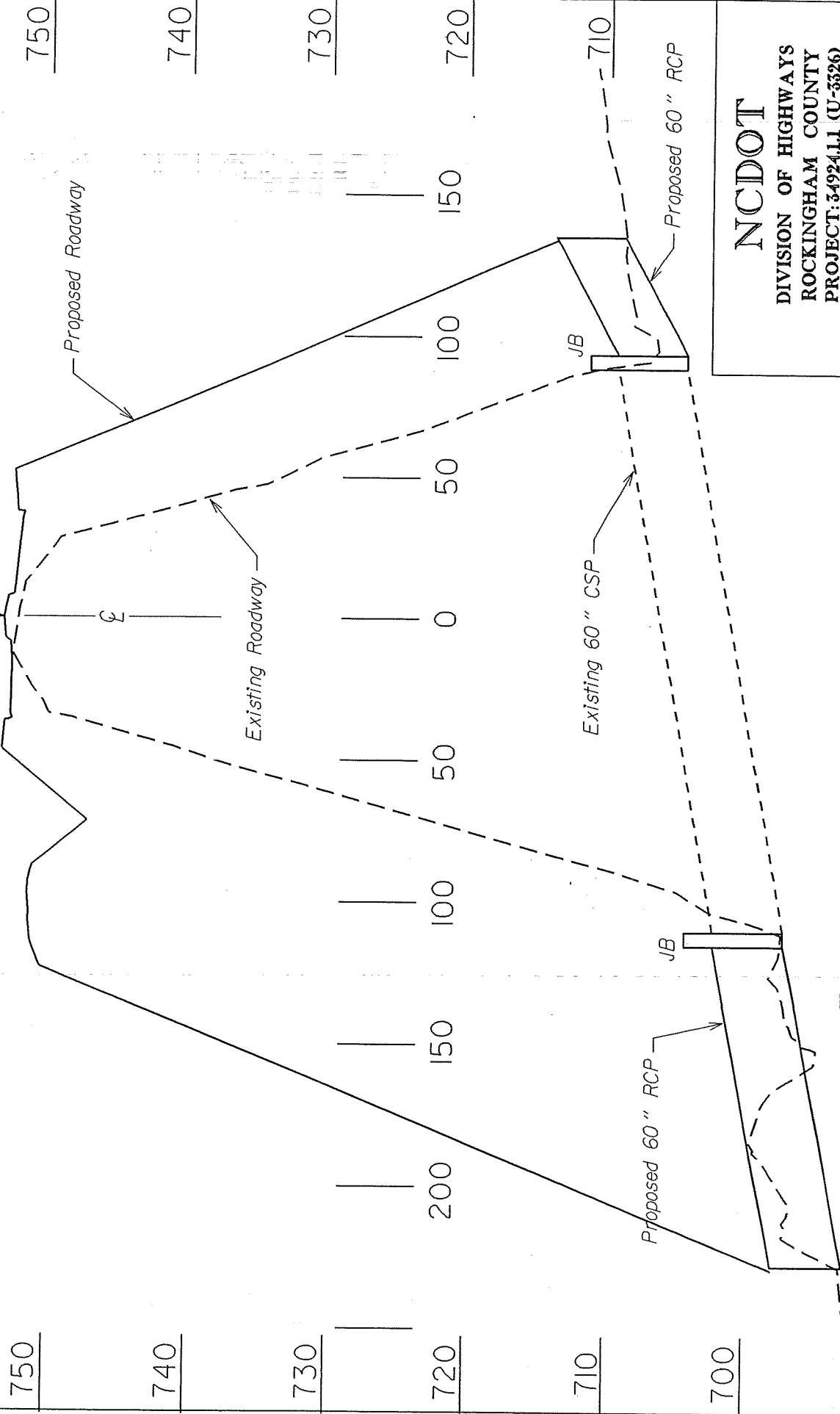


NCDOT

DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.11 (U-3326)
US 29 IN REIDSVILLE

SHEET 23 OF 58
REVISED 08/04/2010
07/02/09

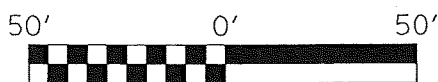
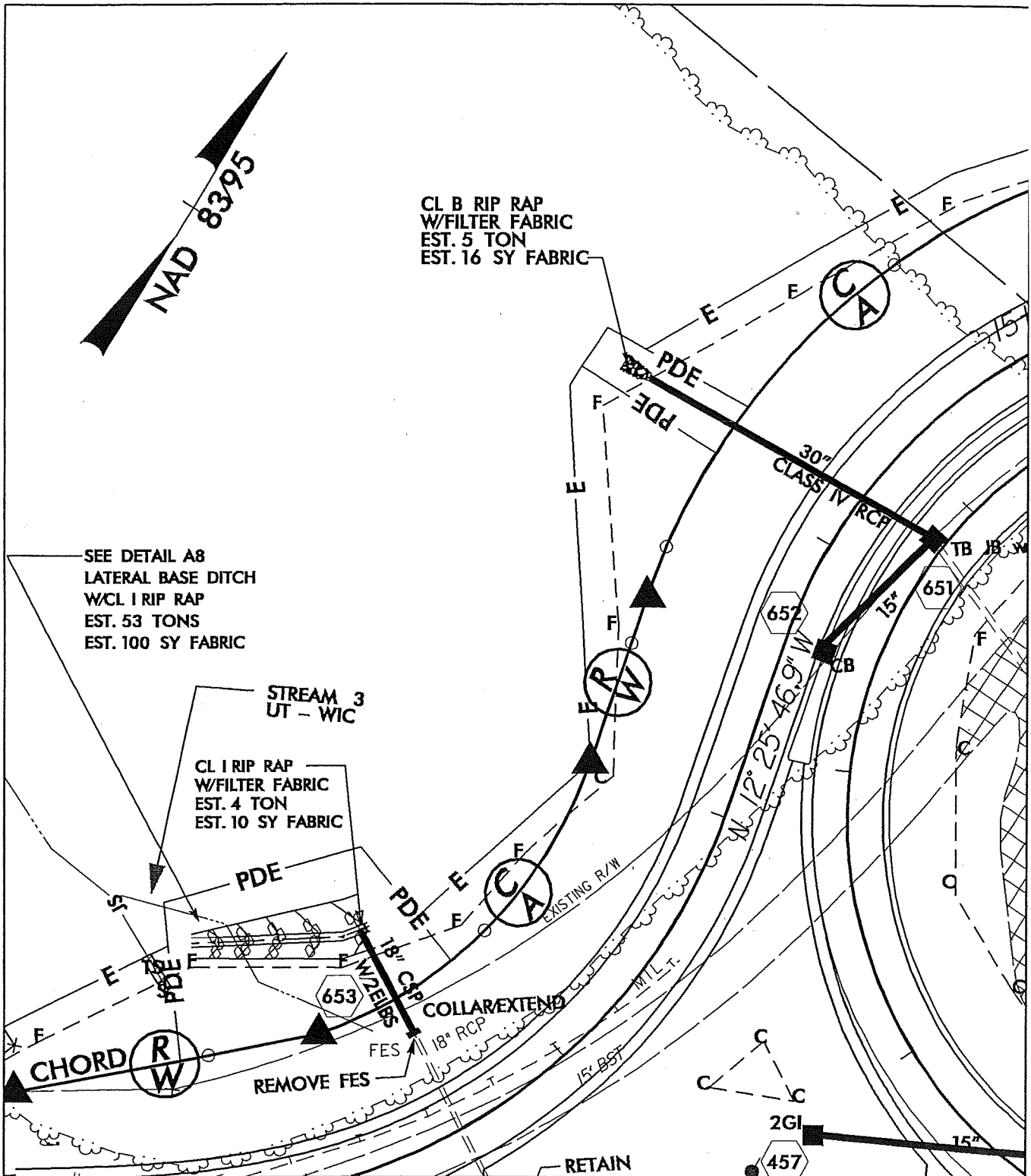
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NCDOT

DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.11 (U-3326)
US 29 IN REIDSVILLE

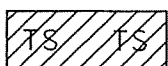
SHEET 24 OF 28
REVISED 08/04/2010
07/02/09



SITE 16 **SURFACE WATER IMPACTS**

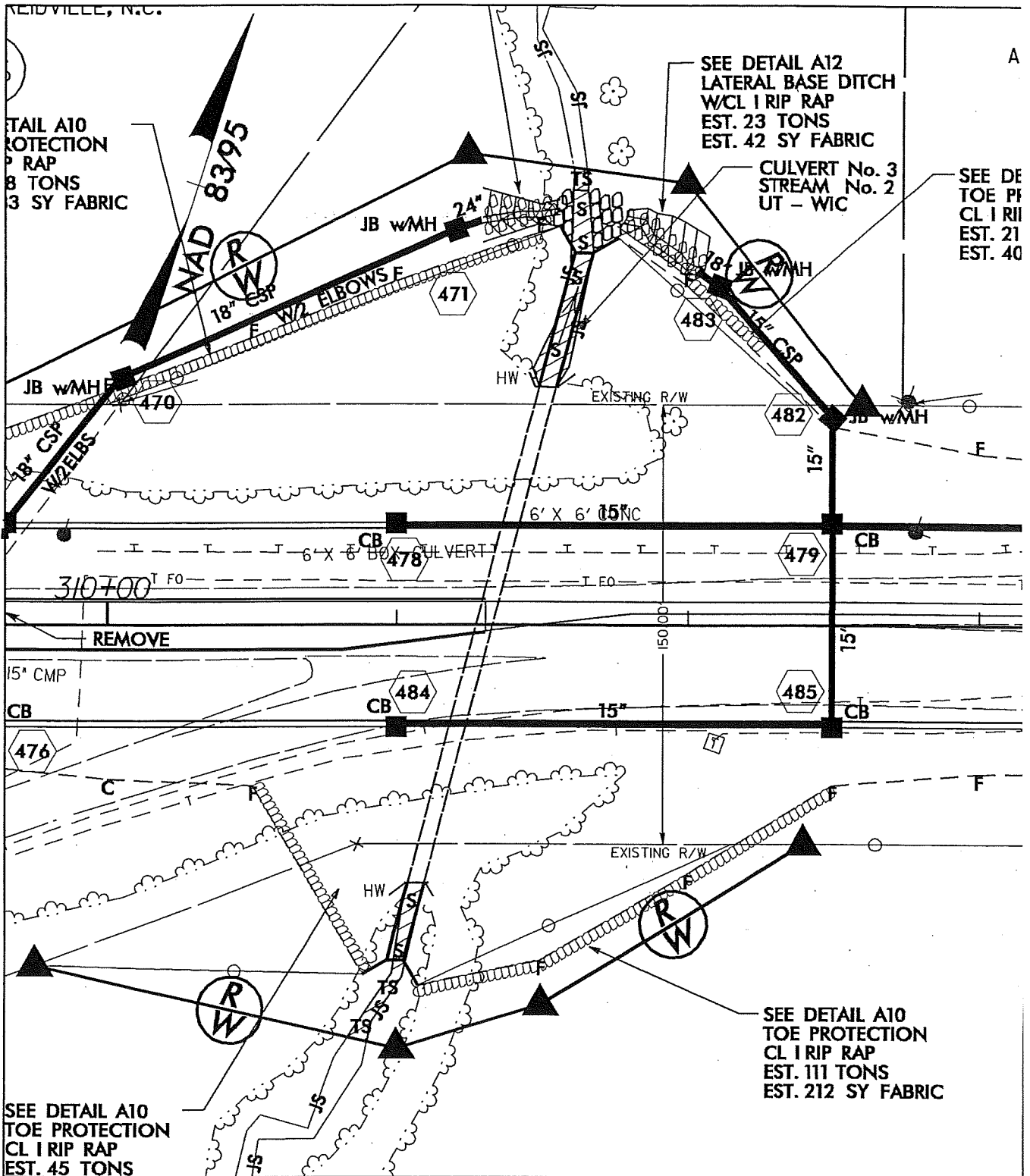


DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A/B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

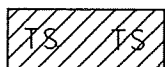


SITE 17

SURFACE WATER IMPACTS



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

NCDOT

DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY

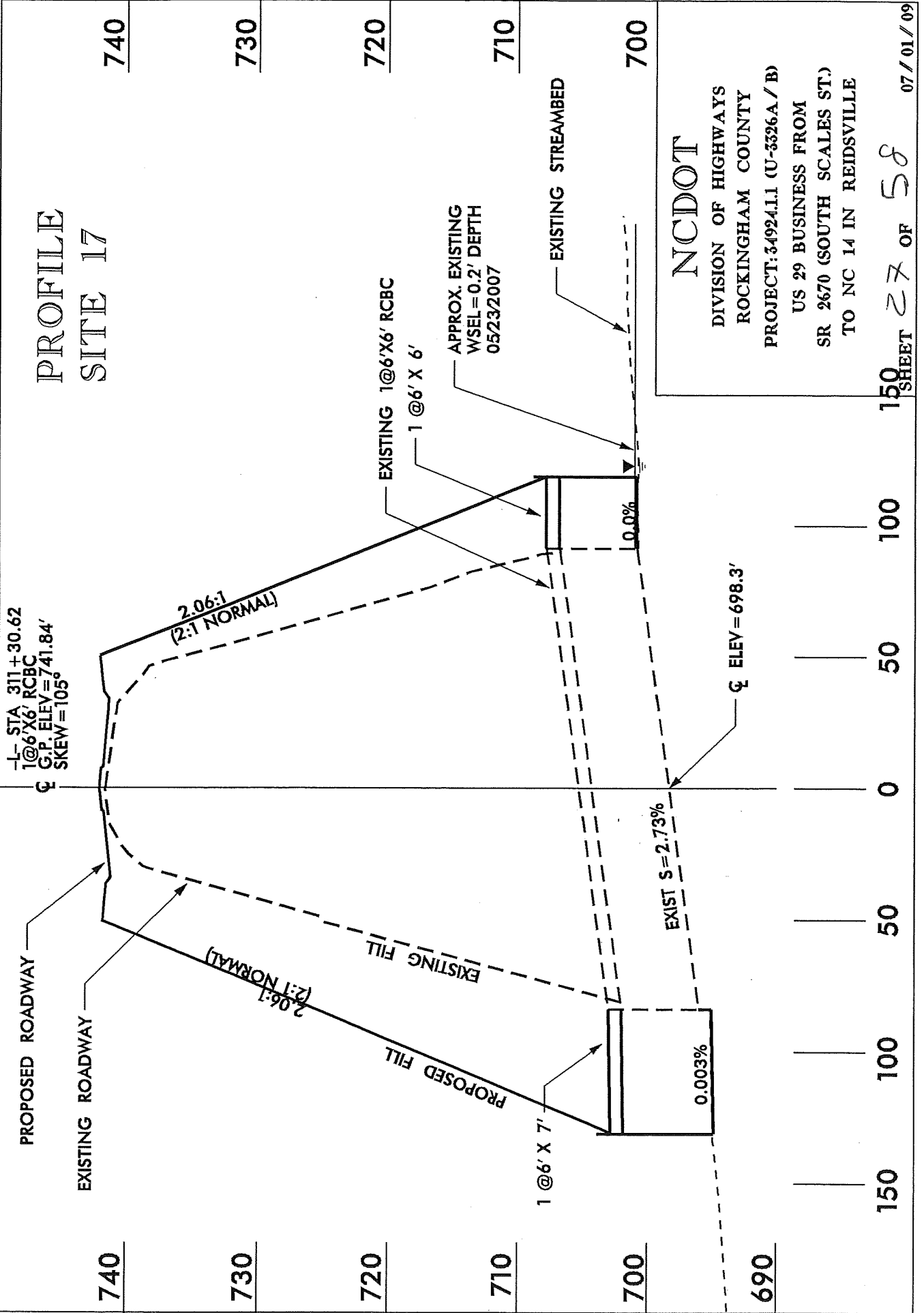
PROJECT: 34924.1.1 (U-3326A/B)

US 29 BUSINESS FROM
WSR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

SHEET 26 OF 58

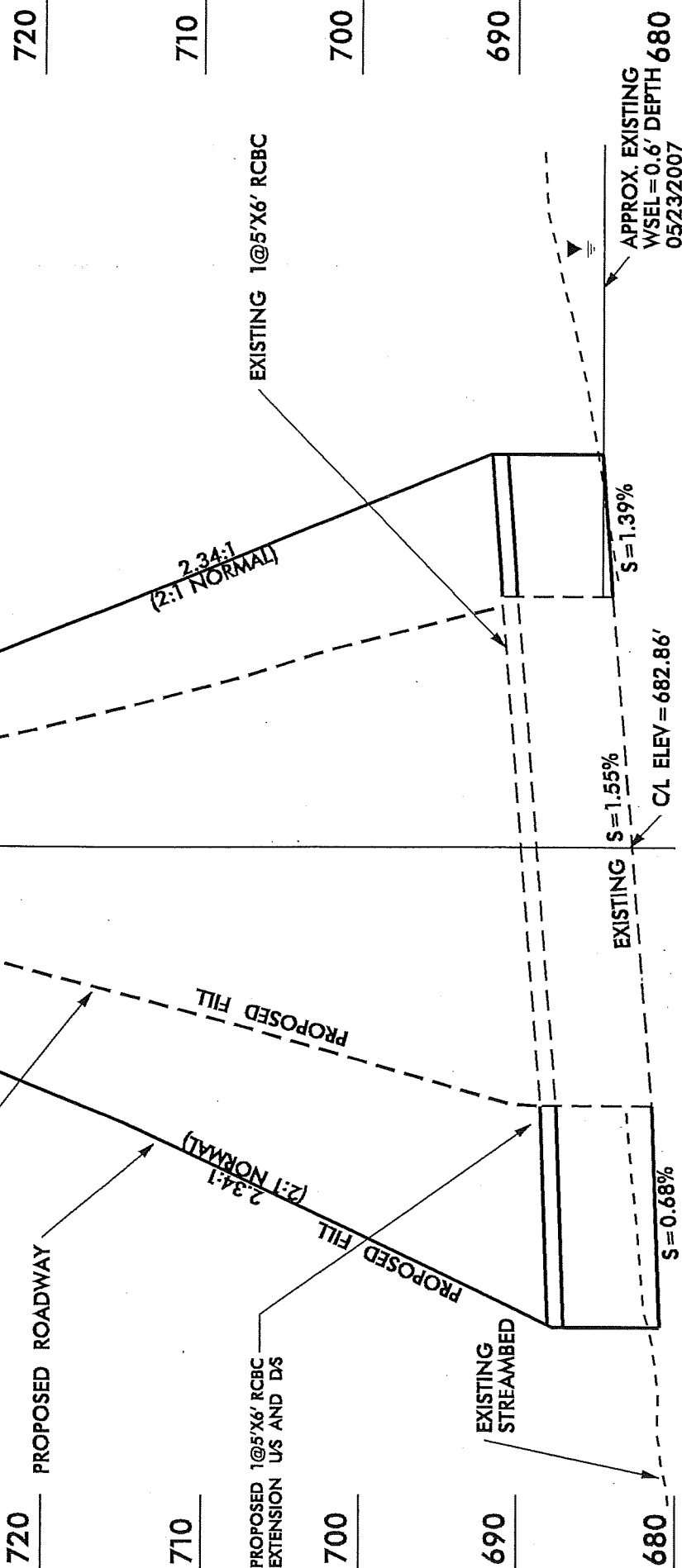
07/02/09

PROFILE SITE 17



NCDOT
DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A/B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

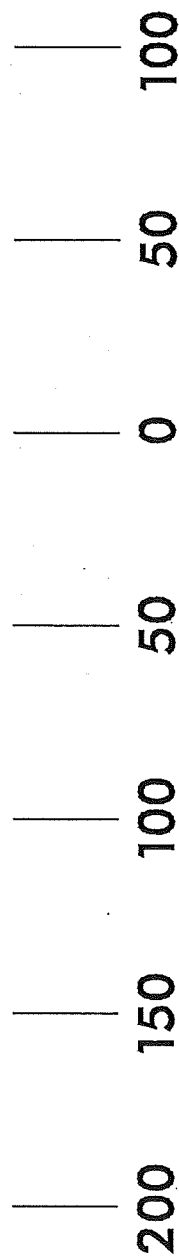
PROFILE SITE 18



NCDOT

DIVISION OF HIGHWAYS
ROCKINGHAM COUNTY
PROJECT: 34924.1.1 (U-3326A/B)
US 29 BUSINESS FROM
SR 2670 (SOUTH SCALES ST.)
TO NC 14 IN REIDSVILLE

-L- STA 324+72.83
1@5'X6' RCBC
G.P. ELEV=728.92'
SKEW=90°



09/08/99

TIP PROJECT: U-3326AB

CONTRACT:

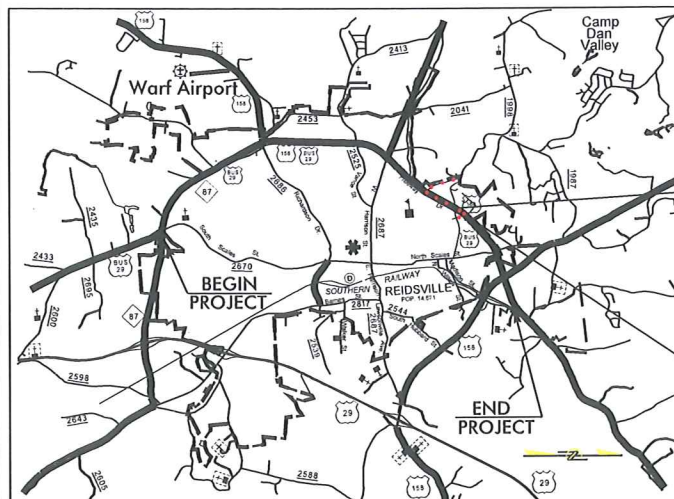
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

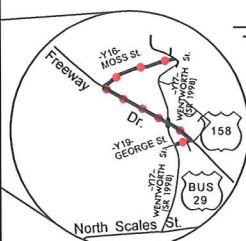
ROCKINGHAM COUNTY

LOCATION: US 29 BUSINESS (FREEWAY DRIVE) FROM SR 2670
(SOUTH SCALES STREET) TO NC 14 IN REIDSVILLE

PERMIT DRAWINGS
SURFACE WATER & WETLAND IMPACTS

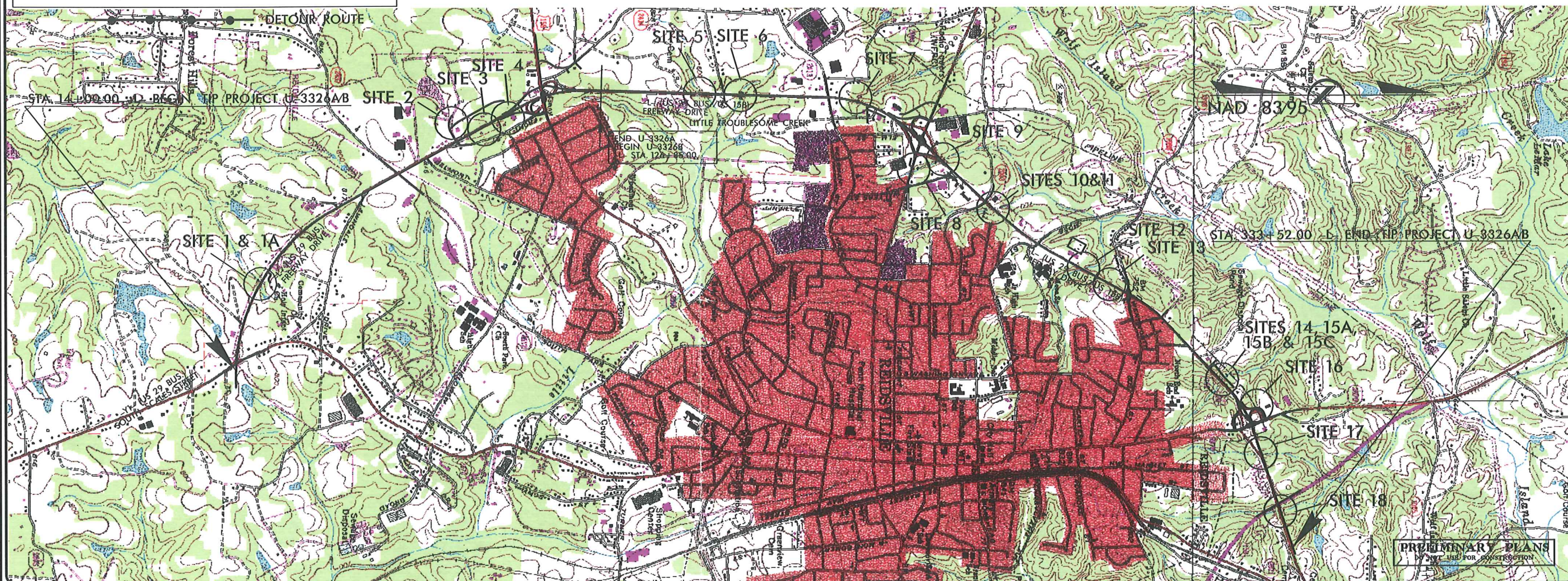


VICINITY MAP

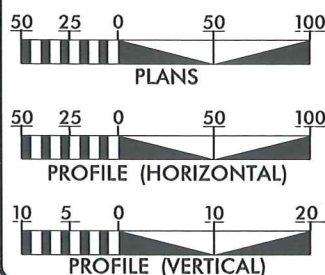


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3326AB	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34924.1.1	STP-298(1)	P.E.	

Permit Drawing
Sheet 30 of 58



GRAPHIC SCALES



DESIGN DATA

ADT 2010 = 20260
ADT 2035 = 41000
DHV = 10 %
D = 55 %
T = 11 % *
V = 50 MPH
* TTST 5% DUAL 6%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3326AB = 5.914 MI
LENGTH STRUCTURE TIP PROJECT U-3326AB = 0.138 MI
TOTAL LENGTH OF TIP PROJECT U-3326AB = 6.052 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 17, 2008

LETTING DATE:
OCTOBER 19, 2010

JAMES A. SPEER, PE
PROJECT ENGINEER

DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.

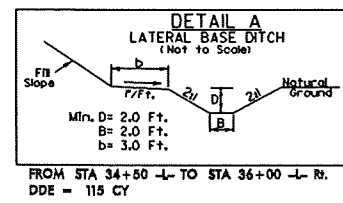
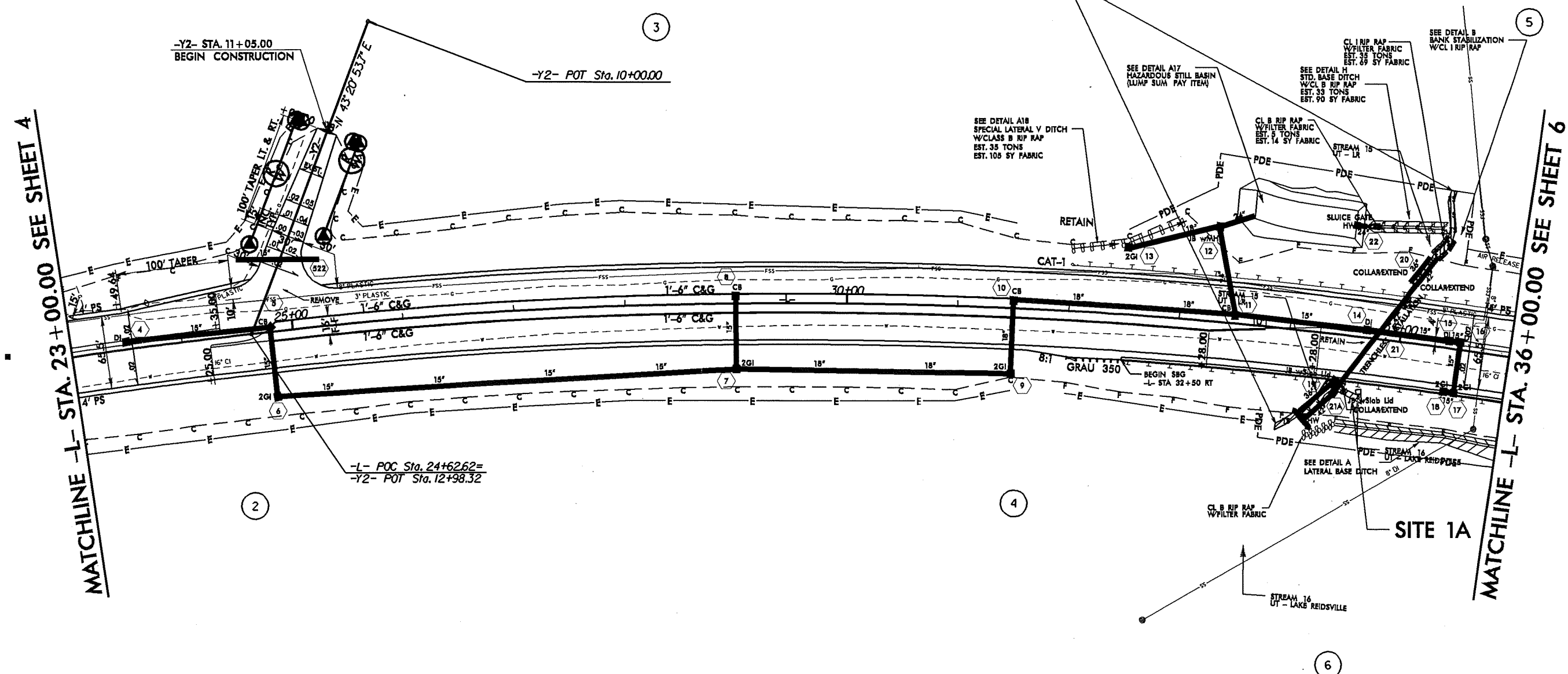
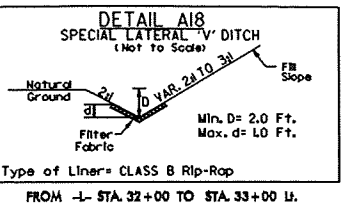
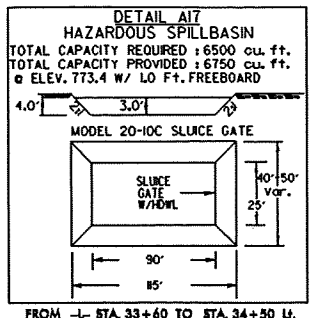
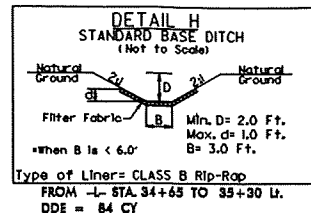
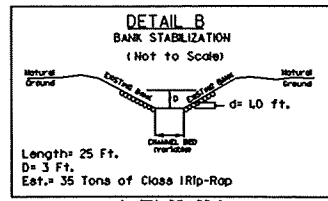
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA





STATE HIGHWAY DESIGN ENGINEER

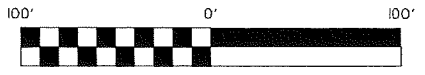
REUSED JAN 25, 2010
Added SITE 1A

Permit Drawing
Sheet 31 of 58



 DENOTES IMPACTS IN SURFACE WATER

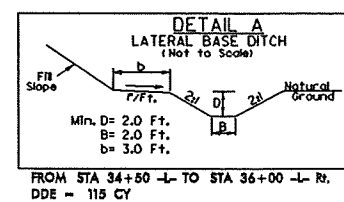
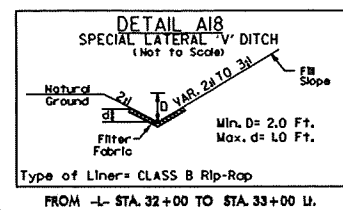
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SBG=SHOULDER BERM GUTTER
SEE SHEET 30 FOR -L- PROFILE
SEE SHEET 43 FOR -Y2- PROFILE

06/08/09 R/W REVISION (P.S.) - PERMANENT DRAINAGE EASEMENT WAS EXTENDED ON PARCEL 6 (HOLY INFANT CATHOLIC CHURCH) 15 FEET BACK TO START AT STA 1+1 - \$349500 RT TO ACCOMMODATE THE REALIGNMENT OF THE 36" AND 42" PIPES TO THE EXISTING STREAM.

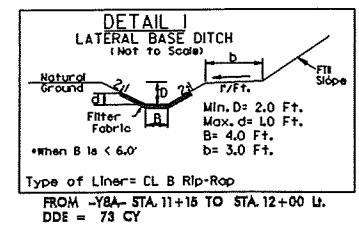
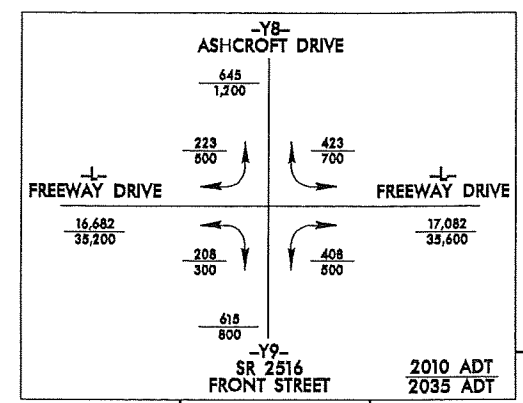
33 JAN-2010 0858115 Environmental Drawings\J3326.rdw	ash.35.dgn	8/17/99
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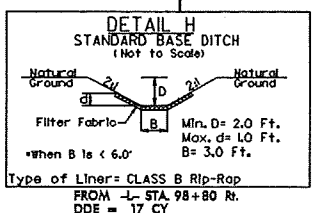
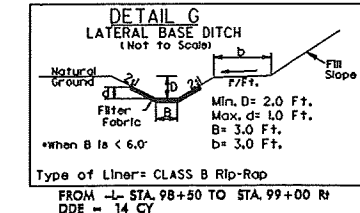
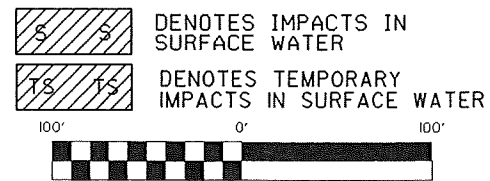
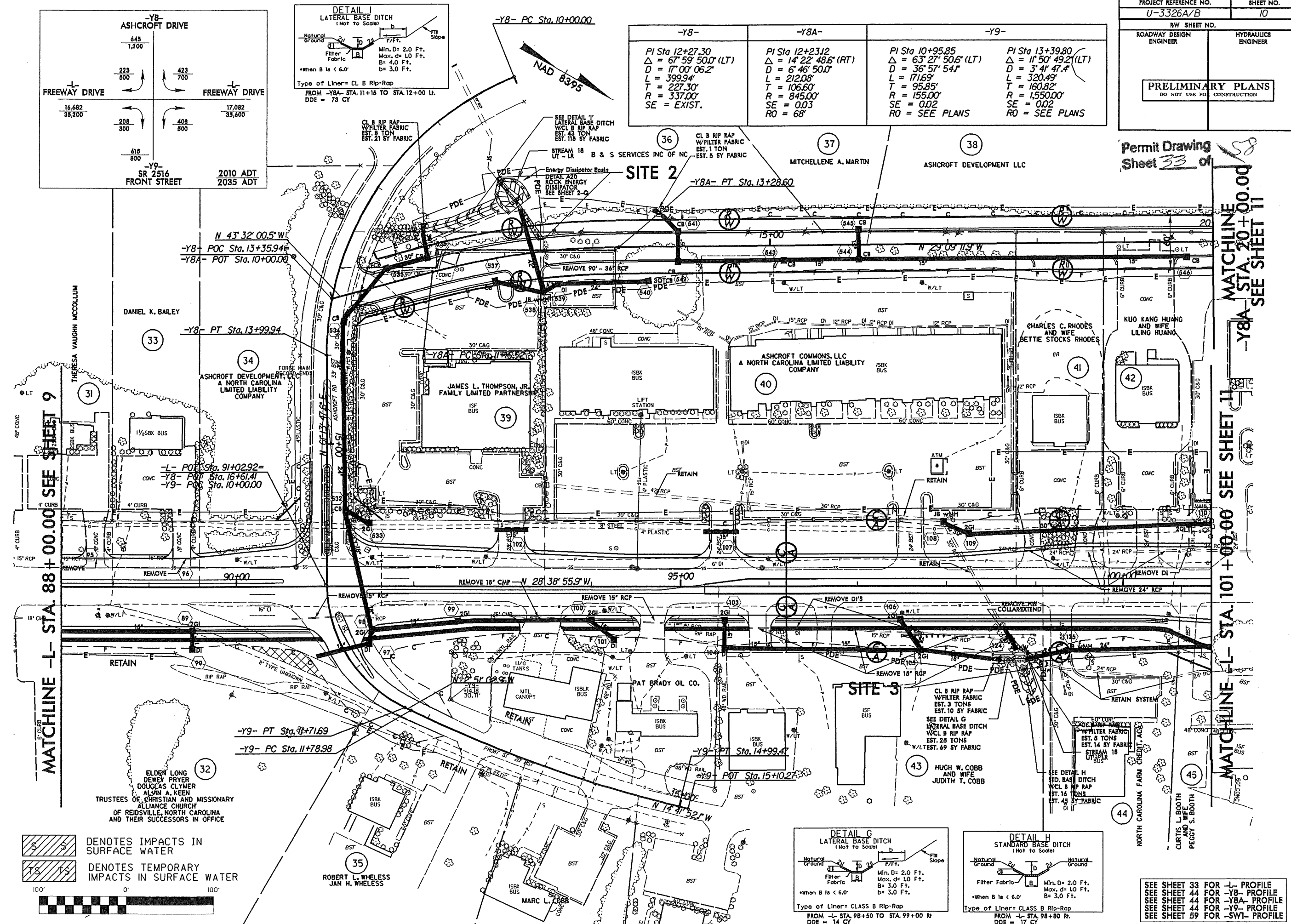
SBG=SHOULDER BERM GUTTER
SEE SHEET 30 FOR -L- PROFILE
SEE SHEET 43 FOR -Y2- PROFILE

05-JAN-2010 08:54
\\Hydraulics\PERN
baulledge

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-Y8-	-Y8A-	-Y9-
PI Sta 12+27.30 Δ = 67° 59' 50.0" (LT) D = 17' 00" 06.2" L = 399.94' T = 227.30' R = 337.00' SE = EXIST.	PI Sta 12+23.12 Δ = 14° 22' 48.6" (RT) D = 6' 46' 50.0" L = 212.08' T = 106.80' R = 845.00' SE = 0.03 RO = 68'	PI Sta 10+95.85 Δ = 63° 27' 50.6" (LT) D = 36' 57' 54.1" L = 71.69' T = 95.85' R = 155.00' SE = 0.02 RO = SEE PLANS



SEE SHEET 33 FOR -L- PROFILE
SEE SHEET 44 FOR -Y8- PROFILE
SEE SHEET 44 FOR -Y8A- PROFILE
SEE SHEET 44 FOR -Y9- PROFILE
SEE SHEET 59 FOR -SW1- PROFILE

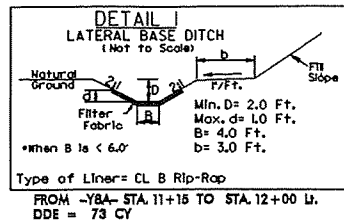
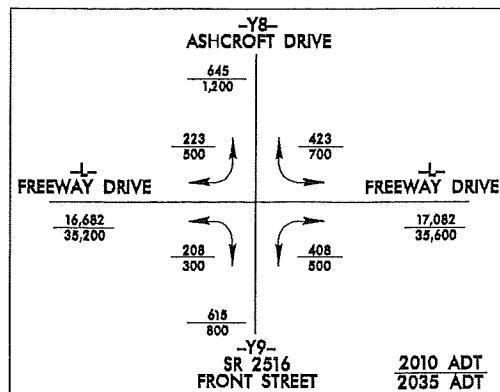
MATCHLINE -L- STA. 88+00.00 SEE SHEET 9
MATCHLINE -Y8A- STA. 20+00.00 SEE SHEET 11
MATCHLINE -L- STA. 101+00.00 SEE SHEET 11

Permit Drawing
Sheet 33 of 38

8/17/99

31-JUL-2009 1410
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REVISIONS



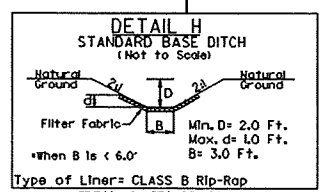
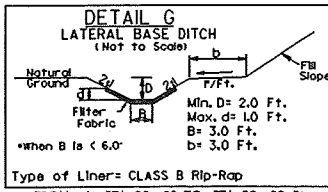
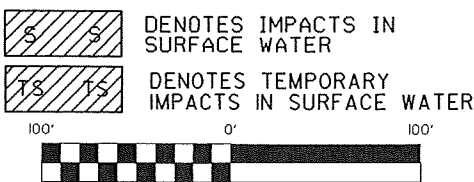
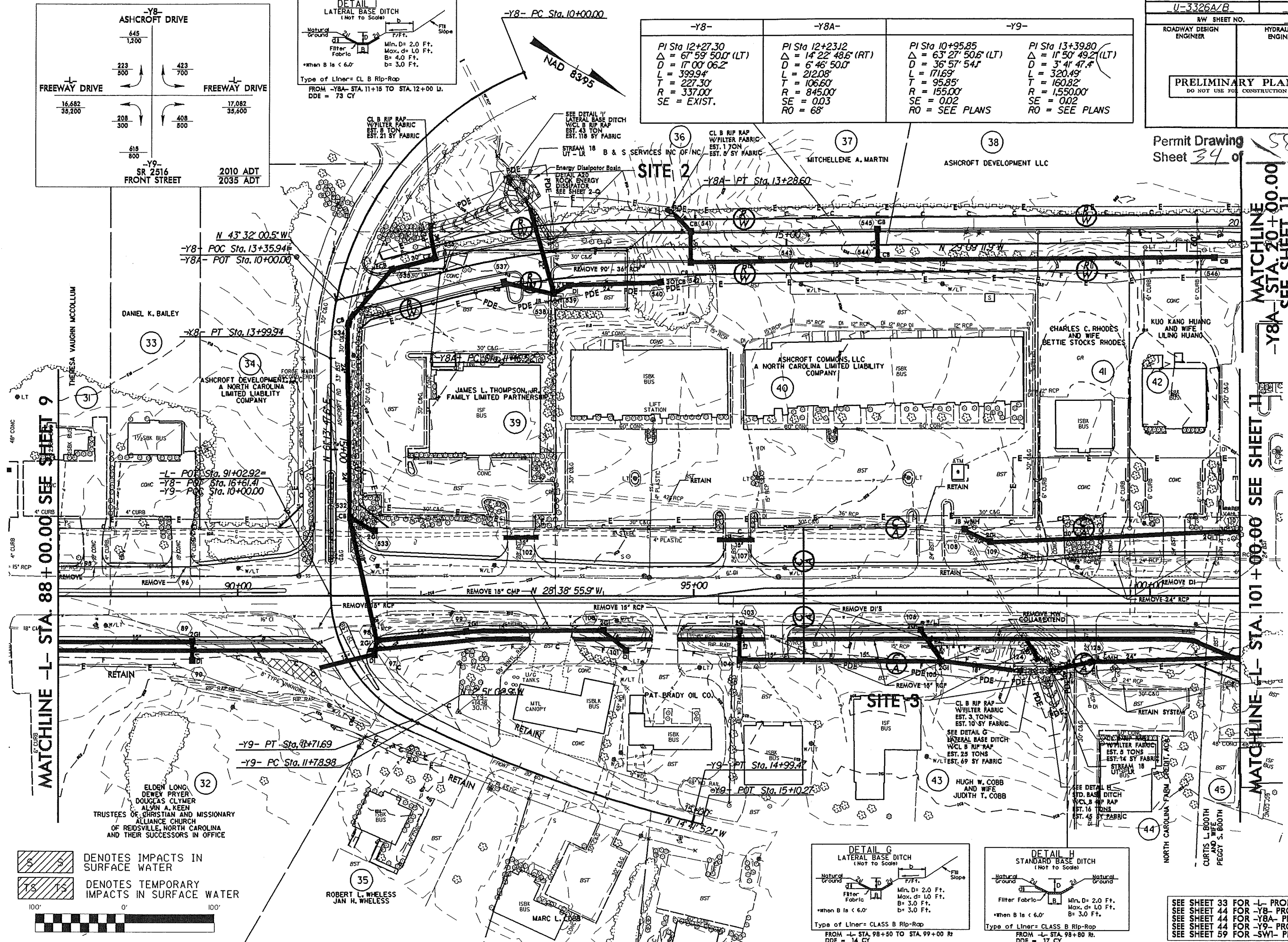
-Y8- PC Sta. 10+00.00

NAD 83/95

-Y8-	-Y8A-	-Y9-
PI Sta 12+27.30 $\Delta = 67^{\circ} 59' 50.0''$ (LT) D = 17' 00" 06.2" L = 399.94' T = 227.30' R = 337.00' SE = EXIST.	PI Sta 12+23.12 $\Delta = 14^{\circ} 22' 48.6''$ (RT) D = 6' 46' 50.0" L = 212.08' T = 106.60' R = 845.00' SE = 0.03 RO = 68'	PI Sta 10+95.85 $\Delta = 63^{\circ} 27' 50.6''$ (LT) D = 36' 57' 54.1" L = 171.69' T = 95.85' R = 155.00' SE = 0.02 RO = SEE PLANS
PI Sta 13+39.80 $\Delta = 11^{\circ} 50' 49.2''$ (LT) D = 3' 41' 47.4" L = 320.49' T = 160.82' R = 1,550.00' SE = 0.02 RO = SEE PLANS		

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 10
NW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 34 of 58

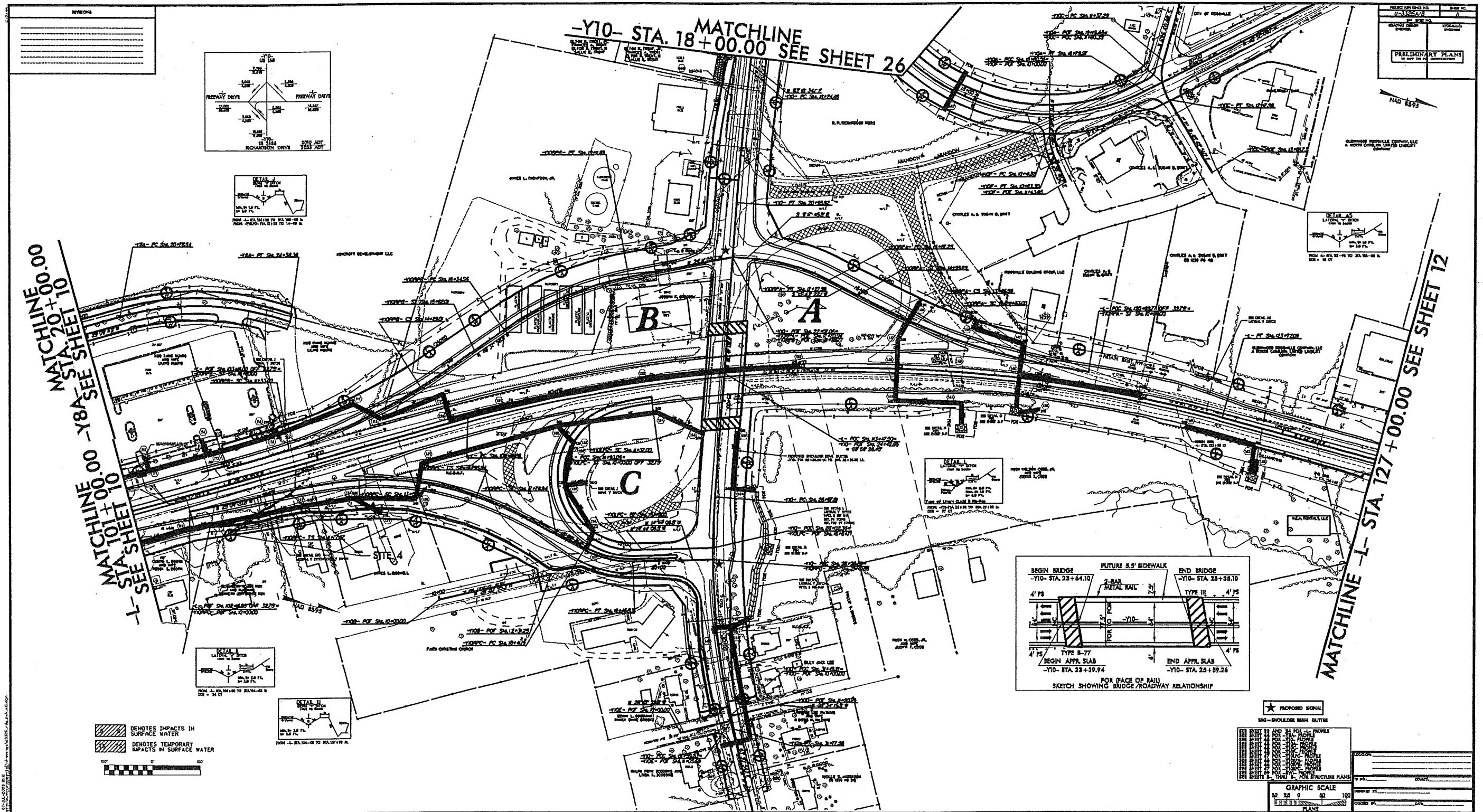


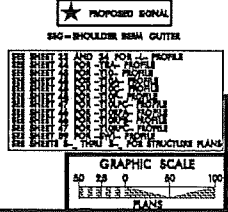
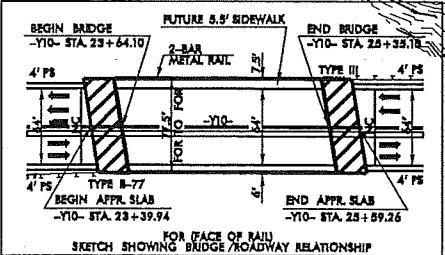
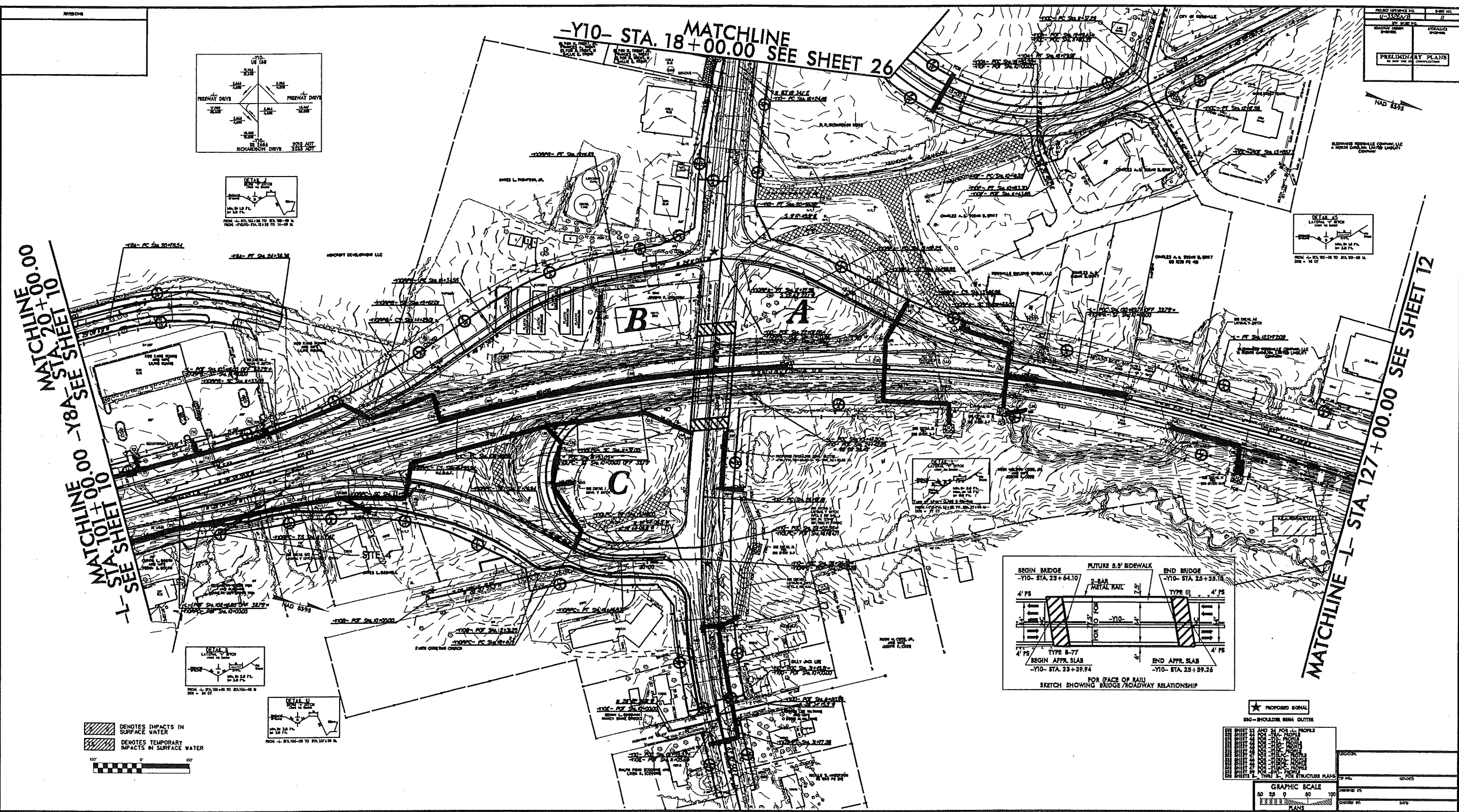
SEE SHEET 33 FOR -L- PROFILE
SEE SHEET 44 FOR -Y8- PROFILE
SEE SHEET 44 FOR -Y8A- PROFILE
SEE SHEET 44 FOR -Y9- PROFILE
SEE SHEET 59 FOR -SWI- PROFILE

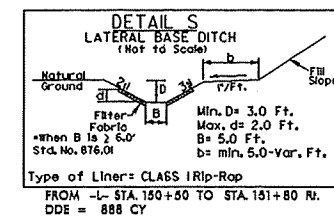
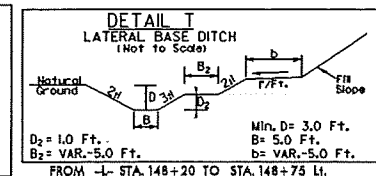
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MATCHLINE -L- STA. 101+00.00 SEE SHEET 11


-Y8A- STA. 20+00.00 SEE SHEET 11

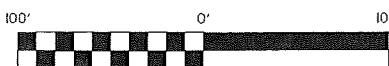




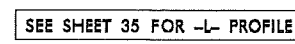


 DENOTES IMPACTS IN SURFACE WATER

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEET 35 FOR -L- PROFILE

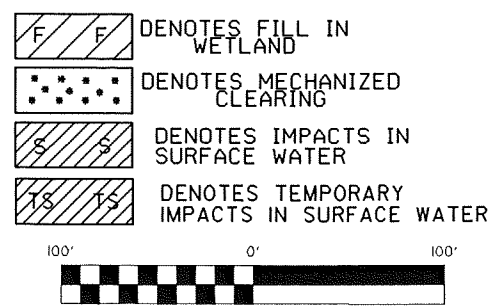
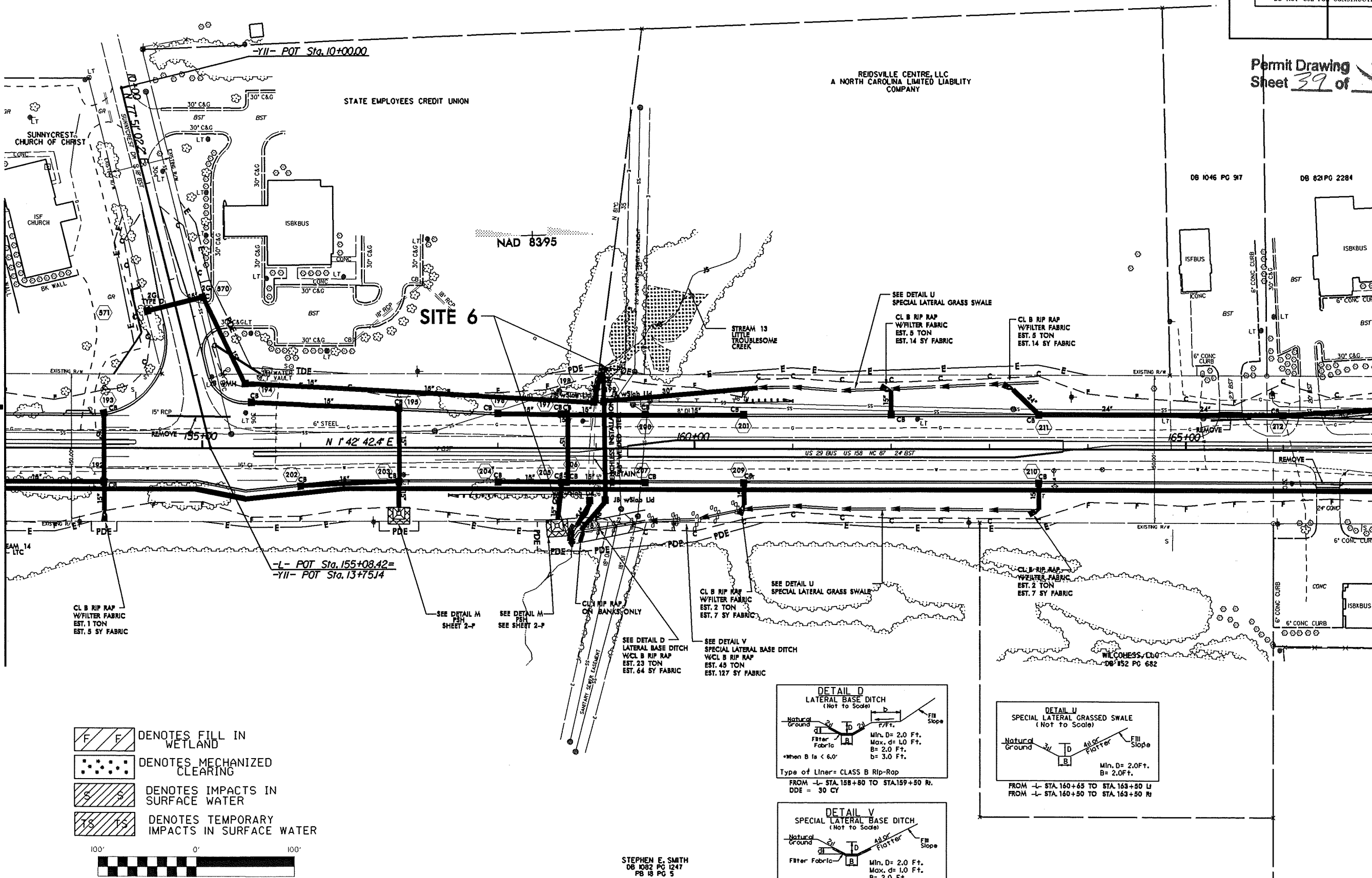


8/17/99

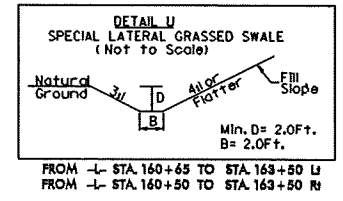
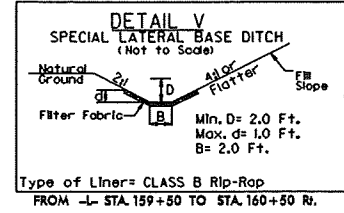
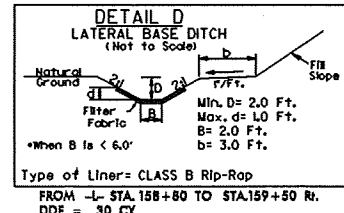
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Author: JST HY244560

REVISIONS

MATCHLINE -L- STA. 153+00.00 SEE SHEET 13



STEPHEN E. SMITH
DB 1082 PG 1247
PB 18 PG 5



Permit Drawing
Sheet 39 of 58

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

8/17/99

13-OCT-2009 09:36
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Author: BT
Plotter: BT

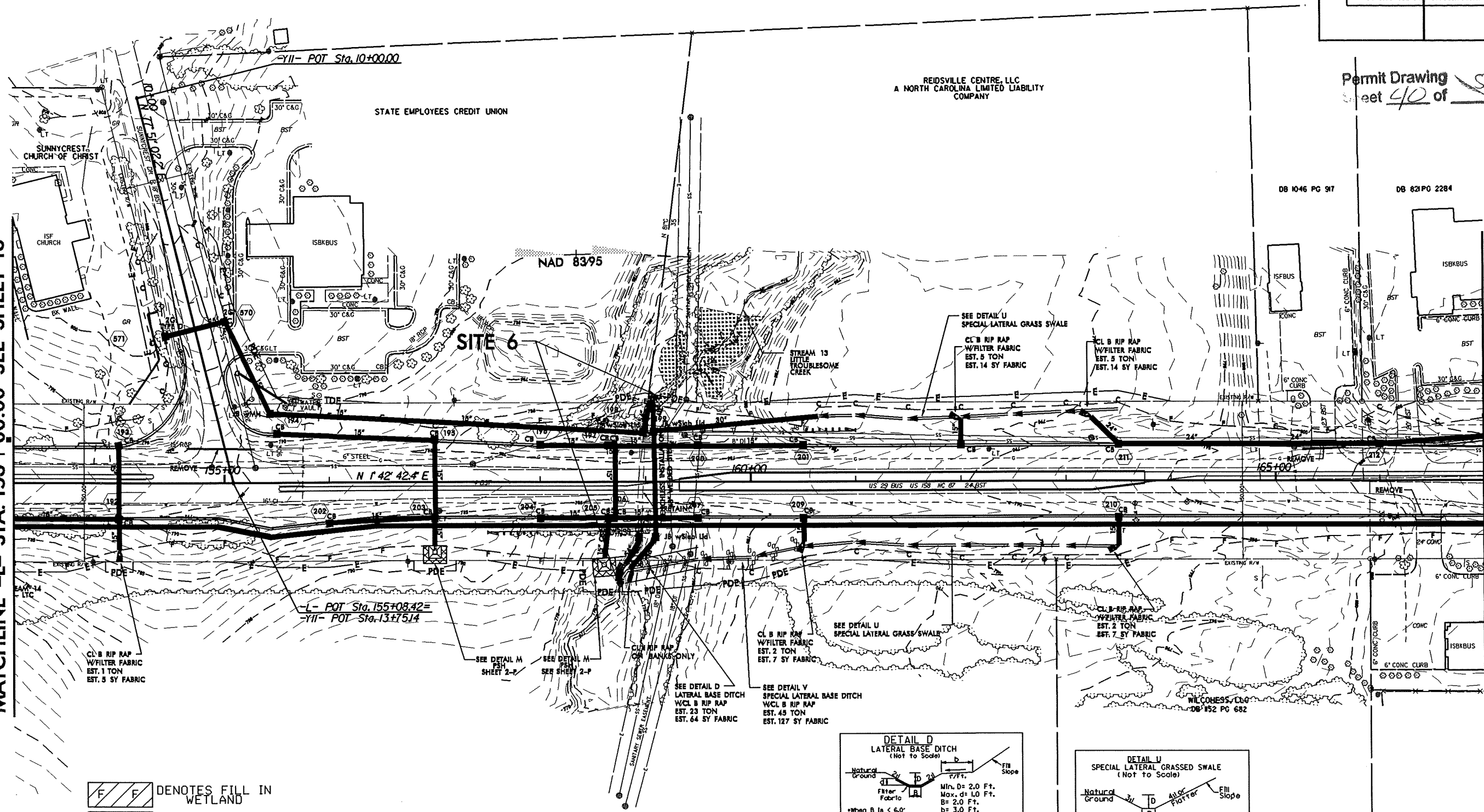
REVISIONS

MATCHLINE -L- STA. 153+00.00 SEE SHEET 13

MATCHLINE -L- STA. 167+00.00 SEE SHEET 15

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

NAD 8395



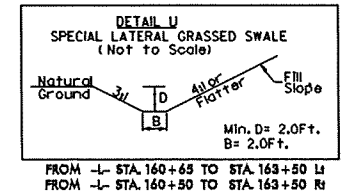
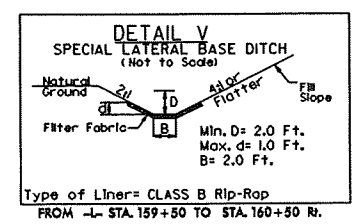
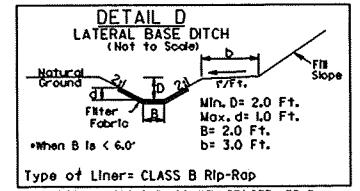
LEGEND

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

SCALE

100' 0' 100'

STEPHEN E. SMITH
DB 1082 PG 1247
PB 18 PG 5



REVISIONS

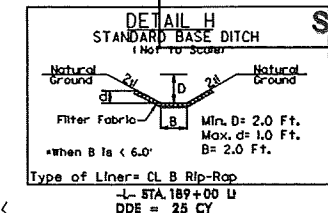
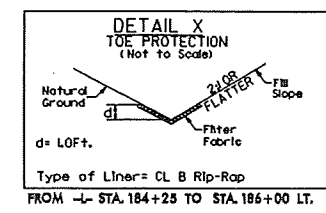
03/23/09 R/W REVISION (PUS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 90 (ROCKINGHAM COUNTY)

30-JUL-2009 14:17
C:\Hydra\ulica\perm\2\env\environmental\drawings\3326-rdy-ph-s15.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 41 of 58

-L-	-Y12C-
PI Sta 186+88.71 $\Delta = 31'56''07.0''$ (RT) $D = 1'58''44.9''$ $L = 1613.60'$ $T = 828.36'$ $R = 2,895.00'$ $SE = 0.03$ $RO = 108'$	PI Sta 13+22.29 $\Delta = 5'10''10.6''$ (RT) $D = 1'54''35.5''$ $L = 270.68'$ $T = 135.43'$ $R = 3,000.00'$ $SE = NC$



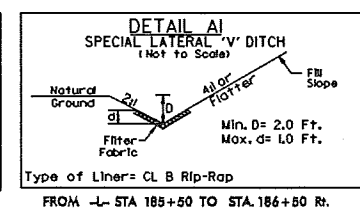
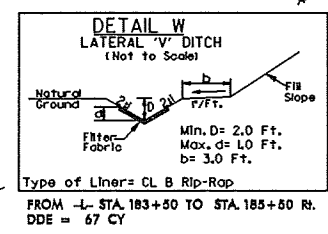
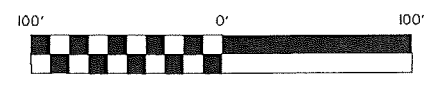
SITE 7

MATCHLINE -L- STA. 181+00.00 SEE SHEET 15

MATCHLINE -L- STA. 192+00.00 SEE SHEET 17

SS DENOTES IMPACTS IN SURFACE WATER

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



MATCHLINE -Y12B- STA. 14+00.00 SEE SHEET 17

SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 48 FOR -Y12B- PROFILE
SEE SHEET 49 FOR -Y12C- PROFILE

03/23/09 R.W. REVISION (PUS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 90 (ROCKINGHAM COUNTY).

