

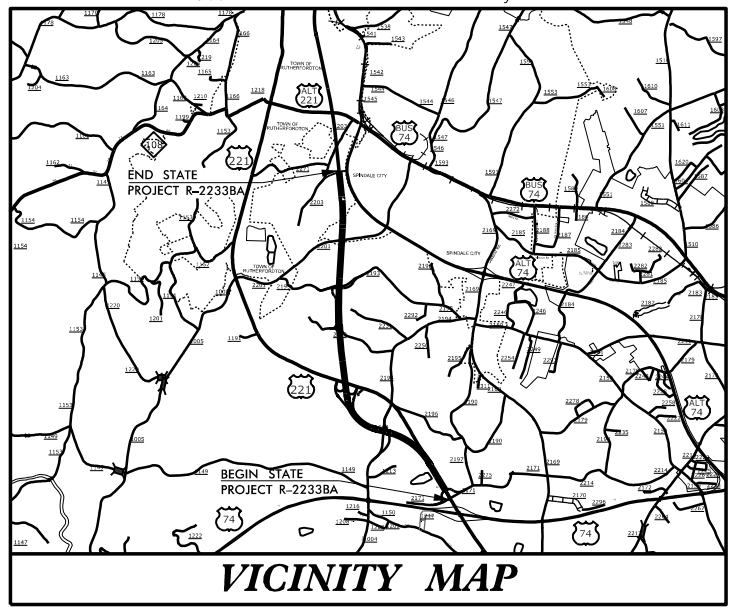
09/08/99

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2233BA	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34400.1.S5		PE	
34400.2.S5		RW & UTIL	

TIP PROJECT: R-2233BA



VICINITY MAP

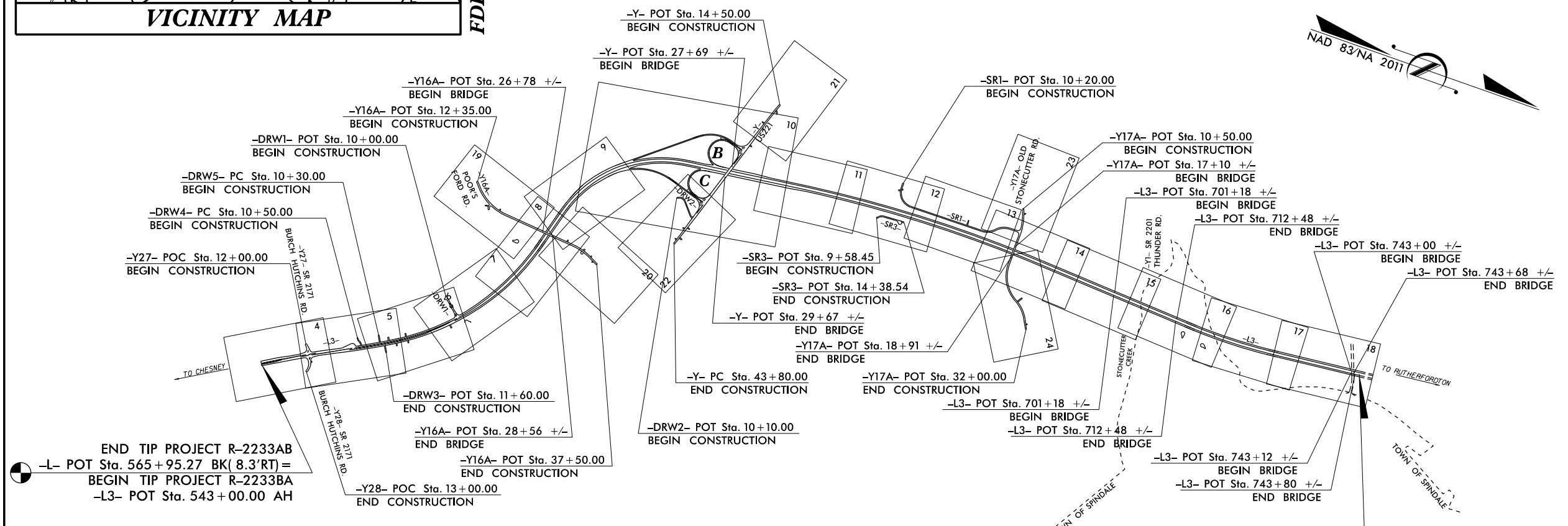
FDPI PLANS

RUTHERFORD COUNTY

**LOCATION: RUTHERFORDTON BYPASS FROM US 74 BYPASS
TO US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING
AND STRUCTURES**

4B PLANS

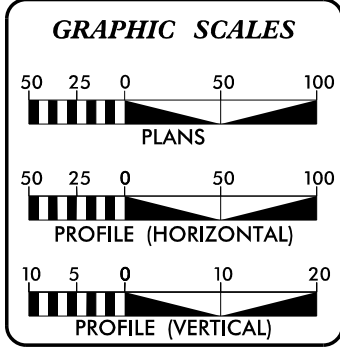


A PORTION OF THIS PROJECT IS CONTROLLED-ACCESS WITH ACCESS BEING LIMITED TO INTERCHANGES.
A PORTION OF THIS PROJECT IS PARTIAL CONTROLLED-ACCESS WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD XX.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF SPINDALE.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NCDOT CONTACT: NATHAN ADIMA, P.E.

CONTRACT:



DESIGN DATA

ADT 2022 =	10400
ADT 2040 =	12900
K =	8 %
D =	55 %
T =	7 % *
V =	70 MPH
* TTST	2% DUAL 5%
FUNC CLASS =	ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2233BA =	3.589 MILES
LENGTH STRUCTURE TIP PROJECT R-2233BA =	0.227 MILES
TOTAL LENGTH TIP PROJECT R-2233BA =	3.816 MILES

STRUCTURE LENGTH BASED ON -L3- NB STATIONING.

PLANS PREPARED FOR NCDOT BY:

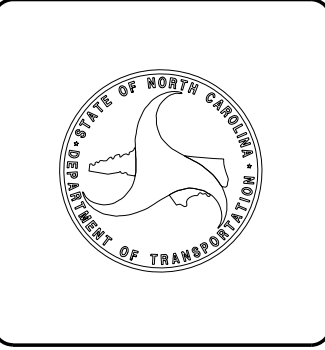
	2610 WYCLIFF ROAD SUITE 410 RALEIGH, NC 27607 PHONE: 919.881.9939 NC COA No. F-0929
	2012 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: JUNE 19, 2020	DENNIS J. MORY, P.E. PROJECT ENGINEER
LETTING DATE: JUNE 20, 2023	BRYAN LAMBETH, P.E. PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



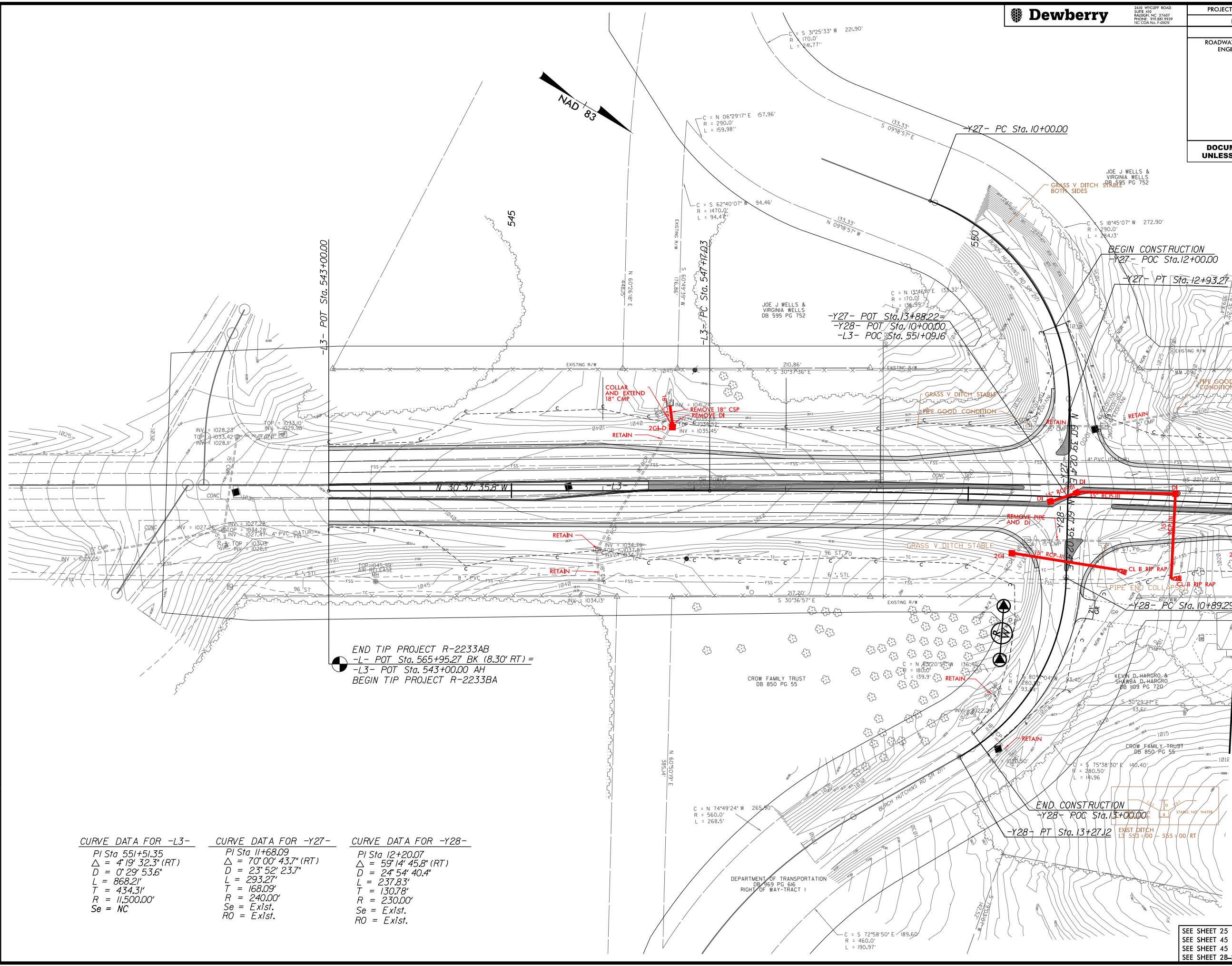
15/02/15
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R2233BA_4B_Permit.Dwg, 20191206

5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-4009

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



END TIP PROJECT R-2233AB
 -L- POT Sta. 565+95.27 BK (8.30' RT) =
 -L3- POT Sta. 543+00.00 AH
 BEGIN TIP PROJECT R-2233BA

CURVE DATA FOR -L3-	CURVE DATA FOR -Y27-	CURVE DATA FOR -Y28-
PI Sta 551+51.35	PI Sta 11+68.09	PI Sta 12+20.07
Δ = 4° 19' 32.3" (RT)	Δ = 70° 00' 43.7" (RT)	Δ = 59° 14' 45.8" (RT)
D = 0' 29' 53.6"	D = 23' 52' 23.7"	D = 24' 54' 40.4"
L = 868.21'	L = 293.27'	L = 237.83'
T = 434.31'	T = 168.09'	T = 130.78'
R = 11,500.00'	R = 240.00'	R = 230.00'
Se = NC	Se = Exist.	Se = Exist.
	RO = Exist.	RO = Exist.

SEE SHEET 25 FOR -L3- PROFILE
 SEE SHEET 45 FOR -Y27- PROFILE
 SEE SHEET 45 FOR -Y28- PROFILE
 SEE SHEET 2B-2 FOR INTERSECTION DETAIL

1562015
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 R2233BA_48 Permit Drawings_20191206

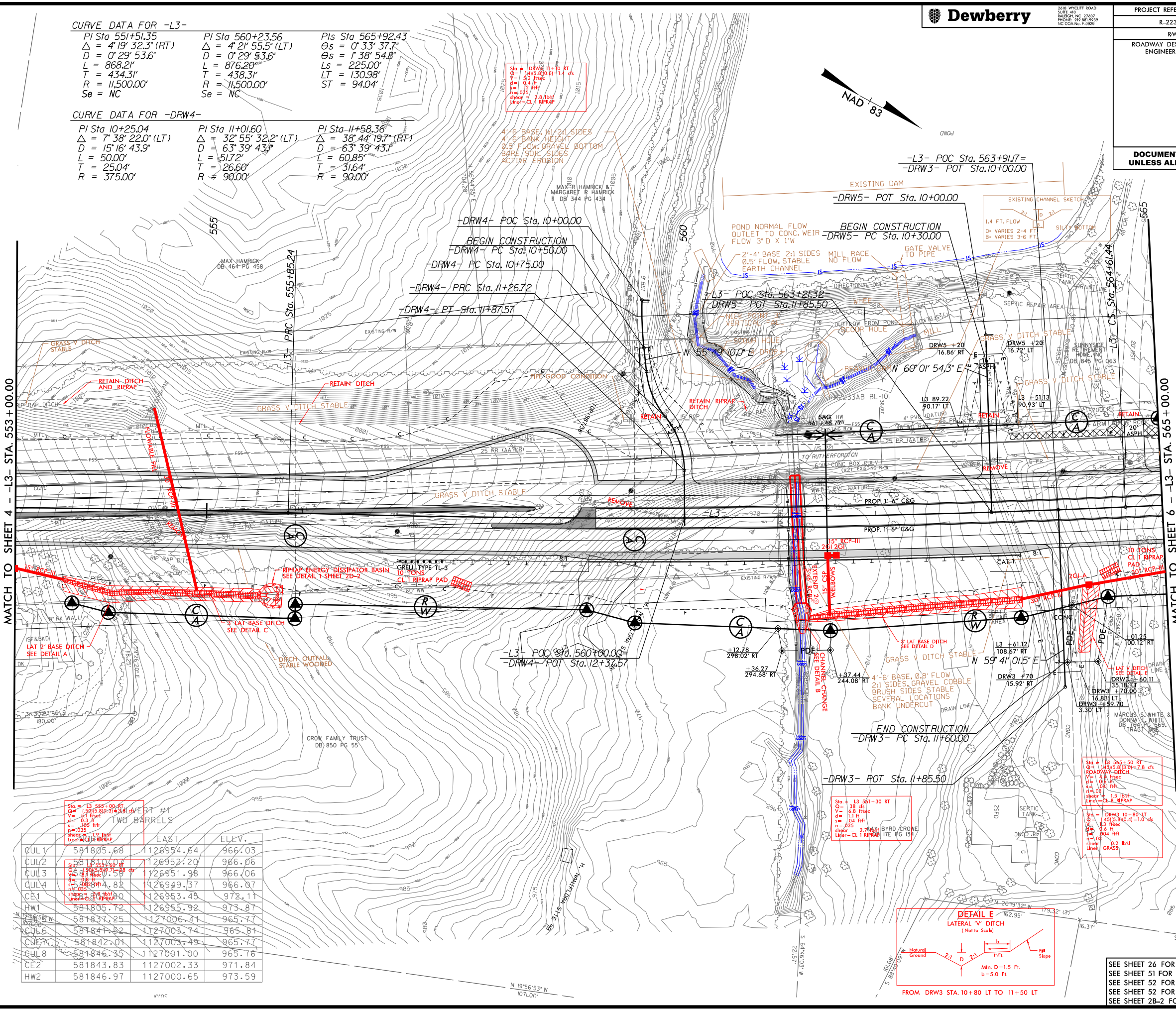
PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		5	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

CURVE DATA FOR -L3-

PI Sta 551+51.35	PI Sta 560+23.56	PIs Sta 565+92.43
$\Delta = 4' 19" 32.3" (RT)$	$\Delta = 4' 21" 55.5" (LT)$	$\Theta_s = 0' 33" 37.7"$
$D = 0' 29" 53.6"$	$D = 0' 29" 53.6"$	$\Theta_s = 1' 38" 54.8"$
$L = 868.21'$	$L = 876.20'$	$L_s = 225.00'$
$T = 434.31'$	$T = 438.31'$	$L_t = 130.98'$
$R = 11,500.00'$	$R = 11,500.00'$	$ST = 94.04'$
$Se = NC$	$Se = NC$	

CURVE DATA FOR -DRW4-

PI Sta 10+25.04	PI Sta 11+01.60	PI Sta 11+58.36
$\Delta = 7' 38" 22.0" (LT)$	$\Delta = 32' 55" 32.2" (LT)$	$\Delta = 38' 44" 19.7" (RT)$
$D = 15' 16" 43.9"$	$D = 63' 39" 43.1"$	$D = 63' 39" 43.1"$
$L = 50.00'$	$L = 51.72'$	$L = 60.85'$
$T = 25.04'$	$T = 26.60'$	$T = 31.64'$
$R = 375.00'$	$R = 90.00'$	$R = 90.00'$

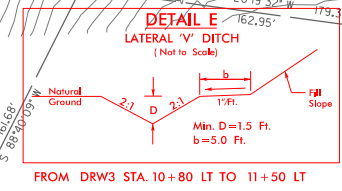


MATCH TO SHEET 4 - L3- STA. 553+00.00

MATCH TO SHEET 6 - L3- STA. 565+00.00

VERT #1
TWO BARRELS

CUL	EAST	ELEV.	
CUL1	581805.68	1126954.64	966.03
CUL2	581810.07	1126952.20	966.06
CUL3	581810.59	1126951.98	966.06
CUL4	581814.82	1126949.37	966.07
CE1	581815.00	1126953.45	972.11
HW1	581805.72	1126955.92	973.87
HW2	581837.25	1127006.41	965.77
CUL5	581841.52	1127003.74	965.81
CUL6	581842.01	1127003.49	965.77
CUL7	581846.35	1127001.00	965.76
CUL8	581843.83	1127002.33	971.84
CE2	581846.97	1127000.65	973.59



SEE SHEET 26 FOR -L3- PROFILE
SEE SHEET 51 FOR -DRW3- PROFILE
SEE SHEET 52 FOR -DRW4- PROFILE
SEE SHEET 52 FOR -DRW5- PROFILE
SEE SHEET 2B-2 FOR INTERSECTION DETAILS

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Permit Drawing, 2019/206

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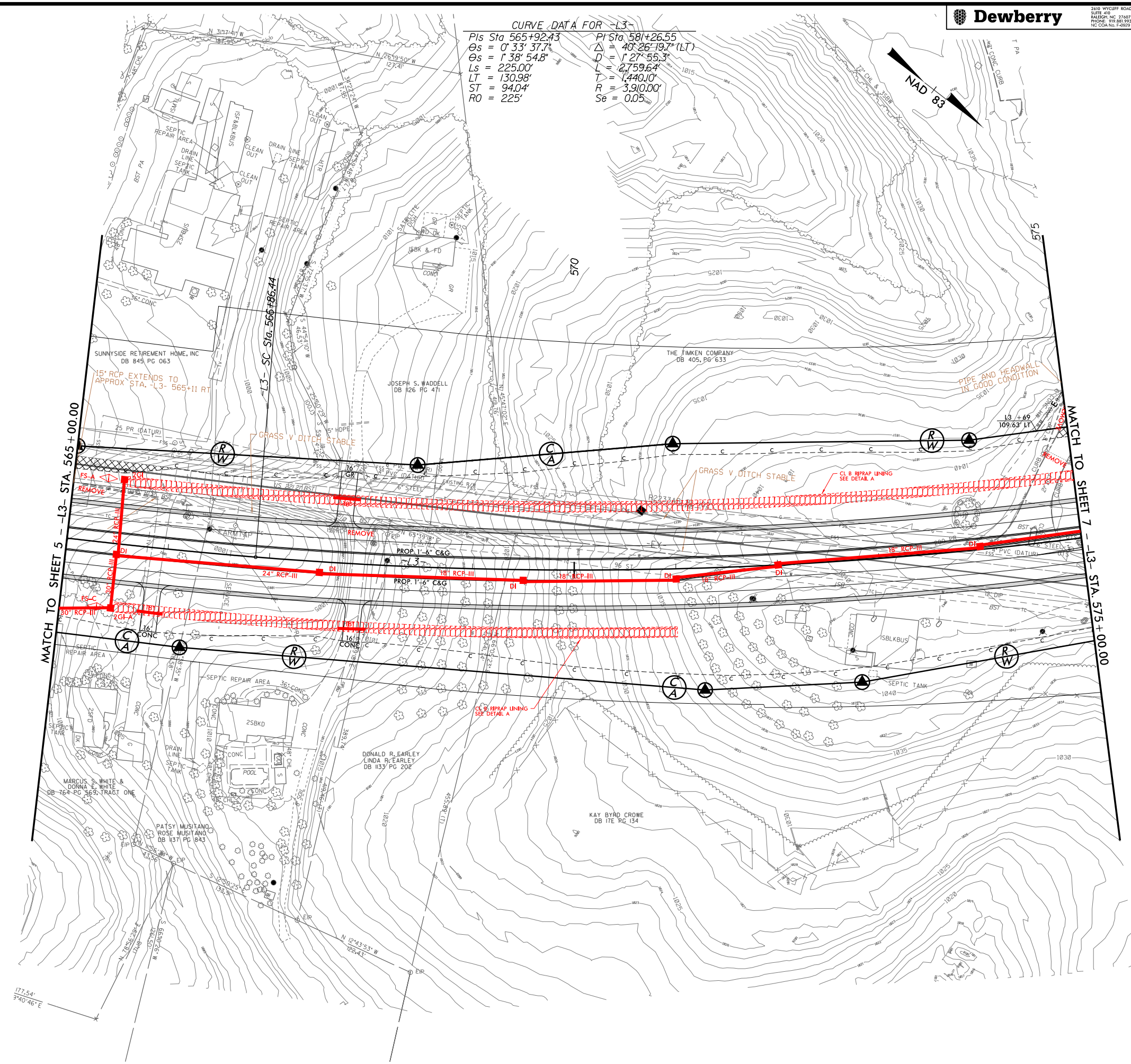


2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CDA No. F-40029

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

CURVE DATA FOR -L3-

PI Sta 565+92.43	PI Sta 581+26.55
$\theta_s = 0^\circ 33' 37.7"$	$\Delta = 40^\circ 26' 19.7" (LT)$
$\theta_s = 1^\circ 38' 54.8"$	$D = 1^\circ 27' 55.3"$
$L_s = 225.00'$	$L = 2,759.64'$
$LT = 130.98'$	$T = 1,440.10'$
$ST = 94.04'$	$R = 3,910.00'$
$RO = 225'$	$S_e = 0.05\%$



MATCH TO SHEET 5 - L3- STA. 565+00.00

MATCH TO SHEET 7 - L3- STA. 575+00.00

L3- SC Sta. 566+86.44

177.54'
3740.46' E

PROP PAVED SHOULDER

SEE SHEET 27 FOR -L3- PROFILE

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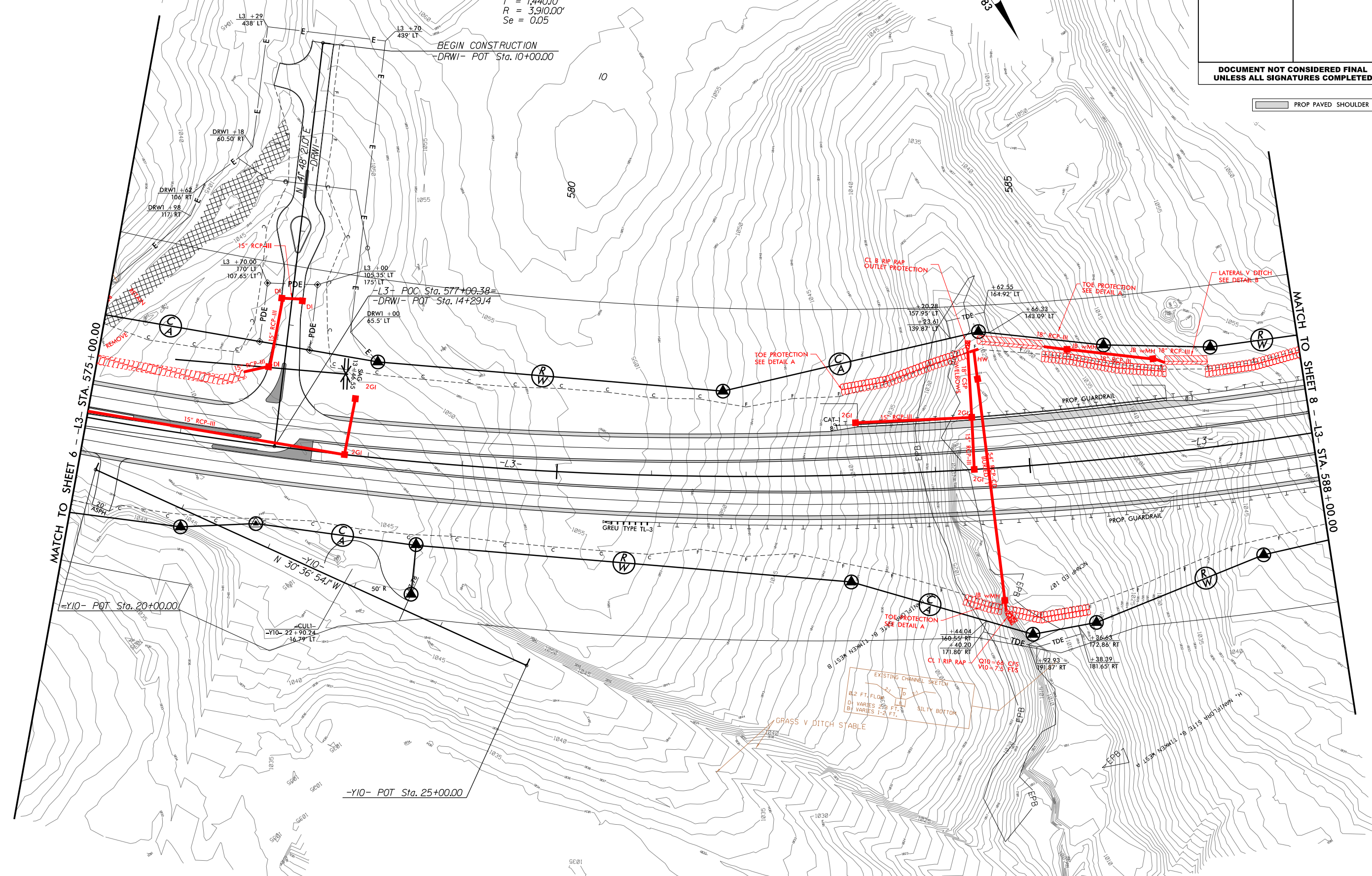
5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. P-40029

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		7	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

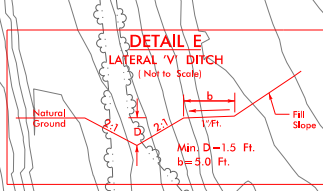
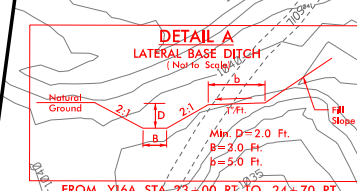
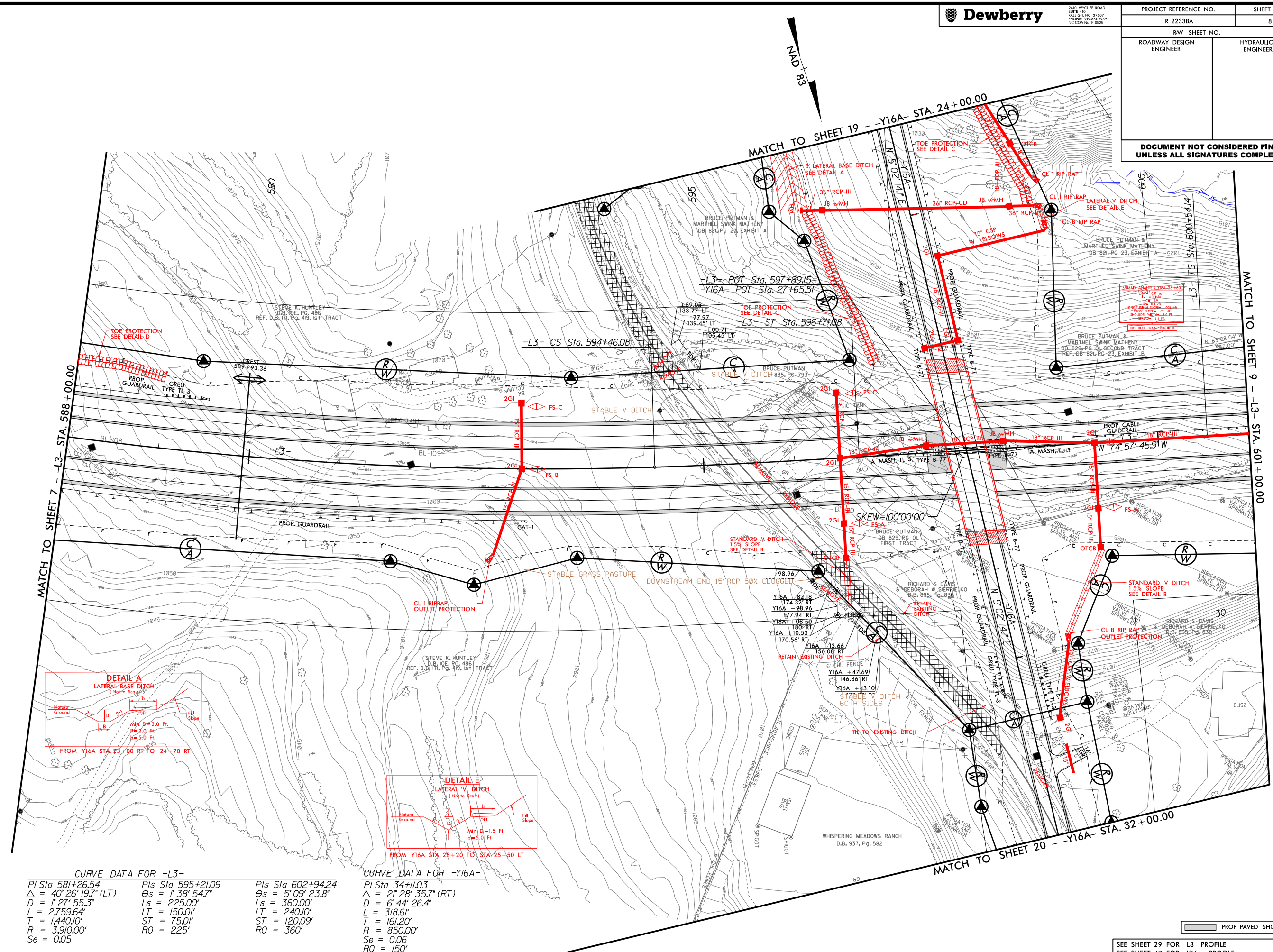
CURVE DATA FOR -L3-
 PI Sta 581+26.54
 $\Delta = 40^\circ 26' 19.7" (LT)$
 $D = 1^\circ 27' 55.3"$
 $L = 2,759.64'$
 $T = 1,440.00'$
 $R = 3,910.00'$
 $Se = 0.05$



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SEE SHEET 28 FOR -L3- PROFILE
 SEE SHEET 51 FOR -DRW1- PROFILE
 SEE SHEET 2B-2 FOR INTERSECTION DETAIL

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		8	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



