

12/06/07

COMPUTED BY: JRGO DATE: 2/12/20
CHECKED BY: WCB DATE: 2/13/20

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. R-3421A
SHEET NO. 3D-8

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

Table with columns for STATION, LOCATION (LT, RT, OR CL), STRUCTURE NO., TOP ELEVATION, INVERT ELEVATION, SLOPE CRITICAL, DRAINAGE PIPE (HDPE PIPE), R.C. PIPE CLASS III, R.C. PIPE CLASS IV, R.C. PIPE CLASS V, ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD STANDARD, CONCRETE TRANSITIONAL SECTION, TYPE OF GRATE, and REMARKS. Includes sub-totals for SHEET 14, SHEET 15, SHEET 16, and overall project totals for R-3421A and R-3421B.

ABBREVIATIONS
C.B. CATCH BASIN
N.D.I. NARROW DROP INLET
D.I. DROP INLET
G.D.I. (N.S.) GRATED DROP INLET
J.B. (NARROW SLOT) JUNCTION BOX
M.H. MANHOLE
T.B.D.I. TRAFFIC BEARING
T.B.J.B. TRAFFIC BEARING

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SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-US74-	60+00	70+00	TBD	TBD	
-Fly-	5+00	25+00	TBD	TBD	
-Ramp C-	17+00	19+50	TBD	TBD	
-Ramp C-	22+00	25+50	TBD	TBD	
-I73-	115+00	123+00	TBD	TBD	
CONTINGENCY				SD	7500
CONTINGENCY				UD	7500
				TOTAL LF:	15000

*UD = Underdrain

*BD = Blind Drain

*SD = Subsurface Drain

EMBANKMENT DENSITY TESTING FREQUENCY

We recommend increasing the density testing frequency to the following requirements:

1 density test per 40,000 sq. ft. of 1 ft. lift placed
1 density test per 20,000 sq. ft. of 1 ft. placed within 5 ft. of subgrade
1 density test per foot of fill placed within 100 ft. of a structure

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent No.	MONTHS
Bridge #240 (LL over US 74 Bus on I-73/US 220 Bypass)	1	3
Bridge #240 (LL over US 74 Bus on I-73/US 220 Bypass)	2	3
Bridge #241 (RL over US 74 Bus on I-73/US 220 Bypass)	1	3
Bridge #241 (RL over US 74 Bus on I-73/US 220 Bypass)	2	3

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE	Approx. Station	Approx. Offset
1	L	100+00	80 ft LT
2	L	100+25	25 ft LT
3	L	102+59	80 ft LT
4	L	102+88	25 ft LT
5	L	100+55	25 ft RT
6	L	100+87	80 ft RT
7	L	103+07	25 ft RT
8	L	103+29	80 ft RT
TOTAL GAUGES (EACH):			8

HORIZONTAL SLOPE DRAINS

For Horizontal Slope Drains see detail for locations and quantity estimates.

CELLULAR CONFINEMENT SYSTEM

For Cellular Confinement System see detail for locations and quantity estimates.

FOR PAVEMENT STABILIZATION

LINE	Station	Station	Offset	SY	CL IV TONS
-US 74-	41+50	43+50	RT	556	
US 74-	130+75	136+50	RT	1597	
-I73-	85+50	88+15	CL	2650	
-I73-	96+00	102+50	LT/RT	7944	
-I73-	107+50	108+00	LT/RT	611	
-I73-	109+50	112+00	RT	694	
-I73-	126+00	127+50	RT	917	
-L2-	40+50	44+00	RT	1167	
-L2CONN-	32+25	33+50	RT	347	
-RPA-	5+50	7+50	CL	800	
-RPC-	11+93	13+00	CL	452	
-RPC-	29+50	37+50	CL	3378	
-RPD-	0+00	3+00	CL	1267	
-RPD-	10+25	12+00	CL	739	
-LPB-	0+00	1+50	CL	633	
-LPB-	5+00	11+53	CL	2032	
-LPC-	0+00	5+00	CL	2111	
-LPC-	11+75	14+75	CL	1267	
TOTAL				29162	7000

We recommend reinforcing all embankment slopes that are steeper than 2.25:1 as shown in the Reinforced Soil Slope Detail Sheet. The estimated quantities are provided below. For actual location see the Roadway Cross Sections

< 20 ft	3000 Sq Yds
20 ft to 40 ft	4000 Sq Yds
40 ft +	4000 Sq Yds

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			AST						500
CONTINGENCY			ASU		2500	5000	7500		
CONTINGENCY			ASU		10000	18000	15000		
TOTAL CY/TONS/SY:					12500	23000	22500*	0	500

ASU = Aggregate Subgrade, AST = Aggregate Stabilization

*Total square yards of Geotextile for Soil Stabilization is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

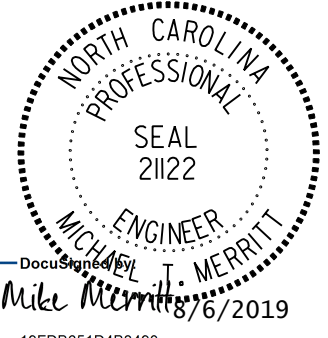
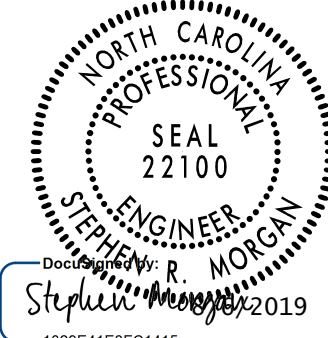
Parcel No.	Sheet No.	PROPERTY OWNERS
R-3421A 1	4-5	DOE INC.
R-3421A 2	5-6	NC DEPT OF TRANS.
R-3421A 3	5-6	DONALD M. DAWKINS
R-3421A 4	6	DONALD M. DAWKINS
R-3421A 5	6-7	AMSOUTH TIMBER COMPANY TE LLC
R-3421A 6	7	BOBBY P. HORNBUKLE
R-3421A 7	7	NC DEPT. TRANS.
R-3421A 8	7-8	JOHNNY D. COLTRANE
R-3421A 9	7-8	NC DEPT. TRANS.
R-3421A 10	8-9	ZEBULON & MAYNIE GIBSON ESTATE
R-3421A 11	8 12	PAUL J. SCHOLL III
R-3421A 12	8 12	ESTATE OF REBEKAH N. McLEAN
R-3421A 13	9-10 13	JAMES HUNTLEY JR
R-3421A 14	9 11	H. BRONSON BRIM
R-3421A 15	9 17	RICHMOND COUNTY
R-3421A 16	9	NORTH CAROLINA NATURAL GAS EASEMENT
R-3421A 17	9-10 14	WOODMONT ASSOCIATES INC.
R-3421A 18	9-11	CHARLES D. SELLARS
R-3421A 19	10-11	JAMES E. SELLARS SR
R-3421A 20	11-12	LENA COBLE
R-3421A 21	12	HORACE J. SMITH
R-3421A 22	15-16	CAROLINA POWER & LIGHT
R-3421A 23	15-17	MICHAEL W. McKENZIE

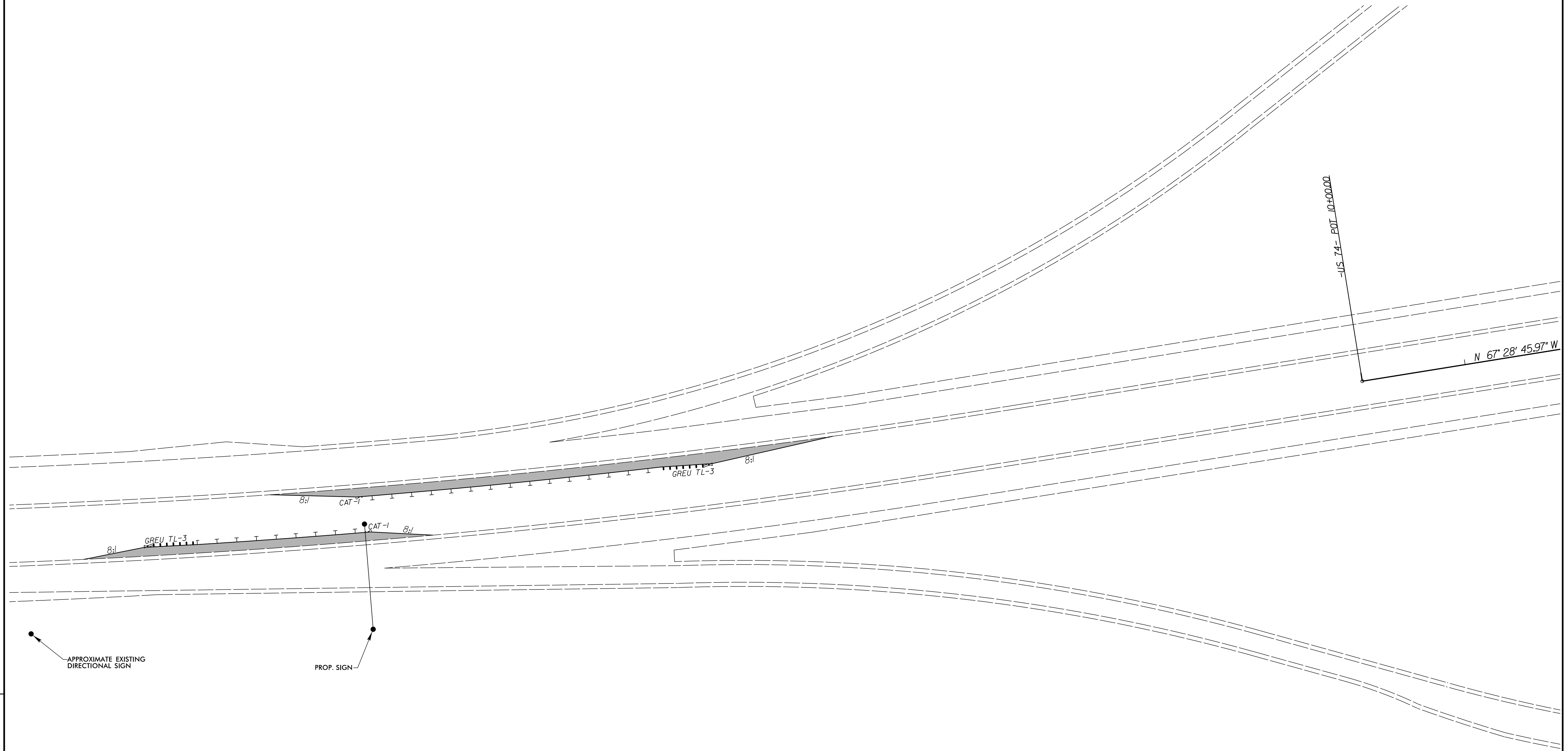
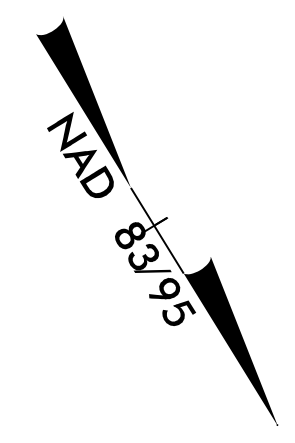
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7/18/2019
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rdj