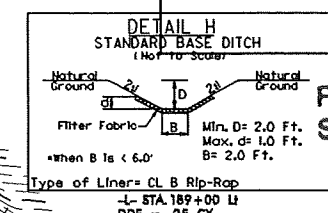
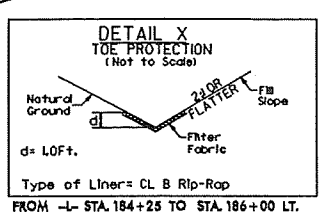
8/17/99
30-JUL-2009 14:18
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13326-rdw-psh-sls.dwg

REVISIONS

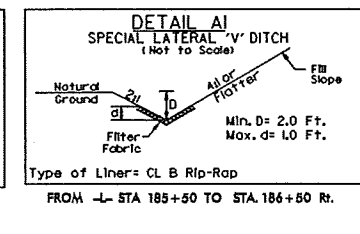
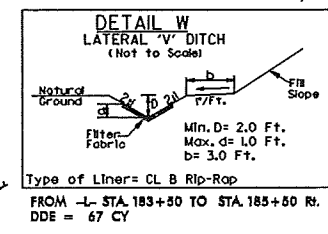
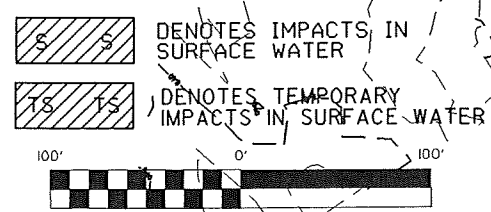
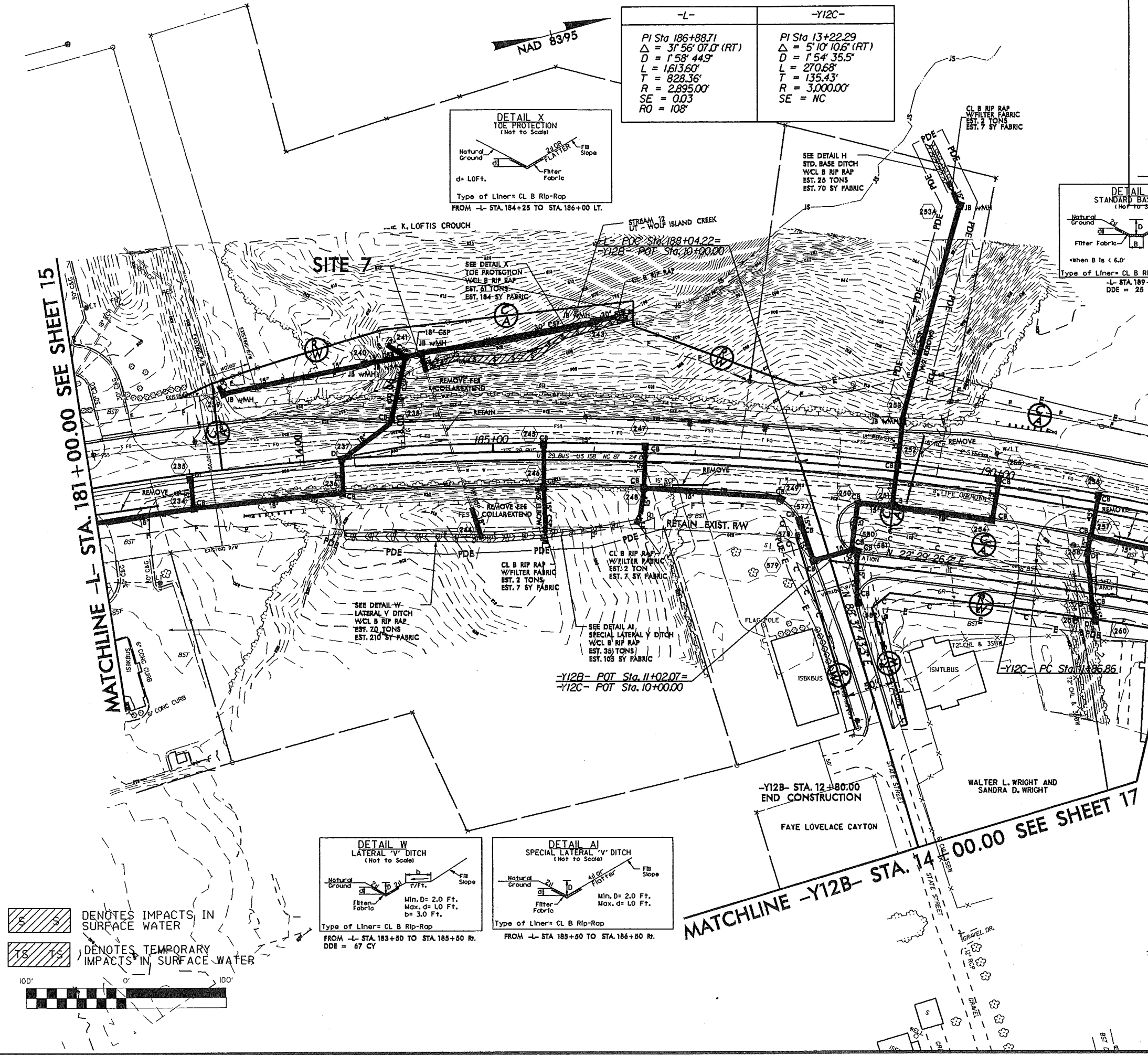
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

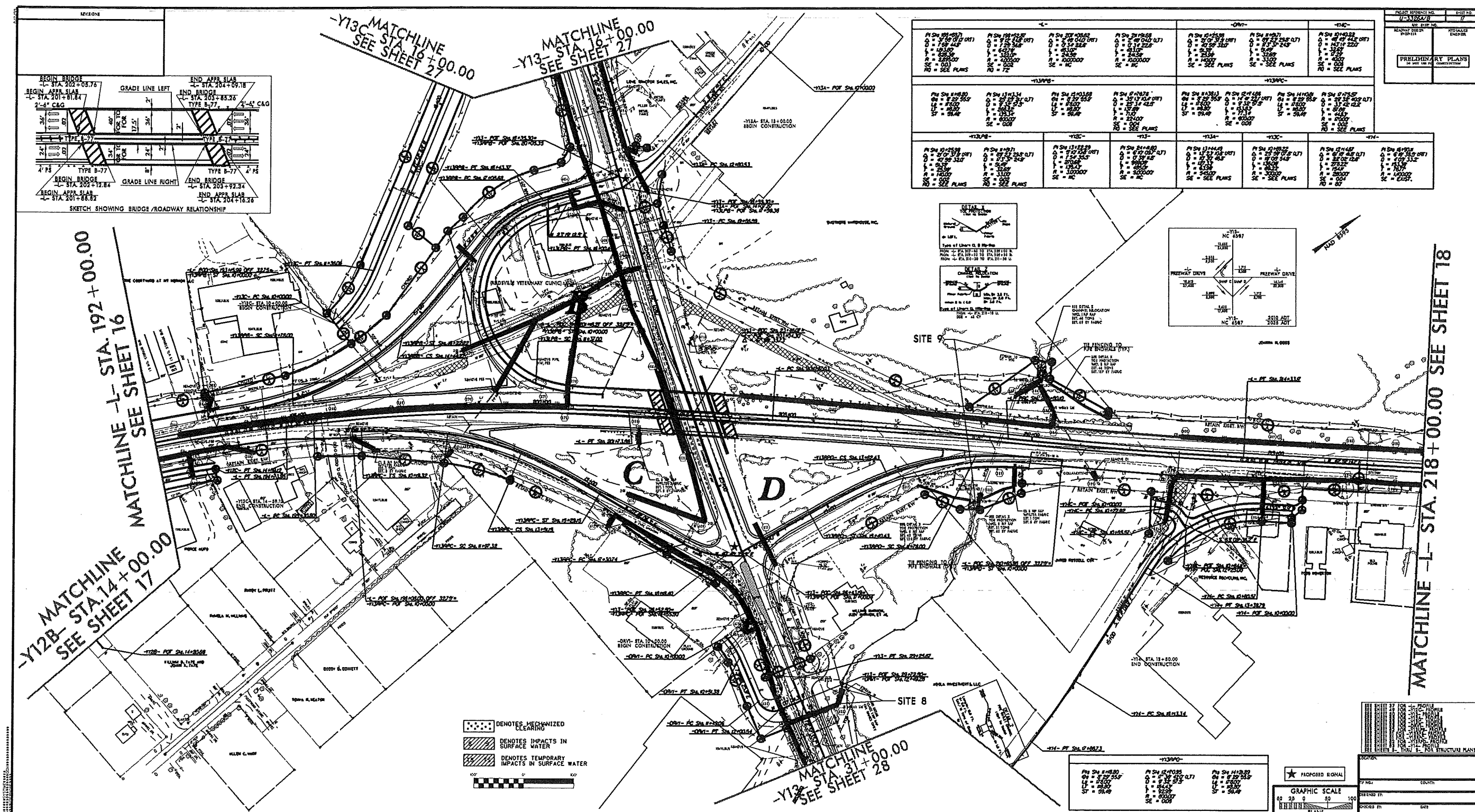
-L-	-Y12C-
PI Sta 186+88.71 $\Delta = 31^{\circ} 56' 07.0''$ (RT) $D = 1^{\circ} 58' 44.9''$ $L = 1613.60'$ $T = 828.36'$ $R = 2895.00'$ $SE = 0.03$ $RO = 108'$	PI Sta 13+22.29 $\Delta = 5^{\circ} 10' 10.6''$ (RT) $D = 1^{\circ} 54' 35.5''$ $L = 270.68'$ $T = 135.43'$ $R = 3,000.00'$ $SE = NC$

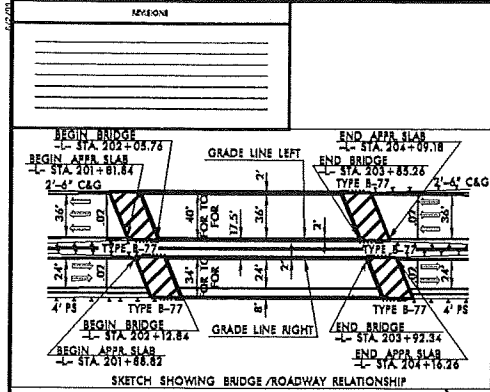
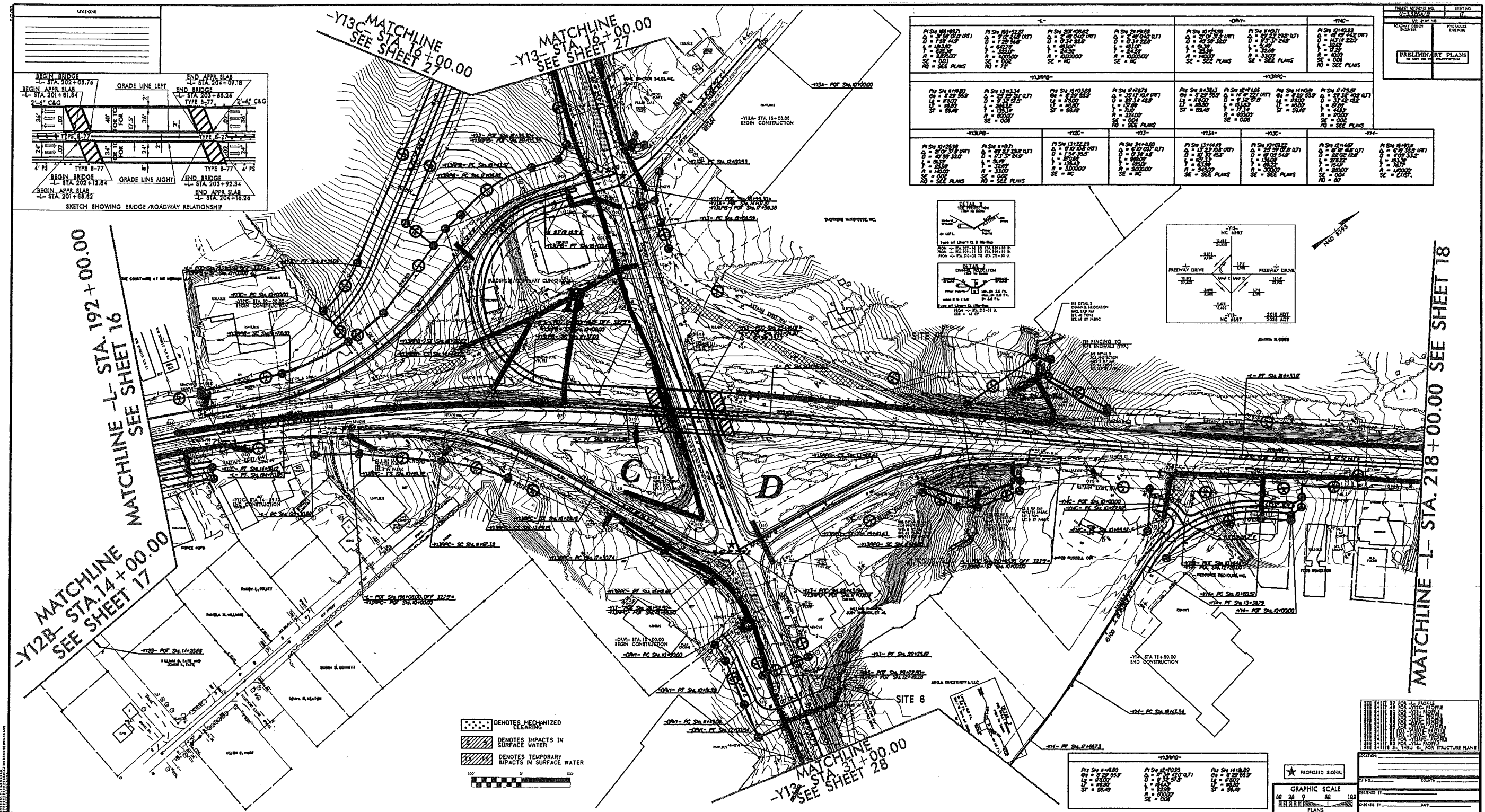


Permit Drawing
Sheet 16 of 58

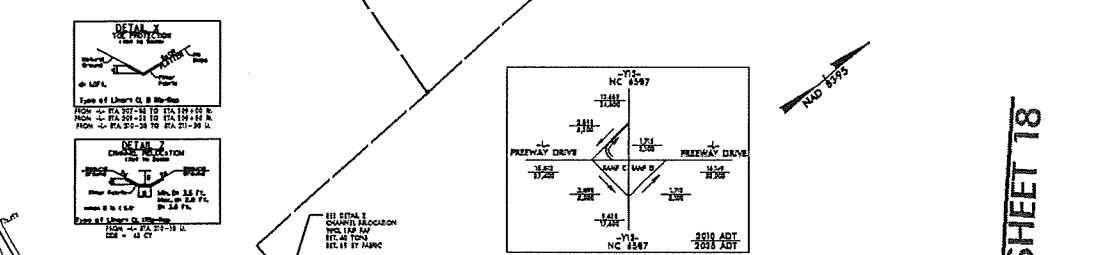


SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 48 FOR -Y12B- PROFILE
SEE SHEET 49 FOR -Y12C- PROFILE





-Y13C-				-Y13-				-Y12B-			
PC SH 192+00.00	PT SH 192+00.00	PI SH 192+00.00	PO SH 192+00.00	PC SH 192+00.00	PT SH 192+00.00	PI SH 192+00.00	PO SH 192+00.00	PC SH 192+00.00	PT SH 192+00.00	PI SH 192+00.00	PO SH 192+00.00
0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00	0 = 0.00
L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00	L = 10.00
SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00	SE = 0.00
NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS	NO = SEE PLANS



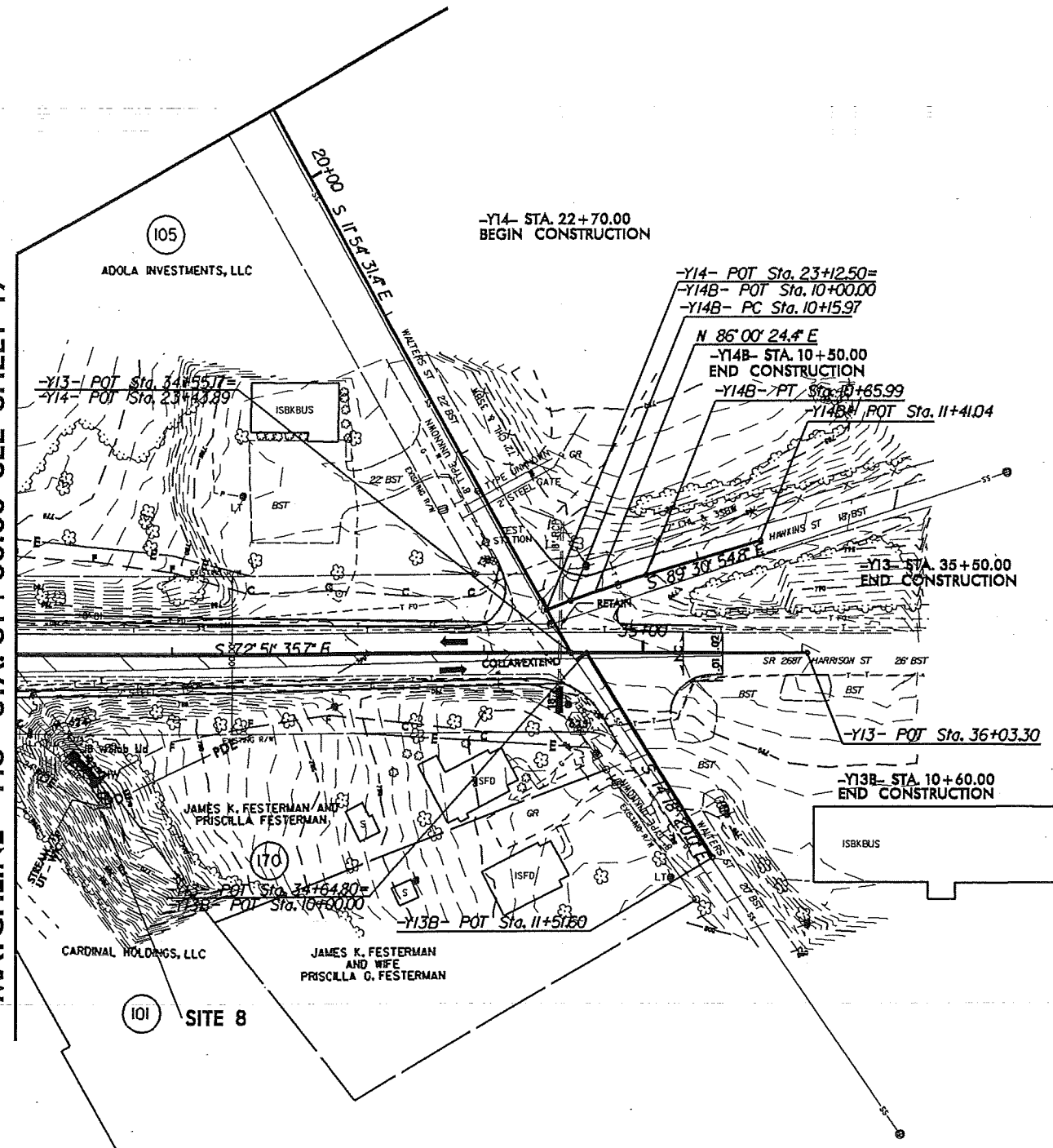
MATCHLINE -L- STA. 218+00.00 SEE SHEET 18

8/17/99

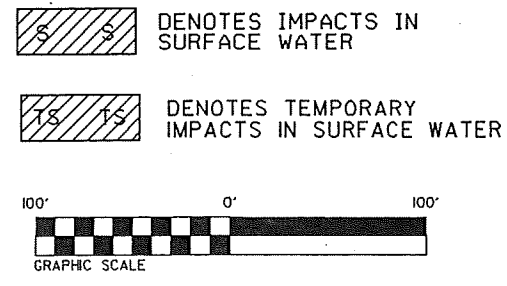
REVISIONS

07-JUL-2009 10:47
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3326.rdy.psh.s28.dgn

MATCHLINE -Y13- STA. 31+00.00 SEE SHEET 17



-Y14B-
PI Sta 10+40.99
 $\Delta = 4' 28' 40.8''$ (RT)
 $D = 8' 57' 08.9''$
 $L = 50.02'$
 $T = 25.02'$
 $R = 640.00'$
SE = EXIST.



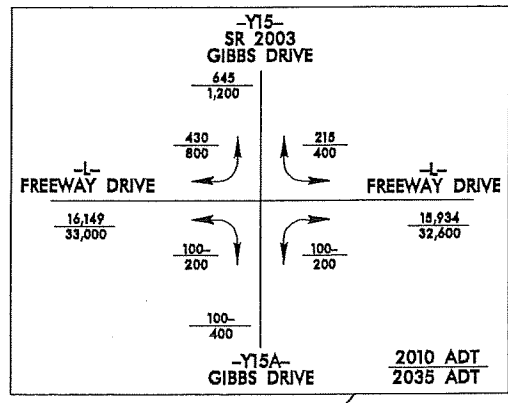
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	28
NW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 46 of 58

SEE SHEET 50 FOR -Y13- PROFILE

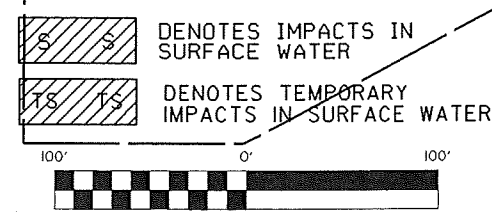
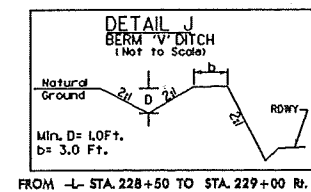
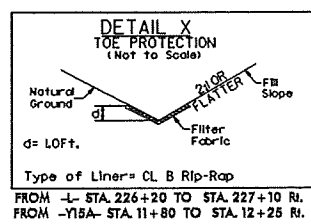
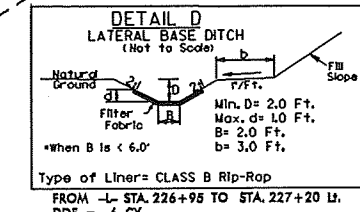
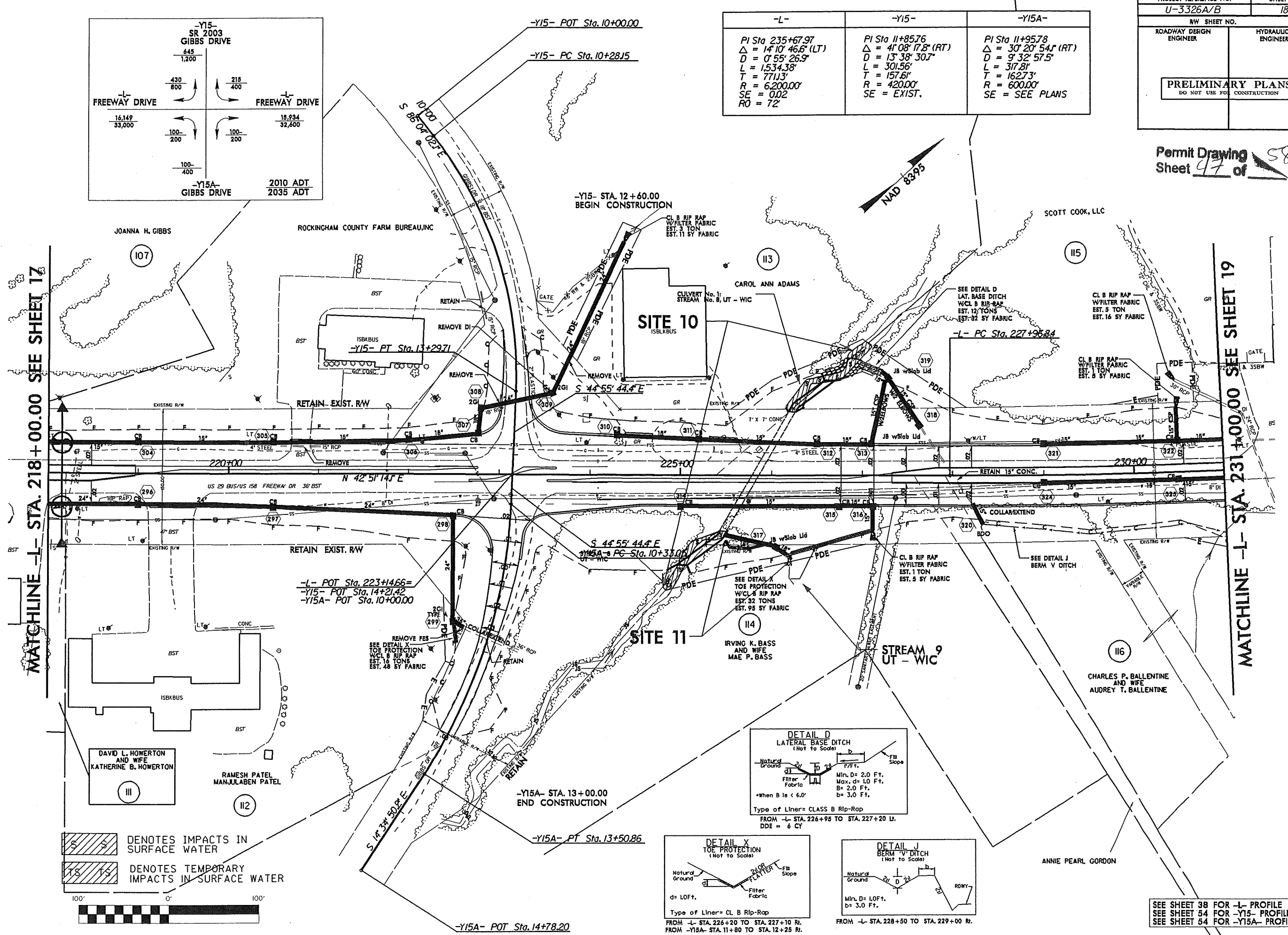
Permit Drawing
Sheet 47 of 58

-L-	-Y15-	-Y15A-
PI Sta 235+67.97 $\Delta = 14^{\circ} 10' 46.6"$ (LT) $D = 0^{\circ} 55' 26.9"$ $L = 1,534.38'$ $T = 771.13'$ $R = 6,200.00'$ $SE = 0.02$ $RO = 72'$	PI Sta 11+85.76 $\Delta = 41^{\circ} 08' 17.8"$ (RT) $D = 13^{\circ} 38' 30.7"$ $L = 301.56'$ $T = 157.61'$ $R = 420.00'$ $SE = EXIST.$	PI Sta 11+95.78 $\Delta = 30^{\circ} 20' 54.7"$ (RT) $D = 9^{\circ} 32' 57.5"$ $L = 317.81'$ $T = 162.73'$ $R = 600.00'$ $SE = SEE PLANS$



MATCHLINE -L- STA. 218+00.00 SEE SHEET 17

MATCHLINE -L- STA. 231+00.00 SEE SHEET 19

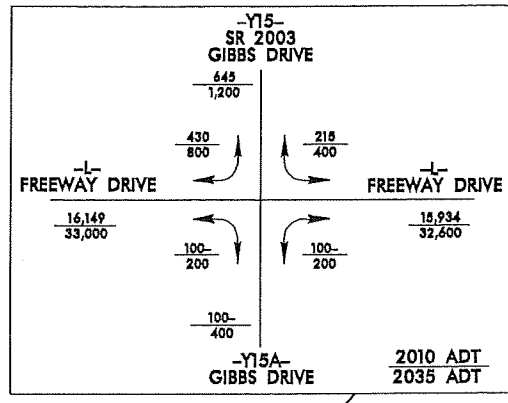


SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 54 FOR -Y15- PROFILE
SEE SHEET 54 FOR -Y15A- PROFILE

30-JUL-2009 15:45
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8/17/99

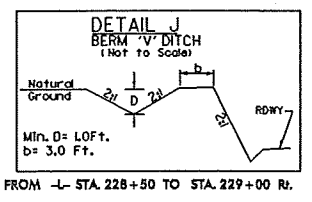
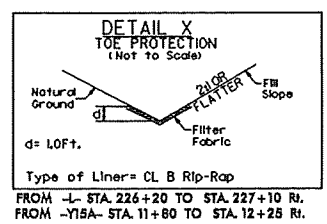
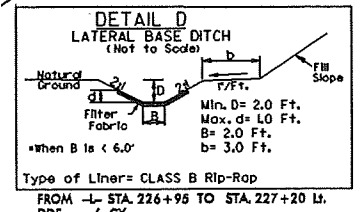
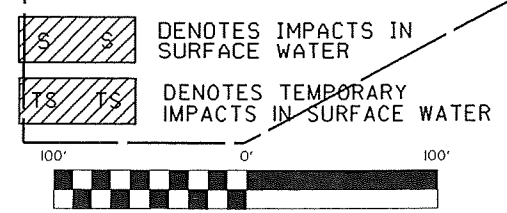
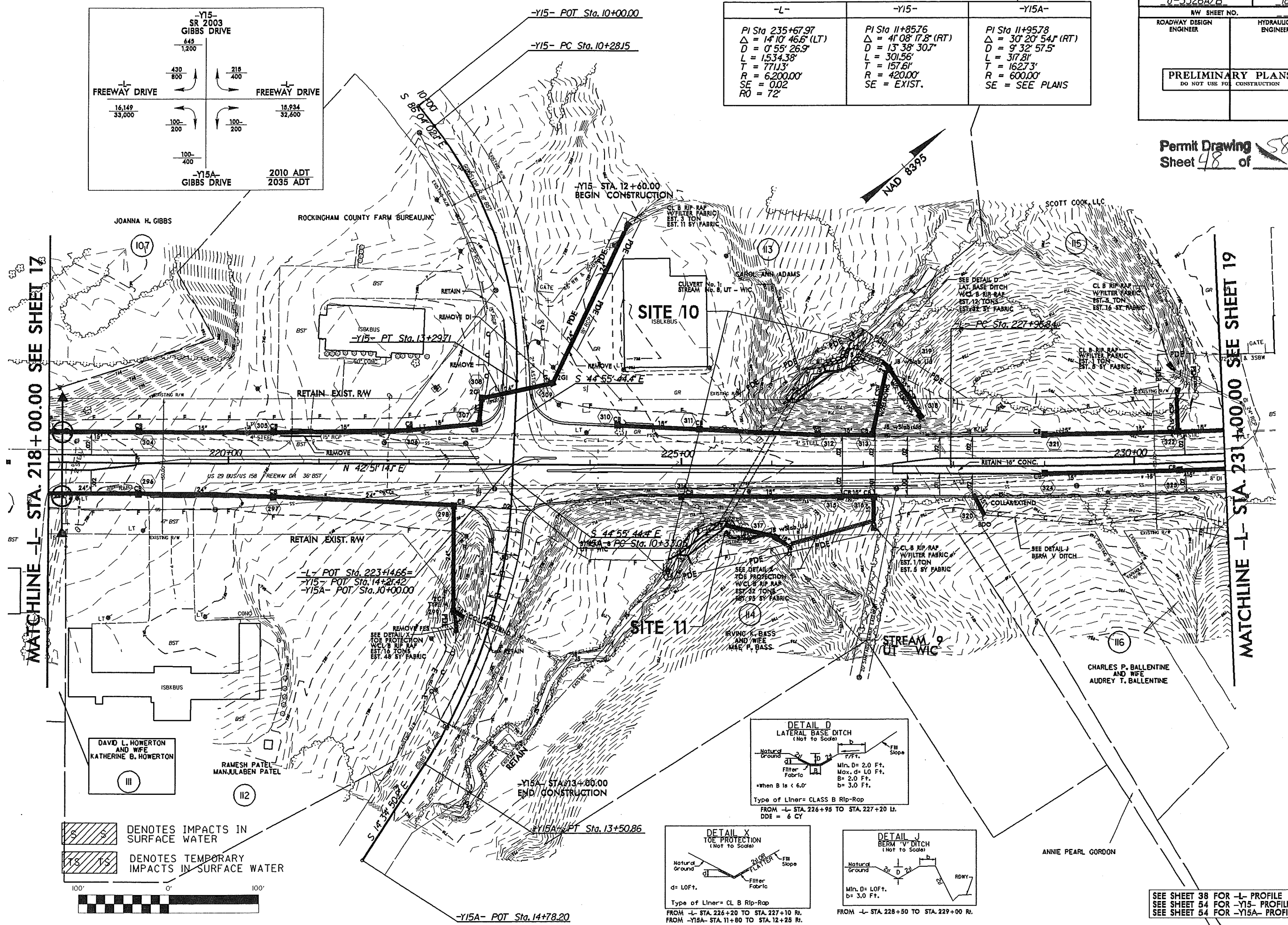
Permit Drawing
Sheet **48** of **58**

-L-	-Y15-	-Y15A-
PI Sta 235+67.97 $\Delta = 14^{\circ} 10' 46.6" (LT)$ $D = 0^{\circ} 55' 26.9"$ $L = 1,534.38'$ $T = 771.13'$ $R = 6,200.00'$ $SE = 0.02$ $RO = 72'$	PI Sta 11+85.76 $\Delta = 41^{\circ} 08' 17.8" (RT)$ $D = 13^{\circ} 38' 30.7"$ $L = 301.56'$ $T = 157.61'$ $R = 420.00'$ $SE = EXIST.$	PI Sta 11+95.78 $\Delta = 30^{\circ} 20' 54.1" (RT)$ $D = 9^{\circ} 32' 57.5"$ $L = 317.81'$ $T = 162.73'$ $R = 600.00'$ $SE = SEE PLANS$



MATCHLINE -L- STA. 218+00.00 SEE SHEET 17

MATCHLINE -L- STA. 231+00.00 SEE SHEET 19

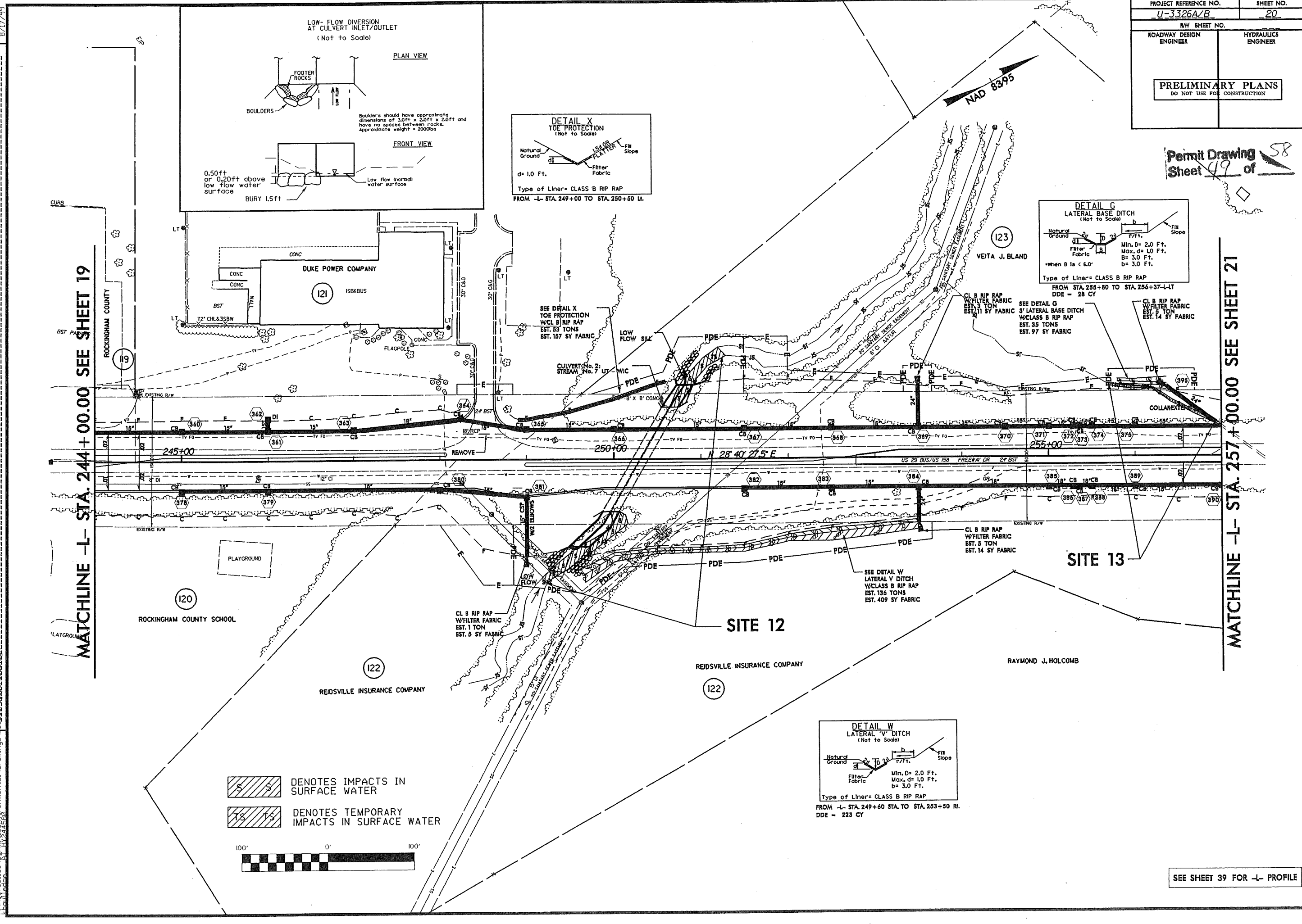
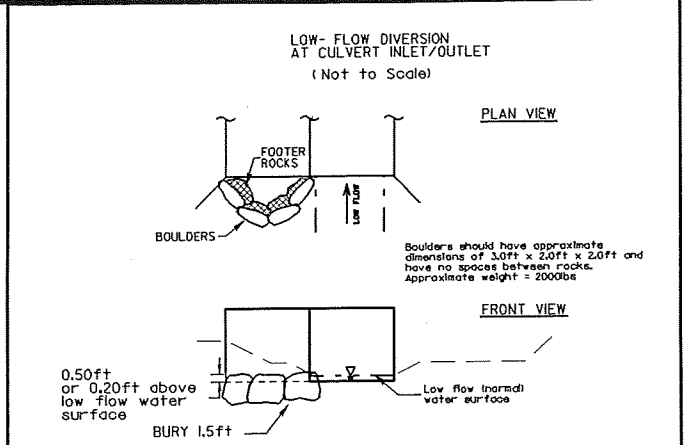
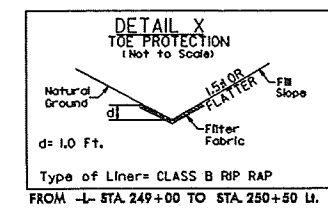
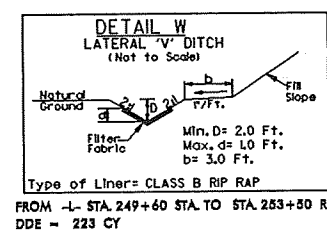
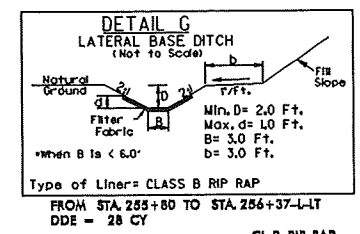


SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 54 FOR -Y15- PROFILE
SEE SHEET 54 FOR -Y15A- PROFILE

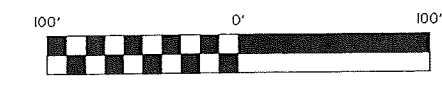
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

Permit Drawing
Sheet 49 of 58



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEET 39 FOR -L- PROFILE

REVISIONS

06/25/09 R/W REVISION - REVISED THE PDE AT -L- STA. 253+50.00 LT. FROM 118 TO 105' OFFSET DUE TO THE 24' RCP ADJUSTMENT BACK TO THE TOE OF THE SLOPE ON PARCEL 123 (VEITA J. BLAND).

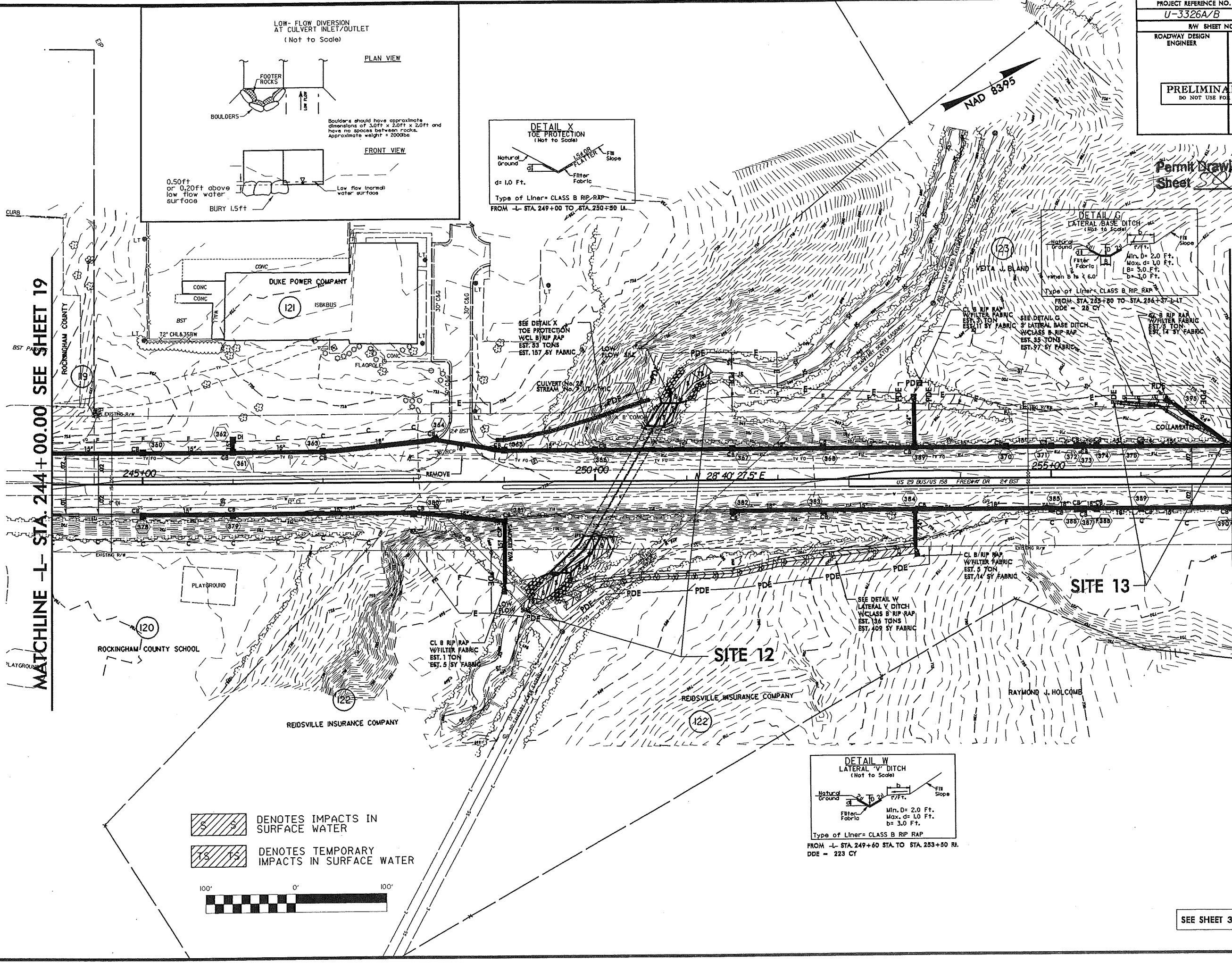
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PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

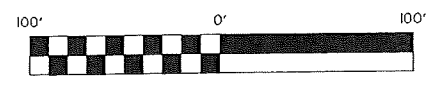
Permit Drawing
Sheet 20 of 38

MATCHLINE -L- STA. 257+00.00 SEE SHEET 21

MATCHLINE -L- STA. 244+00.00 SEE SHEET 19



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



DETAIL W
 LATERAL "V" DITCH
 (Not to Scale)

 Min. D= 2.0 Ft.
 Max. d= 1.0 Ft.
 b= 3.0 Ft.
 Type of Liner= CLASS B RIP RAP
 FROM -L- STA. 249+60 STA. TO STA. 253+80 RJ.
 DDE = 223 CY

SEE SHEET 39 FOR -L- PROFILE

REVISIONS
06/25/09 R/W REVISION - REVISED THE PDE AT -L- STA. 253+5000 LT. FROM 118' TO 105' OFFSET DUE TO THE 24" RCP ADJUSTMENT BACK TO THE TOE OF THE SLOPE ON PARCEL 123 (VEITA J. BLAND).

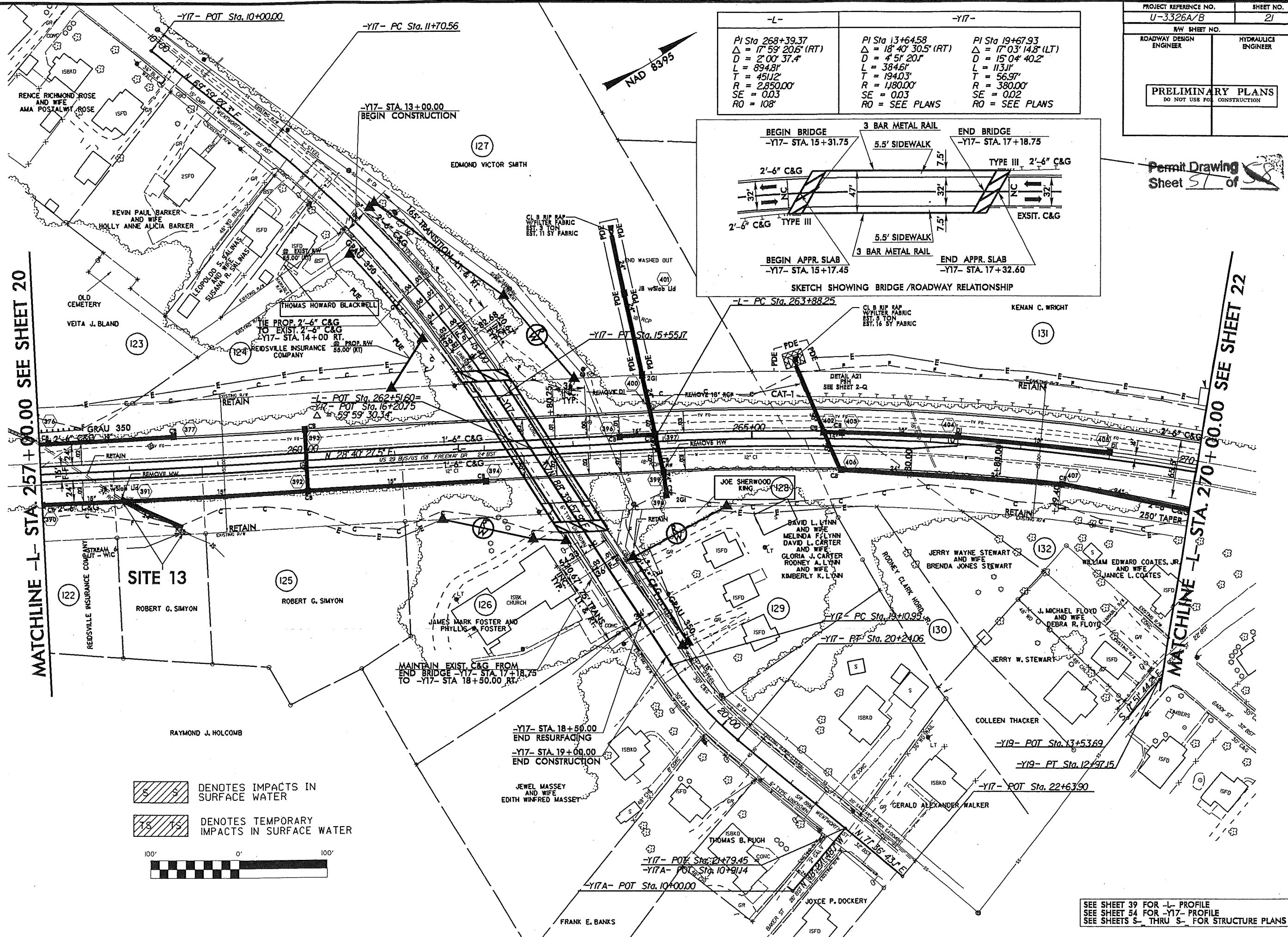
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B/17/99

03/23/09 R/W REVISION (PJS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 124 (REIDSVILLE INSURANCE COMPANY)

07-JUL-2009 10:44
C:\hydro\projects\environmental\drawings\3326-rdy-psd-a21.dgn
3326-rdy-psd-a21.dgn

REVISIONS



BEGIN BRIDGE
-Y17- STA. 15+31.75

3 BAR METAL RAIL

5.5' SIDEWALK

7.5'

END BRIDGE
-Y17- STA. 17+18.75

TYPE III 2'-6" C&G

2'-6" C&G

32'

NC

47'

72'

5.5' SIDEWALK

7.5'

3 BAR METAL RAIL

BEGIN APPR. SLAB
-Y17- STA. 15+17.45

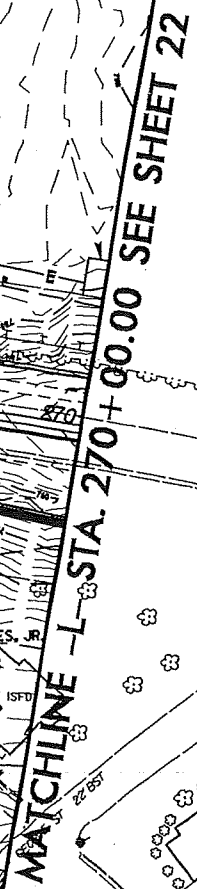
END APPR. SLAB
-Y17- STA. 17+32.60

EXSIT. C&G

32'

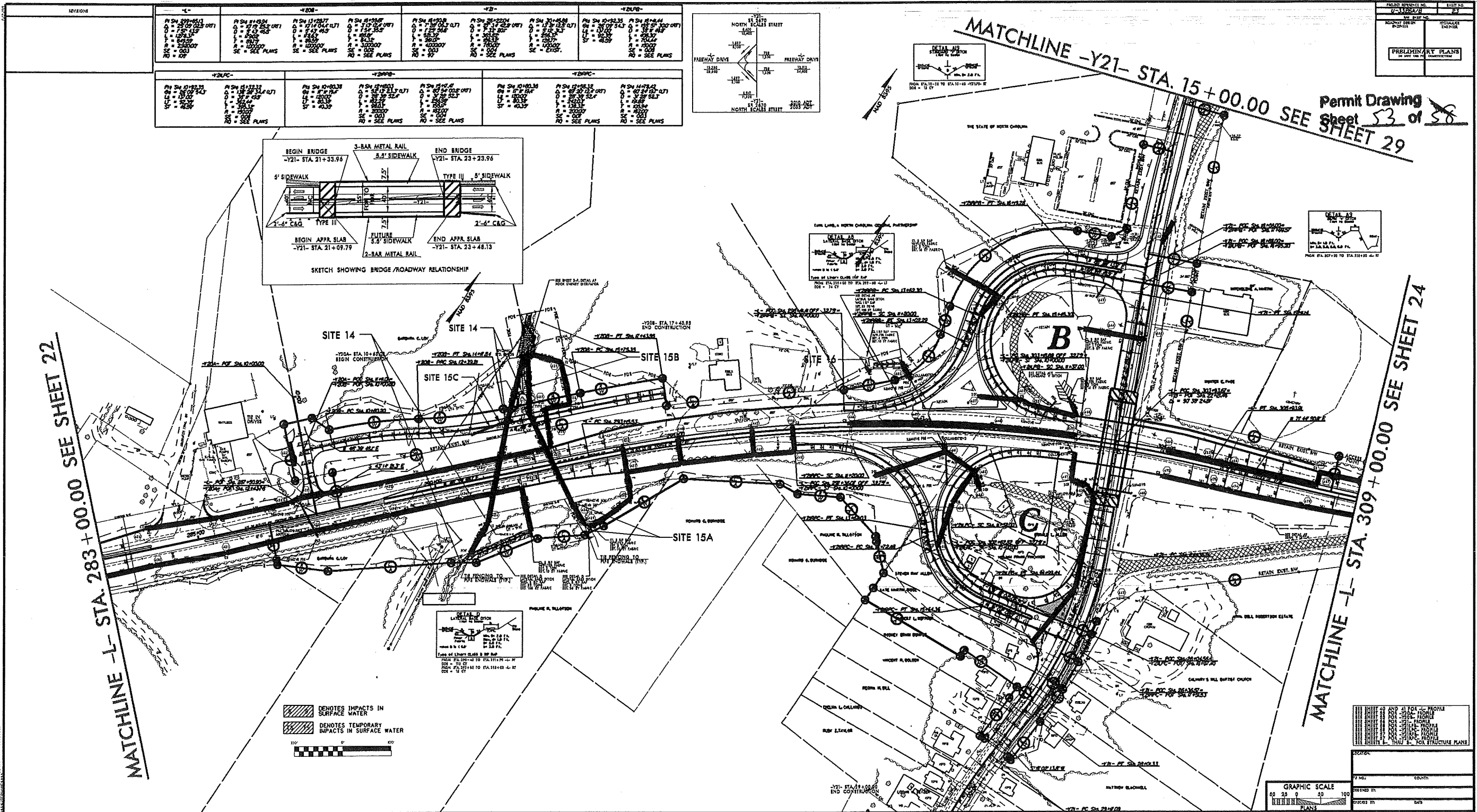
NC

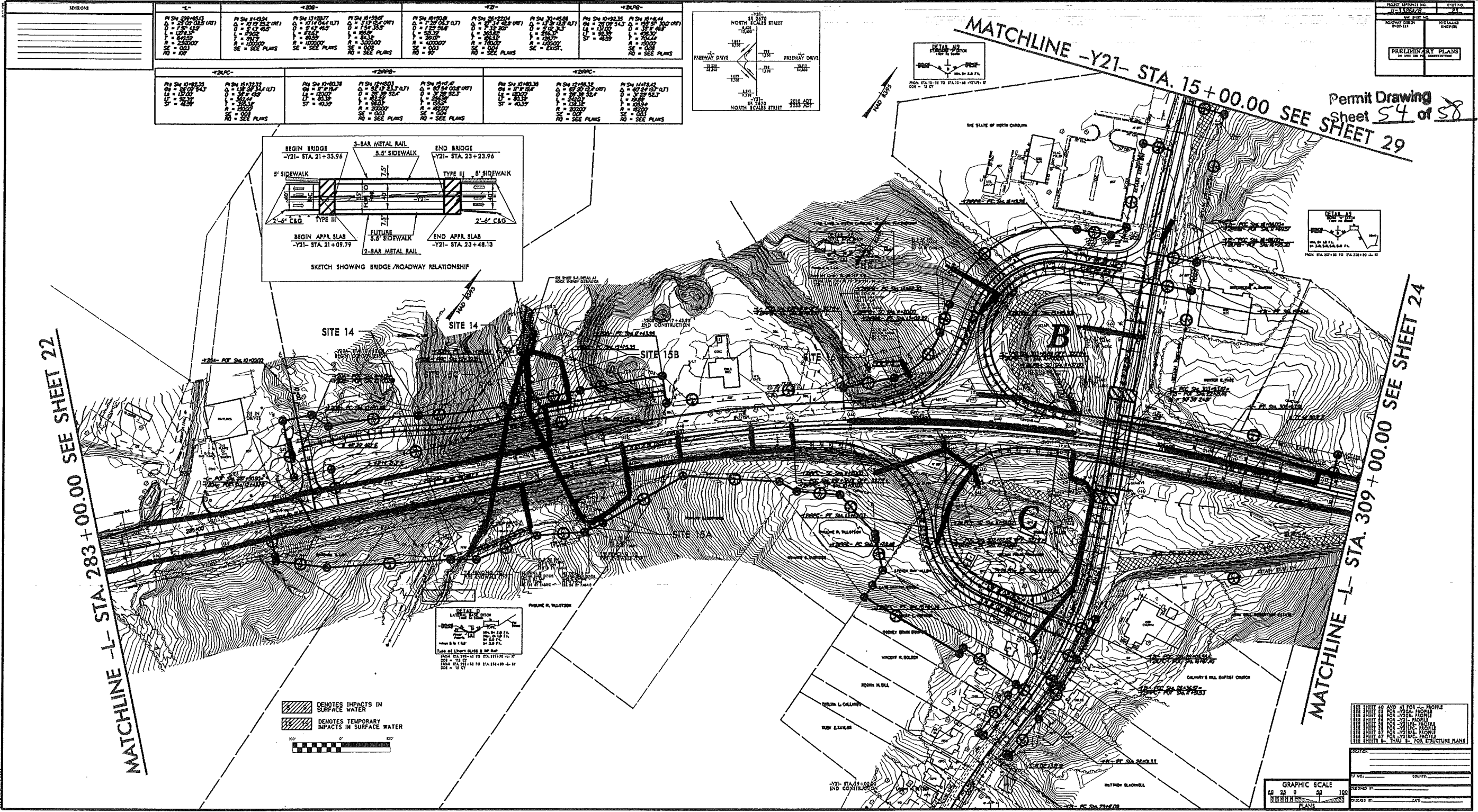
SKETCH SHOWING BRIDGE/ROADWAY RELATIONSHIP



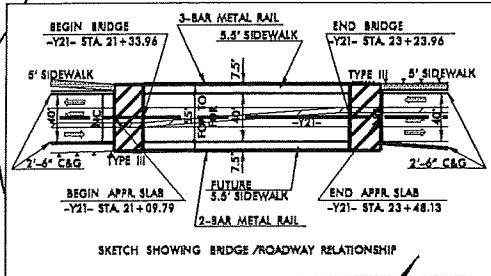
SEE SHEET 39 FOR -L- PROFILE
SEE SHEET 54 FOR -Y17- PROFILE
SEE SHEETS S- THRU S- FOR STRUCTURE PLANS

REVISIONS
03/23/09 R/W REVISION (PJS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 124 (REIDSVILLE INSURANCE COMPANY)





STATION	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-
STA. 283+00.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+10.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+20.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+30.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+40.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+50.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+60.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+70.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+80.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10
STA. 283+90.00	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10

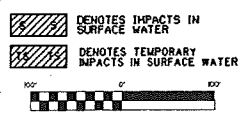


PROJECT NO.	1-100000
DATE	10/1/88
DESIGNED BY	10/1/88
CHECKED BY	10/1/88
APPROVED BY	10/1/88
PRELIMINARY PLANS	10/1/88

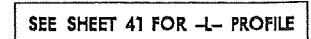
Permit Drawing
Sheet 54 of 58
SEE SHEET 29

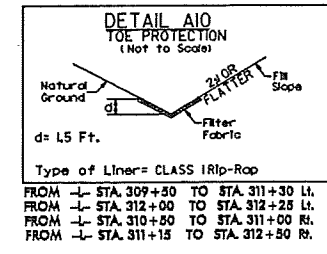
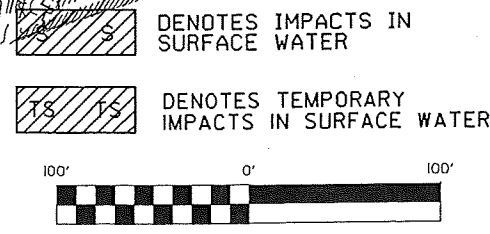
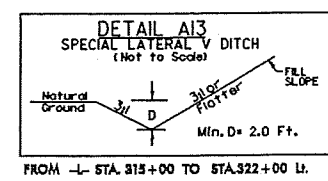
MATCHLINE -L- STA. 283+00.00 SEE SHEET 22

MATCHLINE -L- STA. 309+00.00 SEE SHEET 24



GRAPHIC SCALE	0	50	100
FOOT			
DATE			
DESIGNED BY			
CHECKED BY			
APPROVED BY			



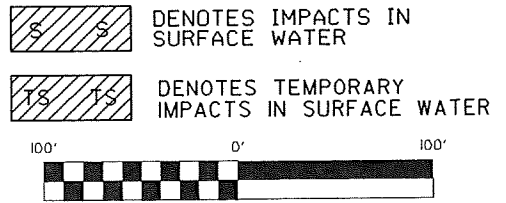
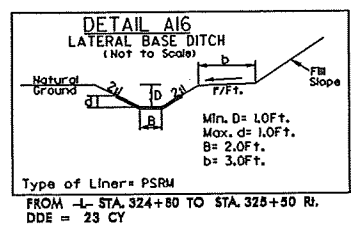
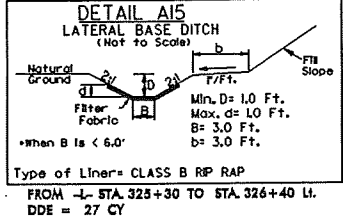
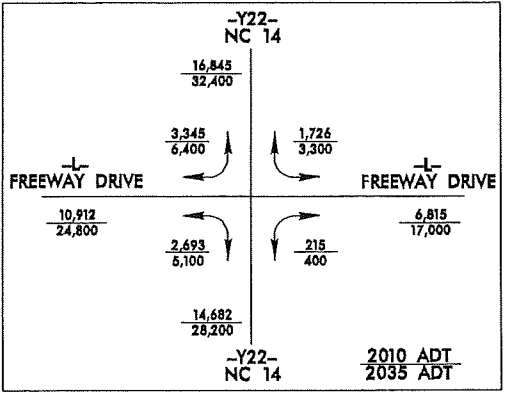
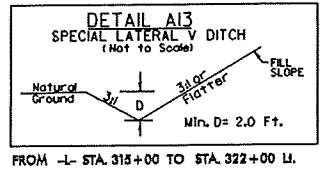
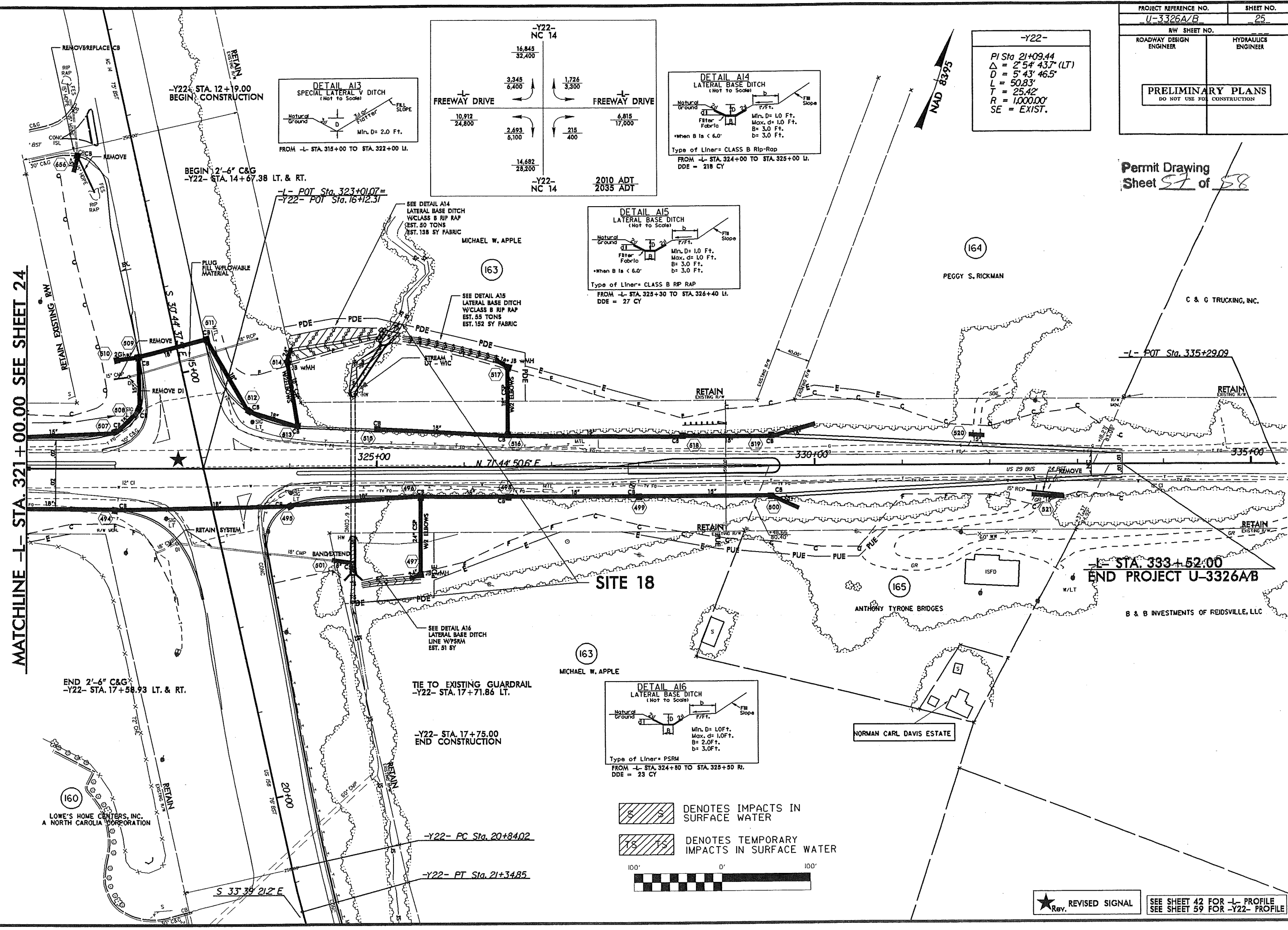


SEE SHEET 41 FOR -L- PROFILE

-Y22-
PI Sta 21+09.44
 $\Delta = 2' 54" 43.7" (LT)$
 $D = 5' 43" 46.5"$
 $L = 50.83'$
 $T = 25.42'$
 $R = 1,000.00'$
SE = EXIST.

Permit Drawing
Sheet 57 of 58

MATCHLINE -L- STA. 321+00.00 SEE SHEET 24

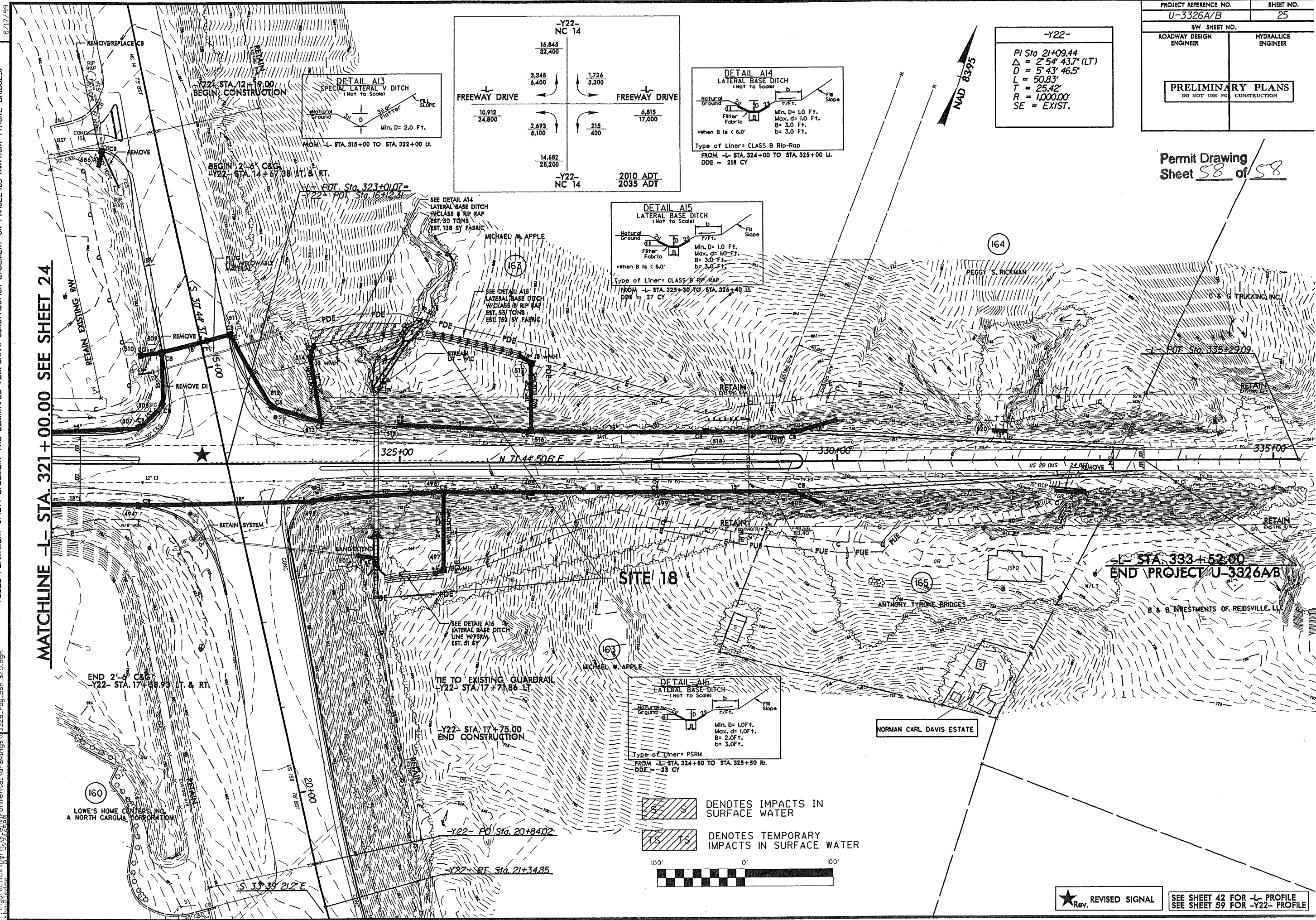
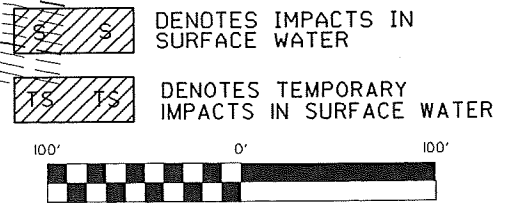
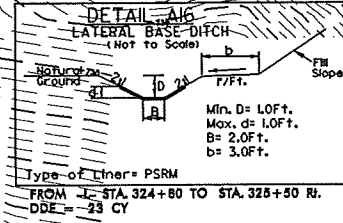
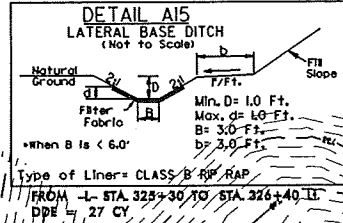
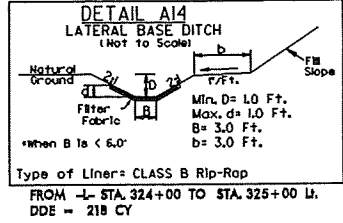
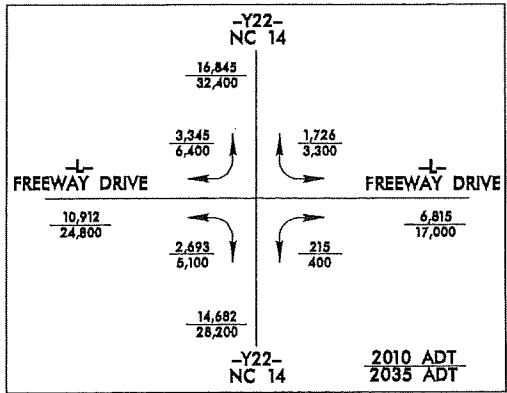


★ REV. REVISED SIGNAL
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 59 FOR -Y22- PROFILE

REVISIONS
03/23/09 R.W. REVISION (PVS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 163 (MICHAEL W. APPLE)
RT. OF -L- STA. 328+50
ADDED PERMANENT UTILITY EASEMENT AND ELIMINATED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 165 (ANTHONY TYRONE BRIDGES)
04-AUG-2009 08:31
C:\Users\jgiles\Documents\Drawings\U-3326A-B\Drawings\U-3326A-B.dwg

-Y22-
 PI Sta 21+09.44
 $\Delta = 2^\circ 54' 43.7" (LT)$
 $D = 5^\circ 43' 46.5"$
 $L = 50.83'$
 $T = 25.42'$
 $R = 1000.00'$
 SE = EXIST.