CURVE DATA FOR -L3-

PI Sta 581+26.54	PIs Sta 595+21.09	PIs Sta 602+94.24
$\Delta = 40^\circ 26' 19.7''$ (LT)	$\Theta_s = 1^\circ 38' 54.7''$	$\Theta_s = 5^\circ 09' 23.8''$
D = 1' 27' 55.3"	Ls = 225.00'	Ls = 360.00'
L = 2,759.64'	LT = 150.01'	LT = 240.10'
T = 1,440.10'	ST = 75.01'	ST = 120.09'
R = 3,910.00'	RO = 225'	RO = 360'
Se = 0.05		

CURVE DATA FOR -Y16A-

PI Sta 34+11.03
$\Delta = 21^\circ 28' 35.7''$ (RT)
D = 6' 44' 26.4"
L = 318.61'
T = 161.20'
R = 850.00'
Se = 0.06
RO = 150'

SEE SHEET 29 FOR -L3- PROFILE
SEE SHEET 47 FOR -Y16A- PROFILE

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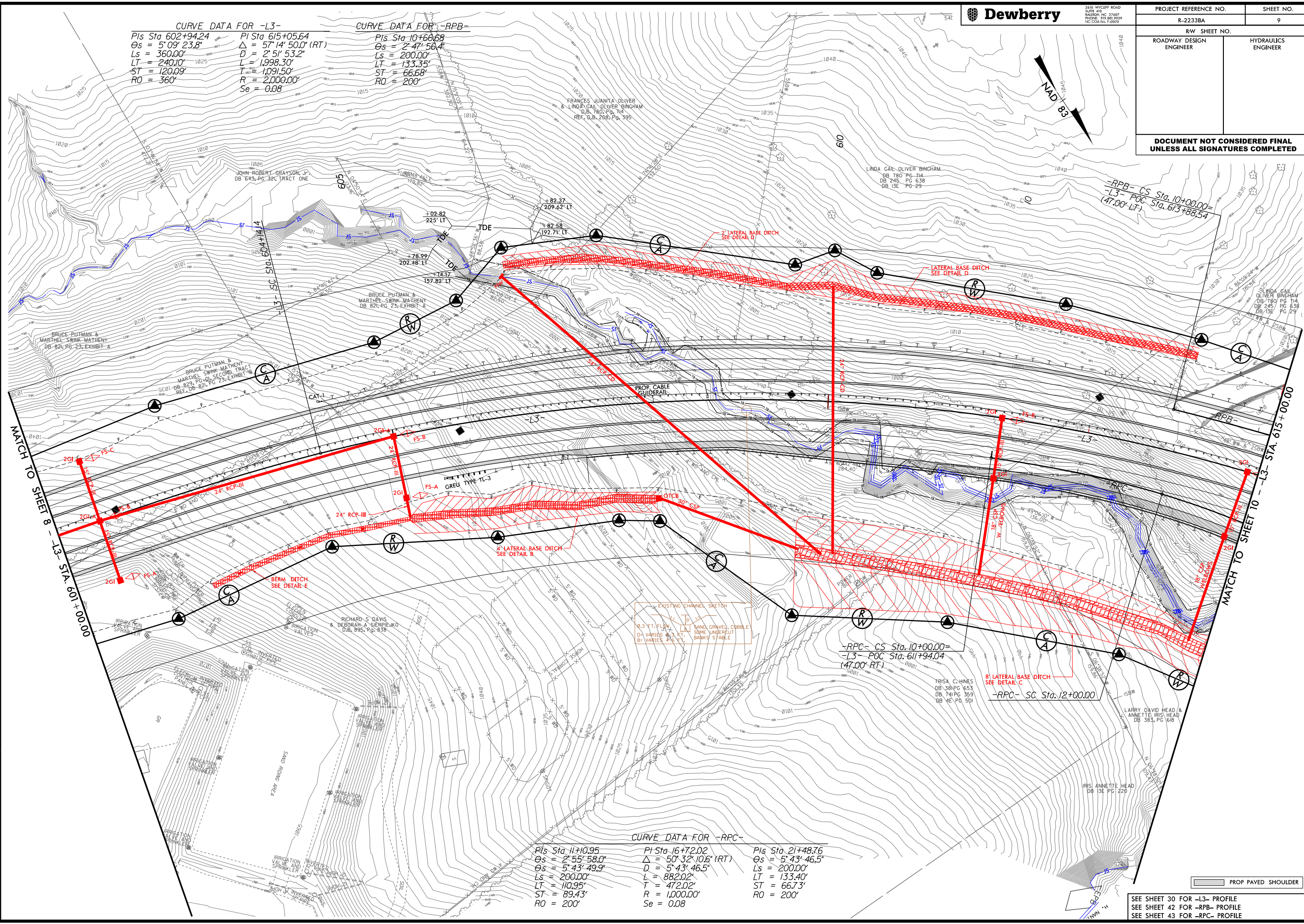
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

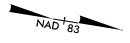
CURVE DATA FOR -L3-
 PIs Sta 602+94.24
 $\Theta_s = 5^{\circ}09'23.8"$
 $L_s = 360.00'$
 $LT = 240.10'$
 $ST = 120.09'$
 $RO = 360'$

CURVE DATA FOR -RPB-
 PIs Sta 10+66.68
 $\Theta_s = 2^{\circ}47'56.4"$
 $L_s = 200.00'$
 $LT = 133.35'$
 $ST = 66.68'$
 $RO = 200'$

CURVE DATA FOR -RPC-
 PIs Sta 11+10.95
 $\Theta_s = 2^{\circ}55'58.0"$
 $\Delta = 50^{\circ}32'10.6" (RT)$
 $D = 5^{\circ}43'46.5"$
 $L_s = 200.00'$
 $L = 882.02'$
 $T = 472.02'$
 $R = 1,000.00'$
 $RO = 200'$

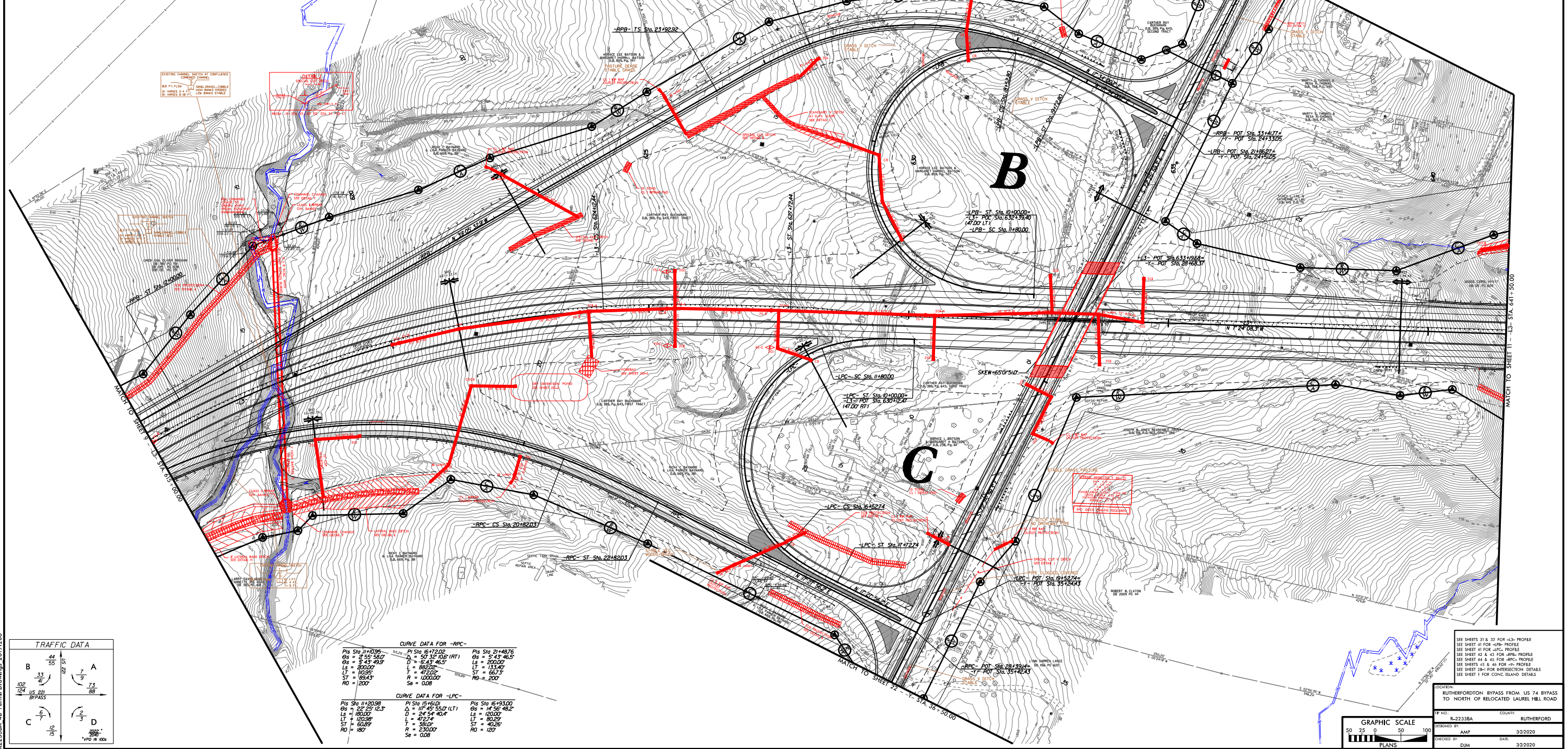
CURVE DATA FOR -RPC-
 PIs Sta 21+48.76
 $\Theta_s = 5^{\circ}43'46.5"$
 $L_s = 200.00'$
 $LT = 133.40'$
 $ST = 66.73'$
 $RO = 200'$





REVISIONS

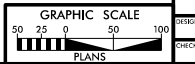
CURVE DATA FOR -RPR-		CURVE DATA FOR -L3-	
PI Sta 10+66.68 G _s = 2° 47' 56.4" L _s = 200.00' LT = 133.35' ST = 66.68' RO = 200'	PI Sta 28+26.45 G _s = 9° 32' 57.0" L _s = 200.00' LT = 133.53' ST = 66.84' RO = 200'	PI Sta 65+05.64 G _s = 5° 14' 50.0" (RT) D = 2° 51' 53.2" L = 198.30' LT = 120.00' ST = 60.00' RO = 200.00'	PI Sta 625+325.3 G _s = 9° 09' 23.8" L _s = 360.00' LT = 240.00' ST = 120.00' RO = 360'



TRAFFIC DATA

B	33	44	55
A	7	9	11
C	6	7	8
D	2	3	4

CURVE DATA FOR -RPC-		CURVE DATA FOR -LPC-	
PI Sta 11+036 G _s = 5° 21' 49.9" L _s = 300.00' LT = 103.95' ST = 89.43' RO = 200'	PI Sta 15+72.02 G _s = 5° 12' 50.0" (RT) D = 2° 43' 46.5" L = 682.00' LT = 472.00' ST = 1000.00' Se = 0.08	PI Sta 21+487.6 G _s = 9° 43' 46.5" L _s = 200.00' LT = 133.40' ST = 66.70' RO = 200'	PI Sta 15+61.0 G _s = 17° 40' 55.0" (LT) D = 2° 54' 40.4" L = 423.74' LT = 103.95' ST = 89.43' RO = 200'



SEE SHEETS 11 & 12 FOR -L3- PROFILE
SEE SHEET 11 FOR -RPR- PROFILE
SEE SHEET 11 FOR -LPC- PROFILE
SEE SHEETS 15 & 16 FOR -RPC- PROFILE
SEE SHEETS 15 & 16 FOR -LPC- PROFILE
SEE SHEET 18 FOR INTERSECTION DETAILS
SEE SHEET 1 FOR CONC ISLAND DETAILS

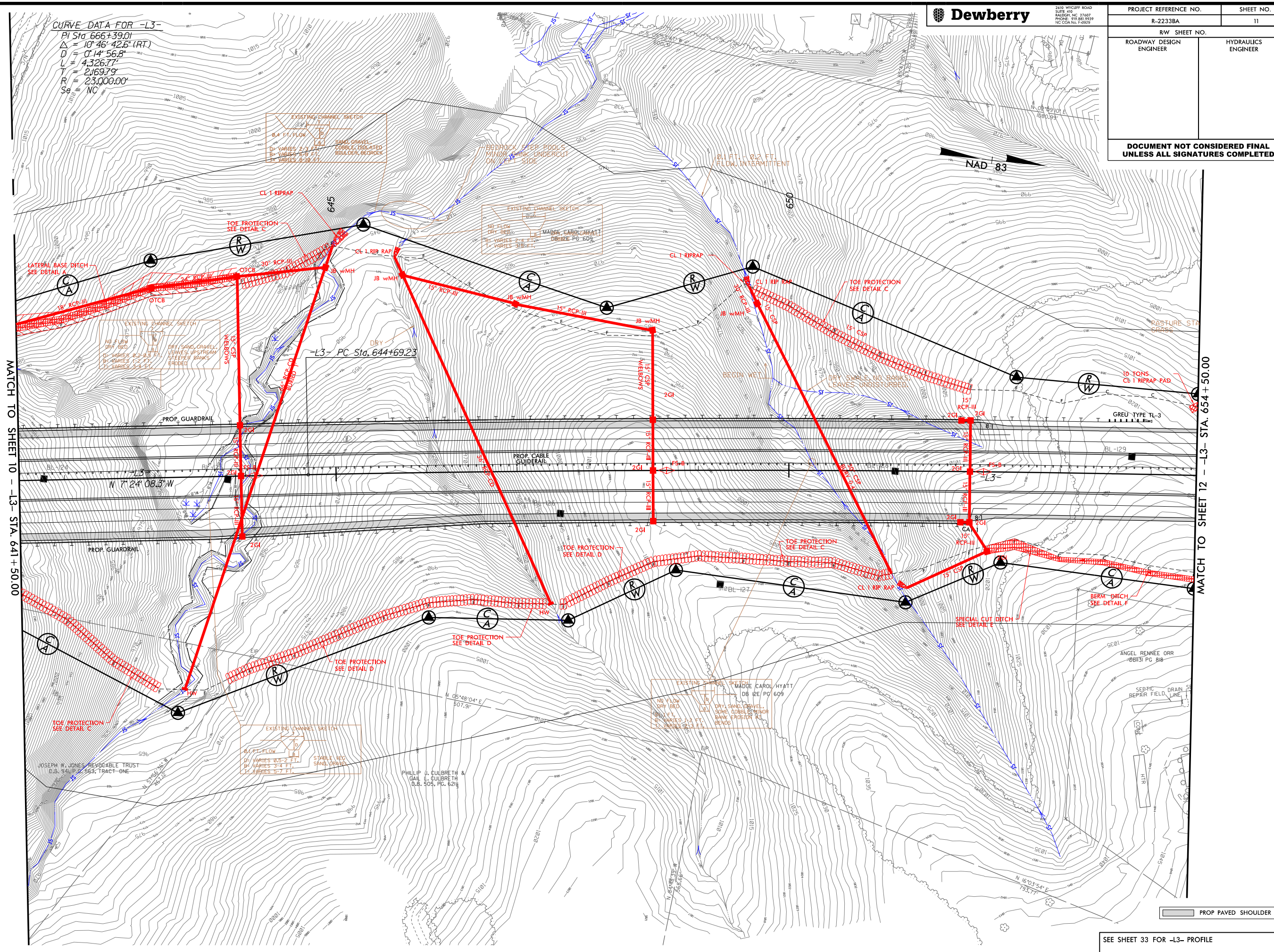
LOCATION:
RUTHERFORDTON BYPASS FROM US 74 BYPASS TO NORTH OF RELOCATED LAUREL HILL ROAD

IP NO.: R-22338A COUNTY: RUTHERFORD
DESIGNED BY: AMP DATE: 3/22/2020
CHECKED BY: DJM DATE: 3/22/2020

CURVE DATA FOR -L3-
 PI Sta. 666+39.01
 $\Delta = 10^{\circ}46'42.6''$ (RT)
 $D = 0^{\circ}14'56.8''$
 $L = 4,326.77'$
 $T = 2,169.79'$
 $R = 23,000.00'$
 $S_e = NC$

MATCH TO SHEET 10 - L3- STA. 641+50.00

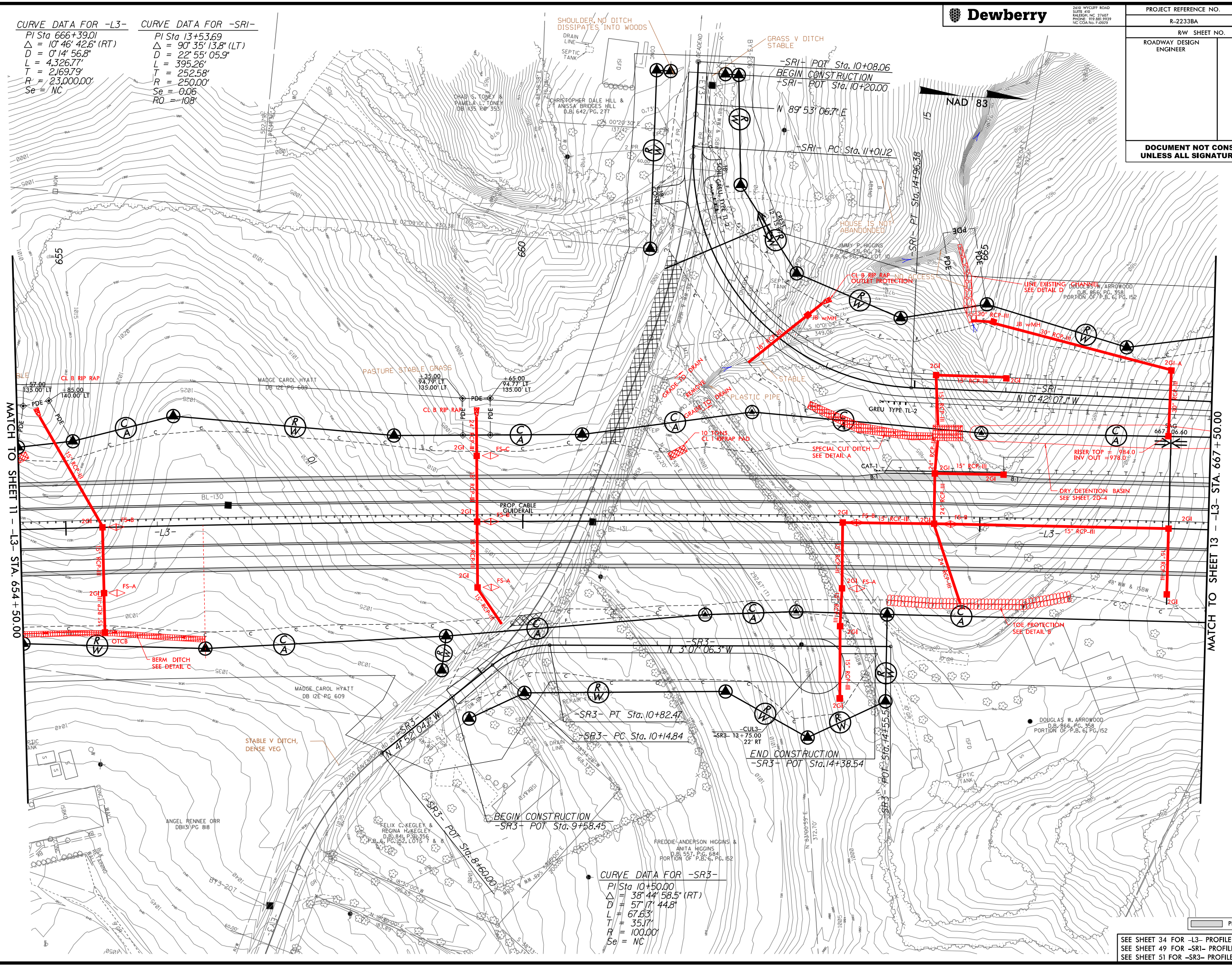
MATCH TO SHEET 12 - L3- STA. 654+50.00



PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		12	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

CURVE DATA FOR -L3-
 PI Sta 666+39.01
 $\Delta = 10^\circ 46' 42.6" (RT)$
 $D = 0' 14' 56.8"$
 $L = 4,326.77'$
 $T = 2,169.79'$
 $R = 23,000.00'$
 $Se = NC$

CURVE DATA FOR -SRI-
 PI Sta 13+53.69
 $\Delta = 90^\circ 35' 13.8" (LT)$
 $D = 22' 55' 05.9"$
 $L = 395.26'$
 $T = 252.58'$
 $R = 250.00'$
 $Se = 0.06$
 $RO = 108'$



CURVE DATA FOR -SR3-
 PI Sta 10+50.00
 $\Delta = 38^\circ 44' 58.5" (RT)$
 $D = 57' 17' 44.8"$
 $L = 67.63'$
 $T = 35.17'$
 $R = 100.00'$
 $Se = NC$

SEE SHEET 34 FOR -L3- PROFILE
 SEE SHEET 49 FOR -SRI- PROFILE
 SEE SHEET 51 FOR -SR3- PROFILE

1562915
 02/06/2019
 R-2233BA-48 Permit Drawing, 20191206

5/14/19

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		13	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			

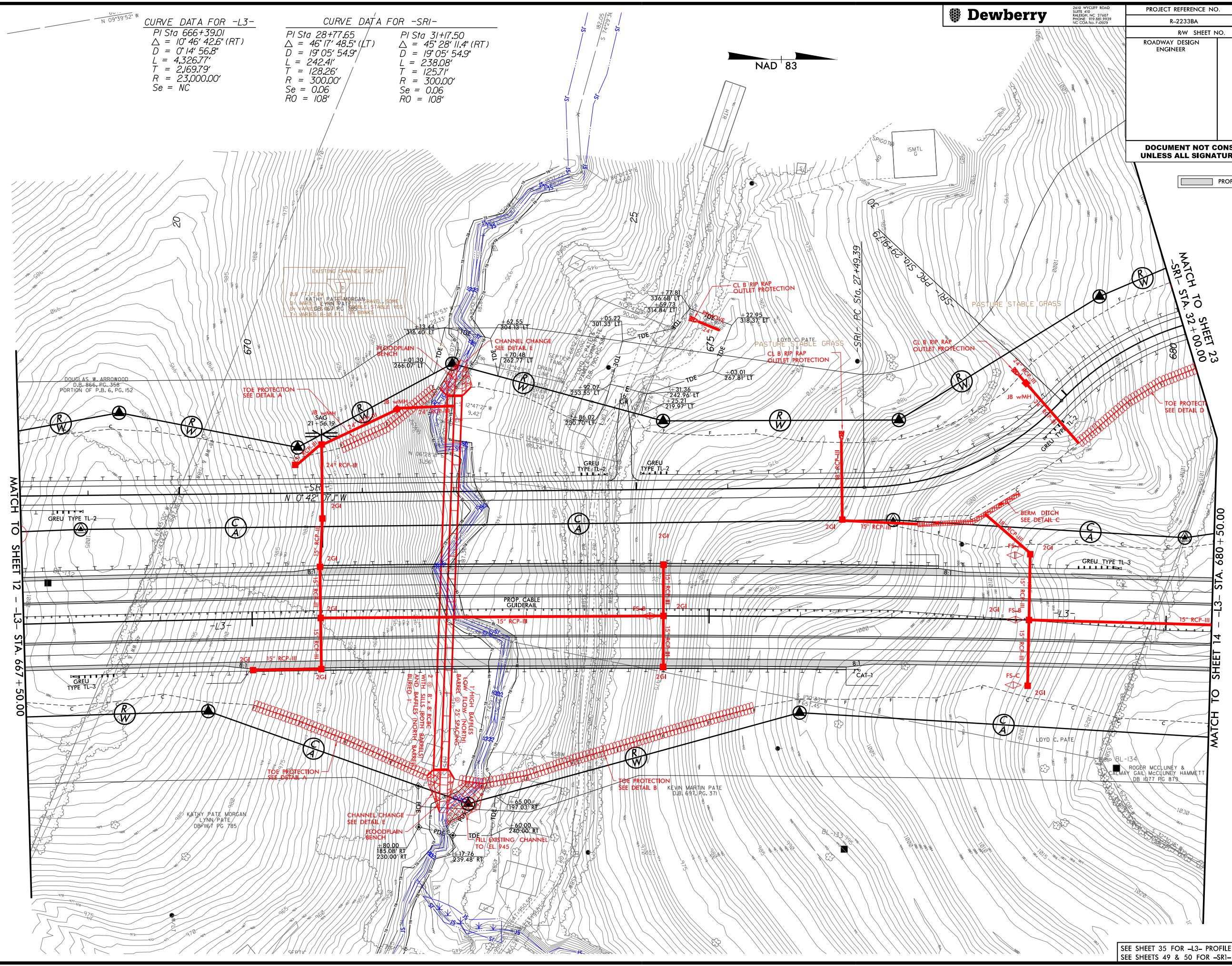
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

PROF PAVED SHOULDER

CURVE DATA FOR -L3-
 PI Sta 666+39.01
 $\Delta = 10^\circ 46' 42.6''$ (RT)
 D = 0' 14' 56.8"
 L = 4,326.77'
 T = 2,169.79'
 R = 23,000.00'
 Se = NC

CURVE DATA FOR -SRI-

PI Sta 28+77.65	PI Sta 31+17.50
$\Delta = 46^\circ 17' 48.5''$ (LT)	$\Delta = 45^\circ 28' 11.4''$ (RT)
D = 19' 05' 54.9"	D = 19' 05' 54.9"
L = 242.41'	L = 238.08'
T = 128.26'	T = 125.71'
R = 300.00'	R = 300.00'
Se = 0.06	Se = 0.06
RO = 108'	RO = 108'



MATCH TO SHEET 12 - L3- STA. 667+50.00

MATCH TO SHEET 23
SRI- PC STA. 29+19.79

MATCH TO SHEET 14 - L3- STA. 680+50.00

5/14/99

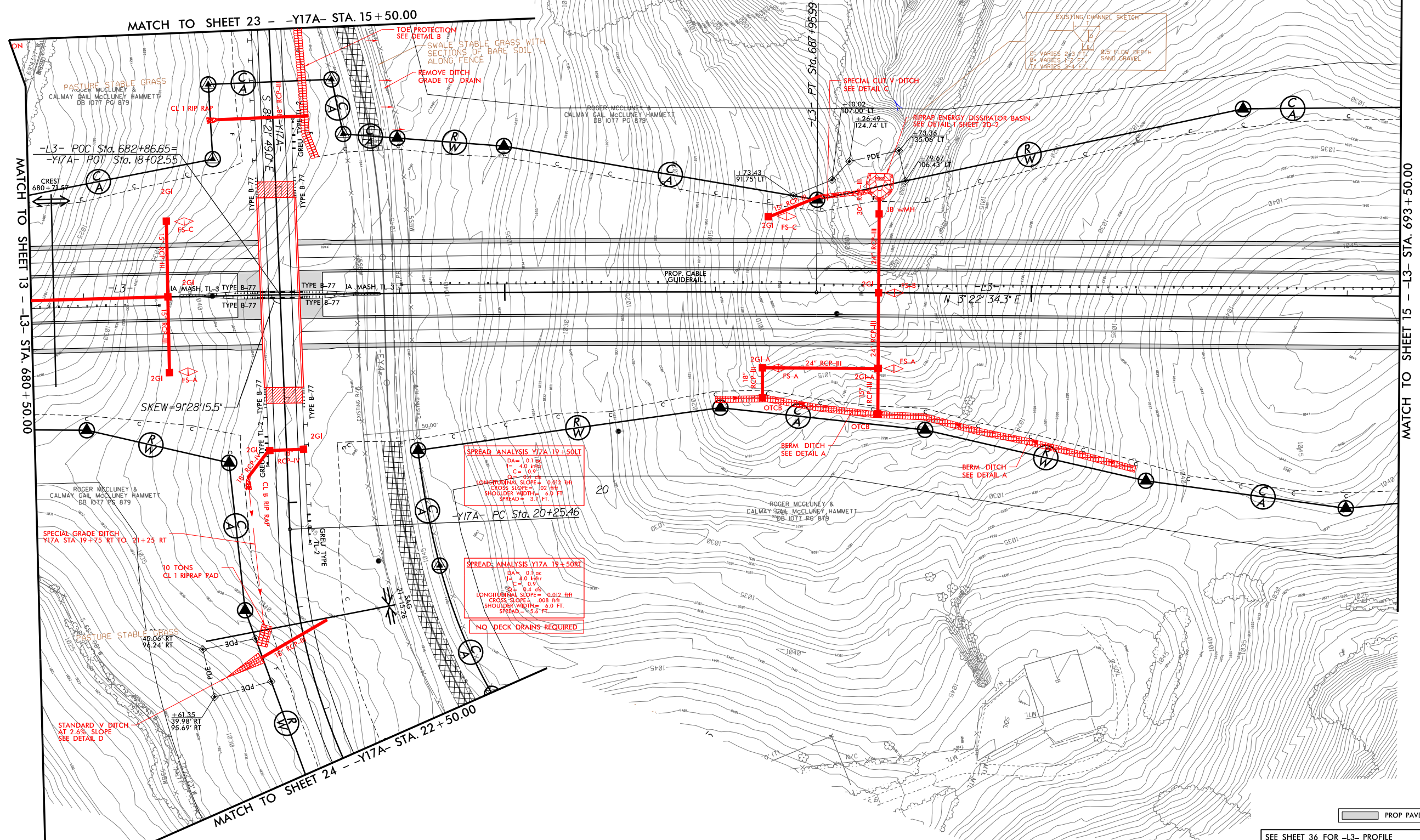


2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CDA No. F-40029

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		14	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

CURVE DATA FOR -Y17A-
 PI Sta 23+85.97
 $\Delta = 62^{\circ}00'00.0"$ (LT)
 $D = 9^{\circ}32'57.5"$
 $L = 649.26'$
 $T = 360.52'$
 $R = 600.00'$
 $S_e = 0.06$
 $RO = 120'$

CURVE DATA FOR -L3-
 PI Sta 666+39.01
 $\Delta = 10^{\circ}46'42.6"$ (RT)
 $D = 0^{\circ}41'56.8"$
 $L = 4,326.77'$
 $T = 2,169.79'$
 $R = 23,000.00'$
 $S_e = NC$



MATCH TO SHEET 13 - L3- STA. 680+50.00

MATCH TO SHEET 23 - Y17A- STA. 15+50.00

MATCH TO SHEET 24 - Y17A- STA. 22+50.00

MATCH TO SHEET 15 - L3- STA. 693+50.00

SPREAD ANALYSIS Y17A 19+50RT
 DA = 0.1 ac
 F = 4.0 mph
 C = 0.9'
 LONGITUDINAL SLOPE = 0.012 hft
 CROSS SLOPE = 0.02 hft
 SHOULDER WIDTH = 6.0 FT
 SPREAD = 3.7 FT

SPREAD ANALYSIS Y17A 19+50RT
 DA = 0.1 ac
 F = 4.0 mph
 C = 0.9'
 LONGITUDINAL SLOPE = 0.012 hft
 CROSS SLOPE = 0.02 hft
 SHOULDER WIDTH = 6.0 FT
 SPREAD = 5.6 FT