6/29/19

REVISIONS

PROJECT REFERENCE NO. R-3421A		SHEET NO. 4A
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
		
DocuSign: Mike Merritt 6/29/2019		DocuSign: Stephen R. Morgan 6/29/2019



● APPROXIMATE EXISTING DIRECTIONAL SIGN

● PROP. SIGN

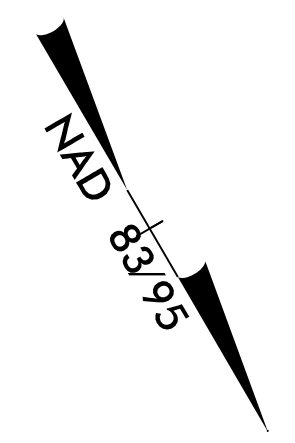
-US 74- POT 10+00.00

N 67° 28' 45.97" W

6/29/2019
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PROJECT REFERENCE NO. R-3421A		SHEET NO. 4
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
Mike Merritt 8/6/2019		Stephen R. Morgan 8/6/2019



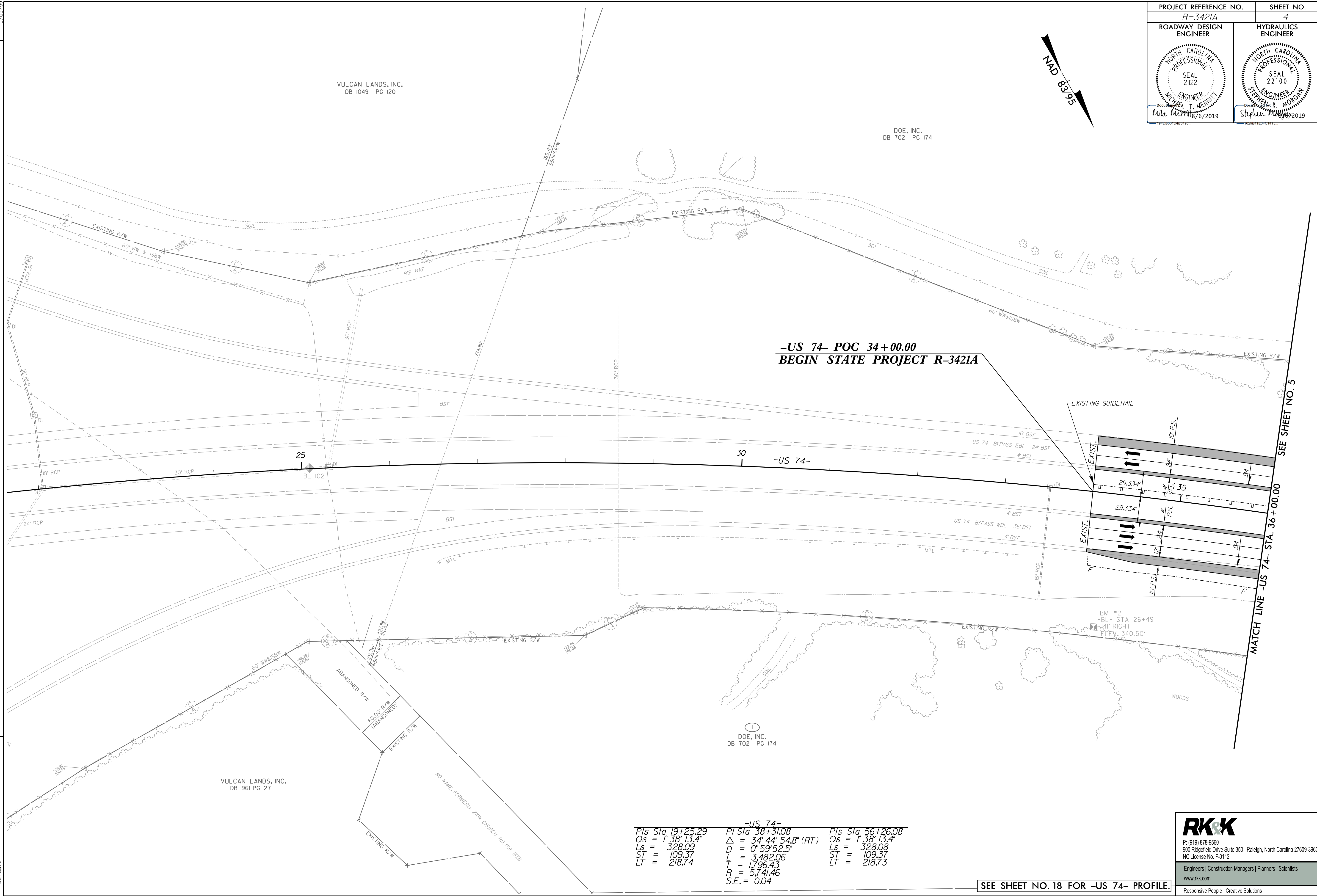
VULCAN LANDS, INC.
DB 1049 PG 120

DOE, INC.
DB 702 PG 174

**-US 74- POC 34+00.00
BEGIN STATE PROJECT R-3421A**

REVISIONS

SEE SHEET NO. 5
MATCH LINE -US 74- STA. 36+00.00



VULCAN LANDS, INC.
DB 961 PG 27

DOE, INC.
DB 702 PG 174

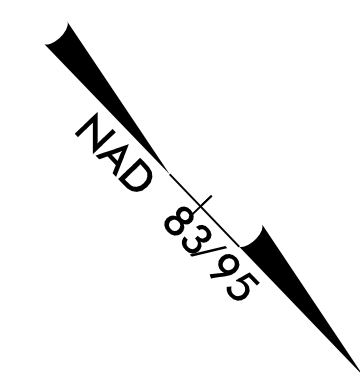
-US 74-		
PI Sta 19+25.29	PI Sta 38+31.08	PI Sta 56+26.08
Os = 1' 38" 13.4"	Δ = 34' 44" 54.8" (RT)	Os = 1' 38" 13.4"
Ls = 328.09	D = 0' 59" 52.5"	Ls = 328.08
ST = 109.37	L = 3,482.06	ST = 109.37
LT = 218.74	T = 1,796.43	LT = 218.73
	R = 5,741.46	
	S.E. = 0.04	

SEE SHEET NO. 18 FOR -US 74- PROFILE.

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

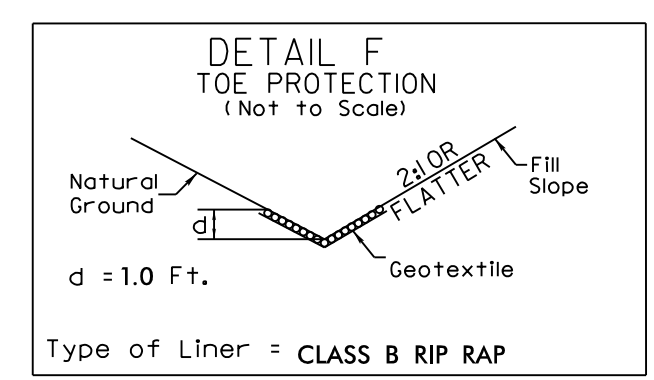
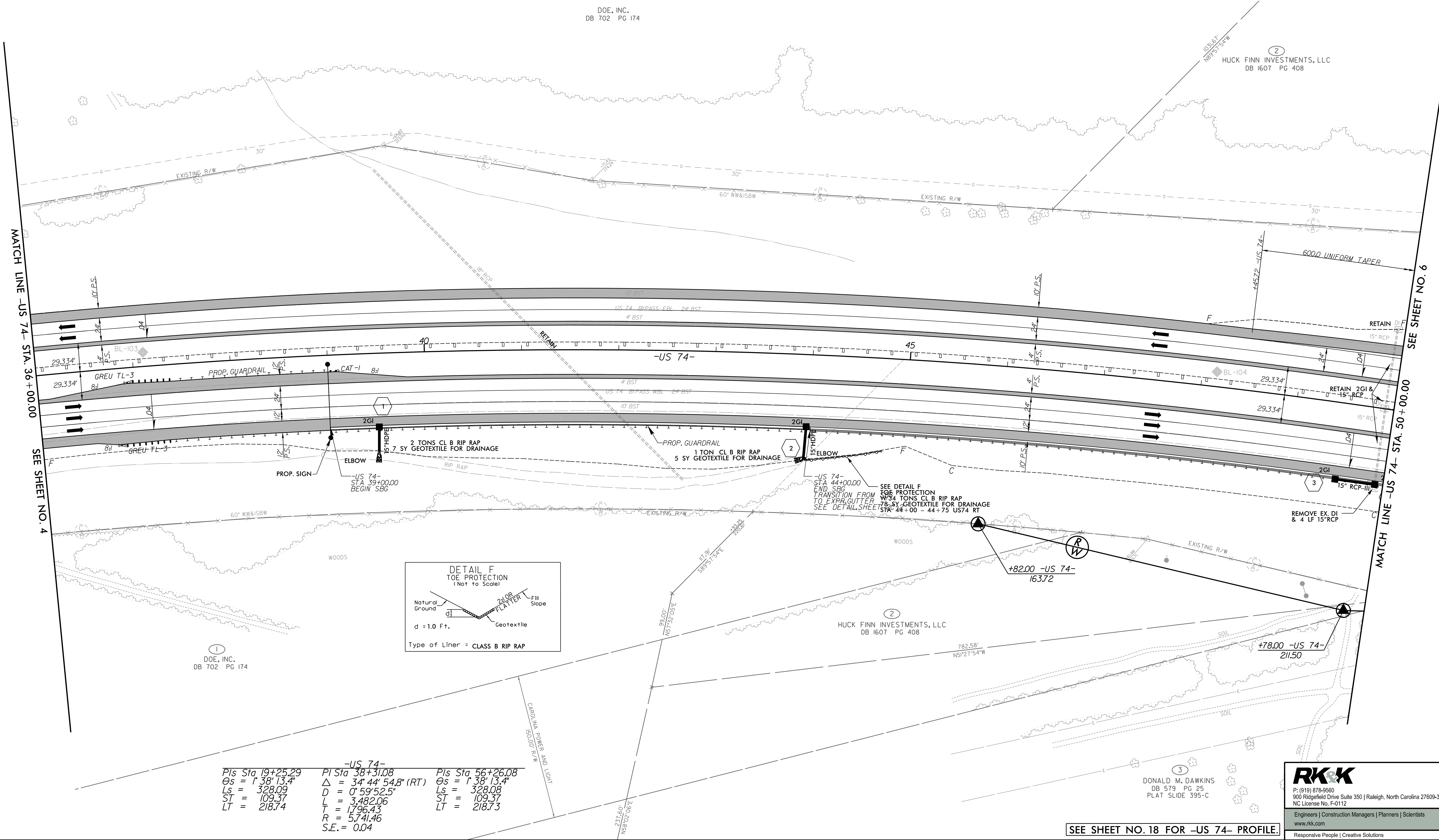