Permit Drawing
 Sheet 58 of 58



MATCHLINE -L- STA. 321+00.00 SEE SHEET 24

-L- STA. 333+52.00
 END PROJECT U-3326A/B

★ REV. REVISED SIGNAL

SEE SHEET 42 FOR -L- PROFILE
 SEE SHEET 59 FOR -Y22- PROFILE

REVISIONS
 03/23/09 R/W REVISION (PJS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 163 (MICHAEL W. APPLE)
 RT OF -L- STA. 328+90
 ADDED PERMANENT UTILITY EASEMENT AND ELIMINATED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 165 (ANTHONY TYRONE BRIDGES)
 04-AUG-2009 08:31
 3326_rdy_psh_a25.dgn
 8/17/99

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3326A/B	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
34924.1.1	STP-29B(1)	P.E.	
(A) 34924.2.4	HPPSTP-029B(2)	R/W & UTILITIES	
(B) 34924.2.3	HPPSTP-029B(3)	R/W & UTILITIES	

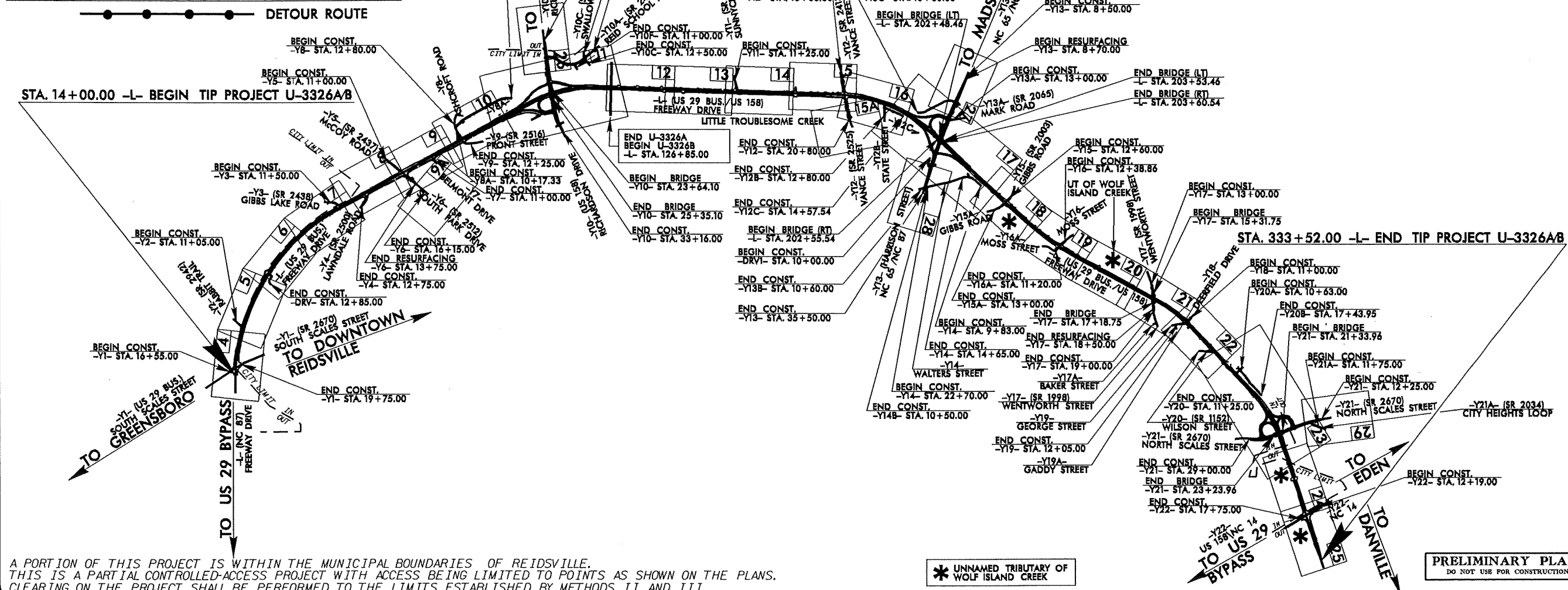
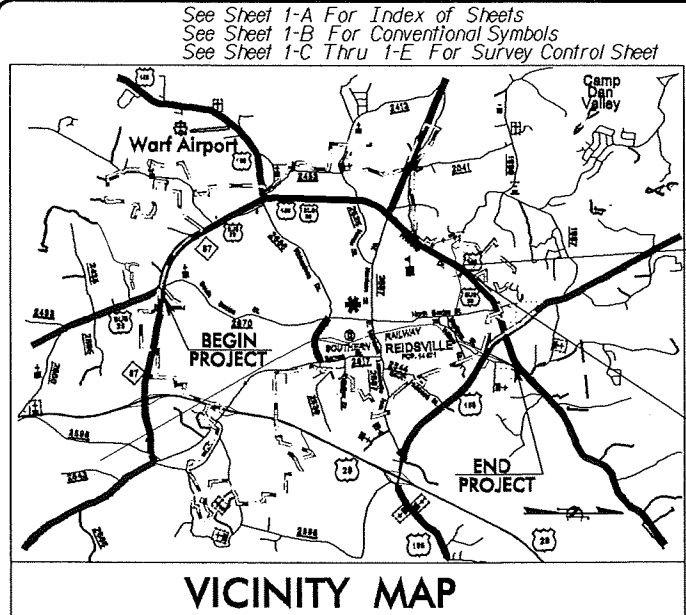
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

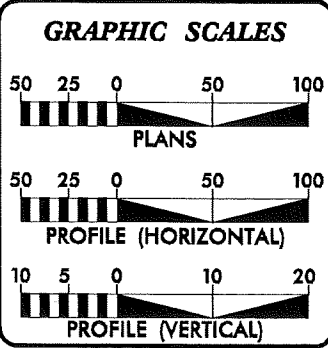
LOCATION: US 29 BUSINESS (FREEWAY DRIVE) FROM SR 2670 (SOUTH SCALES STREET) TO NC 14 IN REIDSVILLE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB AND GUTTER, RETAINING WALLS, STRUCTURES, CULVERTS, AND TRAFFIC SIGNALS

NAD 8395



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF REIDSVILLE. THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS. CLEARING ON THE PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHODS II AND III.



DESIGN DATA	
ADT 2010 =	20260
ADT 2035 =	41000
DHV =	10 %
D =	55 %
T =	11 % *
V =	50 MPH
* TTST 5%	DUAL 6%

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT U-3326A/B =	5.928 MI
LENGTH STRUCTURE TIP PROJECT U-3326A/B =	0.124 MI
TOTAL LENGTH OF TIP PROJECT U-3326A/B =	6.052 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 17, 2008

LETTING DATE:
SEPTEMBER 20, 2011

JAMES A. SPEER, PE
PROJECT ENGINEER

DANIEL W. GARDNER, JR., PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

STATE HIGHWAY DESIGN ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

13-OCT-2009 08:47 P:\ncd\way\proj\U3326A-B\rdy-fsh.dgn

CONTRACT: TIP PROJECT: U-3326A/B

Note: Not to Scale***S.U.E. = Subsurface Utility Engineering**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYSPROJECT REFERENCE NO.
U-3326A/BSHEET NO.
1-B

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ EOM
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-v-l-b-
Proposed Wetland Boundary	-v-l-b-
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	→
False Sump	□

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ NILEPOST 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
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	□

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	-----

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	□
H-Frame Pole	○
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

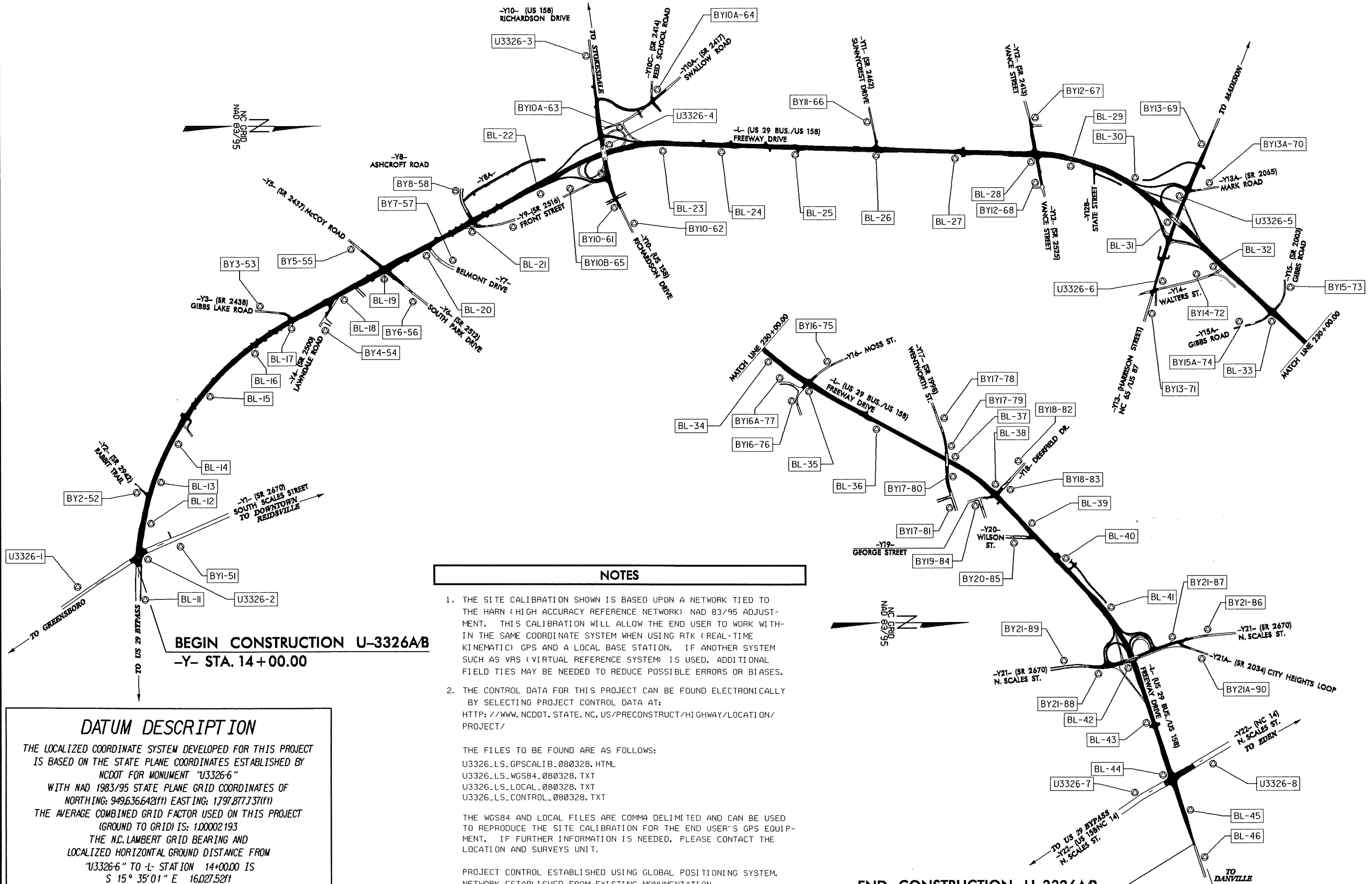
Utility Pole	○
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

12/01/2005

13-OCT-2009 08:47
U3326-1s-1c-080328.dgn
U3326-1s-1c-080328.dgn

U-3326A/B SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	1-C
Location and Surveys	



BEGIN CONSTRUCTION U-3326A/B
-Y- STA. 14+00.00

END CONSTRUCTION U-3326A/B
-Y- STA. 333+52.00

NOTE: DRAWING NOT TO SCALE

NOTES

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL-TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE SYSTEM) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.state.nc.us/preconstruct/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
U3326-LS.GPSCALIB.080328.HTML
U3326-LS.WGS84.080328.TXT
U3326-LS.LOCAL.080328.TXT
U3326-LS.CONTROL.080328.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3326-6"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 949636.642(f1) EASTING: 1797.87737(f1)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00002193
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3326-6" TO -L- STATION 14+00.00 IS
S 15° 35' 01" E 16027.52f1
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

U-3326A/B SURVEY CONTROL SHEET

GPS Calibration Report

Project : U3326SiteCalibration

TIP Number U-3326

User name khudson Date & Time 11:02:16 AM 3/25/2008

Coordinate System US State Plane 1983(at ground) Zone North Carolina 3200

Horizontal Datum NAD 1983 (Conus)

Vertical Datum NAVD88 Geoid Model GEOID03 (Conus)

Coordinate Units US survey feet

Distance Units US survey feet

Height Units US survey feet

LOCAL SITE INFORMATION

Localized around U3326-6

Latitude 36°21'25.92651"N

Longitude 79°41'10.87168"W

Site Scale Factor 0.9999780600

Height 685.185sft

The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived. Please take care in utilizing these coordinates to eliminate confusion of the two systems. This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Datum Transformation Parameters
Datum Transformation computation not requested
Updated Default Projection (Transverse Mercator) Definition
Updated default projection not requested
Horizontal Adjustment Parameters
Northing coordinate of rotation center 935807.776sft
Easting coordinate of rotation center 1797152.859sft
Rotation about the center point 0°00'00"
Translation north -0.011sft
Translation east -0.012sft
Scale factor 1.00000016
Vertical Adjustment Parameters
Northing coordinate of origin point 933308.603sft
Easting coordinate of origin point 1802566.161sft
Vertical separation at origin 0.073sft
Slope north 0.820ppm
Slope east -1.188ppm
Geoid Model Definition
GEOID03 (Conus)
Residual Differences Between GPS (WGS84) And Local Coordinates
Summary
Maximum error Root Mean Square error Point
Horizontal 0.016sft 0.002 WYRICK GPS
Vertical 0.083sft 0.012 SADLER GPS
Three-dimensional 0.084sft 0.013 SADLER_GPS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3326-6"

WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF

NORTHING: 949636642(f1) EASTING: 1797877.737(f1)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00002193

THE N.C. LAMBERT GRID BEARING AND

LOCALIZED HORIZONTAL GROUND DISTANCE FROM

"U3326-6" TO L- STATION 14+00.00 IS

S 15° 35' 01" E 16027.52f1

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NAVD 88

Point Residuals

WGS84 Coordinates Calculated point FOR DISPLAY ONLY Local Coordinates	Point u3326-5 GPS Latitude 36°21'29.71574"N Longitude 79°41'26.13560"W Height 678.407sft Northing 950028.494sft Easting 1796631.818sft Elevation 783.337sft Horz error 0.002sft Vert error 0.046sft 3D error 0.046sft Point u3326-5 Northing 950028.494sft Easting 1796631.820sft Elevation 783.383sft Utilized Horz and Vert Quality Adjusted quality	Point WYRICK GPS Latitude 36°10'59.62328"N Longitude 79°46'26.92349"W Height 697.827sft Northing 886492.471sft Easting 1771531.194sft Elevation 800.866sft Horz error 0.016sft Vert error 0.041sft 3D error 0.044sft Point WYRICK Northing 886492.455sft Easting 1771531.192sft Elevation 800.907sft Utilized Horz and Vert Quality Control quality
Point u3326-1 GPS Latitude 36°18'44.79166"N Longitude 79°40'12.21044"W Height 714.503sft Northing 933308.603sft Easting 1802566.161sft Elevation 818.527sft Horz error 0.006sft Vert error 0.037sft 3D error 0.037sft Point u3326-1 Northing 933308.599sft Easting 1802566.157sft Elevation 818.490sft Utilized Horz and Vert Quality Adjusted quality	Point u3326-6 GPS Latitude 36°21'25.92658"N Longitude 79°41'10.87153"W Height 685.056sft Northing 949636.640sft Easting 1797877.737sft Elevation 789.928sft Horz error 0.001sft Vert error 0.038sft 3D error 0.038sft Point u3326-6 Northing 949636.642sft Easting 1797877.737sft Elevation 789.966sft Utilized Horz and Vert Quality Adjusted quality	Point LITTLE GPS Latitude 36°14'47.18905"N Longitude 79°55'14.26323"W Height 817.331sft Northing 909872.972sft Easting 1728515.874sft Elevation 923.235sft Horz error 0.008sft Vert error 0.054sft 3D error 0.055sft Point LITTLE Northing 909872.976sft Easting 1728515.881sft Elevation 923.181sft Utilized Horz and Vert Quality Control quality
Point u3326-2 GPS Latitude 36°18'54.47453"N Longitude 79°40'18.90837"W Height 718.422sft Northing 934291.507sft Easting 1802024.600sft Elevation 822.508sft Horz error 0.005sft Vert error 0.031sft 3D error 0.031sft Point u3326-2 Northing 934291.506sft Easting 1802024.595sft Elevation 822.477sft Utilized Horz and Vert Quality Adjusted quality	Point u3326-8 GPS Latitude 36°22'55.33780"N Longitude 79°39'44.52638"W Height 611.078sft Northing 958630.801sft Easting 1805001.017sft Elevation 716.075sft Horz error 0.005sft Vert error 0.025sft 3D error 0.025sft Point u3326-8 Northing 958630.804sft Easting 1805001.022sft Elevation 716.100sft Utilized Horz and Vert Quality Adjusted quality	Point SADLER GPS Latitude 36°24'20.54256"N Longitude 79°37'14.13133"W Height 693.865sft Northing 967168.202sft Easting 1817353.271sft Elevation 798.805sft Horz error 0.010sft Vert error 0.083sft 3D error 0.084sft Point SADLER Northing 967168.208sft Easting 1817353.280sft Elevation 798.722sft Utilized Horz and Vert Quality Control quality
Point u3326-3 GPS Latitude 36°20'00.72492"N Longitude 79°41'51.59621"W Height 729.277sft Northing 941043.559sft Easting 1794485.947sft Elevation 833.919sft Horz error 0.004sft Vert error 0.031sft 3D error 0.031sft Point u3326-3 Northing 941043.555sft Easting 1794485.947sft Elevation 833.950sft Utilized Horz and Vert Quality Adjusted quality	Point u3326-7 GPS Latitude 36°22'44.57548"N Longitude 79°39'37.72532"W Height 626.106sft Northing 957538.698sft Easting 1805549.923sft Elevation 731.042sft Horz error 0.005sft Vert error 0.018sft 3D error 0.019sft Point u3326-7 Northing 957538.702sft Easting 1805549.927sft Elevation 731.061sft Utilized Horz and Vert Quality Adjusted quality	Point WADE GPS Latitude 36°13'22.25937"N Longitude 79°30'49.89789"W Height 657.028sft Northing 900417.873sft Easting 1848419.803sft Elevation 757.824sft Horz error 0.013sft Vert error 0.018sft 3D error 0.022sft Point WADE Northing 900417.881sft Easting 1848419.793sft Elevation 757.807sft Utilized Horz and Vert Quality Control quality
Point u3326-4 GPS Latitude 36°20'02.99461"N Longitude 79°41'34.61732"W Height 744.926sft Northing 941263.357sft Easting 1795876.813sft Elevation 849.527sft Horz error 0.003sft Vert error 0.024sft 3D error 0.024sft Point u3326-4 Northing 941263.356sft Easting 1795876.810sft Elevation 849.551sft Utilized Horz and Vert Quality Adjusted quality		

NOTES

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL-TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE SYSTEM) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.state.nc.us/preconstruct/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:

U3326_LS_GPSCALIB_080328.HTML
U3326_LS_WGS84_080328.TXT
U3326_LS_LOCAL_080328.TXT
U3326_LS_CONTROL_080328.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

U-3326A/B SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	1-E
Location and Surveys	

BASELINE DATA

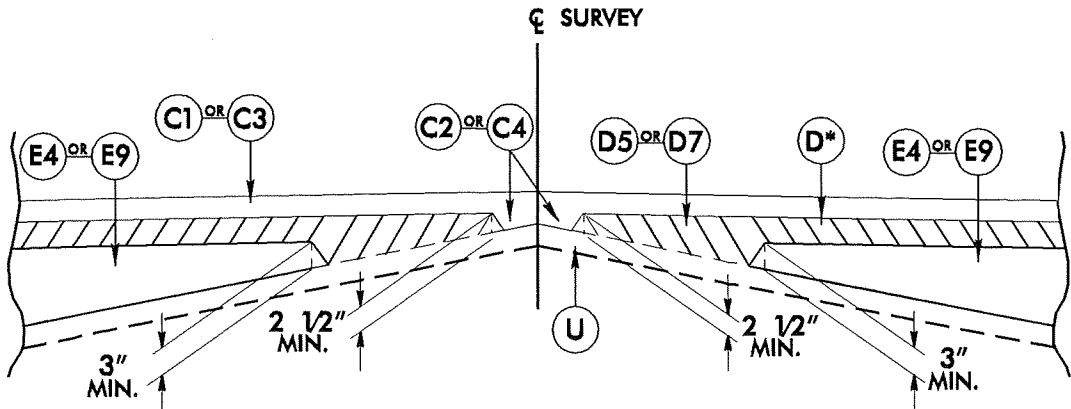
BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
11	BL-11		934235.7880	1802682.5760	813.24	OUTSIDE PROJECT LIMITS	
12	U3326-2		934291.5060	1802024.8750	822.48	15+65.60	83.80 RT
13	BL-12		934322.1850	1801521.4590	821.16	20+76.13	46.28 RT
14	BL-13		934473.9260	1800895.1320	807.49	27+26.30	27.02 RT
15	BL-14		934730.1530	1800286.9120	788.23	33+89.97	14.83 RT
16	BL-15		935223.2020	1799555.1220	796.27	42+76.79	14.09 RT
17	BL-16		935937.6010	1798875.7910	810.72	52+68.22	16.97 RT
18	BL-17		936507.4220	1798508.6010	816.81	59+49.34	17.18 RT
19	BL-18		937275.9720	1798101.9260	816.32	68+18.78	28.76 RT
20	BL-19		937935.1110	1797764.0480	818.12	75+54.21	48.27 RT
21	BL-20		938569.4380	1797389.6870	815.46	82+95.36	23.86 RT
22	BL-21		939234.6120	1797058.6180	820.02	90+37.83	52.23 RT
23	BL-22		940247.8210	1796472.3120	824.34	102+08.10	23.48 RT
24	U3326-4		941263.3560	1795876.8100	849.55	113+75.61	66.46 LT
25	BL-23		942151.6860	1795822.1890	834.52	122+57.94	21.55 RT
26	BL-24		943831.8590	1795851.0190	833.32	131+38.65	26.30 RT
27	BL-25		944138.5240	1795888.3400	815.54	142+46.74	30.52 RT
28	BL-26		945376.4030	1795916.8760	790.20	154+84.92	22.07 RT
29	BL-27		946564.5420	1795955.1010	801.93	166+73.67	24.78 RT
30	BL-28		947756.2070	1795998.7320	825.67	178+66.17	32.79 RT
31	BL-29		948348.2550	1796064.0810	827.77	184+67.89	17.30 RT
32	BL-30		949262.9640	1796398.1620	822.45	194+40.93	39.58 RT
33	BL-31		949835.8430	1796853.3550	806.89	202+35.68	44.48 RT
34	BL-32		950582.6300	1797661.3170	771.73	212+65.58	33.64 RT
35	BL-33		951390.9290	1798405.8100	736.56	223+63.94	28.26 RT
36	BL-34		952005.0840	1798956.6640	731.49	231+87.40	26.73 RT
37	BL-35		952563.1660	1799376.8550	727.54	238+82.60	38.27 RT
38	BL-36		953630.9470	1799962.5450	717.87	250+98.09	23.45 RT
39	BL-37		954781.1960	1800521.9230	739.26	263+49.36	23.30 LT
40	BL-38		955397.2940	1800991.9060	771.91	271+38.06	28.81 RT
41	BL-39		955888.9900	1801508.7010	789.05	278+57.26	21.18 LT
42	BL-40		956351.4780	1801998.4310	775.52	285+38.86	21.47 LT
43	BL-41		957066.6280	1802772.0760	760.35	295+82.62	22.98 LT
44	BL-42		957420.2260	1803564.0600	766.40	304+54.86	60.76 RT
45	BL-43		957749.6240	1804465.1820	736.59	314+16.75	33.42 RT
46	BL-44		957994.7920	1805243.1440	726.40	322+32.36	44.25 RT
47	BL-45		958244.3770	1805791.0400	733.79	328+30.86	21.17 LT
48	BL-46		958481.7230	1806496.6100	760.98	33+27.65	23408.38 RT
BY1	POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
1	U3326-1		933308.5990	1802566.1570	818.49	OUTSIDE PROJECT LIMITS	
101	U3326-2		934291.5060	1802024.8750	822.48	18+77.00	42.45 RT
51	BY1-51		934801.1940	1801783.4590	819.97	24+49.28	35.15 RT
BY2	POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
52	BY2-52		934222.0420	1801025.0860	811.78	11+15.58	18.54 RT
102	BL-12		934322.1850	1801521.4590	821.16	OUTSIDE PROJECT LIMITS	
BY3	POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
53	BY3-53		936038.6260	1798318.8660	807.51	OUTSIDE PROJECT LIMITS	
103	BL-17		936507.4220	1798508.6010	816.81	OUTSIDE PROJECT LIMITS	
BY4	POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
104	BL-18		937275.9720	1798101.9260	816.32	10+28.84	197.64 LT
54	BY4-54		936986.7780	1798534.6730	819.60	OUTSIDE PROJECT LIMITS	
BY5	POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
55	BY5-55		937464.6520	1797355.3950	817.45	OUTSIDE PROJECT LIMITS	
105	BL-19		937935.1110	1797764.0480	818.12	OUTSIDE PROJECT LIMITS	
BY6	POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
106	BL-19		937935.1110	1797764.0480	818.12	10+32.85	48.52 RT
56	BY6-56		938423.8330	1798133.6770	800.78	OUTSIDE PROJECT LIMITS	
BY7	POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
107	BL-20		938569.4380	1797389.6870	815.46	10+22.36	42.77 RT
57	BY7-57		938942.5010	1797643.4730	817.73	OUTSIDE PROJECT LIMITS	
BY8	POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
58	BY8-58		939056.1600	1796527.5890	807.35	11+75.72	48.21 RT
108	BL-21		939234.6120	1797058.6180	820.02	OUTSIDE PROJECT LIMITS	
BY9	POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
109	BL-21		939234.6120	1797058.6180	820.02	10+35.45	71.66 RT
59	BY9-59		939830.2180	1797004.8050	821.17	OUTSIDE PROJECT LIMITS	
BY10	POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
3	U3326-3		940445.5570	1795485.9470	823.95	OUTSIDE PROJECT LIMITS	
110	U3326-4		941263.3560	1795876.8100	849.55	23+72.66	18.05 LT
60	BY10-60		941267.1450	1796264.4500	845.95	27+54.52	41.99 RT
61	BY10-61		941421.7850	1796675.4590	850.87	31+85.30	29.90 RT
62	BY10-62		941655.5140	1797032.6030	854.93	OUTSIDE PROJECT LIMITS	
BY10A	POINT	DESC.	NORTH	EAST	ELEVATION	Y10A STATION	OFFSET
64	BY10A-64		942019.0780	1795088.7340	854.63	19+93.56	38.62 LT
63	BY10A-63		941512.5830	1795559.5170	848.88	14+76.26	275.07 RT
111	U3326-4		941263.3560	1795876.8100	849.55	14+12.16	664.01 RT
BY10B	POINT	DESC.	NORTH	EAST	ELEVATION	Y10B STATION	OFFSET
112	BY10B-60		941267.1450	1796264.4500	845.95	OUTSIDE PROJECT LIMITS	
65	BY10B-65		940768.2740	1796528.5910	834.11	OUTSIDE PROJECT LIMITS	
BY11	POINT	DESC.	NORTH	EAST	ELEVATION	Y11 STATION	OFFSET
66	BY11-66		945293.2710	1795462.9260	806.52	OUTSIDE PROJECT LIMITS	
113	BL-26		945376.4030	1795916.8760	790.20	OUTSIDE PROJECT LIMITS	
BY12	POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
67	BY12-67		947719.7580	1795439.2640	837.30	OUTSIDE PROJECT LIMITS	
114	BL-28		947756.2070	1795998.7320	829.67	15+66.55	40.83 RT
68	BY12-68		947860.8280	1796434.6360	840.35	20+02.51	22.95 RT
BY13	POINT	DESC.	NORTH	EAST	ELEVATION	Y13 STATION	OFFSET
69	BY13-69		950366.3380	1795850.3470	759.05	11+49.36	17.22 RT
5	U3326-5		950828.4940	1796631.8200	783.38	19+93.30	21.50 RT
115	BL-31		949835.8430	1796853.3550	806.89	23+61.43	80.31 RT
6	U3326-6		949636.6420	1797877.7370	789.97	32+98.80	19.60 LT
71	BY13-71		949498.1930	1798344.1150	784.67	OUTSIDE PROJECT LIMITS	
BY13A	POINT	DESC.	NORTH	EAST	ELEVATION	Y13A STATION	OFFSET
70	BY13A-70		950429.2690	1796462.8280	783.22	10+74.21	17.18 RT
116	U3326-5		950828.4940	1796631.8200	783.38	OUTSIDE PROJECT LIMITS	
BY14	POINT	DESC.	NORTH	EAST	ELEVATION	Y14 STATION	OFFSET
117	BL-32		950582.6300	1797661.3170	771.73	13+26.22	132.86 RT
72	BY14-72		950225.7680	1797844.7150	780.55	16+64.41	22.50 RT
BY15	POINT	DESC.	NORTH	EAST	ELEVATION	Y15 STATION	OFFSET
73	BY15-73		951579.2310	1798088.5670	748.73	18+09.27	16.62 LT
118	BL-33		951390.9290	1798405.8100	736.56	OUTSIDE PROJECT LIMITS	
74	BY15-74		950891.2040	1798562.8150	719.72	OUTSIDE PROJECT LIMITS	
BY15A	POINT	DESC.	NORTH	EAST	ELEVATION	Y15A STATION	OFFSET
73	BY15-73		951579.2310	1798088.5670	748.73	OUTSIDE PROJECT LIMITS	
118	BL-33		951390.9290	1798405.8100	736.56	10+26.34	50.33 LT
74	BY15-74		950891.2040	1798562.8150	719.72	OUTSIDE PROJECT LIMITS	
BY16	POINT	DESC.	NORTH	EAST	ELEVATION	Y16 STATION	OFFSET
75	BY16-75		952883.7410	1799052.3330	729.05	OUTSIDE PROJECT LIMITS	
119	BL-35		952563.1660	1799376.8550	727.54	OUTSIDE PROJECT LIMITS	
76	BY16A-76		952369.8700	1799608.8850	737.00	OUTSIDE PROJECT LIMITS	
BY16A	POINT	DESC.	NORTH	EAST	ELEVATION	Y16A STATION	OFFSET
120	BL-35		952563.1660	1799376.8550	727.54	10+32.18	31.18 LT
77	BY16A-77		952135.9240	1799317.1820	759.10	OUTSIDE PROJECT LIMITS	
BY17	POINT	DESC.	NORTH	EAST	ELEVATION	Y17 STATION	OFFSET
78	BY17-78		954545.9670	1799896.1670	716.22	10+10.36	20.19 LT
79	BY17-79		954680.5510	1800388.4480	744.20	14+35.43	16.81 LT
121	BL-37		954781.1960	1800521.9230	739.26	15+49.46	9.31 LT
80	BY17-80		954683.5450	1800741.3370	758.49	18+67.24	23.57 LT
81	BY17-81		954755.3680	1801192.2490	778.97	OUTSIDE PROJECT LIMITS	
BY18	POINT	DESC.	NORTH	EAST	ELEVATION	Y18 STATION	OFFSET
82	BY18-82		955888.9900	1801508.7010	789.05	11+02.11	161.40 RT
83	BY18-83		955953.5030	1800899.9330	770.93	13+05.66	20.33 LT
122	BL-38		955397.2940	1800981.9060	771.91	12+98.23	20.19 LT
BY19	POINT	DESC.	NORTH	EAST	ELEVATION	Y19 STATION	OFFSET
123	BL-38		955397.2940	1800981.9060	771.91	OUTSIDE PROJECT LIMITS	
84	BY19-84		955123.3640	1801186.8780	787.16	12+98.23	20.19 LT
BY20	POINT	DESC.	NORTH	EAST	ELEVATION	Y20 STATION	OFFSET
124	BL-39		955888.9900	1801508.7010	789.05	11+02.11	161.40 RT
85	BY20-85		955677.3290	1801680.9090	790.69	13+05.66	20.33 LT
BY21	POINT	DESC.	NORTH	EAST	ELEVATION	Y21 STATION	OFFSET
86	BY21-86		956810.6120	1803118.4110	754.88	18+08.74	21.76 RT
87	BY21-87		956804.7440	1803244.0340	758.11	15+46.96	9.78 RT
125	BL-42		957420.2260	1803564.0600	766.40	22+82.18	60.59 LT
88	BY21-88		956942.3530	1803641.2690	781.56	27+54.13	24.92 LT
89	BY21-89		956428.7670	1803593.7280	781.53	OUTSIDE PROJECT LIMITS	
BY21A	POINT	DESC.	NORTH	EAST	ELEVATION	Y21A STATION	OFFSET
90	BY21A-90		956530.9030	1803416.6190	761.18	OUTSIDE PROJECT LIMITS	
126	BY21-87		956804.7440	1803244.0340	758.11	OUTSIDE PROJECT LIMITS	
BY22	POINT	DESC.	NORTH	EAST	ELEVATION	Y22 STATION	OFFSET
8	U3326-8		958638.8040	1805001.8220	716.10	OUTSIDE PROJECT LIMITS	
127	BL-44		957994.7920	1805243.1440	726.40	16+40.65	76.65 RT
7	U3326-7		957538.7020	1805549.9270	731.06	21+87.01	50.15 RT

BENCHMARK DATA

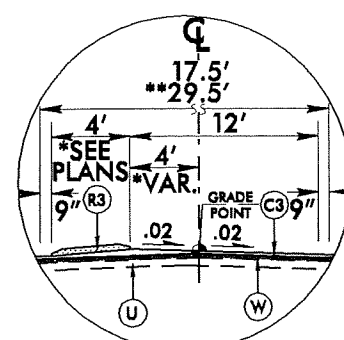
BM1 ELEVATION = 800.58 N 934290 E 1802927 L STATION 10+00 N 74° 4
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PROJECT REFERENCE NO.		SHEET NO.	
U-3326A/B		2	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>			

PRELIMINARY PAVEMENT SCHEDULE			
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E5	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
C2	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.	E6	PROP. APPROX. 3½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E7	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 468 LBS. PER SQ. YD.
C4	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.	E8	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 670 LBS. PER SQ. YD.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	E9	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" OR GREATER THAN 6½" IN DEPTH.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	J1	PROP. 8" AGGREGATE BASE COURSE
D3	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.	J2	PROP. 10" AGGREGATE BASE COURSE
D4	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 468 LBS. PER SQ. YD.	R1	1'-6" CONCRETE CURB AND 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 2½" OR GREATER THAN 4" IN DEPTH.	R2	2'-6" CONCRETE CURB AND GUTTER
D6	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 468 LBS. PER SQ. YD.	R3	6" MONOLITHIC CONCRETE ISLAND (KEYED IN)
D7	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" OR GREATER THAN 4" IN DEPTH.	R4	4'-0" EXPRESSWAY GUTTER
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK
E2	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 468 LBS. PER SQ. YD.	T	EARTH MATERIAL
E3	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 670 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
E4	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" OR GREATER THAN 6½" IN DEPTH.	W	VAR. DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

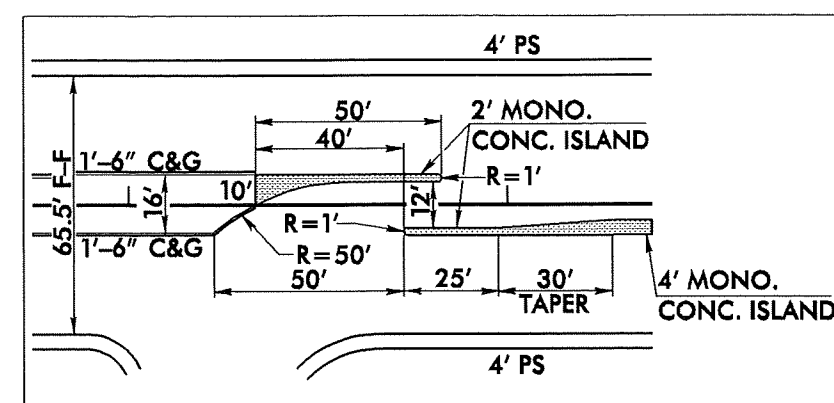


Detail Showing Method of Wedging
D* – SEE TYPICAL SECTIONS FOR SPECIFIC "D SERIES" PAVEMENT TYPES



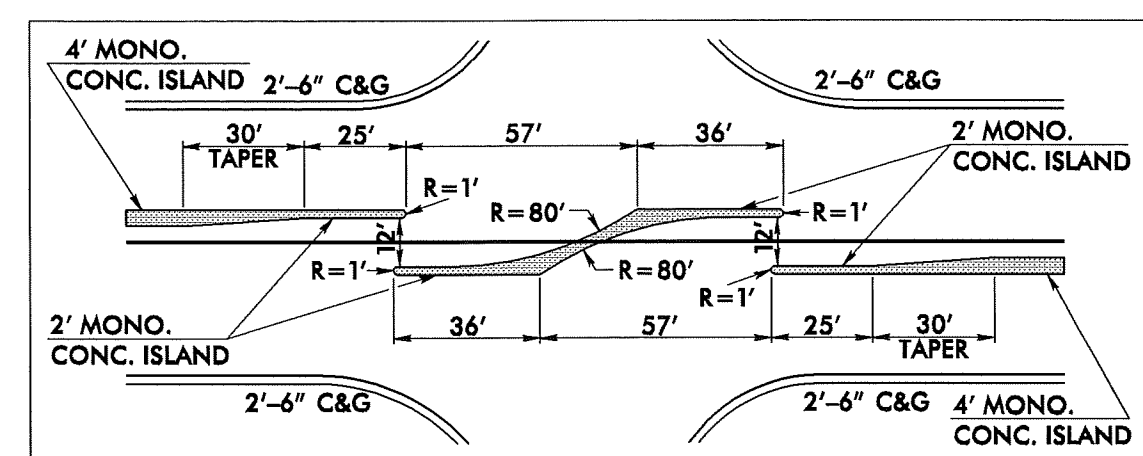
USE WITH TYPICAL SECTION NO. 2, 3 AND 7
 MEDIAN DETAIL REVERSE FOR SOUTHBOUND TURN LANE

-L- STA. 16+71.00 TO STA. 23+80.00	*-L- STA. 136+56.00 TO STA. 137+06.00	*-L- STA. 226+83.00 TO STA. 227+33.00
-L- STA. 33+78.00 TO STA. 34+28.00	*-L- STA. 138+77.00 TO STA. 139+27.00	*-L- STA. 234+12.00 TO STA. 234+62.00
-L- STA. 34+28.00 TO STA. 37+58.00	-L- STA. 139+27.00 TO STA. 142+57.00	-L- STA. 234+62.00 TO STA. 237+92.00
-L- STA. 38+51.00 TO STA. 41+81.00	-L- STA. 143+47.00 TO STA. 146+77.00	-L- STA. 239+31.00 TO STA. 242+61.00
-L- STA. 41+81.00 TO STA. 42+31.00	*-L- STA. 146+77.00 TO STA. 147+27.00	*-L- STA. 242+61.00 TO STA. 244+78.00
*-L- STA. 55+75.00 TO STA. 56+25.00	*-L- STA. 150+53.00 TO STA. 151+03.00	-L- STA. 244+78.00 TO STA. 248+08.00
-L- STA. 56+25.00 TO STA. 59+00.00	-L- STA. 151+03.00 TO STA. 154+33.00	-L- STA. 248+08.00 TO STA. 252+28.00
-L- STA. 61+96.00 TO STA. 62+46.00	-L- STA. 155+52.00 TO STA. 158+82.00	*-L- STA. 252+28.00 TO STA. 252+78.00
-L- STA. 62+46.00 TO STA. 65+76.00	*-L- STA. 158+82.00 TO STA. 159+32.00	-L- STA. 267+30.00 TO STA. 267+80.00
*-L- STA. 66+66.00 TO STA. 70+46.00	-L- STA. 163+75.00 TO STA. 164+25.00	-L- STA. 267+80.00 TO STA. 271+10.00
-L- STA. 76+53.00 TO STA. 79+05.00	-L- STA. 164+25.00 TO STA. 167+55.00	-L- STA. 272+32.00 TO STA. 275+62.00
*-L- STA. 79+05.00 TO STA. 80+33.57	-L- STA. 168+45.00 TO STA. 171+75.00	*-L- STA. 275+62.00 TO STA. 276+12.00
-L- STA. 84+27.00 TO STA. 90+54.00	-L- STA. 171+75.00 TO STA. 172+25.00	-L- STA. 280+22.00 TO STA. 280+72.00
-L- STA. 91+47.00 TO STA. 94+77.00	*-L- STA. 174+52.00 TO STA. 175+02.00	-L- STA. 280+72.00 TO STA. 284+02.00
-L- STA. 94+77.00 TO STA. 95+27.00	-L- STA. 175+02.00 TO STA. 178+32.00	-L- STA. 285+12.00 TO STA. 288+42.00
*-L- STA. 128+56.00 TO STA. 129+06.00	-L- STA. 179+84.00 TO STA. 183+14.00	*-L- STA. 288+42.00 TO STA. 288+92.00
-L- STA. 129+06.00 TO STA. 132+36.00	*-L- STA. 183+14.00 TO STA. 183+64.00	-L- STA. 311+31.00 TO STA. 311+81.00
-L- STA. 133+26.00 TO STA. 136+56.00	-L- STA. 218+97.00 TO STA. 219+47.00	-L- STA. 311+81.00 TO STA. 313+51.00
	-L- STA. 219+47.00 TO STA. 222+22.00	-L- STA. 315+51.00 TO STA. 322+01.00
	-L- STA. 224+08.00 TO STA. 226+83.00	-L- STA. 324+08.00 TO STA. 327+38.00
		-L- STA. 327+38.00 TO STA. 327+88.00



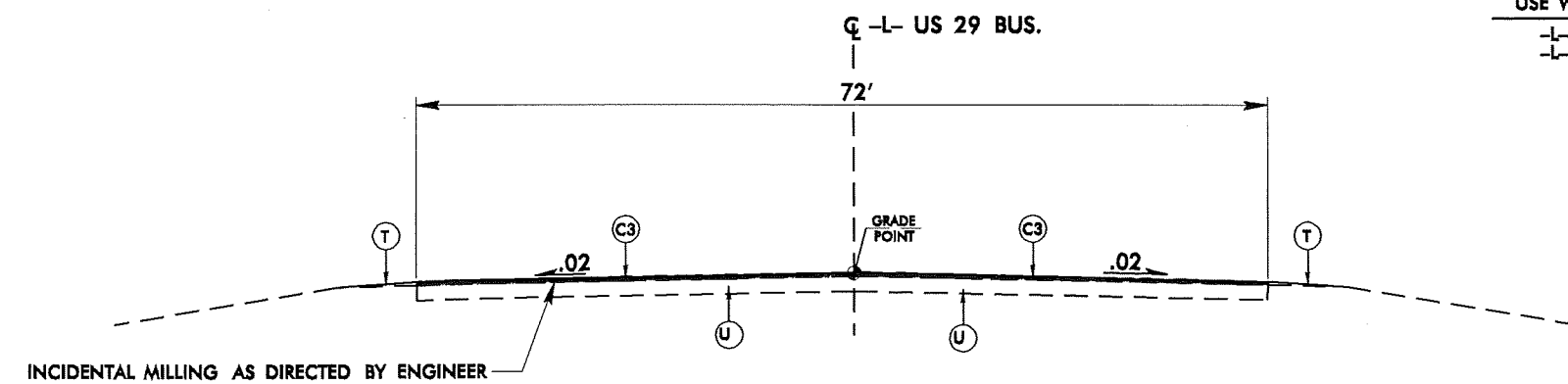
USE WITH TYPICAL SECTION NO. 2 AND 3

- L- STA. 24+50.00 MEDIAN
- L- STA. 59+50.00 MEDIAN
- L- STA. 84+00.00 MEDIAN

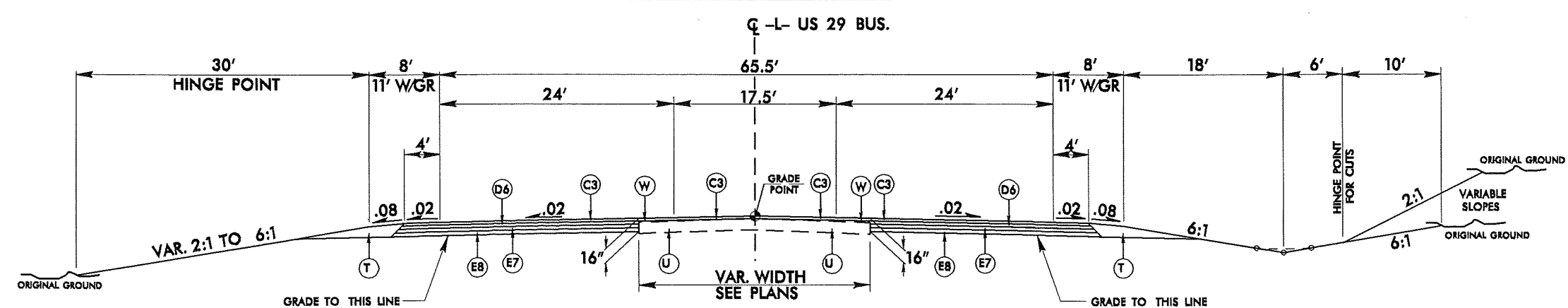


USE WITH TYPICAL SECTION NO. 7

- L- STA. 223+15.00 MEDIAN
- L- STA. 314+51.00 MEDIAN



TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 2

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PAVEMENT SCHEDULE	
C1	3" 89.88
C2	VAR. DEPTH 89.88
C3	3" 89.60
C4	VAR. DEPTH 89.50
D1	2 1/2" 119.08
D2	3" 119.08
D3	3 1/2" 119.08
D4	4" 119.08
D5	VAR. DEPTH 119.08
D6	4" 119.00
D7	VAR. DEPTH 119.00
E1	3" B25.08
E2	4" B25.08
E3	5" B25.08
E4	VAR. DEPTH B25.08
E5	3" B25.00
E6	3 1/2" B25.00
E7	4" B25.00
E8	5" B25.00
E9	VAR. DEPTH B25.00
J1	8" ABC
J2	10" ABC
R1	1'-8" C & G
R2	2'-8" C & G
R3	6" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING

USE TYPICAL SECTION NO. 1 AS FOLLOWS

- L- STA. 14+00.00 TO STA. 15+94.68

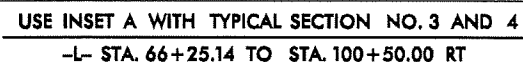
USE TYPICAL SECTION NO. 2 AS FOLLOWS

- L- STA. 15+94.68 TO STA. 24+77.75



-L	STA. 33 + 78.00	TO	STA. 42 + 31.00
-L	STA. 55 + 75.00	TO	STA. 59 + 97.79
-L	STA. 61 + 96.00	TO	STA. 66 + 65.00
*-L	STA. 75 + 03.00	TO	STA. 79 + 05.00
-L	STA. 85 + 05.00	TO	STA. 95 + 27.00

NOTE: TRANSITION FROM TYPICAL SECTION NO.3 TO TYPICAL NO. 4
-L STA. 66+65.00 TO STA. 72+65.00
NOTE: TRANSITION FROM 77.5' WIDTH TO 66.5' WIDTH
-L STA. 79+05.00 TO STA. 85+05.00

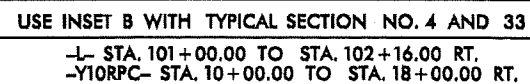


NOTE: TRANSITION FROM INSET A TO INSET B
 -L- STA. 100+50.00 TO STA 101+00.00



-L STA. 24+77.75 TO STA. 28+00.00
 -L STA. 42+31.00 TO STA. 52+00.00
 *-L STA. 72+65.00 TO STA. 75+03.00
 -L STA. 95+27.00 TO STA. 111+00.00
 -L STA. 122+00.00 TO STA. 126+85.00
 -L STA. 208+00.00 TO STA. 210+65.95 RT.

NOTE: FOR NARROW WIDENING IN MEDIAN USE:
(C3), (D6), (E7), AND (E8)

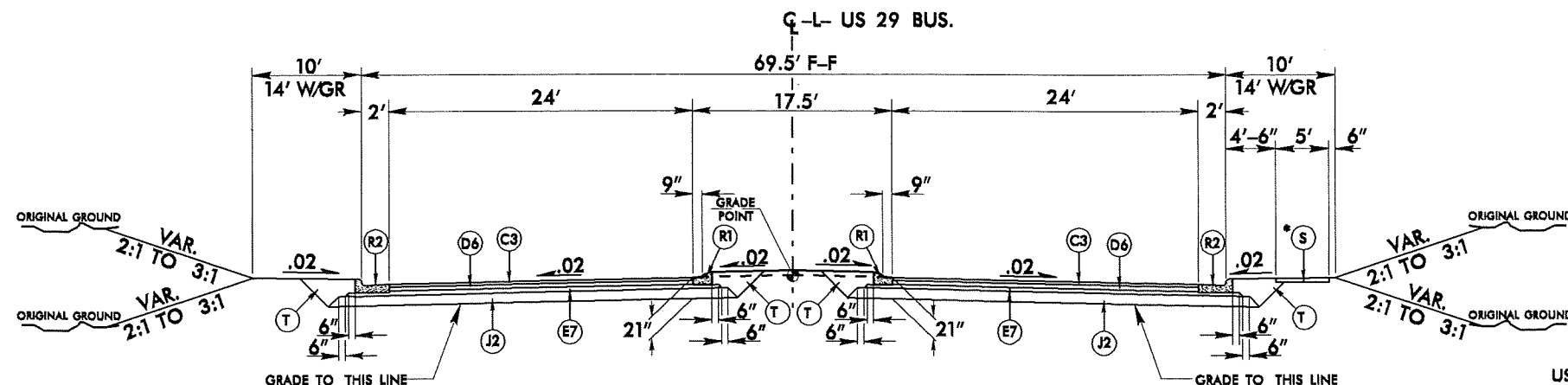


PROJECT REFERENCE NO.		SHEET NO.
U-3326A/B		2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER	
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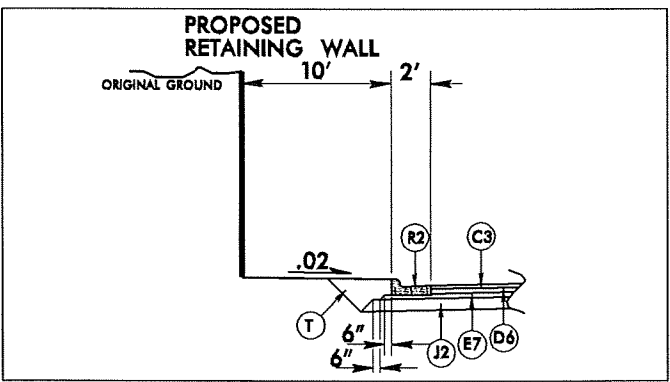
PAVEMENT SCHEDULE	
C1	3" 89.6B
C2	VAR. DEPTH 89.6B
C3	3" 89.6C
C4	VAR. DEPTH 89.6C
D1	2 1/2" 119.0B
D2	3" 119.0B
D3	3 1/2" 119.0B
D4	4" 119.0B
D5	VAR. DEPTH 119.0B
D6	4" 119.0C
D7	VAR. DEPTH 119.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-8" C & G
R2	2'-6" C & G
R3	5" MONO. ISLAND (KEYED IN
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING

6/2/99

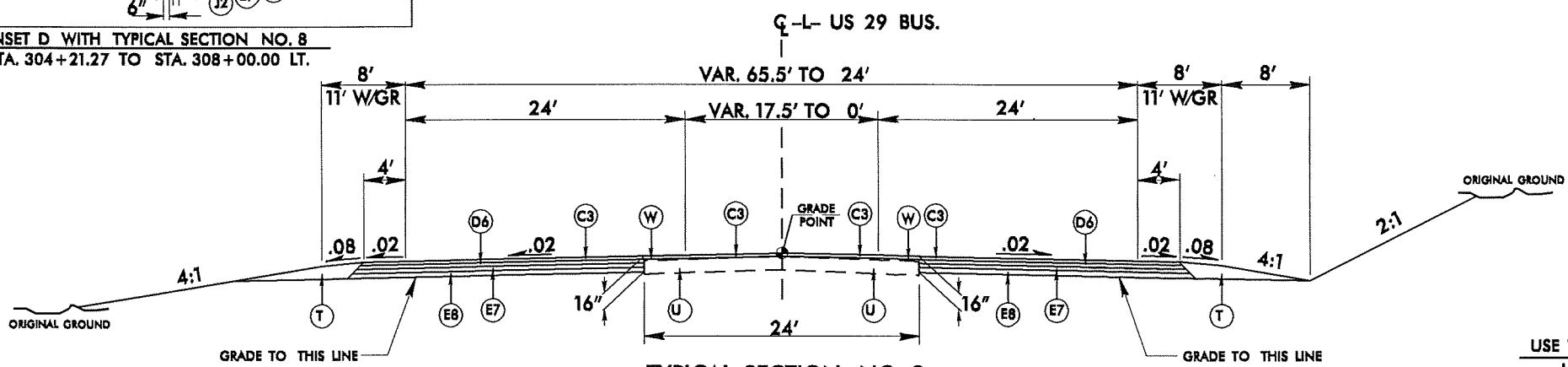
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TYPICAL SECTION NO. 8

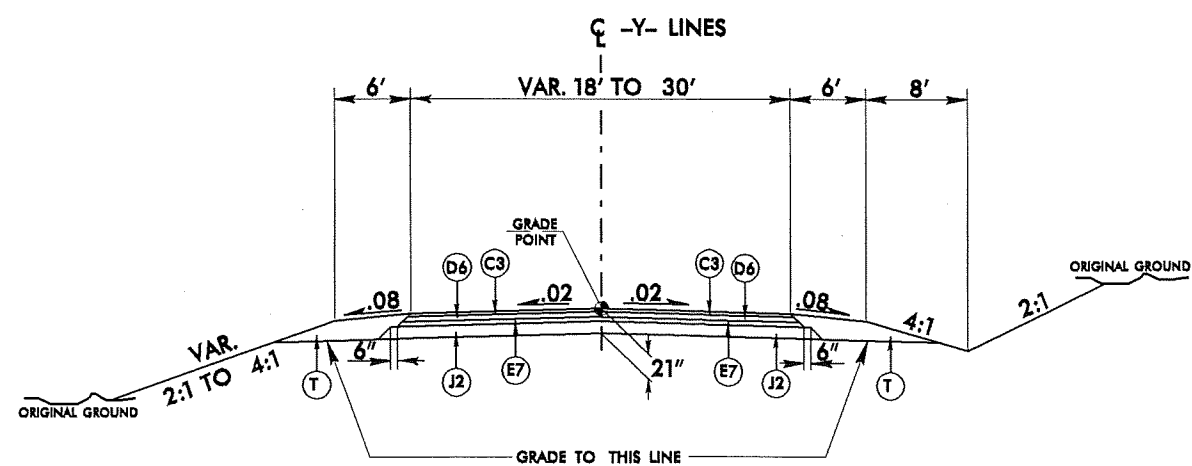


USE INSET D WITH TYPICAL SECTION NO. 8
-L- STA. 304+21.27 TO STA. 308+00.00 LT.



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9 AS FOLLOWS
-L- STA. 329+52.00 TO 333+52.00



TYPICAL SECTION NO. 10

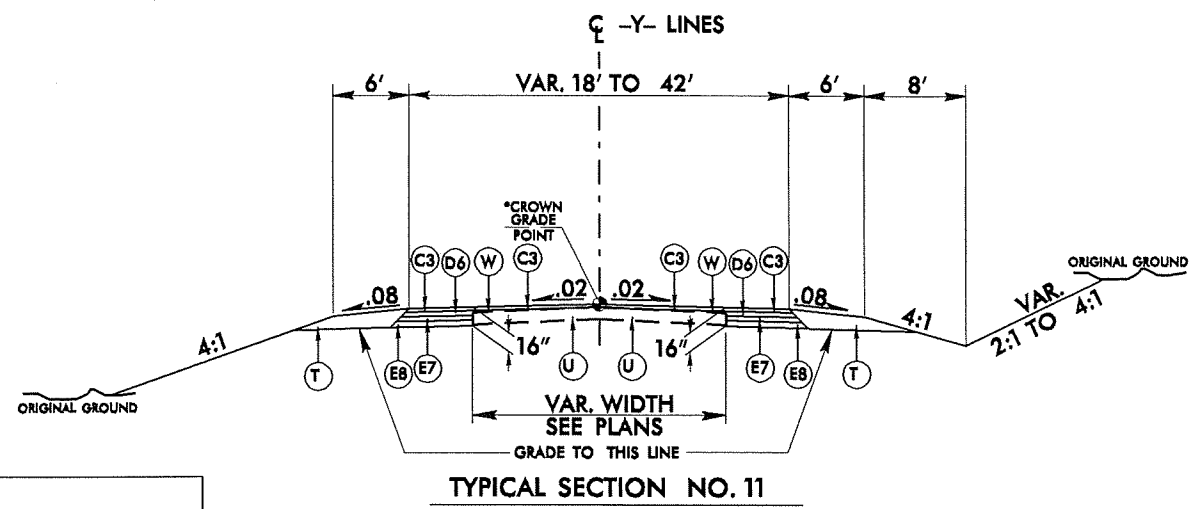
USE TYPICAL SECTION NO. 10 AS FOLLOWS
-Y2- STA. 11+05.00 TO STA. 12+05.47
-Y13C- STA. 10+00.00 TO STA. 18+49.54
-Y20A- STA. 10+63.00 TO STA. 11+71.10
-Y20B- STA. 10+42.07 TO STA. 17+43.95

PROJECT REFERENCE NO.		SHEET NO.	
U-3326A/B		2-D	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>			

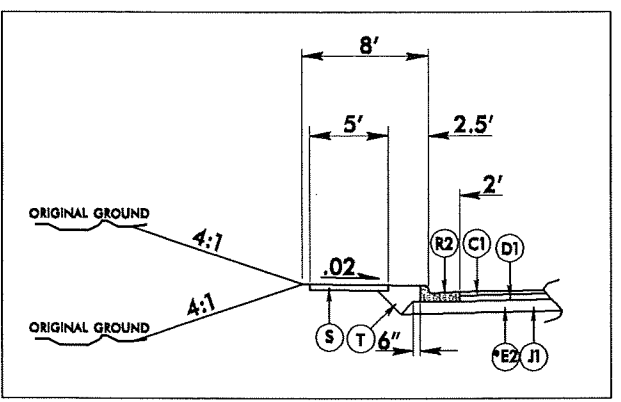
PAVEMENT SCHEDULE	
C1	3" 89.5B
C2	VAR. DEPTH 89.5B
C3	3" 89.6C
C4	VAR. DEPTH 89.5C
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	3 1/2" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
D6	4" I19.0C
D7	VAR. DEPTH I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-6" C & G
R2	2'-6" C & G
R3	5" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING

PROJECT REFERENCE NO.		SHEET NO.
U-3326A/B		2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER	
<div><div>PRELIMINARY PLANS</div><div>DO NOT USE FOR CONSTRUCTION</div></div>		

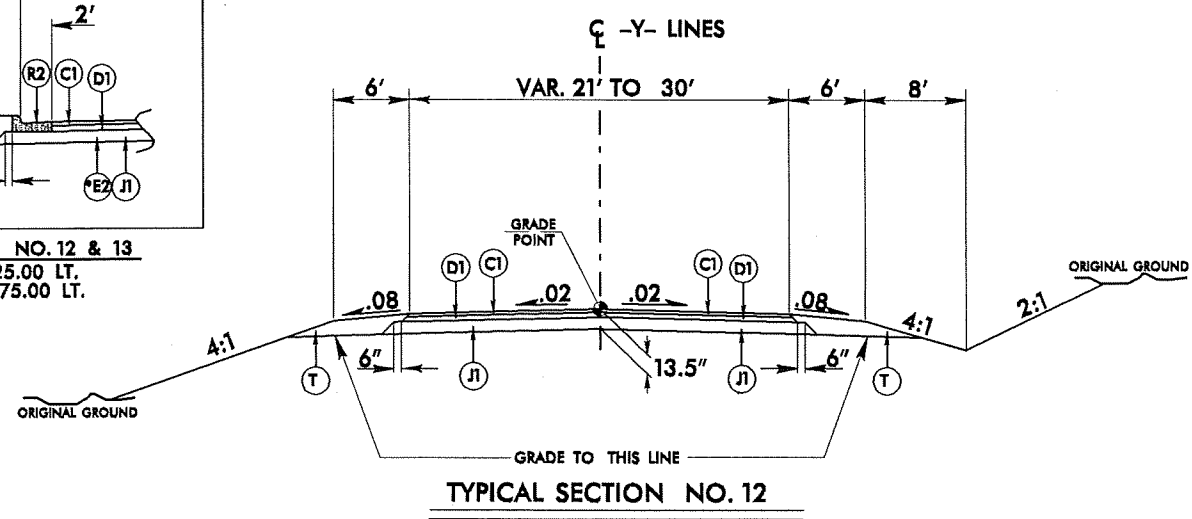
PAVEMENT SCHEDULE	
C1	3" 89.5B
C2	VAR. DEPTH 89.5B
C3	3" 89.6C
C4	VAR. DEPTH 89.5C
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	3 1/2" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
D6	4" I19.0C
D7	VAR. DEPTH I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-8" C & G
R2	2'-8" C & G
R3	8" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING



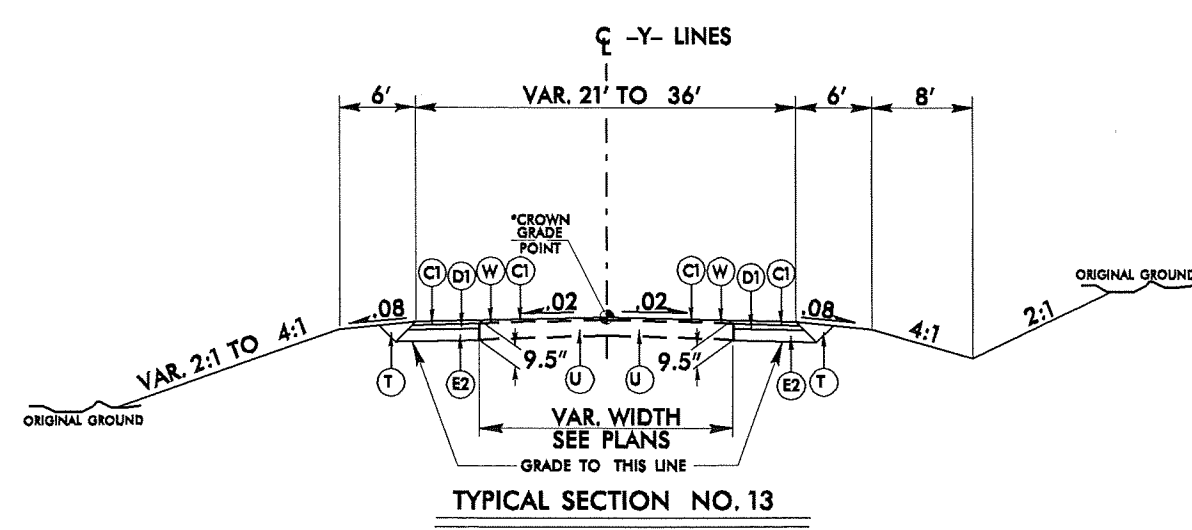
TYPICAL SECTION NO. 11



USE INSET E WITH TYPICAL SECTION NO. 12 & 13
-Y4- STA. 11+51.48 TO STA. 12+25.00 LT.
*-Y4- STA. 12+25.00 TO STA. 12+75.00 LT.



TYPICAL SECTION NO. 12



TYPICAL SECTION NO. 13

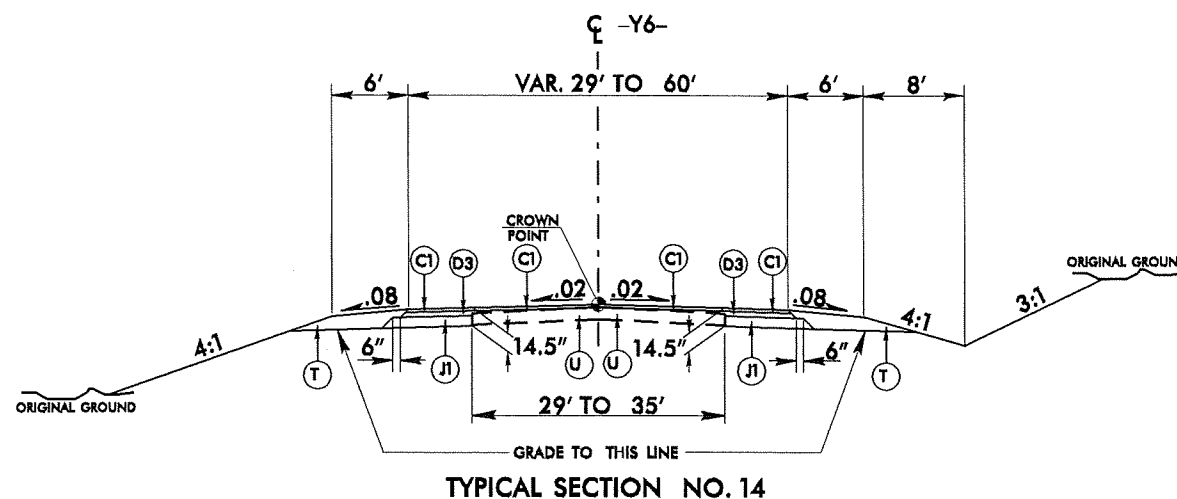
USE TYPICAL SECTION NO. 11 AS FOLLOWS
-Y3- STA. 11+50.00 TO STA. 12+72.87
*-Y11- STA. 11+25.00 TO STA. 12+00.00
-Y11- STA. 12+00.00 TO STA. 12+41.95
-Y13A- STA. 13+00.00 TO STA. 13+31.45
*-Y15- STA. 12+60.00 TO STA. 13+34.48
*-Y16- STA. 12+38.86 TO STA. 13+00.00
-Y16- STA. 13+00.00 TO STA. 13+10.73
-Y16A- STA. 11+06.94 TO STA. 11+20.00
-Y19- STA. 11+04.17 TO STA. 12+05.00

USE TYPICAL SECTION NO. 12 AS FOLLOWS
-Y4- STA. 11+51.48 TO STA. 12+25.00
-Y9- STA. 10+99.01 TO STA. 12+25.00

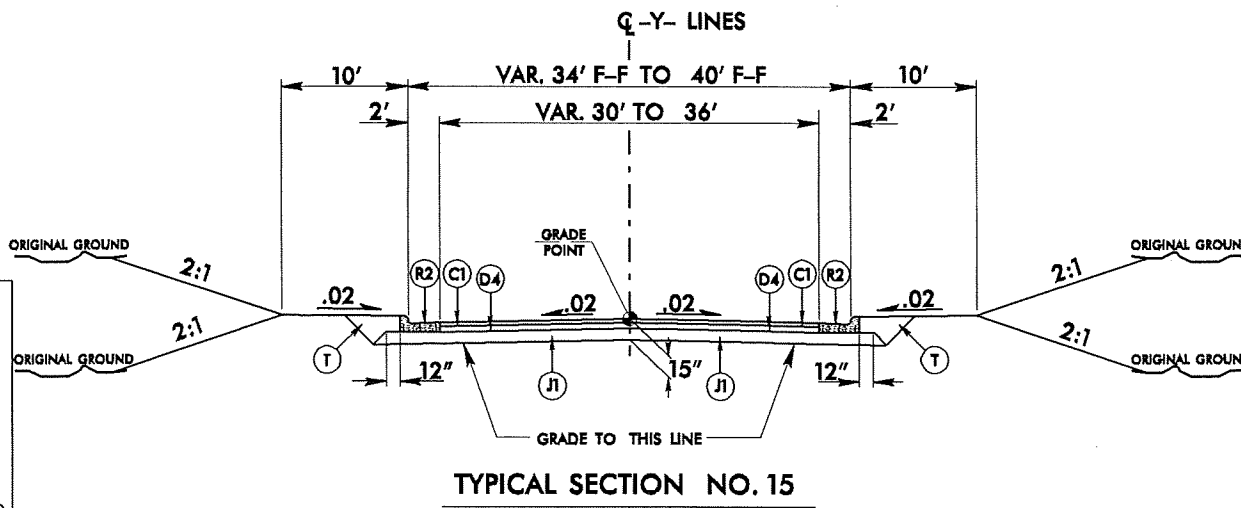
USE TYPICAL SECTION NO. 13 AS FOLLOWS
-Y4- STA. 12+25.00 TO STA. 12+50.00
*-Y4- STA. 12+50.00 TO STA. 12+75.00
*-Y5- STA. 11+00.00 TO STA. 14+00.00
-Y5- STA. 14+00.00 TO STA. 14+47.64

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

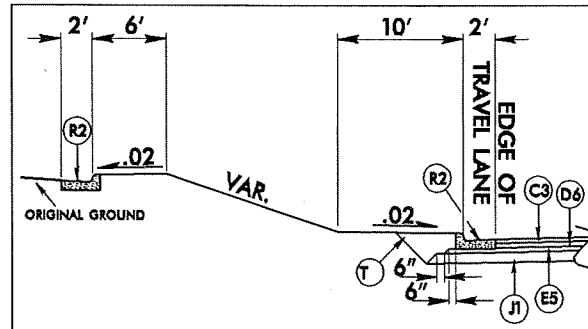
PAVEMENT SCHEDULE	
C1	3" 89.6B
C2	VAR. DEPTH 89.6B
C3	3" 89.6C
C4	VAR. DEPTH 89.6C
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	3 1/2" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
D6	4" I19.0C
D7	VAR. DEPTH I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-8" C & G
R2	2'-8" C & G
R3	8" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING



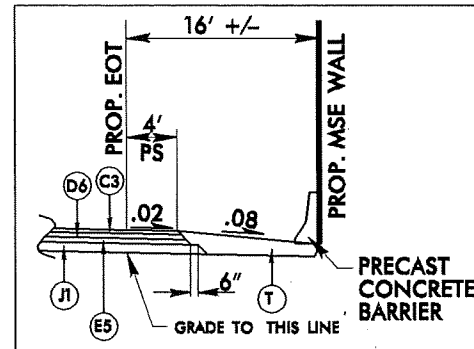
USE TYPICAL SECTION NO. 14 AS FOLLOWS
 -Y6- STA. 11+22.67 TO STA. 13+75.00



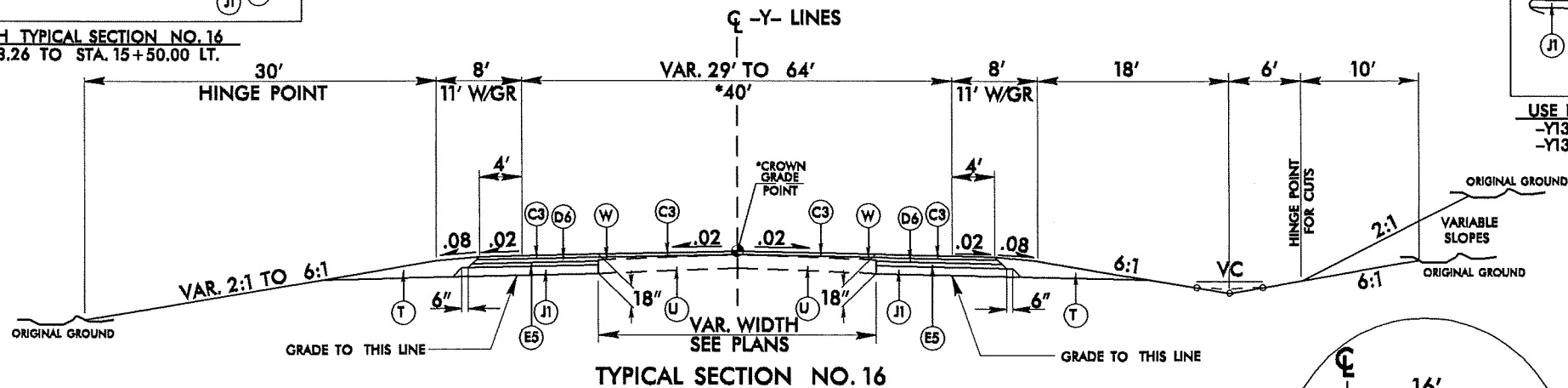
USE TYPICAL SECTION NO. 15 AS FOLLOWS
 -Y8- STA. 15+20.00 TO STA. 15+76.73
 -Y8A- STA. 10+52.63 TO STA. 24+38.36



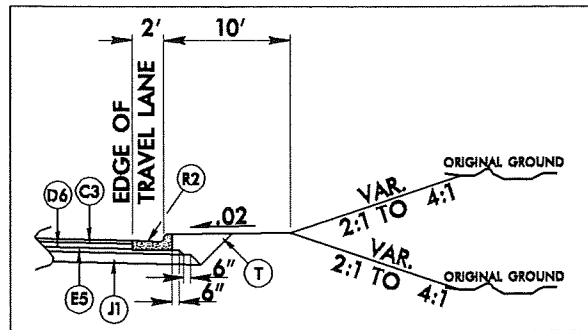
USE INSET F WITH TYPICAL SECTION NO. 16
 -Y13- STA. 14+73.26 TO STA. 15+50.00 LT.