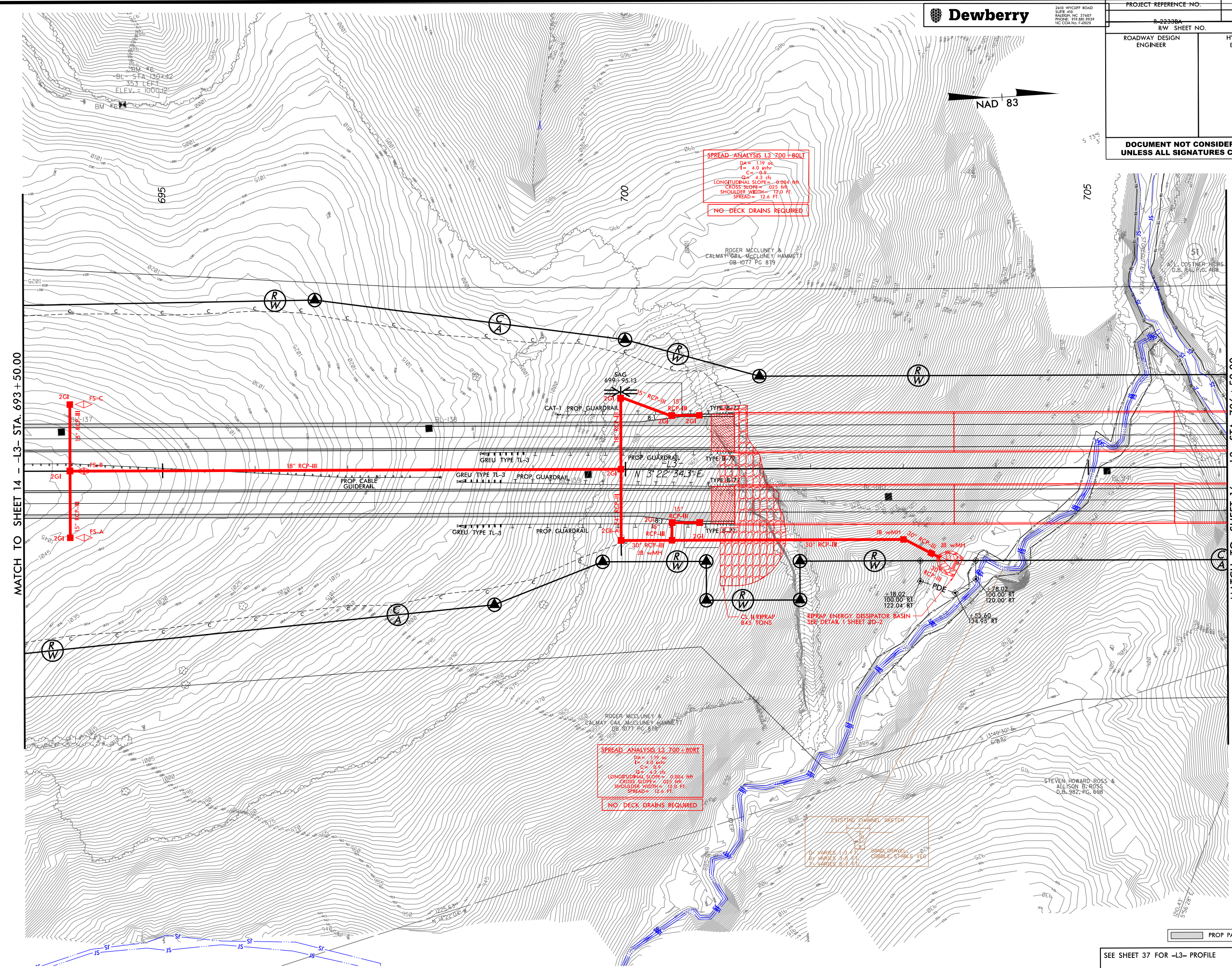
NO DECK DRAINS REQUIRED

PROP PAVED SHOULDER

SEE SHEET 36 FOR -L3- PROFILE
SEE SHEET 48 FOR -Y17A- PROFILE

1562915
Dewberry
R-2233BA-48 Permit Drawing, 20191206

PROJECT REFERENCE NO.	SHEET NO.
R-23338A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SPREAD ANALYSIS L3 700+80T
 DA = 1.19 ft
 I = 4.0 in/hr
 C = 0.2
 Q = 4.3 cfs
 LONGITUDINAL SLOPE = 0.004 H/F
 CROSS SLOPE = 0.025 H/F
 SHOULDER WIDTH = 12.0 FT
 SPREAD = 12.6 FT
NO DECK DRAINS REQUIRED

SPREAD ANALYSIS L3 700+80T
 DA = 1.19 ft
 I = 4.0 in/hr
 C = 0.2
 Q = 4.3 cfs
 LONGITUDINAL SLOPE = 0.004 H/F
 CROSS SLOPE = 0.025 H/F
 SHOULDER WIDTH = 12.0 FT
 SPREAD = 12.6 FT
NO DECK DRAINS REQUIRED

EXISTING CHANNEL SKETCH
 D₅₀ VARIES 1.5 FT
 B₅₀ VARIES 3.5 FT
 T₅₀ VARIES 8.5 FT
 SAND, GRAVEL
 COBBLE, STABLE VEG

MATCH TO SHEET 14 - L3- STA. 693+50.00

MATCH TO SHEET 16 - L3- STA. 706+50.00

PROP PAVED SHOULDER

SEE SHEET 37 FOR -L3- PROFILE

5/14/19

1562915
D:\060884
232338A_48_Permit\Drawings_2019\206

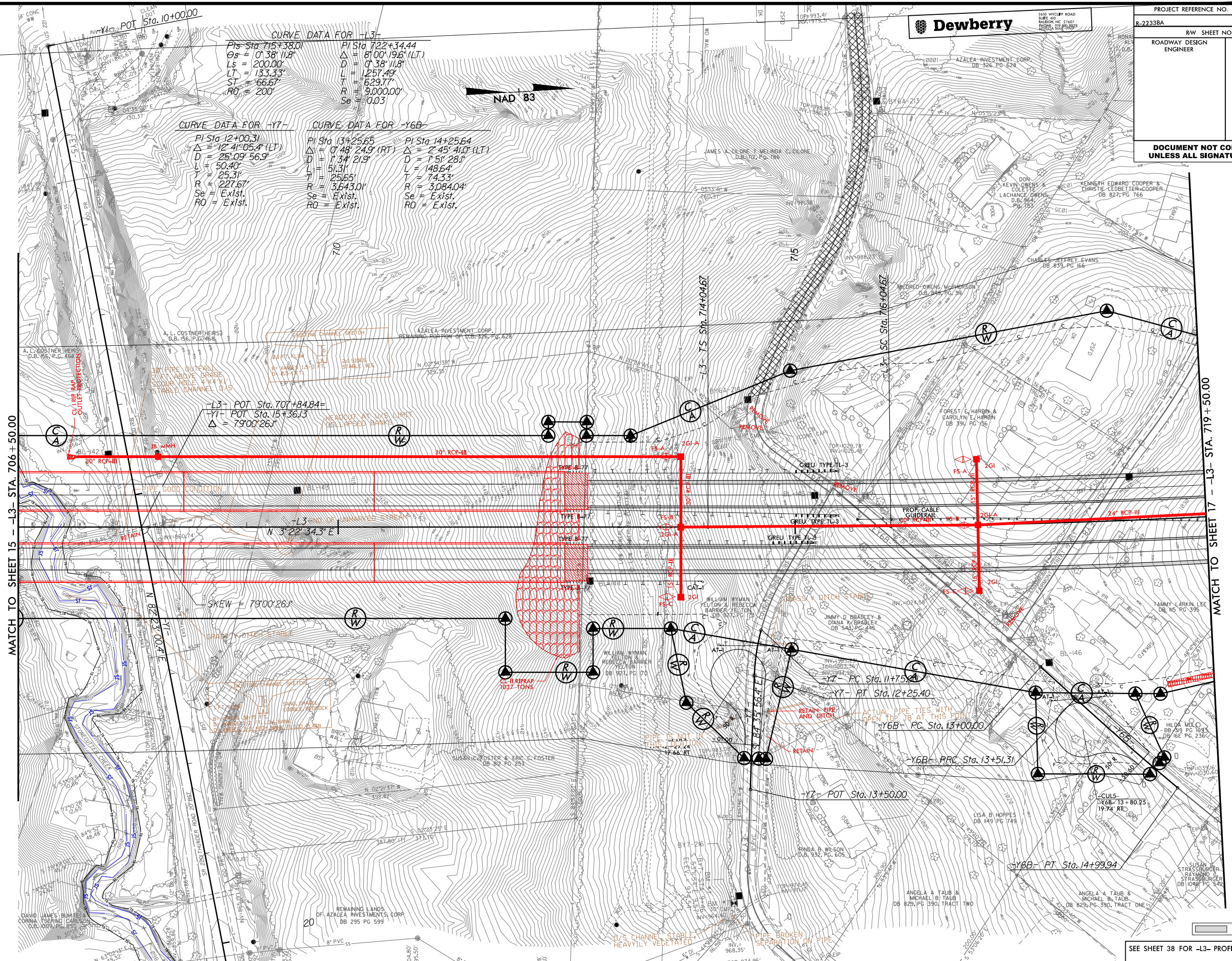
PROJECT REFERENCE NO.	SHEET NO.
R-22338A	16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



CURVE DATA FOR -L3-
 Pts Sta 715+38.01 P/ Sta 722+34.44
 $\Delta = 0^\circ 38' 11.8"$ $\Delta = 81^\circ 00' 19.6"$ (LT)
 $L_s = 200.00'$ $D = 0^\circ 38' 11.8"$
 $L = 133.33'$ $L = 1257.49'$
 $ST = 66.67'$ $T = 629.77'$
 $RO = 200'$ $R = 9,000.00'$
 $Se = 0.03$

CURVE DATA FOR -Y7-
 P/ Sta 12+00.31
 $\Delta = 12^\circ 41' 05.4"$ (LT)
 $D = 25^\circ 09' 56.9"$
 $L = 50.40'$
 $T = 25.31'$
 $R = 227.67'$
 $Se = Exist.$
 $RO = Exist.$

CURVE DATA FOR -Y6B-
 P/ Sta 13+25.65 P/ Sta 14+25.64
 $\Delta = 0^\circ 48' 24.9"$ (RT) $\Delta = 2^\circ 45' 41.0"$ (LT)
 $D = 1^\circ 34' 21.9"$ $D = 1^\circ 51' 28.1"$
 $L = 51.31'$ $L = 148.64'$
 $T = 25.65'$ $T = 74.33'$
 $R = 3,643.01'$ $R = 3,084.04'$
 $Se = Exist.$ $Se = Exist.$
 $RO = Exist.$ $RO = Exist.$



MATCH TO SHEET 15 - L3- STA. 706+50.00

MATCH TO SHEET 17 - L3- STA. 719+50.00

PROP PAVED SHOULDER

SEE SHEET 38 FOR -L3- PROFILE

5/14/19

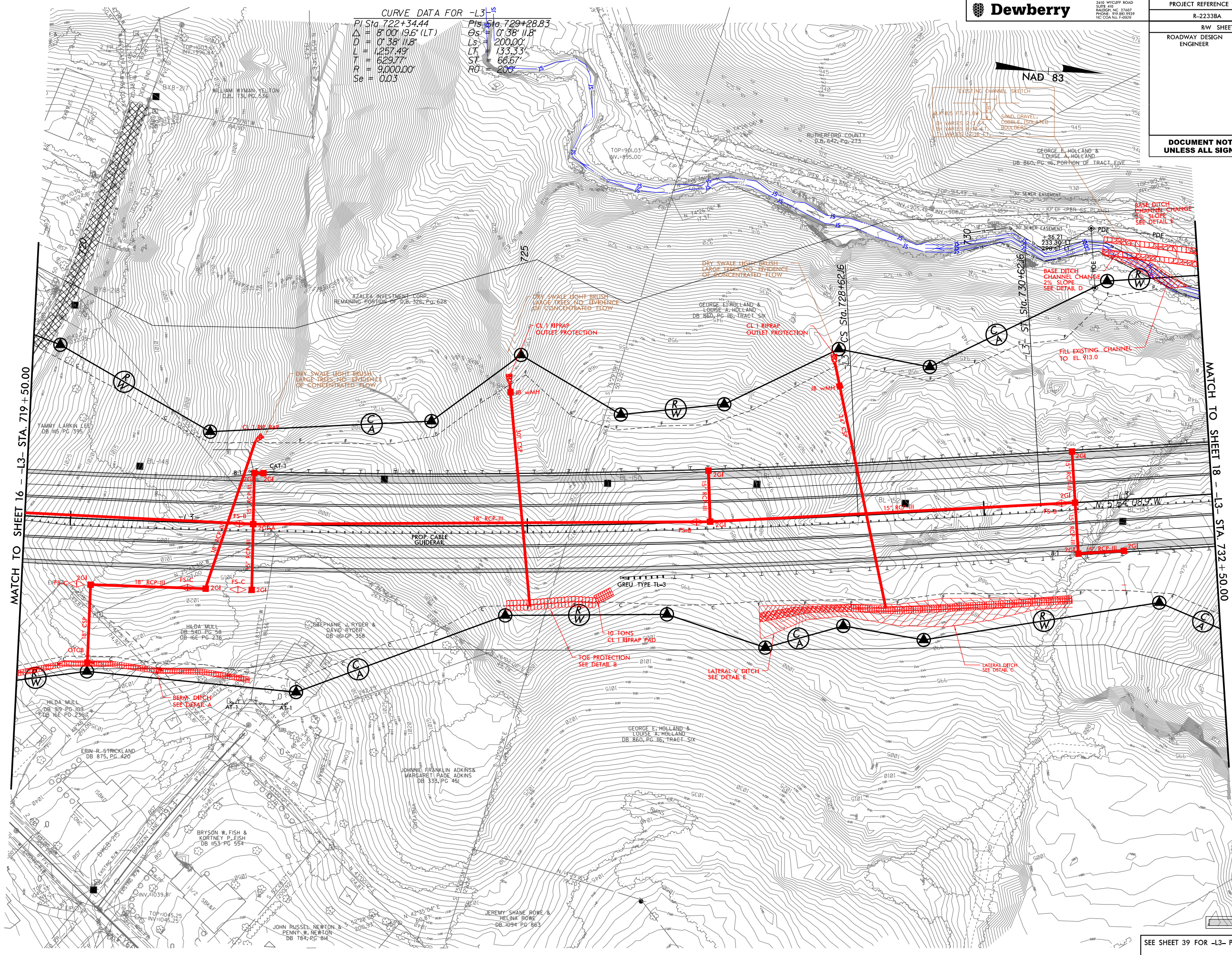
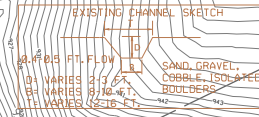
Permit Drawings - 20191206
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UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -L3-

PI Sta. 722+34.44	PIs Sta. 729+28.83
$\Delta = 81^{\circ}00'19.6"$ (LT)	$\Theta_s = 0^{\circ}38'11.8"$
$D = 0^{\circ}38'11.8"$	$L_s = 200.00'$
$L = 1257.49'$	$LT = 133.33'$
$R = 6297.77'$	$ST = 66.67'$
$S_e = 0.03$	$RO = 200'$

NAD 83



MATCH TO SHEET 16 -- L3- STA. 719 + 50.00

MATCH TO SHEET 18 -- L3- STA. 732 + 50.00

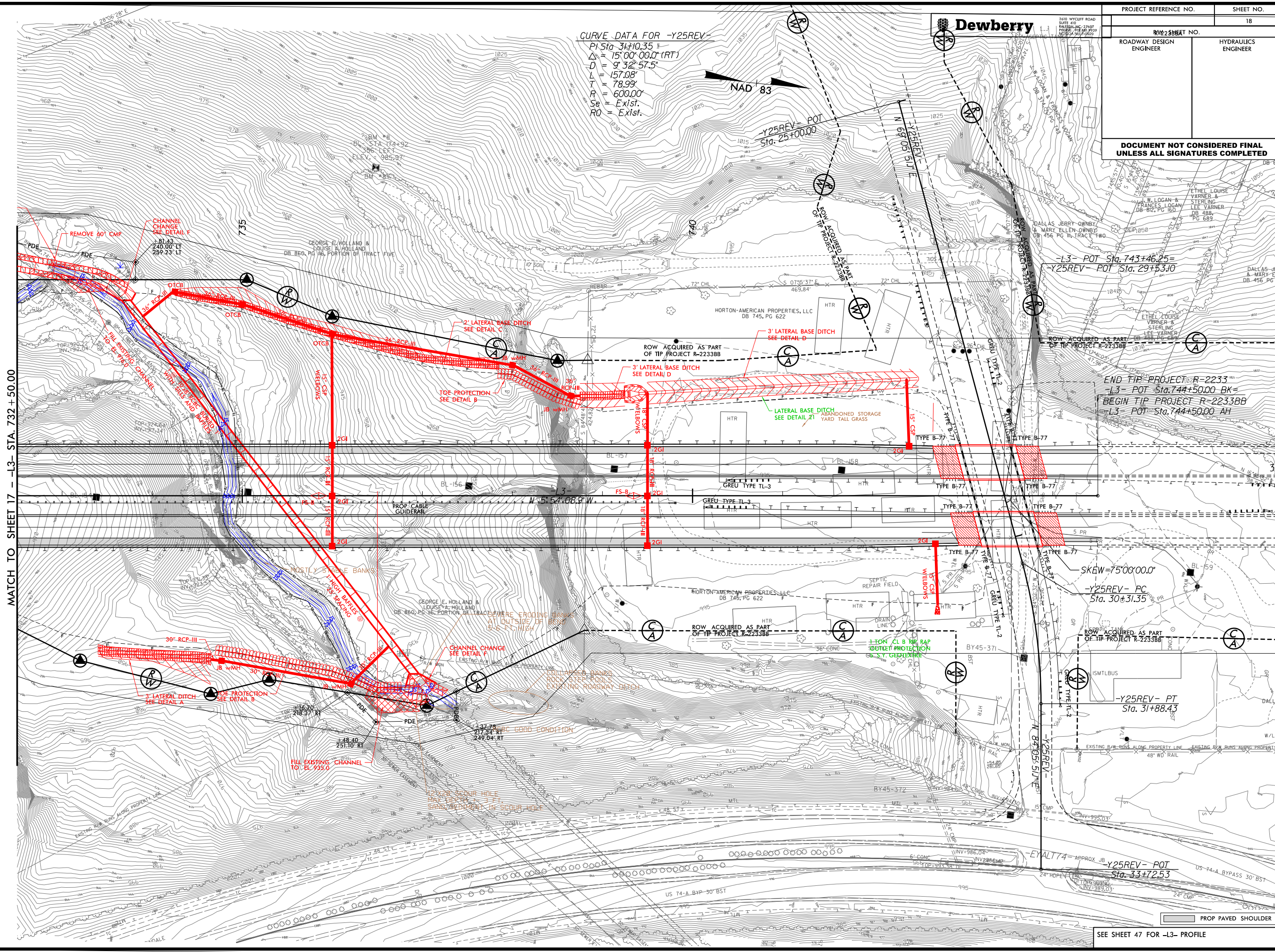
PROP PAVED SHOULDER

SEE SHEET 39 FOR -L3- PROFILE

PROJECT REFERENCE NO.		SHEET NO.
R-2233		18
ROADWAY DESIGN ENGINEER		
HYDRAULICS ENGINEER		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

CURVE DATA FOR -Y25REV-
 PI Sta. 31+10.35
 $\Delta = 15^{\circ}00'00.0"$ (RT)
 $D = 9^{\circ}32'57.5"$
 $L = 157.08'$
 $T = 78.99'$
 $R = 600.00'$
 $S_e = \text{Exist.}$
 $R_0 = \text{Exist.}$

Dewberry
 2430 WYCLIFF ROAD
 SUITE 410
 FAYETTEVILLE, NC 27407
 PHONE: 703.993.9939
 FAX: 703.993.9938



MATCH TO SHEET 17 - L3- STA. 732 + 50.00

END TIP PROJECT R-2233
 L3- POT Sta. 744+50.00 BK=
 BEGIN TIP PROJECT R-2233BB
 L3- POT Sta. 744+50.00 AH

SKEW=75°00'00.0"
 -Y25REV- PC
 Sta. 30+31.35

-Y25REV- PT
 Sta. 31+88.43

-Y25REV- POT
 Sta. 33+72.53

PROP PAVED SHOULDER

SEE SHEET 47 FOR -L3- PROFILE

5/14/99
 1262015
 0262015
 022338A 48 Permit Drawings, 20191206

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

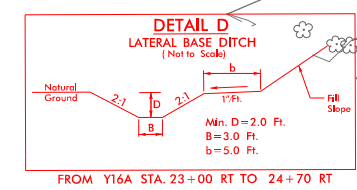
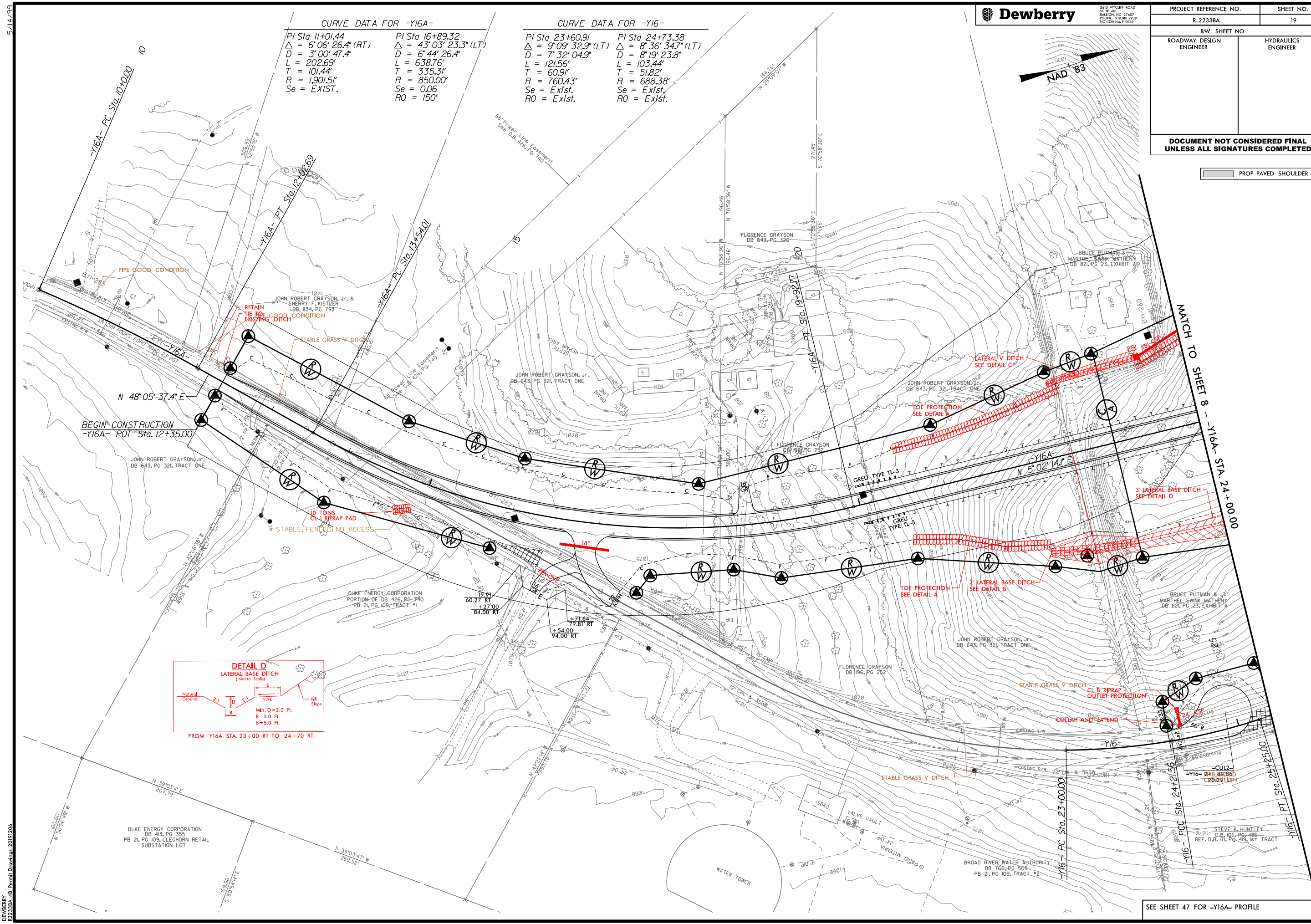
PROP PAVED SHOULDER

CURVE DATA FOR -Y16A-

PI Sta 11+01.44	PI Sta 16+89.32
$\Delta = 6^{\circ}06'26.4"$ (RT)	$\Delta = 43^{\circ}03'23.3"$ (LT)
$D = 3^{\circ}00'47.4"$	$D = 6^{\circ}44'26.4"$
$L = 202.69'$	$L = 638.76'$
$T = 101.44'$	$T = 335.31'$
$R = 1,901.51'$	$R = 850.00'$
$Se = EXIST.$	$Se = 0.06'$
	$RO = 150'$

CURVE DATA FOR -Y16-

PI Sta 23+60.91	PI Sta 24+73.38
$\Delta = 9^{\circ}09'32.9"$ (LT)	$\Delta = 8^{\circ}36'34.7"$ (LT)
$D = 7^{\circ}32'04.9"$	$D = 8^{\circ}19'23.8"$
$L = 121.56'$	$L = 103.44'$
$T = 60.91'$	$T = 51.82'$
$R = 760.43'$	$R = 688.38'$
$Se = EXIST.$	$Se = EXIST.$
$RO = EXIST.$	$RO = EXIST.$



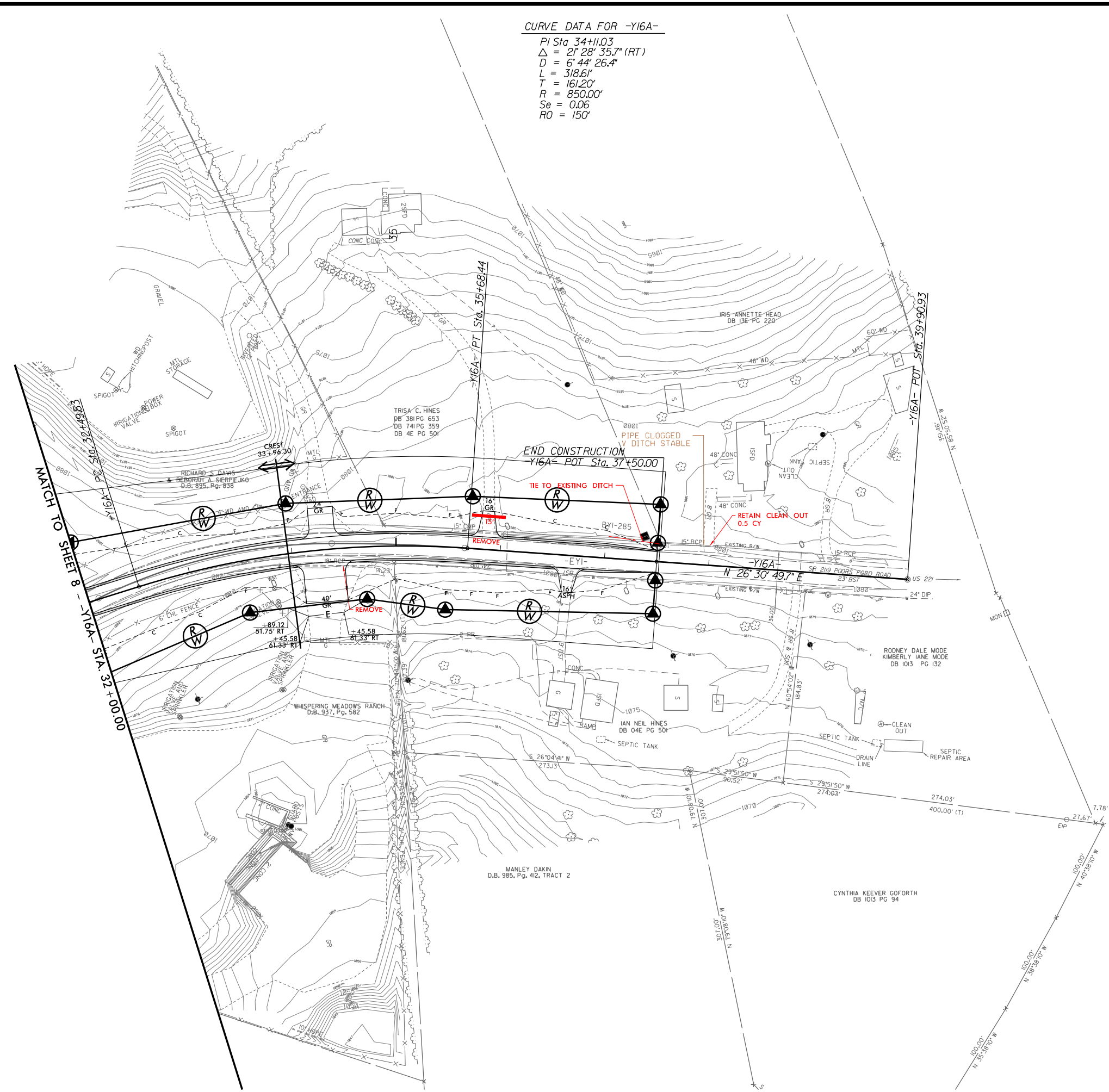
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SEE SHEET 47 FOR -Y16A- PROFILE

5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		20	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

CURVE DATA FOR -Y16A-
 PI Sta. 34+11.03
 $\Delta = 21^{\circ}28'35.7"$ (RT)
 $D = 6'44"26.4"$
 $L = 318.61'$
 $T = 161.20'$
 $R = 850.00'$
 $Se = 0.06$
 $RO = 150'$



126/0215
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 R2233BA_48_Permit_Drawing.dwg, 20191206