DOE, INC.
DB 702 PG 174

HUCK FINN INVESTMENTS, LLC
DB 1607 PG 408

MATCH LINE -US 74- STA. 36+00.00

MATCH LINE -US 74- STA. 50+00.00



-US 74-	
PI Sta 19+25.29	PI Sta 38+31.08
Os = 1' 38" 13.4"	Δ = 34' 44" 54.8" (RT)
LS = 328.09	D = 0' 59" 52.5"
ST = 109.37	L = 3,482.06
LT = 218.74	T = 1,796.43
	R = 5,741.46
	S.E. = 0.04
	PI Sta 56+26.08
	Os = 1' 38" 13.4"
	LS = 328.08
	ST = 109.37
	LT = 218.73

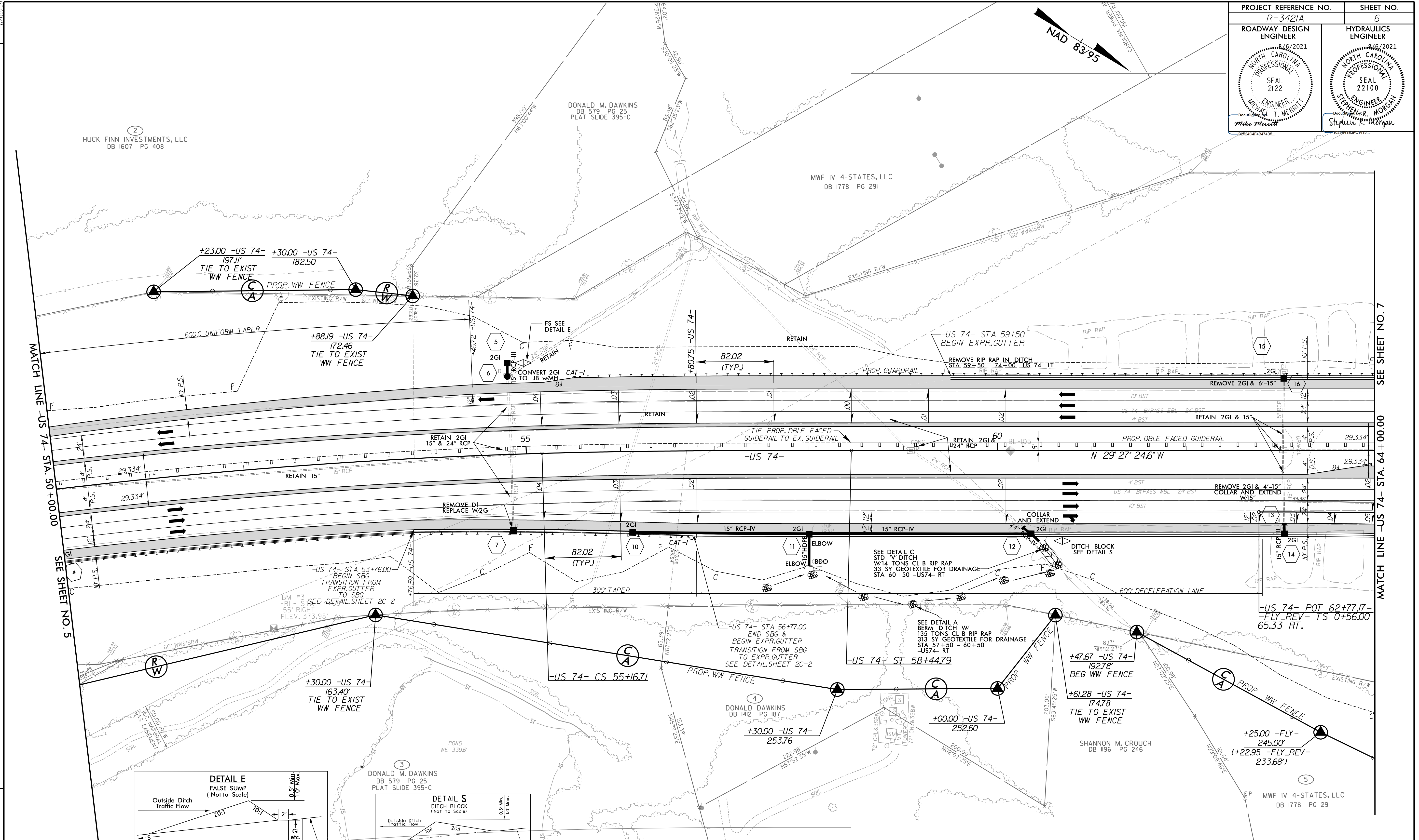
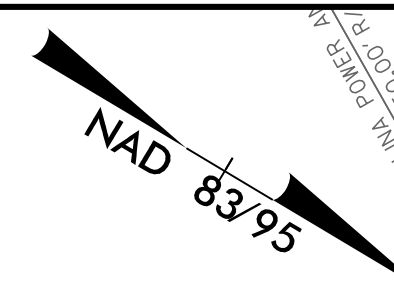
REVISIONS

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SEE SHEET NO. 18 FOR -US 74- PROFILE.

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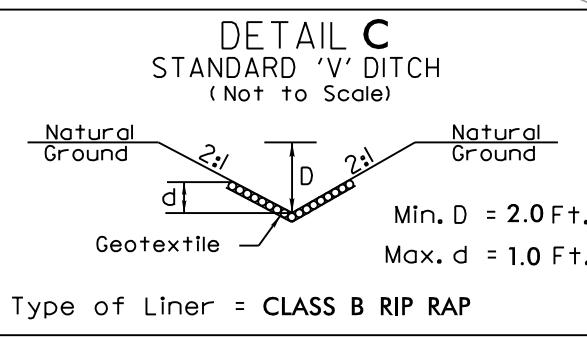
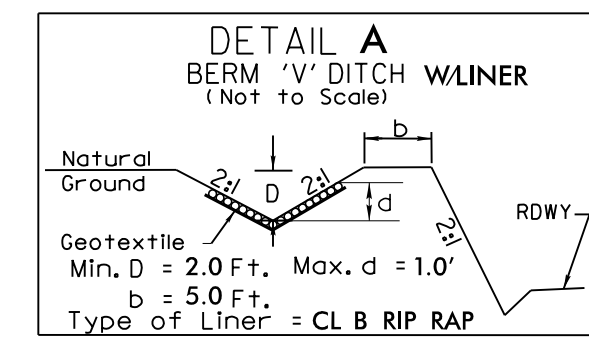
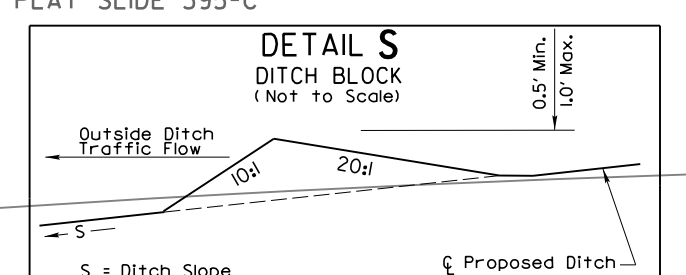
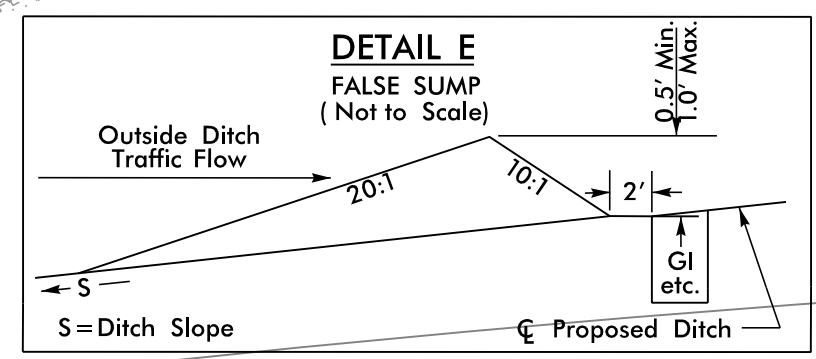
DONALD M. DAWKINS
 DB 579 PG 25
 PLAT SLIDE 395-C



REVISIONS
DRAINAGE REVISION: REVISED DRAINAGE BETWEEN STRUCTURES 7 TO 10 AND STRUCTURES 10 TO 11. JRCO 8/09/2021

MATCH LINE -US 74- STA. 50+00.00
SEE SHEET NO. 5

MATCH LINE -US 74- STA. 64+00.00
SEE SHEET NO. 7



Station	PI	Δ	θs	Ls	ST	LT	R	S.E.
Sta 19+25.29	38+31.08	34' 44" 54.8" (RT)	1' 38" 13.4"	328.09	109.37	218.74	574.46	0.04
Sta 56+26.08	56+26.08	0' 59" 52.5"	1' 38" 13.4"	328.08	109.37	218.73	574.46	0.04
Sta 1+89.36	4+10.47	3' 08" 53.2"	3' 08" 53.2"	200.00'	133.35'	66.69'	1820.00'	0.07
Sta 6+30.89	4+10.47	9' 42" 08.9" (RT)	3' 08" 53.2"	200.00'	133.35'	66.69'	1820.00'	0.07

SEE SHEET NO. 19 FOR -US 74- PROFILE.
SEE SHEET NO. 27 FOR -FLY- PROFILE.