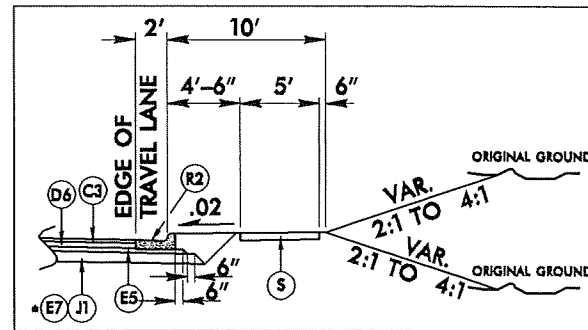
USE INSET G WITH TYPICAL SECTION NO. 16
 -Y13- STA. 22+32.00 TO STA. 24+14.00 RT.
 -Y13- STA. 22+74.00 TO STA. 24+44.00 LT.



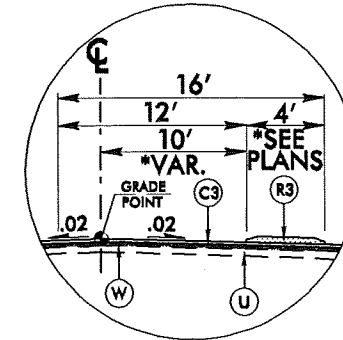
USE TYPICAL SECTION NO. 16 AS FOLLOWS
 *-Y10- STA. 15+15.00 TO STA. 15+50.00
 -Y10- STA. 15+50.00 TO STA. 20+50.00
 -Y10- STA. 29+00.00 TO STA. 29+16.00
 -Y13- STA. 14+70.00 TO STA. 29+30.00



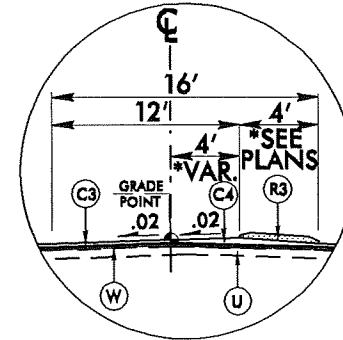
USE INSET H WITH TYPICAL SECTION NO. 16, 17, AND 18
 -Y10- STA. 14+39.39 TO STA. 21+56.04 RT.
 -Y13- STA. 14+51.84 TO STA. 18+11.76 LT.



USE INSET I WITH TYPICAL SECTION NO. 16 AND 17
 *-Y10- STA. 28+56.03 TO STA. 29+16.00 RT.
 -Y10- STA. 29+16.00 TO STA. 31+44.61 RT.

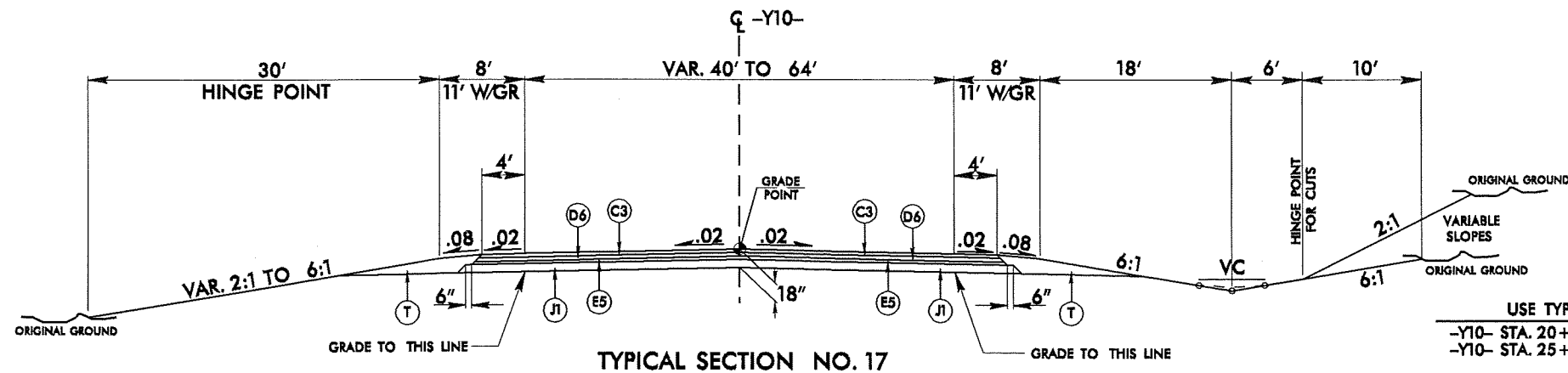


USE INSET J WITH TYPICAL SECTION NO. 16
 MEDIAN DETAIL REVERSE FOR EASTBOUND TURN LANE
 -Y13- STA. 14+73.00 TO STA. 16+00.00
 *-Y13- STA. 16+00.00 TO STA. 17+85.00
 -Y13- STA. 18+97.00 TO STA. 21+80.00
 *-Y13- STA. 21+80.00 TO STA. 25+90.00
 *-Y13- STA. 26+64.00 TO STA. 29+28.00



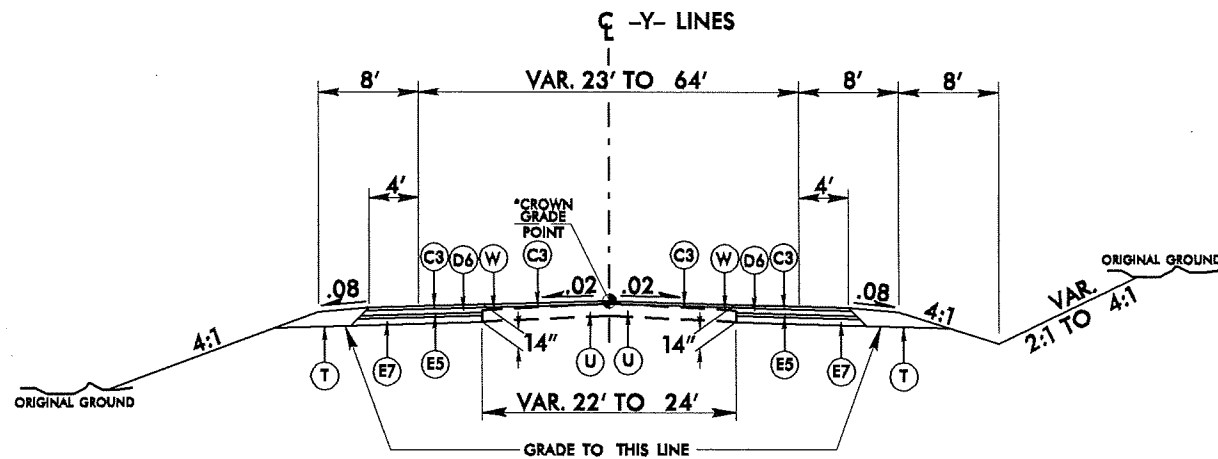
USE INSET K WITH TYPICAL SECTION NO. 16, 17 & 18
 MEDIAN DETAIL REVERSE FOR EASTBOUND TURN LANE
 -Y10- STA. 22+60.00 TO STA. 23+64.10 (BEGIN BRIDGE)
 -Y10- STA. 25+35.10 (END BRIDGE) TO STA. 25+97.81
 *-Y10- STA. 25+97.81 TO STA. 27+85.00
 *-Y10- STA. 28+68.00 TO STA. 32+18.00

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



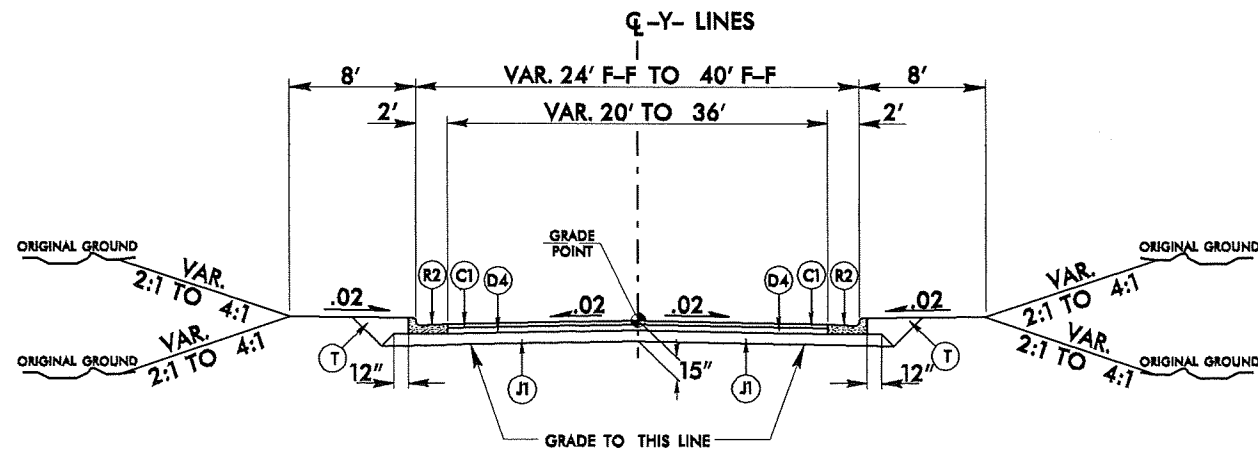
TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17 AS FOLLOWS
 -Y10- STA. 20+50.00 TO STA. 23+64.10 (BEGIN BRIDGE)
 -Y10- STA. 25+35.10 (END BRIDGE) TO STA. 29+00.00



TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18 AS FOLLOWS
 *-Y10- STA. 12+50.00 TO STA. 15+15.00
 -Y10- STA. 29+16.00 TO STA. 32+00.00
 *-Y10- STA. 32+00.00 TO STA. 33+16.00
 -Y13- STA. 8+70.00 TO STA. 14+70.00
 -Y13- STA. 29+30.00 TO STA. 35+50.00



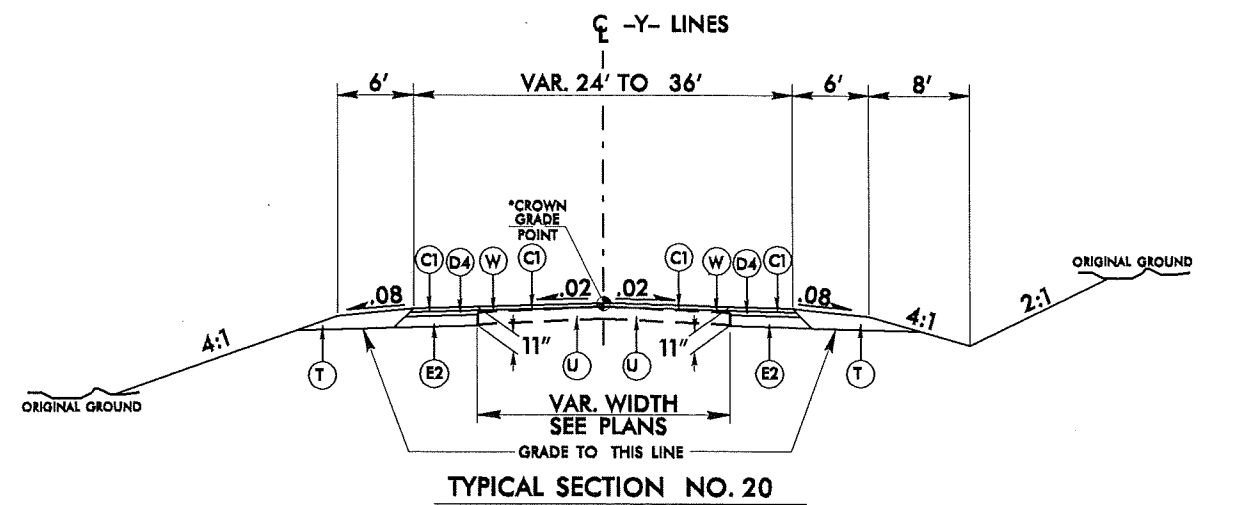
TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19 AS FOLLOWS
 -Y10A- STA. 10+66.77 TO STA. 17+50.00
 -Y10F- STA. 10+49.23 TO STA. 10+88.00

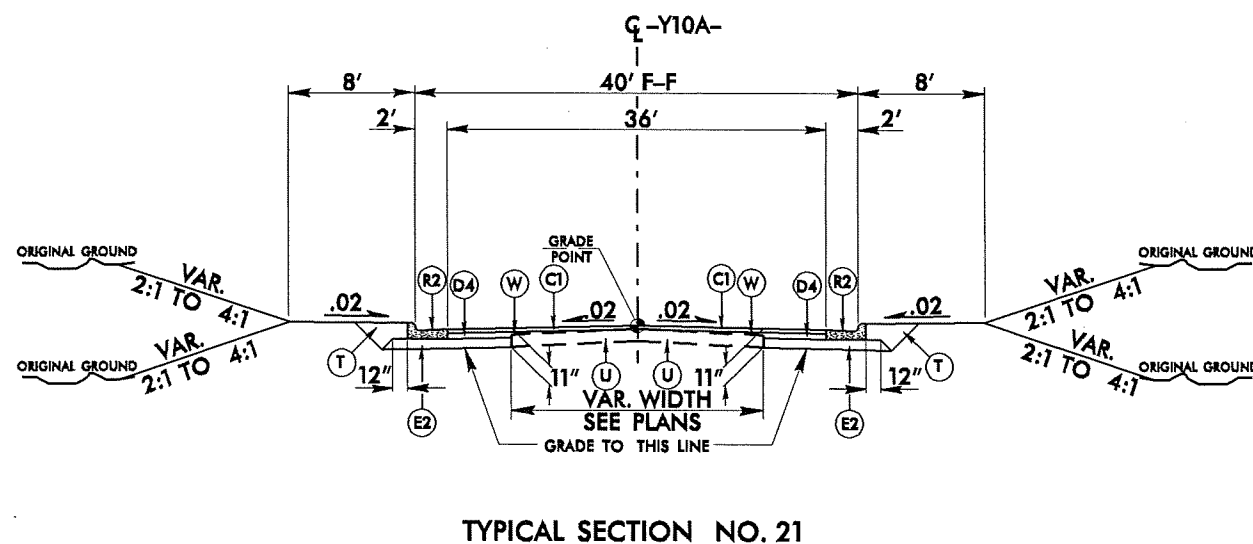
PAVEMENT SCHEDULE	
C1	3" 89.5B
C2	VAR. DEPTH 89.5B
C3	3" 89.6C
C4	VAR. DEPTH 89.6C
D1	2 1/2" 119.0B
D2	3" 119.0B
D3	3 1/2" 119.0B
D4	4" 119.0B
D5	VAR. DEPTH 119.0B
D6	4" 119.0C
D7	VAR. DEPTH 119.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-6" C & G
R2	2'-6" C & G
R3	8" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING

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U3326-2-H

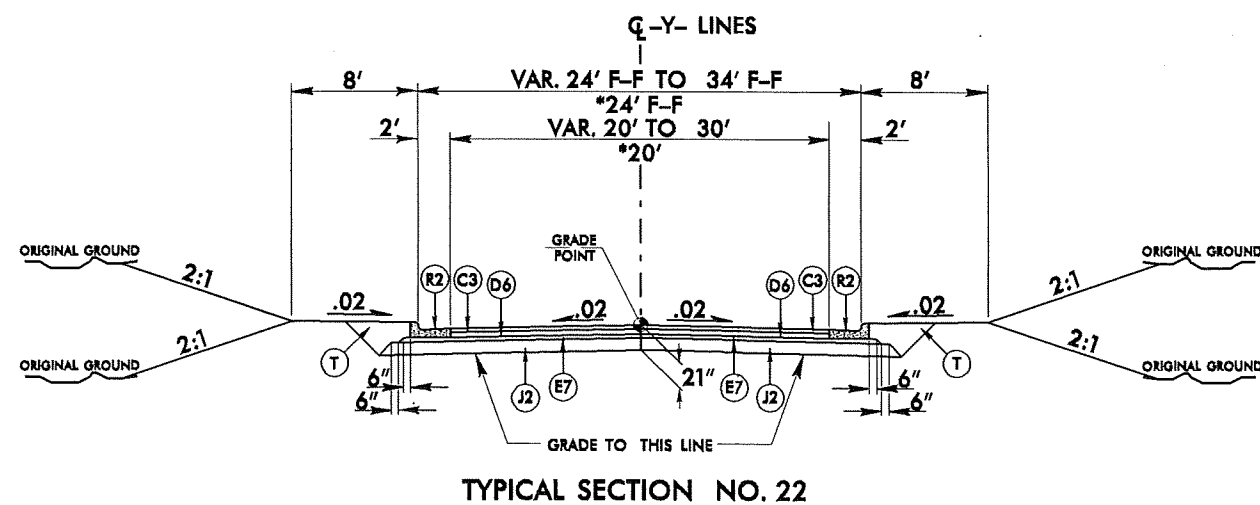
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	2-H
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



USE TYPICAL SECTION NO. 20 AS FOLLOWS
-Y10A- STA. 19+18.37 TO STA. 21+00.00
*-Y10A- STA. 21+00.00 TO STA. 22+00.00
*-Y10C- STA. 10+80.00 TO STA. 12+50.00



USE TYPICAL SECTION NO. 21 AS FOLLOWS
-Y10A- STA. 17+50.00 TO STA. 19+18.37



USE TYPICAL SECTION NO. 22 AS FOLLOWS
-Y12B- STA. 10+78.99 TO STA. 12+80.00
-Y12C- STA. 10+55.16 TO STA. 14+57.54
*-Y14- STA. 9+83.00 TO STA. 14+15.00

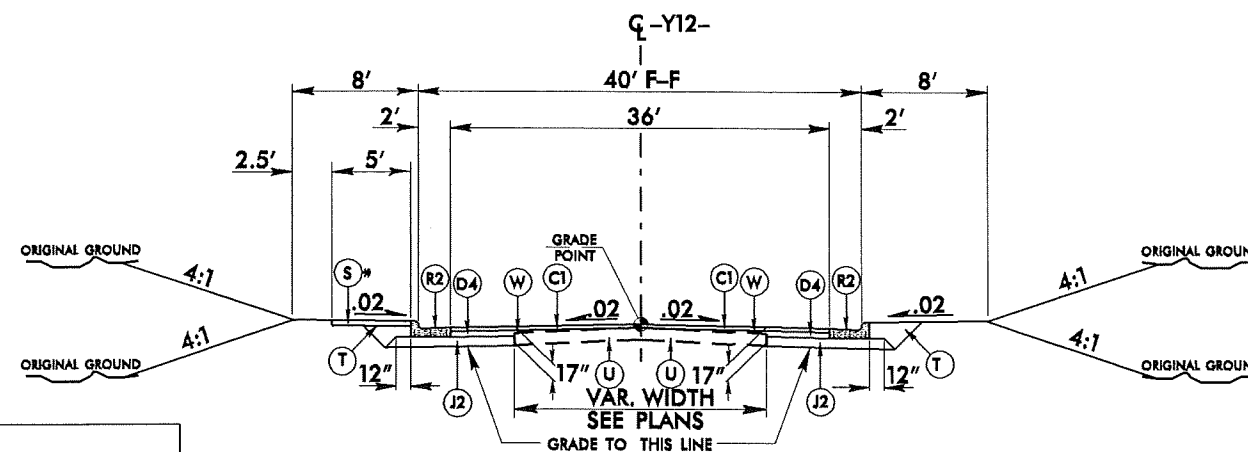
NOTE: TRANSITION FROM TYPICAL SECTION NO. 22 TO EXISTING
-Y14- STA. 14+15.00 TO STA. 14+65.00

PAVEMENT SCHEDULE	
C1	3" 89.5B
C2	VAR. DEPTH 89.5B
C3	3" 89.6C
C4	VAR. DEPTH 89.5C
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	3 1/2" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
D6	4" I19.0C
D7	VAR. DEPTH I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-8" C & G
R2	2'-8" C & G
R3	5" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING

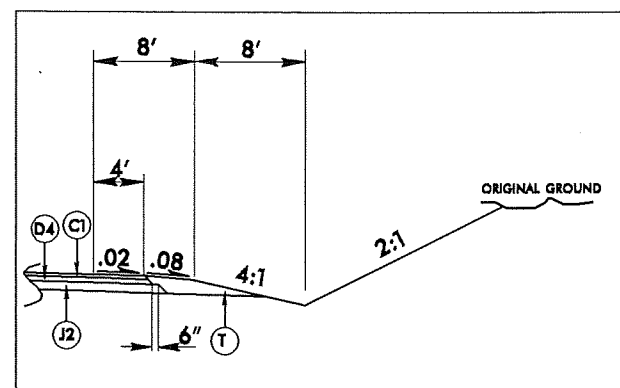
PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PAVEMENT SCHEDULE

C1	3" 89.5B
C2	VAR. DEPTH 89.5B
C3	3" 89.5C
C4	VAR. DEPTH 89.5C
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	3 1/2" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
D6	4" I19.0C
D7	VAR. DEPTH I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-6" C & G
R2	2'-6" C & G
R3	6" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING



TYPICAL SECTION NO. 23



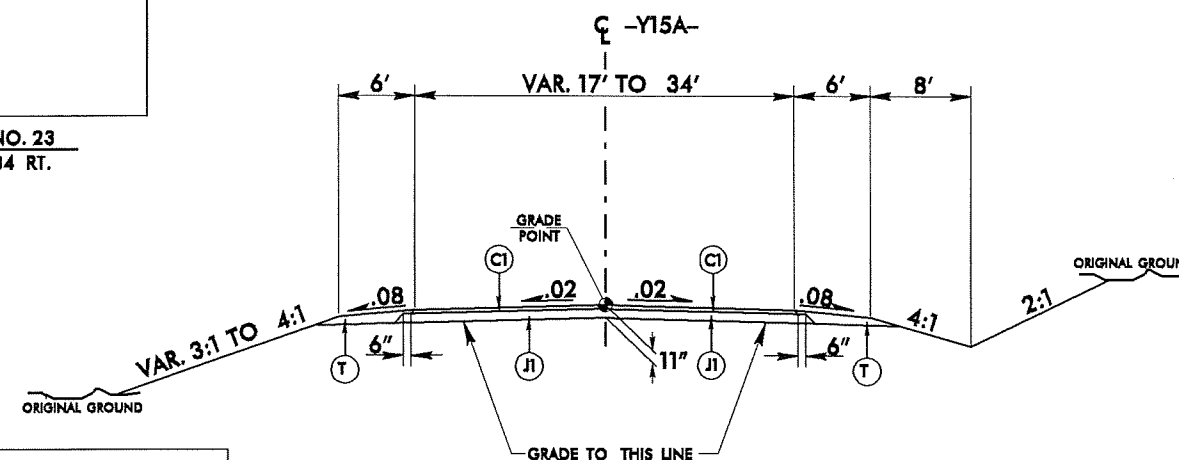
USE INSET L WITH TYPICAL SECTION NO. 23
-Y12- STA. 10+00.00 TO STA. 12+21.34 RT.

NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 23
-Y12- STA. 10+00.00 TO STA. 11+40.00

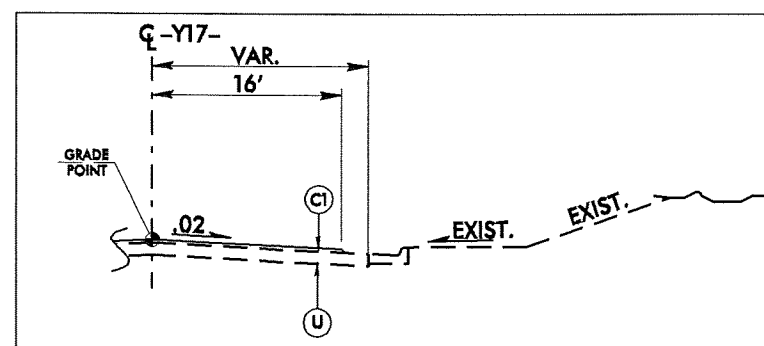
USE TYPICAL SECTION NO. 23 AS FOLLOWS

-Y12- STA. 11+40.00 TO STA. 14+21.34
-Y12- STA. 16+45.96 TO STA. 20+25.00
*-Y12- STA. 19+49.18 TO STA. 20+26.60 LT.

NOTE: TRANSITION FROM TYPICAL SECTION NO. 23 TO EXISTING
-Y12- STA. 20+25.00 TO STA. 20+80.00



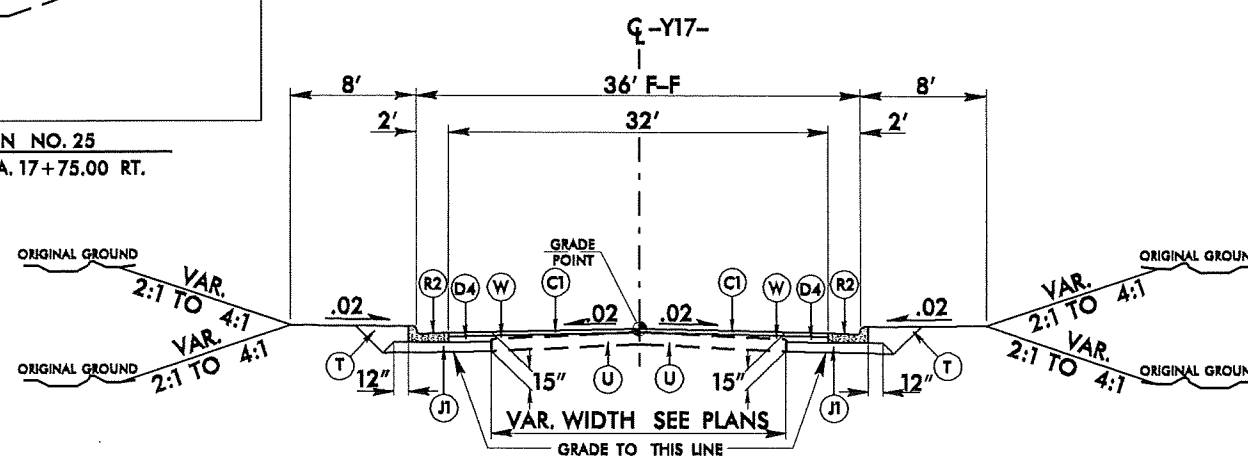
TYPICAL SECTION NO. 24



USE INSET M WITH TYPICAL SECTION NO. 25
-Y17- STA. 17+18.75 (END BRIDGE) TO STA. 17+75.00 RT.

USE TYPICAL SECTION NO. 24 AS FOLLOWS

-Y15A- STA. 10+92.59 TO STA. 13+00.00



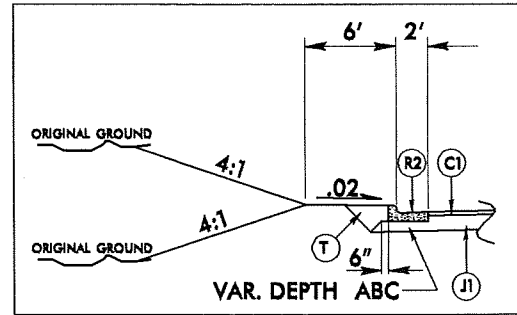
TYPICAL SECTION NO. 25

NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 25
-Y17- STA. 13+00.00 TO STA. 14+65.00

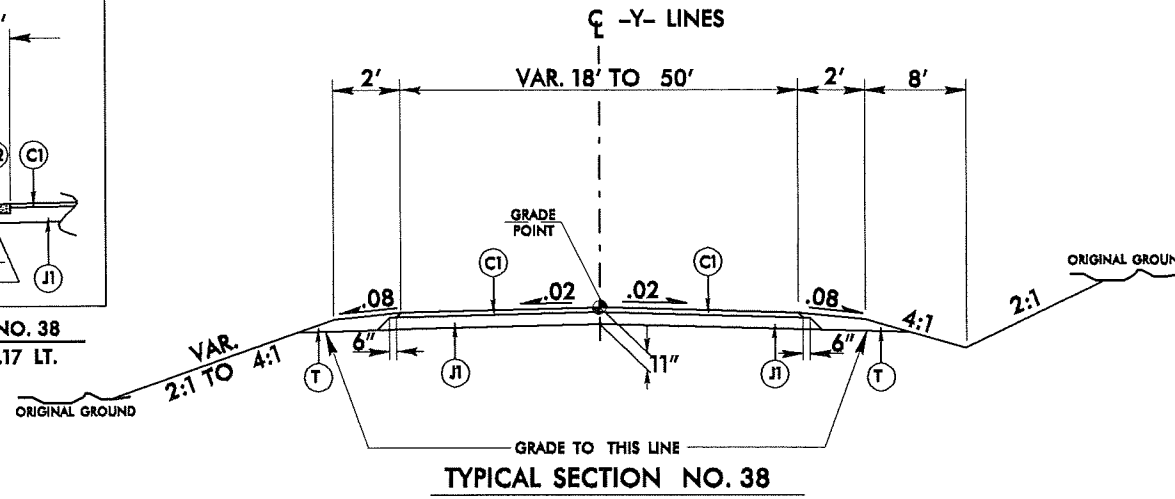
USE TYPICAL SECTION NO. 25 AS FOLLOWS

-Y17- STA. 14+65.00 TO STA. 15+31.75 (BEGIN BRIDGE)
-Y17- STA. 17+18.75 (END BRIDGE) TO STA. 17+75.00

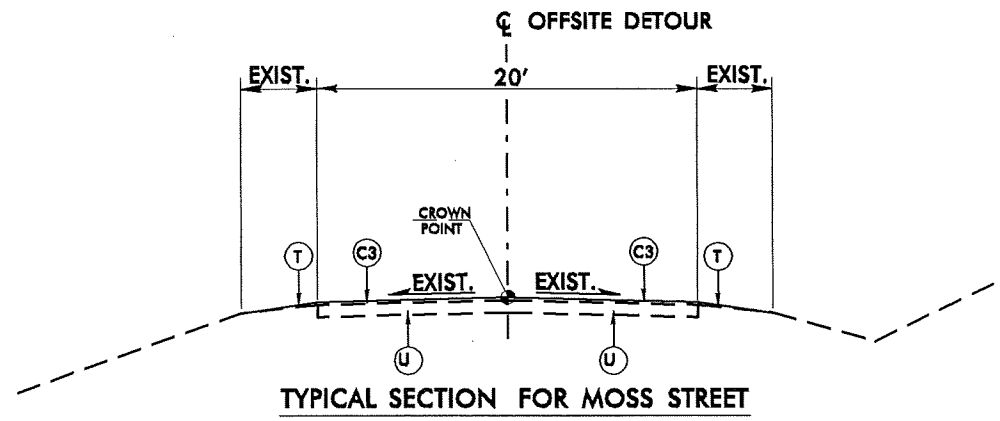
NOTE: TRANSITION FROM TYPICAL SECTION NO. 25 TO EXISTING
-Y17- STA. 17+75.00 TO STA. 18+50.00



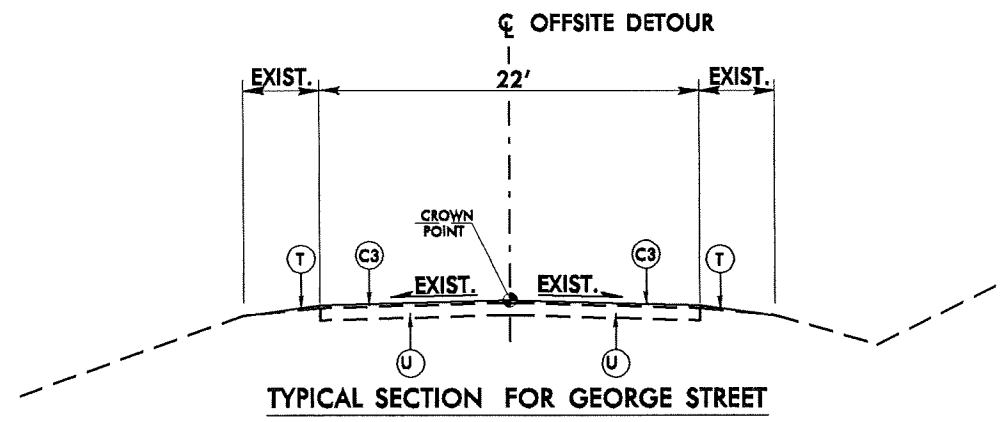
USE INSET R WITH TYPICAL SECTION NO. 38
-DRV3- STA. 10+15.00 TO STA. 10+78.17 LT.



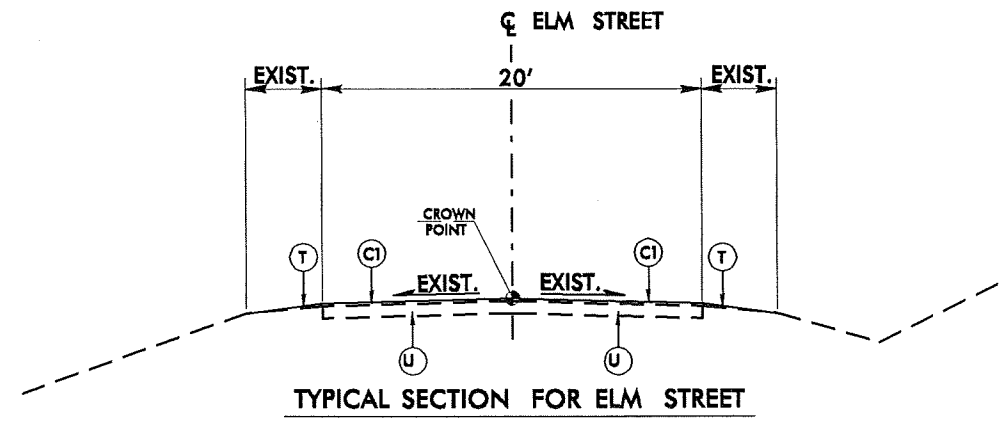
USE TYPICAL SECTION NO. 38 AS FOLLOWS
-DRV- STA. 10+72.98 TO STA. 12+75.00
-DRV1- STA. 10+00.00 TO STA. 12+03.39
-DRV2- STA. 10+53.44 TO STA. 10+80.00
-DRV3- STA. 10+15.00 TO STA. 10+78.17



TYPICAL FOR DETOUR IMPROVEMENTS
0.50 MILES MOSS STREET



TYPICAL FOR DETOUR IMPROVEMENTS
0.13 MILES GEORGE STREET



TYPICAL FOR IMPROVEMENTS
0.03 MILES ELM STREET

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-N
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

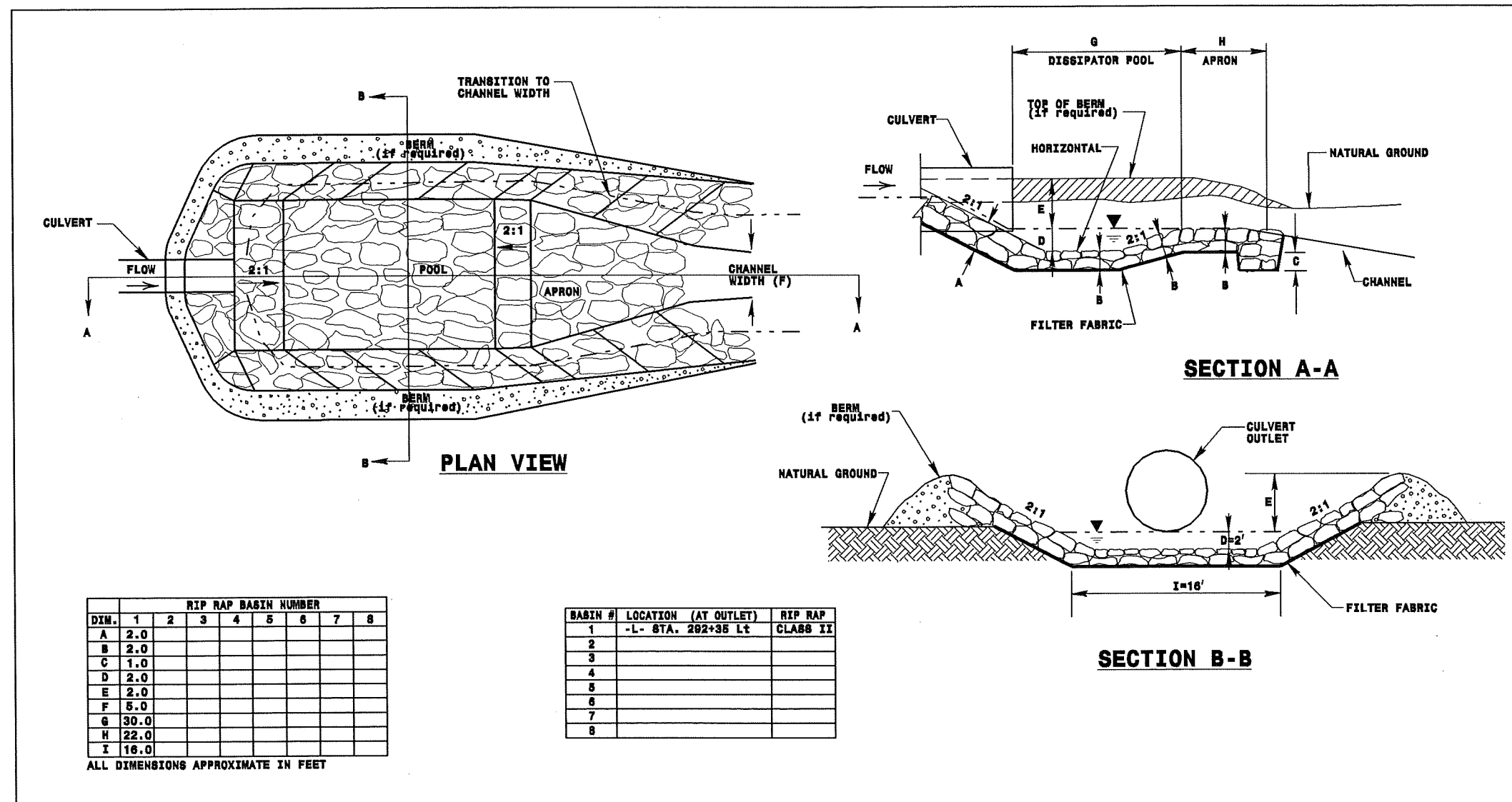
PAVEMENT SCHEDULE	
C1	3" 89.5B
C2	VAR. DEPTH 89.5B
C3	3" 89.5C
C4	VAR. DEPTH 89.5C
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	3 1/2" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
D6	4" I19.0C
D7	VAR. DEPTH I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
E4	VAR. DEPTH B25.0B
E5	3" B25.0C
E6	3 1/2" B25.0C
E7	4" B25.0C
E8	5" B25.0C
E9	VAR. DEPTH B25.0C
J1	8" ABC
J2	10" ABC
R1	1'-6" C & G
R2	2'-6" C & G
R3	5" MONO. ISLAND (KEYED IN)
R4	4'-0" EXPRESSWAY GUTTER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VAR. DEPTH WEDGING

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-0
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

DETAIL A7

ROCK ENERGY DISSIPATOR BASIN DETAIL

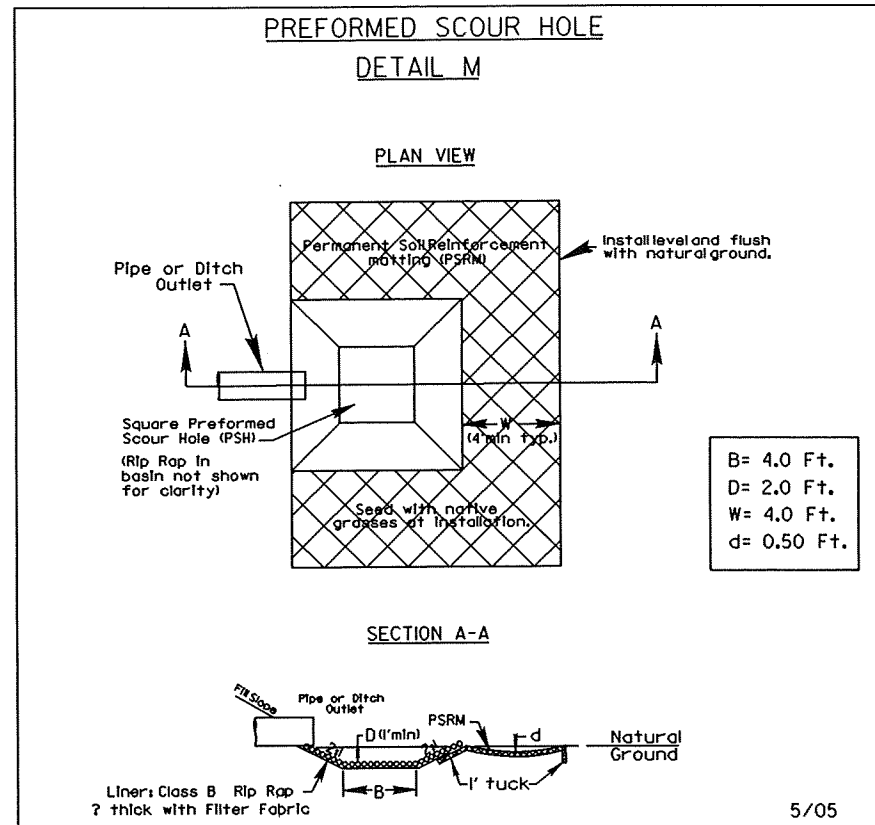
NOT TO SCALE



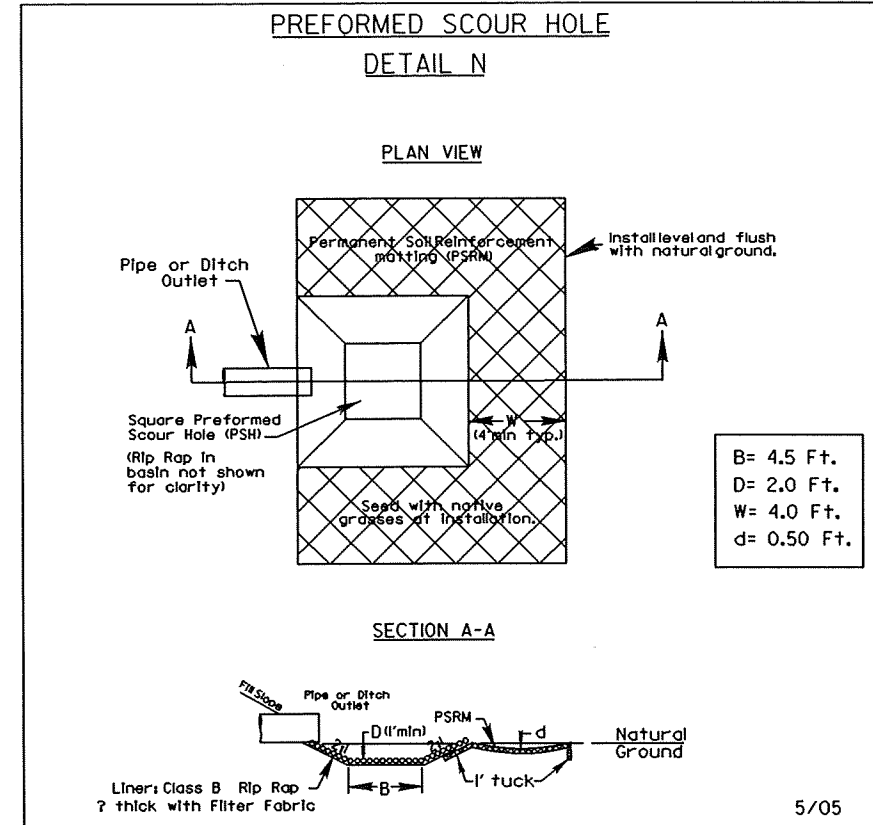
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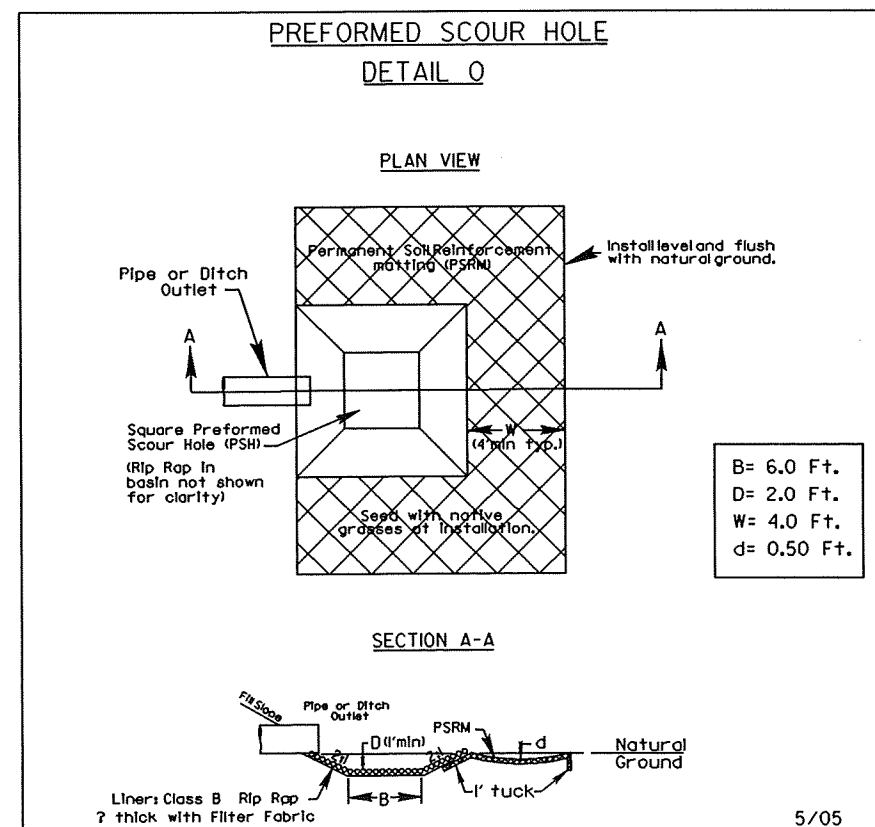
PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 2-P
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



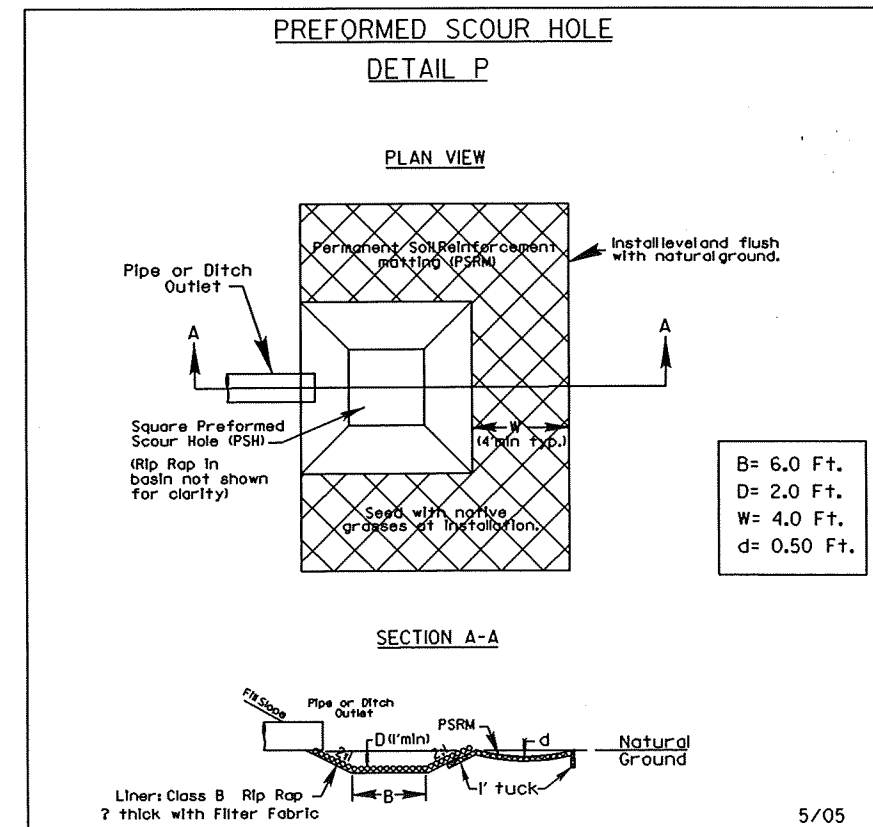
FROM -Y10- STA. 28+00 Lt.
FROM -L- STA. 157+00 Rt.
FROM -L- STA. 158+64 Rt.



FROM -L- STA. 118+50 Rt.
FROM -L- STA. 124+50 Rt.
FROM -L- STA. 147+90 Lt.



FROM -L- STA. 119+50 Rt.



FROM -L- STA. 128+50 Rt.

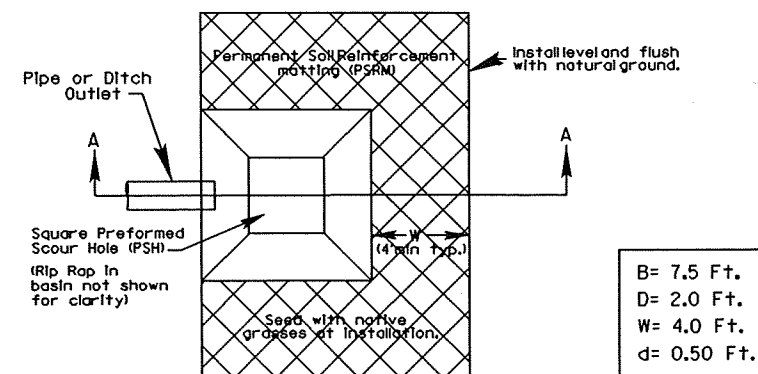
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	2-0
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS

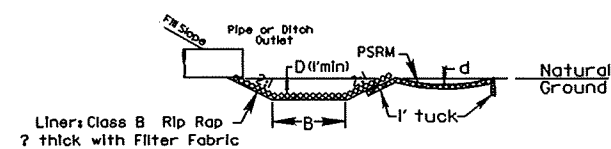
DO NOT USE FOR CONSTRUCTION

PREFORMED SCOUR HOLE
DETAIL A2I

PLAN VIEW



SECTION A-A



5/05

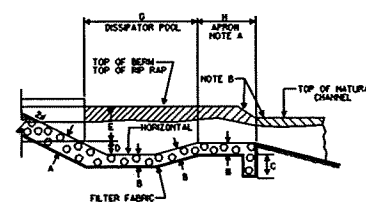
FROM -L- STA. 265+50 Lt.

DETAIL A20

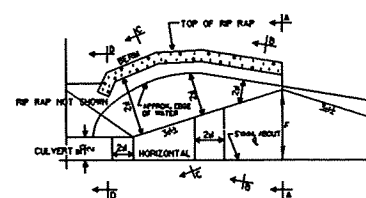
DETAIL A-5

RIP-RAPPED ENERGY DISSIPATOR BASIN

SECTION



HALF PLAN



DML	RP RAP BASIN "							
	1	2	3	4	5	6	7	8
A	2.0							
B	2.0							
C	1.0							
D	2.0							
E	2.0							
F	3.0							
G	70.0							
H	10.0							

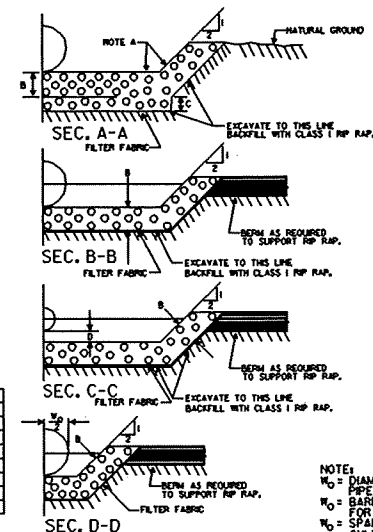
BASIN #	LOCATION (AT OUTLET)
1	-YBA- 12+24 U.
2	
3	
4	
5	
6	
7	
8	

*ALL DIMENSIONS APPROXIMATE IN FT.

NOTE A IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A-A SUCH THAT $Q \leq Q_{CR}$ /CROSS SECTIONAL AREA AT SEC. A-A) = SPECIFIED EXIT VELOCITY.

NOTE B. WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

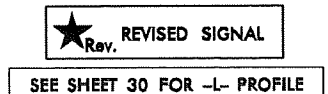
NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

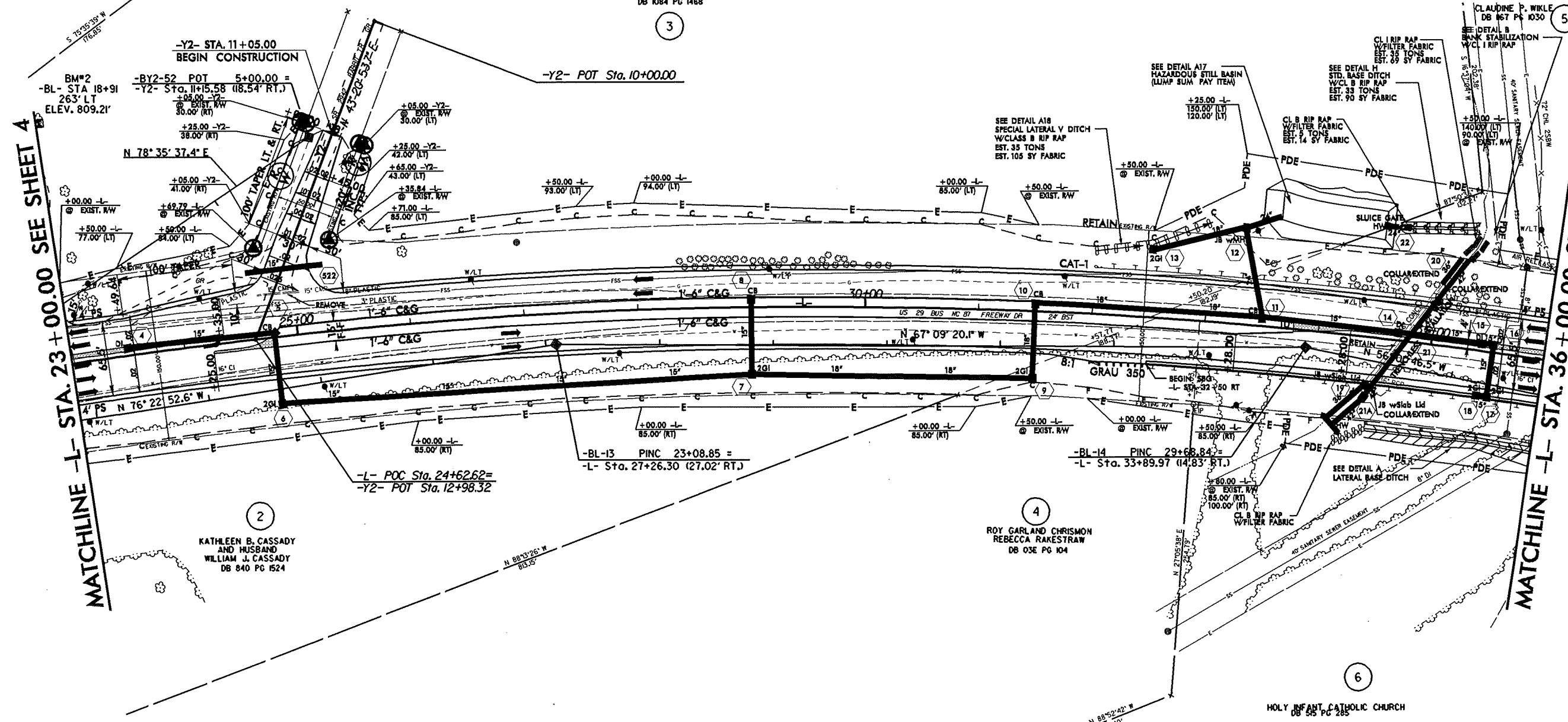
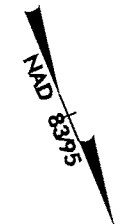
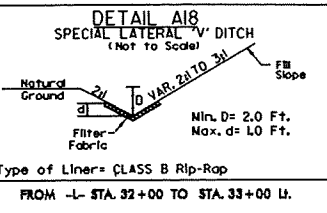
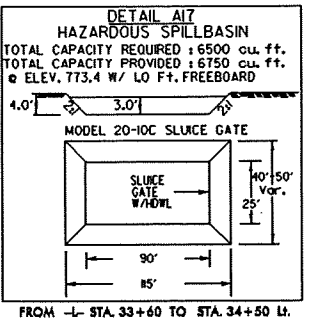
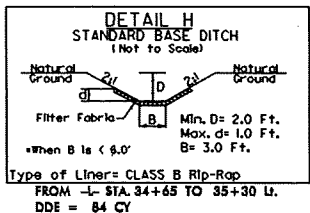
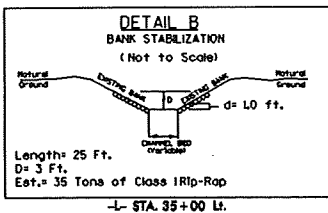


NOTE:
 W_0 = DIAMETER FOR
 PIPE CULVERT
 W_0 = BARREL WIDTH
 FOR BOX CULVERT
 W_0 = SPAN OF PIPE-ARCH
 CULVERT

5/05

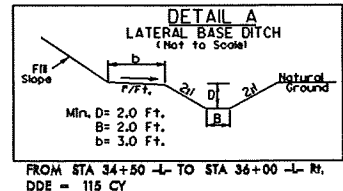
FROM -Y8A- STA. 12+24 Lt.





-L-

PI Sta 38+14.77
Δ = 62° 00' 31.6" (RT.)
D = 118' 18.5"
L = 475.11'
T = 2636.24'
R = 4390.00'
SE = 0.02
RO = 72'



SBG = SHOULDER BERM GUTTER
SEE SHEET 30 FOR -L- PROFILE
SEE SHEET 43 FOR -Y2- PROFILE

REVISIONS
08/04/09 R/W REVISION (PJS) - THE TCE WAS REVISED AND THE PDE WAS EXTENDED AN ADDITIONAL 15 FEET BACK TO START AT STA -L- 33+80.00 RT. TO ACCOMMODATE THE PLACEMENT OF THE PIPES AND THE CONSTRUCTION OF THE HEADWALL ON PARCEL 6 (HOLY INFANT CATHOLIC CHURCH).

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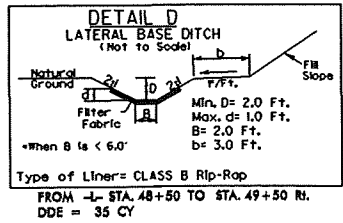
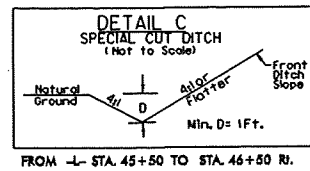
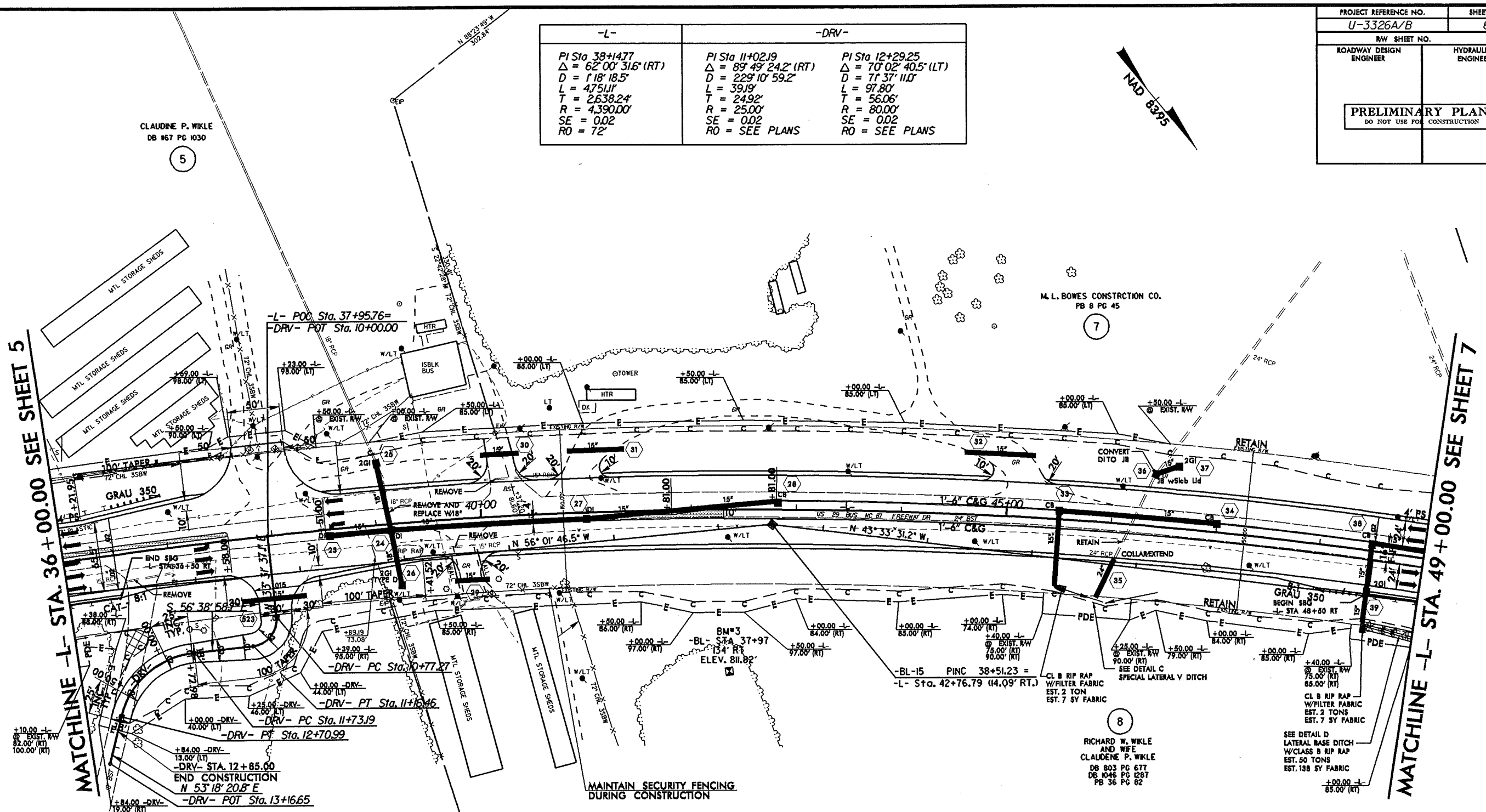
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ASSISTANT ENGINEER

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-L-	-DRV-	
PI Sta 38+14.77 $\Delta = 62^{\circ}00'31.6"$ (RT) $D = 118'18.5"$ $L = 475.11'$ $T = 2638.24'$ $R = 4390.00'$ $SE = 0.02$ $RO = 72'$	PI Sta 11+02.19 $\Delta = 89^{\circ}49'24.2"$ (RT) $D = 229'10'59.2"$ $L = 39.19'$ $T = 24.92'$ $R = 25.00'$ $SE = 0.02$ $RO = SEE PLANS$	PI Sta 12+29.25 $\Delta = 70^{\circ}02'40.5"$ (LT) $D = 71'37'11.0"$ $L = 97.80'$ $T = 56.06'$ $R = 80.00'$ $SE = 0.02$ $RO = SEE PLANS$



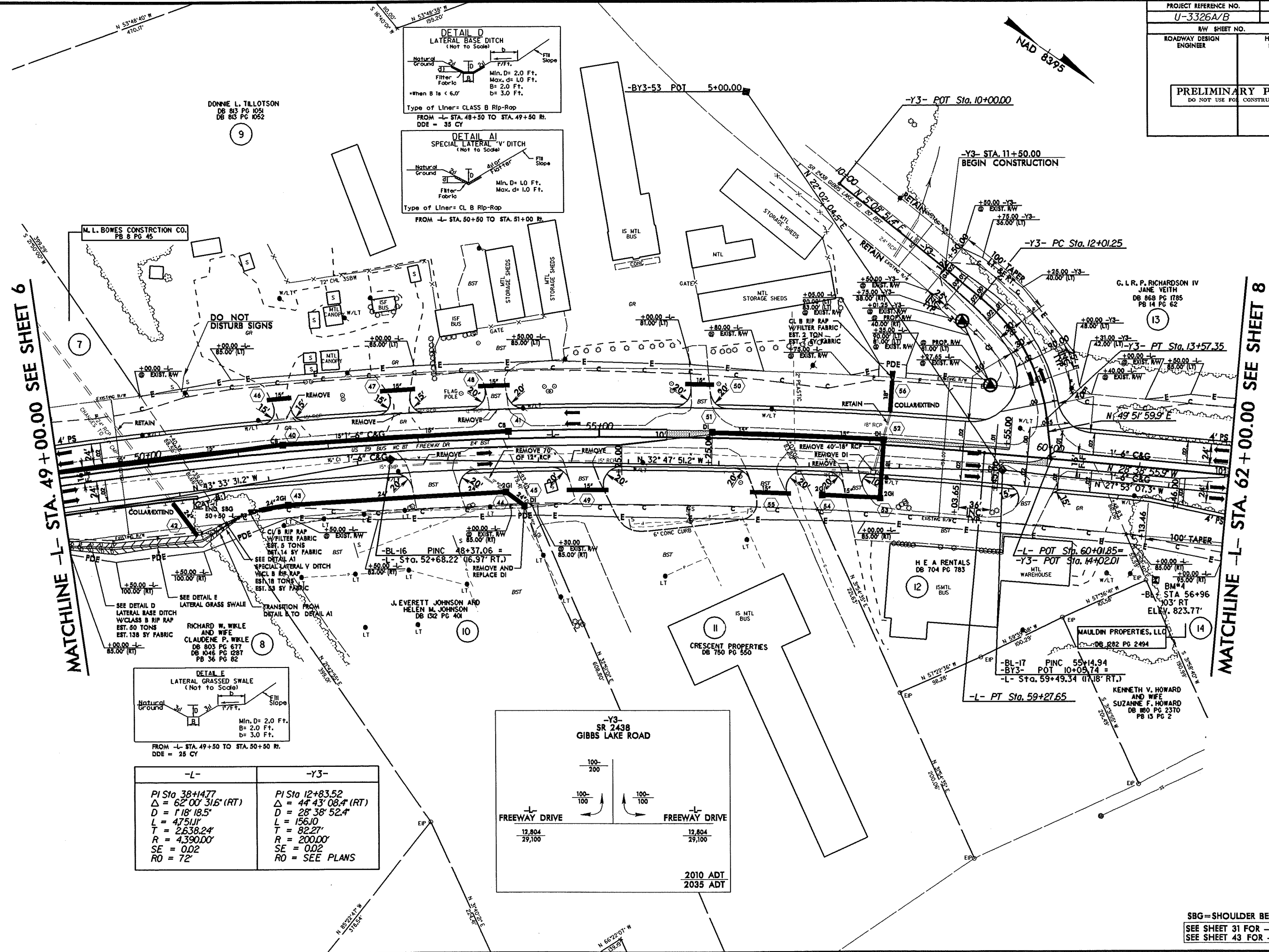
SBG=SHOULDER BERM GUTTER
SEE SHEET 31 FOR -L- PROFILE
SEE SHEET 43 FOR -DRV- PROFILE

8/17/99

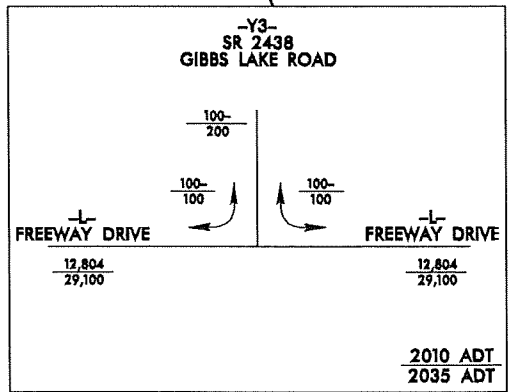
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-L-	-Y3-
PI Sta 38+14.77 Δ = 62°00'31.6" (RT) D = 1'18"18.5" L = 475.11' T = 2638.24' R = 4390.00' SE = 0.02 RO = 72'	PI Sta 12+83.52 Δ = 44°43'08.4" (RT) D = 28°38'52.4" L = 156.10' T = 82.27' R = 200.00' SE = 0.02 RO = SEE PLANS