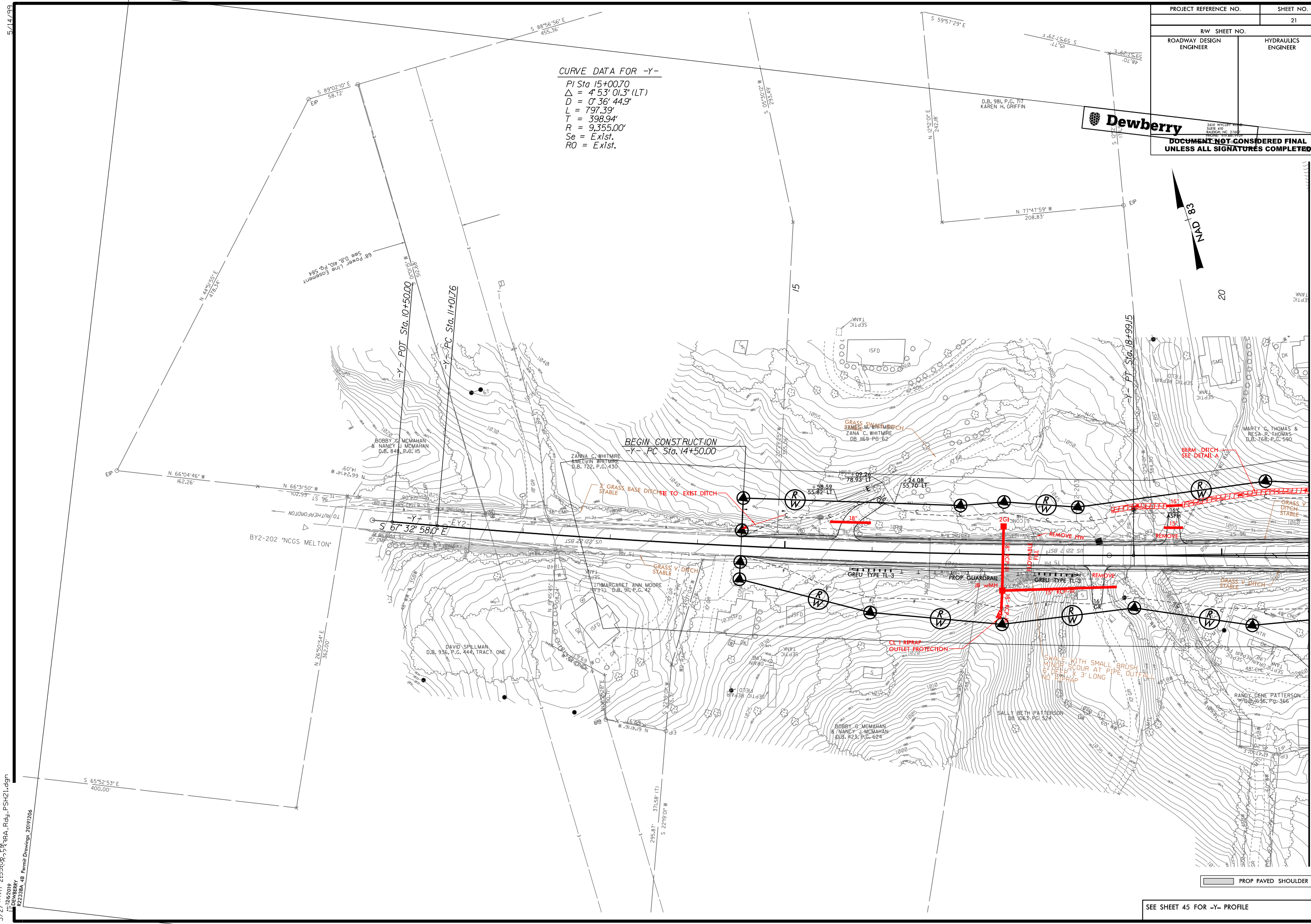
PROP PAVED SHOULDER

SEE SHEET 47 FOR -Y16A- PROFILE

PROJECT REFERENCE NO.		SHEET NO.
		21
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

Dewberry
 2810 WELBY RD
 SUITE 410
 RALEIGH, NC 27607
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -Y-
 PI Sta 15+00.70
 $\Delta = 4^{\circ} 53' 01.3" (LT)$
 $D = 0^{\circ} 36' 44.9"$
 $L = 797.39'$
 $T = 398.94'$
 $R = 9,355.00'$
 $Se = Exist.$
 $Ro = Exist.$



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 11/26/2019
 DEWBERRY
 12233BA 48 Permit Drawing 20191206

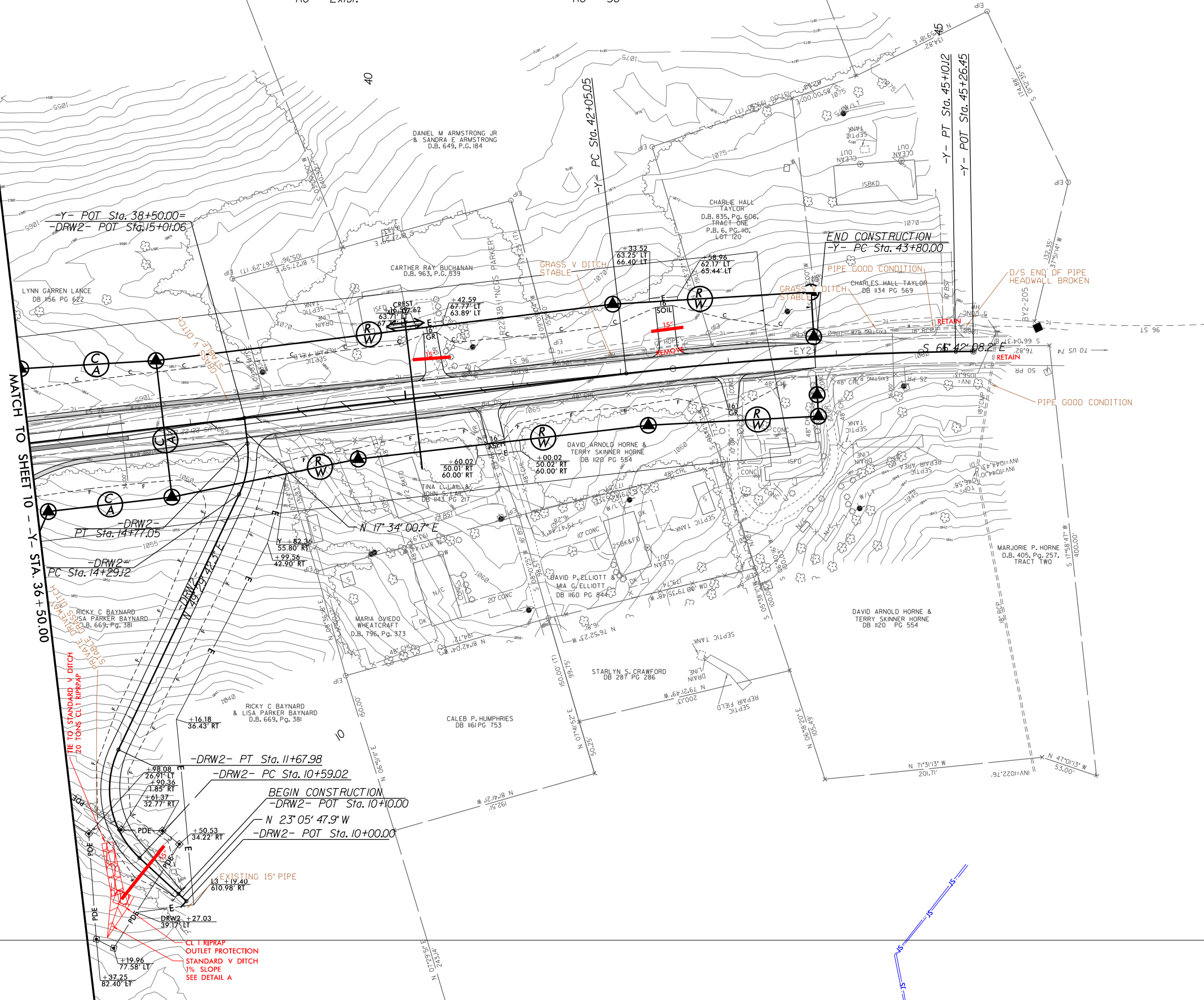
SEE SHEET 45 FOR -Y- PROFILE

MATCH TO SHEET 10 - Y- STA. 21+00.00

PROJECT REFERENCE NO.		SHEET NO.	
		22	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



CURVE DATA FOR -Y-	CURVE DATA FOR -DRW2-
PI Sta 43+57.71 Δ = 5' 43' 51" (RT) D = 1' 52' 42.8" L = 305.07' T = 152.66' R = 3,050.00' Se = Exist. RO = Exist.	PI Sta 11+22.18 Δ = 72' 35' 30.3" (RT) D = 66' 37' 22.8" L = 108.96' T = 63.16' R = 86.00' Se = NC
	PI Sta 14+53.73 Δ = 31' 55' 41.7" (LT) D = 66' 37' 22.8" L = 47.92' T = 24.60' R = 86.00' Se = RC RO = 30'



MATCH TO SHEET 10 - Y- STA. 36 + 50.00

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PROP PAVED SHOULDER

SEE SHEET 46 FOR -Y- PROFILE
SEE SHEET 51 FOR -DRW2- PROFILE

CURVE DATA FOR -SRI-

PI Sta 31+17.50
 $\Delta = 45^\circ 28' 11.4''$ (RT)
 D = 19' 05" 54.9"
 L = 238.08'
 T = 125.71'
 R = 300.00'
 Se = 0.06
 RO = 108'

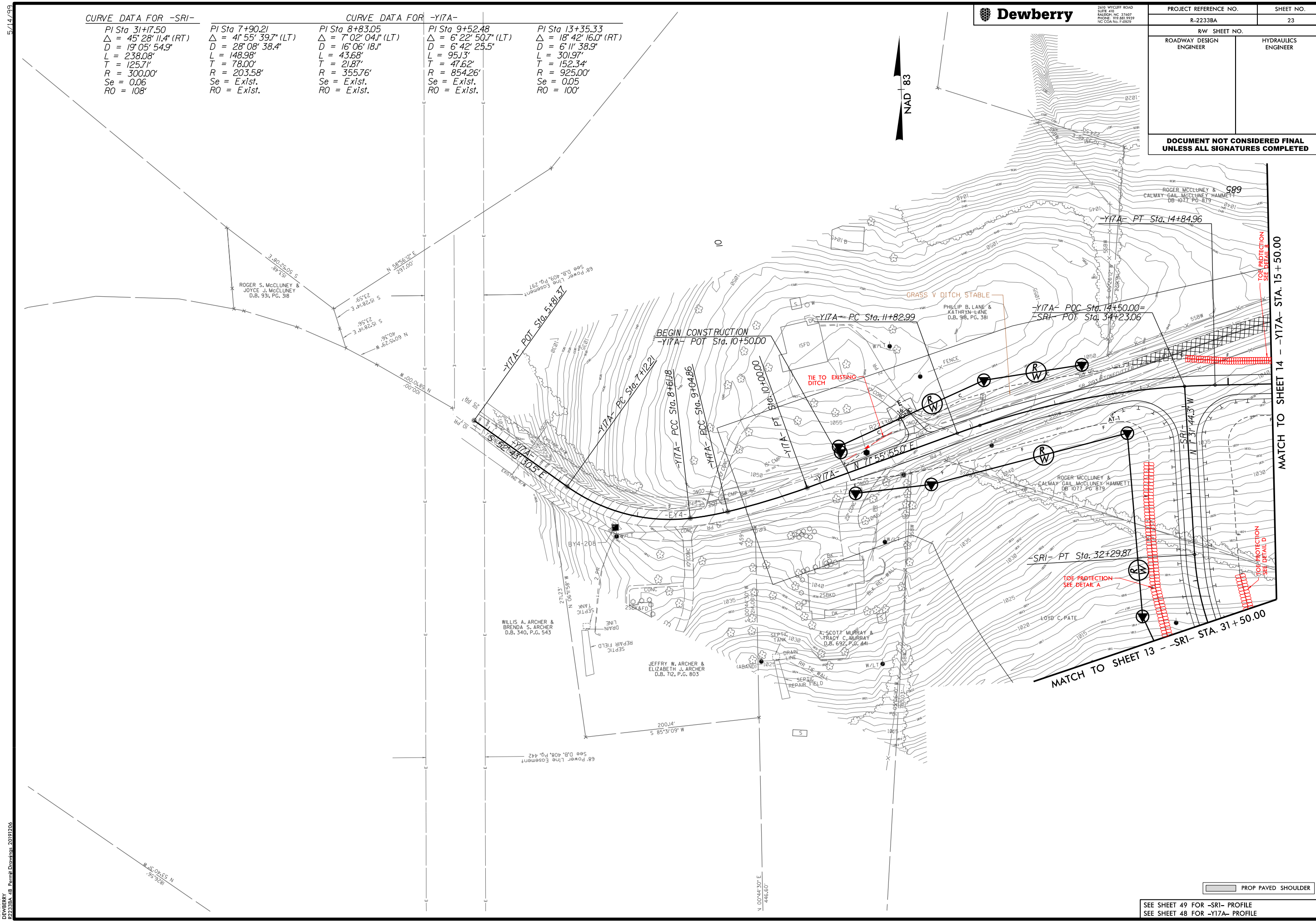
CURVE DATA FOR -Y17A-

PI Sta 7+90.21
 $\Delta = 41^\circ 55' 39.7''$ (LT)
 D = 28' 08" 38.4"
 L = 148.98'
 T = 78.00'
 R = 203.58'
 Se = Exist.
 RO = Exist.

PI Sta 8+83.05
 $\Delta = 7^\circ 02' 04.1''$ (LT)
 D = 16' 06" 18.1"
 L = 43.68'
 T = 21.87'
 R = 355.76'
 Se = Exist.
 RO = Exist.

PI Sta 9+52.48
 $\Delta = 6^\circ 22' 50.7''$ (LT)
 D = 6' 42" 25.5"
 L = 95.13'
 T = 47.62'
 R = 854.26'
 Se = Exist.
 RO = Exist.

PI Sta 13+35.33
 $\Delta = 18^\circ 42' 16.0''$ (RT)
 D = 6' 11" 38.9"
 L = 301.97'
 T = 152.34'
 R = 925.00'
 Se = 0.05
 RO = 100'



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PROP PAVED SHOULDER

SEE SHEET 49 FOR -SRI- PROFILE
 SEE SHEET 48 FOR -Y17A- PROFILE

5/14/99

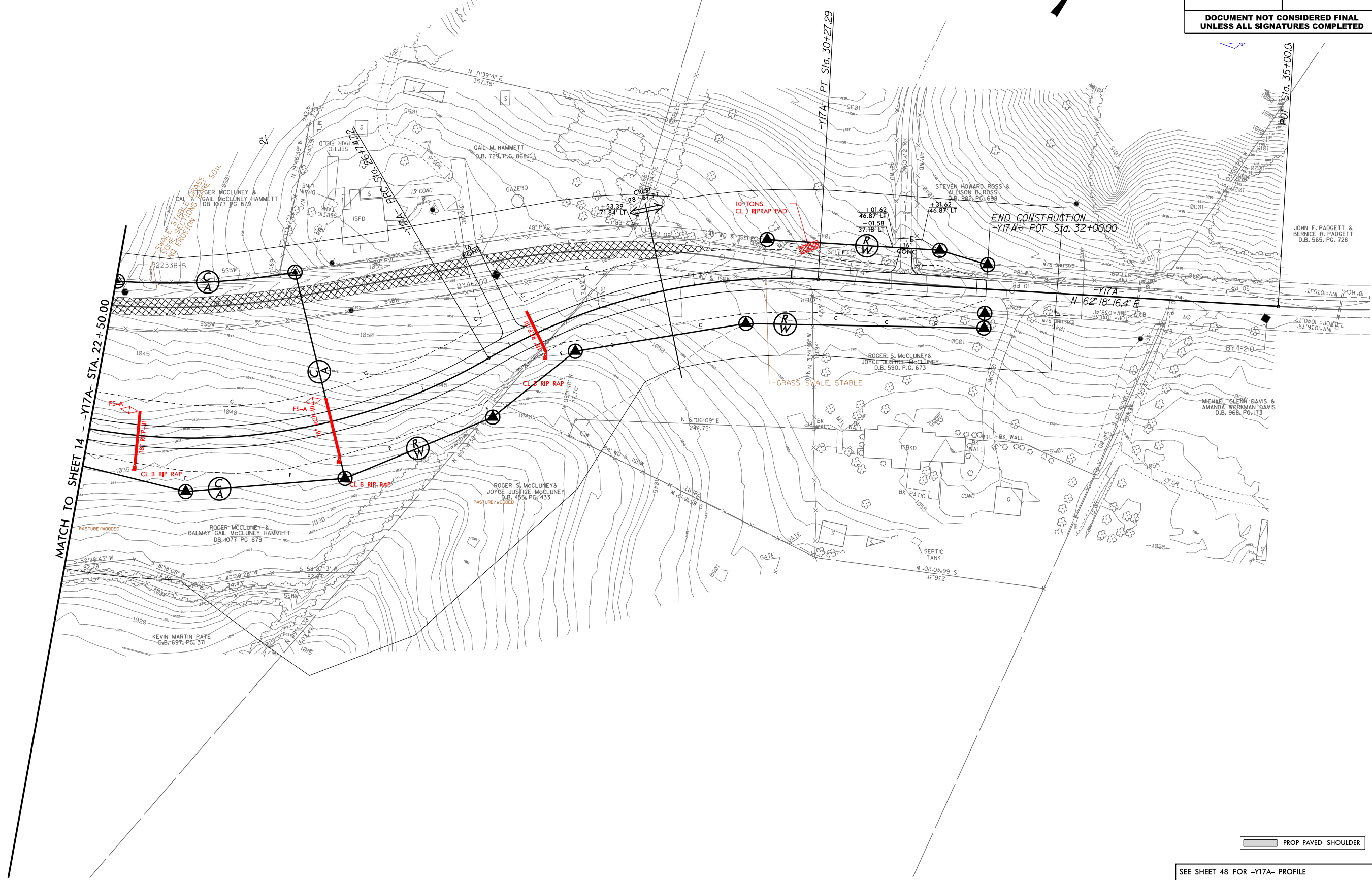
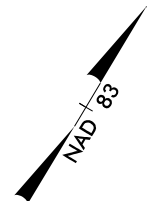


2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-40029

PROJECT REFERENCE NO.		SHEET NO.	
R-2233BA		24	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

CURVE DATA FOR -Y17A-

PI Sta 23+85.97	PI Sta 28+56.26
$\Delta = 62^{\circ} 00' 00.0''$ (LT)	$\Delta = 33^{\circ} 40' 05.4''$ (RT)
D = 9' 32' 57.5"	D = 9' 32' 57.5"
L = 649.26'	L = 352.57'
T = 360.52'	T = 181.54'
R = 600.00'	R = 600.00'
Se = 0.06	Se = 0.06
RO = 120'	RO = 120'



MATCH TO SHEET 14 -Y17A- STA. 22+50.00

PROP PAVED SHOULDER

SEE SHEET 48 FOR -Y17A- PROFILE

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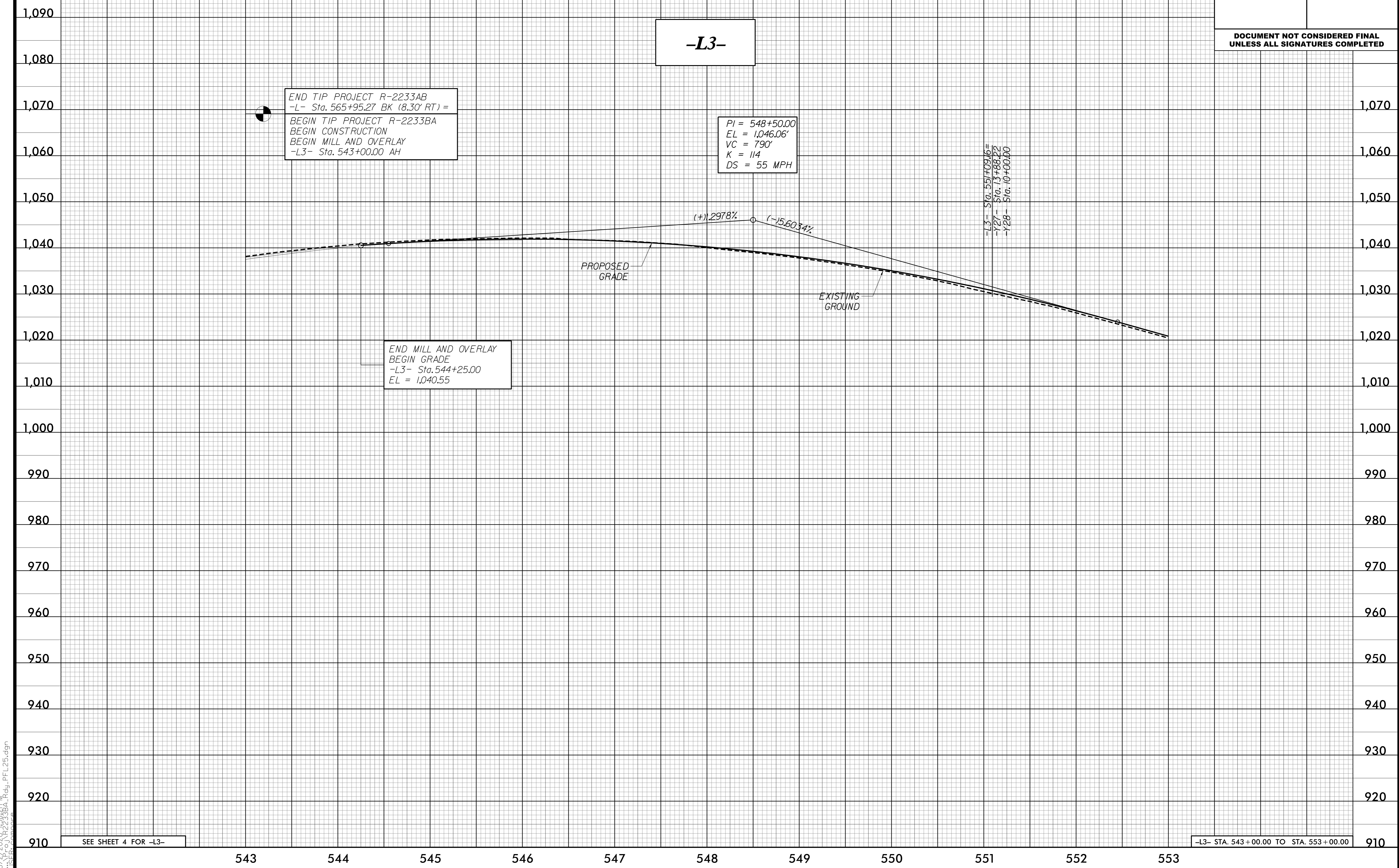
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 25

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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UNLESS ALL SIGNATURES COMPLETED



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5/14/99

DITCH LEGEND

RIGHT DITCH - - - - -

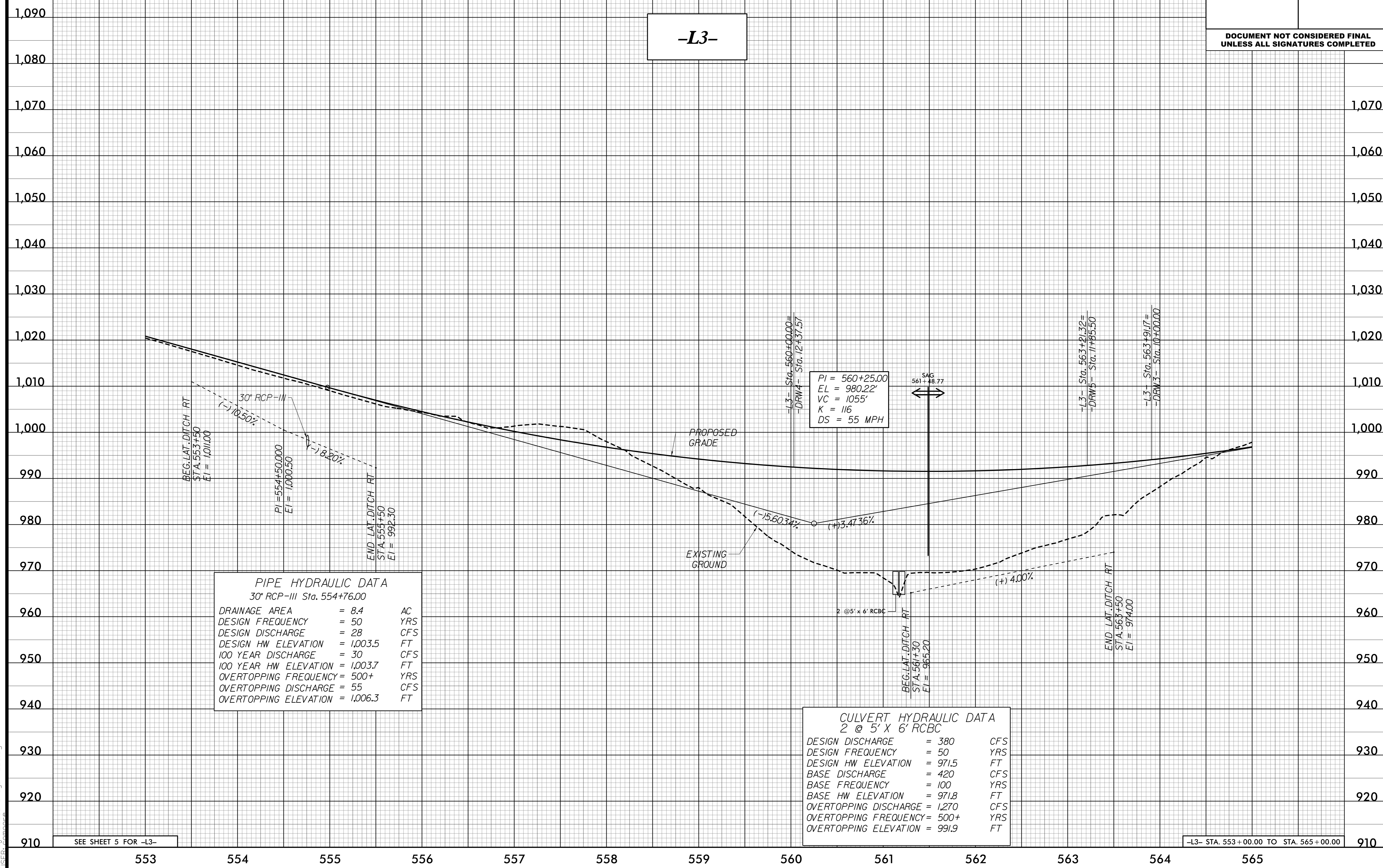
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-



PIPE HYDRAULIC DATA
 30" RCP-III Sta. 554+76.00

DRAINAGE AREA	= 8.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 28	CFS
DESIGN HW ELEVATION	= 1,003.5	FT
100 YEAR DISCHARGE	= 30	CFS
100 YEAR HW ELEVATION	= 1,003.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 55	CFS
OVERTOPPING ELEVATION	= 1,006.3	FT

CULVERT HYDRAULIC DATA
 2 @ 5' X 6' RCBC

DESIGN DISCHARGE	= 380	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 971.5	FT
BASE DISCHARGE	= 420	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 971.8	FT
OVERTOPPING DISCHARGE	= 1,270	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 991.9	FT

SEE SHEET 5 FOR -L3-

-L3- STA. 553+00.00 TO STA. 565+00.00

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9729
NC CCA No. F-0029

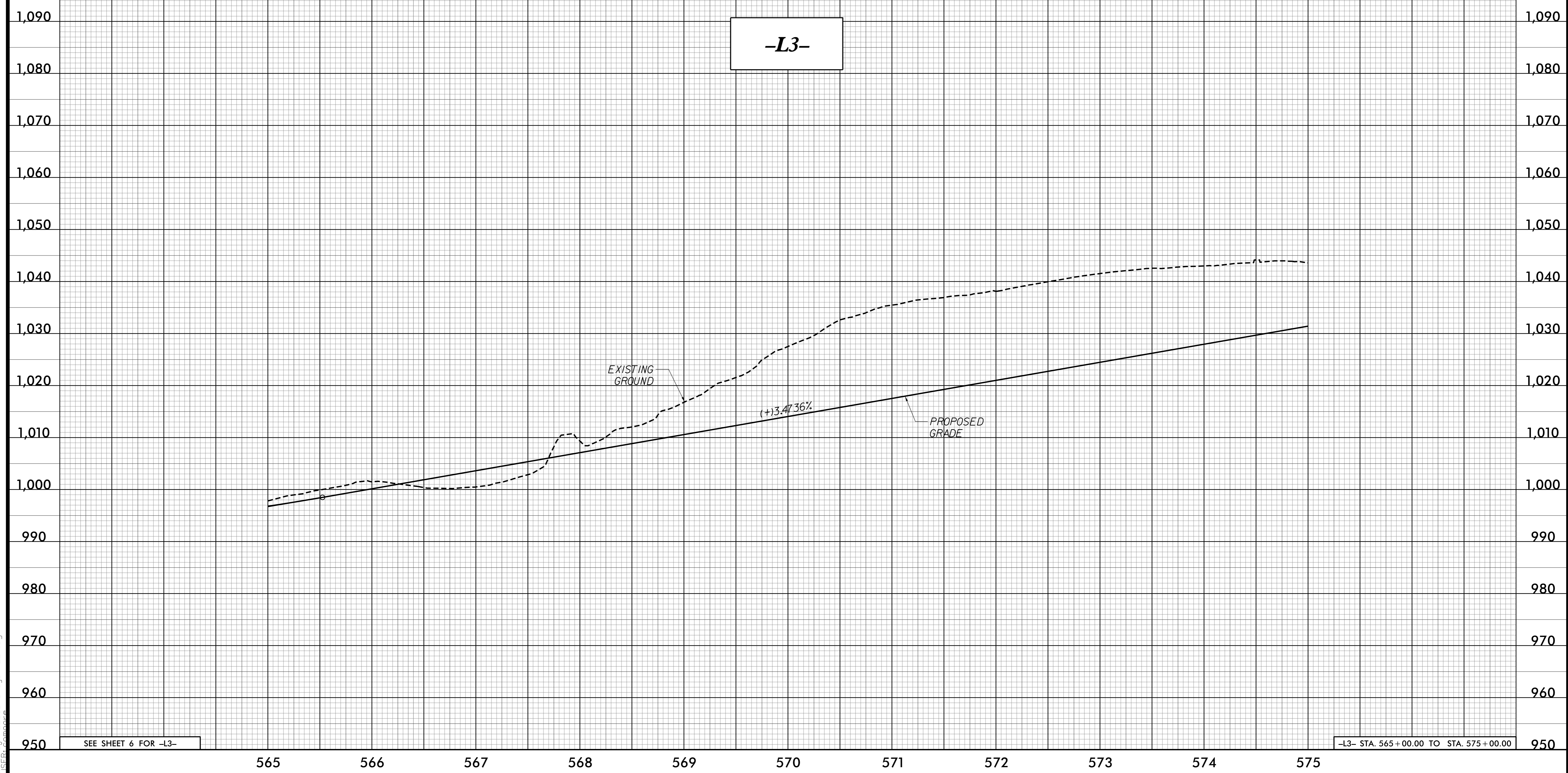
PROJECT REFERENCE NO. R-2233BA SHEET NO. 27

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-



SEE SHEET 6 FOR -L3-

-L3- STA. 565+00.00 TO STA. 575+00.00

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ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