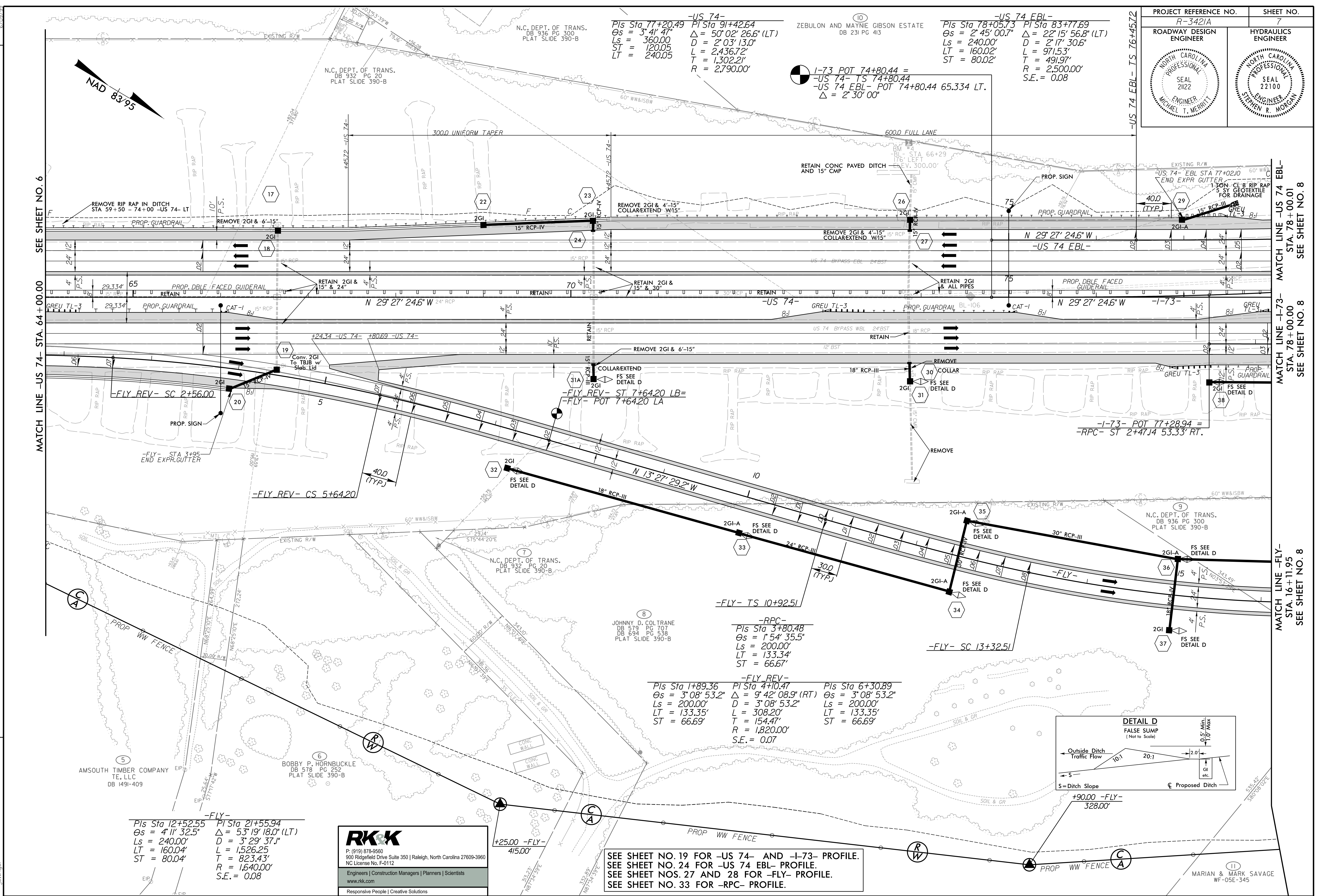
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8/16/2021
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ROADWAY REVISION: REVISED SLOPE STAKES BETWEEN STATIONS 67+00 -US 74- TO 16+11.95 RT -FLY--JRG 1029/20

REVISIONS

10/29/2020
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jcollins



MATCH LINE -US 74- STA. 64+00.00 SEE SHEET NO. 6

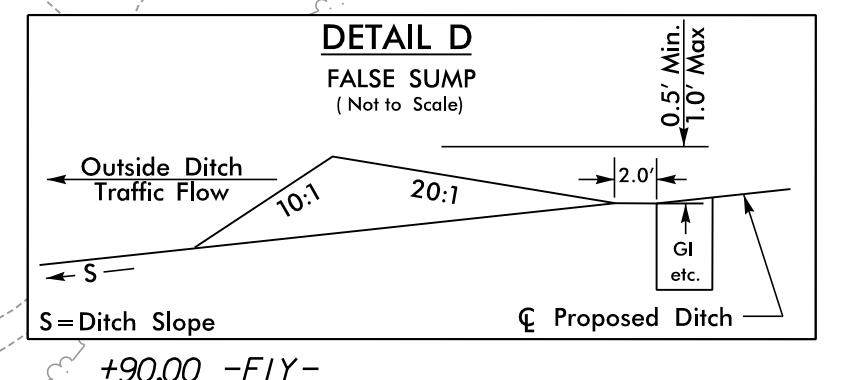
MATCH LINE -US 74 EBL- STA. 78+00.01 SEE SHEET NO. 8

MATCH LINE -FLY- STA. 16+11.95 SEE SHEET NO. 8

-FLY-
 PIs Sta 12+52.55 PIs Sta 21+55.94
 $\Theta_s = 4^\circ 11' 32.5''$ $\Delta = 53^\circ 19' 18.0''$ (LT)
 $L_s = 240.00'$ $D = 3^\circ 29' 37.1''$
 $LT = 160.04'$ $L = 1526.25'$
 $ST = 80.04'$ $T = 823.43'$
 $R = 1640.00'$ $S.E. = 0.08$

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SEE SHEET NO. 19 FOR -US 74- AND -I-73- PROFILE.
 SEE SHEET NO. 24 FOR -US 74 EBL- PROFILE.
 SEE SHEET NOS. 27 AND 28 FOR -FLY- PROFILE.
 SEE SHEET NO. 33 FOR -RPC- PROFILE.



PROJECT REFERENCE NO. R-3421A		SHEET NO. 7	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

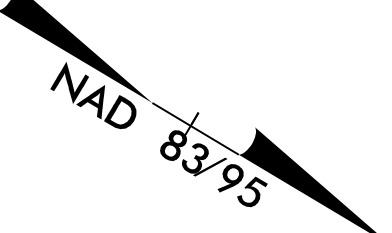
-US 74-
 PIs Sta 77+20.49 PIs Sta 91+42.64
 $\Theta_s = 3^\circ 41' 47''$ $\Delta = 50^\circ 02' 26.6''$ (LT)
 $L_s = 360.00'$ $D = 2^\circ 03' 13.0''$
 $LT = 120.05'$ $L = 2,436.72'$
 $ST = 240.05'$ $T = 1,302.21'$
 $R = 2,790.00'$

-US 74 EBL-
 PIs Sta 78+05.73 PIs Sta 83+77.69
 $\Theta_s = 2^\circ 45' 00.7''$ $\Delta = 22^\circ 15' 56.8''$ (LT)
 $L_s = 240.00'$ $D = 2^\circ 17' 30.6''$
 $LT = 160.02'$ $L = 971.53'$
 $ST = 80.02'$ $T = 491.97'$
 $R = 2,500.00'$ $S.E. = 0.08$

I-73 POT 74+80.44 = -US 74- TS 74+80.44
 $\Delta = 2^\circ 30' 00''$

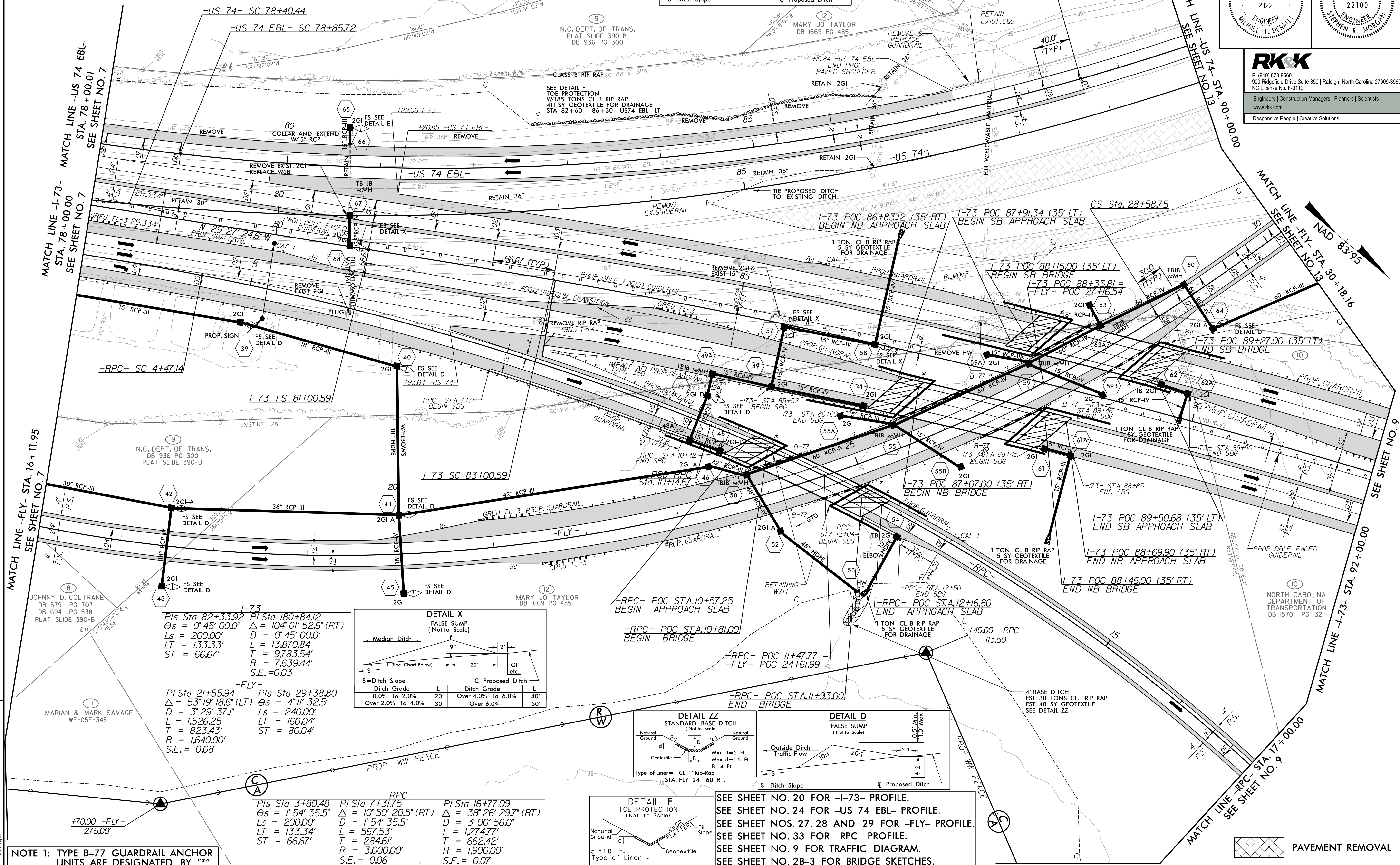
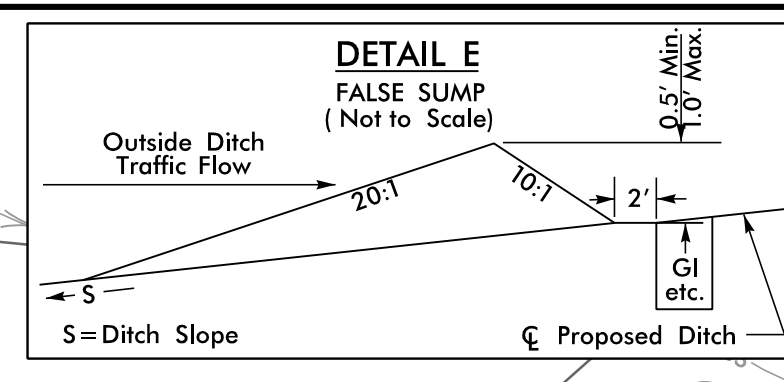
-RPC-
 PIs Sta 3+80.48
 $\Theta_s = 1^\circ 54' 35.5''$
 $L_s = 200.00'$
 $LT = 133.35'$
 $ST = 66.67'$