SRG=SHOULDER BERM GUTTER
SEE SHEET 31 FOR -L- PROFILE
SEE SHEET 43 FOR -Y3- PROFILE

8/17/99

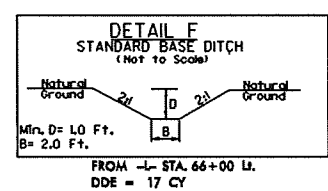
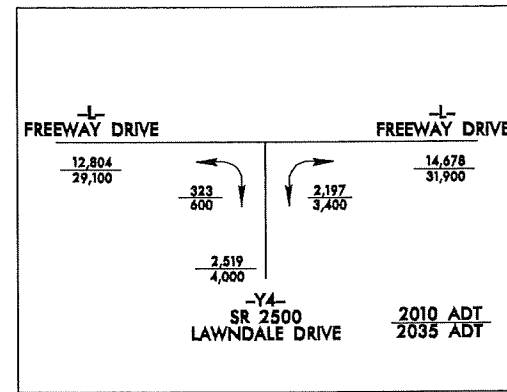
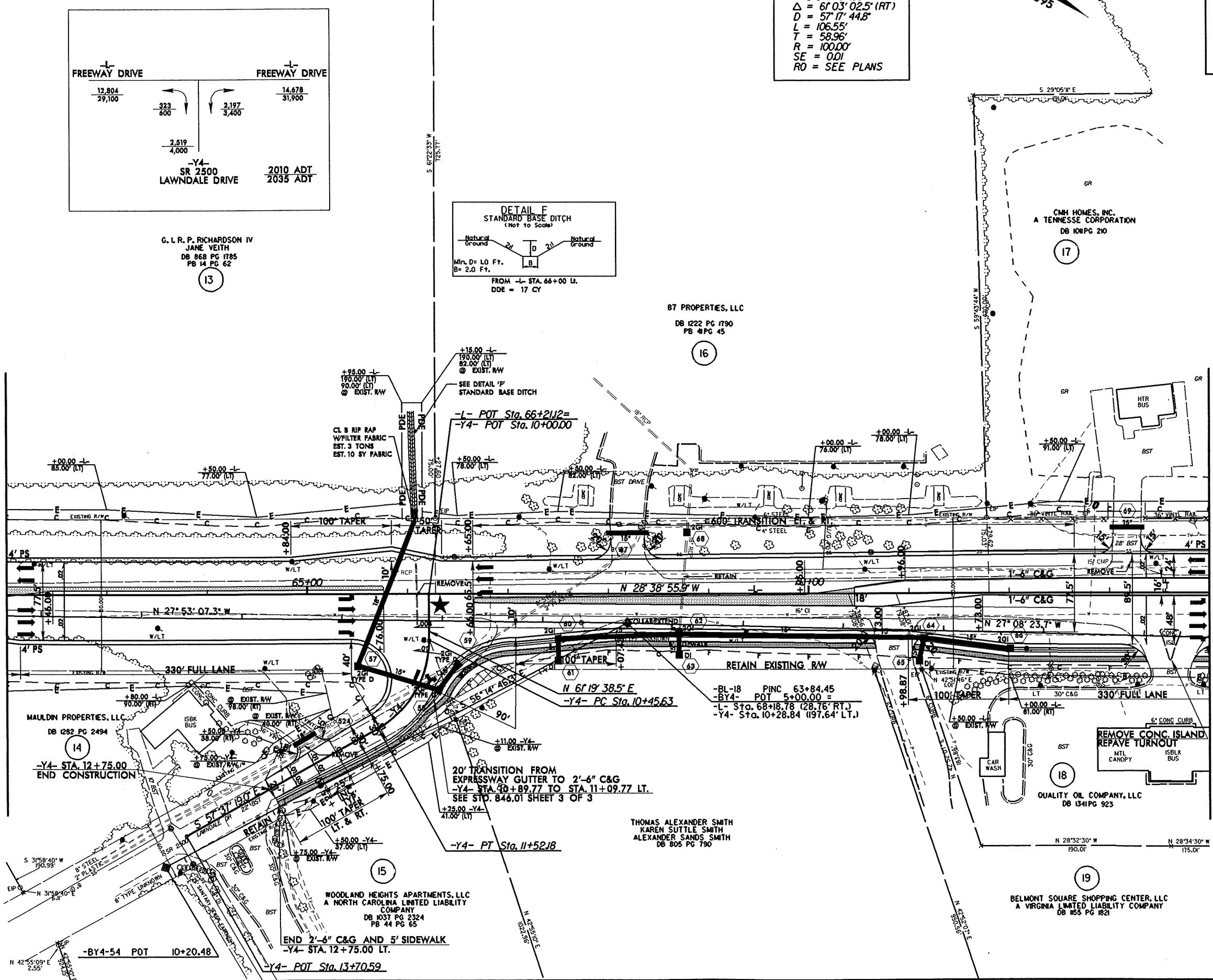
13-001-2009 0848
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

MATCHLINE -L- STA. 62+00.00 SEE SHEET 7

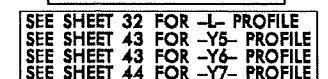
MATCHLINE -L- STA. 74+00.00 SEE SHEET 9



-Y4-
PI Sta 11+04.60
 $\Delta = 61^{\circ}03'02.5''$ (RT)
 $D = 57^{\circ}17'44.8''$
 $L = 106.55'$
 $T = 58.96'$
 $R = 100.00'$
 $SE = 0.01$
 $RO = \text{SEE PLANS}$

★ PROPOSED SIGNAL

SEE SHEET 32 FOR -L- PROFILE
SEE SHEET 43 FOR -Y4- PROFILE



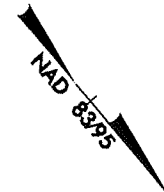
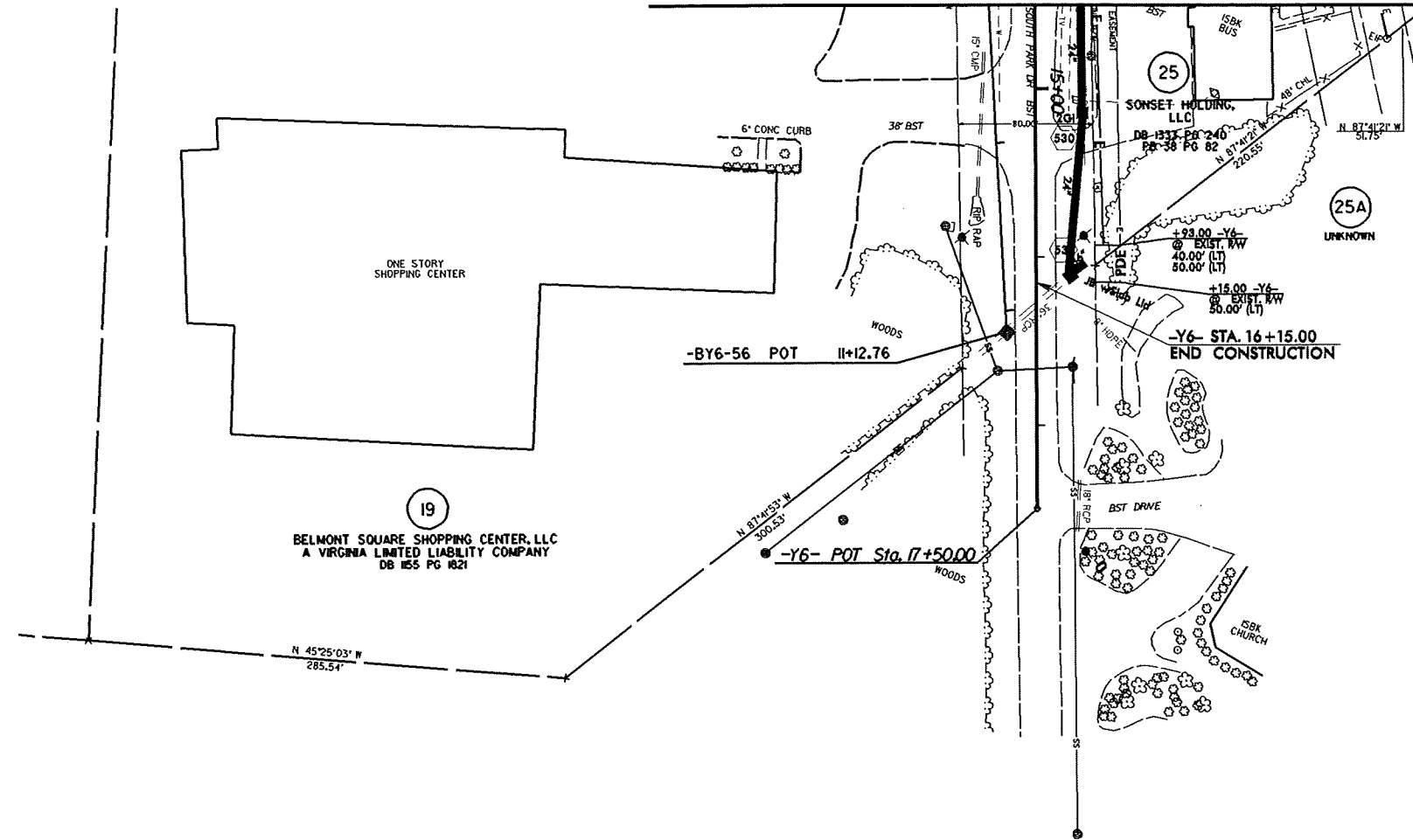
3-OCT-2009 08:49
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8/17/99

REVISIONS

13-OCT-2009 08:49
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SSUSHERMAN

MATCHLINE -Y6- STA. 14 + 50.00 SEE SHEET 9



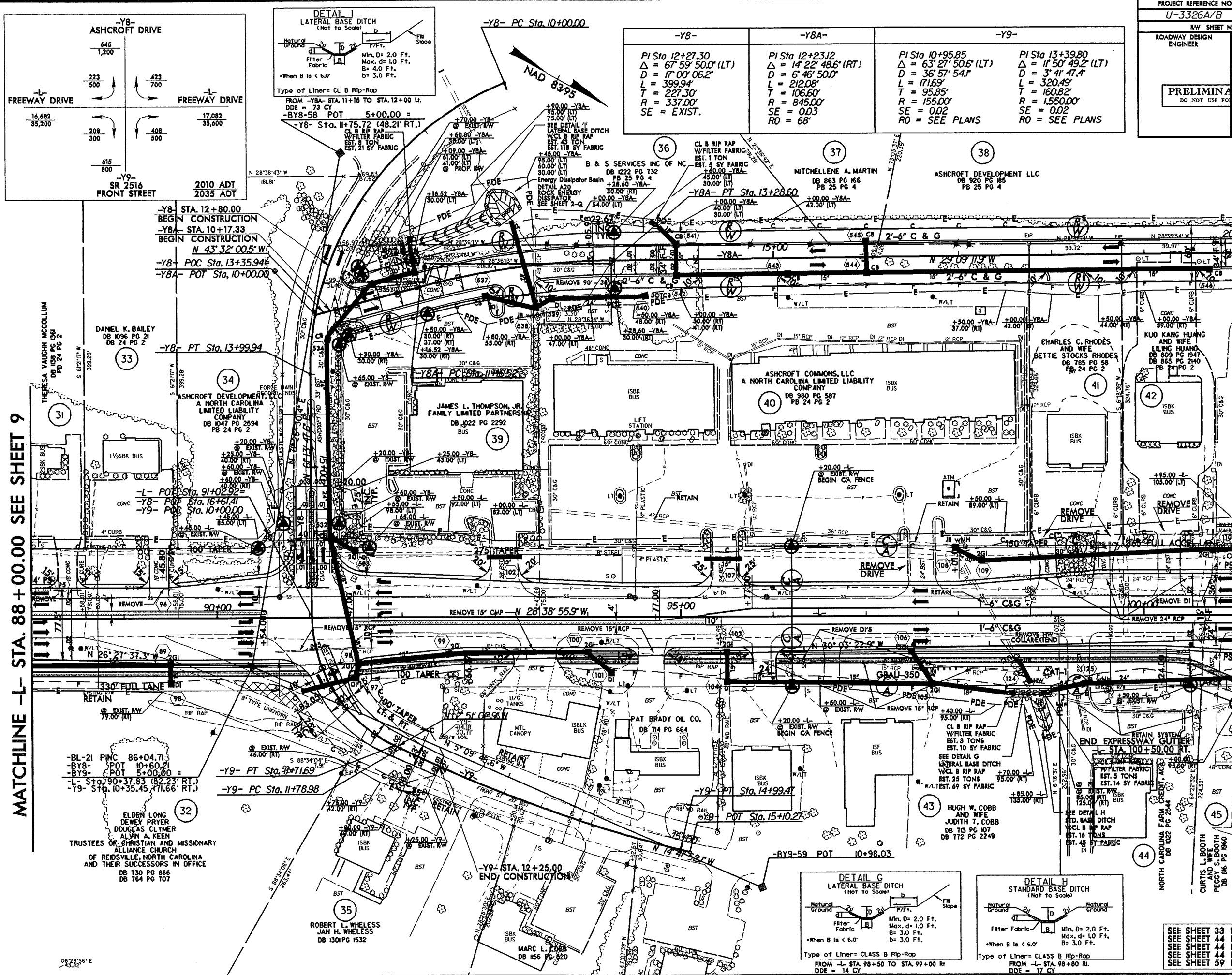
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	9A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

8/17/99

REVISIONS
10/12/09 R/W REVISION (PJS) - THE TCE WAS REVISED FROM -L- STA. 98+50.00 TO STA. 100+95.00 LT TO ACCOMMODATE THE REMOVAL OF THE 20' DRIVEWAY CONNECTIONS AT PARCEL 40 (ASHCROFT COMMONS, LLC), PARCEL 41 (CHARLES C. RHODES AND WIFE BETTIE STOCKS RHODES), AND PARCEL 42 (KUIO KANG HUANG AND WIFE LILING HUANG)

13-OCT-2009 08:49
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3326A.dwg

MATCHLINE -L- STA. 88+00.00 SEE SHEET 9

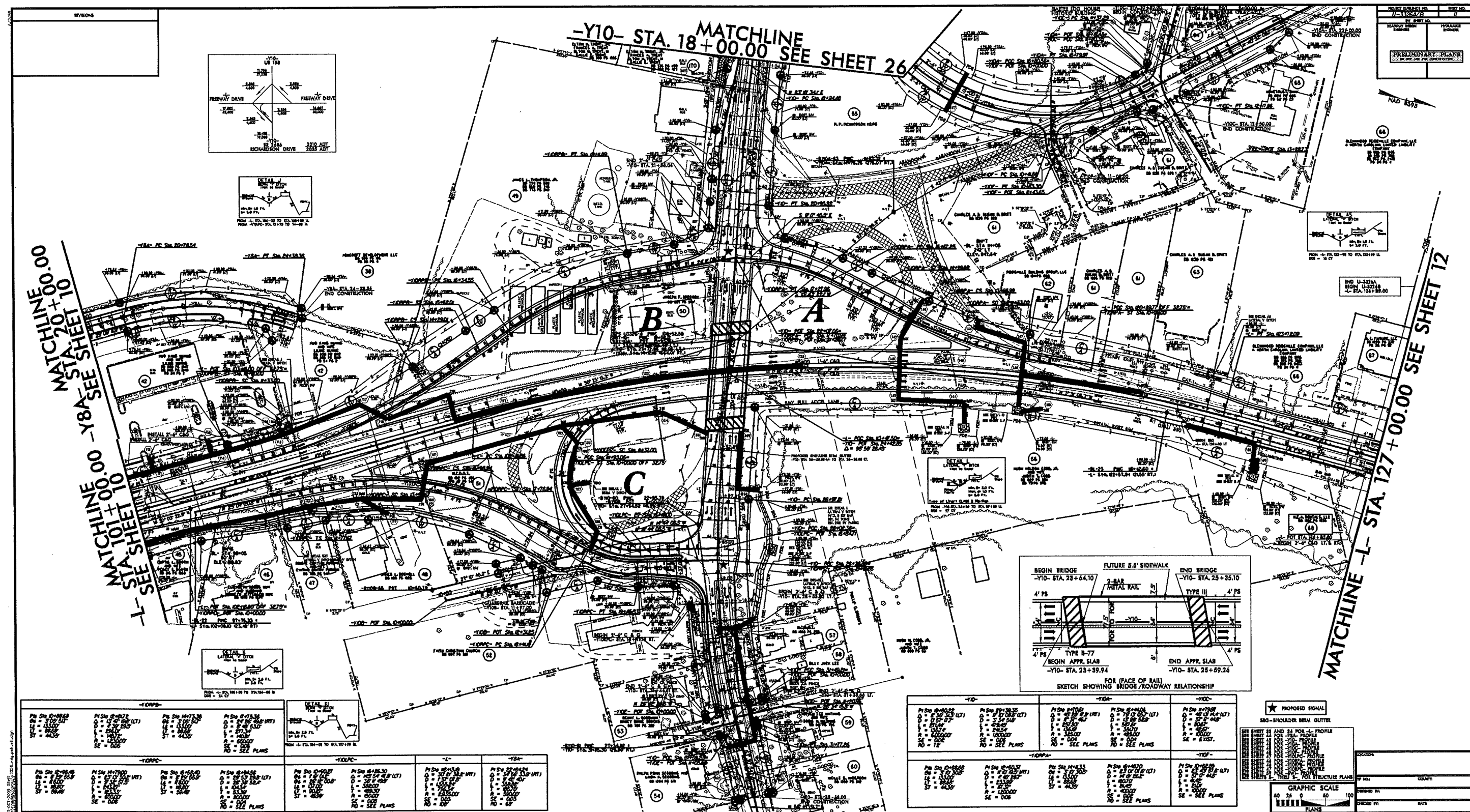


MATCHLINE -L- STA. 101+00.00 SEE SHEET 11

MATCHLINE
-Y8A- STA. 20+00.00
SEE SHEET 11

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 10	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 33 FOR -L- PROFILE
SEE SHEET 44 FOR -Y8- PROFILE
SEE SHEET 44 FOR -Y8A- PROFILE
SEE SHEET 44 FOR -Y9- PROFILE
SEE SHEET 59 FOR -SW1- PROFILE

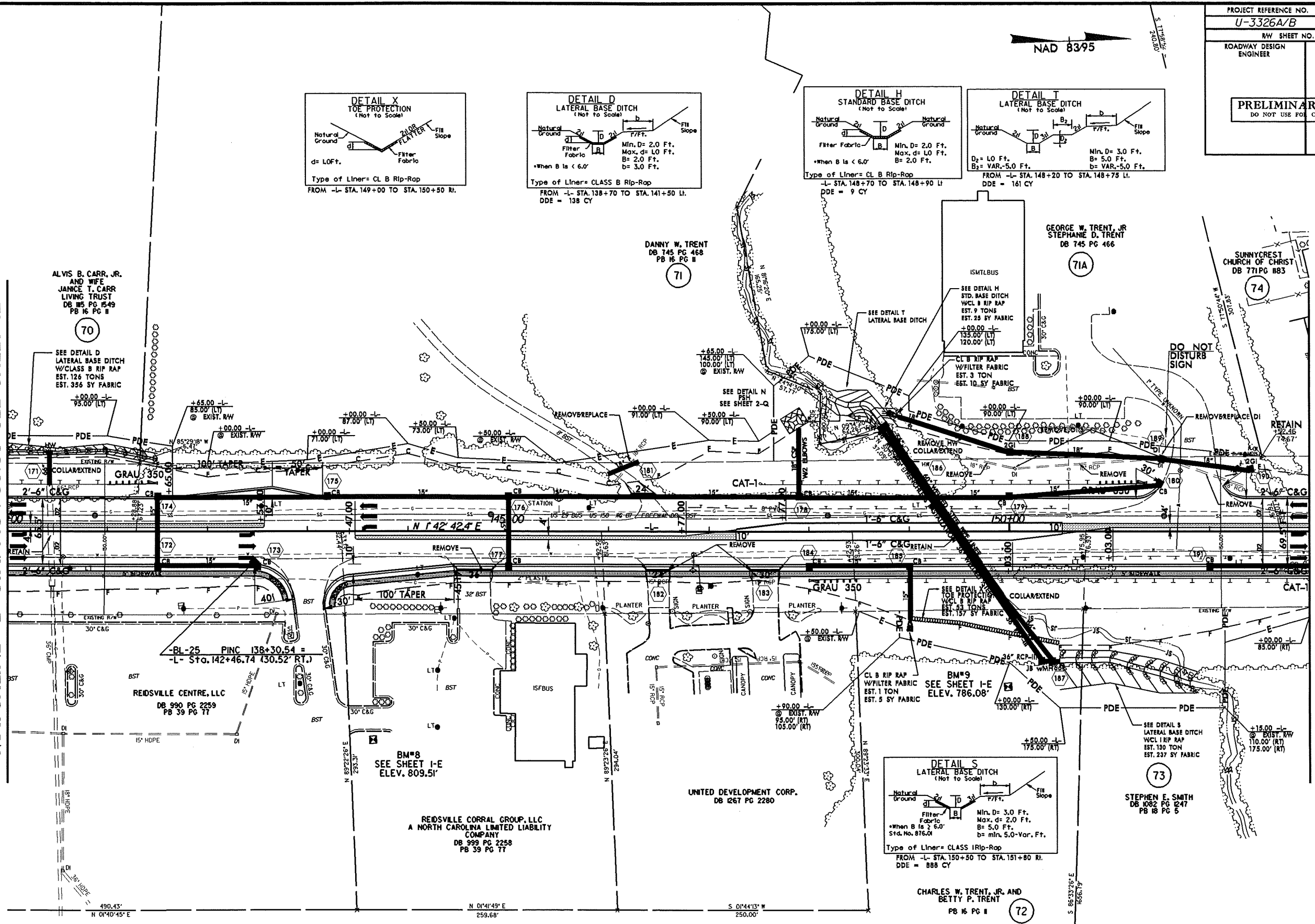


8/17/99

06-AUG-2010 08:36 3326.rdy.psh-313.dgn
3326 PRELIMINARY

REVISIONS
R/W REVISION (01/04/10) PJS - PARCEL 71(DANNY W.TRENT) HAS BEEN SPLIT ALONG THE STREAM AT -L- STA.149+00.00 +/- LT.
AND THE NORTHERN PARCEL WILL BE ADDED AS PARCEL 71A (GEORGE W.TRENT JR. AND STEPHANIE D.TRENT).

MATCHLINE -L- STA. 140 + 00.00 SEE SHEET 12



MATCHLINE -L- STA. 153 + 00.00 SEE SHEET 14

PROJECT REFERENCE NO. <i>U-3326A/B</i>		SHEET NO. <i>13</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>		

SEE SHEET 35 FOR -L- PROFILE

NAD 83/95

76

DA PRIDDY HUNDLEY
AND HUSBAND
MILTON D. HUNDLEY
DB 1046 PG 917

BBY HILL SEAFOOD, INC
A NORTH CAROLINA
CORPORATION
DB 821PG 2284

MATCHLINE -L- STA. 153+00.00 SEE SHEET 13

WATCHLINE - L- STA. 167+00.00 SEE SHEET 15

01/02/23/09 R/W REVISION (PJS) - THE PDE WAS REVISED FROM -L- STA+58+40.00 TO STA+60+00.00 RT. TO ACCOMMODATE THE CHANGE IN THE GRADE FOR THE LATERAL BASE DITCH ON PARCEL 73 (STEPHEN E.SMITH).

66/21/8

06-AUG-2010 08:36
 221 Roadway Proj\0326_rdy_psh_sl4.dgn
 \$\$\$USERNAME\$\$\$

-Y11-
SR 2462
SUNNYCREST DRIVE

FREEWAY DRIVE

$\frac{415}{600}$

$\frac{20,260}{41,000}$

830
 $\frac{1,200}{}$

415
 $\frac{600}{}$

415
 $\frac{600}{}$

FREEWAY DRIVE

$\frac{20,260}{41,000}$

2010 ADT
2035 ADT

DETAIL ?

PIPE OUTLET CHANNEL

(Not to Scale)

Natural Ground

EXISTING BANK

CONCRETE BOX

d = L0 Ft.

Length= 10.0 Ft.
D= 2.0 Ft.
Est.= 10 Tons of Class IRip-Rop

@ STA. 158+75 +/-

DETAIL D
LATERAL BASE DITCH
 (Not to Scale)

Natural Ground

Filter Fabric

b

1 2 2

F.F.F.

Min. D = 2.0 Ft.
 Max. d = L0 Ft.
 B = 2.0 Ft.
 b = 3.0 Ft.

Fm Slope

When B is < 6.0'

Type of Liner = CLASS B Rip-Rap

FROM -1- STA.158+80 TO STA.159+80 RL.

DETAIL V
SPECIAL LATERAL BASE DITCH
 (Not to Scale)

Natural Ground
 2:1
 Filter Fabric
 B
 4:1 or Flatter
 F.W. Slope

Min. D = 2.0 Ft.
 Max. d = 1.0 Ft.
 B = 2.0 Ft.

Type of Liner = CLASS B Rip-Rap

FROM - STA. 159 + 50 TO STA. 160 + 50 Ri.

DETAIL U
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)

Natural Ground 3:1 D 4:1 or Flatter Fill Slope

Min. D = 2.0 Ft.
B = 2.0 Ft.

FROM -L STA. 160+65 TO STA. 163+50 LI
FROM -L STA. 160+50 TO STA. 163+50 RI

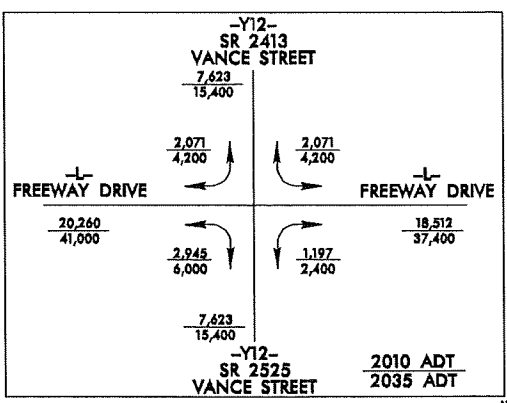
BM#10
SEE SHEET I-E
ELEV. 800.93'

73

SEE SHEET 35 FOR -L- PROFILE
SEE SHEET 48 FOR -Y11- PROFILE

8/17/99

03/23/09 R/W REVISION (PJS) - ADDED PERMANENT UTILITY EASEMENT AND ELIMINATED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 86 (BODDIE-NOEL ENTERPRISES, INC.)
ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 82 (JOHN D. LOVE OIL COMPANY)
ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 86 (BODDIE-NOEL ENTERPRISES, INC.)



-L-	-Y12-
PI Sta 186+88.71 $\Delta = 31' 56'' 07.0''$ (RT) $D = 1' 58'' 44.9''$ $L = 1613.60'$ $T = 828.36'$ $R = 2895.00'$ $SE = 0.03$ $RO = 108'$	PI Sta 11+50.14 $\Delta = 2' 35'' 54.5''$ (RT) $D = 0' 59'' 59.7''$ $L = 259.87'$ $T = 129.96'$ $R = 5730.00'$ $SE = NC$
	PI Sta 17+41.77 $\Delta = 3' 23'' 46.7''$ (LT) $D = 0' 49'' 06.6''$ $L = 414.94'$ $T = 207.53'$ $R = 7000.00'$ $SE = NC$

NAD 8395

PROJECT REFERENCE NO.
U-3326A/B

SHEET NO.
15

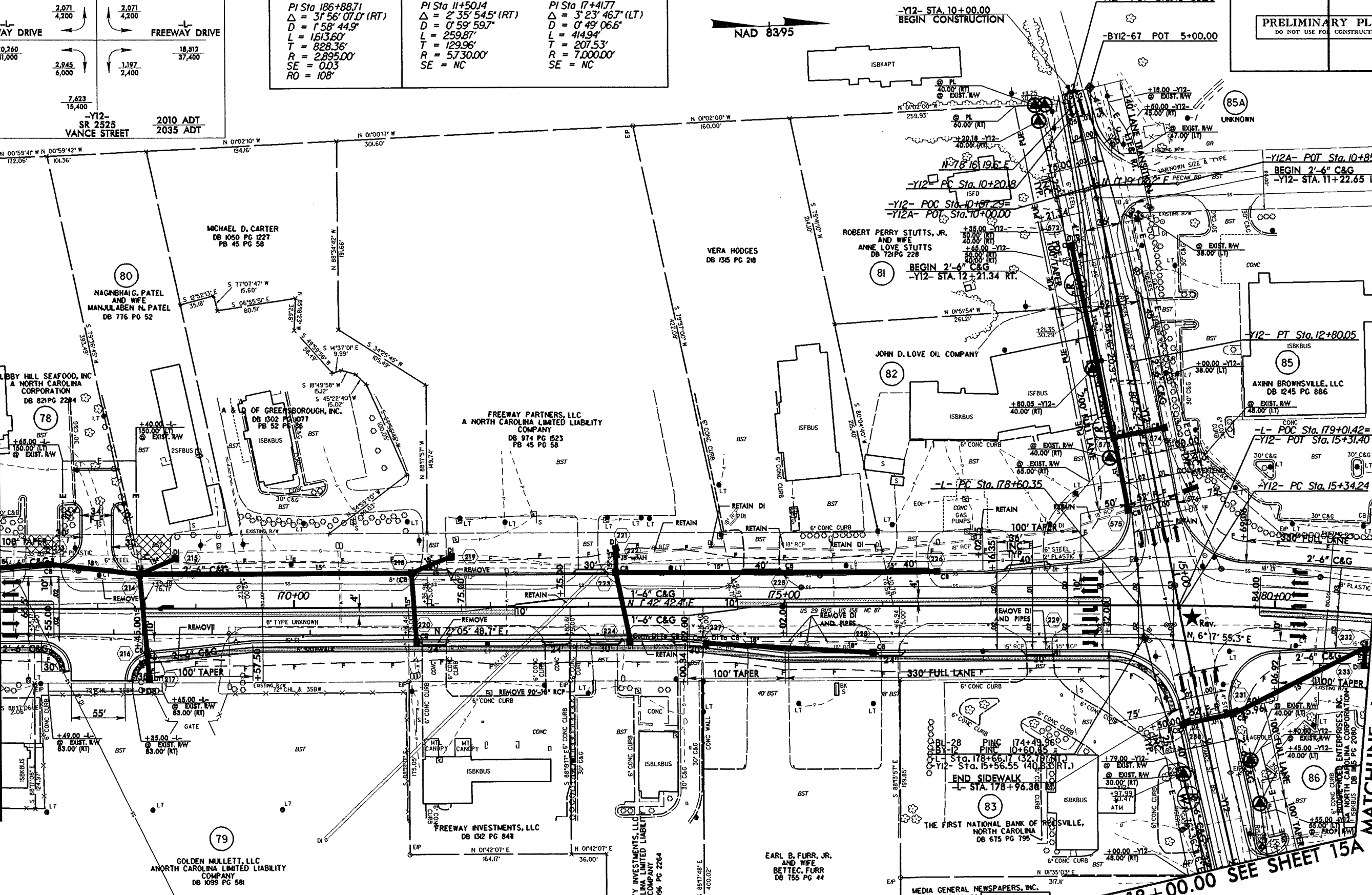
R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MATCHLINE -L- STA. 167+00.00 SEE SHEET 14



MATCHLINE -L- STA. 181+00.00 SEE SHEET 16

13-OCT-2009 08:49
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MATCHLINE -Y12- STA. 18+00.00 SEE SHEET 15A

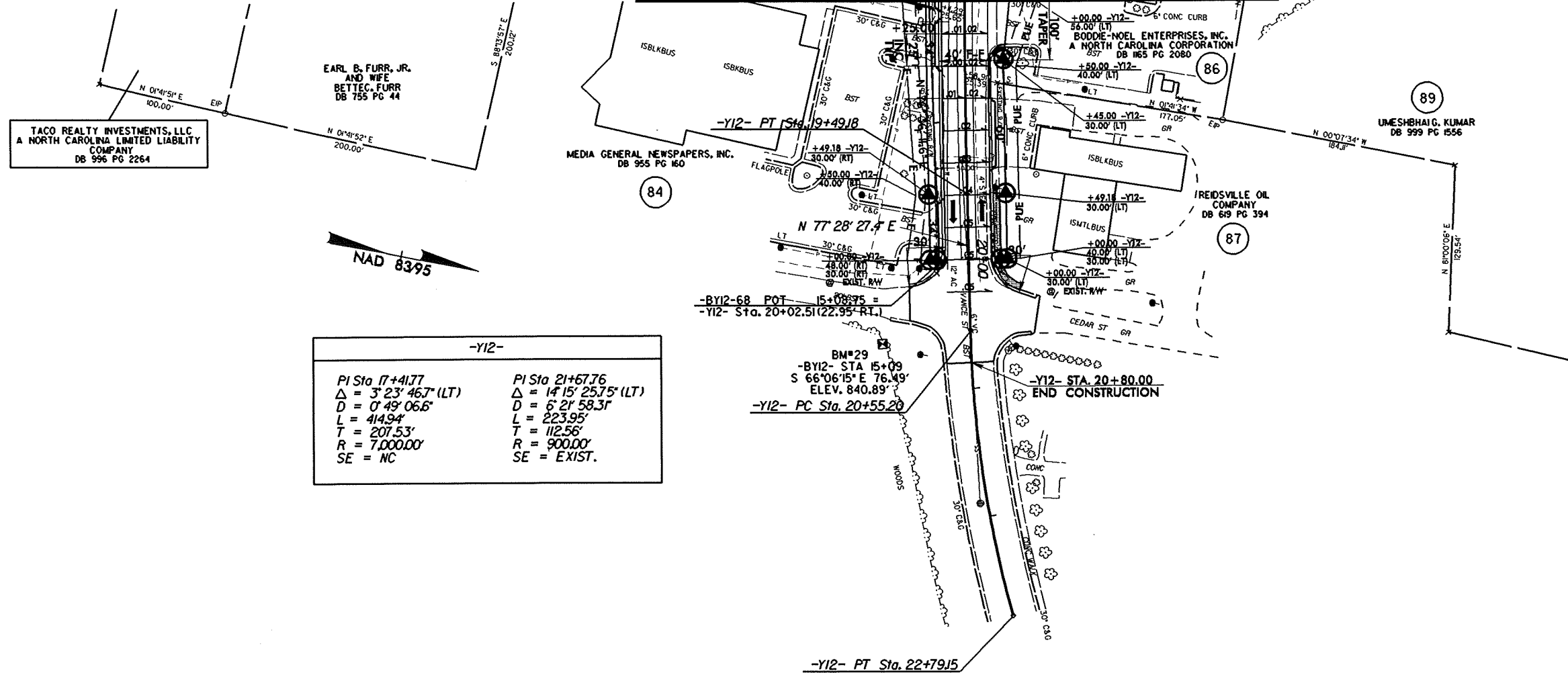
★ REV. REVISED SIGNAL

SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 49 FOR -Y12- PROFILE

8/17/99

REVISIONS
03/23/09 R/W REVISION (PJS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 86 (BODDIE-NOEL ENTERPRISES, INC.)
ADDED PERMANENT UTILITY EASEMENT AND ELIMINATED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 87 (REIDSVILLE OIL COMPANY)

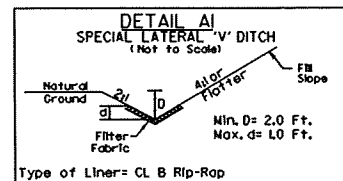
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PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	15A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	

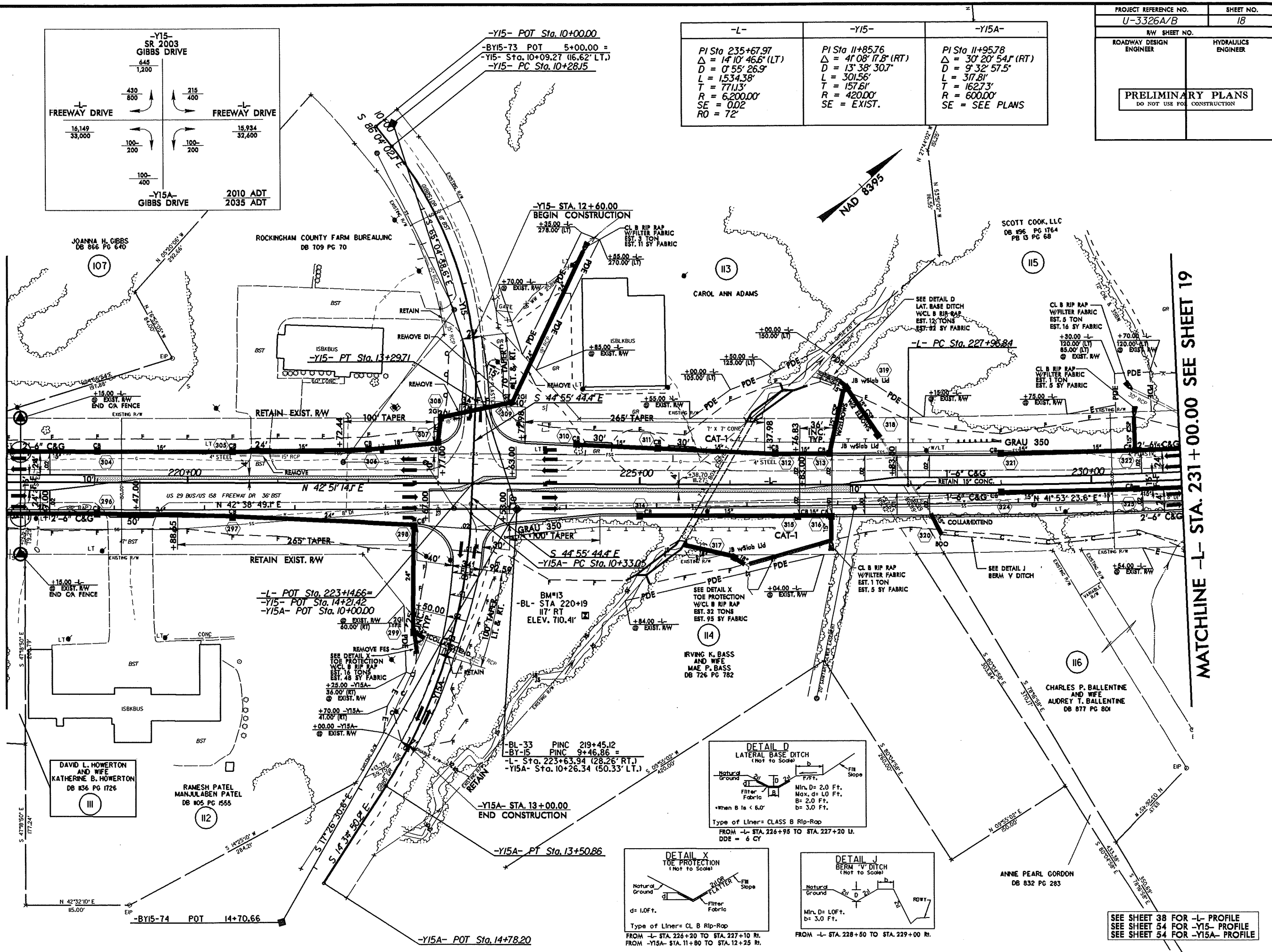
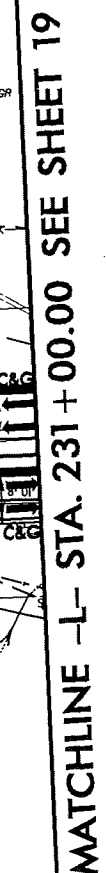
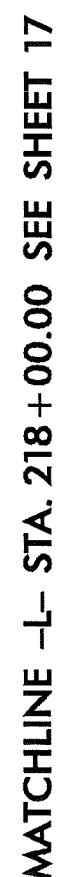
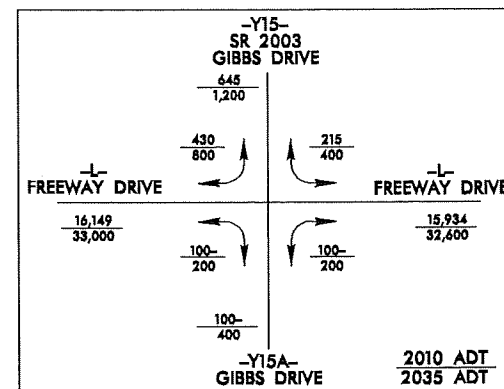
SEE SHEET 49 FOR -Y12- PROFILE

-L-	-Y12C-
PI Sta 186+88.71	PI Sta 13+22.29
$\Delta = 3^\circ 56' 07.0" (RT)$	$\Delta = 5^\circ 10' 10.6" (RT)$
$D = 1^\circ 58' 44.9"$	$D = 1^\circ 54' 35.5"$
$L = 1613.60'$	$L = 270.68'$
$T = 828.36'$	$T = 135.43'$
$R = 2,895.00'$	$R = 3,000.00'$
$SE = 0.03$	$SE = NC$
$RO = 108'$	

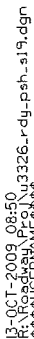


SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 49 FOR -Y12B- PROFILE
SEE SHEET 49 FOR -Y12C- PROFILE

-L-	-Y15-	-Y15A-
<i>PI Sta 235+67.97</i> $\Delta = 14^{\circ} 10' 46.6" (LT)$ $D = 0^{\circ} 55' 26.9"$ $L = 1,534.38'$ $T = 771.13'$ $R = 6,200.00'$ $SE = 0.02$ $RO = 72'$	<i>PI Sta 11+85.76</i> $\Delta = 41^{\circ} 08' 17.8" (RT)$ $D = 13^{\circ} 38' 30.7"$ $L = 301.56'$ $T = 157.61'$ $R = 420.00'$ $SE = EXIST.$	<i>PI Sta 11+95.78</i> $\Delta = 30^{\circ} 20' 54.1" (RT)$ $D = 9^{\circ} 32' 57.5"$ $L = 317.81'$ $T = 162.73'$ $R = 600.00'$ $SE = SEE PLANS$



SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 54 FOR -Y15- PROFILE
SEE SHEET 54 FOR -Y15A- PROFILE

8/17/99

REVISIONS

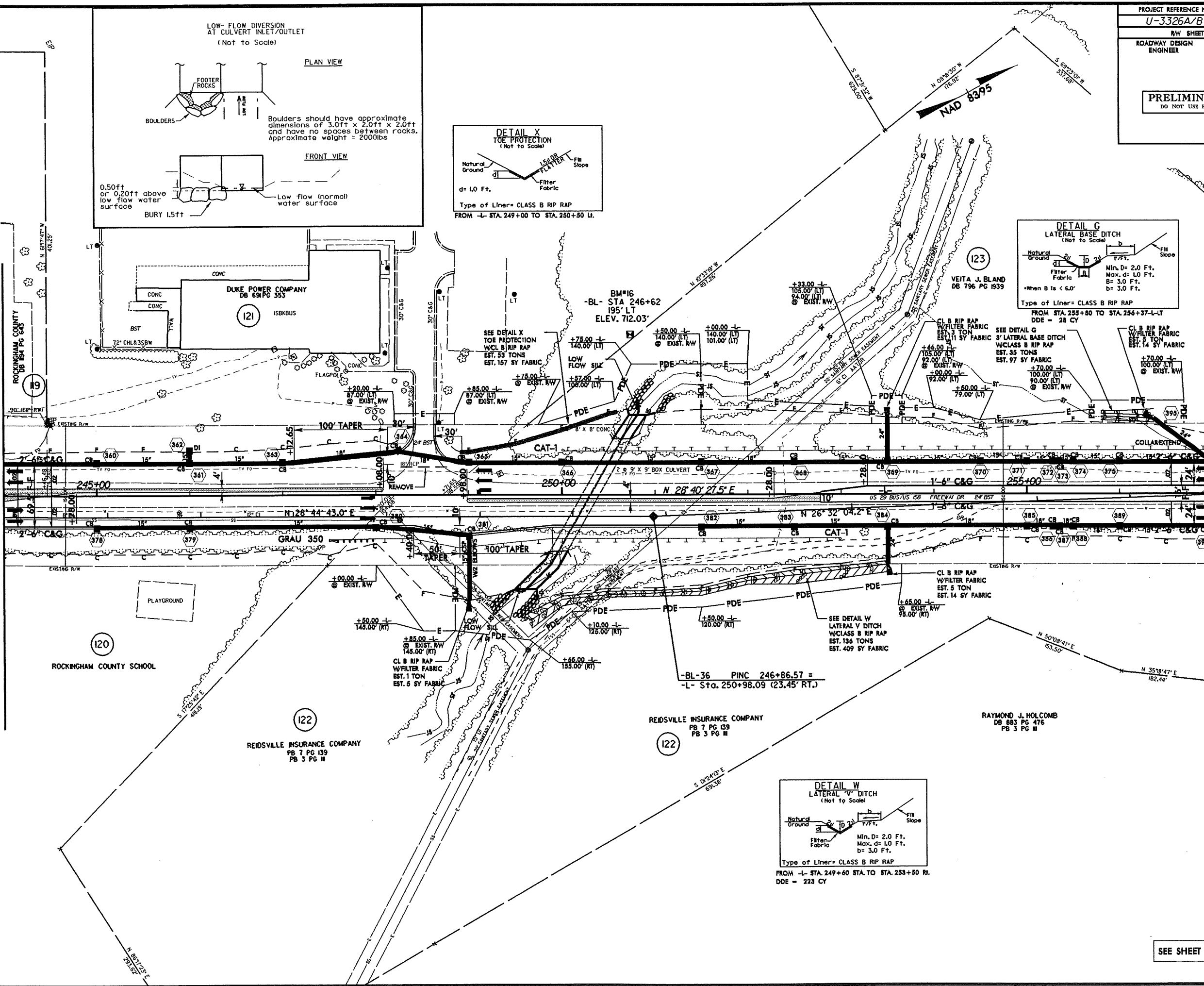
06/25/09 R/W REVISION - REVISED THE PDE AT -L- STA. 253+50.00 LT. FROM 118 TO 105' OFFSET DUE TO THE 24" RCP ADJUSTMENT BACK TO THE TOE OF THE SLOPE ON PARCEL 123 (VEITA J. BLAND).

8/17/99

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3326-PLAN-11-11-09

MATCHLINE -L- STA. 244+00.00 SEE SHEET 19

MATCHLINE -L- STA. 257+00.00 SEE SHEET 21



PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 39 FOR -L- PROFILE

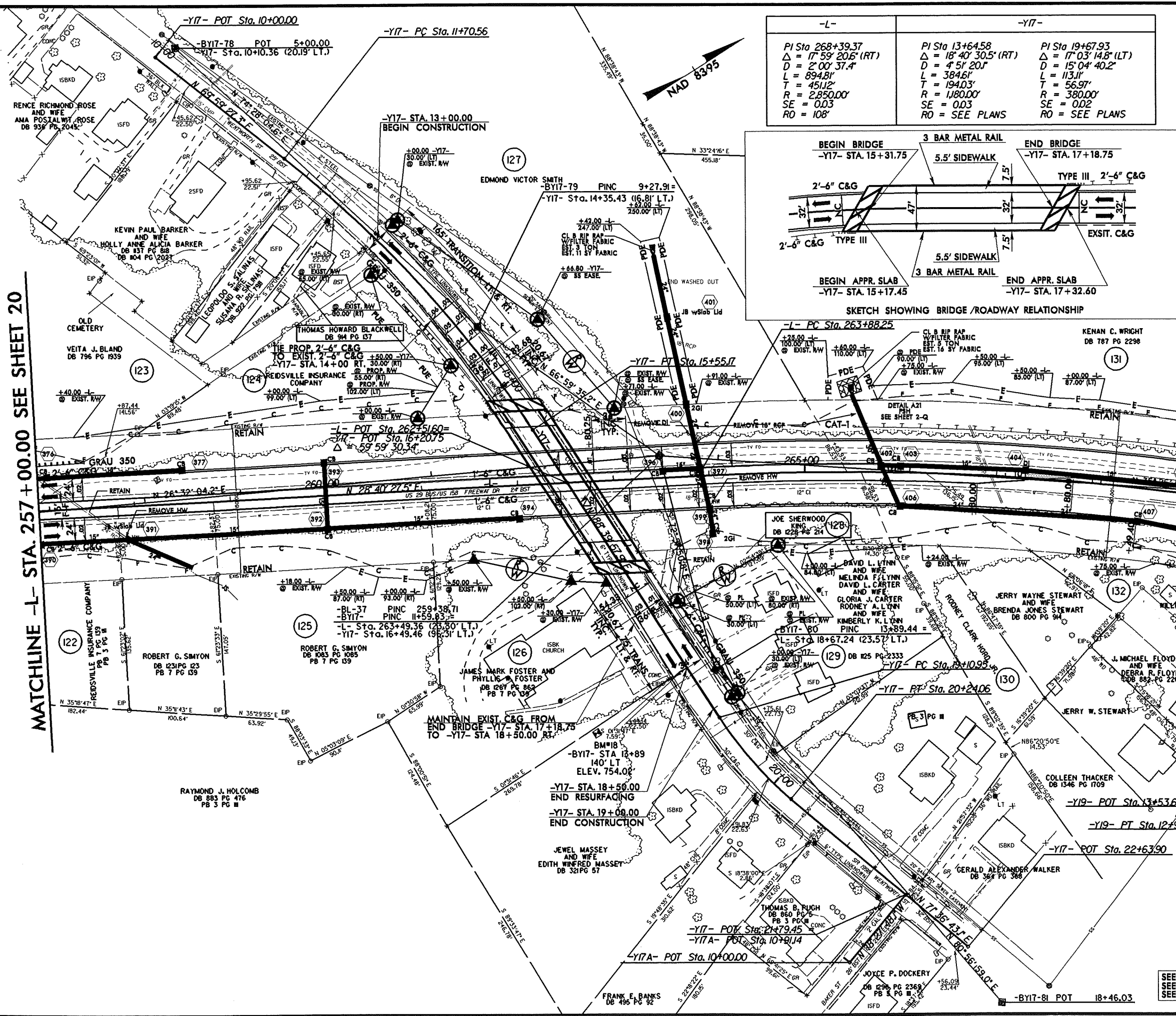
REVISIONS
03/23/09 R/W REVISION (P/S) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 124 (REIDSVILLE INSURANCE COMPANY)

8/17/99

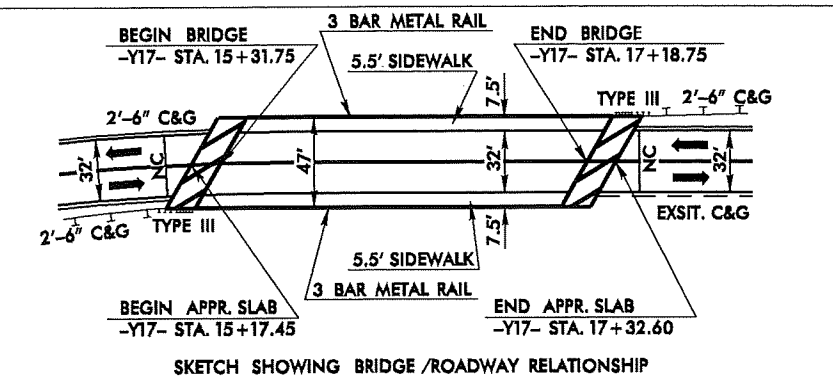
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MATCHLINE -L- STA. 257+00.00 SEE SHEET 20

MATCHLINE -L- STA. 270+00.00 SEE SHEET 22

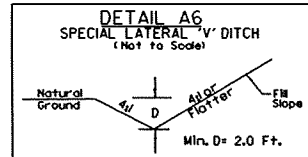
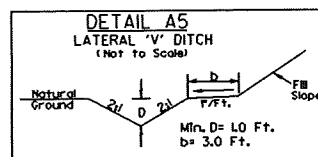


-L-	-Y17-
PI Sta 268+39.37 $\Delta = 17^{\circ} 59' 20.6''$ (RT) D = 2'00' 37.4' L = 894.81' T = 451.12' R = 2850.00' SE = 0.03 RO = 108'	PI Sta 13+64.58 $\Delta = 18^{\circ} 40' 30.5''$ (RT) D = 4'51' 20.1' L = 384.61' T = 194.03' R = 1180.00' SE = 0.03 RO = SEE PLANS
PI Sta 19+67.93 $\Delta = 17^{\circ} 03' 14.8''$ (LT) D = 15'04' 40.2' L = 113.11' T = 56.97' R = 380.00' SE = 0.02 RO = SEE PLANS	

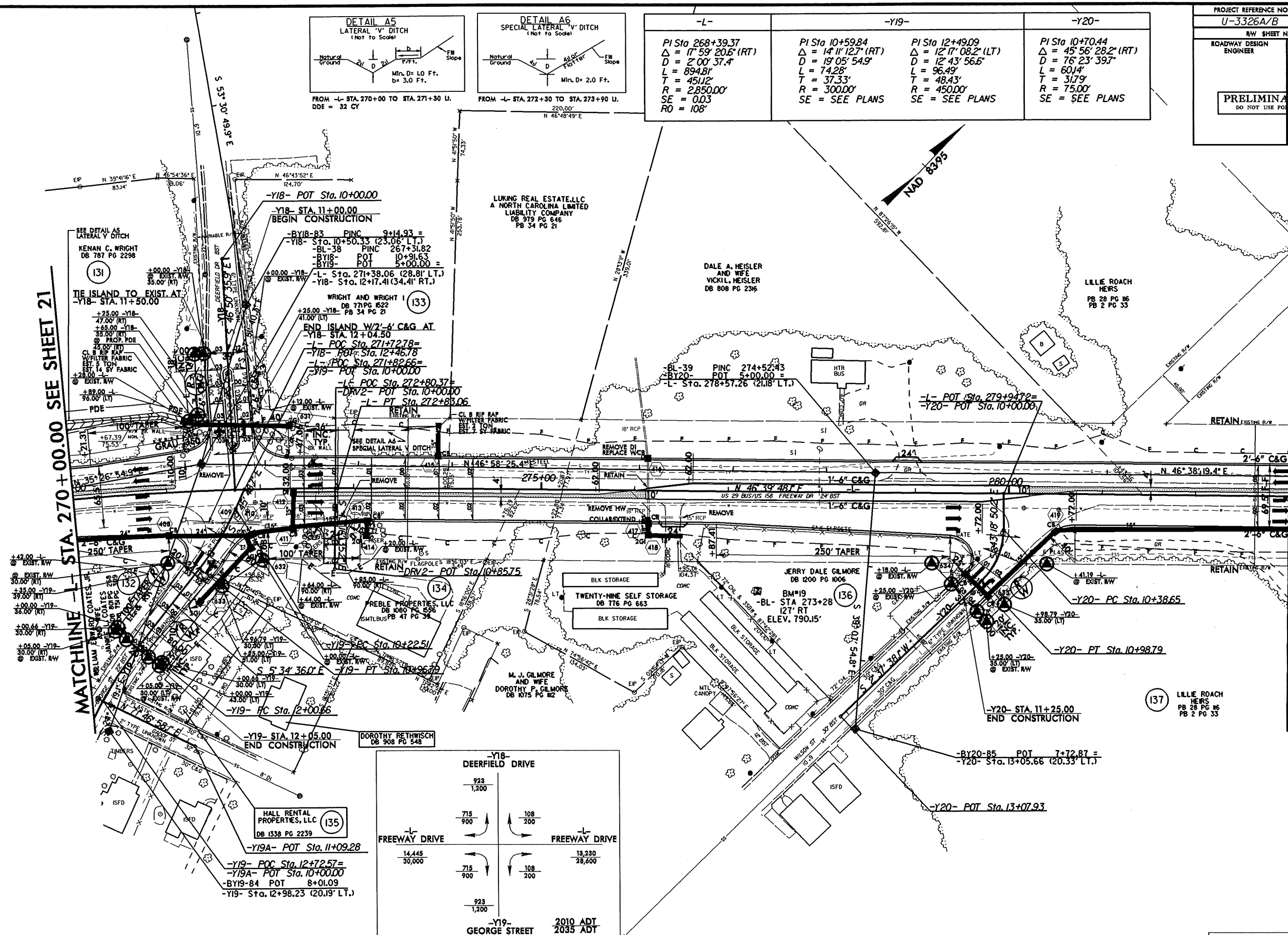


PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 21
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		

SEE SHEET 39 FOR -L- PROFILE
SEE SHEET 54 FOR -Y17- PROFILE
SEE SHEETS S- THRU S- FOR STRUCTURE PLANS



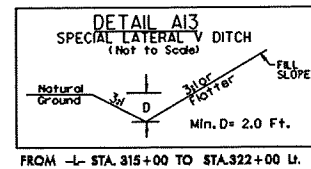
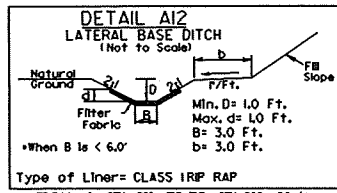
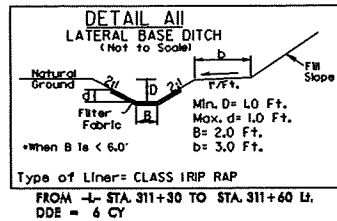
-L-	-Y19-	-Y20-
<i>PI Sta 268+39.37</i> $\Delta = 17^{\circ} 59' 20.6" (RT)$ $D = 2^{\circ} 00' 37.4"$ $L = 894.81'$ $T = 451.12'$ $R = 2,850.00'$ $SE = 0.03$ $RO = 108'$	<i>PI Sta 10+59.84</i> $\Delta = 14^{\circ} 11' 12.7" (RT)$ $D = 19^{\circ} 05' 54.9"$ $L = 74.28'$ $T = 37.33'$ $R = 300.00'$ $SE = \text{SEE PLANS}$	<i>PI Sta 12+49.09</i> $\Delta = 12^{\circ} 17' 08.2" (LT)$ $D = 12^{\circ} 43' 56.6"$ $L = 96.49'$ $T = 48.43'$ $R = 450.00'$ $SE = \text{SEE PLANS}$
		<i>PI Sta 10+70.44</i> $\Delta = 45^{\circ} 56' 28.2" (RT)$ $D = 76^{\circ} 23' 39.7"$ $L = 6014'$ $T = 3179'$ $R = 75.00'$ $SE = \text{SEE PLANS}$



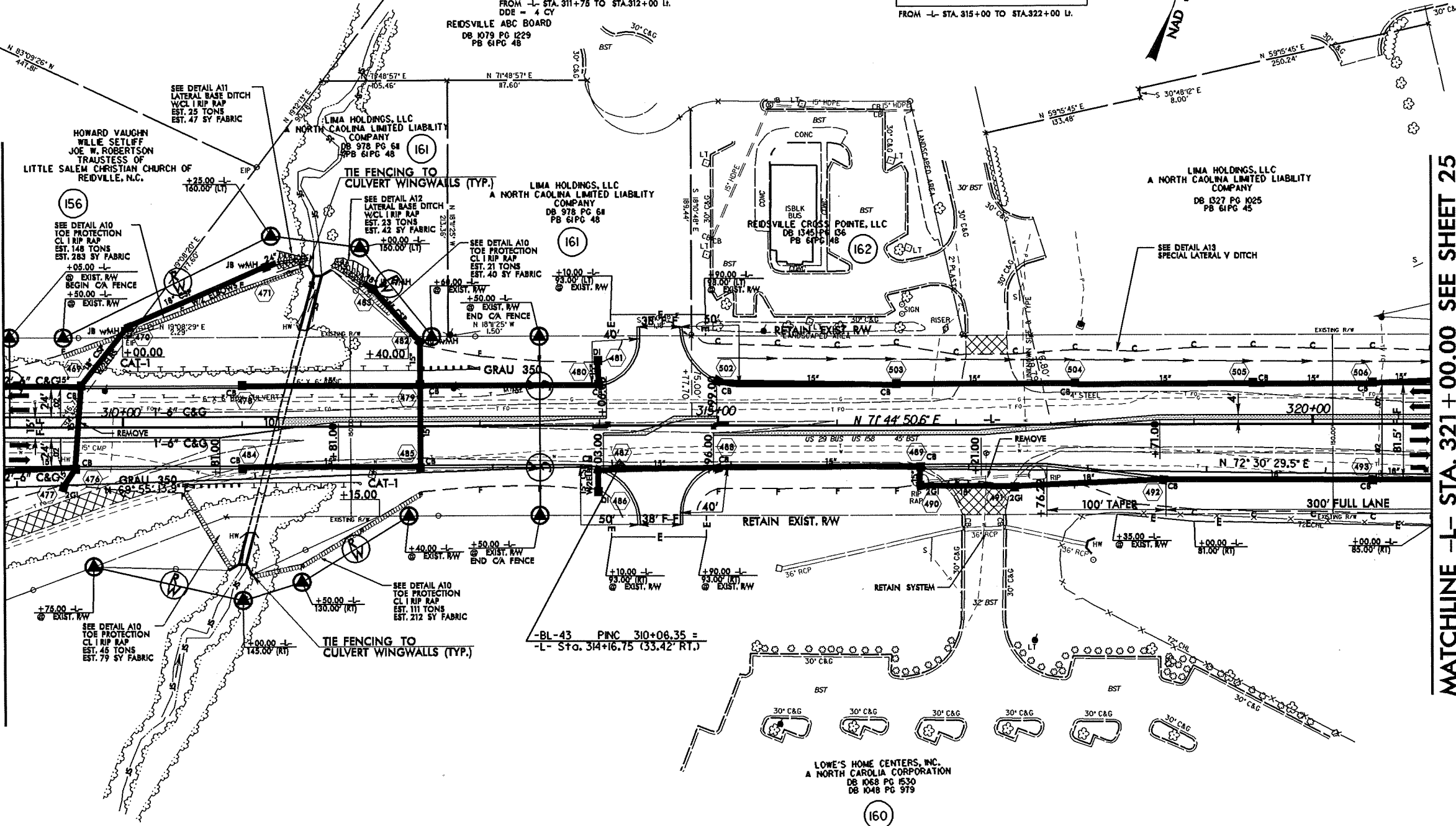
0 -
1ST. RW
(RT)
00 -Y19-
7 (RT)
00 -Y19-
9 (RT)
64 -Y19-
0 (RT)
5.00 -Y19-
00 (RT)
EXST. RW

MATCHLINE -L- STA. 283 + 00.00 SEE SHEET 23

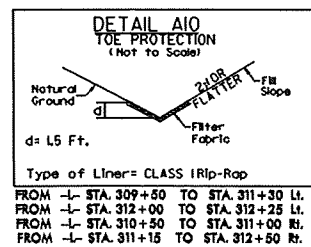
SEE SHEET 40 FOR -L- PROFILE
SEE SHEET 55 FOR -Y18- PROFILE
SEE SHEET 55 FOR -Y19- PROFILE
SEE SHEET 55 FOR -DRV2- PROFILE
SEE SHEET 55 FOR -Y20- PROFILE



MATCHLINE -L- STA. 309 + 00.00 SEE SHEET 23



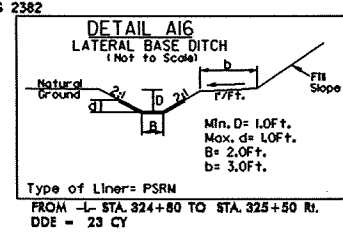
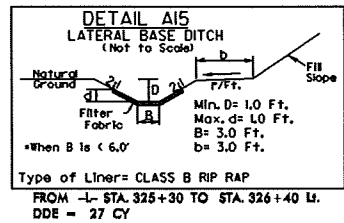
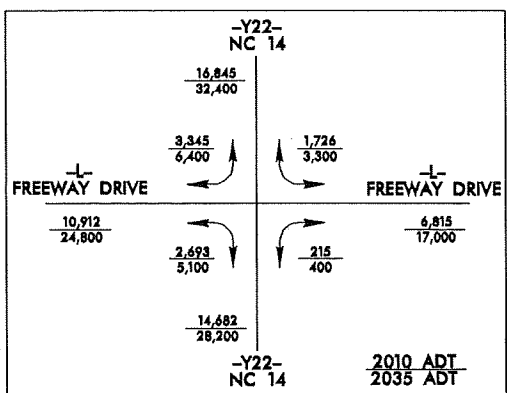
MATCHLINE -L- STA. 321 + 00.00 SEE SHEET 25



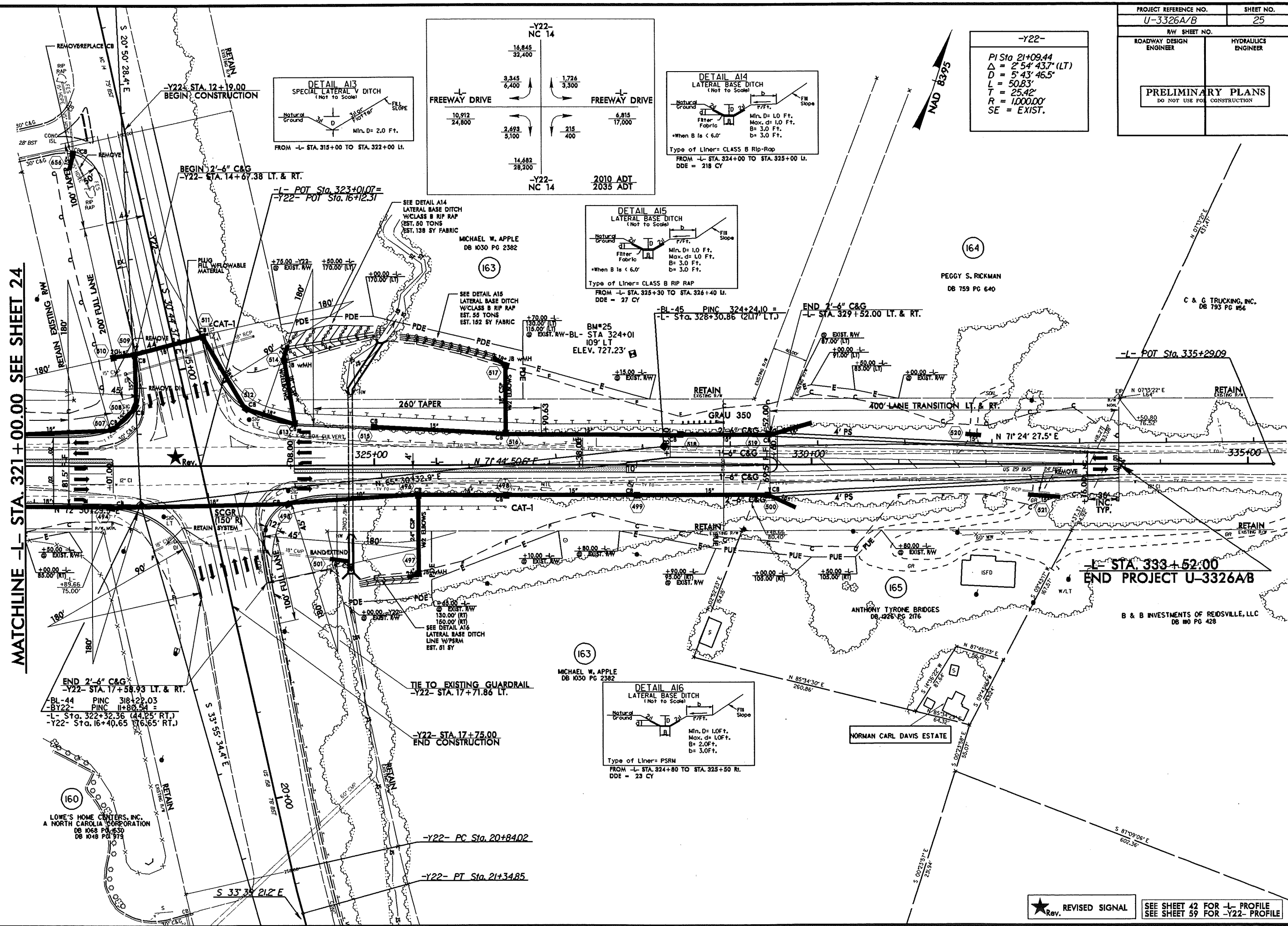
SEE SHEET 41 FOR -L- PROFILE

-Y22-

Pi Sta 21+09.44
 $\Delta = 2' 54" 43.7" (LT)$
 $D = 5' 43" 46.5"$
 $L = 50.83'$
 $T = 25.42'$
 $R = 1,000.00'$
 $SE = EXIST.$

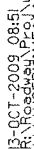


MATCHLINE -L- STA. 321+00.00 SEE SHEET 24



REVISIONS
 03/23/09 R/W REVISION (PJS) - ADDED PERMANENT UTILITY EASEMENT AND REVISED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 163 (MICHAEL W. APPLE)
 RT OF -L- STA. 328+90.
 ADDED PERMANENT UTILITY EASEMENT AND ELIMINATED TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 165 (ANTHONY TYRONE BRIDGES)

13-OCT-2009 08:51
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SEE SHEET 45 FOR -Y10- PROFILE
SEE SHEET 48 FOR -Y10A- PROFILE