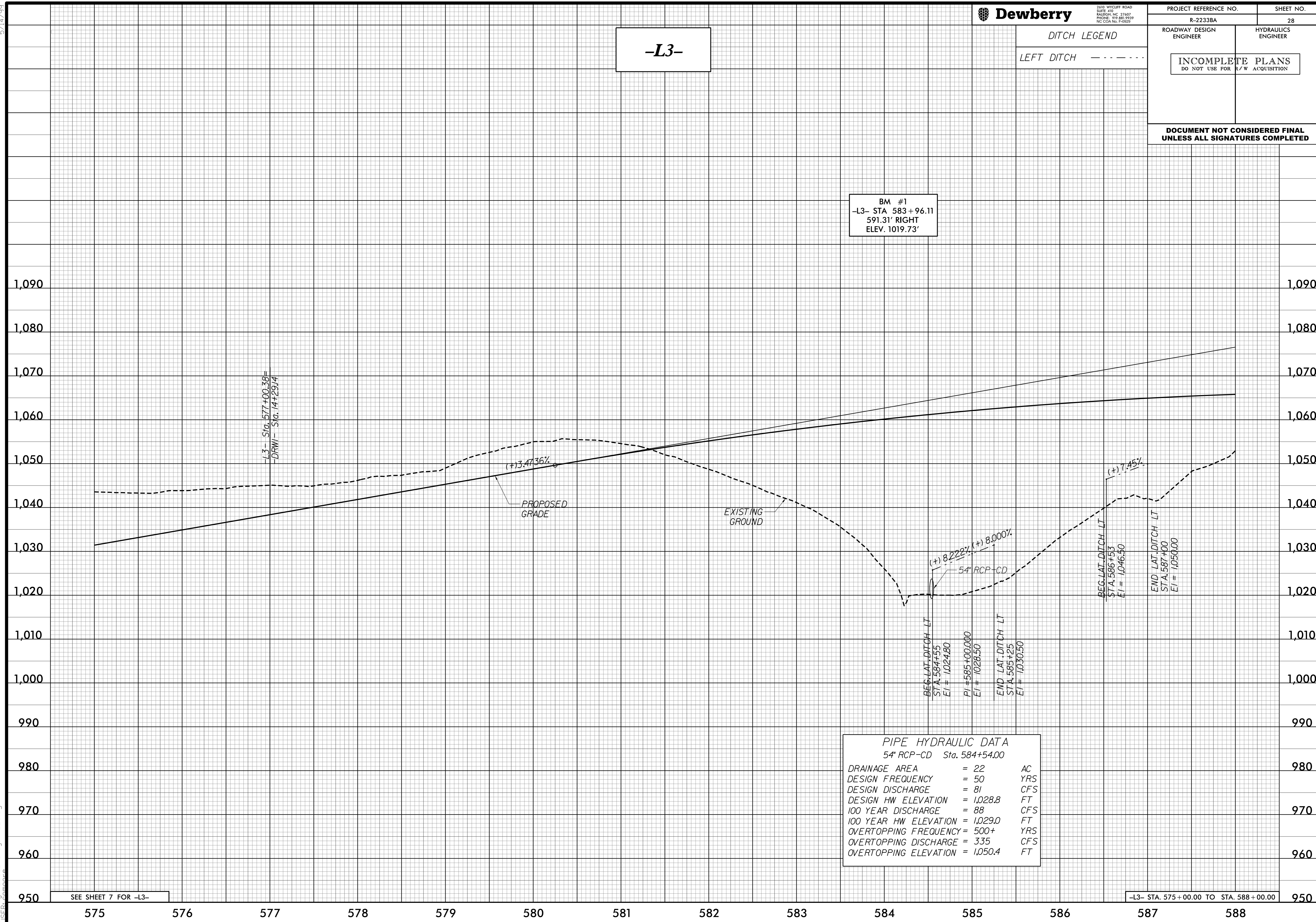
INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-

DITCH LEGEND
 LEFT DITCH - - - - -

BM #1
 -L3- STA 583+96.11
 591.31' RIGHT
 ELEV. 1019.73'



PIPE HYDRAULIC DATA
 54" RCP-CD Sta. 584+54.00

DRAINAGE AREA	= 22	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 81	CFS
DESIGN HW ELEVATION	= 1,028.8	FT
100 YEAR DISCHARGE	= 88	CFS
100 YEAR HW ELEVATION	= 1,029.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 335	CFS
OVERTOPPING ELEVATION	= 1,050.4	FT

SEE SHEET 7 FOR -L3-

-L3- STA. 575+00.00 TO STA. 588+00.00

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5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9729
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 29

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-

PI = 589+00.00
EL = 1080.09'
VC = 1750'
K = 279
DS = 70 MPH

CREST
589+93.36

(+)3.4736% (-)2.8038%

-L3- Sta. 597+89.15
-Y16A- Sta. 27+65.51-

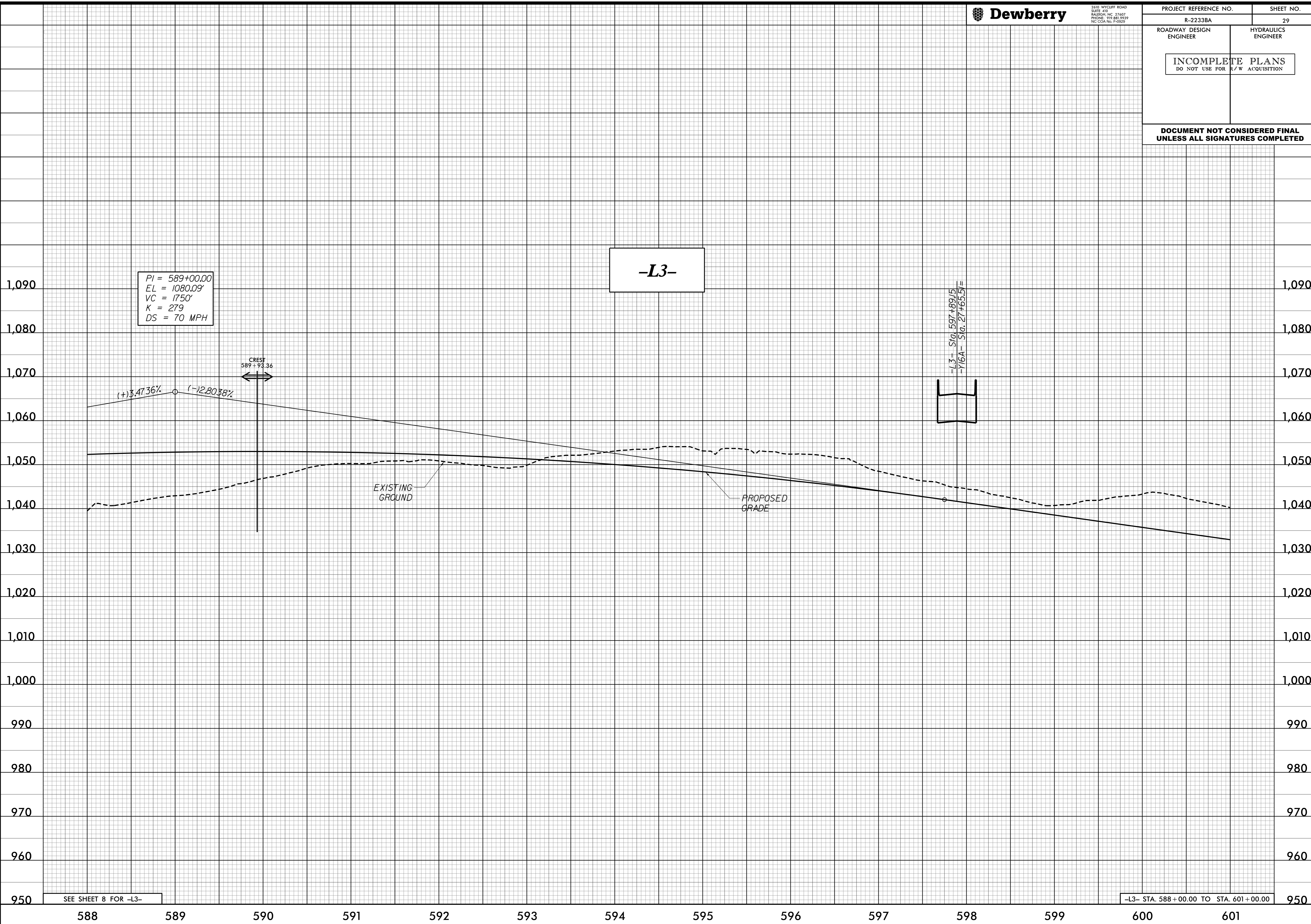
EXISTING GROUND

PROPOSED GRADE

SEE SHEET 8 FOR -L3-

-L3- STA. 588+00.00 TO STA. 601+00.00

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5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 30

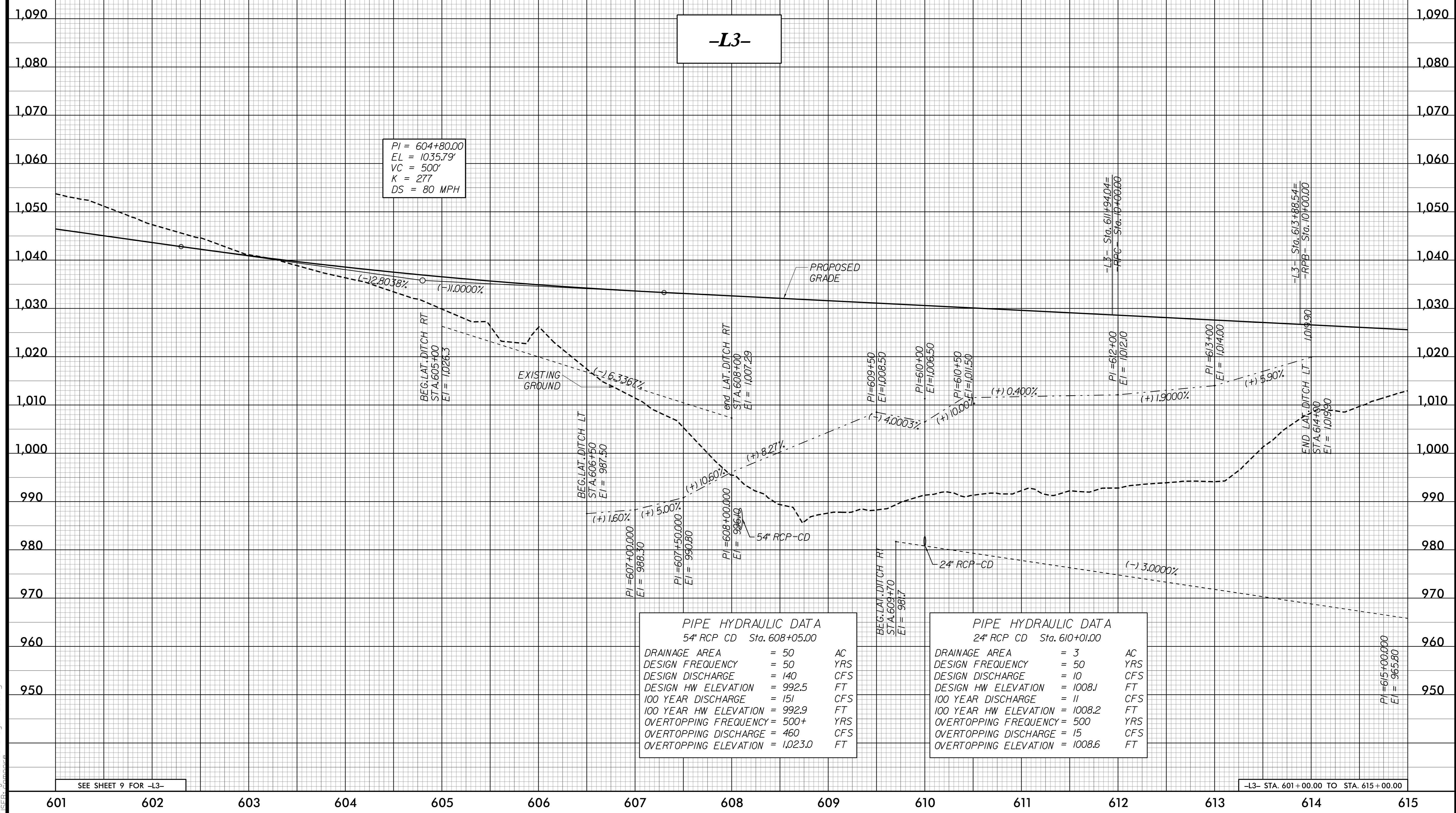
DITCH LEGEND
LEFT DITCH - - - - -
RIGHT DITCH - - - - -

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-

PI = 604+80.00
EL = 1035.79'
VC = 500'
K = 277
DS = 80 MPH



PIPE HYDRAULIC DATA
54" RCP CD Sta. 608+05.00

DRAINAGE AREA	= 50	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 140	CFS
DESIGN HW ELEVATION	= 992.5	FT
100 YEAR DISCHARGE	= 151	CFS
100 YEAR HW ELEVATION	= 992.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 460	CFS
OVERTOPPING ELEVATION	= 1023.0	FT

PIPE HYDRAULIC DATA
24" RCP CD Sta. 610+01.00

DRAINAGE AREA	= 3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 10	CFS
DESIGN HW ELEVATION	= 1008.1	FT
100 YEAR DISCHARGE	= 11	CFS
100 YEAR HW ELEVATION	= 1008.2	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 15	CFS
OVERTOPPING ELEVATION	= 1008.6	FT

SEE SHEET 9 FOR -L3-

-L3- STA. 601+00.00 TO STA. 615+00.00

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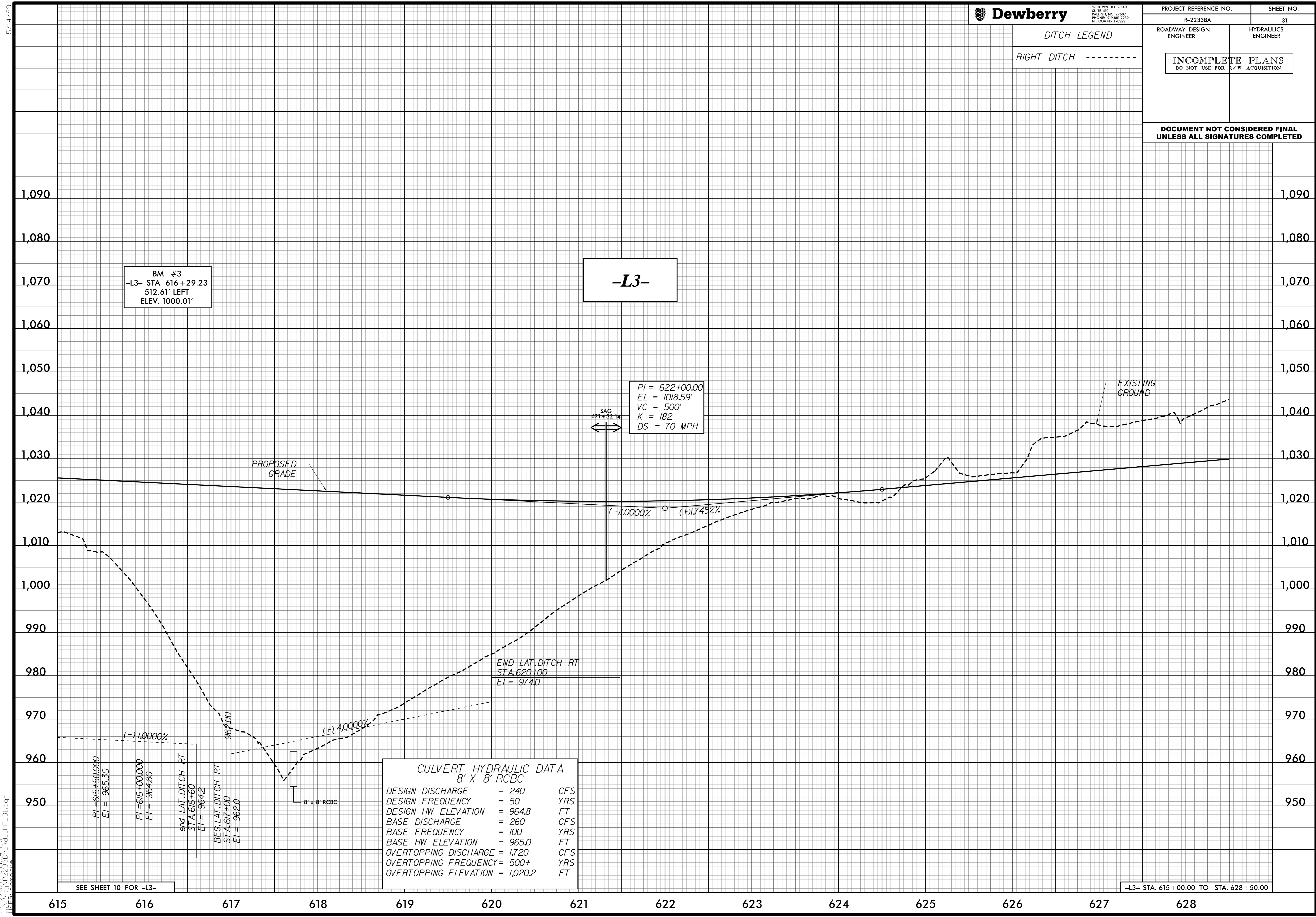
DITCH LEGEND

RIGHT DITCH - - - - -

ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



BM #3
 -L3- STA 616+29.23
 512.61' LEFT
 ELEV. 1000.01'

-L3-

PI = 622+00.00
 EL = 1018.59'
 VC = 500'
 K = 182
 DS = 70 MPH

CULVERT HYDRAULIC DATA
 8' X 8' RCBC

DESIGN DISCHARGE	= 240	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 964.8	FT
BASE DISCHARGE	= 260	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 965.0	FT
OVERTOPPING DISCHARGE	= 1720	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 1,020.2	FT

SEE SHEET 10 FOR -L3-

-L3- STA. 615+00.00 TO STA. 628+50.00

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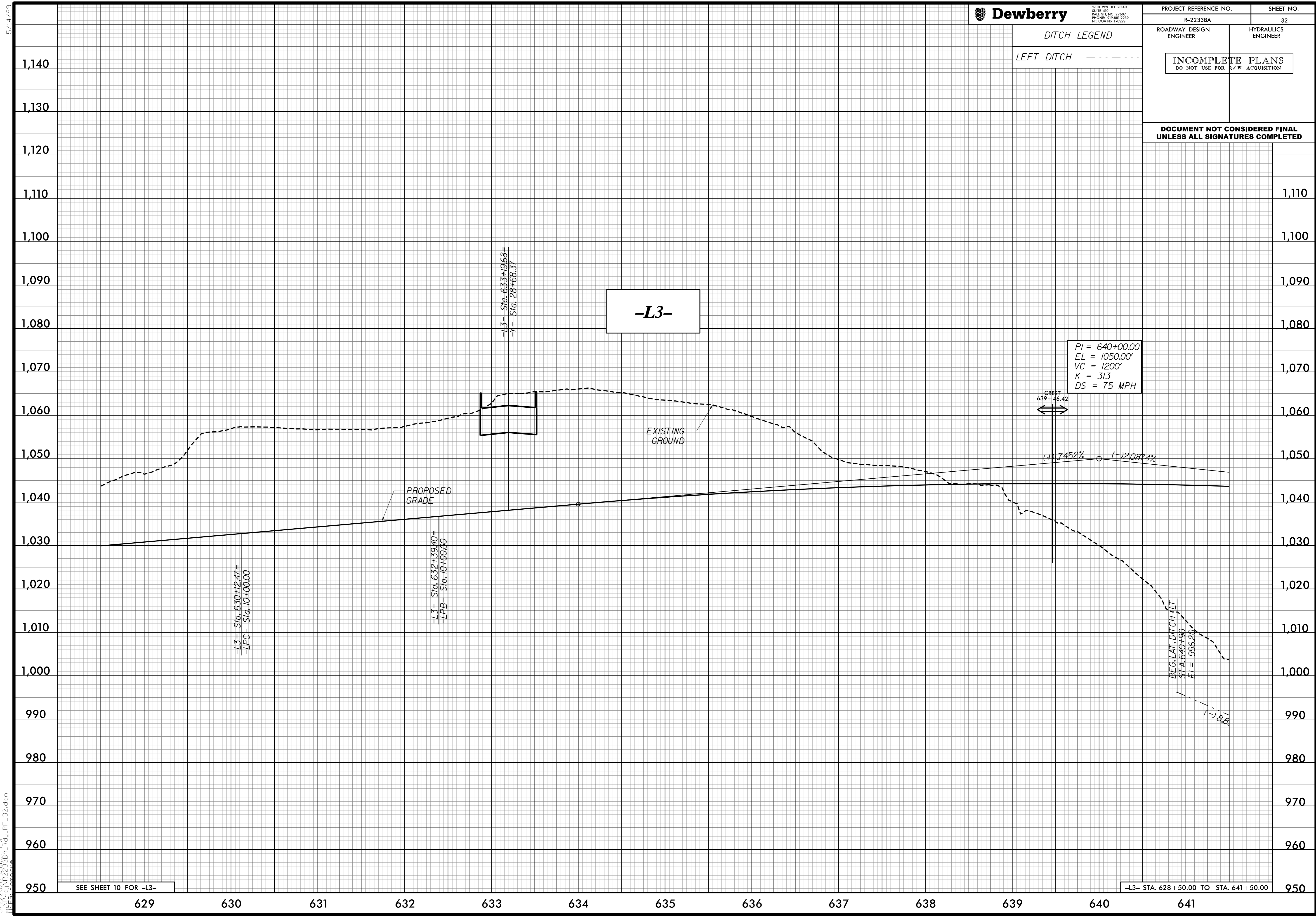
5/14/99

DITCH LEGEND
 LEFT DITCH - - - - -

ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



-L3-

PI = 640+00.00
 EL = 1050.00'
 VC = 1200'
 K = 313
 DS = 75 MPH

CREST
 639+46.42

(+)1.7452% (-)2.0874%

PROPOSED GRADE

EXISTING GROUND

BEG. LAT. DITCH CUT
 STA. 640+90
 EL = 996.20

SEE SHEET 10 FOR -L3-

-L3- STA. 628+50.00 TO STA. 641+50.00

3/2/2020 1:38:37 PM
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5/14/99

DITCH LEGEND

LEFT DITCH - - - - -

RIGHT DITCH - - - - -

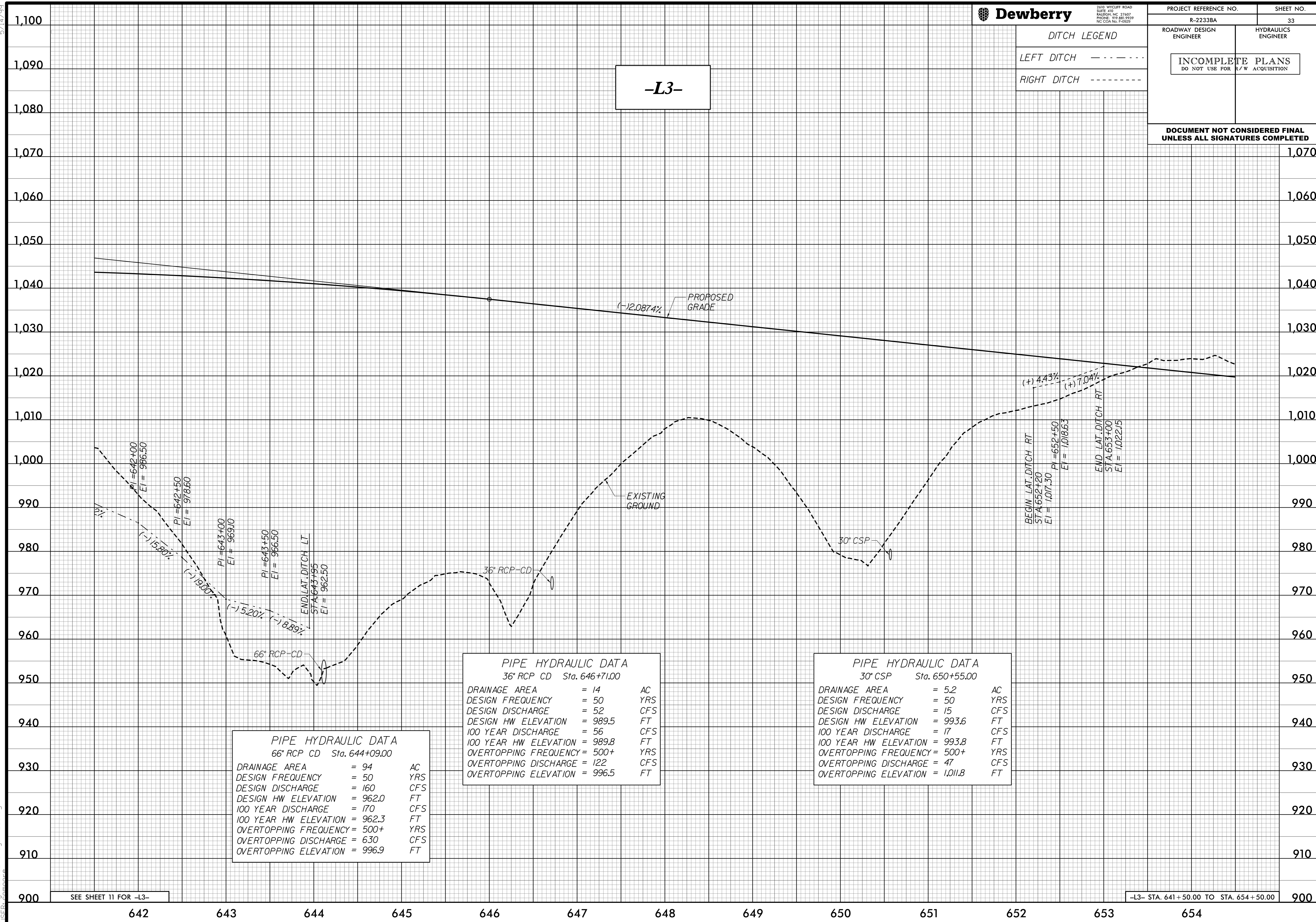
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-



PIPE HYDRAULIC DATA
66" RCP CD Sta. 644+09.00

DRAINAGE AREA	= 94	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 160	CFS
DESIGN HW ELEVATION	= 962.0	FT
100 YEAR DISCHARGE	= 170	CFS
100 YEAR HW ELEVATION	= 962.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 630	CFS
OVERTOPPING ELEVATION	= 996.9	FT

PIPE HYDRAULIC DATA
36" RCP CD Sta. 646+71.00

DRAINAGE AREA	= 14	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 52	CFS
DESIGN HW ELEVATION	= 989.5	FT
100 YEAR DISCHARGE	= 56	CFS
100 YEAR HW ELEVATION	= 989.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 122	CFS
OVERTOPPING ELEVATION	= 996.5	FT

PIPE HYDRAULIC DATA
30" CSP Sta. 650+55.00

DRAINAGE AREA	= 5.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 993.6	FT
100 YEAR DISCHARGE	= 17	CFS
100 YEAR HW ELEVATION	= 993.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 47	CFS
OVERTOPPING ELEVATION	= 1,011.8	FT

SEE SHEET 11 FOR -L3-

-L3- STA. 641+50.00 TO STA. 654+50.00

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5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9729
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 34

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-

BM #4
-L3- STA 656+54.67
569.95' RIGHT
ELEV. 1048.26'

EXISTING GROUND
PROPOSED GRADE

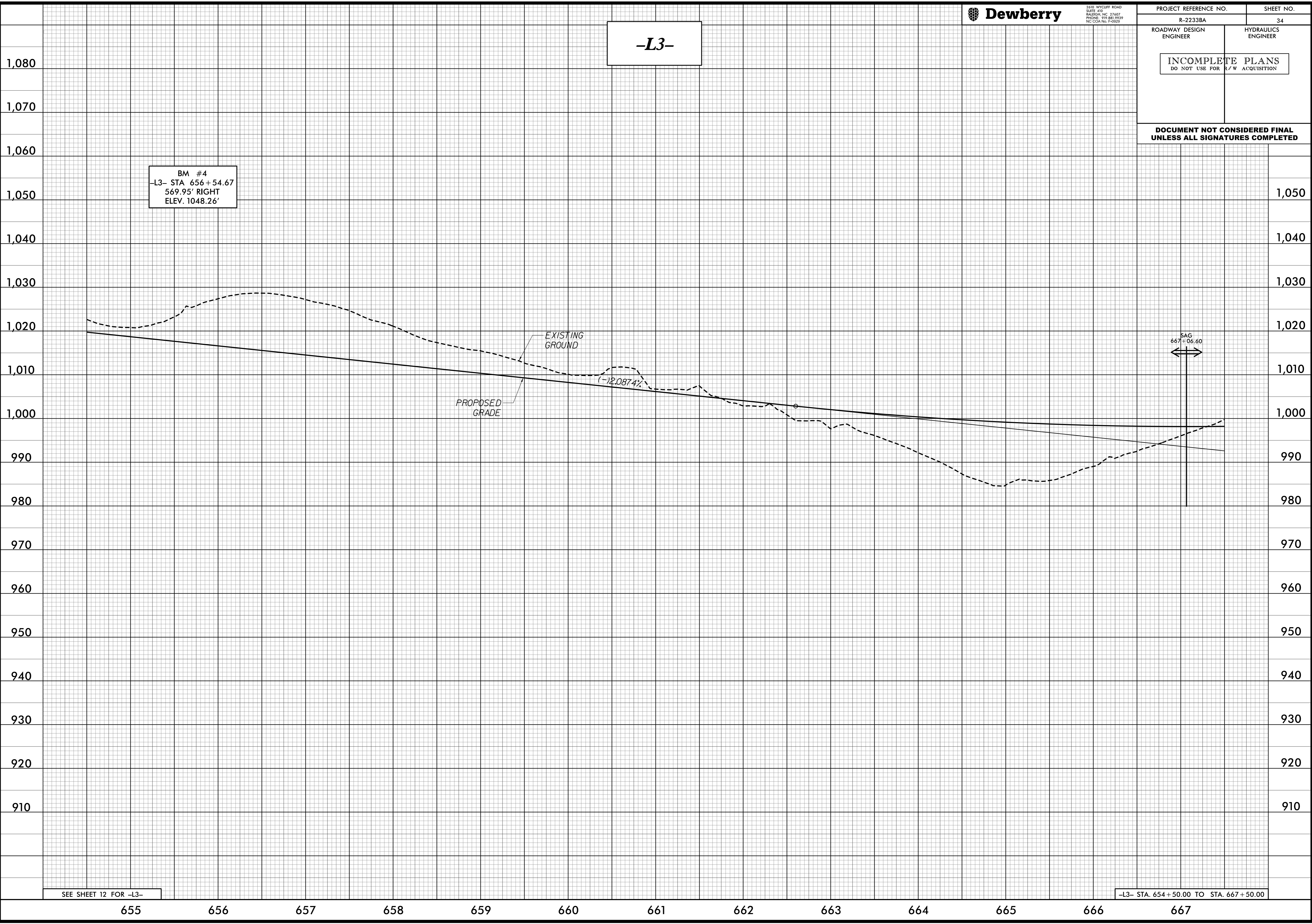
(-12.0874%)

SAG
667+06.60

SEE SHEET 12 FOR -L3-

-L3- STA. 654+50.00 TO STA. 667+50.00

3/27/2020 1:38:41 PM
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5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