-FLY REV-
 PIs Sta 4+10.47 PIs Sta 6+30.89
 $\Theta_s = 3^\circ 08' 53.2''$ $\Delta = 9^\circ 42' 08.9''$ (RT) $\Theta_s = 3^\circ 08' 53.2''$
 $L_s = 200.00'$ $D = 3^\circ 08' 53.2''$ $L_s = 200.00'$
 $LT = 133.35'$ $L = 308.20'$ $LT = 133.35'$
 $ST = 66.67'$ $T = 154.47'$ $ST = 66.67'$
 $R = 1,820.00'$ $S.E. = 0.07$

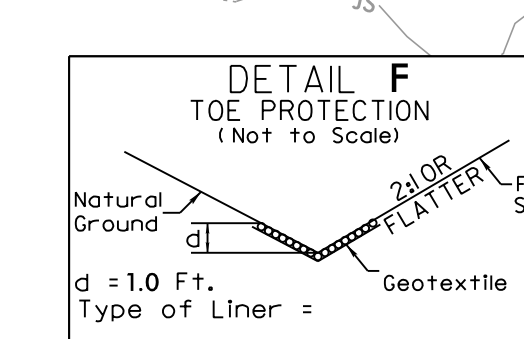
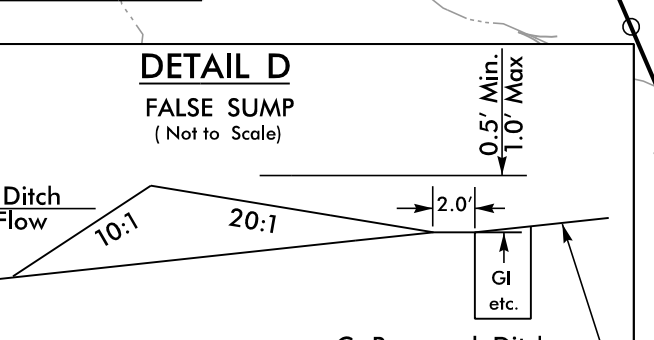
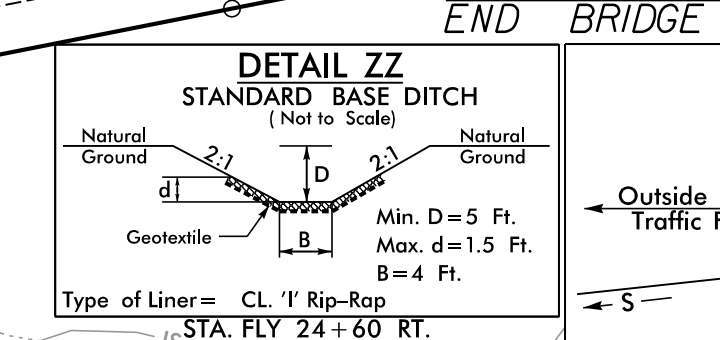
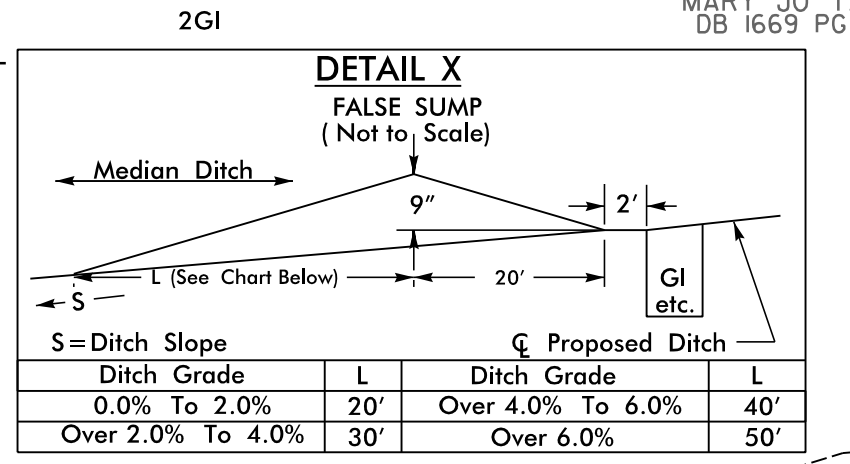


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-US 74- PIs Sta 77+20.49 Os = 3° 41' 47" Ls = 360.00 ST = 120.05 LT = 240.05	PI Sta 91+42.64 Δ = 50° 02' 26.6" (LT) D = 2° 03' 13.0" L = 2,436.72' T = 1,302.21' R = 2,790.00'	PIs Sta 78+05.73 Os = 2° 45' 00.7" Ls = 240.00' LT = 160.02' ST = 80.02'	-US 74 EBL- PI Sta 83+77.69 Δ = 22° 15' 56.8" (LT) D = 2° 17' 30.6" L = 971.53' T = 491.97' R = 2,500.00' S.E. = 0.08	PI Sta 95+61.05 Δ = 28° 43' 16.5" (LT) D = 2° 05' 03.3" L = 1,378.02' T = 703.81' R = 2,749.00'
--	---	---	---	---



I-73 PIs Sta 82+33.92 Os = 0° 45' 00.0" Ls = 200.00' LT = 133.33' ST = 66.67'	PI Sta 180+84.12 Δ = 104° 01' 52.6" (RT) D = 0° 45' 00.0" L = 13,870.84' T = 9,783.54' R = 7,639.44' S.E. = 0.03
-FLY- PI Sta 21+55.94 Δ = 53° 19' 18.6" (LT) D = 3° 29' 37.1" L = 1,526.25' T = 823.43' R = 1,640.00' S.E. = 0.08	PIs Sta 29+38.80 Os = 4° 11' 32.5" Ls = 240.00' LT = 160.04' ST = 80.04'



SEE SHEET NO. 20 FOR -I-73- PROFILE.
 SEE SHEET NO. 24 FOR -US 74 EBL- PROFILE.
 SEE SHEET NOS. 27, 28 AND 29 FOR -FLY- PROFILE.
 SEE SHEET NO. 33 FOR -RPC- PROFILE.
 SEE SHEET NO. 9 FOR TRAFFIC DIAGRAM.
 SEE SHEET NO. 2B-3 FOR BRIDGE SKETCHES.

NOTE 1: TYPE B-77 GUARDRAIL ANCHOR UNITS ARE DESIGNATED BY "A".