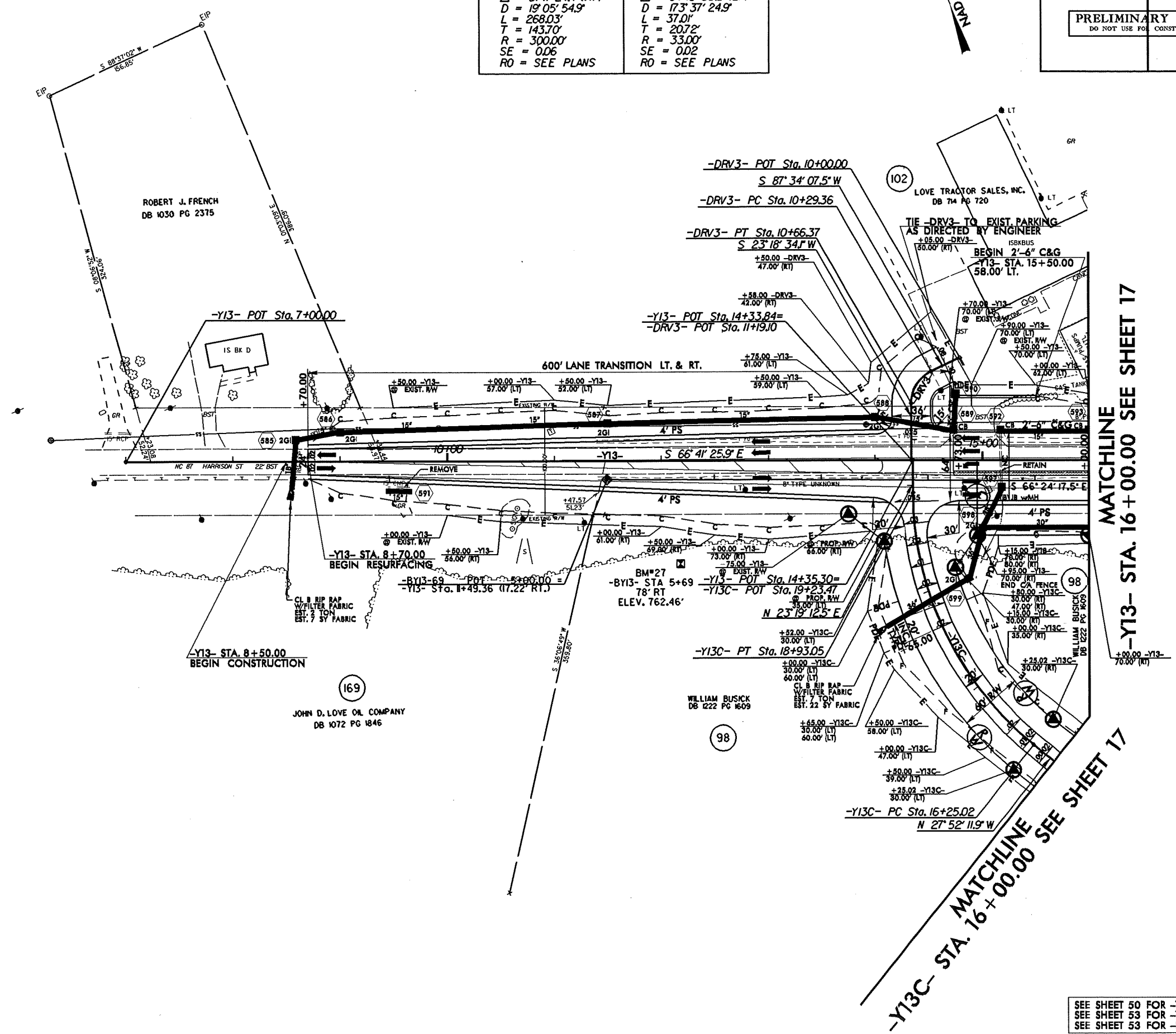
8/17/99

REVISIONS

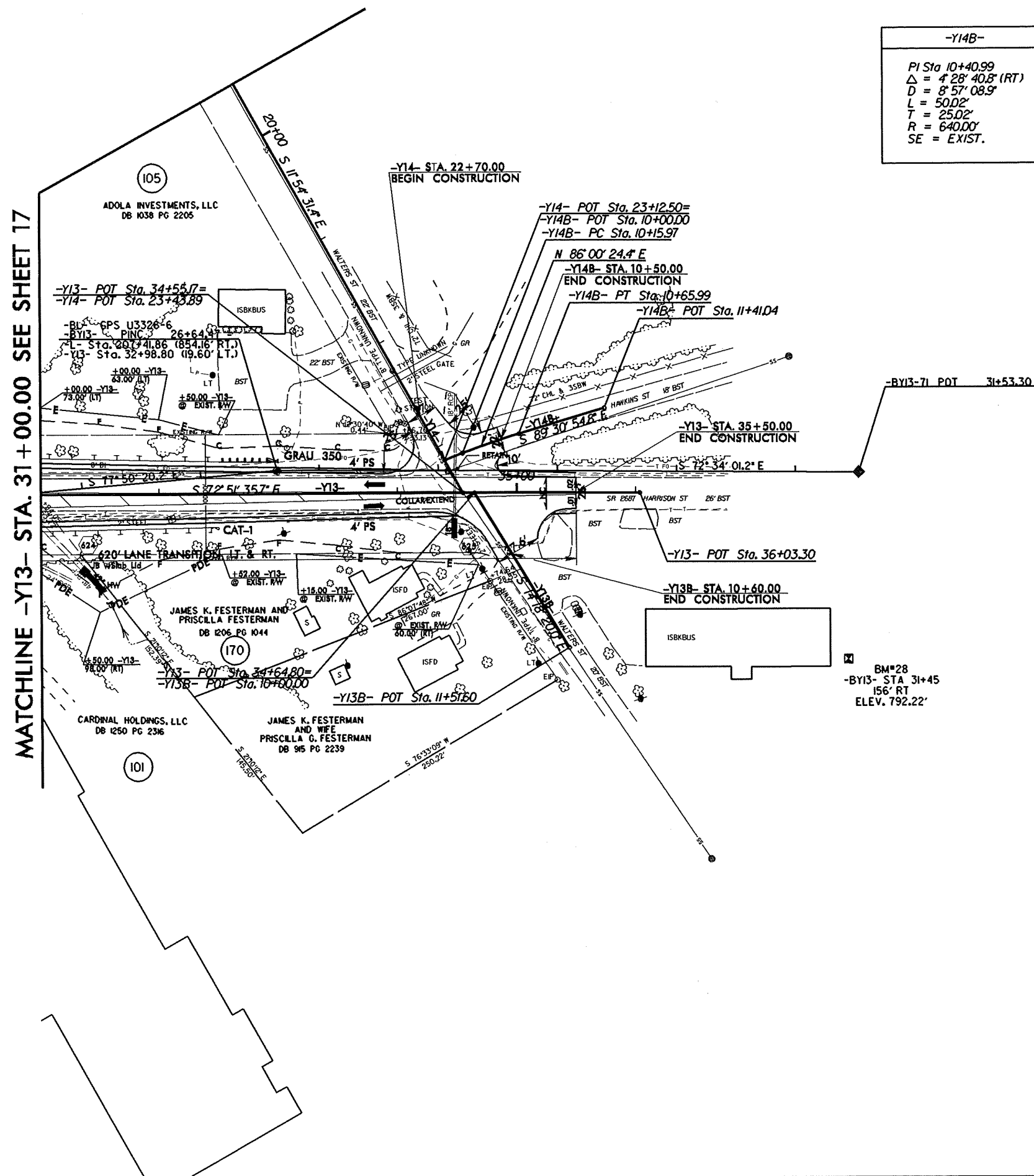
13-OCT-2009 08:51
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3326-DRY-PH-11.dwg

-Y13C-	-DRV3-
PI Sta 17+68.73 $\Delta = 51^{\circ} 11' 24.4''$ (RT) $D = 19^{\circ} 05' 54.9''$ $L = 268.03'$ $T = 143.70'$ $R = 300.00'$ $SE = 0.06$ $RO = \text{SEE PLANS}$	PI Sta 10+50.08 $\Delta = 64^{\circ} 15' 33.5''$ (LT) $D = 17^{\circ} 37' 24.9''$ $L = 37.01'$ $T = 20.72'$ $R = 33.00'$ $SE = 0.02$ $RO = \text{SEE PLANS}$

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 27
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



SEE SHEET 50 FOR -Y13- PROFILE
SEE SHEET 53 FOR -Y13C- PROFILE
SEE SHEET 53 FOR -DRV3- PROFILE



SEE SHEET 50 FOR -Y13- PROFILE

8/17/99

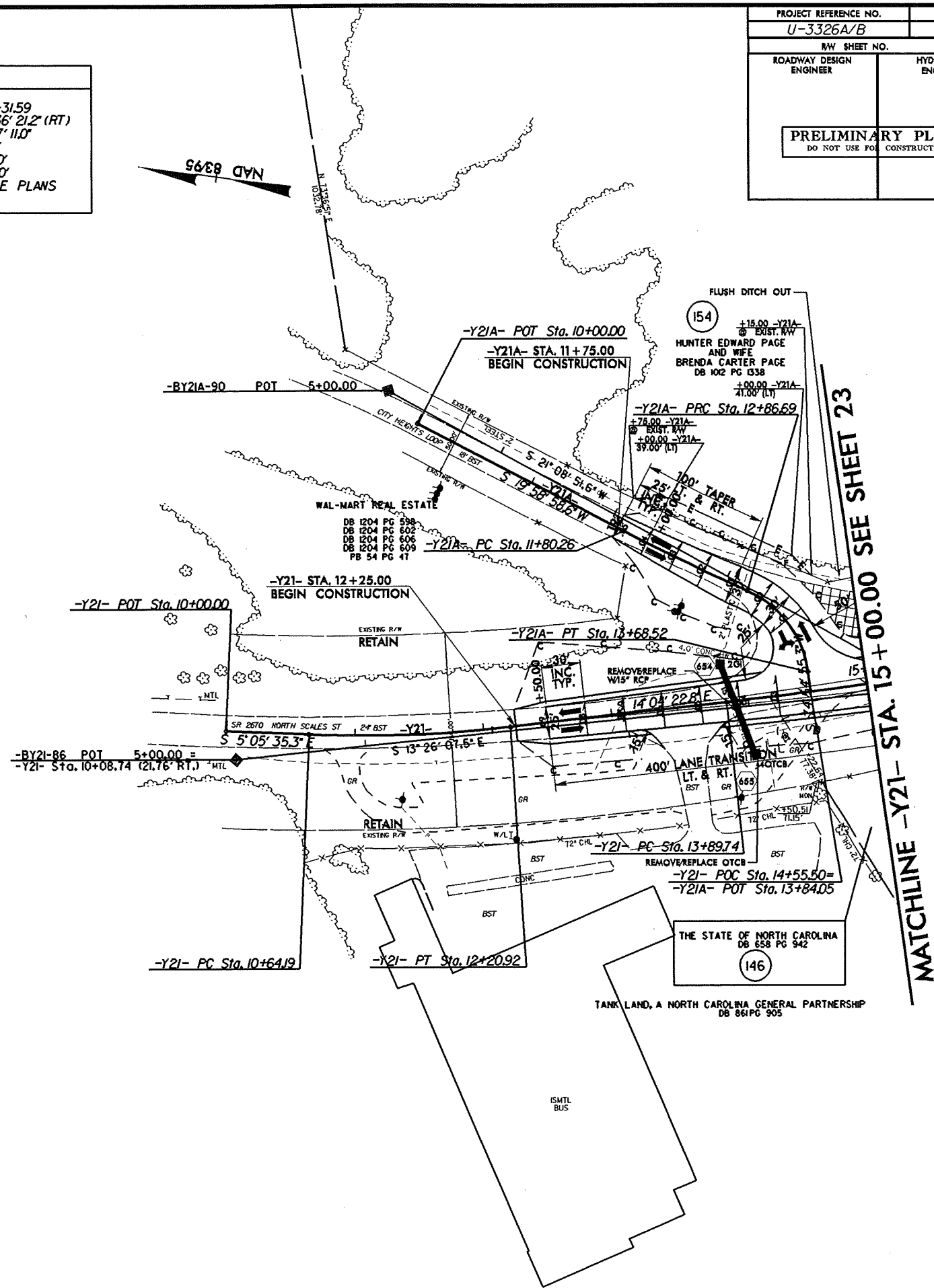
REVISIONS

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3326-RDY-PH-A29

-Y2I-		-Y2IA-	
PI Sta 11+42.72	PI Sta 16+50.81	PI Sta 12+33.50	PI Sta 13+31.59
$\Delta = 8^{\circ} 58' 47.5" (LT)$	$\Delta = 7^{\circ} 28' 06.3" (LT)$	$\Delta = 3^{\circ} 40' 24.5" (LT)$	$\Delta = 58^{\circ} 36' 21.2" (RT)$
$D = 5^{\circ} 43' 46.5"$	$D = 1^{\circ} 25' 56.6"$	$D = 3^{\circ} 27' 05.6"$	$D = 71^{\circ} 37' 11.0"$
$L = 156.73'$	$L = 521.39'$	$L = 106.43'$	$L = 81.83'$
$T = 78.52'$	$T = 261.07'$	$T = 53.23'$	$T = 44.90'$
$R = 1,000.00'$	$R = 4,000.00'$	$R = 1,660.00'$	$R = 80.00'$
$SE = EXIST.$	$SE = 0.03$	$SE = SEE PLANS$	$SE = SEE PLANS$
	$RO = SEE PLANS$		

PROJECT REFERENCE NO.		SHEET NO.	
U-3326A/B		29	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>			

BM*22
-BY2I- STA 5+00
N 9°58'21" W 326.97'
ELEV. 740.73'

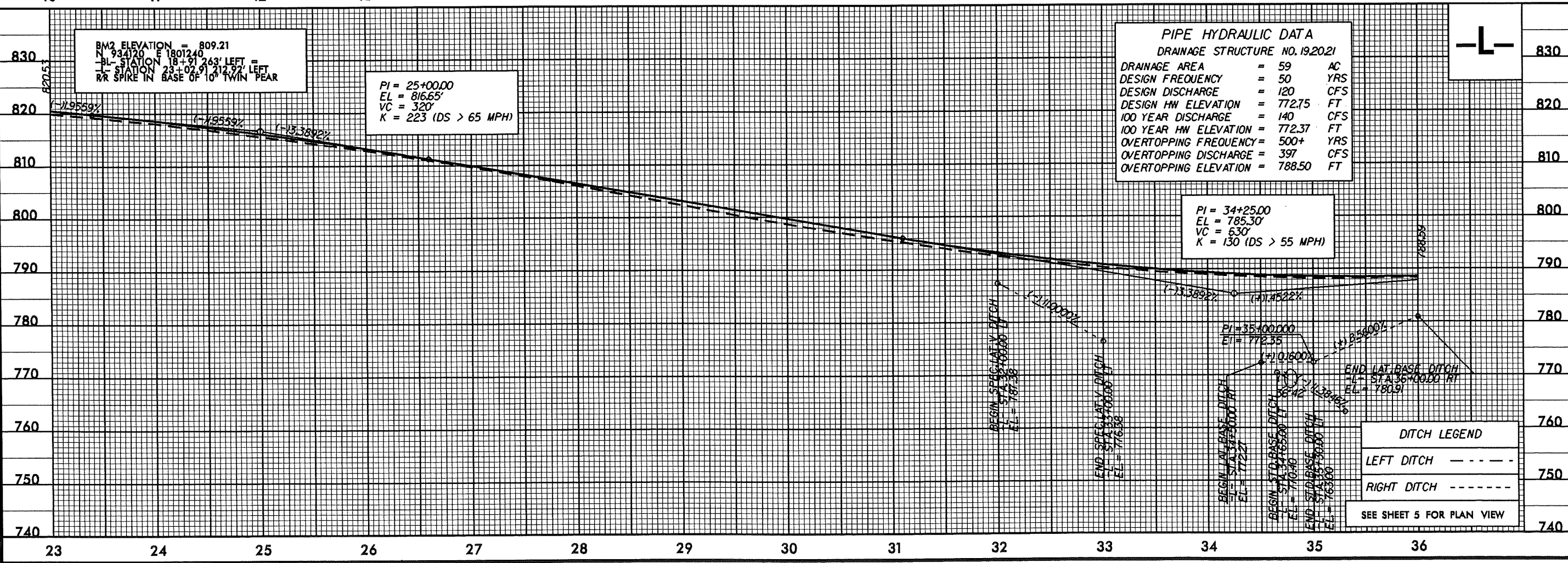
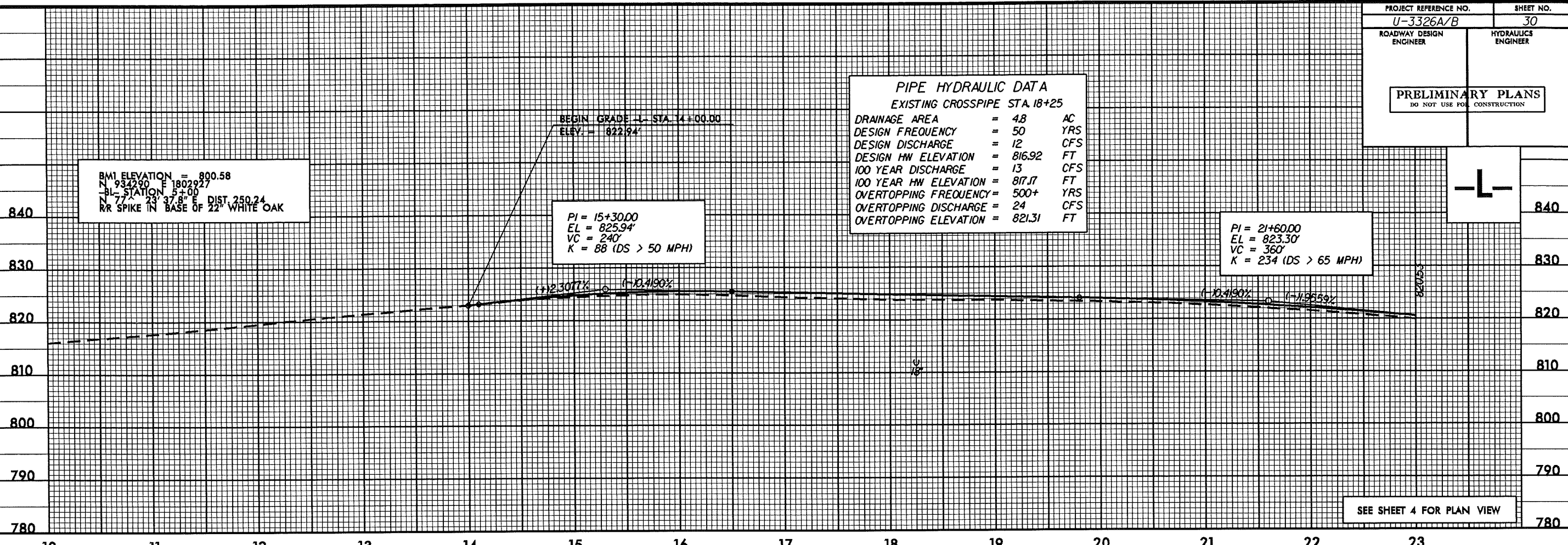
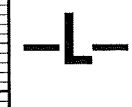


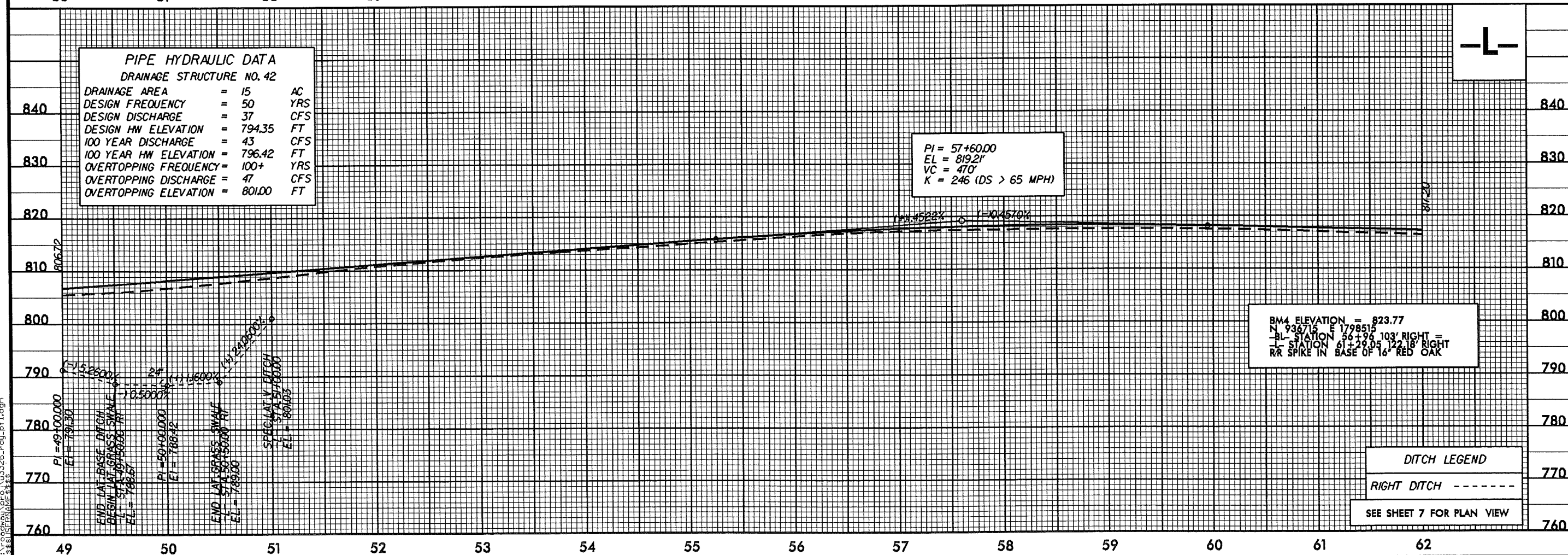
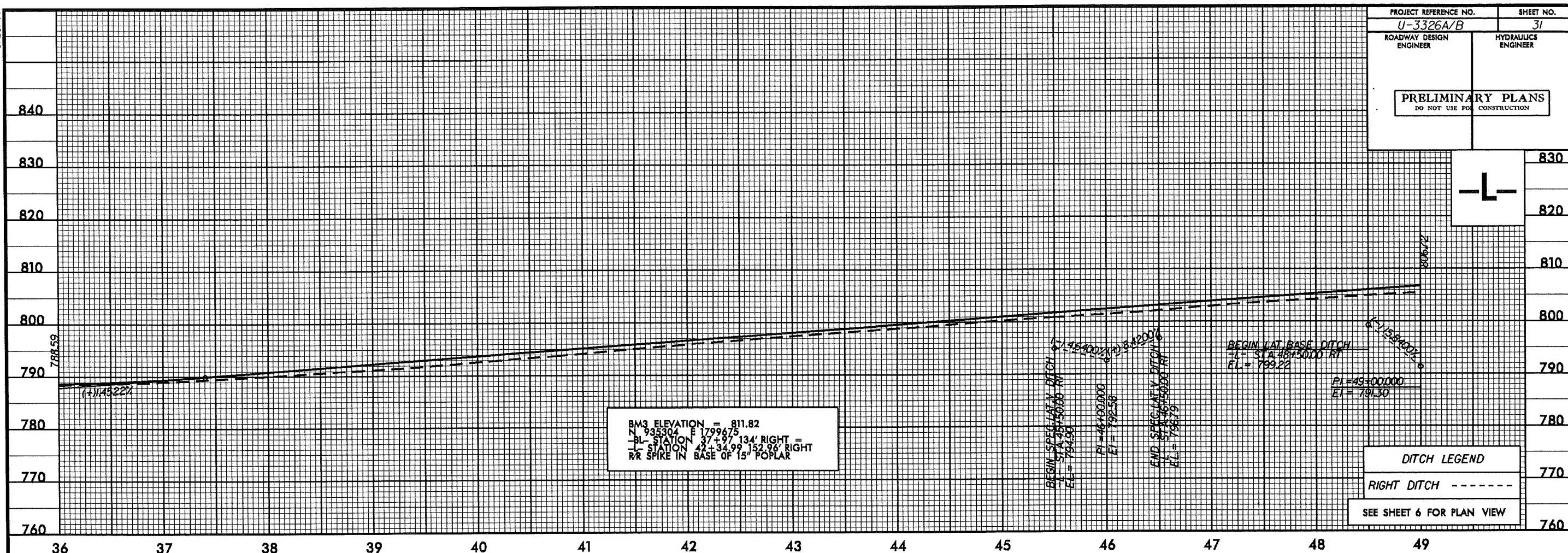
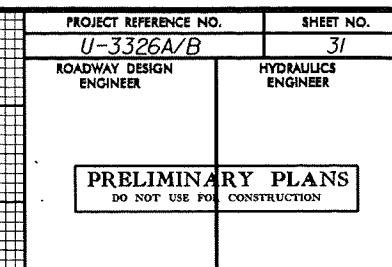
SEE SHEET 56 FOR -Y2I- PROFILE
SEE SHEET 56 FOR -Y2IA- PROFILE

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3326-0000-0000

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 30	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

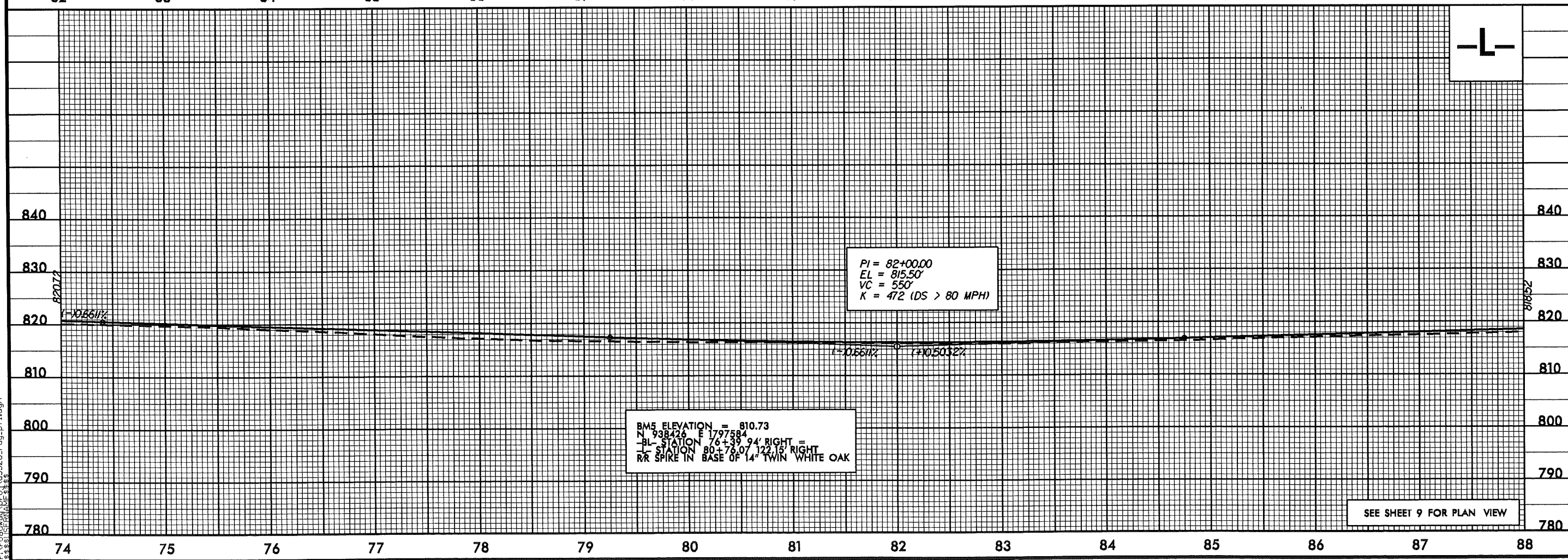
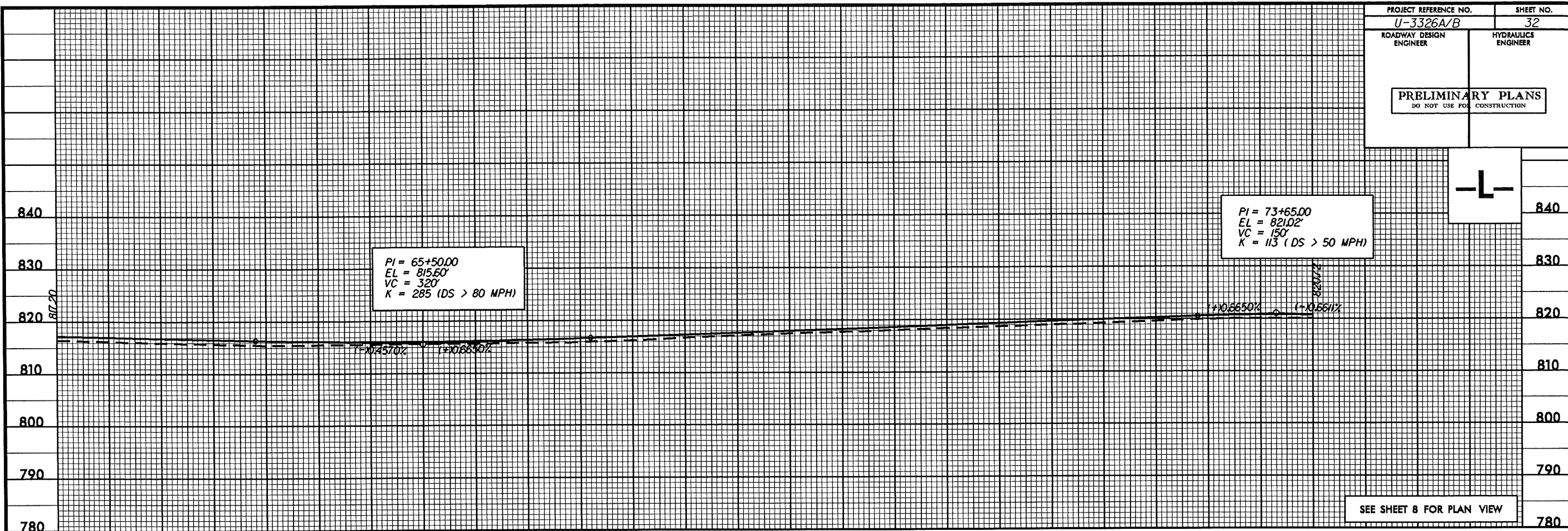
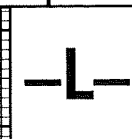




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3326-rdy-pl.dgn

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 32	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

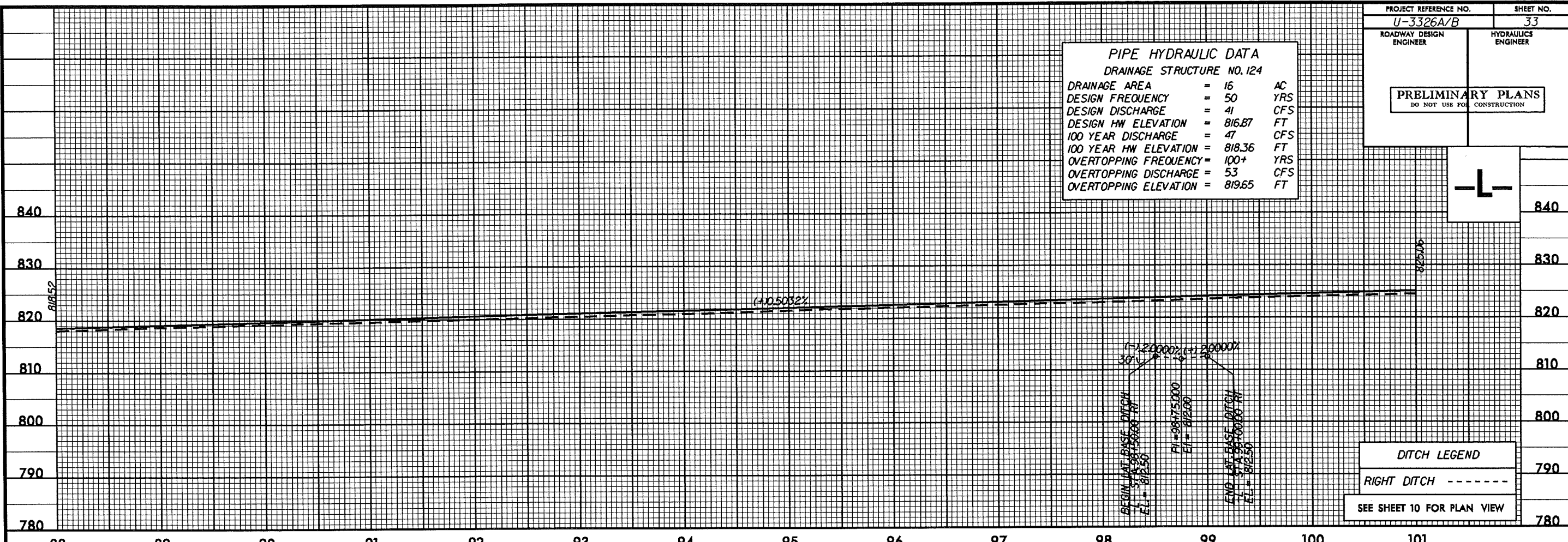
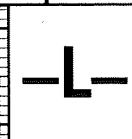


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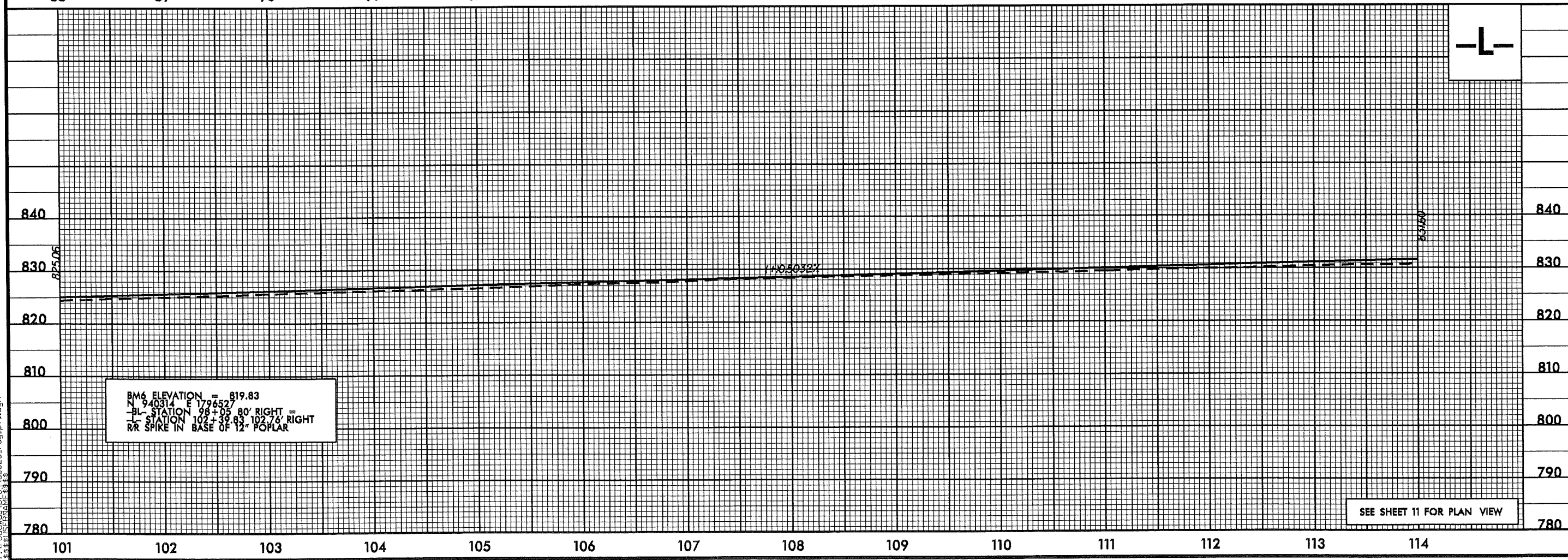
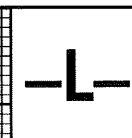
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3326.dwg

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 33	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

PIPE HYDRAULIC DATA			
DRAINAGE STRUCTURE NO. 124			
DRAINAGE AREA	=	15	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	41	CFS
DESIGN HW ELEVATION	=	816.87	FT
100 YEAR DISCHARGE	=	47	CFS
100 YEAR HW ELEVATION	=	818.36	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	53	CFS
OVERTOPPING ELEVATION	=	819.65	FT



DITCH LEGEND
RIGHT DITCH - - - - -
SEE SHEET 10 FOR PLAN VIEW



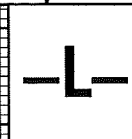
BM6 ELEVATION = 819.83
BL STATION 98+00 80' RIGHT =
L STATION 102+30 83' 102' 76' RIGHT
RR SPIKE IN BASE OF 12" POPLAR

SEE SHEET 11 FOR PLAN VIEW

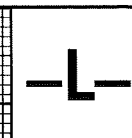
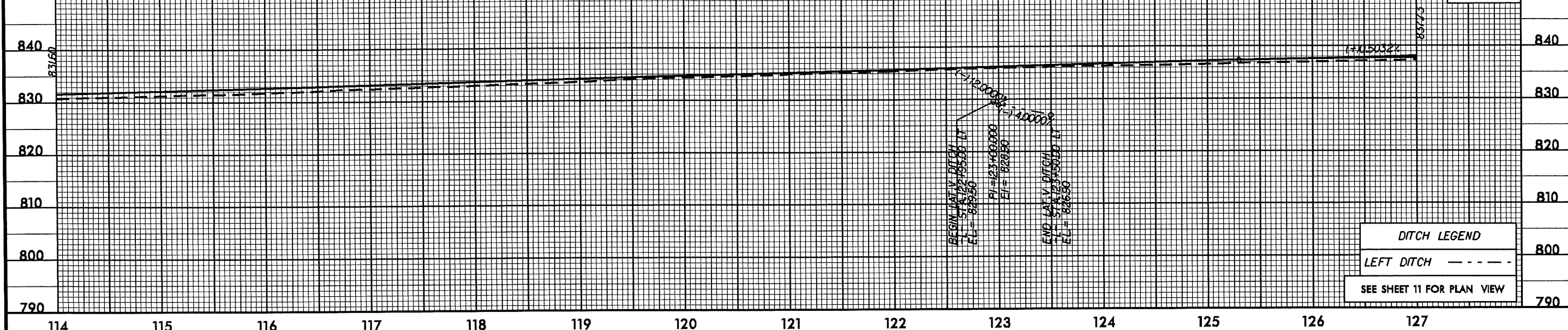
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3326.dwg

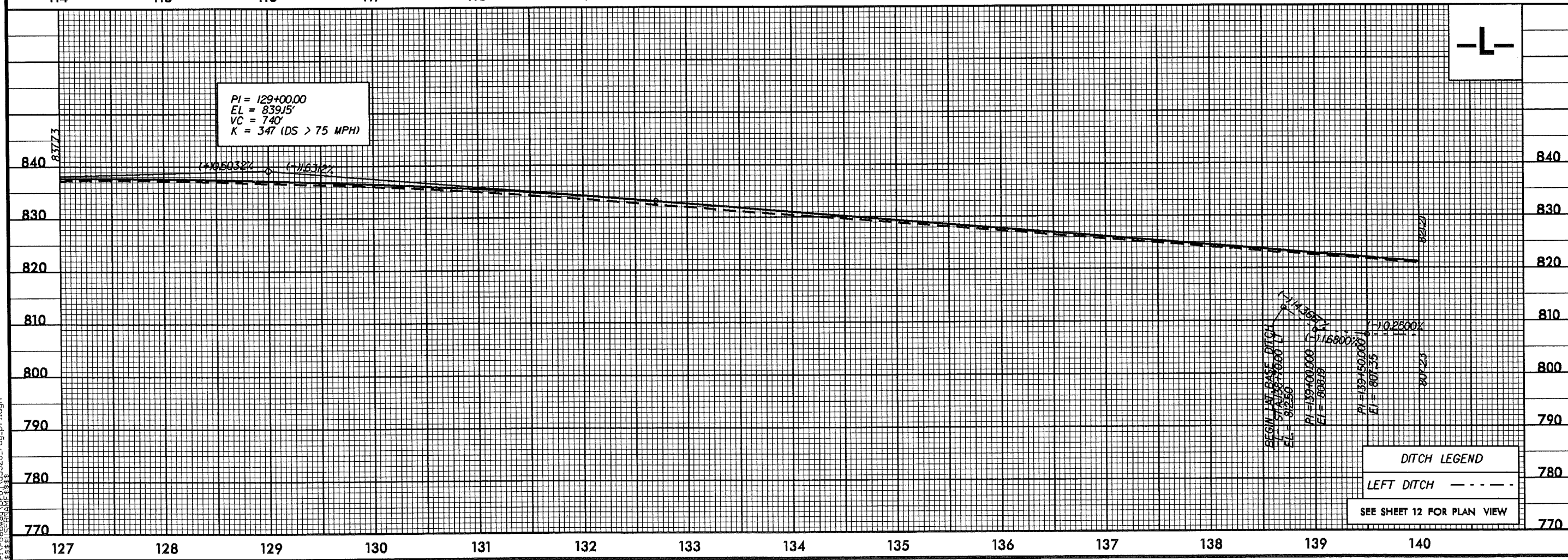
PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 34
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



BM7 ELEVATION = 847.64
N 941700 E 1795608
BL STATION 114+05.242' LEFT =
L STATION 118+39.75' 229.23' LEFT
R/R SPIKE IN BASE OF 6" WILLOW OAK



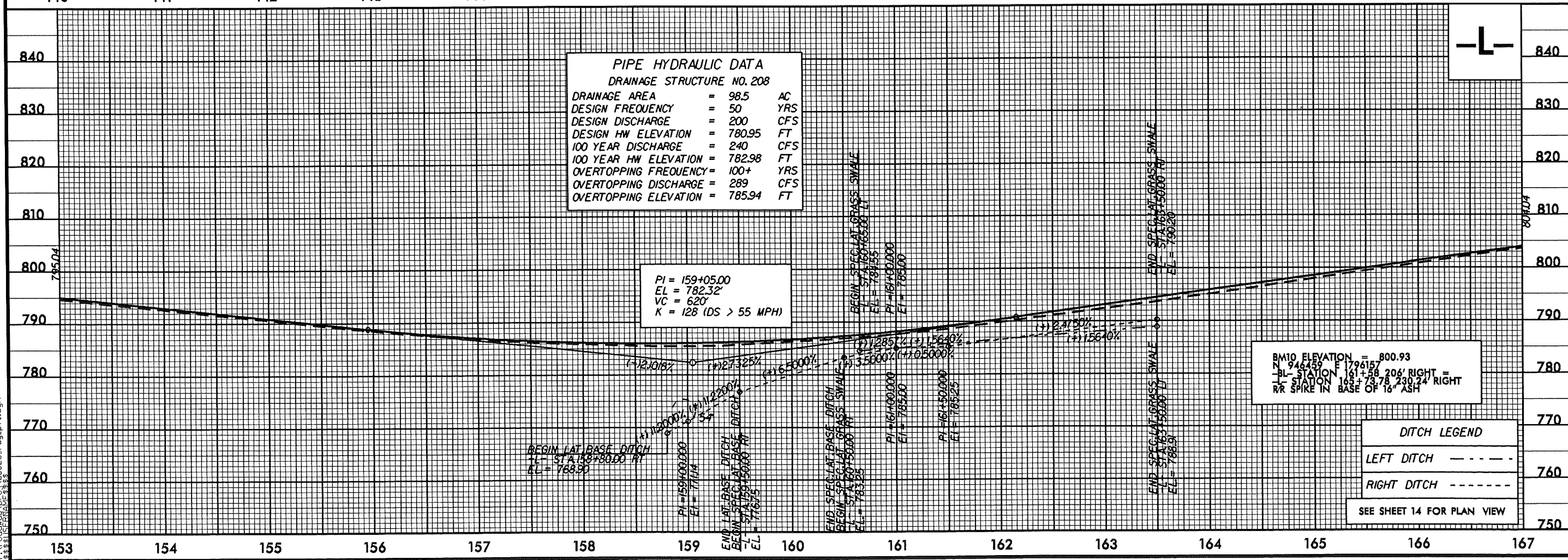
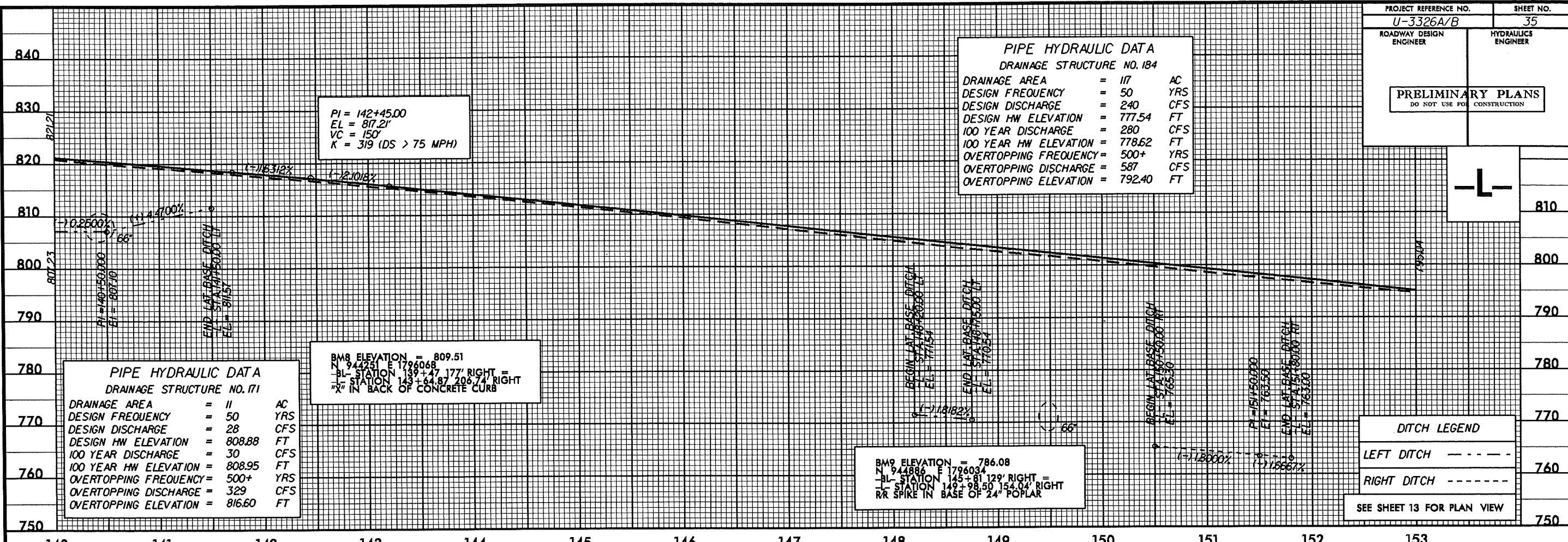
PI = 129+00.00
EL = 839.15'
VC = 740'
K = 347 (DS > 75 MPH)



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3326a.dwg

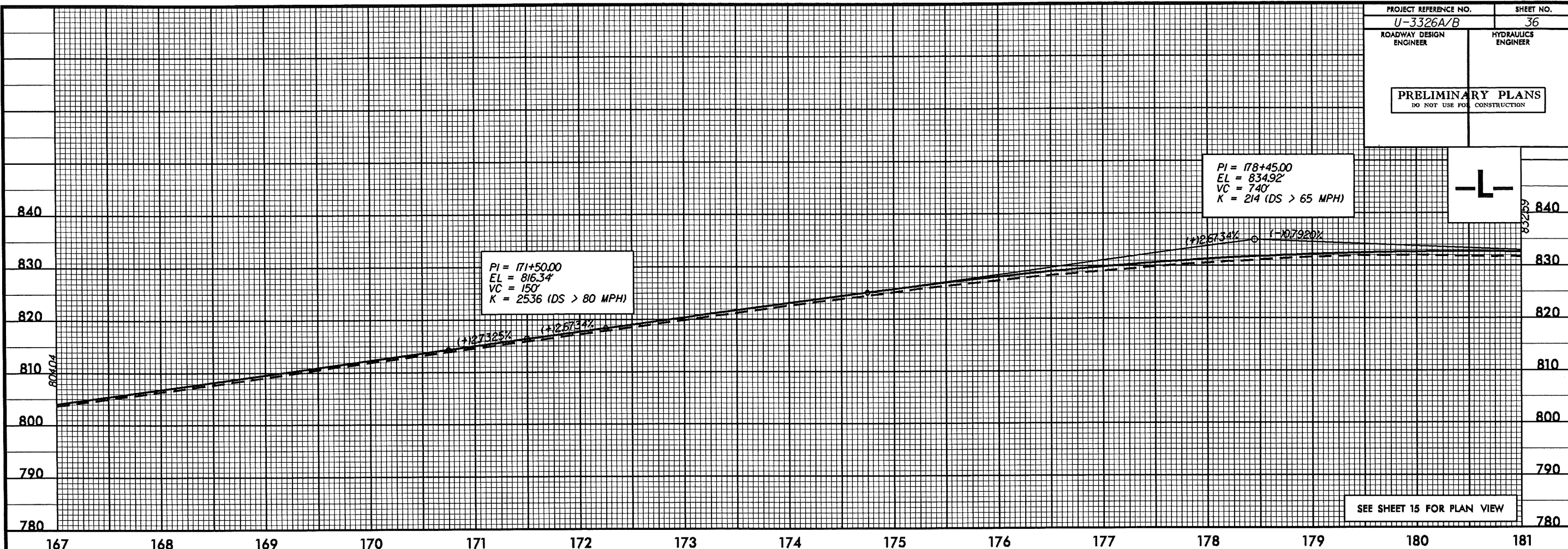
PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 35	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



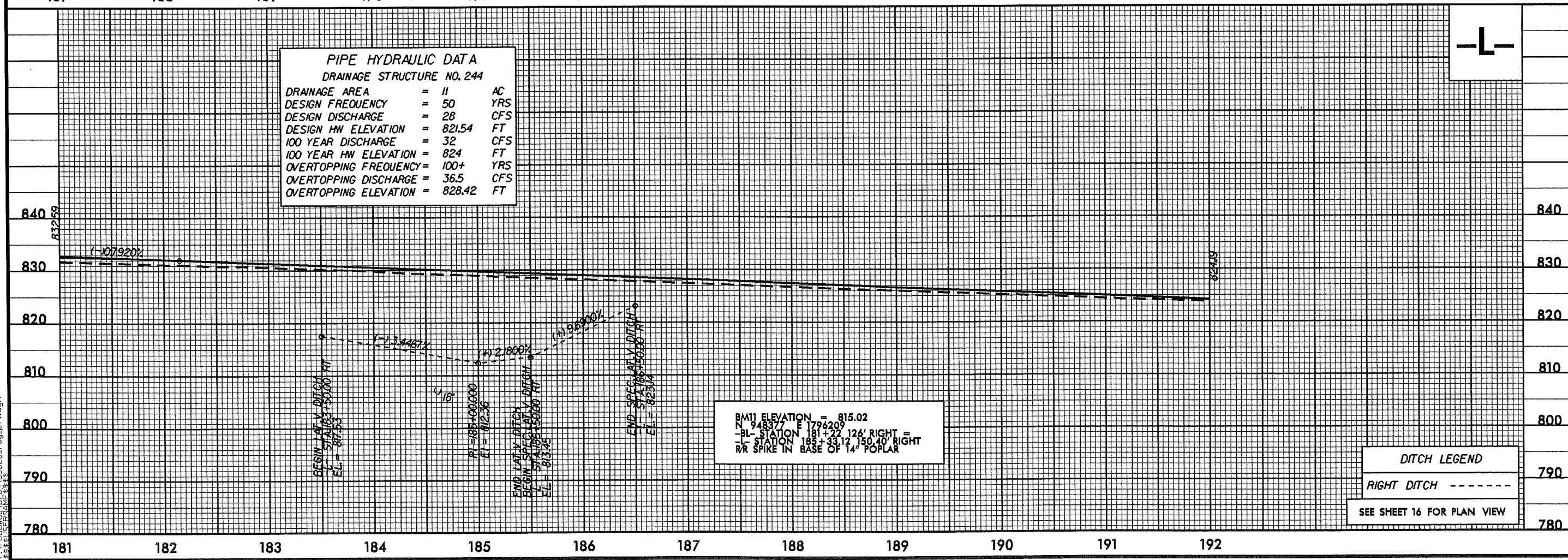
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3326-rdy-p1.dgn

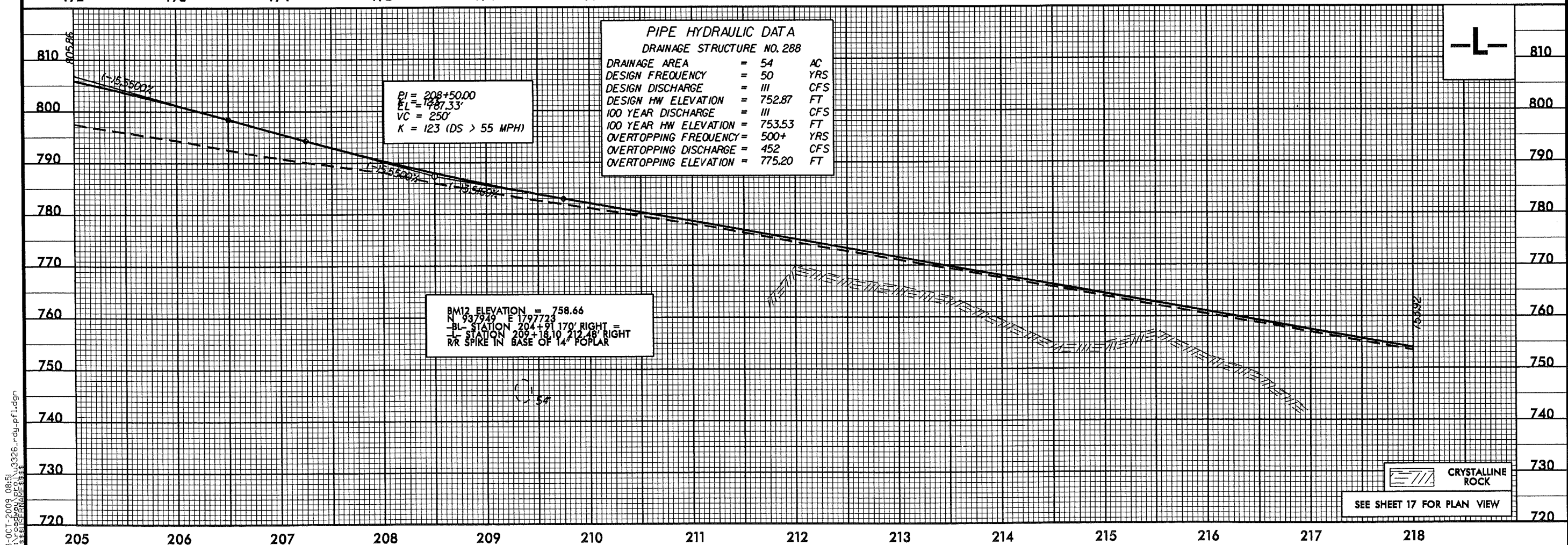
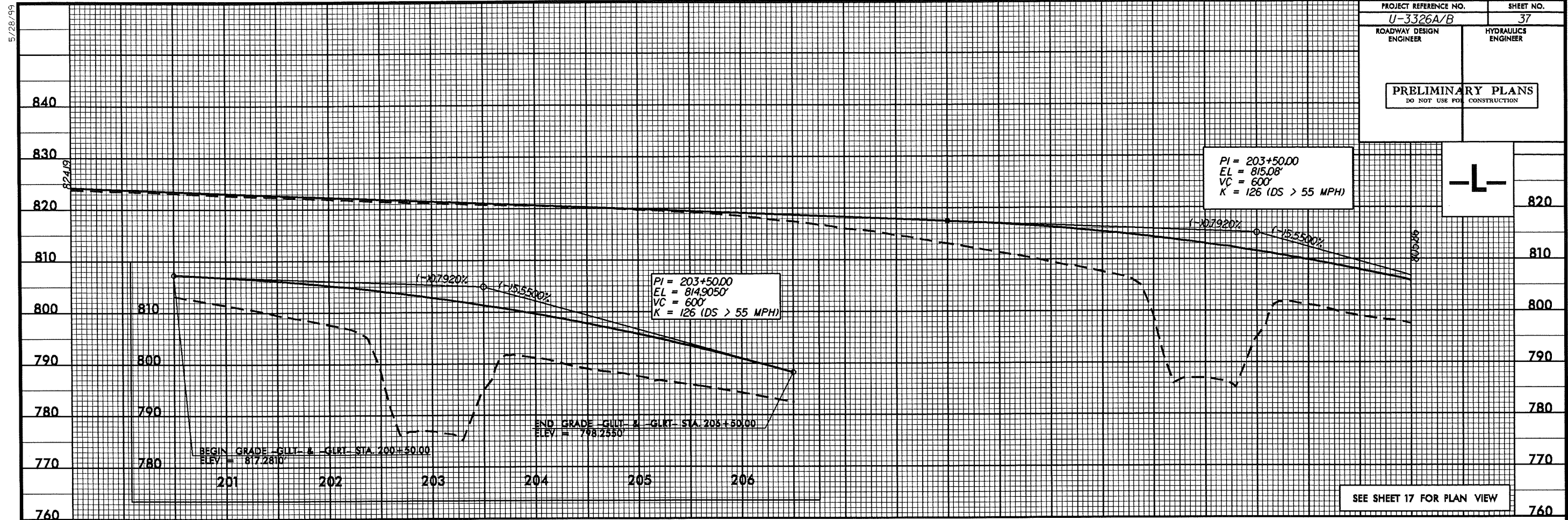
PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO. 244		
DRAINAGE AREA	= 11	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 28	CFS
DESIGN HW ELEVATION	= 821.54	FT
100 YEAR DISCHARGE	= 32	CFS
100 YEAR HW ELEVATION	= 824	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 36.5	CFS
OVERTOPPING ELEVATION	= 828.42	FT



5/28/99



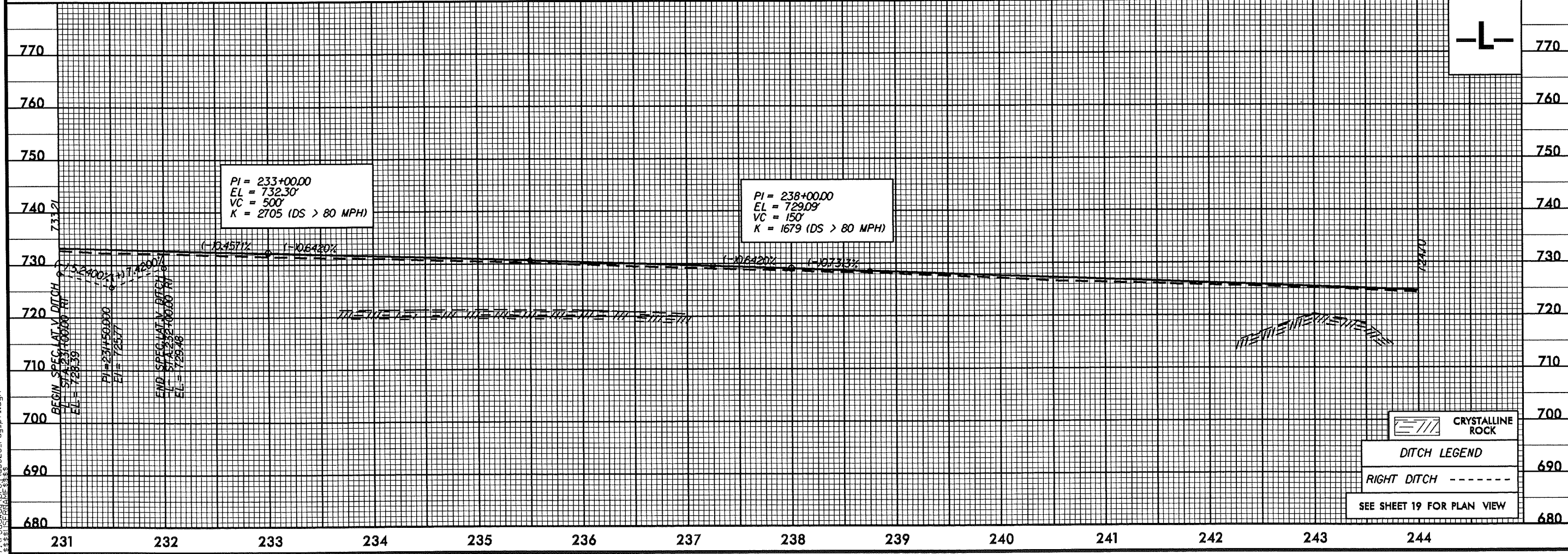
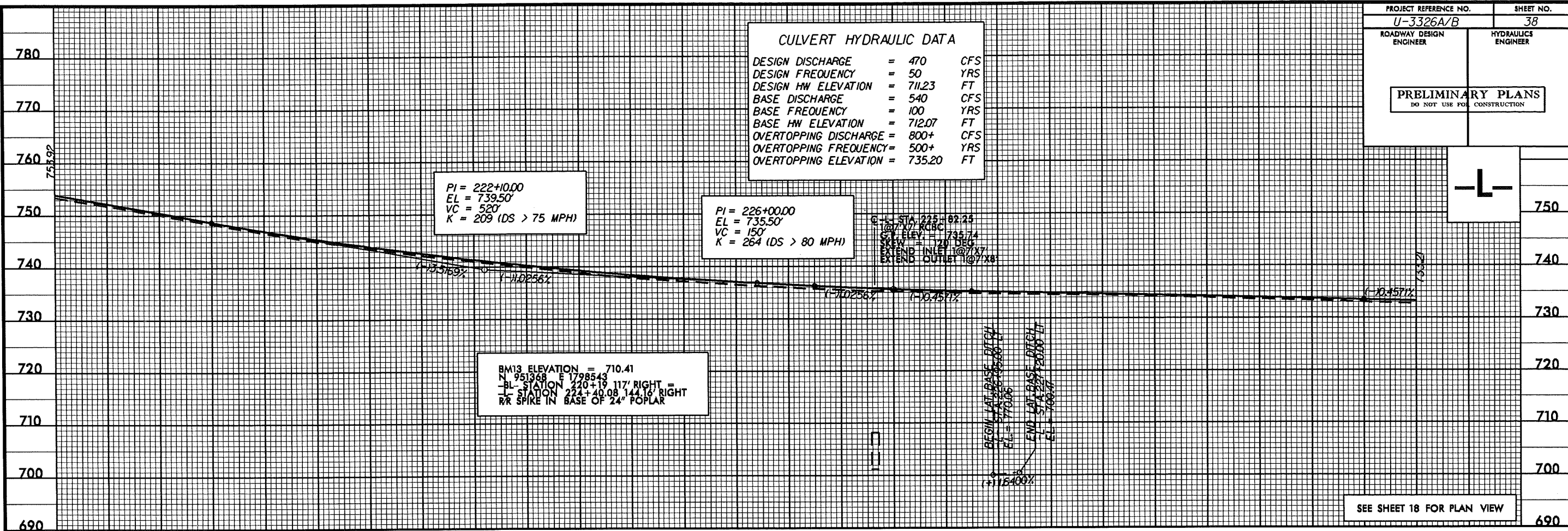
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3326A/B.dwg

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3326.dwg

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 38	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	=	470 CFS
DESIGN FREQUENCY	=	50 YRS
DESIGN HW ELEVATION	=	711.23 FT
BASE DISCHARGE	=	540 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	712.07 FT
OVERTOPPING DISCHARGE	=	800+ CFS
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING ELEVATION	=	735.20 FT



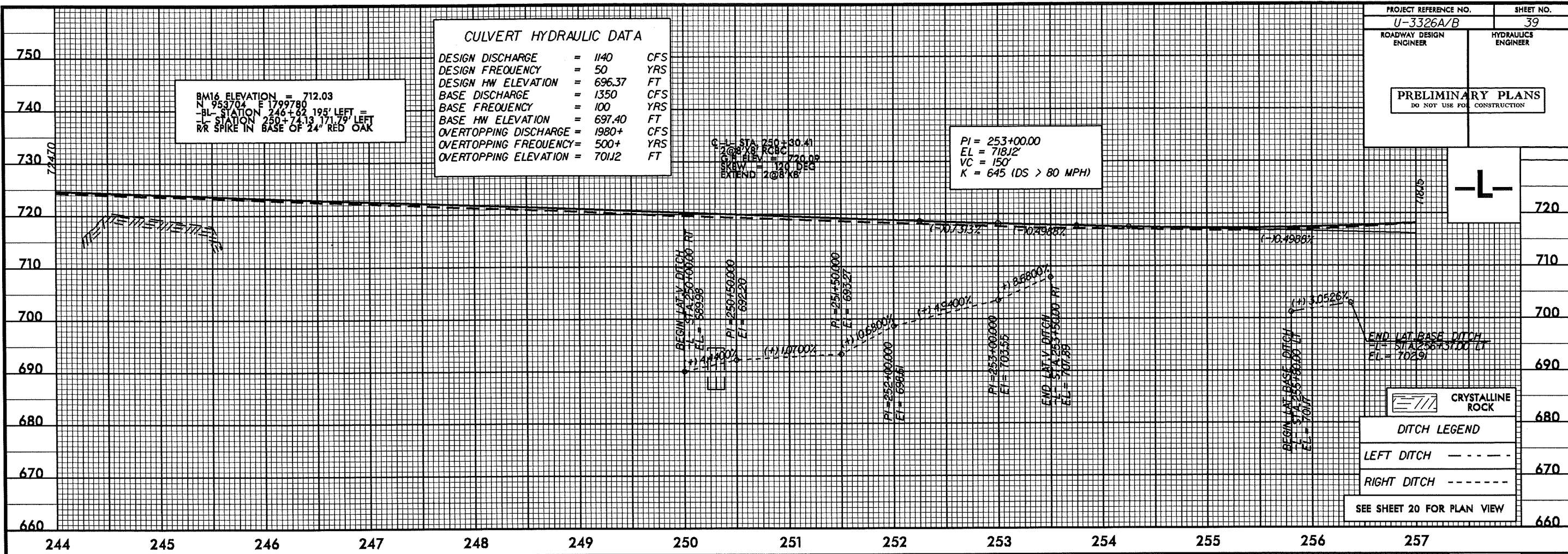
	CRYSTALLINE ROCK
DITCH LEGEND	
RIGHT DITCH - - - - -	
SEE SHEET 19 FOR PLAN VIEW	

5/28/99
13-OCT-2009 08:52 0326.rdy.plt.dgn
r:\projects\0326\0326.dgn

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		

CULVERT HYDRAULIC DATA			
DESIGN DISCHARGE	=	1140	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	696.37	FT
BASE DISCHARGE	=	1350	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	697.40	FT
OVERTOPPING DISCHARGE	=	1980+	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	701.2	FT

BM16 ELEVATION = 712.03
N 953704 E 1799780
BL STATION 246+62.195' LEFT =
L STATION 250+74.13' 171.79' LEFT
RR SPIKE IN BASE OF 24" RED OAK

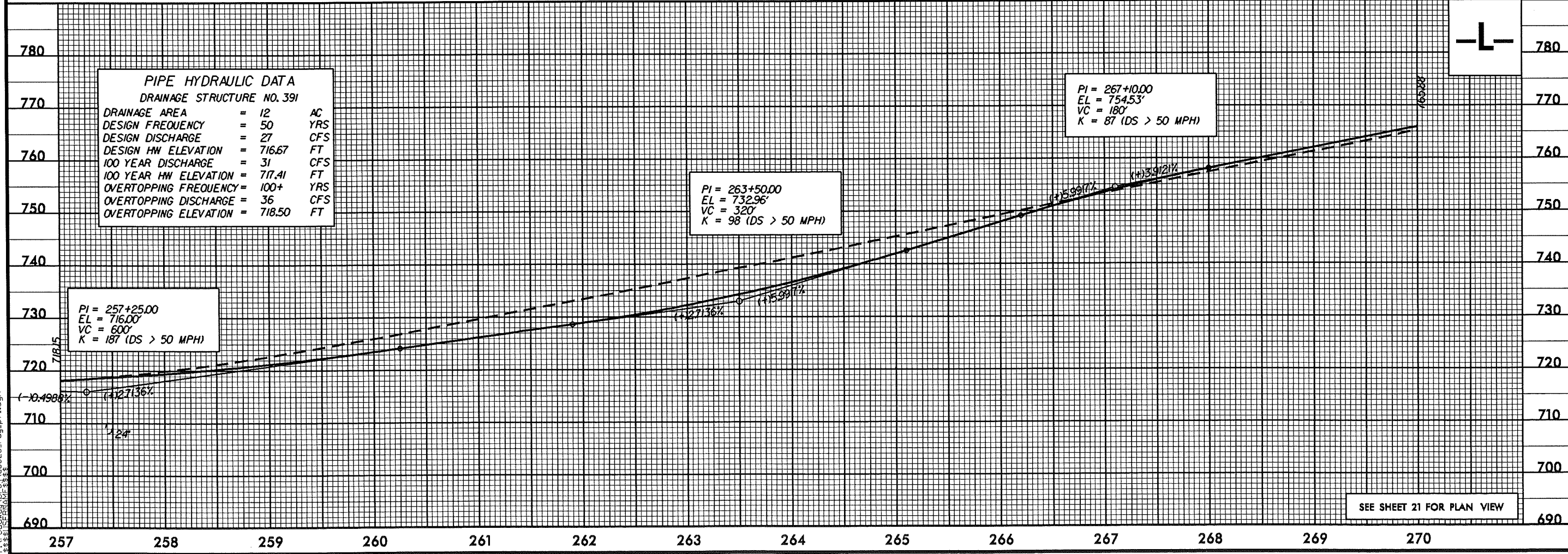


PIPE HYDRAULIC DATA			
DRAINAGE STRUCTURE NO. 391			
DRAINAGE AREA	=	12	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	27	CFS
DESIGN HW ELEVATION	=	716.67	FT
100 YEAR DISCHARGE	=	31	CFS
100 YEAR HW ELEVATION	=	717.41	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	36	CFS
OVERTOPPING ELEVATION	=	718.50	FT

PI = 257+25.00
EL = 716.00'
VC = 600'
K = 187 (DS > 50 MPH)

PI = 263+50.00
EL = 732.96'
VC = 320'
K = 98 (DS > 50 MPH)

PI = 267+10.00
EL = 754.53'
VC = 180'
K = 87 (DS > 50 MPH)



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3326.dwg

PROJECT REFERENCE NO.
U-3326A/B

SHEET NO.
40

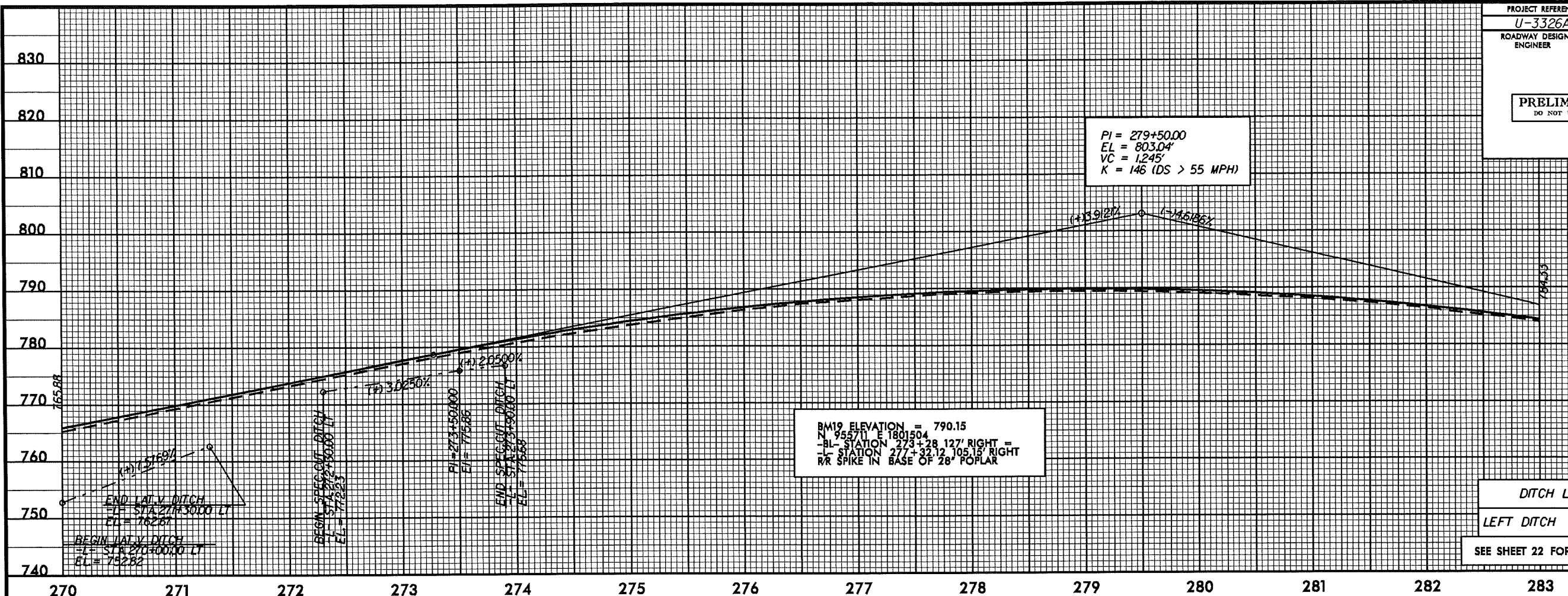
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