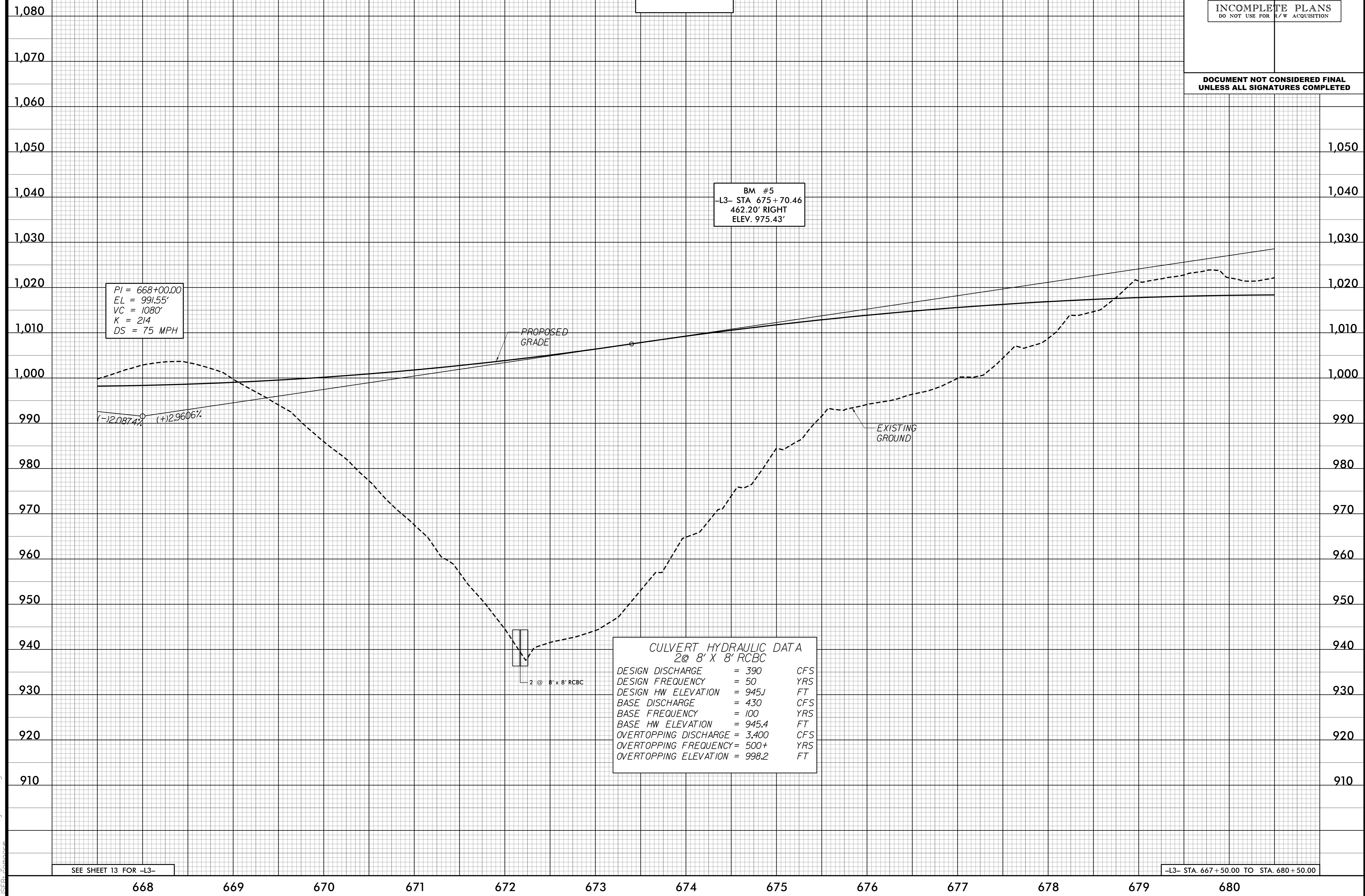
PROJECT REFERENCE NO. R-2233BA SHEET NO. 35

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-



PI = 668+00.00
EL = 991.55'
VC = 1080'
K = 214
DS = 75 MPH

BM #5
-L3- STA 675+70.46
462.20' RIGHT
ELEV. 975.43'

CULVERT HYDRAULIC DATA
2 @ 8' X 8' RCBC

DESIGN DISCHARGE	= 390	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 945.1	FT
BASE DISCHARGE	= 430	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 945.4	FT
OVERTOPPING DISCHARGE	= 3,400	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 998.2	FT

SEE SHEET 13 FOR -L3-

-L3- STA. 667+50.00 TO STA. 680+50.00

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5/14/99

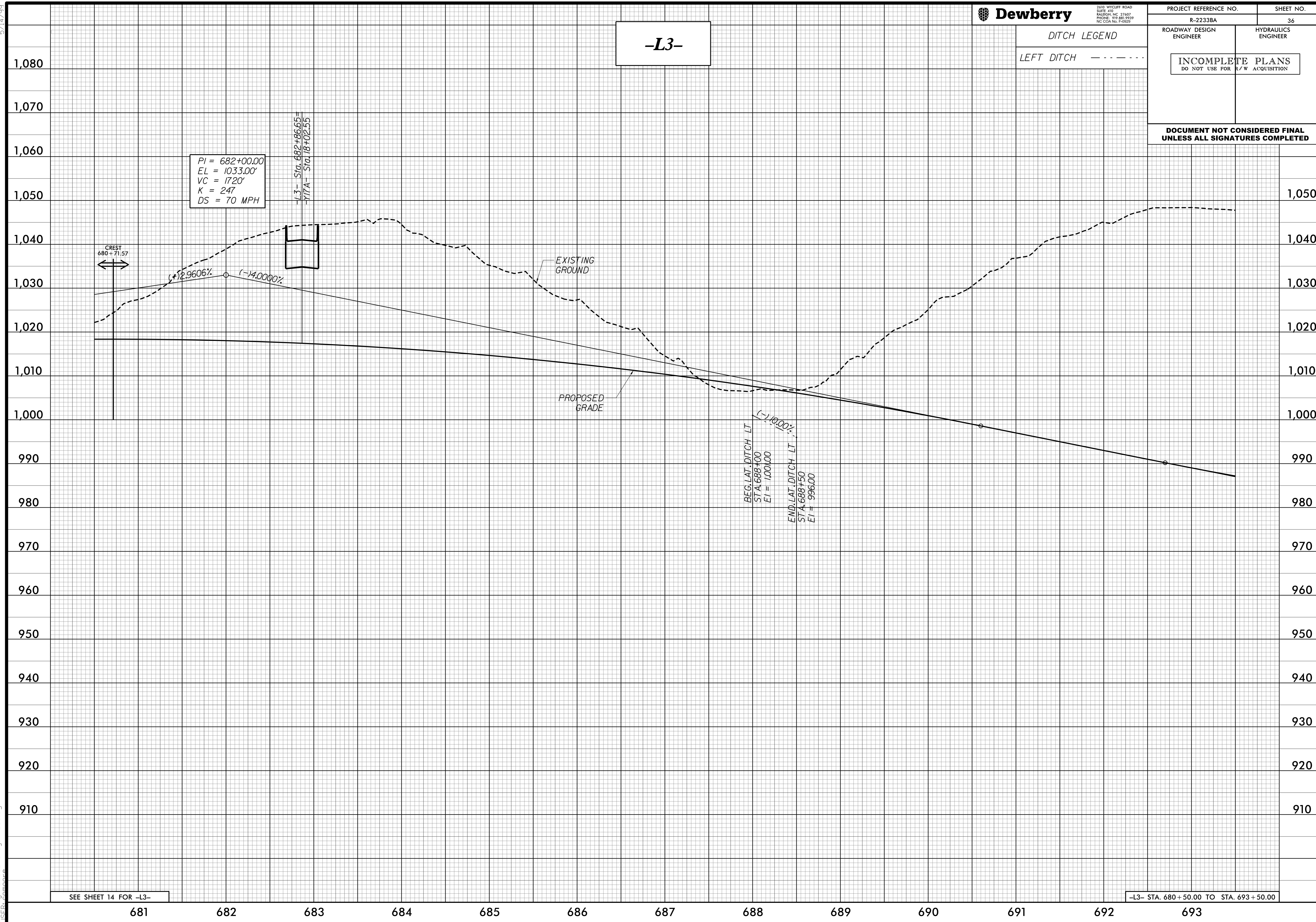
ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

-L3-

DITCH LEGEND
 LEFT DITCH - - - - -



PI = 682+00.00
 EL = 1033.00'
 VC = 1720'
 K = 247
 DS = 70 MPH

CREST
 680+71.57

(+2.9606%) (-1.0000%)

-L3- Sta. 682+86.65+
 -YITA- Sta. 18+02.55

EXISTING GROUND

PROPOSED GRADE

BEG. LAT. DITCH LT
 STA. 688+00
 EI = 1001.00

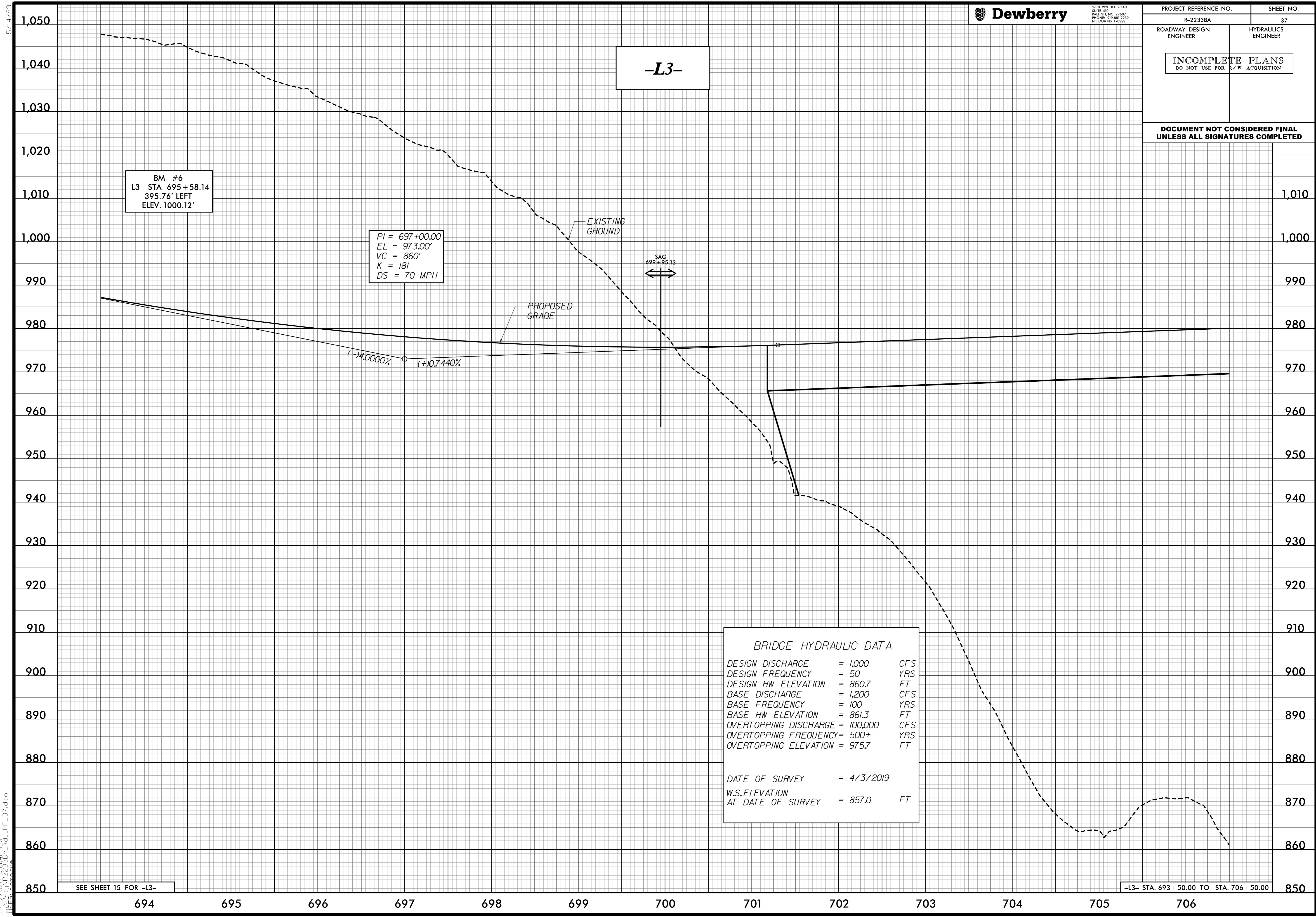
END. LAT. DITCH LT
 STA. 688+50
 EI = 996.00

(-1.0000%)

SEE SHEET 14 FOR -L3-

-L3- STA. 680+50.00 TO STA. 693+50.00

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 JTS:EG:JNR:2233BA_L_Rdy_PFL 36.dgn



-L3-

BM #6
-L3- STA 695+58.14
395.76' LEFT
ELEV. 1000.12'

PI = 697+00.00
EL = 973.00'
VC = 860'
K = 181
DS = 70 MPH

SAG
699+95.13

-14.0000% +0.7440%

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 860.7	FT
BASE DISCHARGE	= 1,200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 861.3	FT
OVERTOPPING DISCHARGE	= 100,000	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 975.7	FT
DATE OF SURVEY	= 4/3/2019	
W.S. ELEVATION AT DATE OF SURVEY	= 857.0	FT

SEE SHEET 15 FOR -L3-

-L3- STA. 693+50.00 TO STA. 706+50.00

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5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 38

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-

BM #7
-L3- STA 714.3314
411.46' RIGHT
ELEV. 974.54'

-L3- Sta. 707+84.84=
-YI- Sta. 15+36.73

(+10.7440%

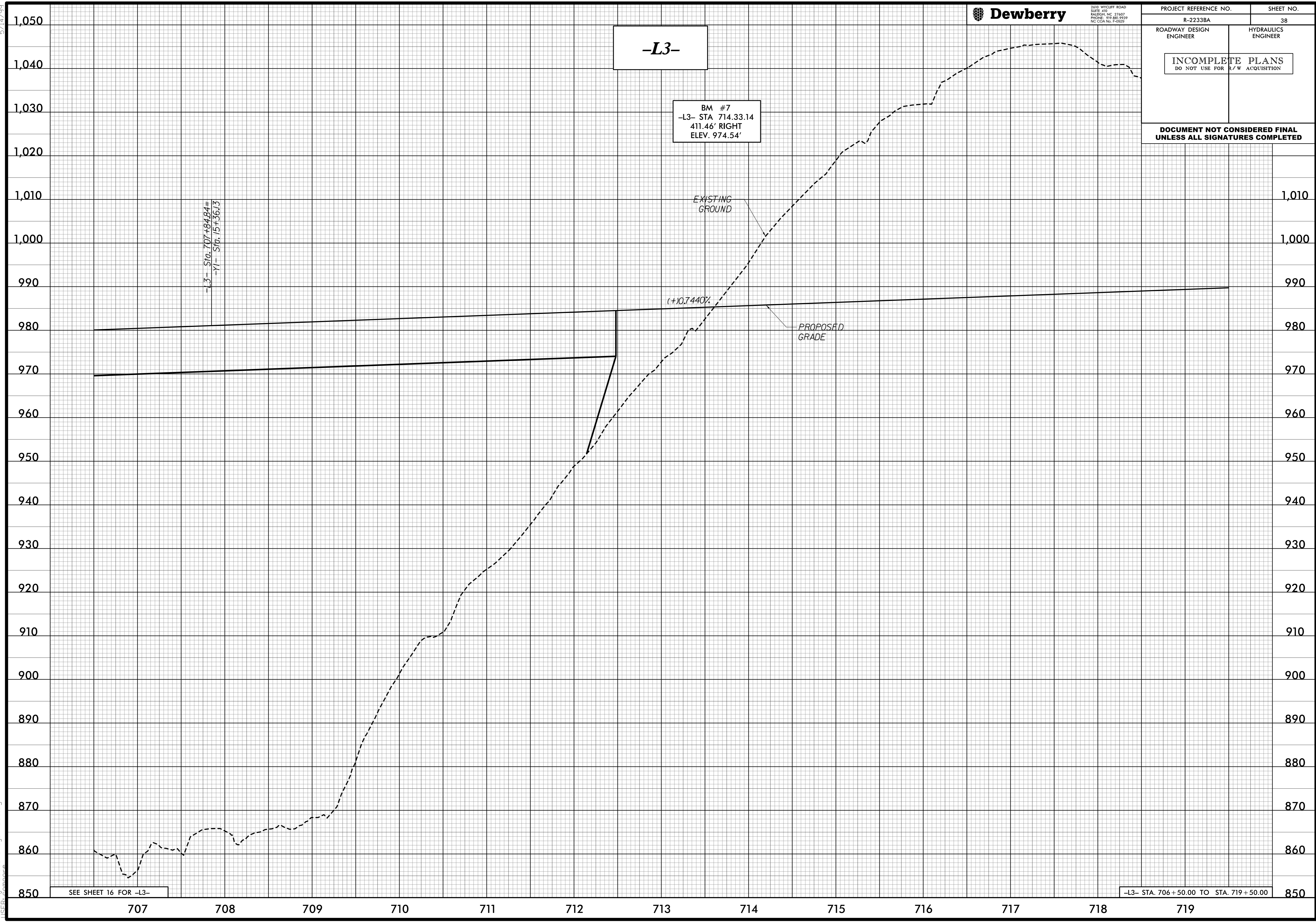
PROPOSED GRADE

EXISTING GROUND

SEE SHEET 16 FOR -L3-

-L3- STA. 706+50.00 TO STA. 719+50.00

3/24/2020 1:38:50 PM
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5/14/99

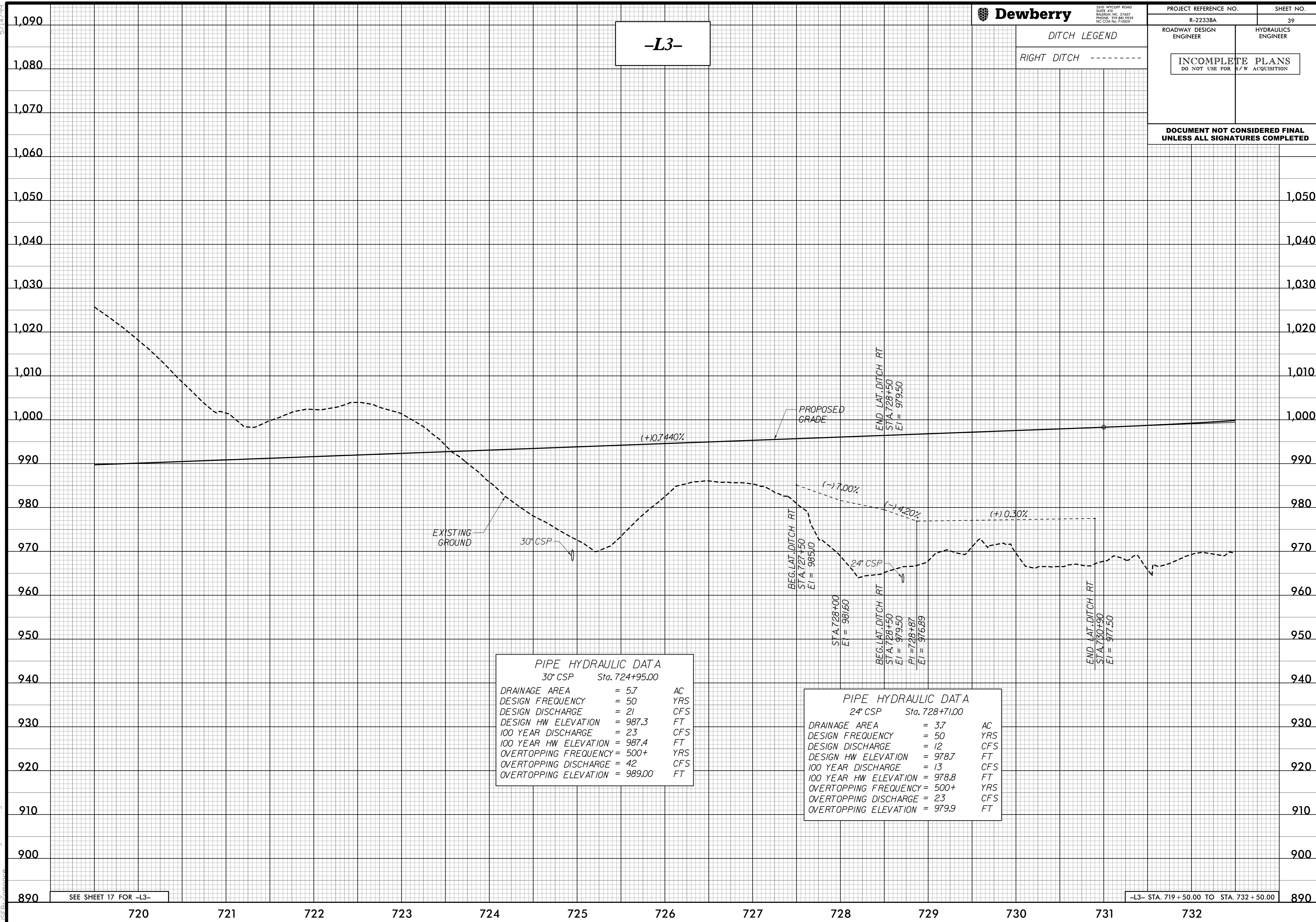
ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L3-

DITCH LEGEND
 RIGHT DITCH - - - - -



PIPE HYDRAULIC DATA
 30" CSP Sta. 724+95.00

DRAINAGE AREA	= 5.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 21	CFS
DESIGN HW ELEVATION	= 987.3	FT
100 YEAR DISCHARGE	= 23	CFS
100 YEAR HW ELEVATION	= 987.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 42	CFS
OVERTOPPING ELEVATION	= 989.00	FT

PIPE HYDRAULIC DATA
 24" CSP Sta. 728+71.00

DRAINAGE AREA	= 3.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 978.7	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 978.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 23	CFS
OVERTOPPING ELEVATION	= 979.9	FT

SEE SHEET 17 FOR -L3-

-L3- STA. 719+50.00 TO STA. 732+50.00

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5/14/99

DITCH LEGEND

LEFT DITCH - - - - -

RIGHT DITCH - - - - -

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

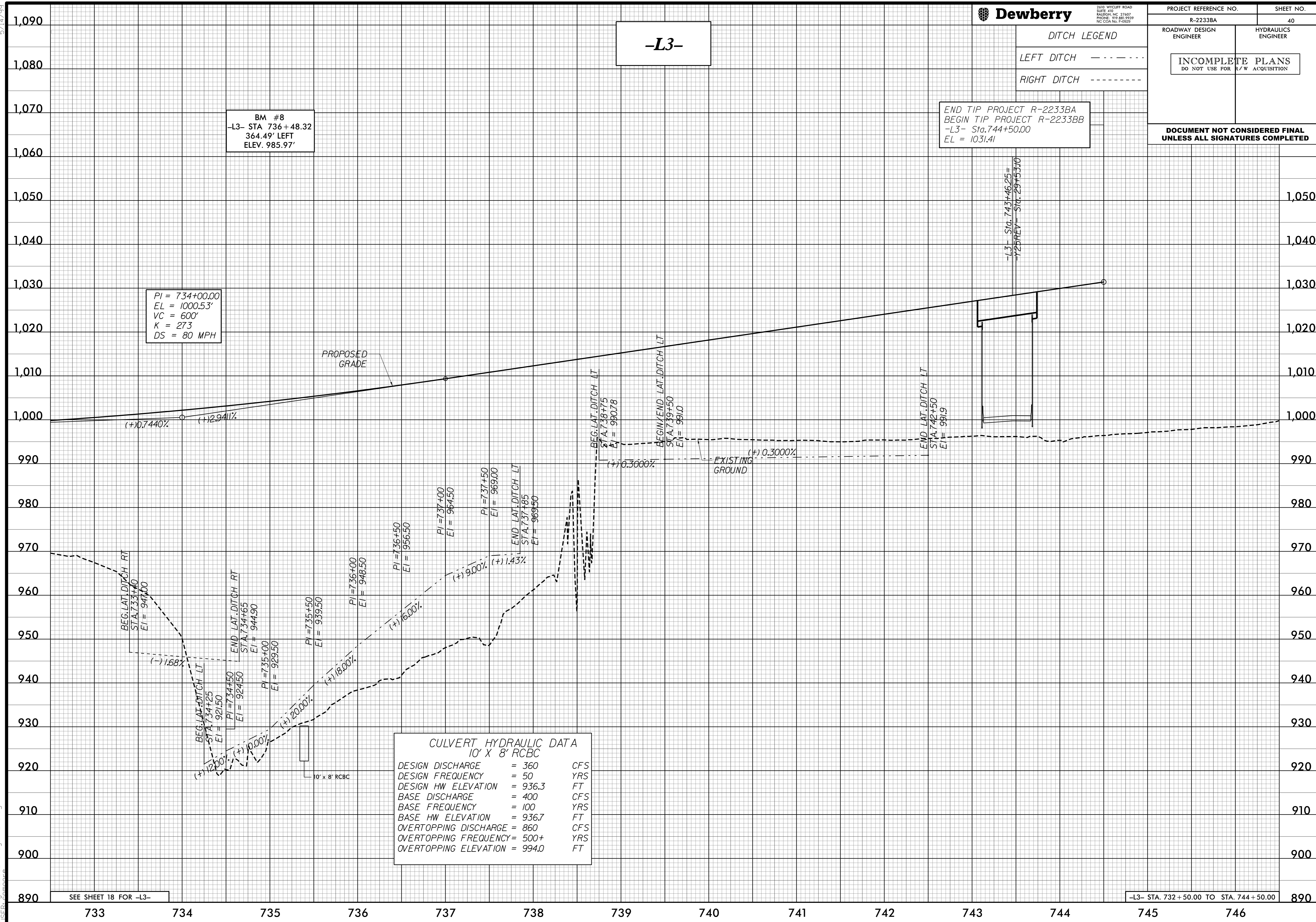
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

END TIP PROJECT R-2233BA
 BEGIN TIP PROJECT R-2233BB
 -L3- Sta. 744+50.00
 EL = 1031.41

BM #8
 -L3- STA 736 + 48.32
 364.49' LEFT
 ELEV. 985.97'

PI = 734+00.00
 EL = 1000.53'
 VC = 600'
 K = 273
 DS = 80 MPH



CULVERT HYDRAULIC DATA
 10' X 8' RCBC

DESIGN DISCHARGE	= 360	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 936.3	FT
BASE DISCHARGE	= 400	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 936.7	FT
OVERTOPPING DISCHARGE	= 860	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 994.0	FT

SEE SHEET 18 FOR -L3-

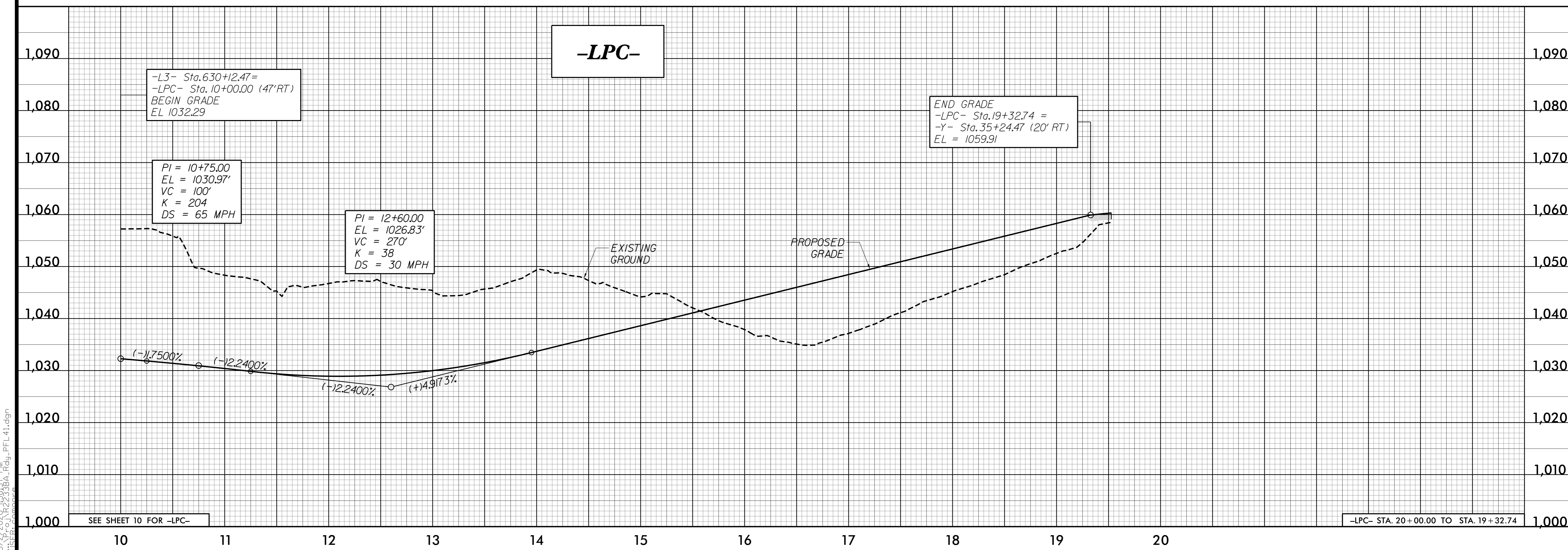
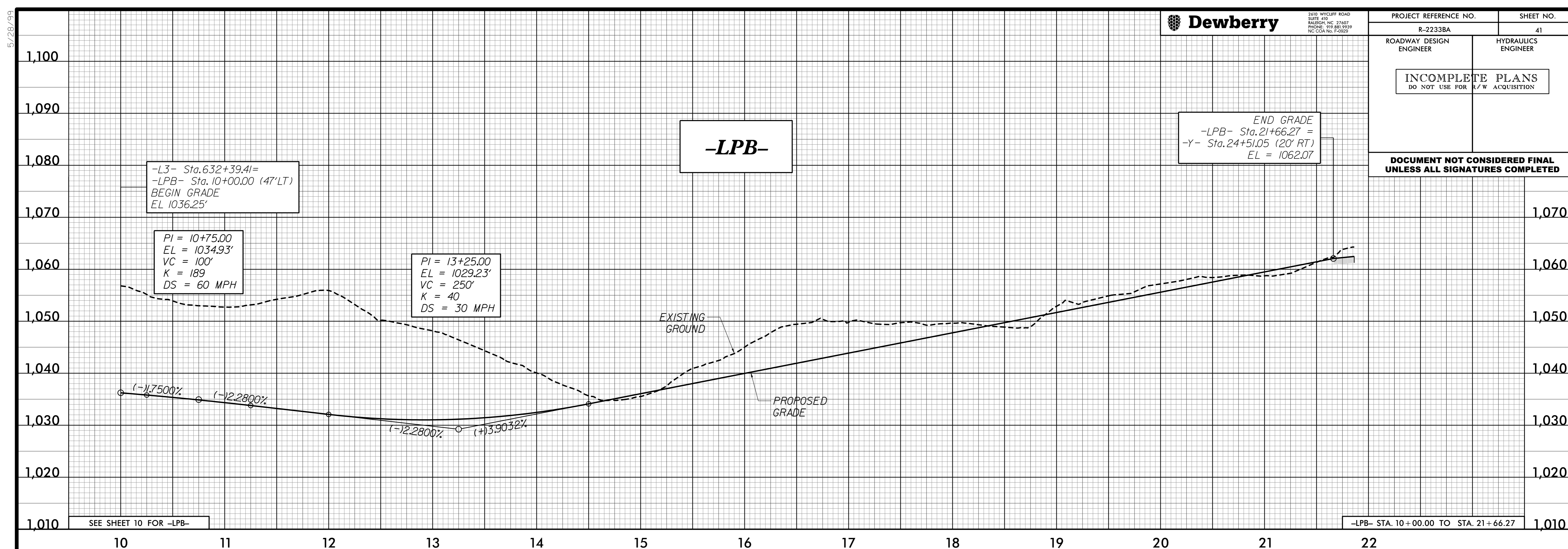
-L3- STA. 732 + 50.00 TO STA. 744 + 50.00

3/24/2020 1:38:55 PM
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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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5/28/99



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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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UNLESS ALL SIGNATURES COMPLETED