PAVEMENT REMOVAL

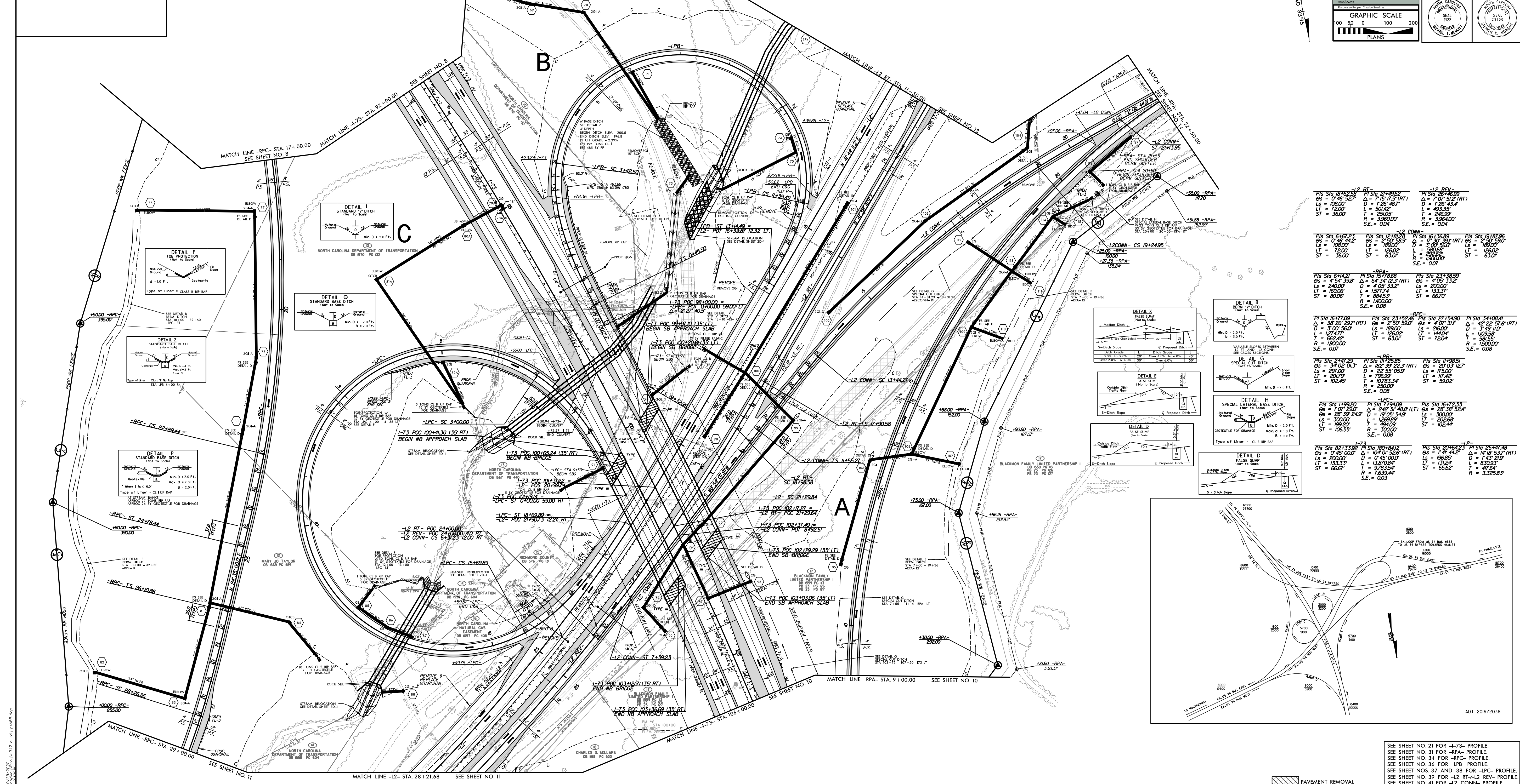
REVISIONS

DRAINAGE REVISION: REVISED DRAINAGE STRUCTURES BETWEEN STATIONS 20+00 TO 29+00 LTRT -FLY- JRG 2/13/20

DRAINAGE REVISION: REVISED DRAINAGE STRUCTURES BETWEEN STATIONS 84+87 TO 86+90 RT -I-73- WCB 10/07/20

ROADWAY REVISION: REVISED SLOPE STAKES BETWEEN STATIONS 16+11.95 TO 23+00 RT -FLY- JRG 10/29/20

REVISIONS
ROADWAY REVISION: REVISED SLOPE STAKES BETWEEN STATIONS 14+25 TO 27+50 RT -RPC- JRG 10/29/20

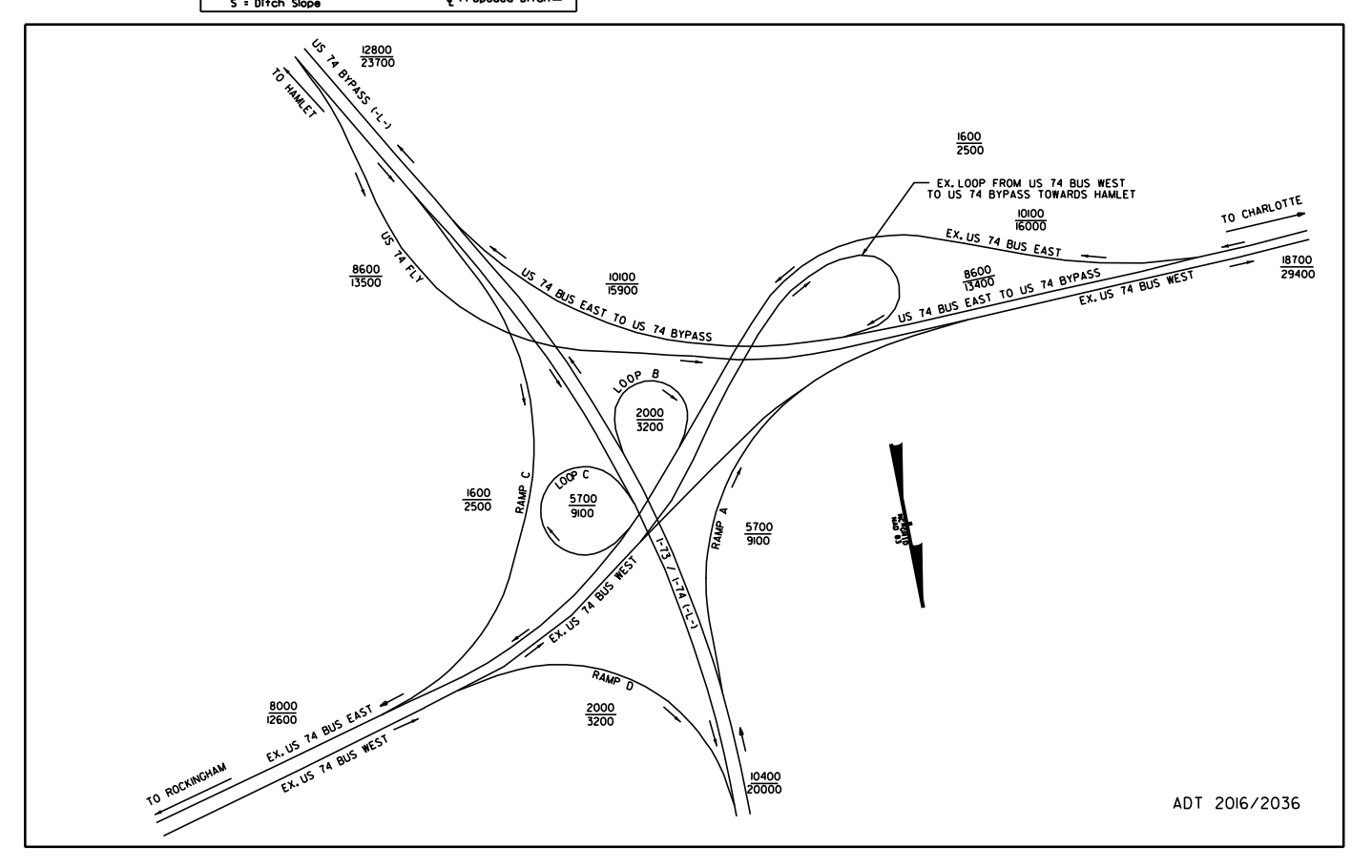


REVISED 10/29/20 JRG

RK-K
REGISTERED PROFESSIONAL ENGINEER
No. 10000, State of North Carolina
100 S. D. ST. Rm. 200
CHARLOTTE, N.C. 28203
GRAPHIC SCALE
1" = 50' 0"
PLANS

PROJECT REFERENCE NO. R-3421A
SHEET NO. 9
AWY SHEET NO. 9
ROADWAY DESIGN
ENGINEER
MICHEL L. WELLS
HYDRAULICS ENGINEER
MICHEL L. WELLS

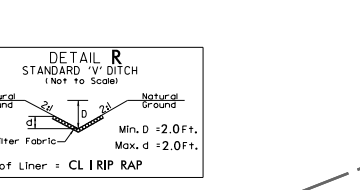
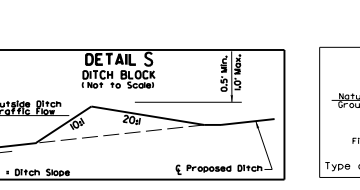
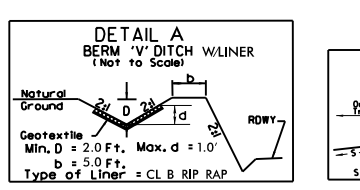
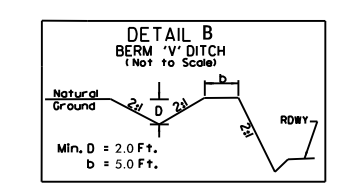
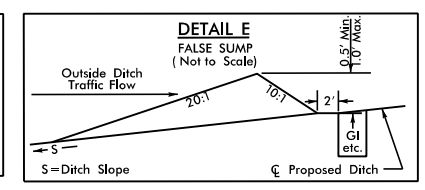
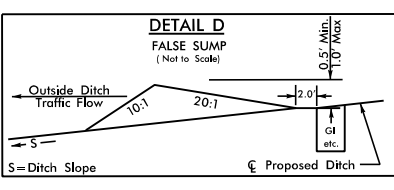
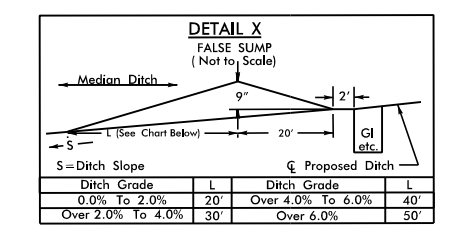
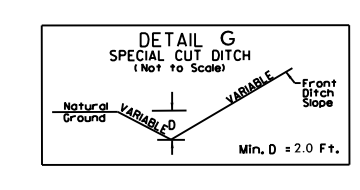
-L2 RT-		-L2 CONN-		-L2 DOWN-	
PI Stg 18462.58 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'	PI Stg 21492.52 G _s = 1.70 151'(RT) D = 7.26 45.7' L = 50.42' T = 246.99' R = 3.96000' S.E. = 0.04'	PI Stg 21492.59 G _s = 1.70 151'(RT) D = 7.26 45.7' L = 50.42' T = 246.99' R = 3.96000' S.E. = 0.04'	PI Stg 18187.56 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'	PI Stg 18187.56 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'	PI Stg 18187.56 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'
PI Stg 18462.58 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'	PI Stg 21492.52 G _s = 1.70 151'(RT) D = 7.26 45.7' L = 50.42' T = 246.99' R = 3.96000' S.E. = 0.04'	PI Stg 21492.59 G _s = 1.70 151'(RT) D = 7.26 45.7' L = 50.42' T = 246.99' R = 3.96000' S.E. = 0.04'	PI Stg 18187.56 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'	PI Stg 18187.56 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'	PI Stg 18187.56 G _s = 0.45 442' L _s = 108.00' LT = 72.00' ST = 36.00'
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SEE SHEET NO. 21 FOR -L2- PROFILE.
SEE SHEET NO. 31 FOR -RPA- PROFILE.
SEE SHEET NO. 34 FOR -RPC- PROFILE.
SEE SHEET NO. 36 FOR -LPB- PROFILE.
SEE SHEET NOS. 37 AND 38 FOR -LPC- PROFILE.
SEE SHEET NO. 39 FOR -L2 RT- AND -L2 CONN- PROFILE.
SEE SHEET NO. 41 FOR -L2 CONN- PROFILE.
SEE SHEET NO. 28-3 FOR BRIDGE SKETCHES.