800
790
780
770
760
750
740



BM19 ELEVATION = 790.15
N 95.57° E 180.1504
-BL- STATION 273+28.12' RIGHT =
-L- STATION 277+32.12 105.15' RIGHT
RR SPIKE IN BASE OF 28" POPLAR

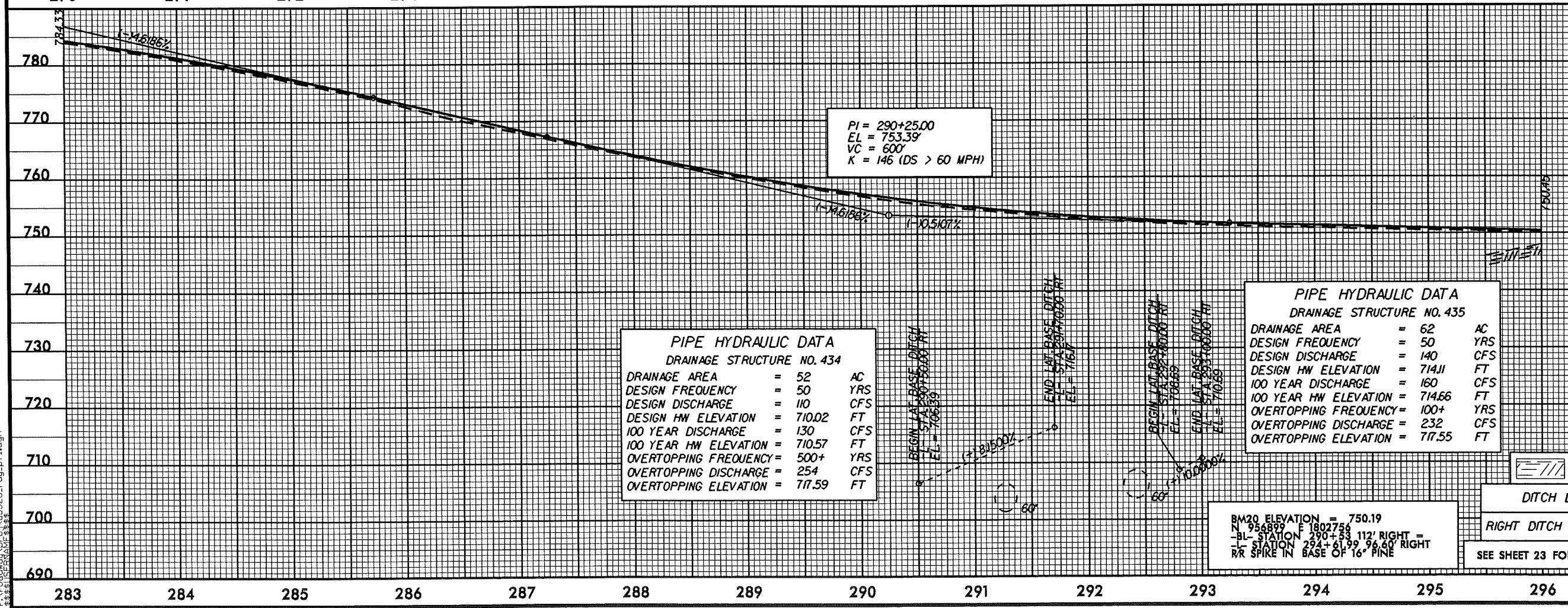
DITCH LEGEND

LEFT DITCH - - - - -

SEE SHEET 22 FOR PLAN VIEW



780
770
760
750
740
730
720
710
700
690



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO. 434		
DRAINAGE AREA	= 52	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 110	CFS
DESIGN HW ELEVATION	= 710.02	FT
100 YEAR DISCHARGE	= 130	CFS
100 YEAR HW ELEVATION	= 710.57	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 254	CFS
OVERTOPPING ELEVATION	= 717.59	FT

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO. 435		
DRAINAGE AREA	= 62	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 140	CFS
DESIGN HW ELEVATION	= 714.11	FT
100 YEAR DISCHARGE	= 160	CFS
100 YEAR HW ELEVATION	= 714.66	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 232	CFS
OVERTOPPING ELEVATION	= 717.55	FT

CRYSTALLINE
ROCK

DITCH LEGEND

RIGHT DITCH - - - - -

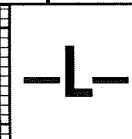
SEE SHEET 23 FOR PLAN VIEW

BM20 ELEVATION = 750.19
N 95.57° E 180.2756
-BL- STATION 290+61.12' RIGHT =
-L- STATION 294+61.99 96.60' RIGHT
RR SPIKE IN BASE OF 16" PINE

5/28/99

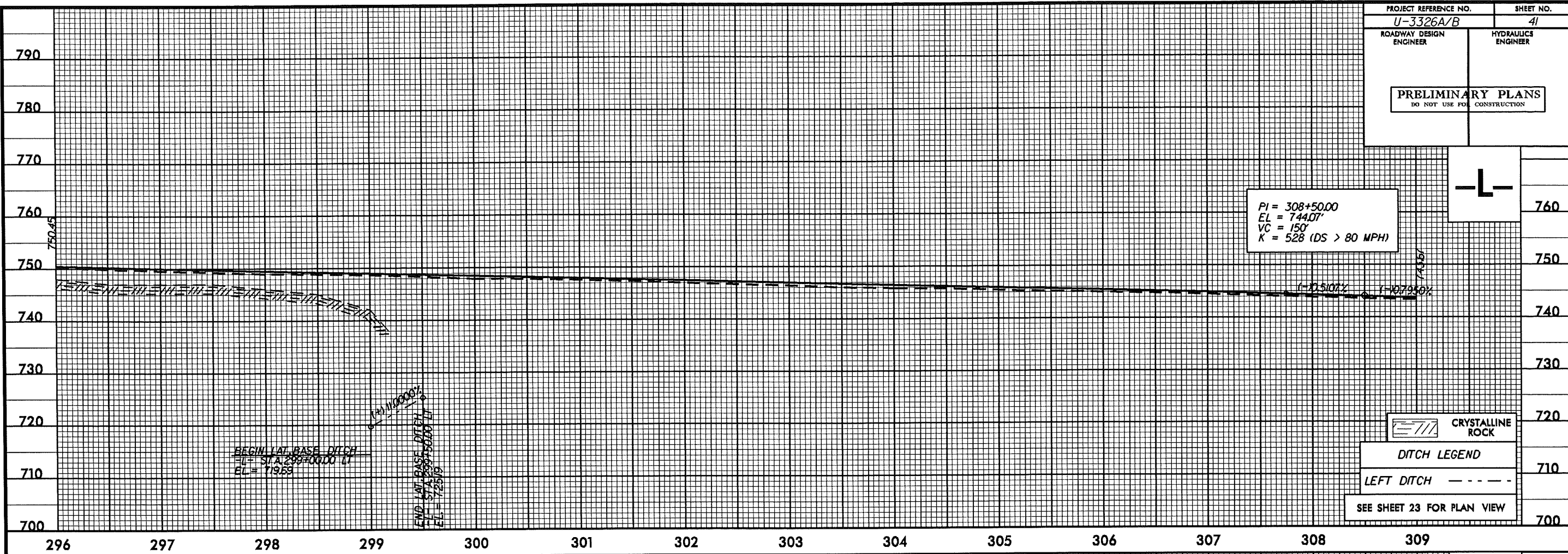
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p3326.dwg

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 41	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



PI = 308+50.00
EL = 744.07'
VC = 150'
K = 528 (DS > 80 MPH)

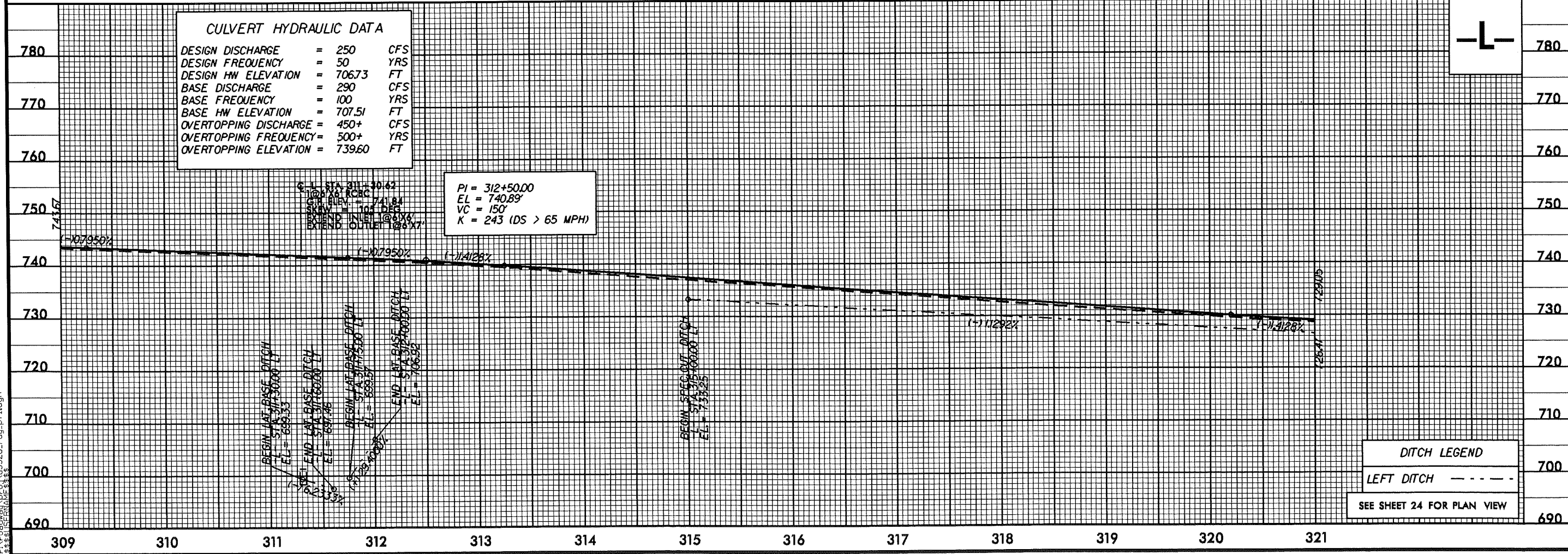
	CRYSTALLINE ROCK
DITCH LEGEND	
LEFT DITCH - - - - -	
SEE SHEET 23 FOR PLAN VIEW	



CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	=	250 CFS
DESIGN FREQUENCY	=	50 YRS
DESIGN HW ELEVATION	=	706.73 FT
BASE DISCHARGE	=	290 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	707.51 FT
OVERTOPPING DISCHARGE	=	450+ CFS
OVERTOPPING FREQUENCY	=	500+ YRS
OVERTOPPING ELEVATION	=	739.60 FT

PI = 312+50.00
EL = 740.89'
VC = 150'
K = 243 (DS > 65 MPH)

DITCH LEGEND	
LEFT DITCH - - - - -	
SEE SHEET 24 FOR PLAN VIEW	



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PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 42	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

L

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	360	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	692.77	FT
BASE DISCHARGE	=	420	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	693.61	FT
OVERTOPPING DISCHARGE	=	750+	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	725.00	FT

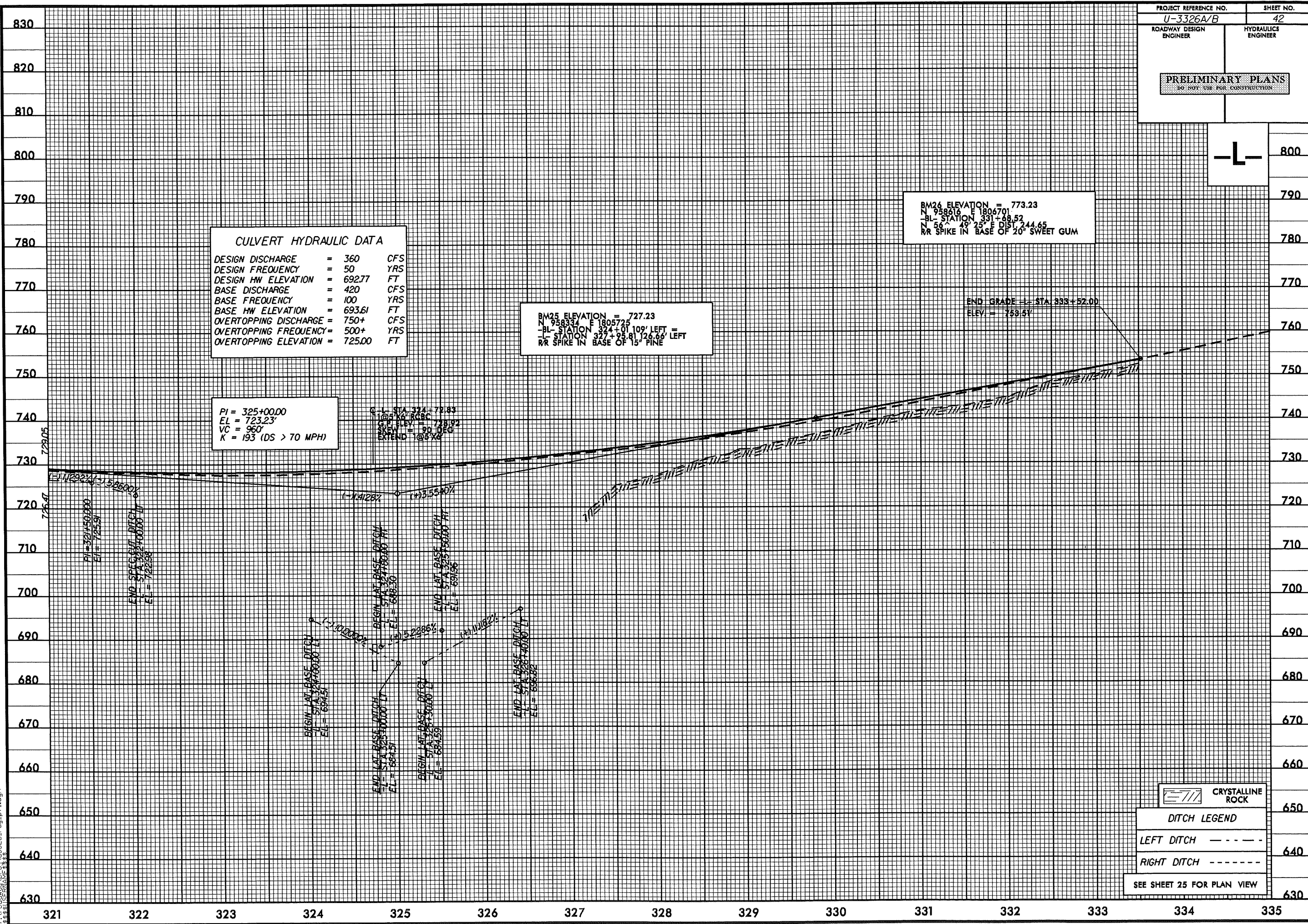
PI = 325+00.00
EL = 723.23'
VC = 960'
K = 193 (DS > 70 MPH)

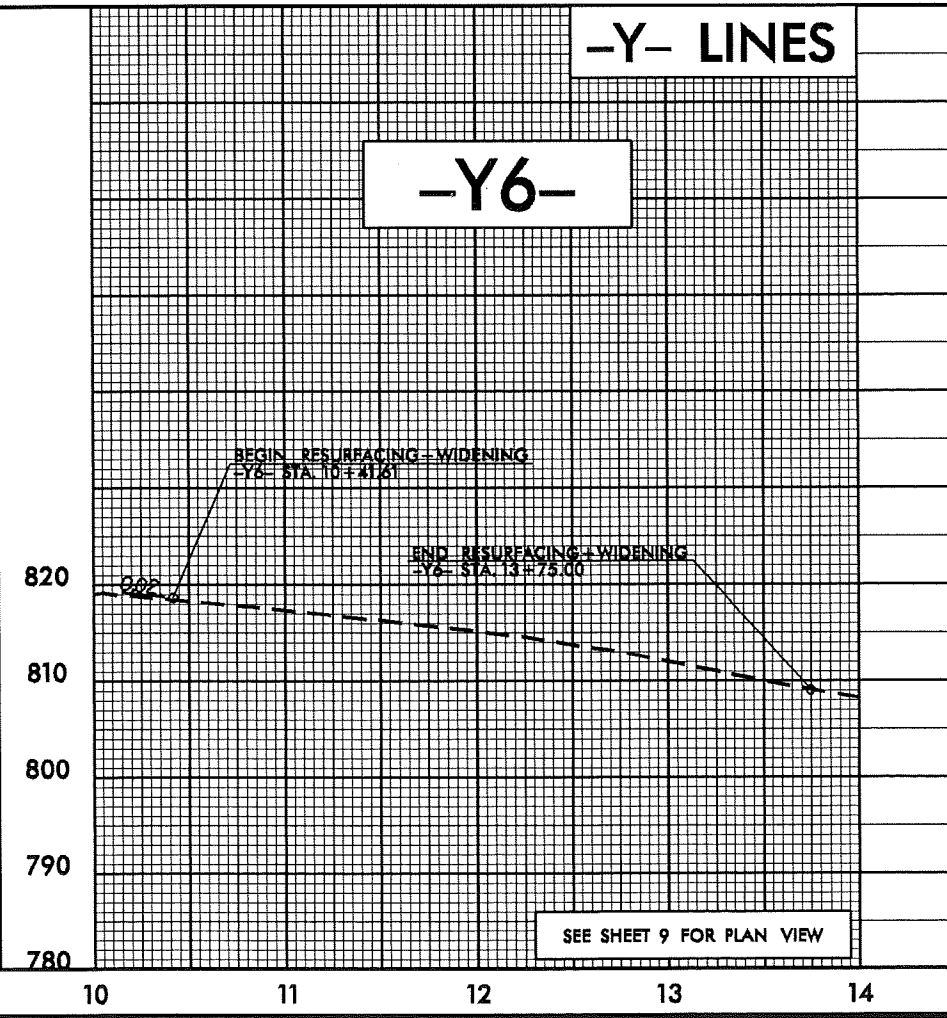
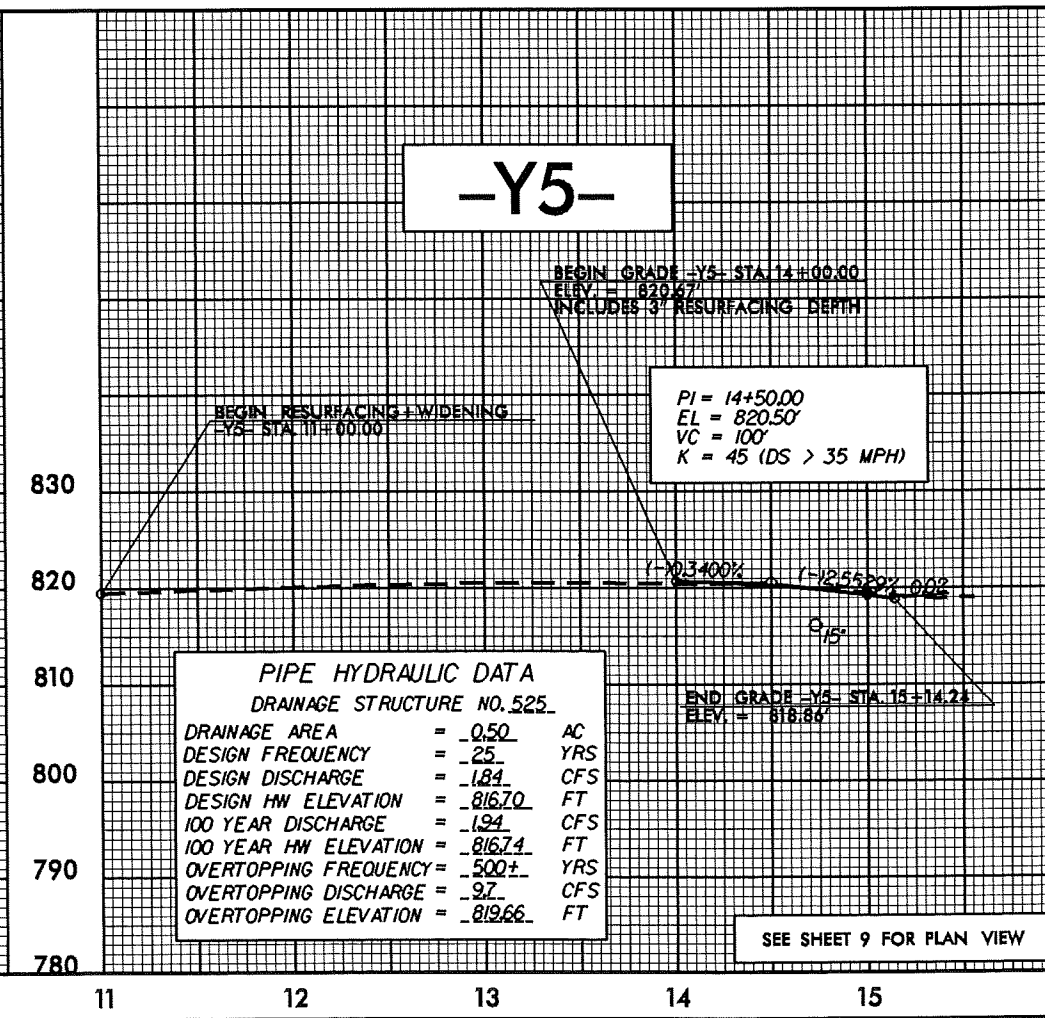
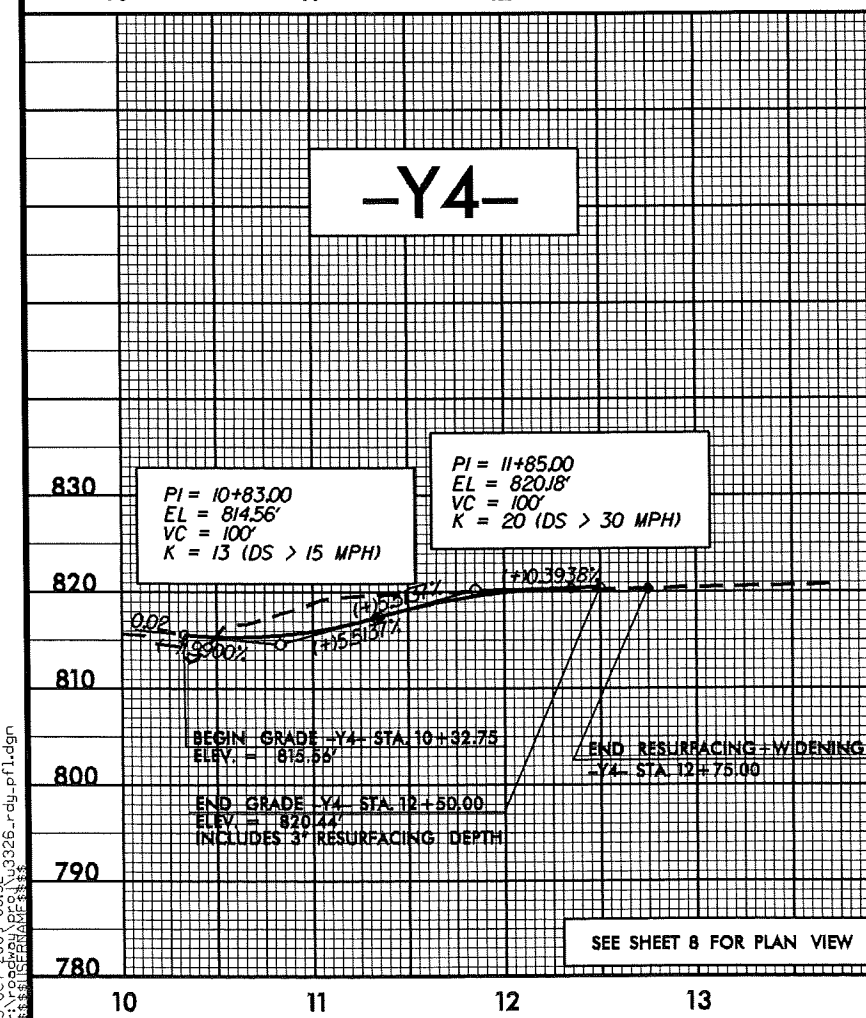
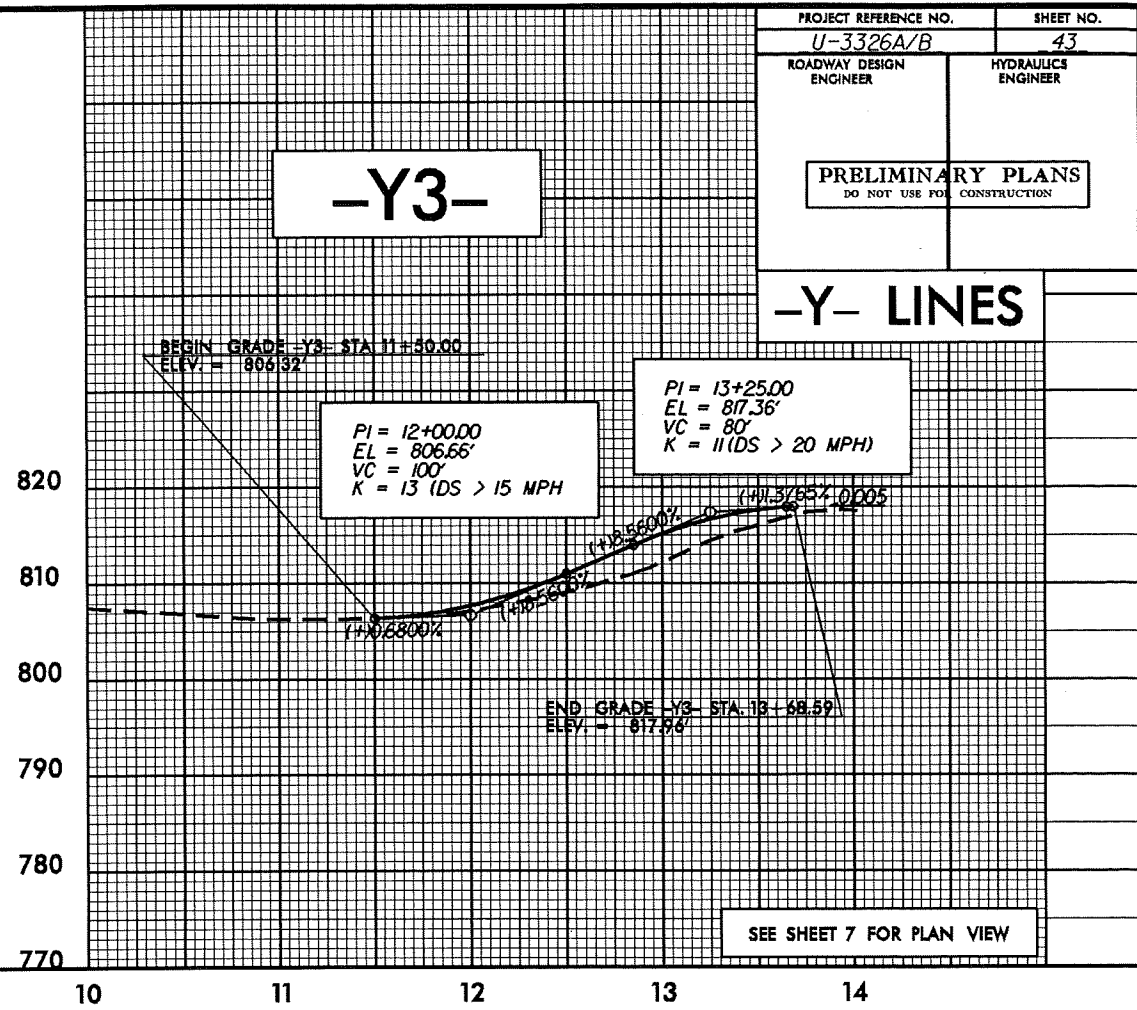
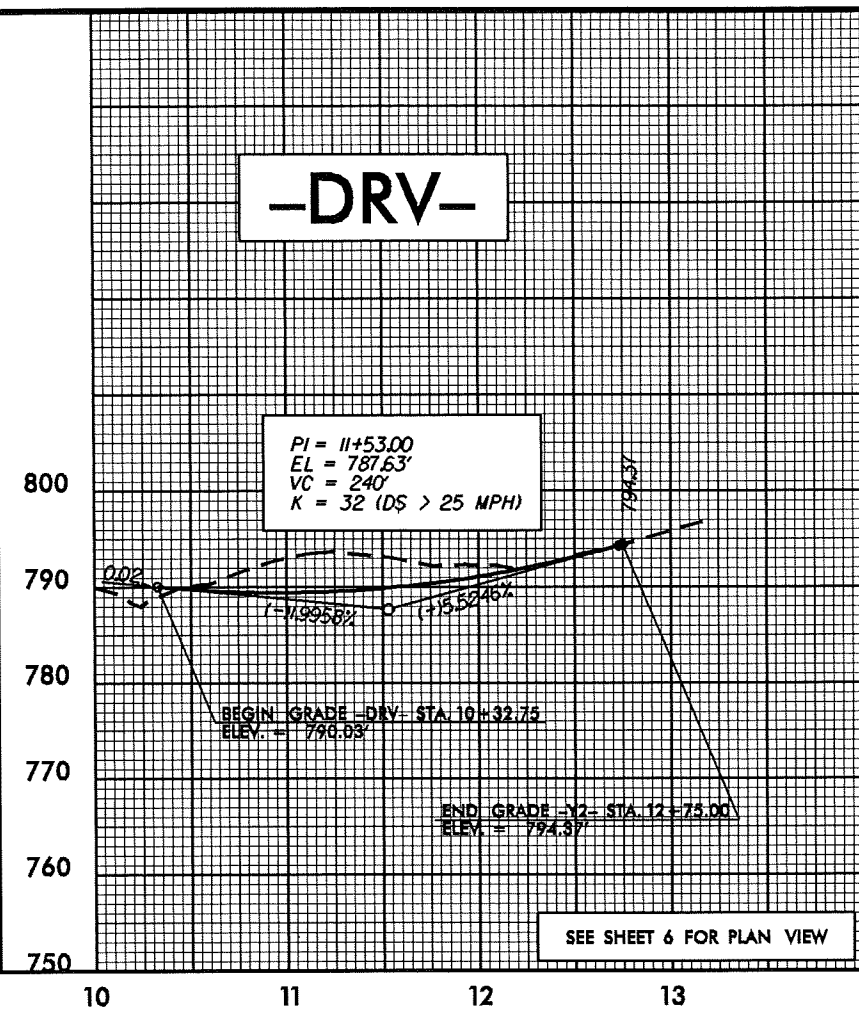
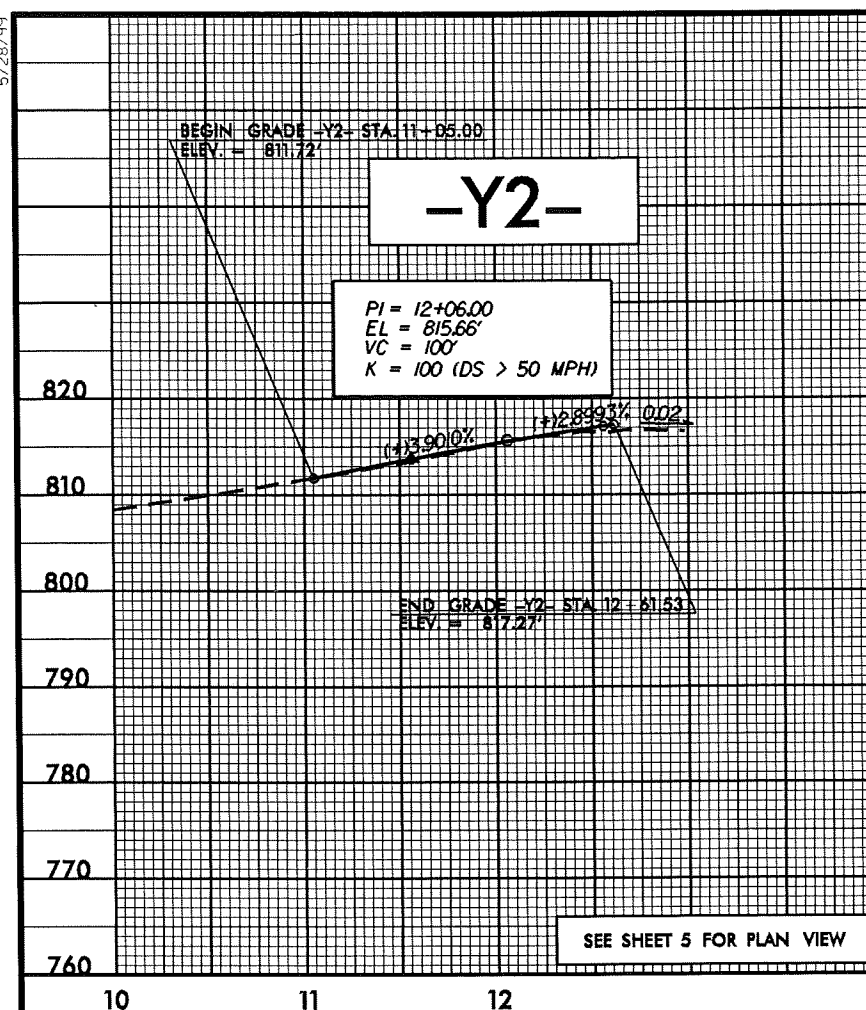
BM25 ELEVATION = 727.23
N 958334 E 1805725
-BL- STATION 324+01.109' LEFT =
-L- STATION 322+92.8126.66' LEFT
R/R SPIKE IN BASE OF 15" PINE

BM26 ELEVATION = 773.23
N 958616 E 1806701
-BL- STATION 331+68.52
N 56° 49' 25" E DIST. 244.65
R/R SPIKE IN BASE OF 20" SWEET GUM

END GRADE -L- STA 333+52.00
ELEV. = 759.51'

	CRYSTALLINE ROCK
DITCH LEGEND	
LEFT DITCH	----
RIGHT DITCH	-----
SEE SHEET 25 FOR PLAN VIEW	



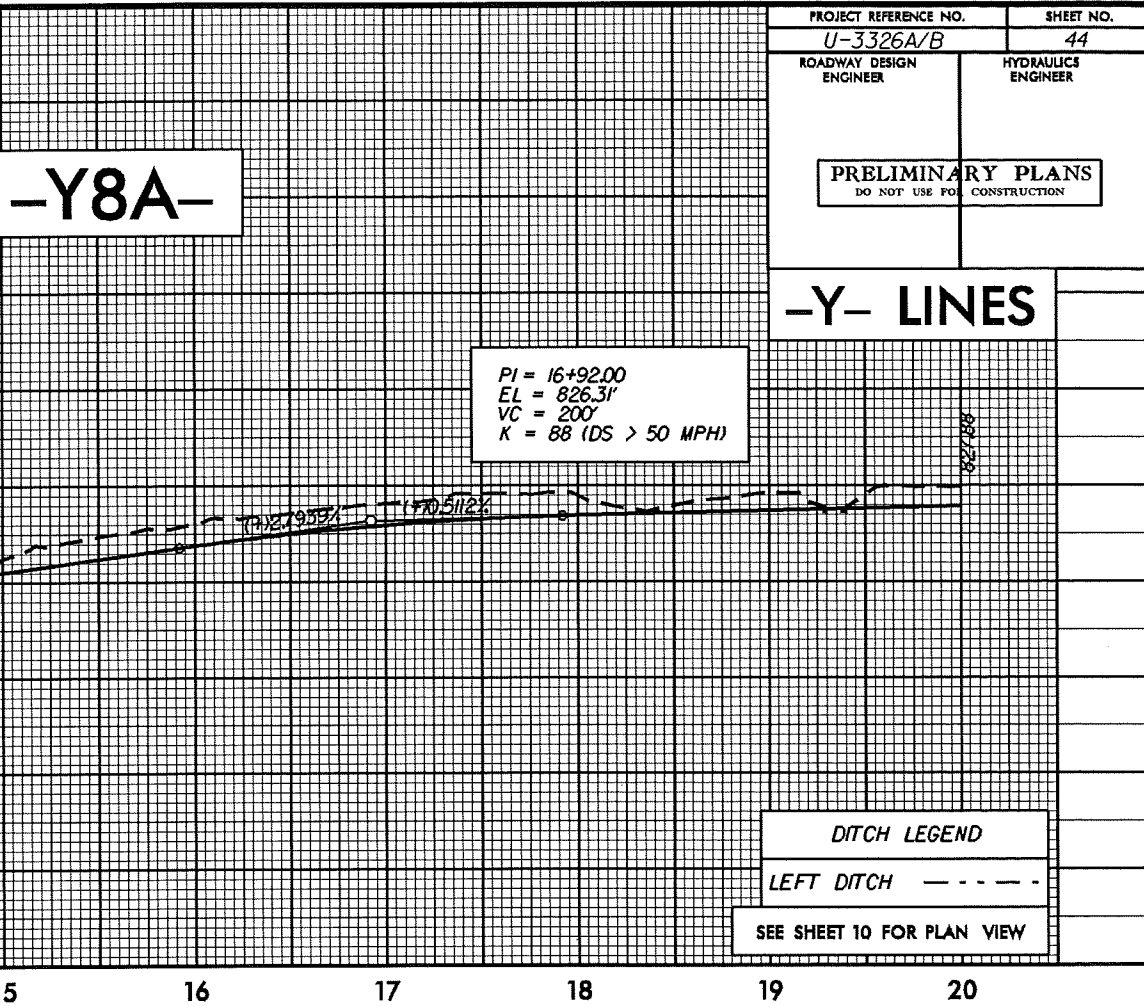
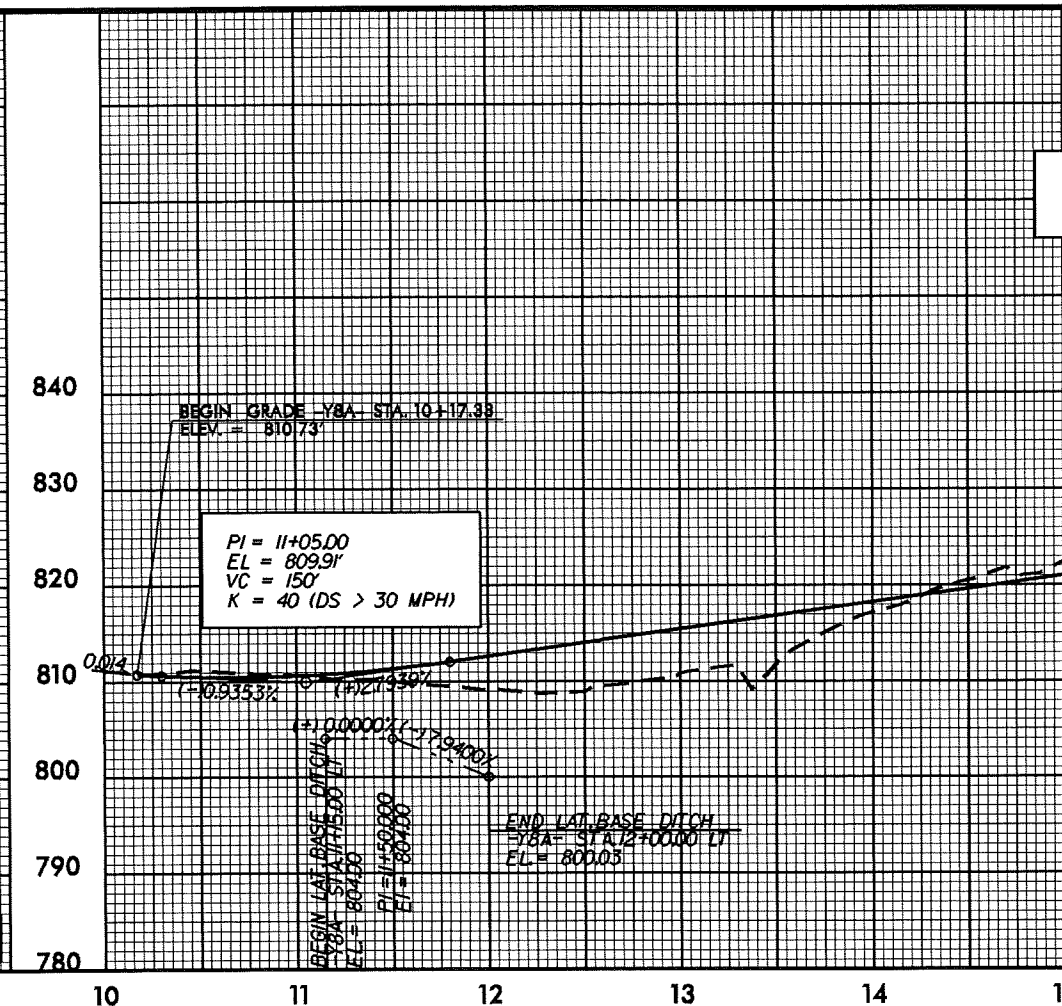
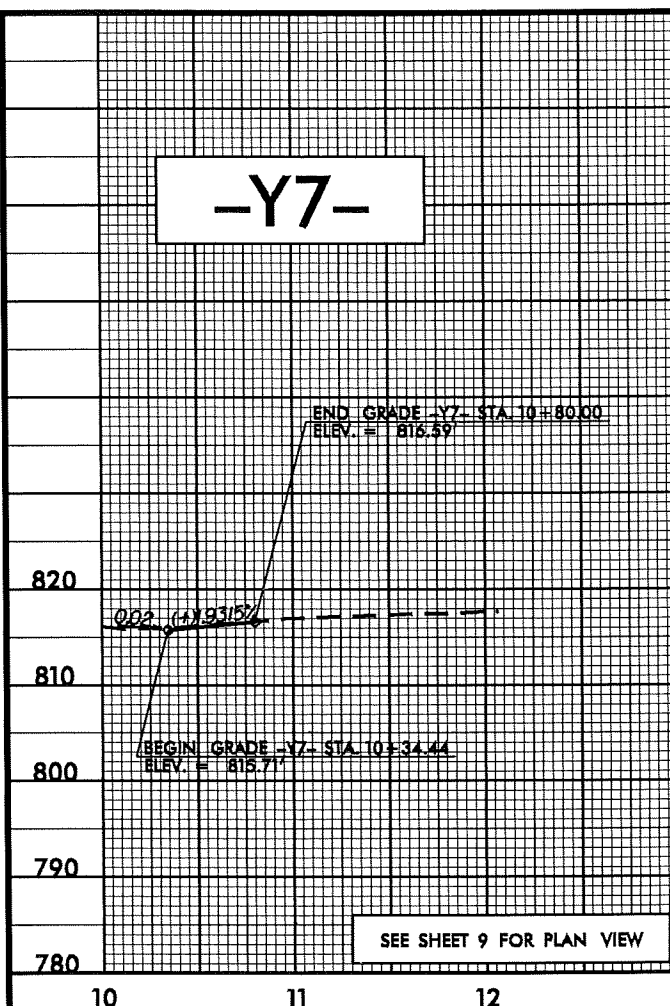


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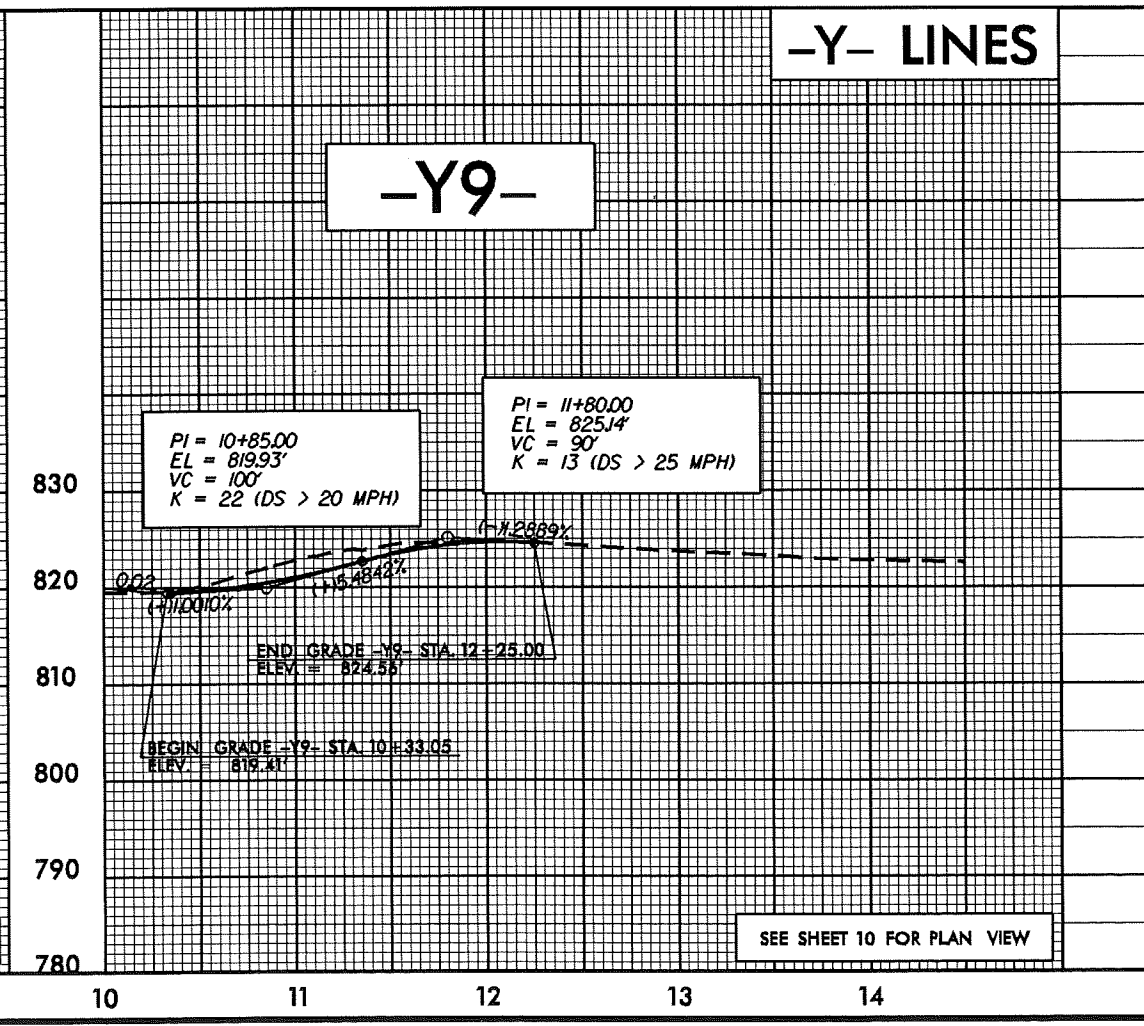
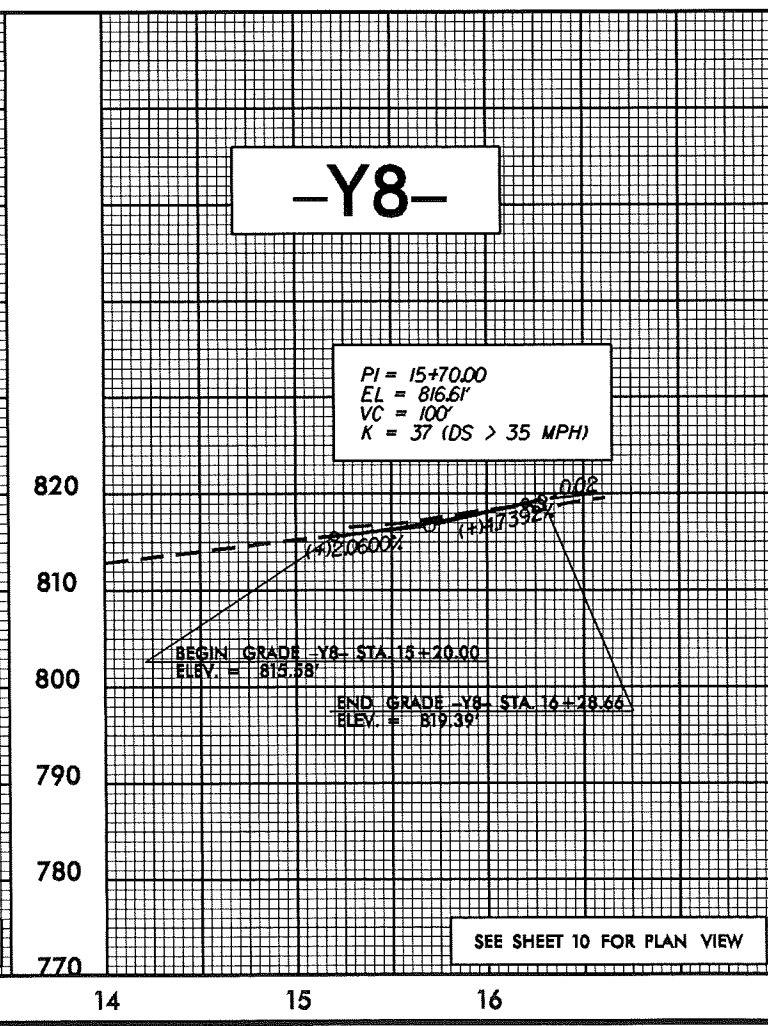
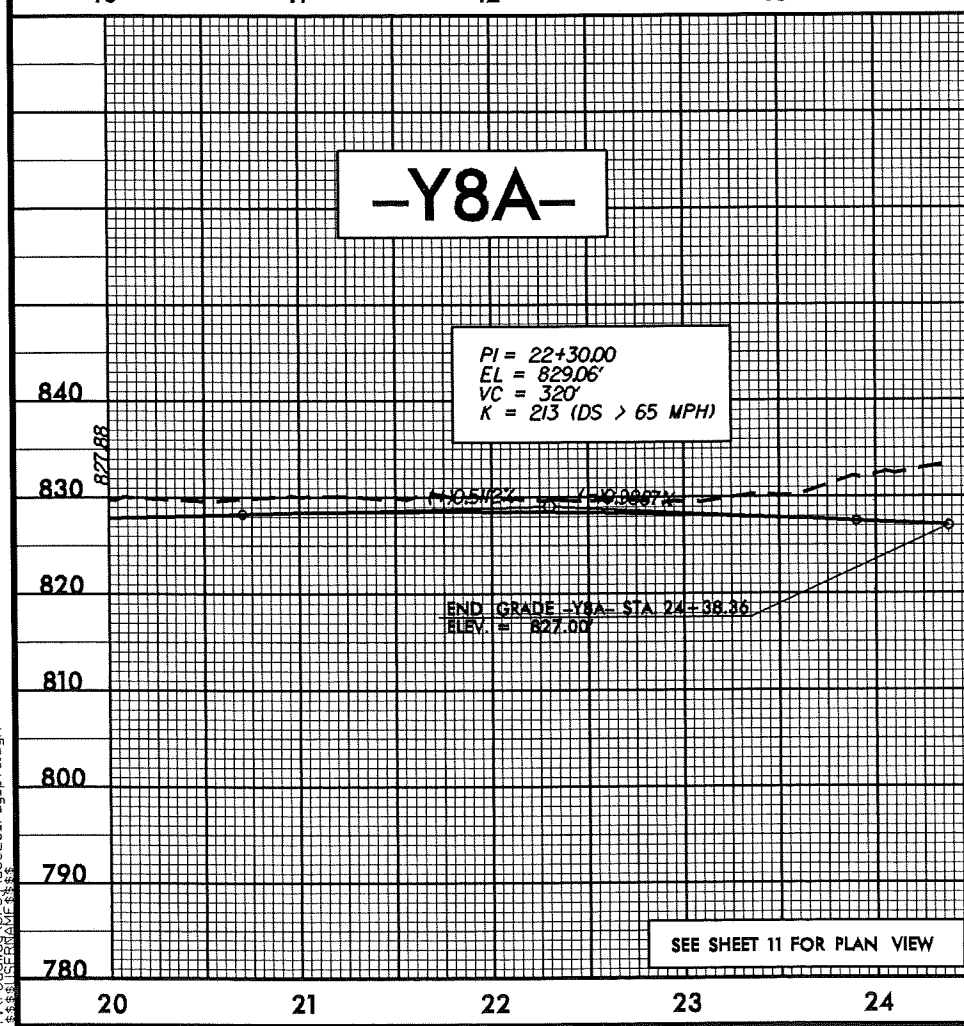
13-OCT-2009 08:52 0326.rdy.plt.dgn
13-OCT-2009 08:52 0326.rdy.plt.dgn

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

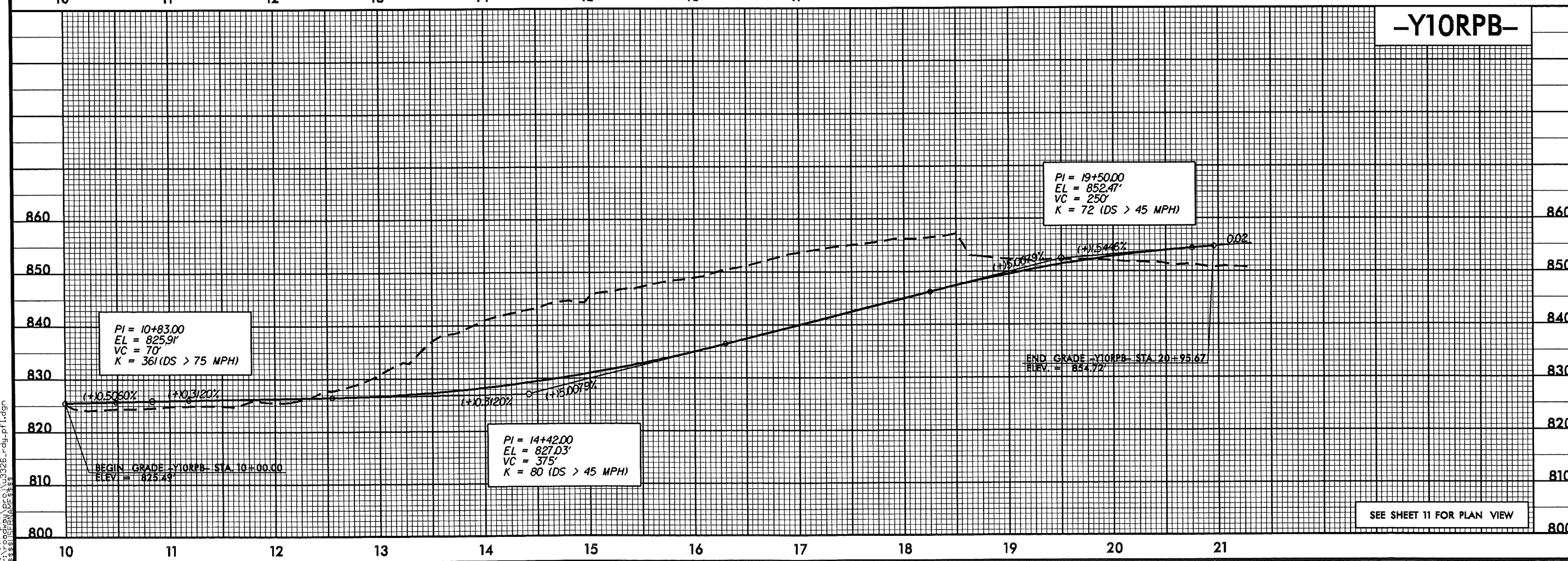
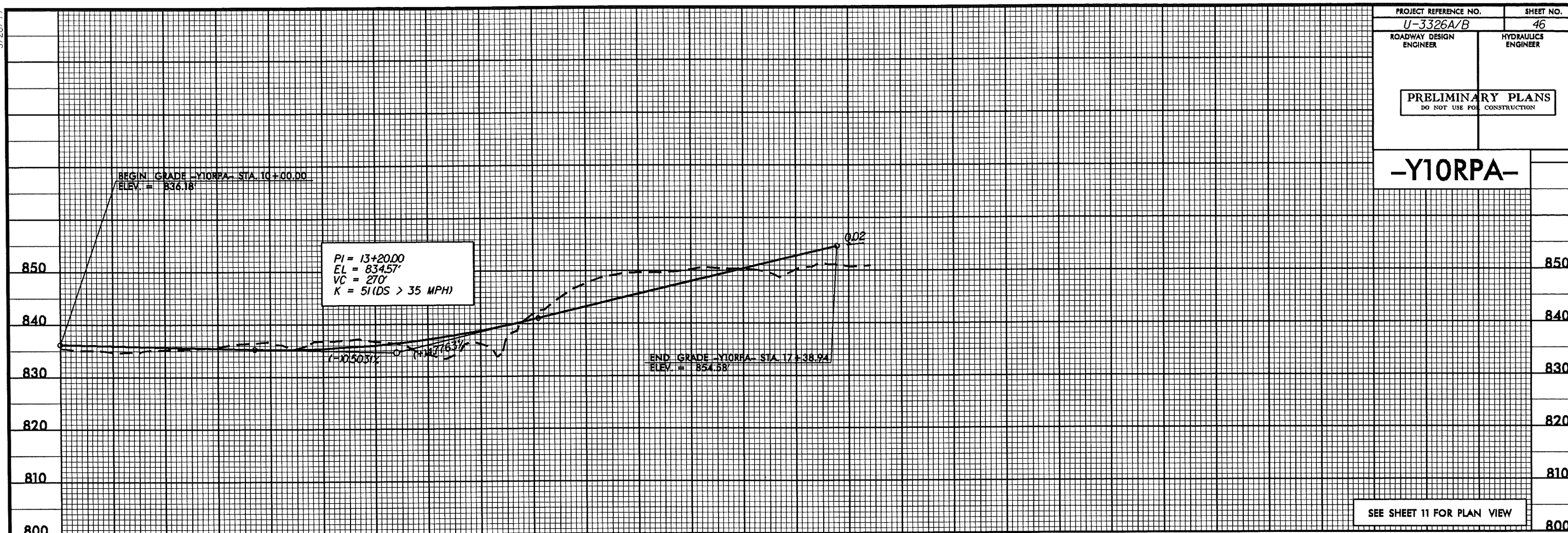
-Y- LINES



DITCH LEGEND
LEFT DITCH - - - -



-Y- LINES

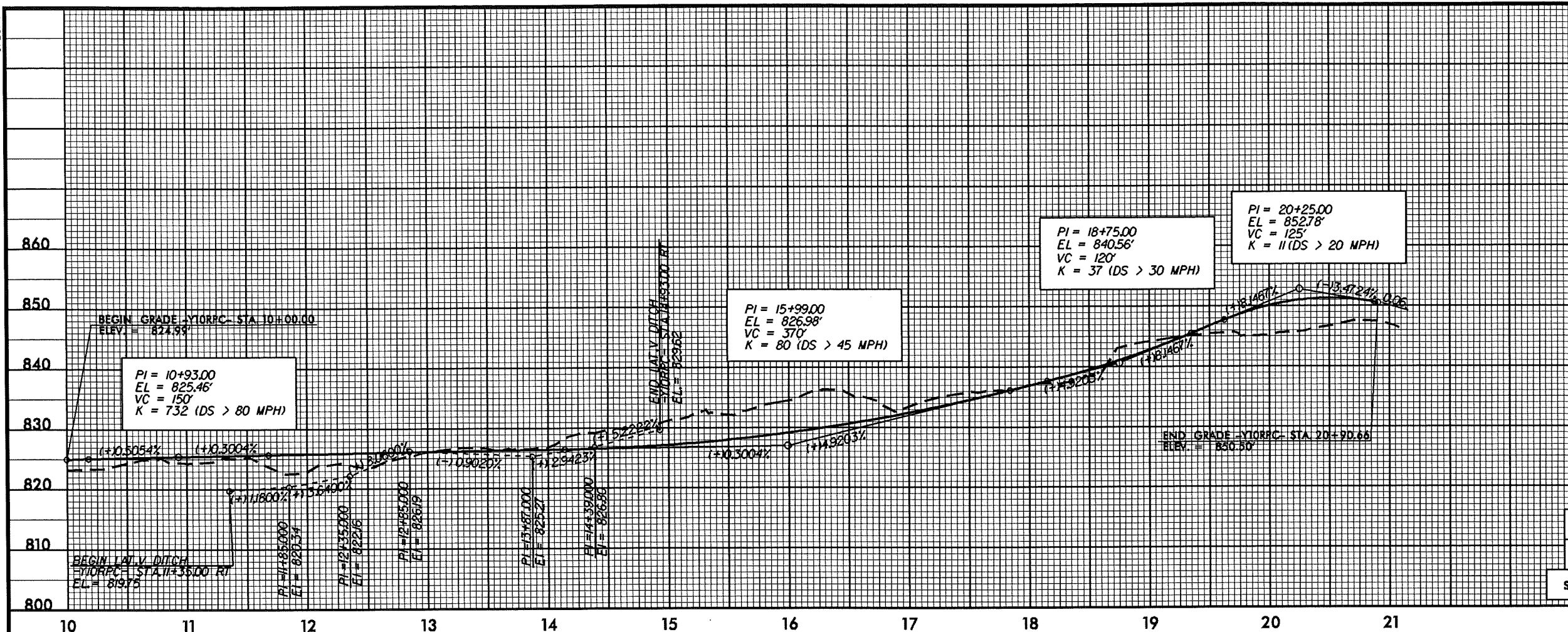


5/28/99

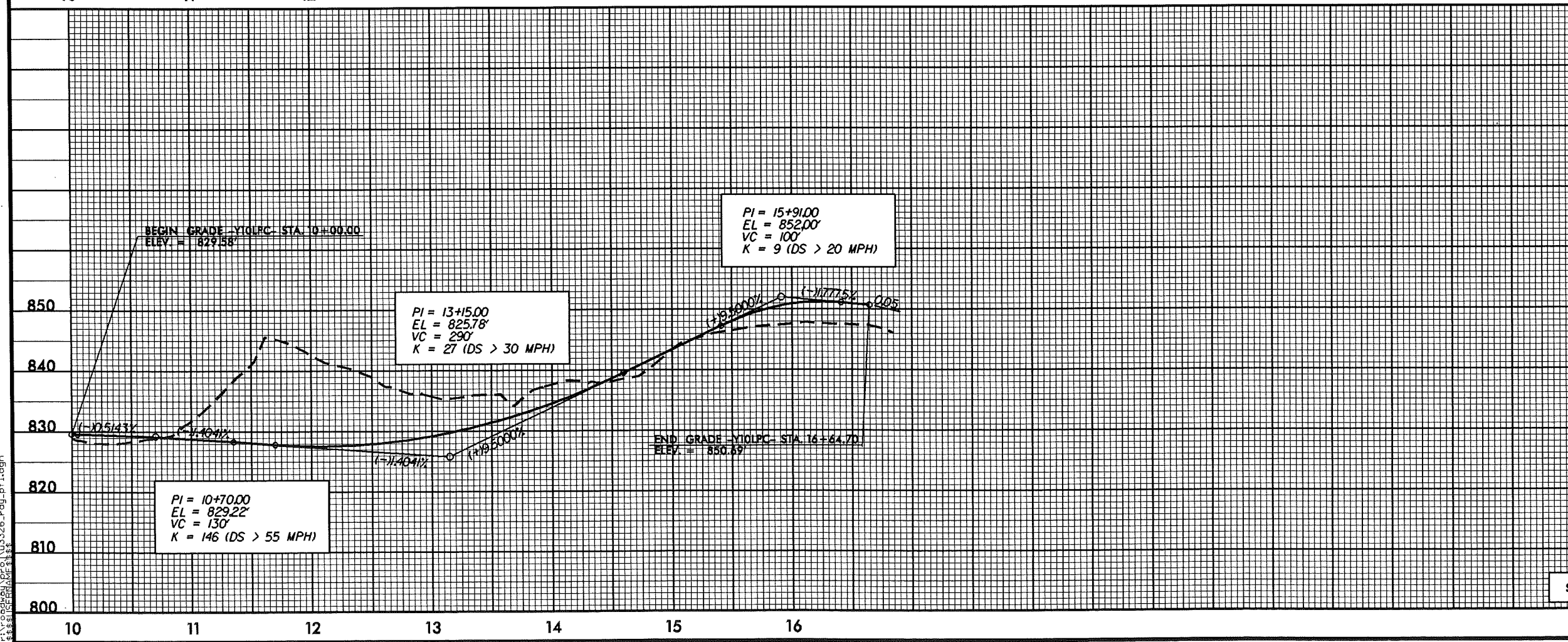
13-OCT-2009 08:52
\\v:\oedden\proj\3326.rdy.p1.dgn
3326.dwg

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y10RPC-	
	860
	850
	840
	830
	820
	810
	800
DITCH LEGEND RIGHT DITCH - - - - -	
SEE SHEET 11 FOR PLAN VIEW	



-Y10LPC-	
	850
	840
	830
	820
	810
	800
SEE SHEET 11 FOR PLAN VIEW	



5/28/99

13-OCT-2009 08:52 0326.rdy.pfl.dgn
11/10/2009 08:52 0326.rdy.pfl.dgn

PROJECT REFERENCE NO.
U-3326A/B

SHEET NO.
48

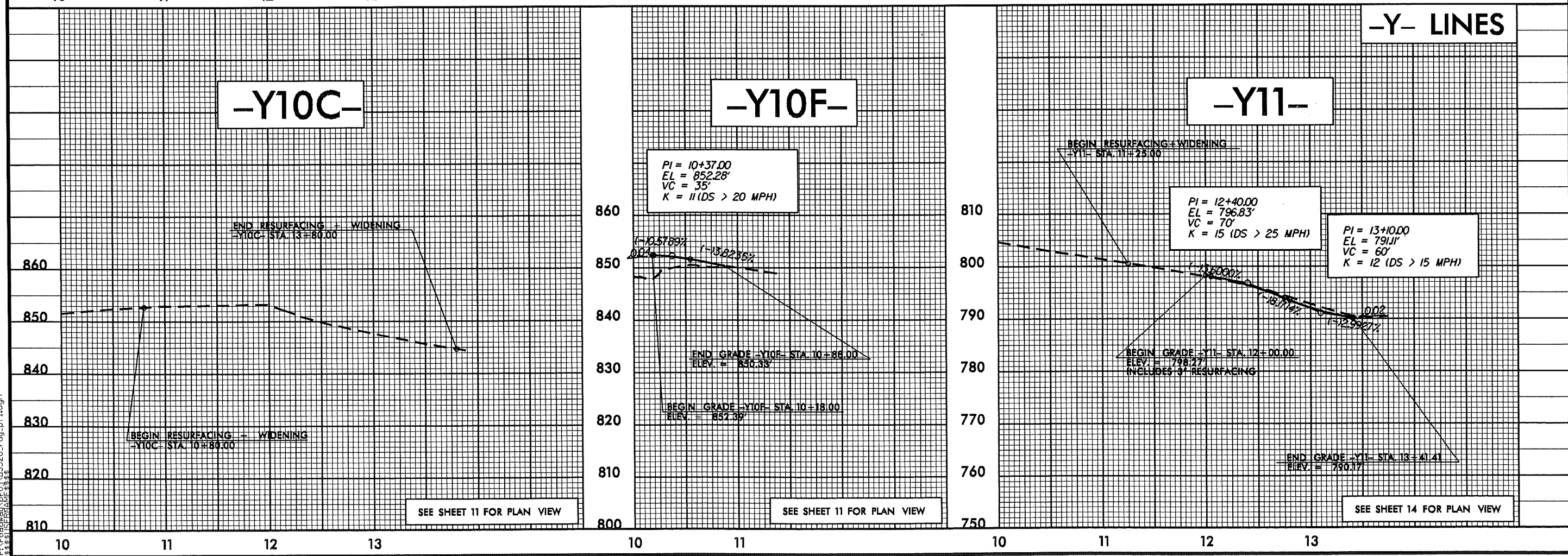
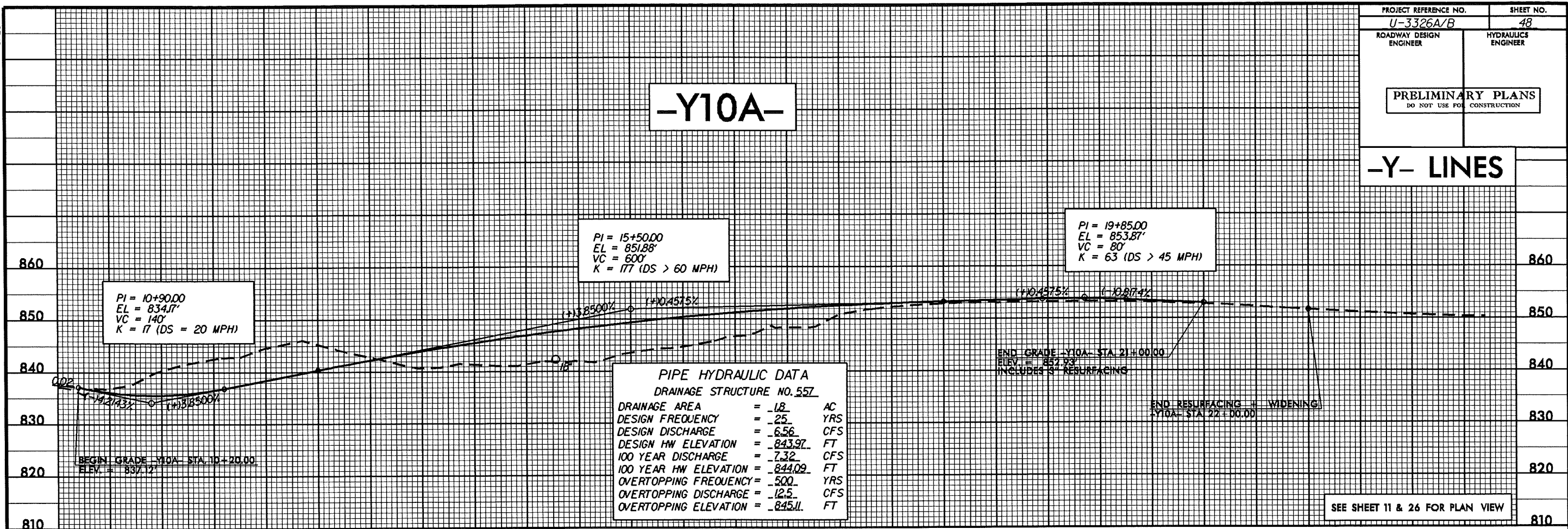
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