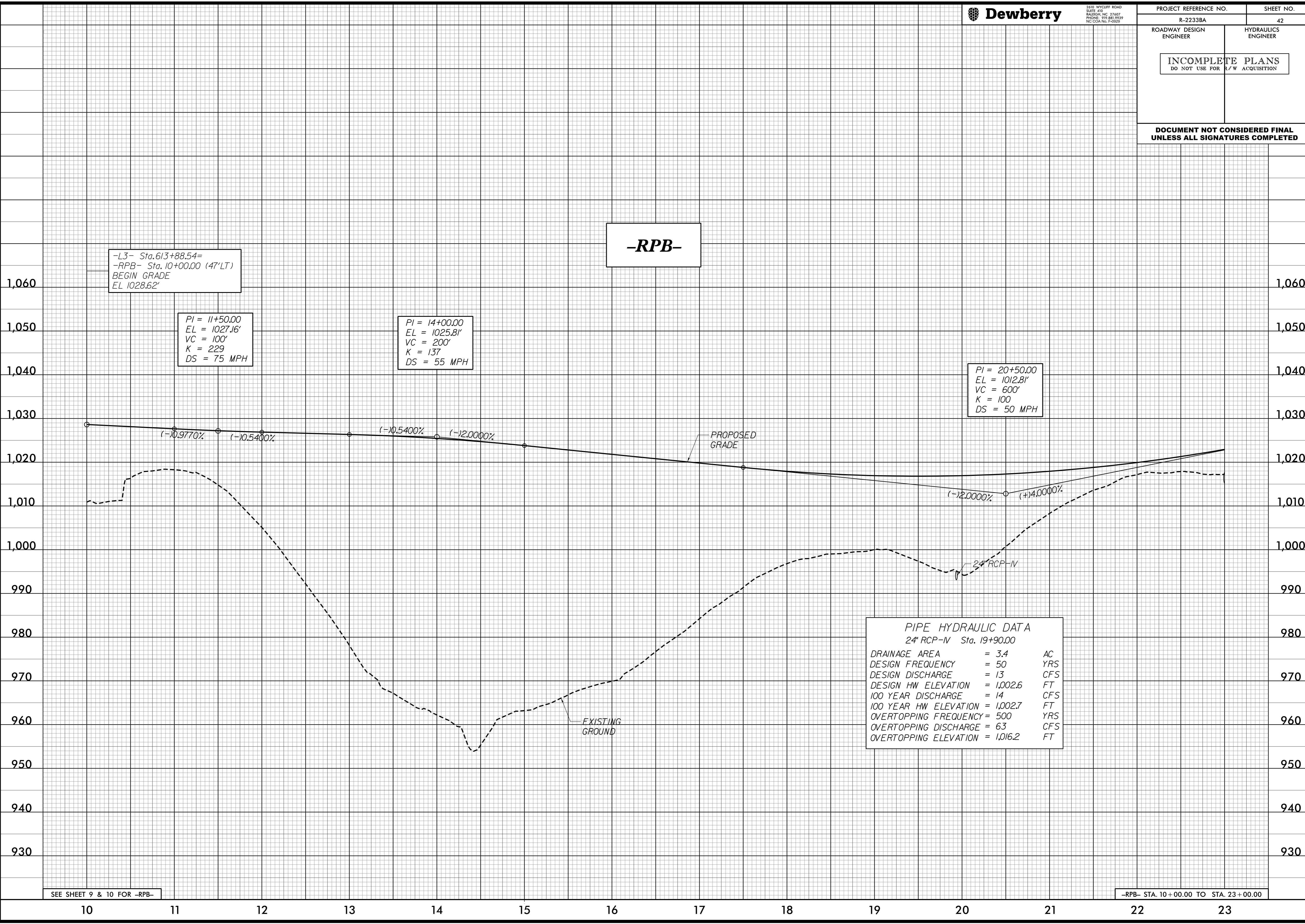
-RPB-

-L3- Sta. 613+88.54=
-RPB- Sta. 10+00.00 (47'LT)
BEGIN GRADE
EL 1028.62'

PI = 11+50.00
EL = 1027.16'
VC = 100'
K = 229
DS = 75 MPH

PI = 14+00.00
EL = 1025.81'
VC = 200'
K = 137
DS = 55 MPH

PI = 20+50.00
EL = 1012.81'
VC = 600'
K = 100
DS = 50 MPH



PIPE HYDRAULIC DATA
24" RCP-IV Sta. 19+90.00

DRAINAGE AREA	= 3.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 1,002.6	FT
100 YEAR DISCHARGE	= 14	CFS
100 YEAR HW ELEVATION	= 1,002.7	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 63	CFS
OVERTOPPING ELEVATION	= 1,016.2	FT

SEE SHEET 9 & 10 FOR -RPB-

-RPB- STA. 10+00.00 TO STA. 23+00.00

5/14/99

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5/14/99



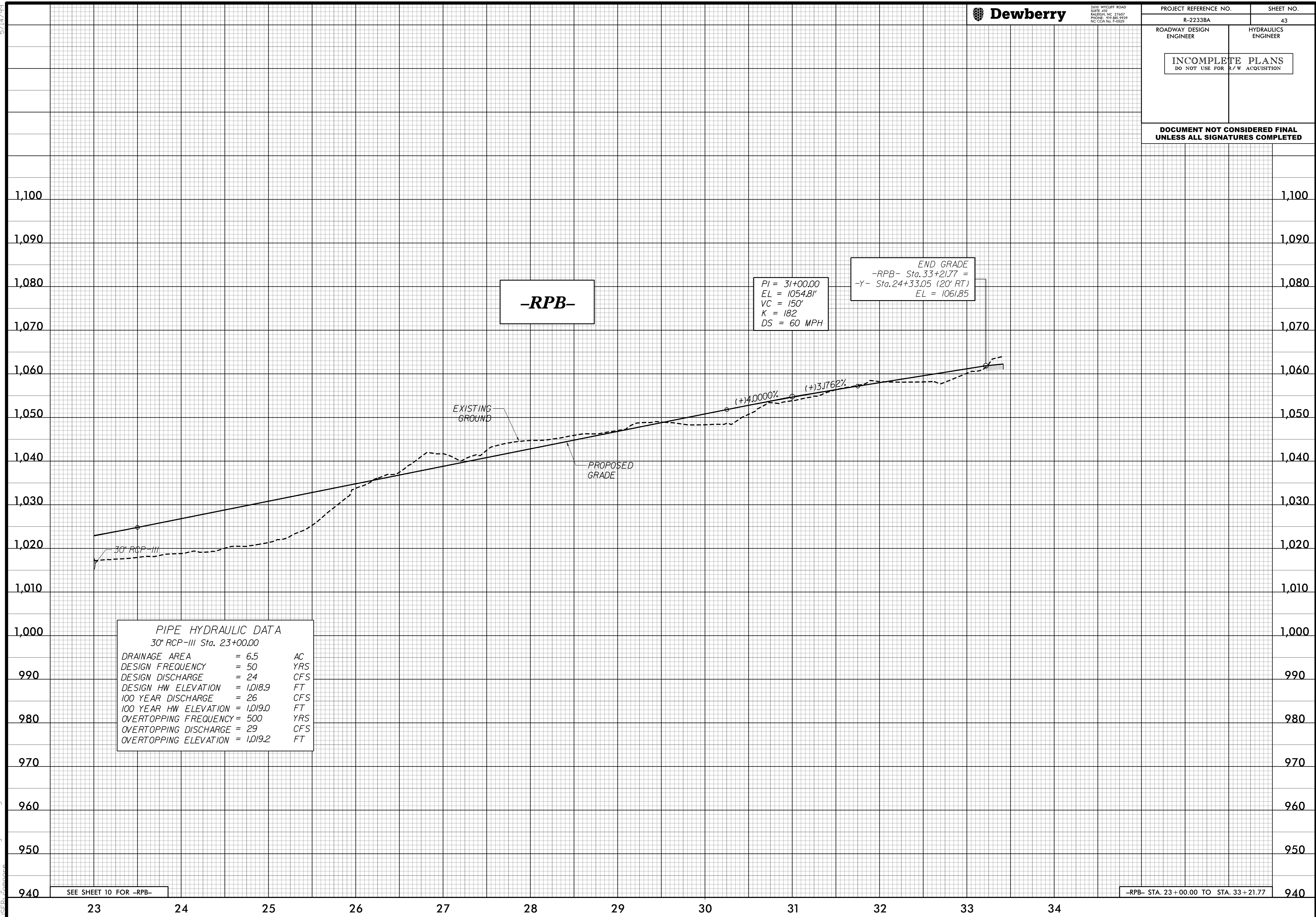
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 43

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PIPE HYDRAULIC DATA
30" RCP-III Sta. 23+00.00

DRAINAGE AREA	= 6.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 24	CFS
DESIGN HW ELEVATION	= 1,018.9	FT
100 YEAR DISCHARGE	= 26	CFS
100 YEAR HW ELEVATION	= 1,019.0	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 29	CFS
OVERTOPPING ELEVATION	= 1,019.2	FT

SEE SHEET 10 FOR -RPB-

-RPB- STA. 23+00.00 TO STA. 33+21.77

3/24/2020 4:39:02 PM
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5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 44

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

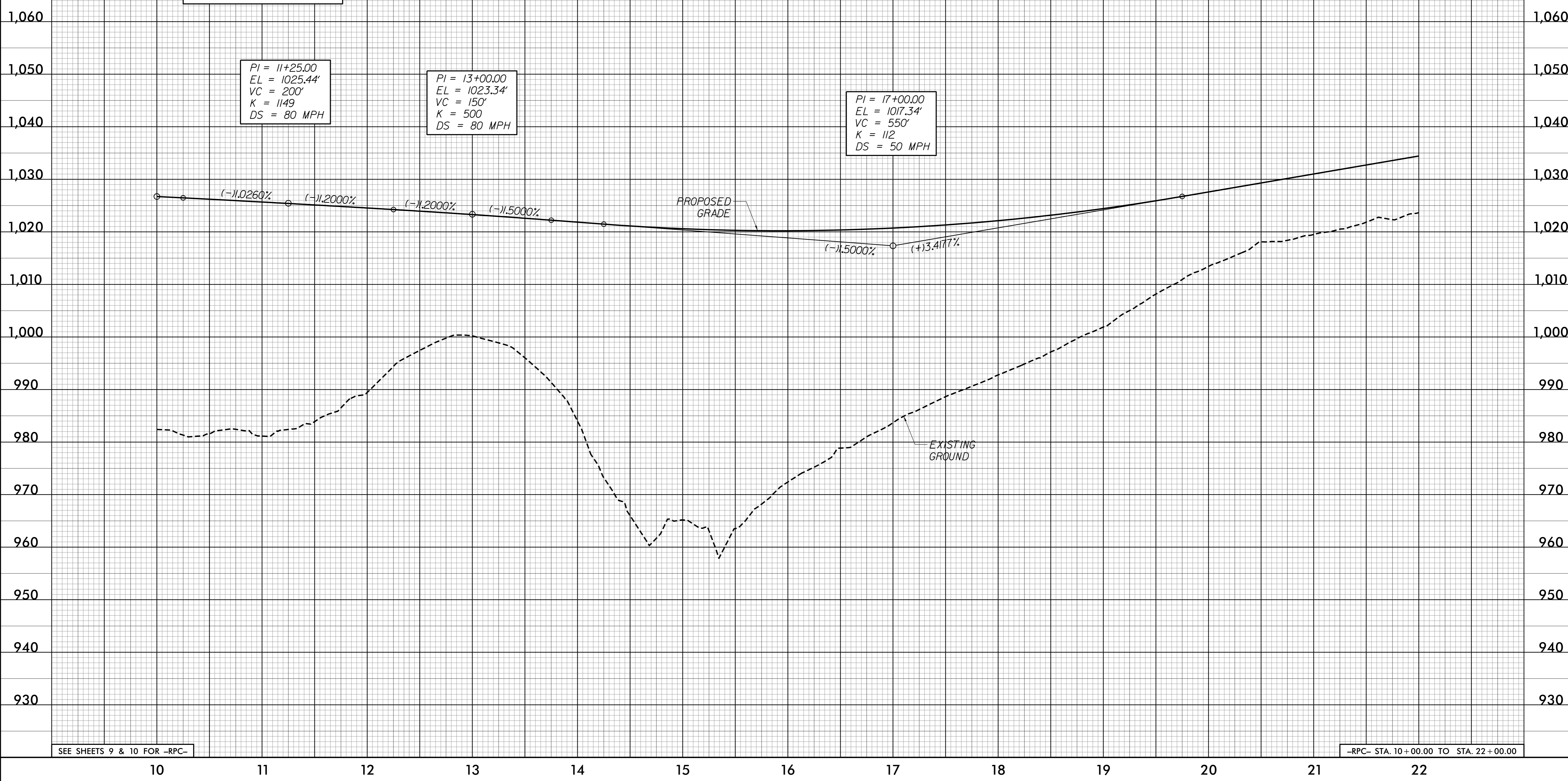
-RPC-

-L3- Sta. 611+94.04=
-RPC- Sta. 10+00.00 (47' RT)
BEGIN GRADE
EL 1026.73'

PI = 11+25.00
EL = 1025.44'
VC = 200'
K = 1149
DS = 80 MPH

PI = 13+00.00
EL = 1023.34'
VC = 150'
K = 500
DS = 80 MPH

PI = 17+00.00
EL = 1017.34'
VC = 550'
K = 112
DS = 50 MPH



SEE SHEETS 9 & 10 FOR -RPC-

-RPC- STA. 10+00.00 TO STA. 22+00.00

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5/28/99



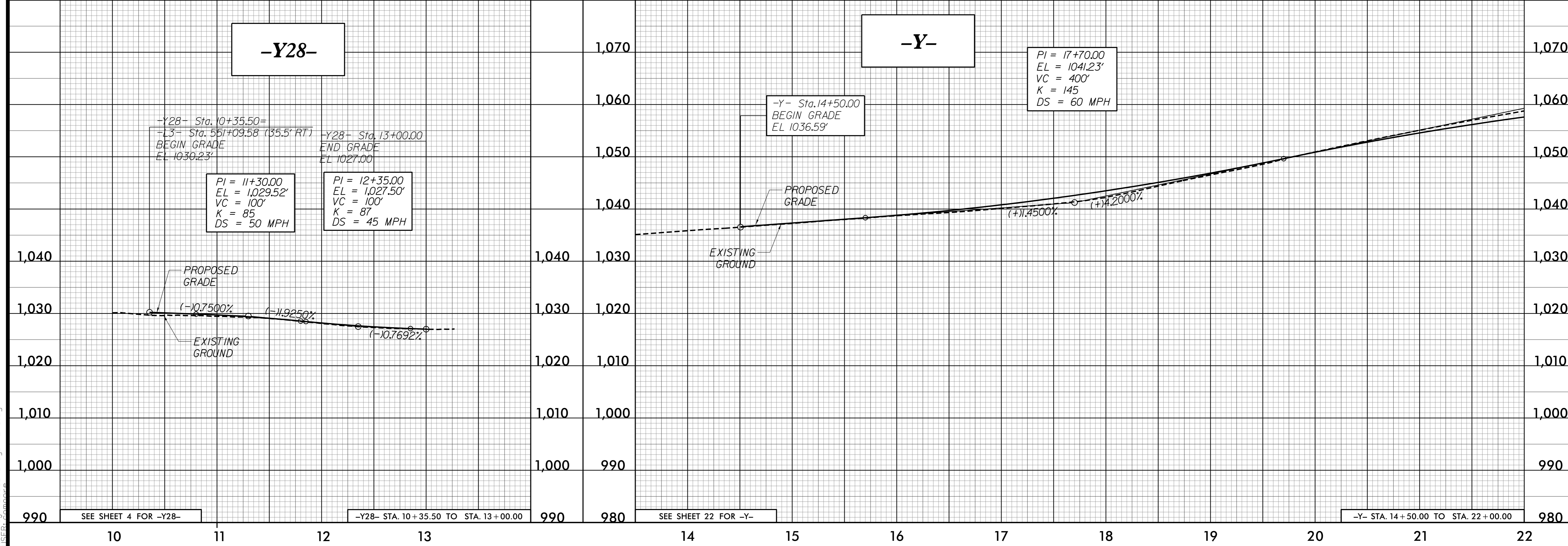
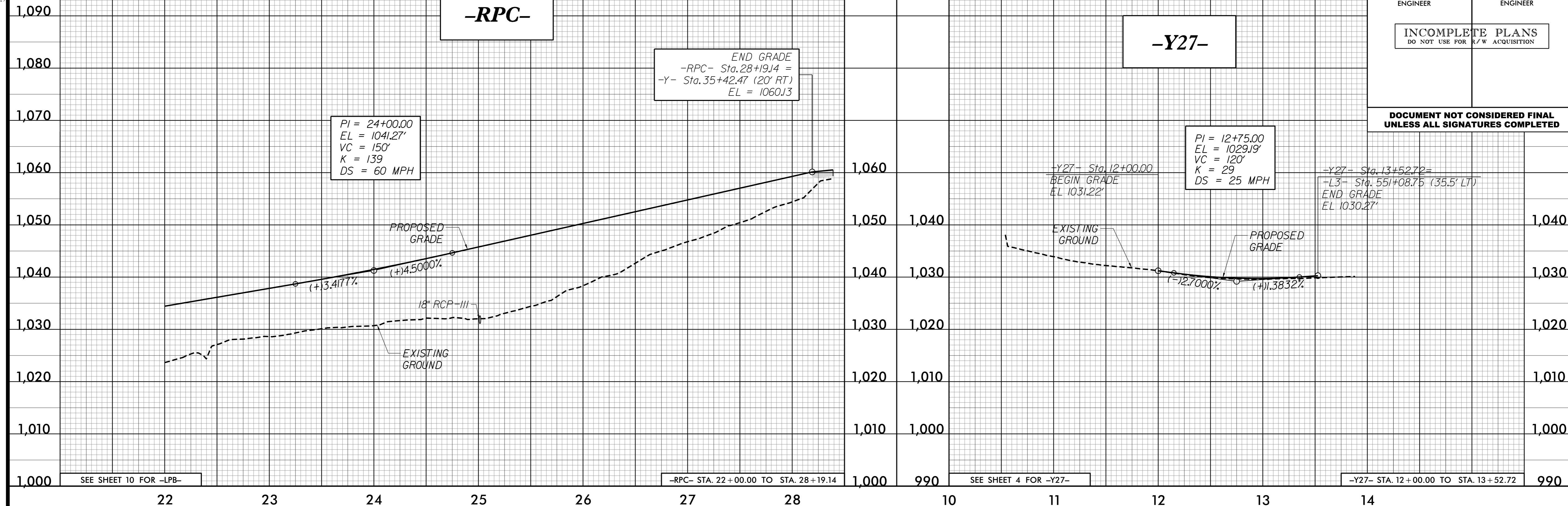
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 45

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



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5/28/99

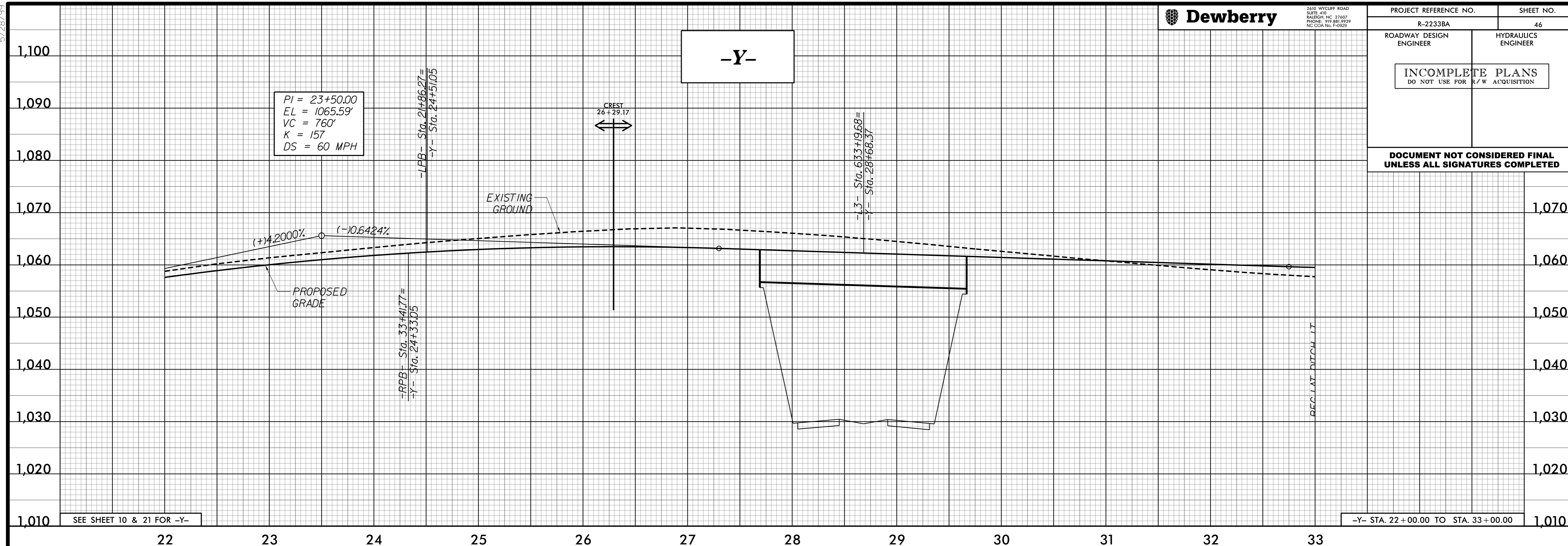


2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

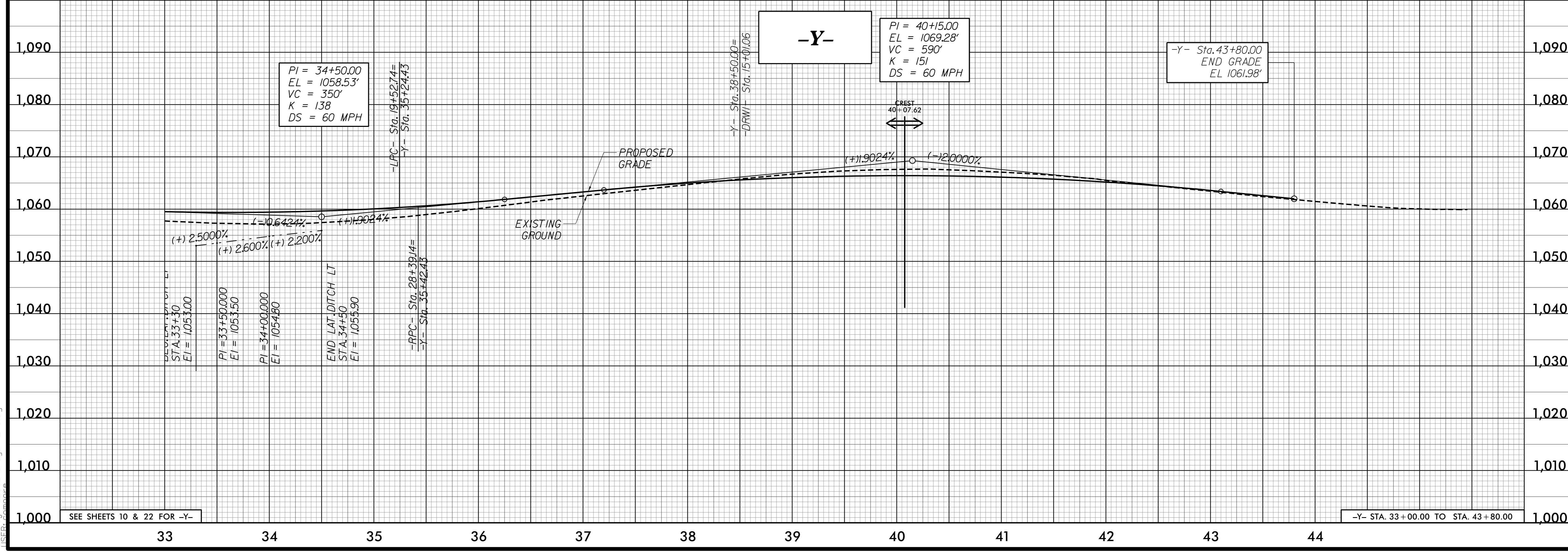
PROJECT REFERENCE NO. R-2233BA SHEET NO. 46

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



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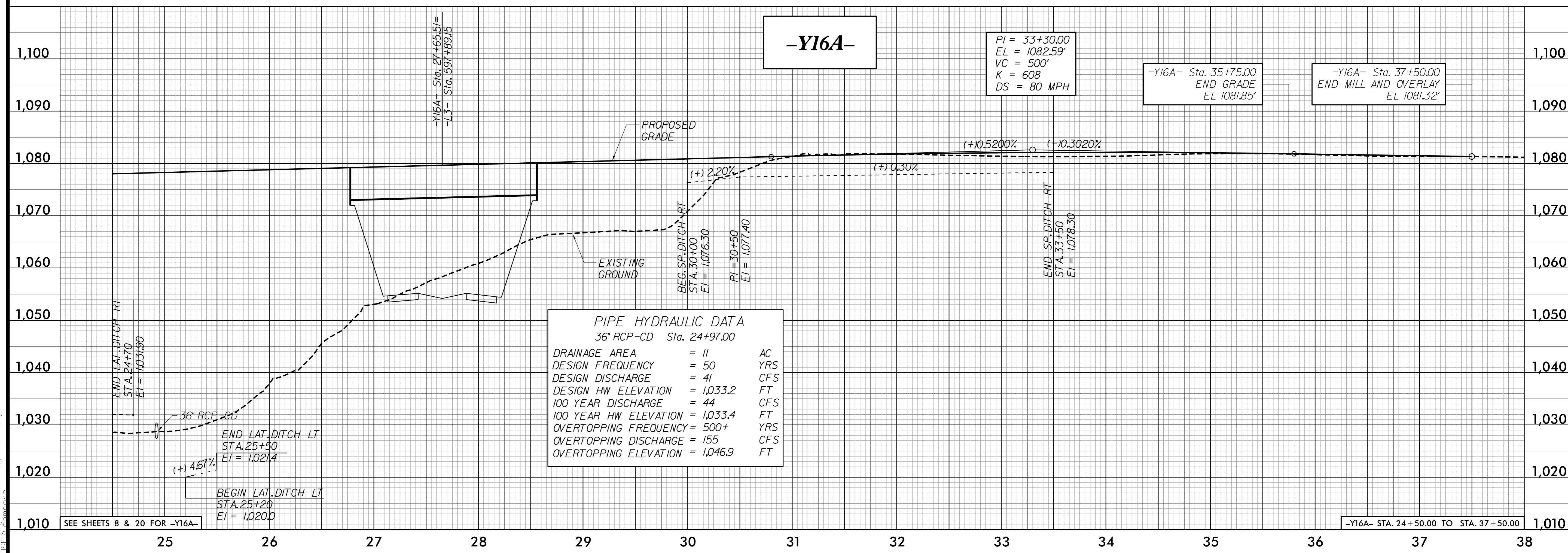
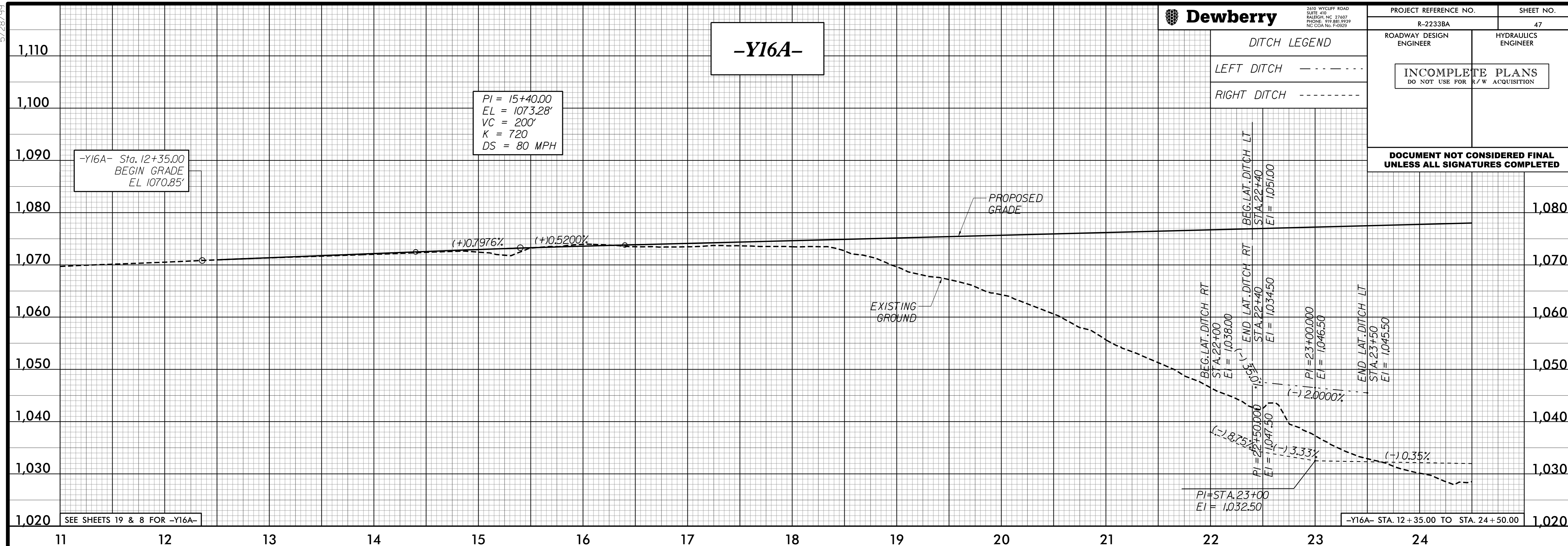