PAVEMENT REMOVAL

NO.	REVISIONS



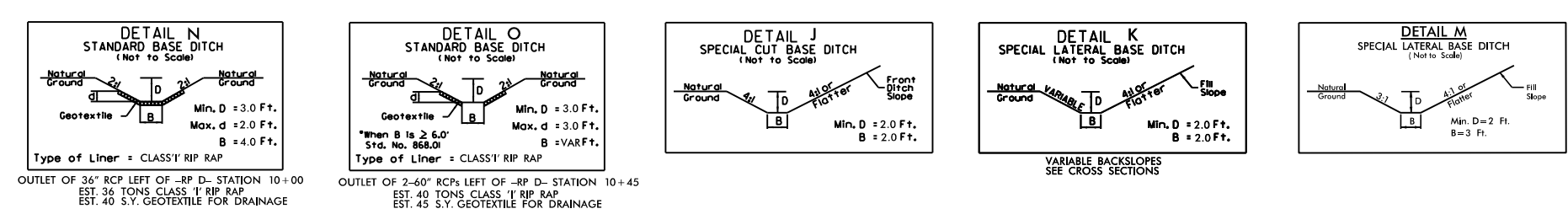
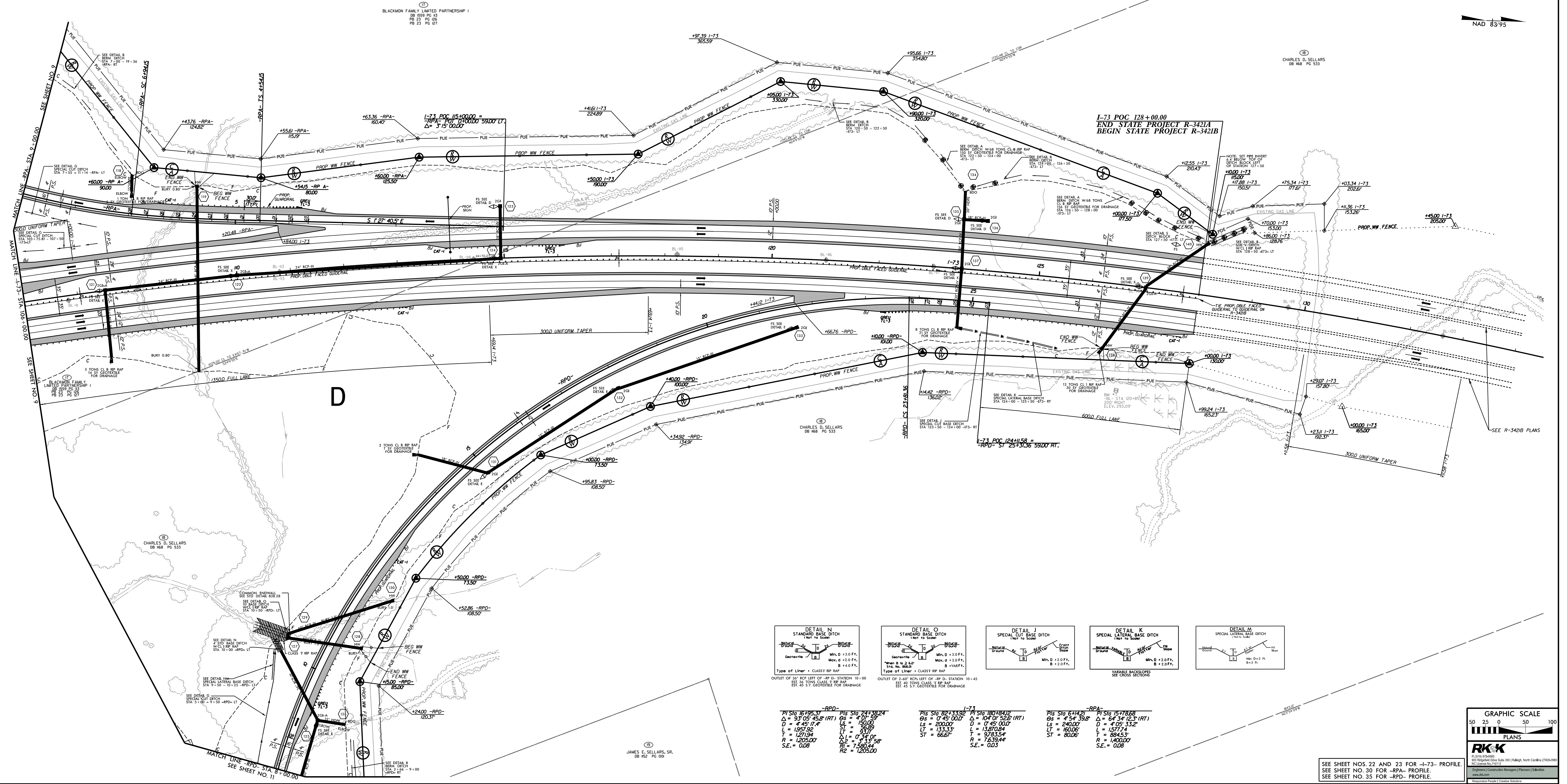
PROJECT REFERENCE NO: **R-3421A** SHEET NO: **10**

ROADWAY DESIGN ENGINEER: **Stephan M. Moran**

HYDRAULICS ENGINEER: **Stephan M. Moran**

DATE: **8/7/2019**

NAD 83/95



Station	Profile	Delta	Length	Radius	Station	Profile	Delta	Length	Radius
Pt Sta 16+95.17	-RPD-	Δ = 93'05" 45.8' (RT)	L = 1097.92'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 4'11" 1.8'	L = 57.14'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 4'11" 1.8'	L = 57.14'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 10'07" 5.2' (RT)	L = 1337.33'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 10'07" 5.2' (RT)	L = 1337.33'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 4'54" 3.8'	L = 180.00'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 4'54" 3.8'	L = 180.00'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 6'34" 12.3' (RT)	L = 1577.74'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 6'34" 12.3' (RT)	L = 1577.74'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 4'05" 3.2'	L = 284.53'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 4'05" 3.2'	L = 284.53'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 15'77" 7.4'	L = 180.00'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 15'77" 7.4'	L = 180.00'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 8'45" 3.7'	L = 180.00'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 8'45" 3.7'	L = 180.00'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 7'63" 4.4'	L = 180.00'	R = 1205.00'
Pt Sta 24+11.58	-RPD-	Δ = 7'63" 4.4'	L = 180.00'	R = 1205.00'	Pt Sta 24+11.58	-RPD-	Δ = 1'00" 0.0'	L = 180.00'	R = 1205.00'

SEE SHEET NOS. 22 AND 23 FOR I-73 - PROFILE.
SEE SHEET NO. 30 FOR -RPA- PROFILE.
SEE SHEET NO. 35 FOR -RPD- PROFILE.

GRAPHIC SCALE

50 25 0 50 100

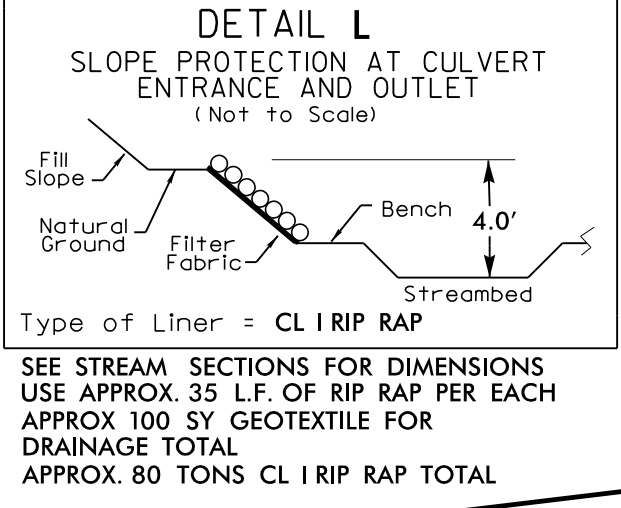
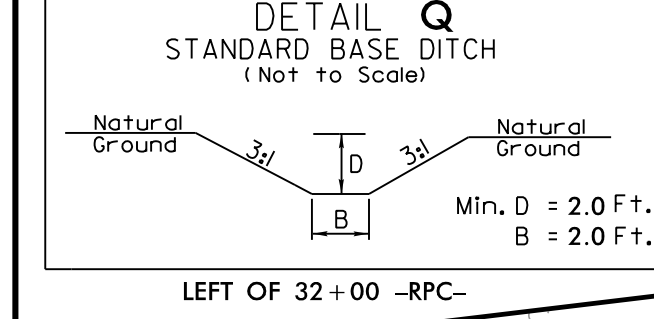
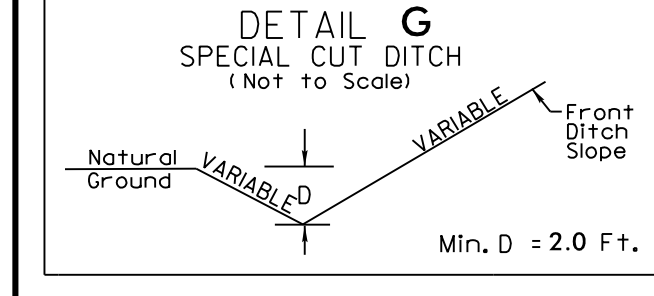
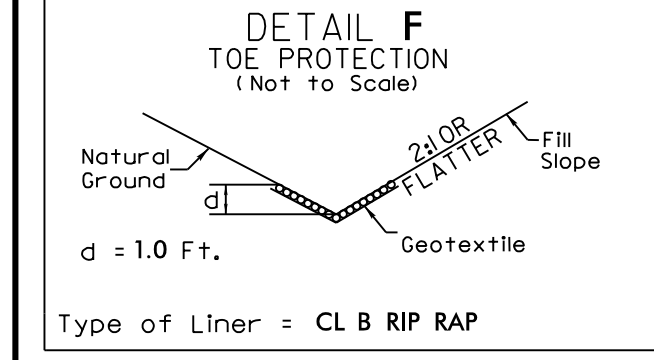
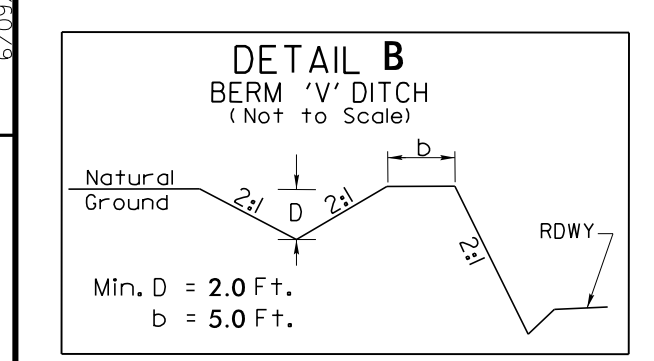
PLANS

RK

Professional Engineer
No. 000000000
State of New York
8/7/2019

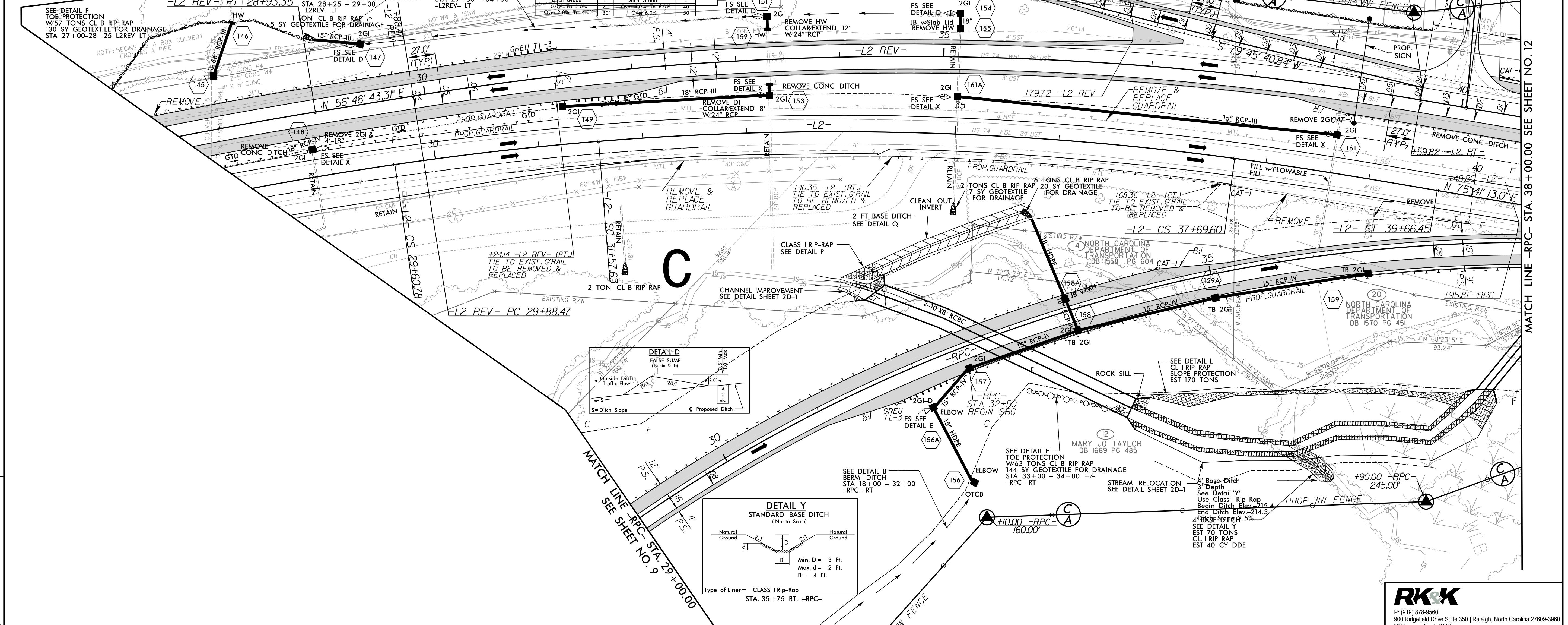
PROJECT REFERENCE NO. R-3421A	SHEET NO. 11
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 2122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22100 STEPHEN R. MORGAN