PRELIMINARY PLANS

DO NOT USE FOR CONSTRUCTION

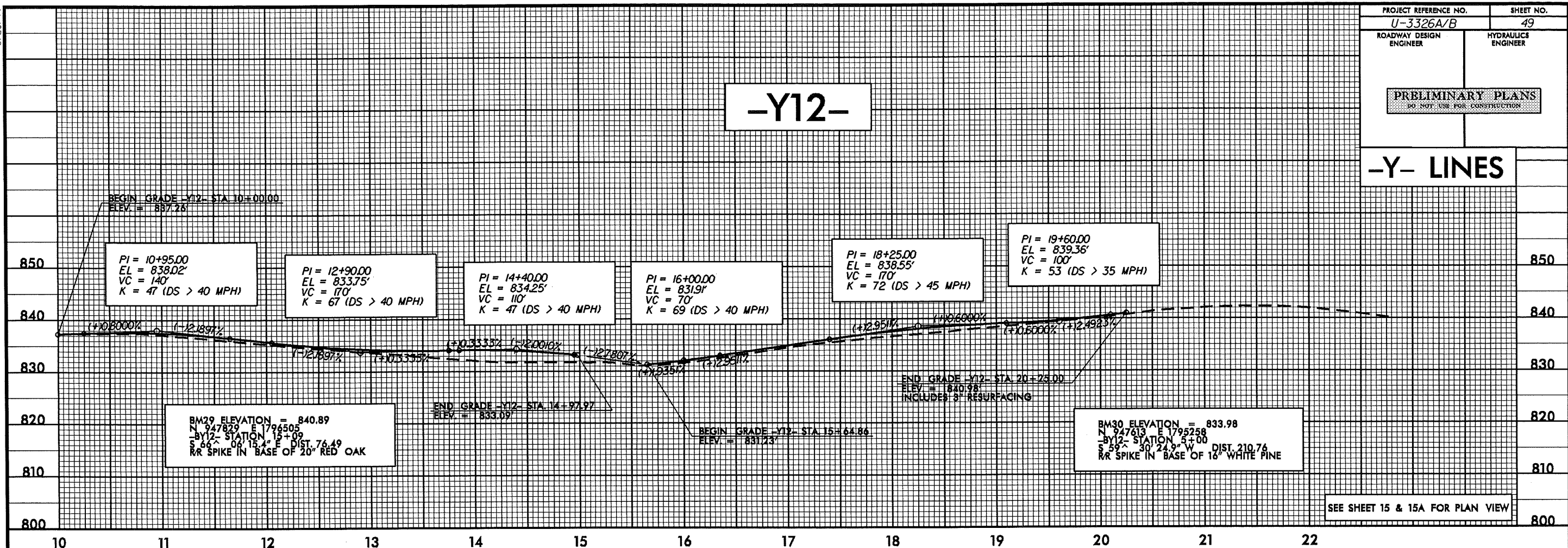
-Y- LINES



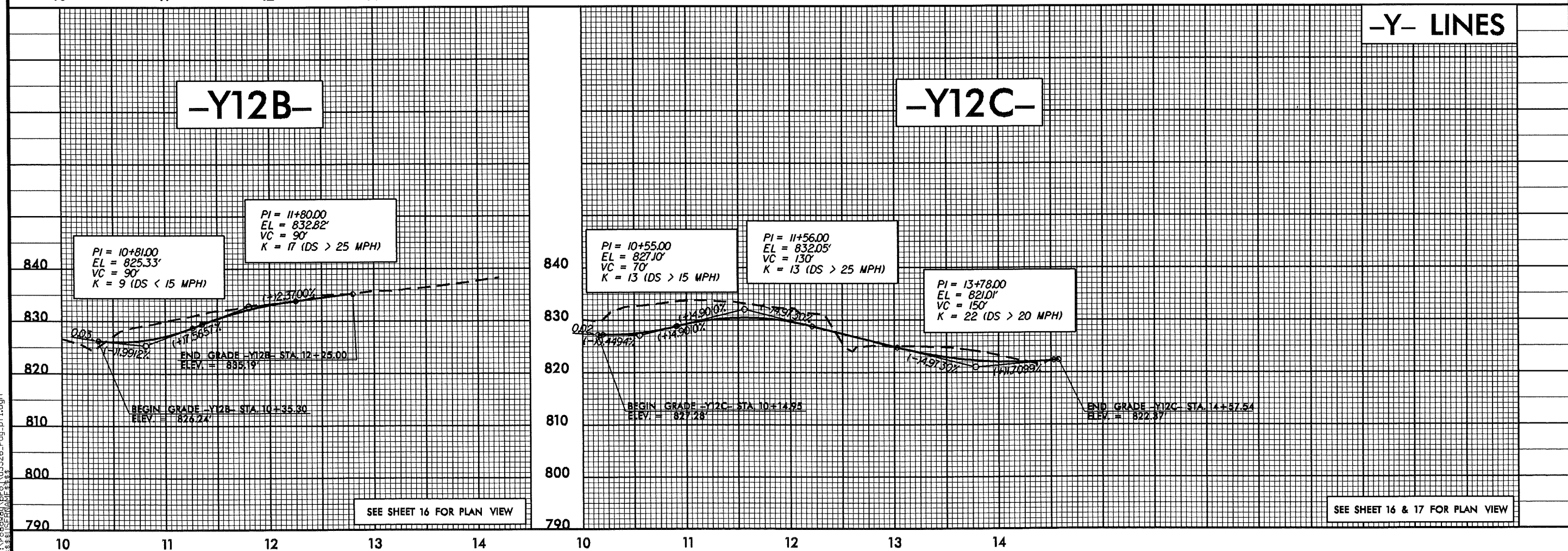
5/28/99

13-001-2009 08:52
r:\v\roadway\proj\0326-rdy-p1.dgn
3/23/2010 10:18:18

-Y- LINES



-Y- LINES



5/28/99

PROJECT REFERENCE NO.
U-3326A/B

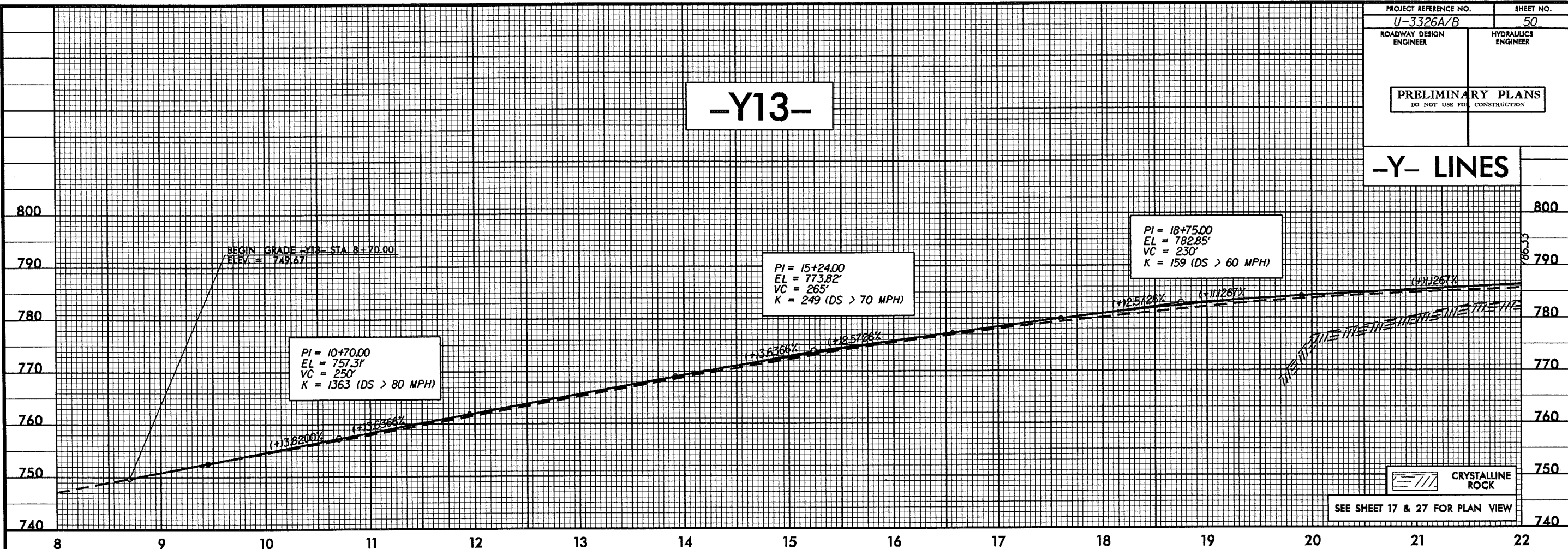
SHEET NO.
50

ROADWAY DESIGN
ENGINEER

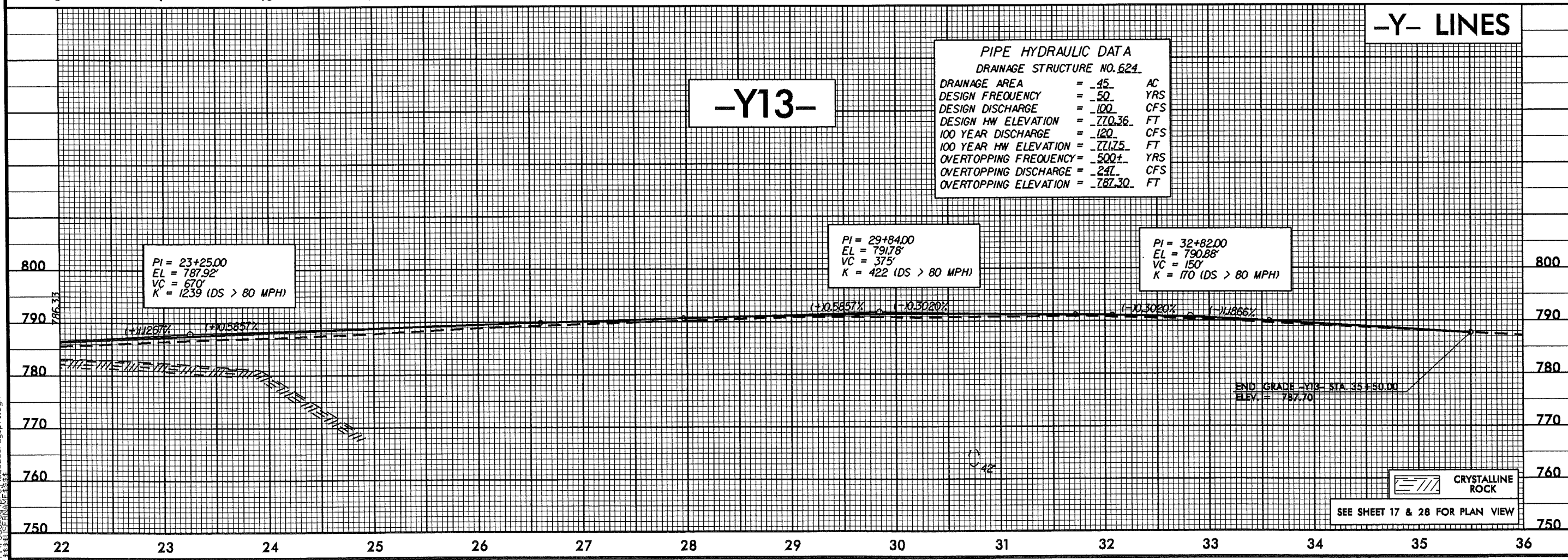
HYDRAULICS
ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y- LINES



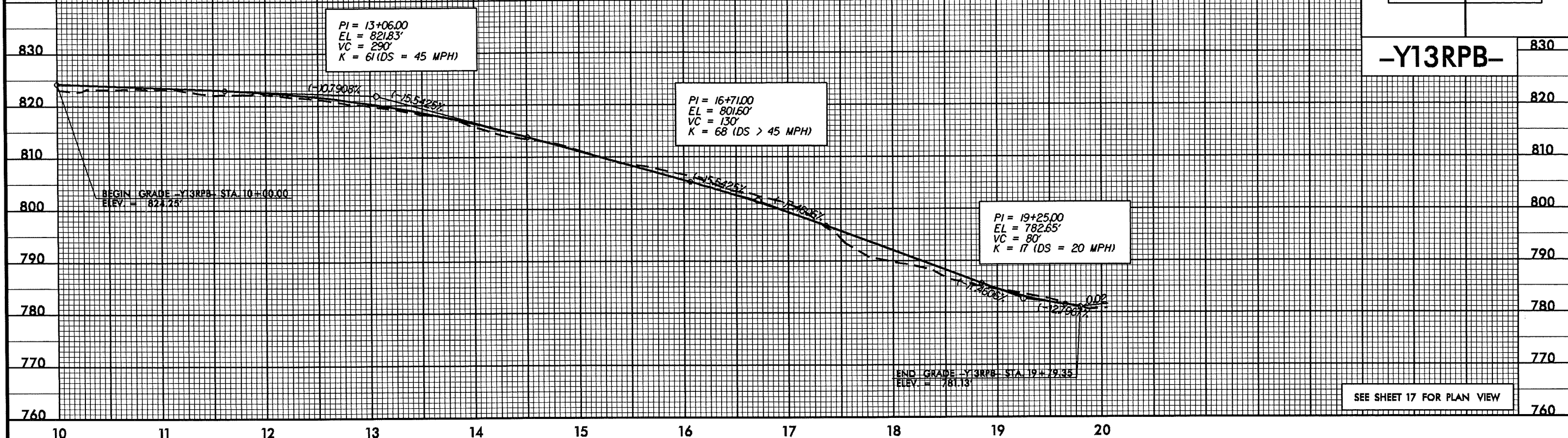
13-OCT-2009 08:52 0326.rdy.pfl.dgn
13-OCT-2009 08:52 0326.rdy.pfl.dgn



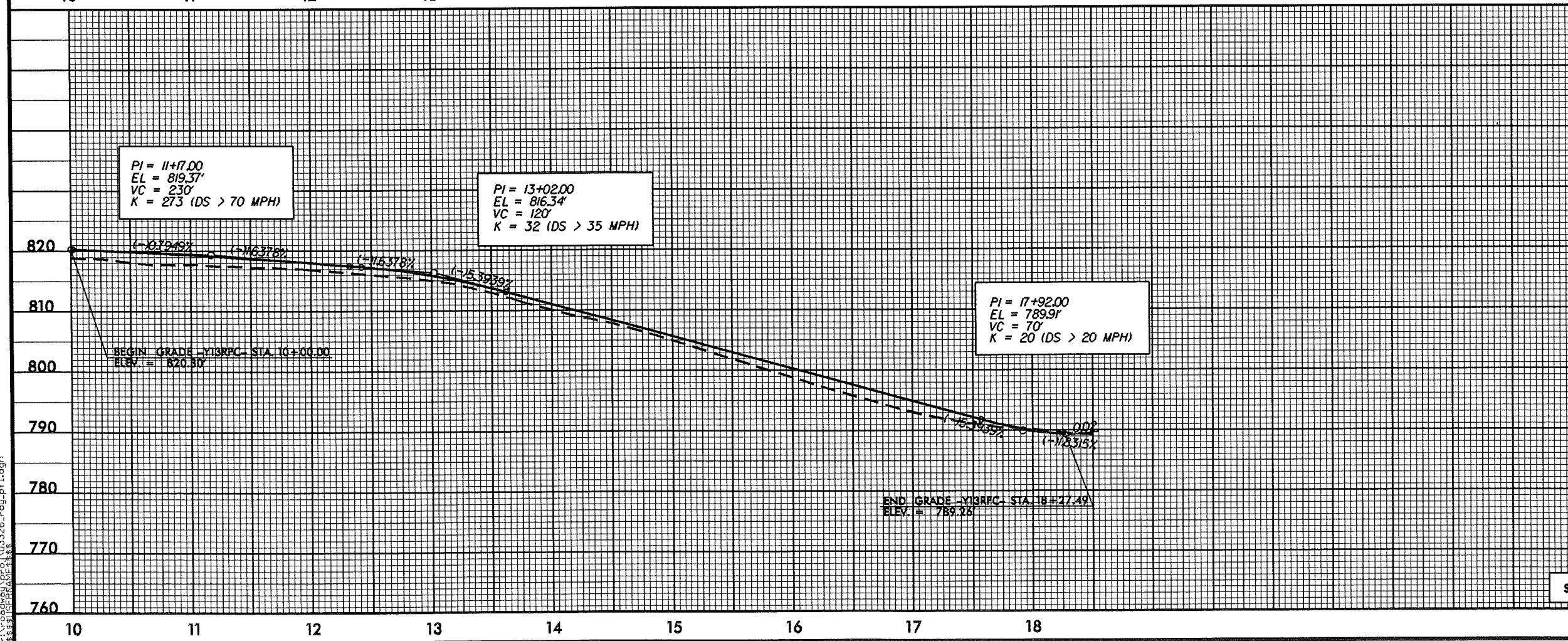
5/28/99

13-OCT-2009 08:52
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3326-rdy-pl.dwg

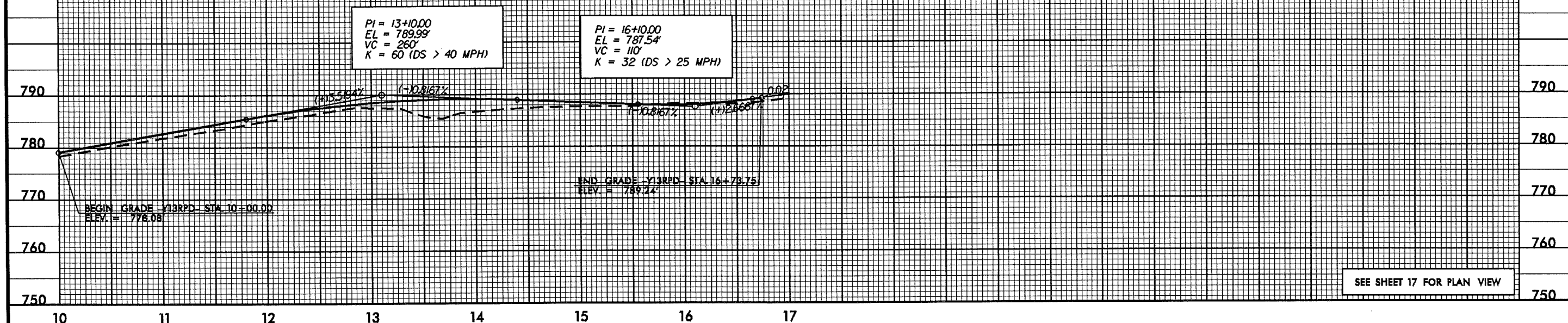
PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 51	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
-Y13RPB-		830	



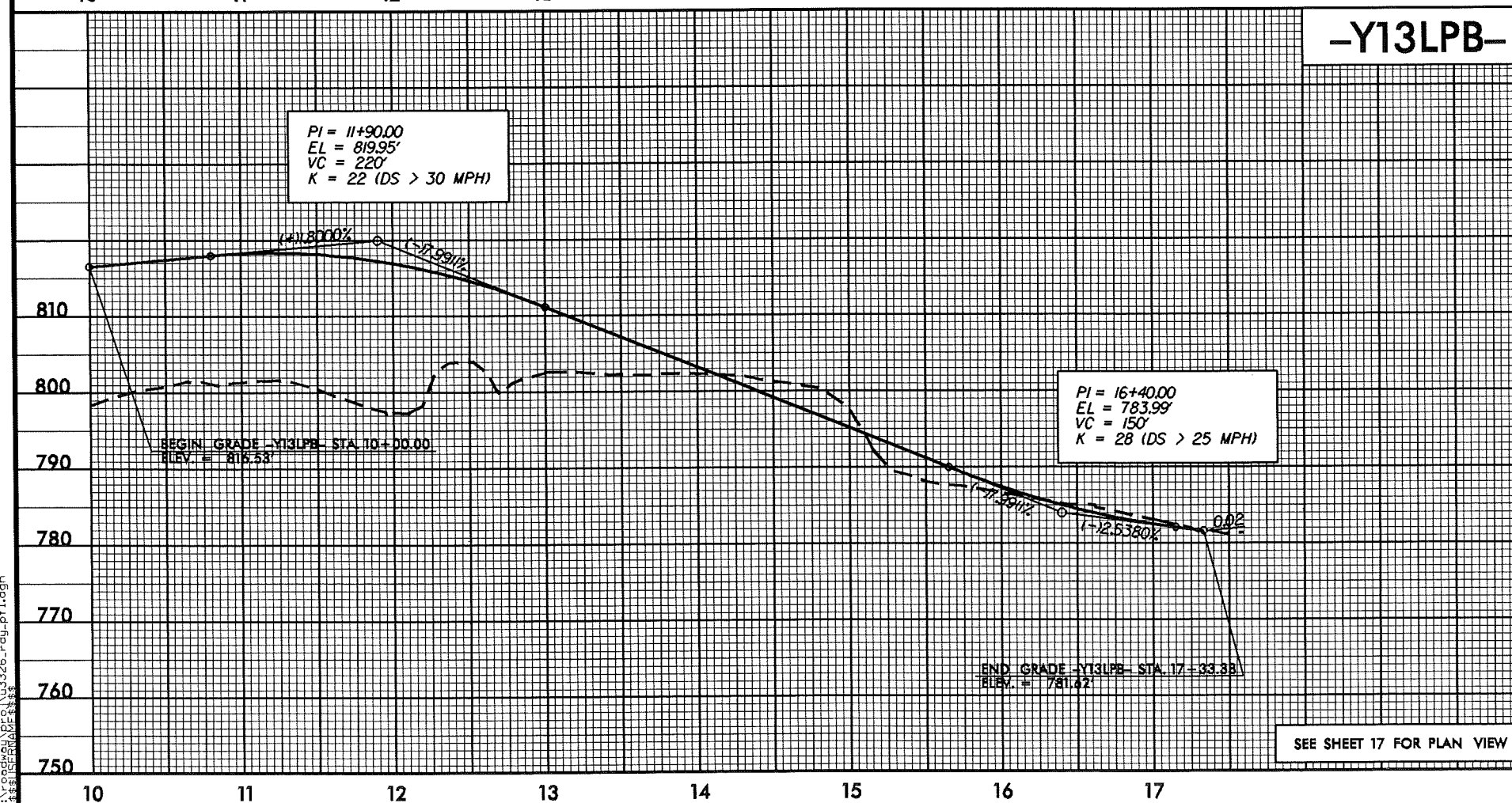
-Y13RPC-		820	
		810	
		800	
		790	
		780	
		770	
		760	
SEE SHEET 17 FOR PLAN VIEW			



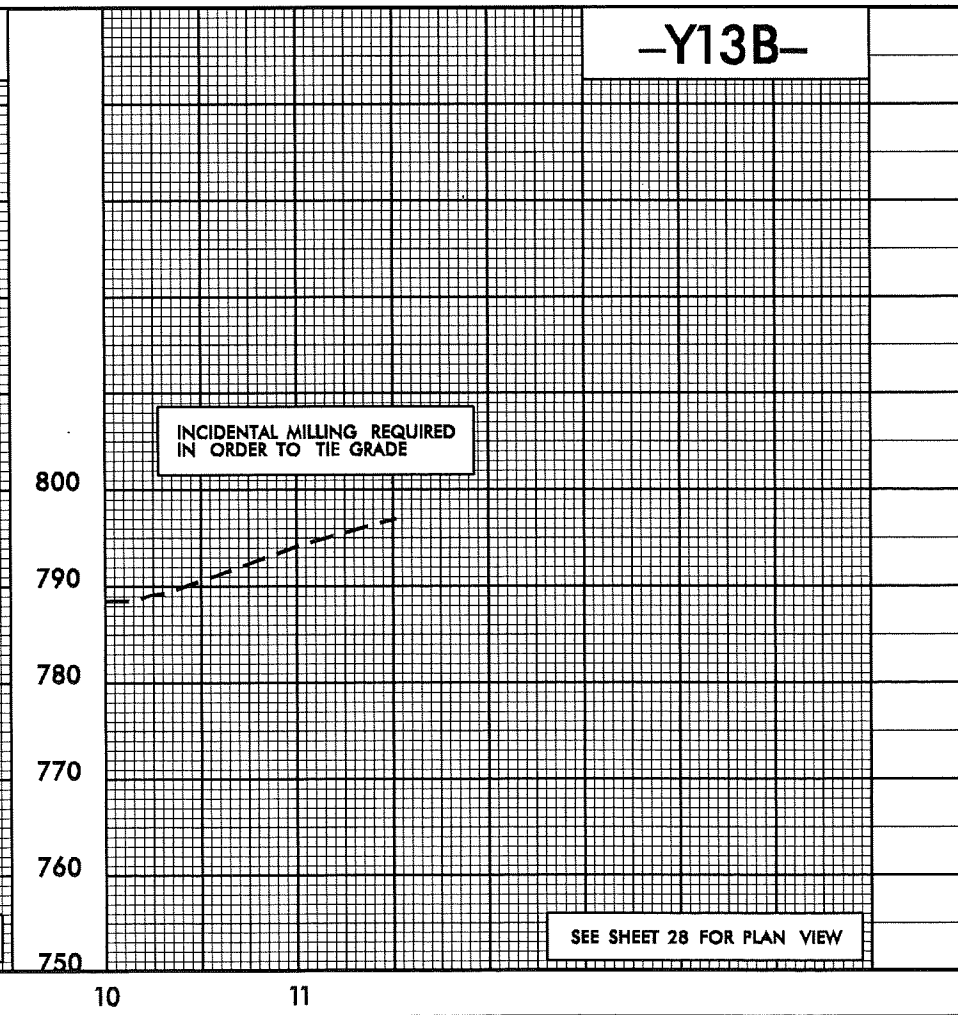
-Y13RPD-



-Y13LPB-



-Y13B-

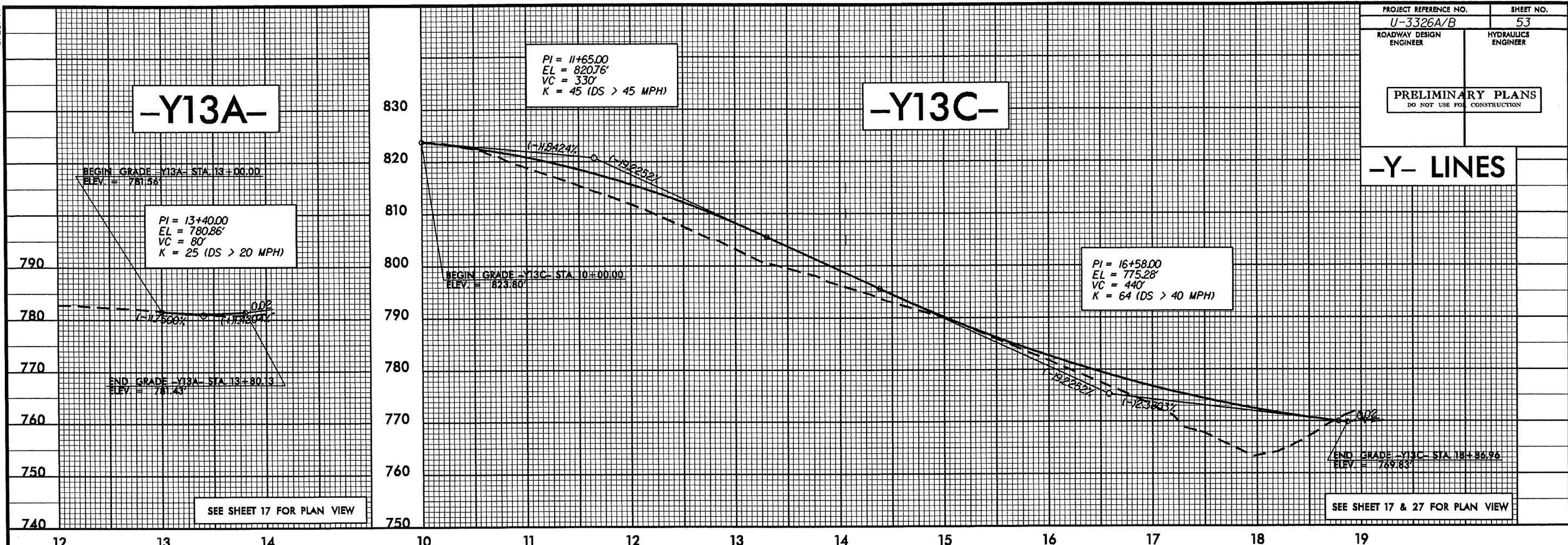


5/28/99

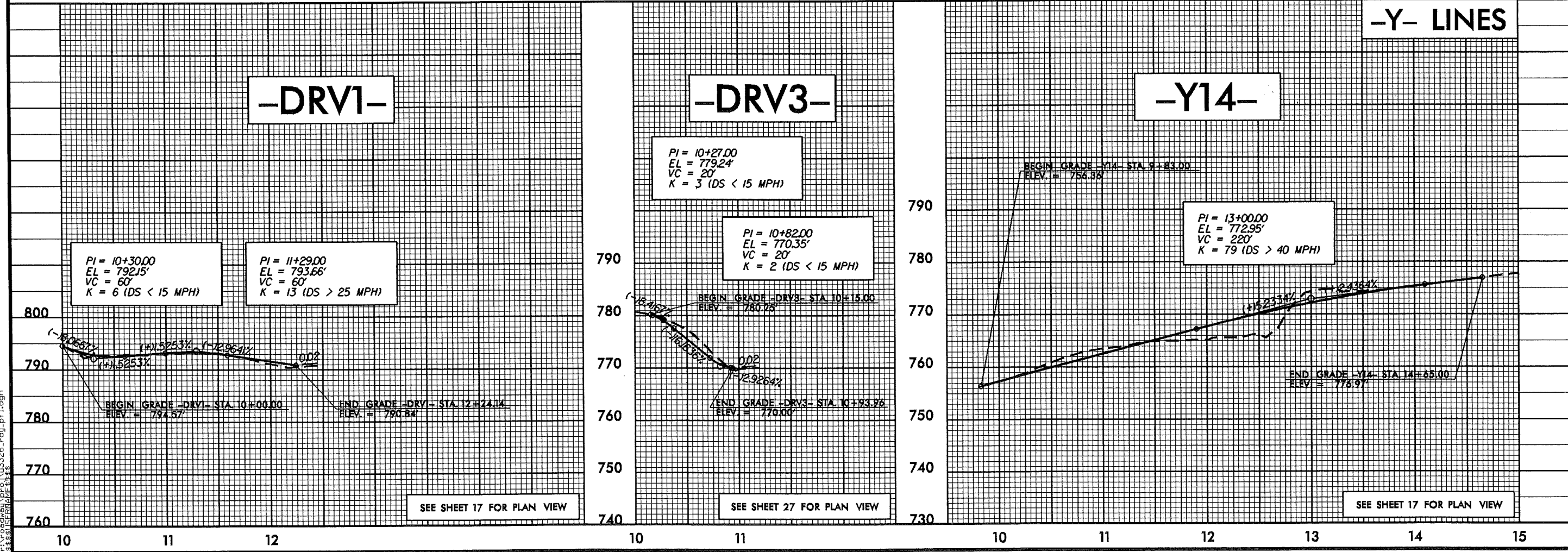
13-OCT-2009 08:52
\\vooden\proj\3326.rdy.pfl.dgn
3326-PLAN-533

PROJECT REFERENCE NO. U-3326A/B	SHEET NO. 53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y- LINES



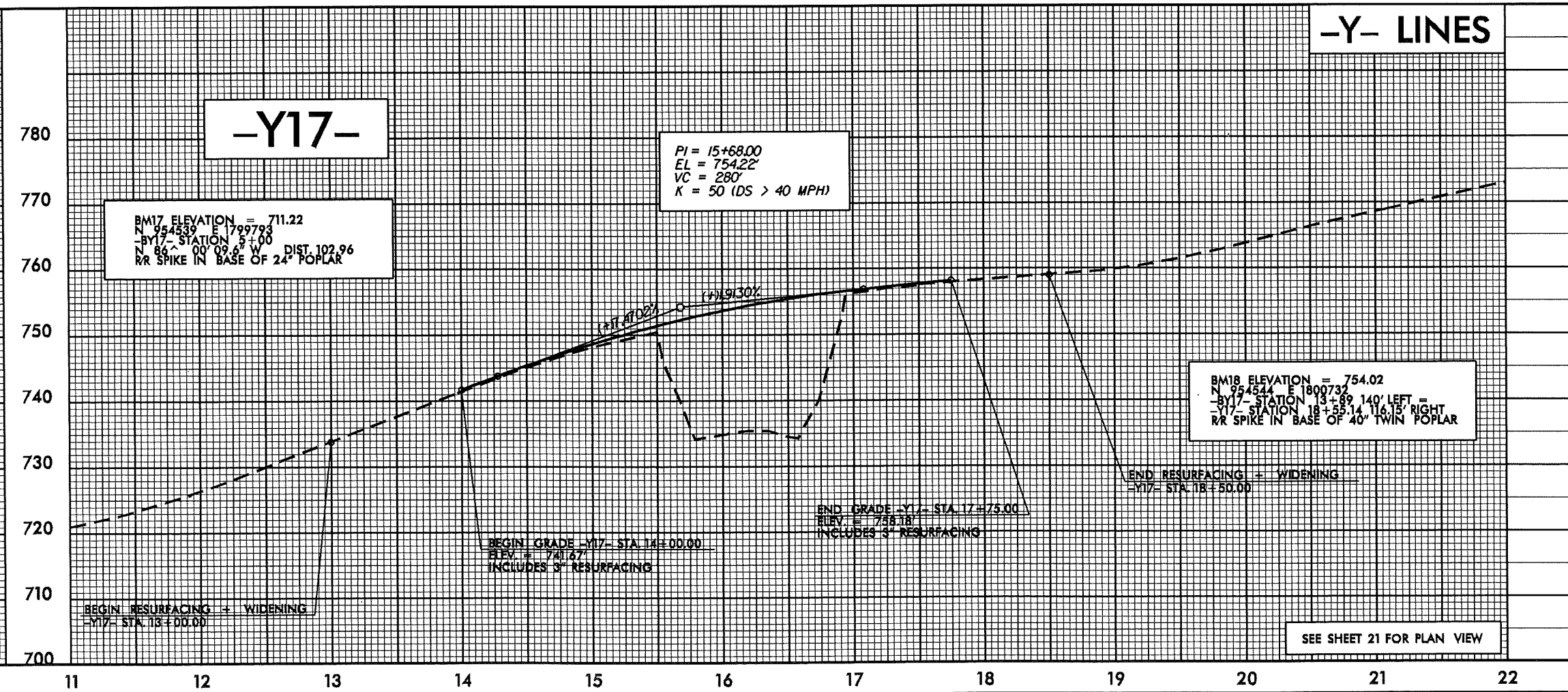
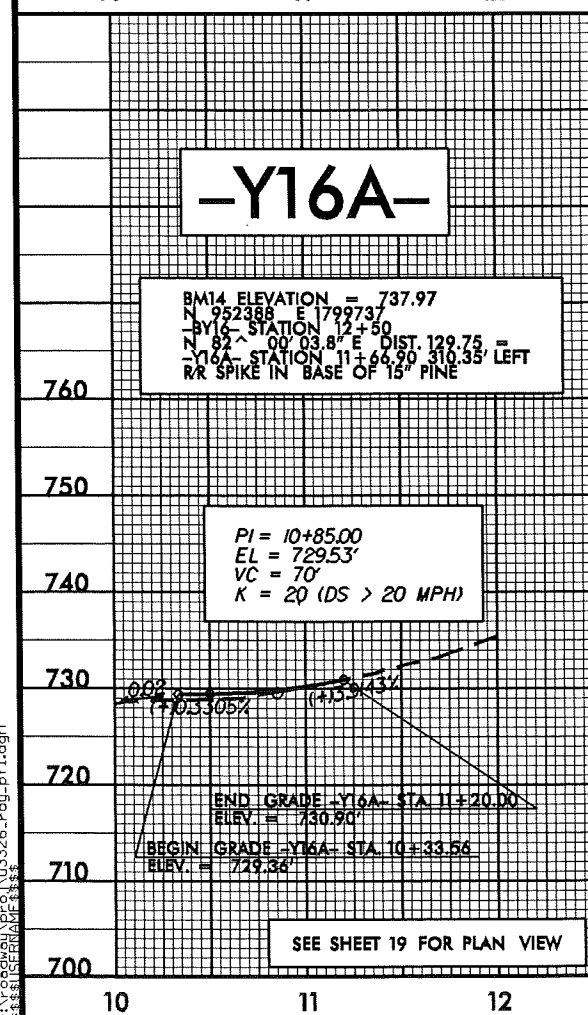
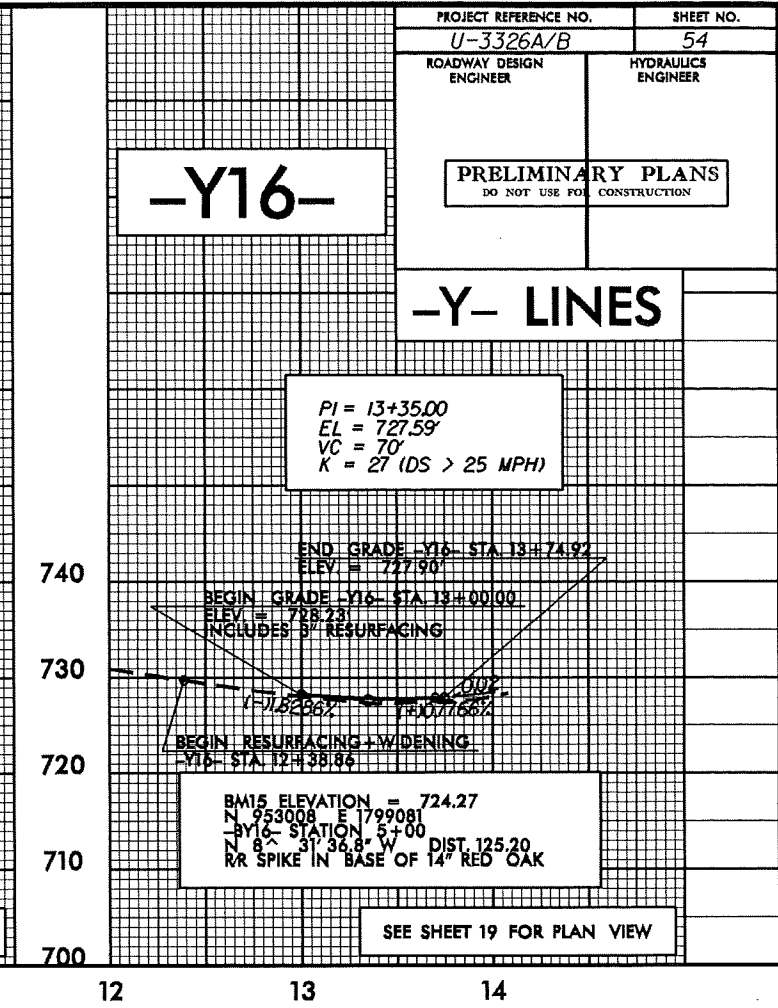
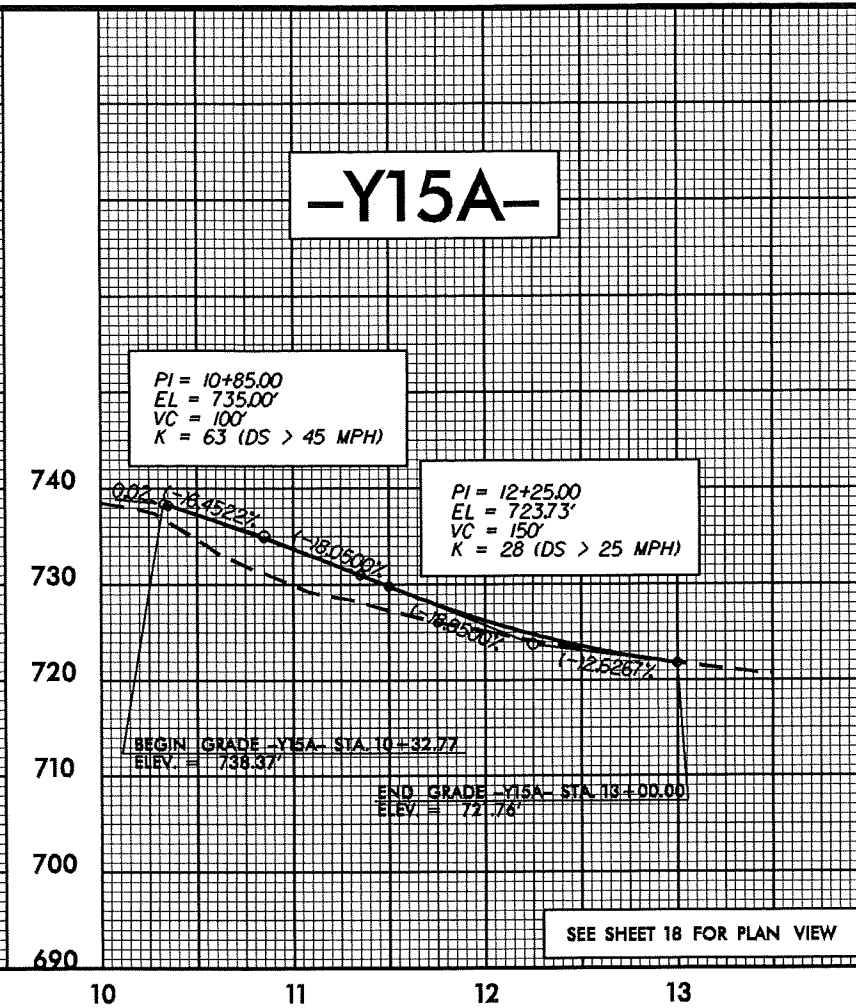
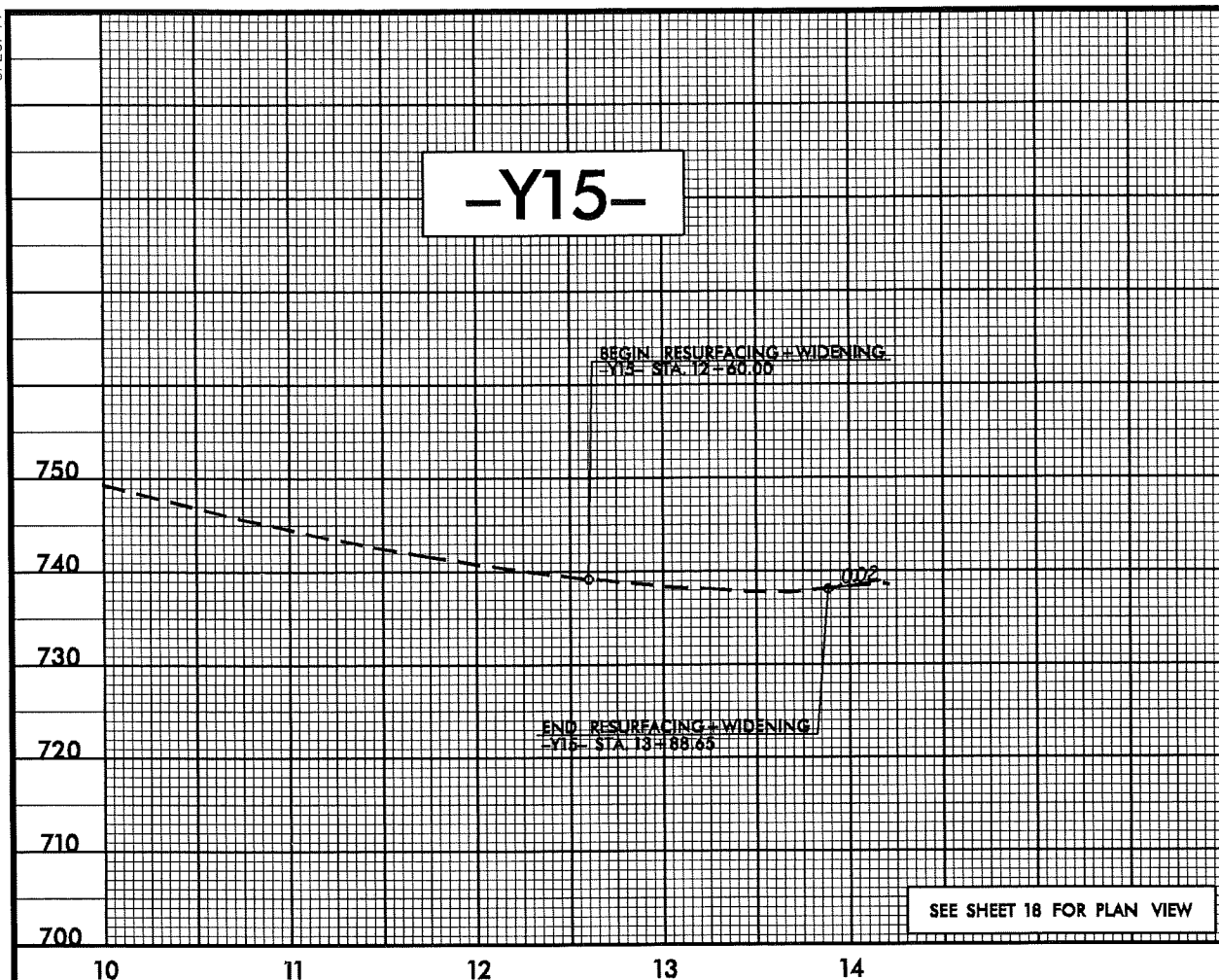
-Y- LINES

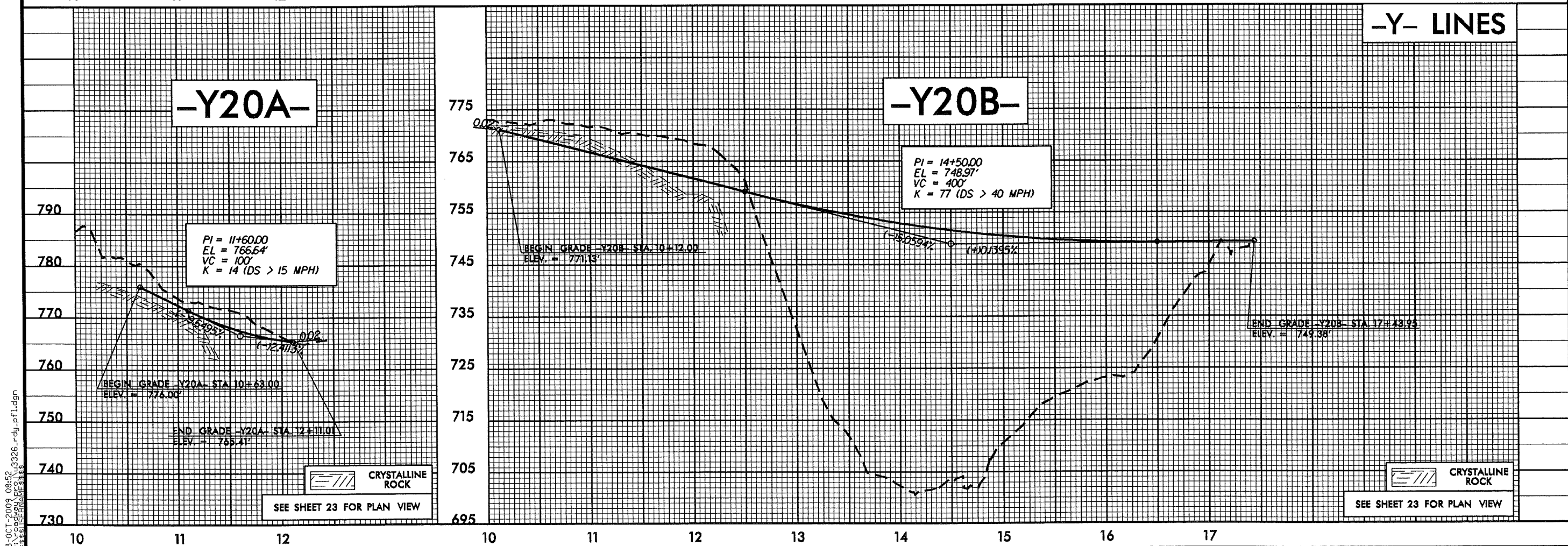
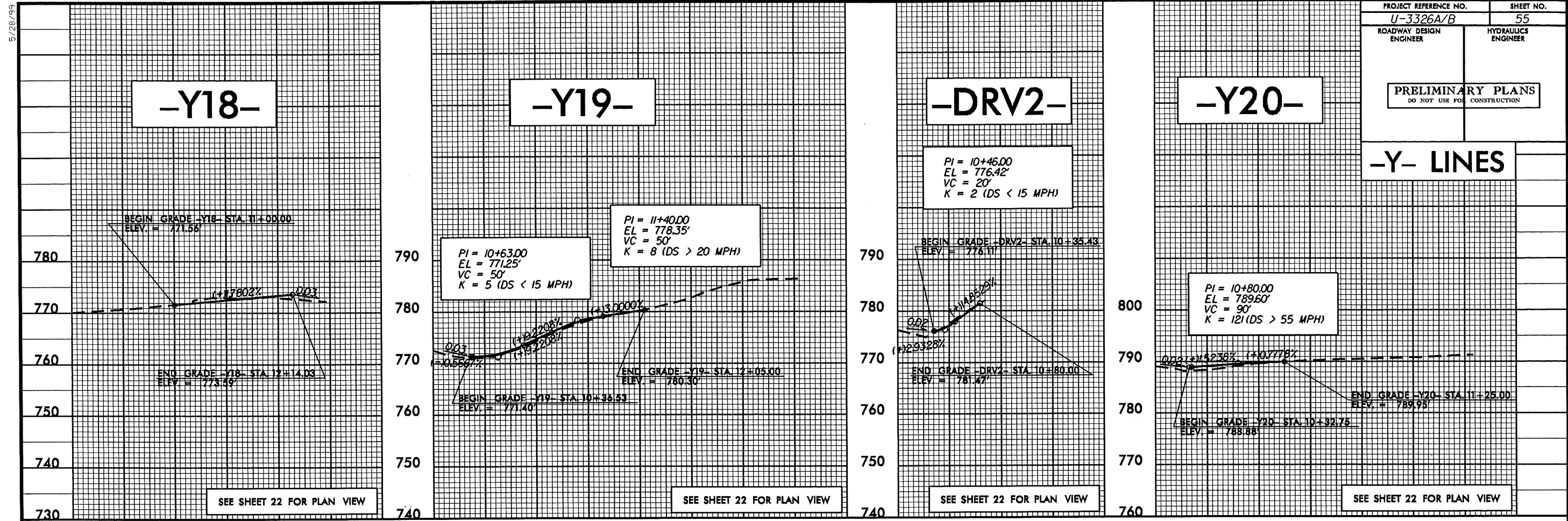


5/28/99

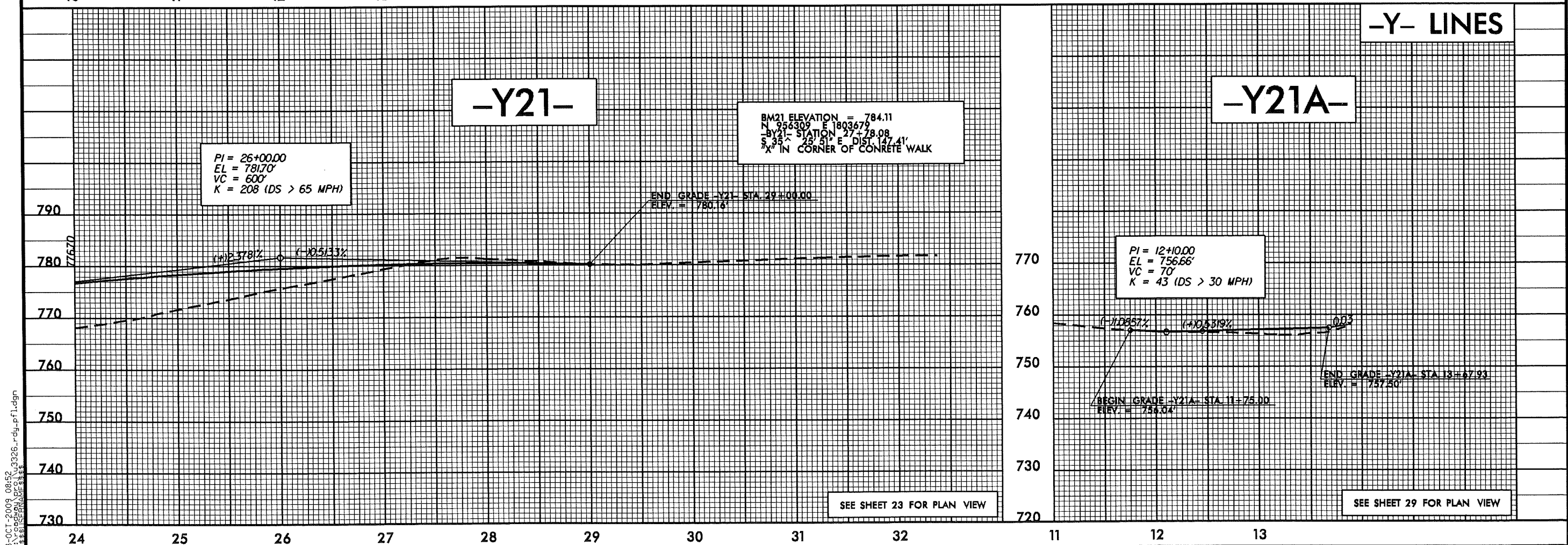
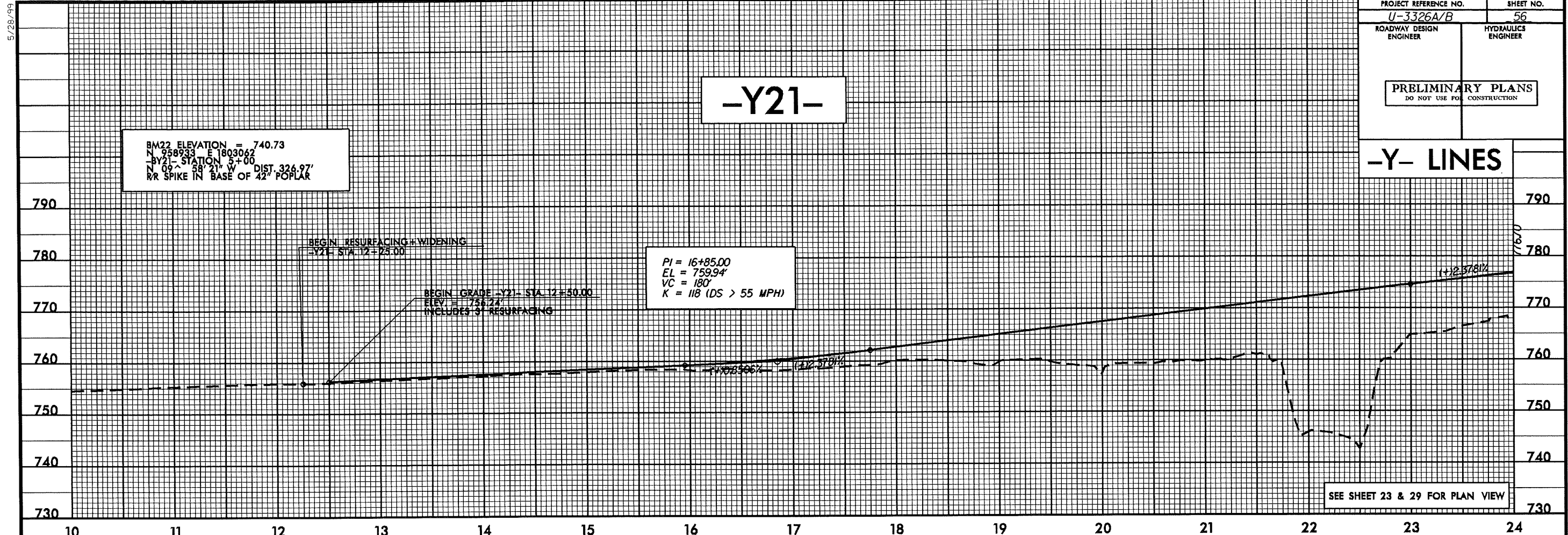
13-OCT-2009 08:52
\\V:\oedwin\proj\3326.rdy.pfl.dgn
3326.rdy.pfl.dgn

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 54	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
-Y- LINES			





5/28/99

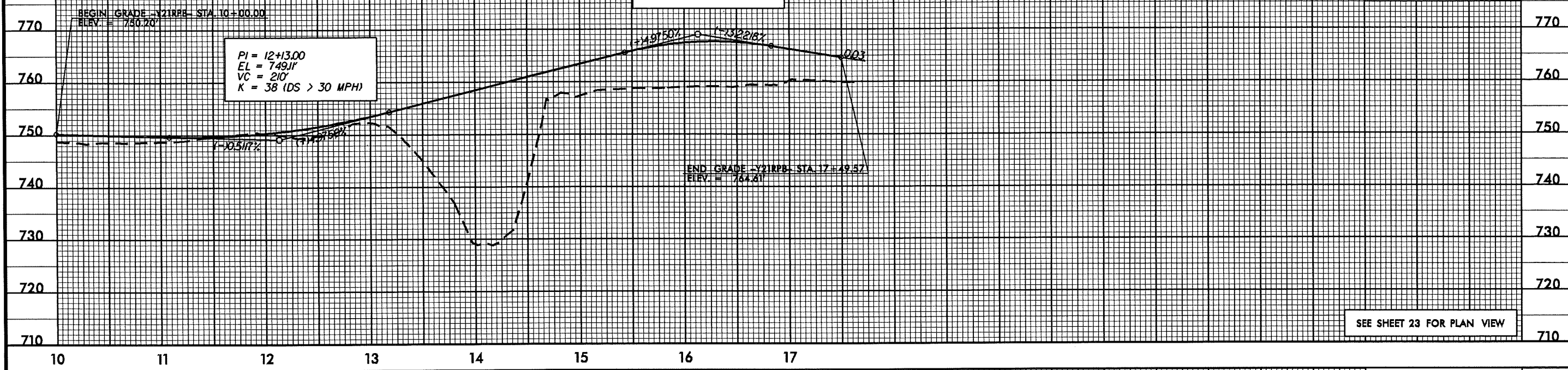


13-OCT-2009 08:52
\\v-prod\proj\3326-rdy-pfl.dgn
3326-rdy-pfl.dwg

5/28/99

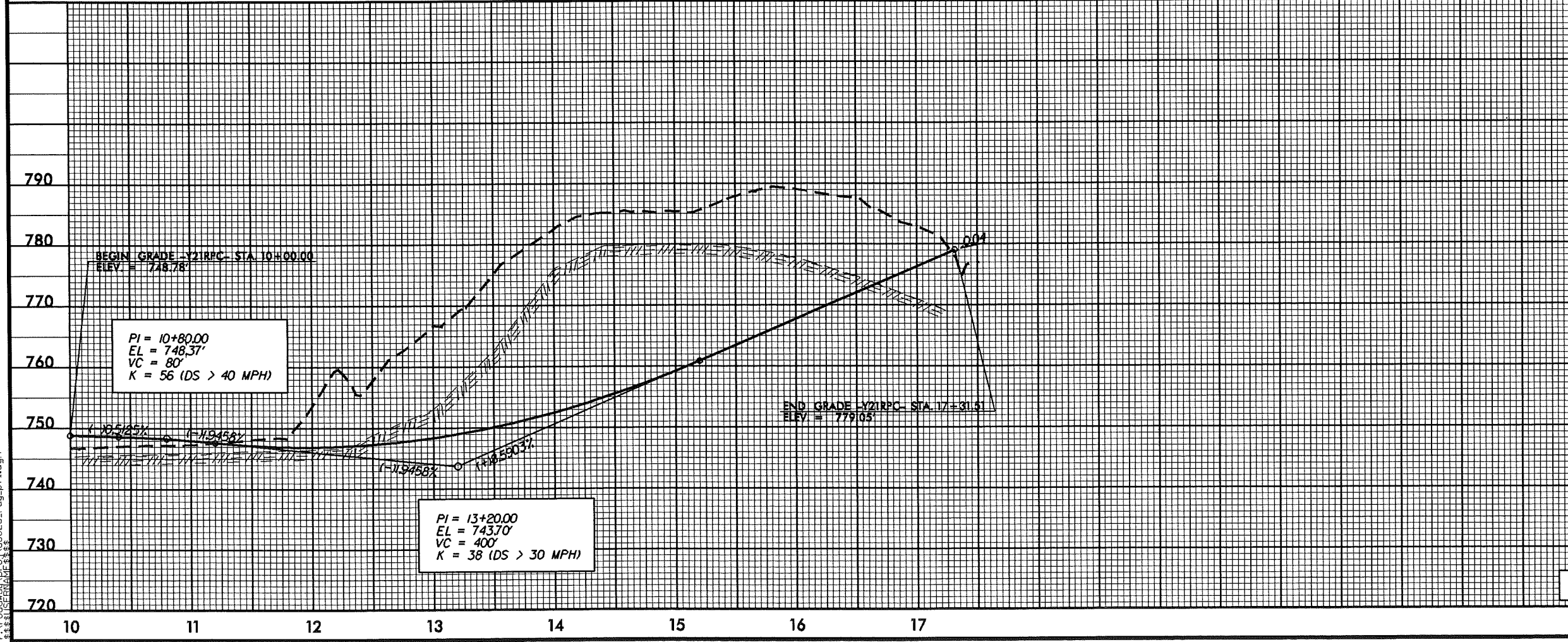
13-OCT-2009 08:52
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3/28/2009 10:58

PROJECT REFERENCE NO. U-3326A/B		SHEET NO. 57	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
-Y21RPB-			



SEE SHEET 23 FOR PLAN VIEW

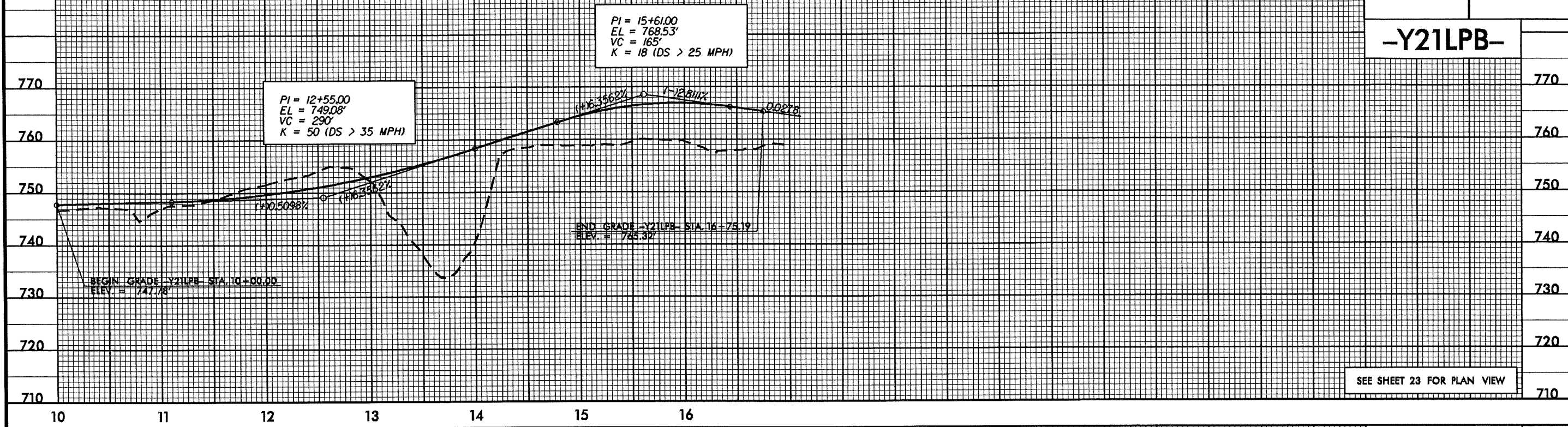
-Y21RPC-	
790	
780	
770	
760	
750	
740	
730	
720	
SEE SHEET 23 FOR PLAN VIEW	



5/28/99

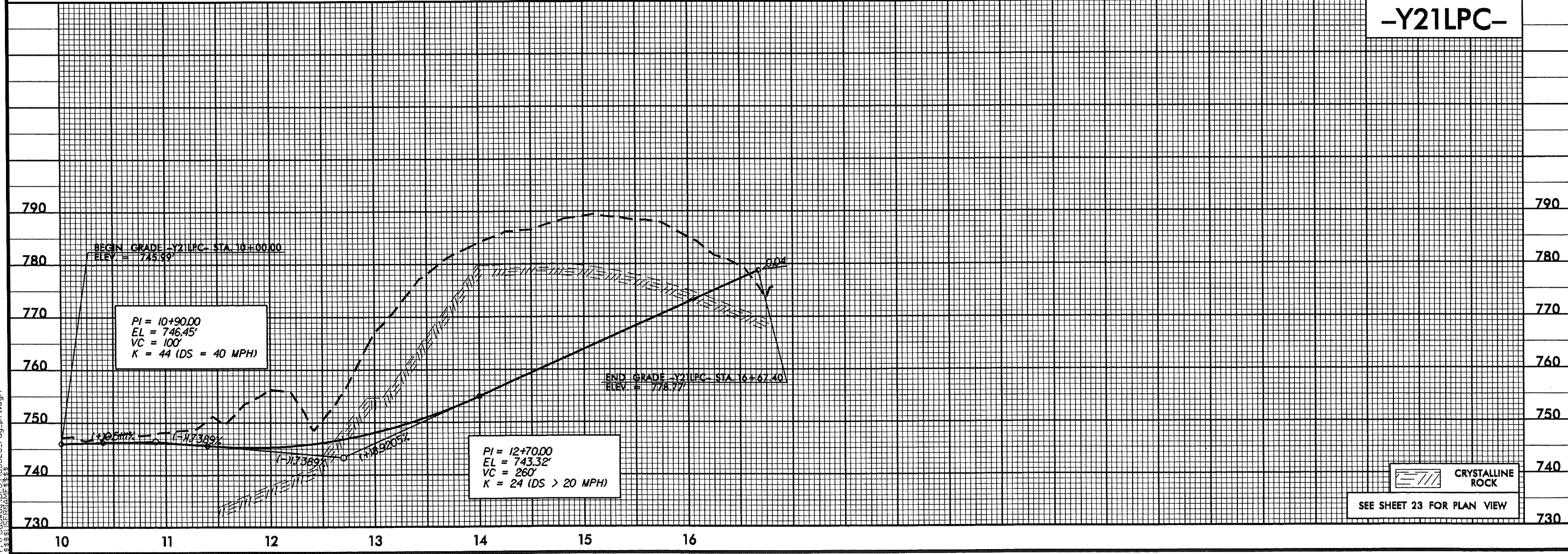
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	58
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y21LPB-



SEE SHEET 23 FOR PLAN VIEW

-Y21LPC-



CRYSTALLINE ROCK

SEE SHEET 23 FOR PLAN VIEW

13-OCT-2009 08:52 03326.rdy.pfl.dgn

5/28/99

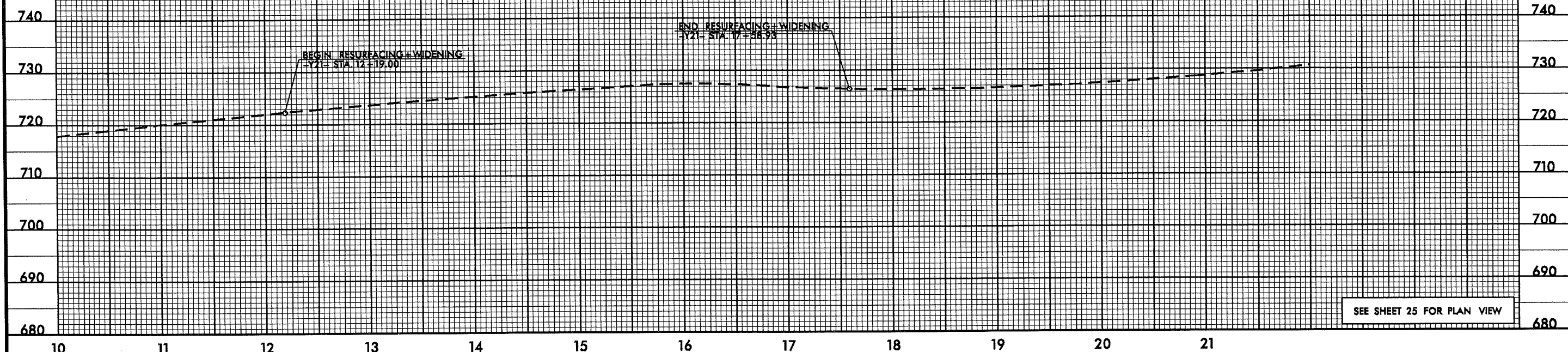
PROJECT REFERENCE NO.	SHEET NO.
U-3326A/B	59
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

BM24 ELEVATION = 731.80
N 95°57'01" E 1805030
BY22- STATION 5+00
22' 24' 39.6" E DIST 75.41'
R/R SPIKE IN BASE OF 9" RED OAK

-Y22-

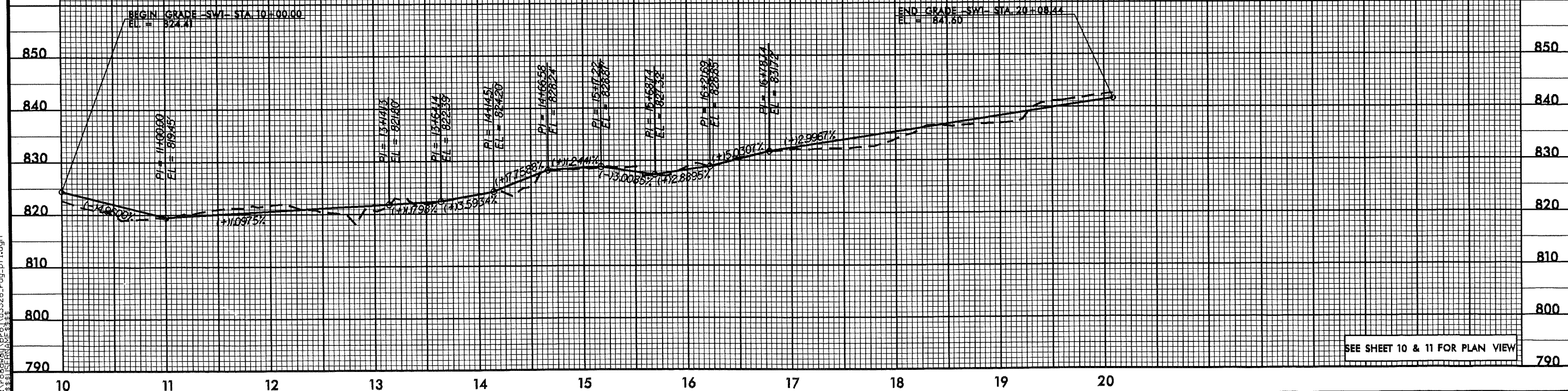
BM23 ELEVATION = 748.73
N 95°57'01" E 1805030
BY22- STATION 17+30
S 65° 21' 22.4" E DIST 308.20'
R/R SPIKE IN BASE OF 14" WHITE OAK

-Y- LINES



-Y- LINES

-SW1-



13-OCT-2009 08:52
P:\roadway\pco\3326.rdy.pfl.dgn
P:\roadway\pco\3326.rdy.pfl.dgn