5/28/99

ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

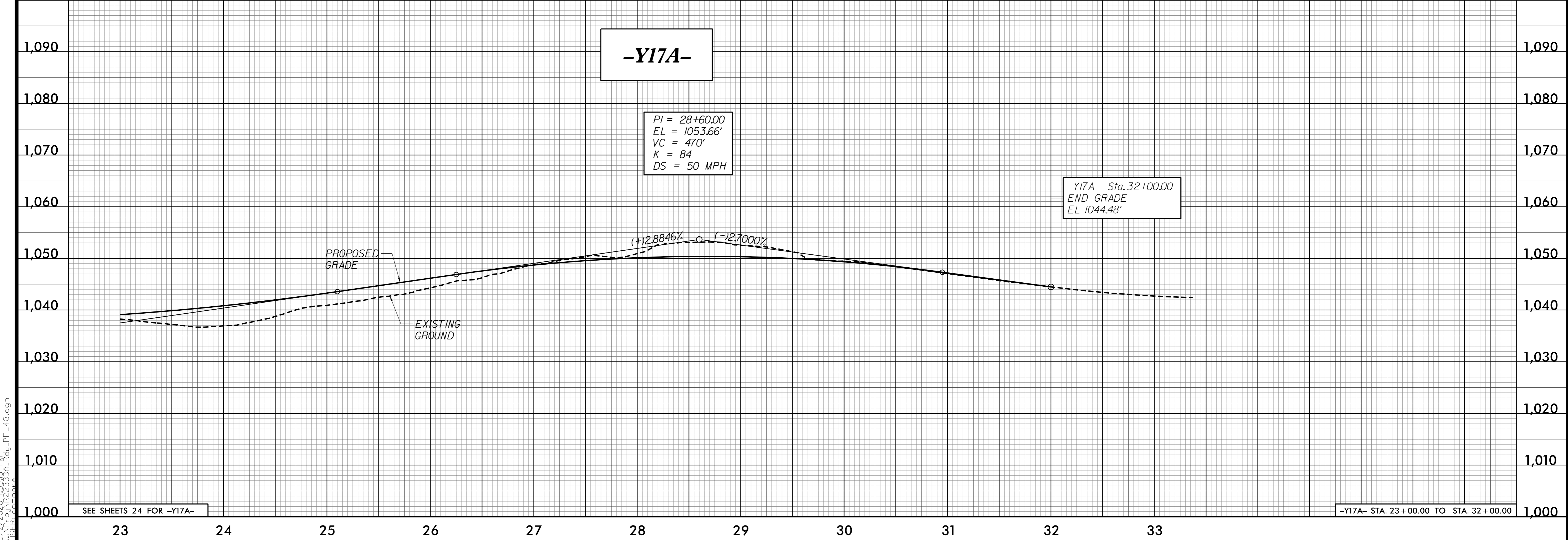
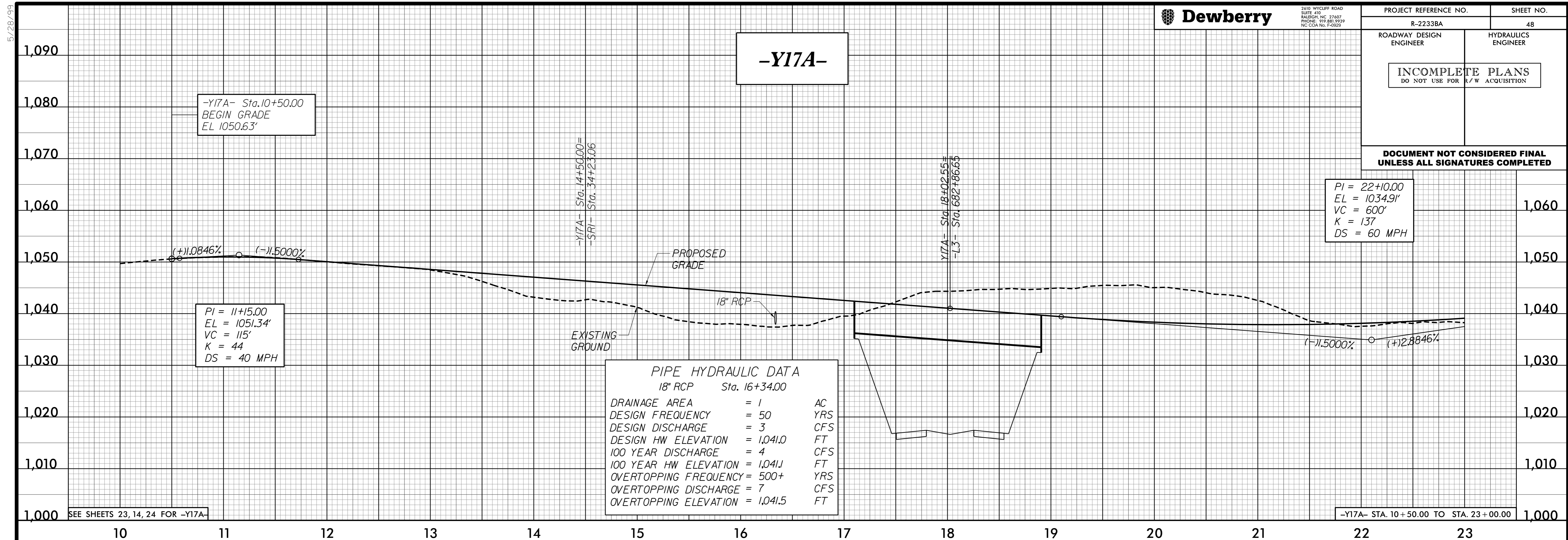


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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PI = 22+10.00
EL = 1034.91'
VC = 600'
K = 137
DS = 60 MPH



5/28/99

3/2/2020 4:59:13 PM
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5/14/99



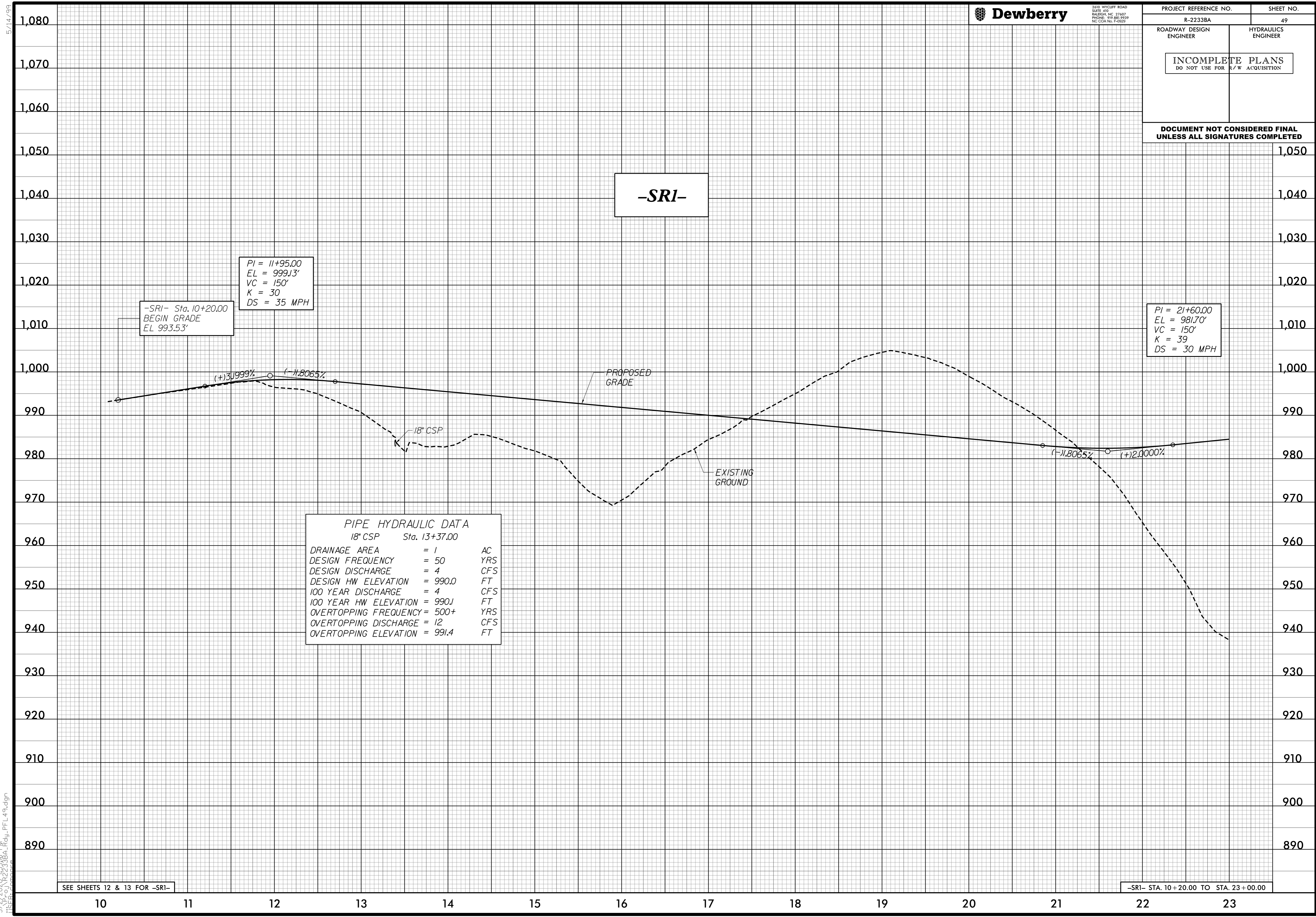
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 49

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



-SRI- Sta. 10+20.00
BEGIN GRADE
EL 993.53'

PI = 11+95.00
EL = 999.13'
VC = 150'
K = 30
DS = 35 MPH

PI = 21+60.00
EL = 981.70'
VC = 150'
K = 39
DS = 30 MPH

PIPE HYDRAULIC DATA
18" CSP Sta. 13+37.00

DRAINAGE AREA	= 1	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 4	CFS
DESIGN HW ELEVATION	= 990.0	FT
100 YEAR DISCHARGE	= 4	CFS
100 YEAR HW ELEVATION	= 990.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 12	CFS
OVERTOPPING ELEVATION	= 991.4	FT

SEE SHEETS 12 & 13 FOR -SRI-

-SRI- STA. 10+20.00 TO STA. 23+00.00

3/24/2020 4:39:16 PM
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5/14/99



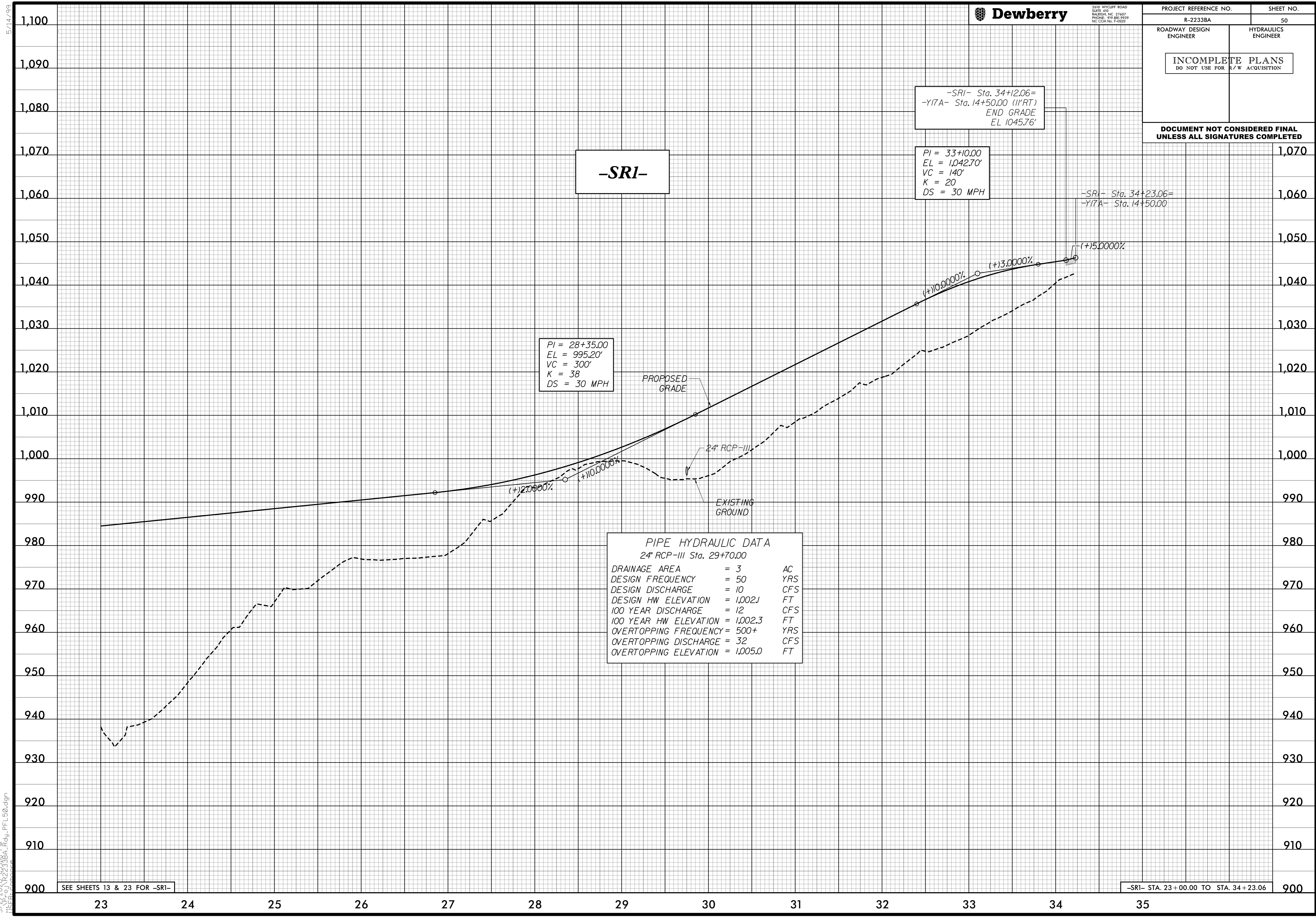
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9729
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 50

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



-SRI- Sta. 34+12.06=
-Y17A- Sta. 14+50.00 (11'RT)
END GRADE
EL 1045.76'

PI = 33+10.00
EL = 1,042.70'
VC = 140'
K = 20
DS = 30 MPH

-SRI- Sta. 34+23.06=
-Y17A- Sta. 14+50.00

PI = 28+35.00
EL = 995.20'
VC = 300'
K = 38
DS = 30 MPH

PIPE HYDRAULIC DATA
24" RCP-III Sta. 29+70.00

DRAINAGE AREA	= 3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 10	CFS
DESIGN HW ELEVATION	= 1,002.1	FT
100 YEAR DISCHARGE	= 12	CFS
100 YEAR HW ELEVATION	= 1,002.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 32	CFS
OVERTOPPING ELEVATION	= 1,005.0	FT

SEE SHEETS 13 & 23 FOR -SRI-

-SRI- STA. 23+00.00 TO STA. 34+23.06

3/24/2020 4:39:18 PM
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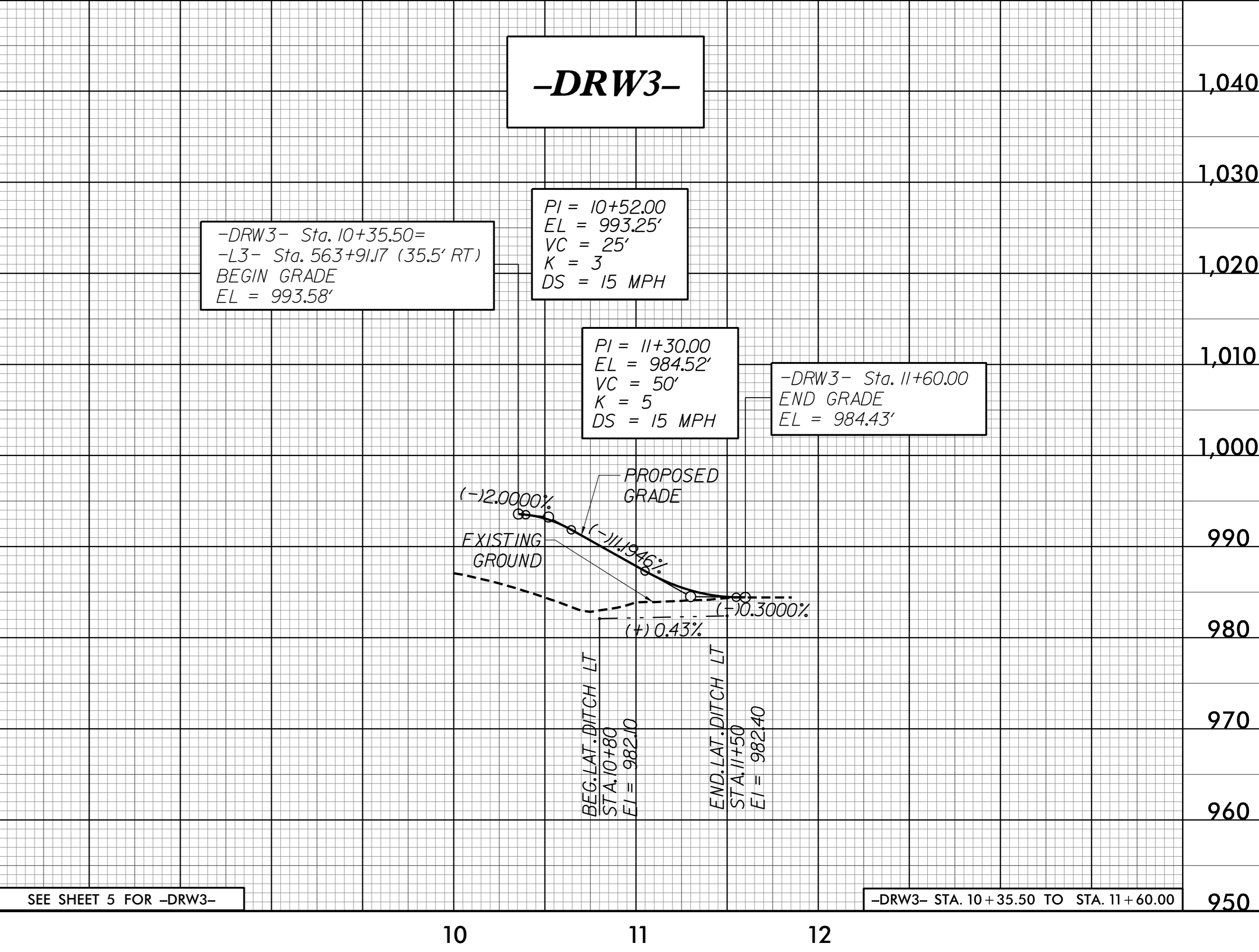
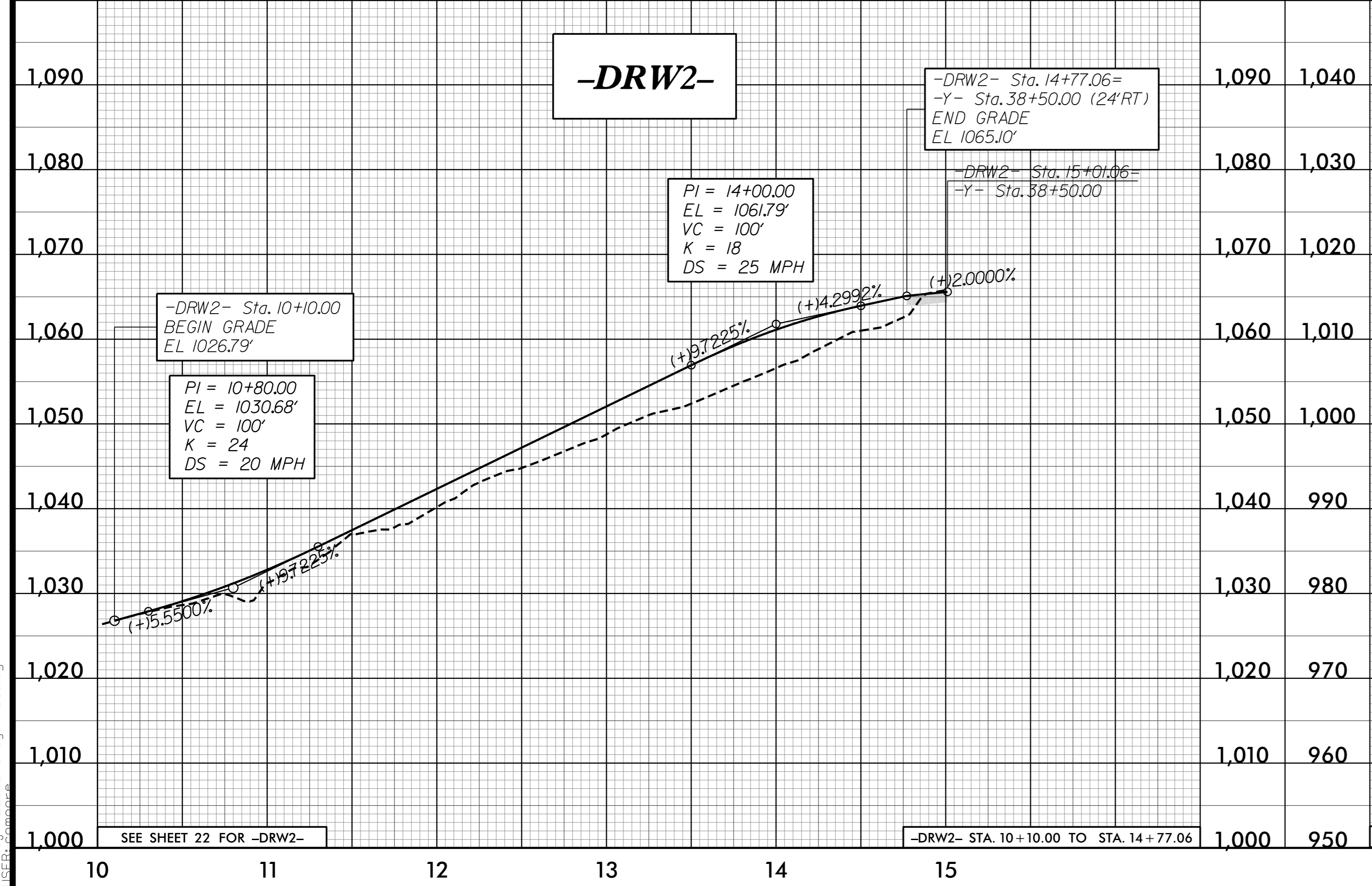
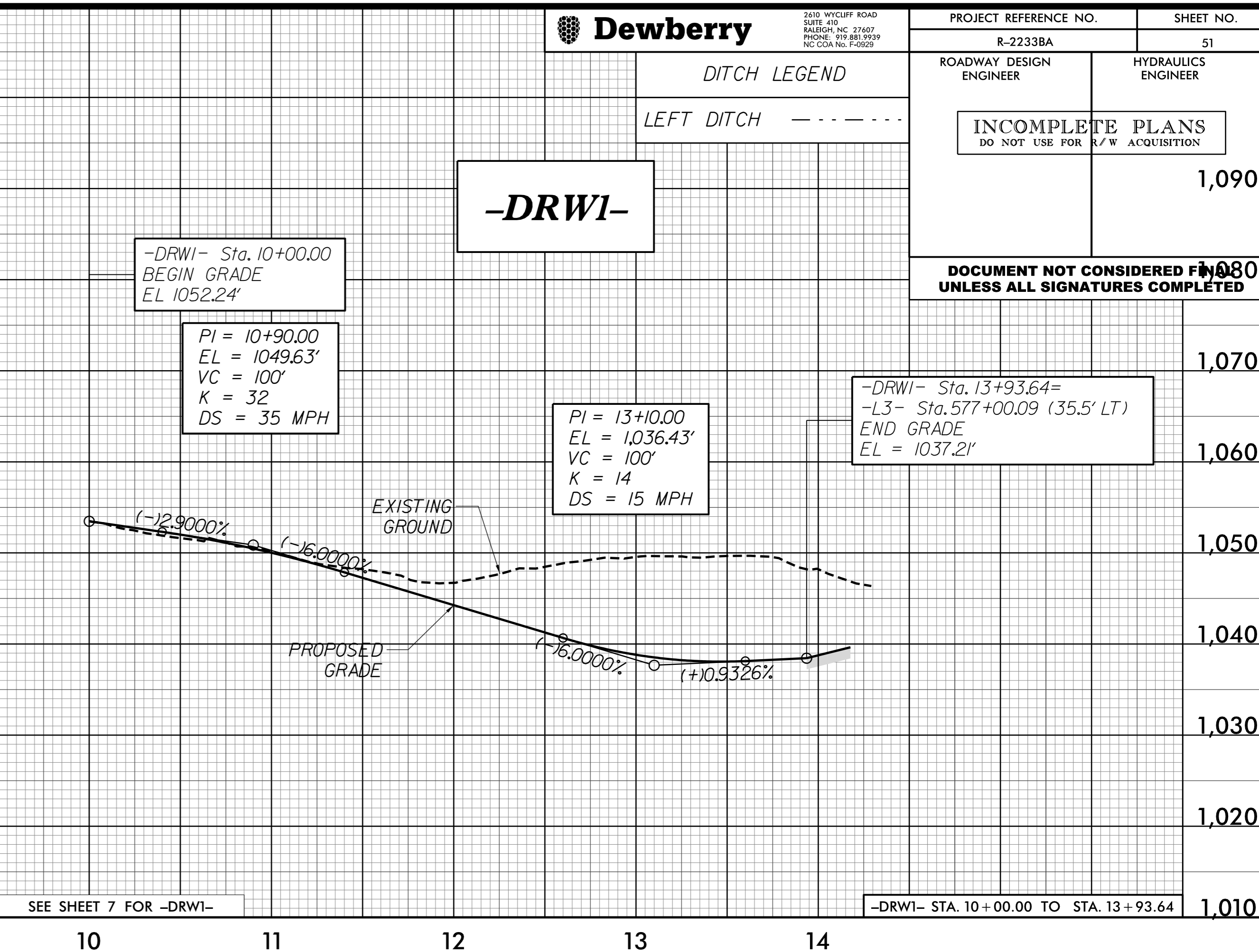
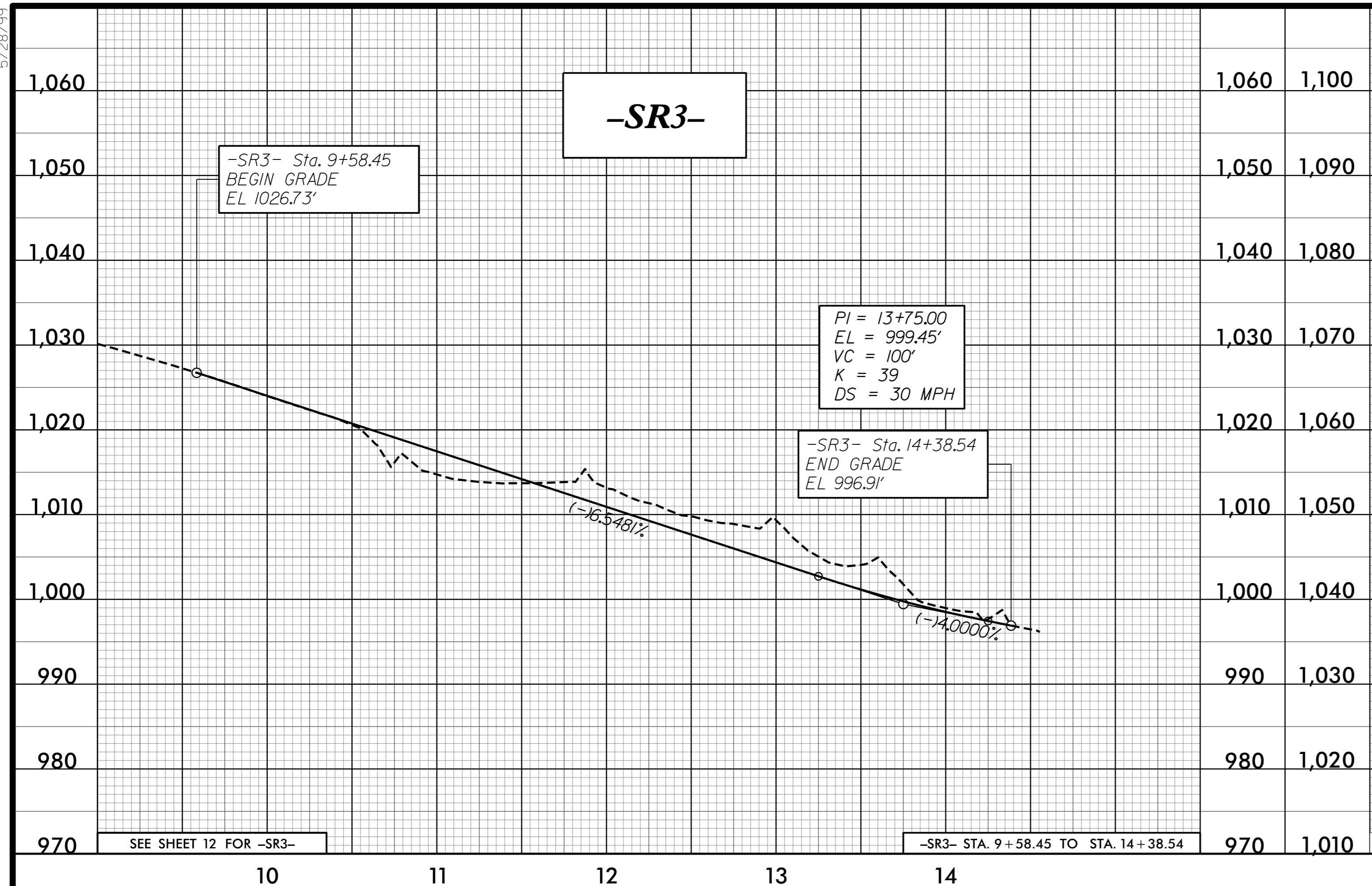
5/28/99

DITCH LEGEND
 LEFT DITCH - - - - -

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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5/28/99



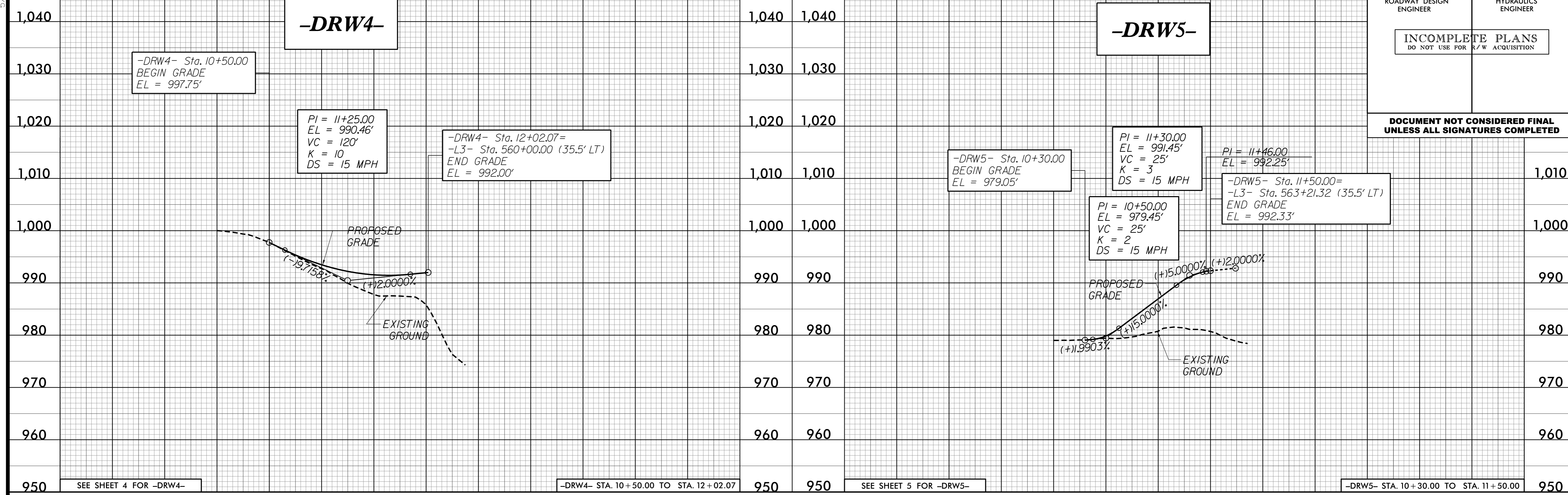
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.883.9329
NC CCA No. F-0029

PROJECT REFERENCE NO. R-2233BA SHEET NO. 52

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 4 FOR -DRW4-

-DRW4- STA. 10+50.00 TO STA. 12+02.07

SEE SHEET 5 FOR -DRW5-

-DRW5- STA. 10+30.00 TO STA. 11+50.00

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10 11 12 13 14 15