-RPD-
 PI Sta 3+51.49 PI Sta 16+95.37 PI Sta 26+46.99 PI Sta 34+78.58
 Δs = 5' 08" 06.8" Δ = 93' 05" 45.8" (RT) Δ = 7' 07" 51.2" (RT) Δ = 18' 51" 57.5" (RT)
 Ls = 216.00' D = 4' 45" 17.4" D = 1' 26" 43.4" D = 1' 56" 32.0"
 LT = 144.06' L = 1,957.92 L = 493.35' L = 971.36'
 ST = 72.06' T = 1,271.94 T = 246.99' T = 490.11' T = 2,950.00'
 R = 1,205.00' R = 3,964.00' R = 2,950.00'
 S.E. = 0.08 S.E. = 0.04 S.E. = 0.04 S.E. = 0.06



DETAIL X: FALSE SWAMP (Not to Scale)

S=Ditch Slope	L=Ditch Length	Ditch Grade	L
0.00% to 2.00%	20'	Charter 10% to 6.0%	40'
Over 2.00% to 8.00%	30'	Over 6.0%	60'

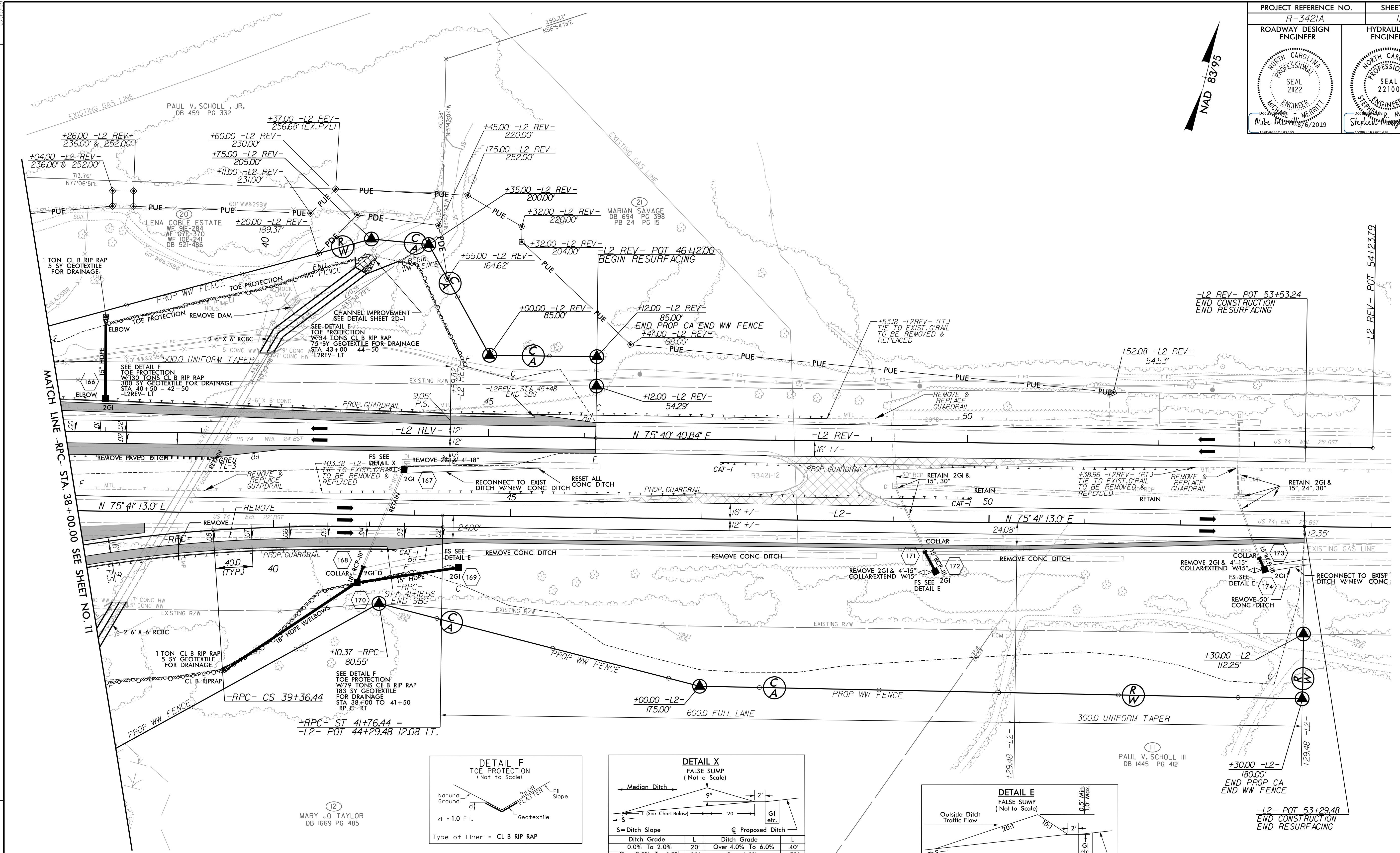
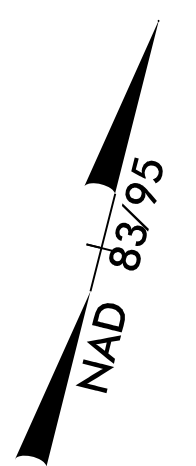


REVISIONS
 RIGHT OF WAY REVISION: PERMANENT UTILITY EASEMENT (PUE) HAS BEEN DECREASED ON PARCEL 20-JR60 1/21/2020
 DRAINAGE REVISION: -L2- FROM STA. 35+71.88 TO STA. 38+63.03 JR60 4/26/2021
 DRAINAGE REVISION: -L2- STRUCTURE 161 TO 161A JR60 08/09/2021

SEE SHEET NO. 34 FOR -RPC- PROFILE.
 SEE SHEET NO. 35 FOR -RPD- PROFILE.
 SEE SHEET NO. 39 AND NO. 40 FOR -L2 REV- / -L2 RT- PROFILE.

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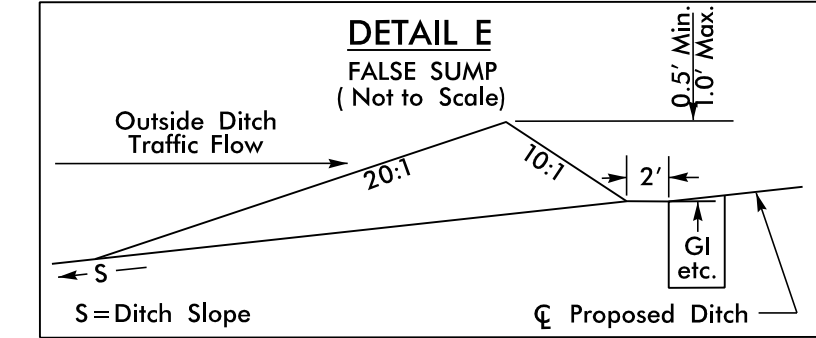
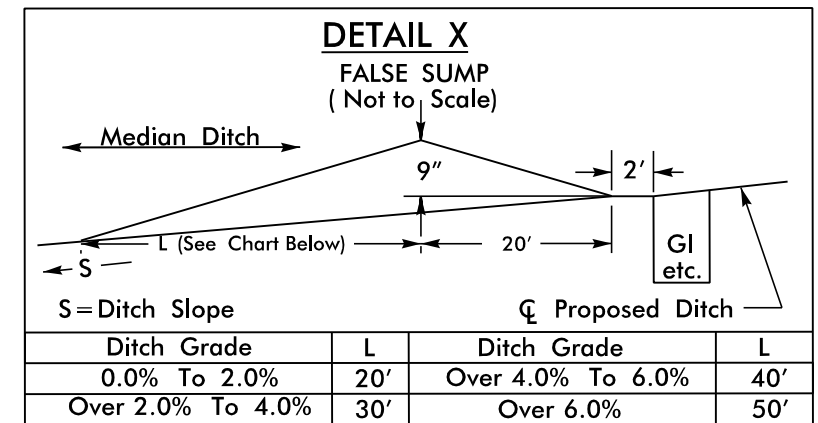
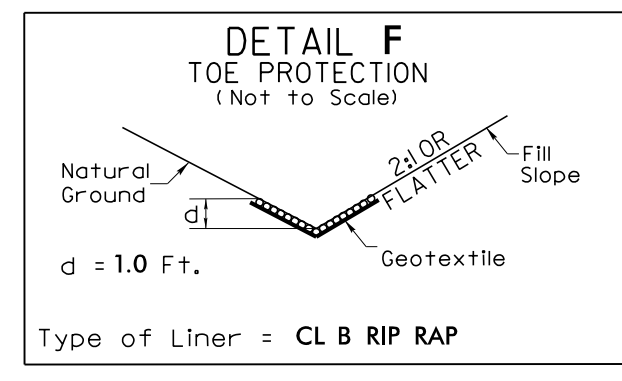
PROJECT REFERENCE NO. R-3421A	SHEET NO. 12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



REVISIONS

MATCH LINE -RPC- STA. 38+00.00 SEE SHEET NO. 11

-L2 REV- POT 54+23.79



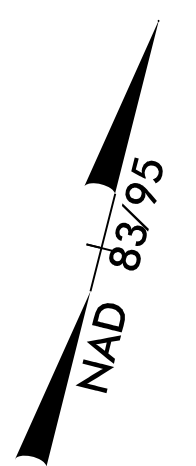
-RPC-
 PI Sta 34+08.41 Pls Sta 40+16.49
 $\Delta = 42^\circ 22' 57.6''$ (RT) $\Theta_s = 4^\circ 35' 01.2''$
 $D = 3^\circ 49' 11.0''$ $L_s = 240.00'$
 $L = 1,109.58$ $LT = 160.05'$
 $T = 581.55'$ $ST = 80.05'$
 $R = 1,500.00'$
 $S.E. = 0.08$

PAVEMENT REMOVAL

SEE SHEET NO. 34 FOR -RPC- PROFILE.
SEE SHEET NO. 40 FOR -L2 REV- PROFILE.

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 12A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DocuSign Mike Merritt 6/2019	DocuSign Stephen R. Morgan 2019

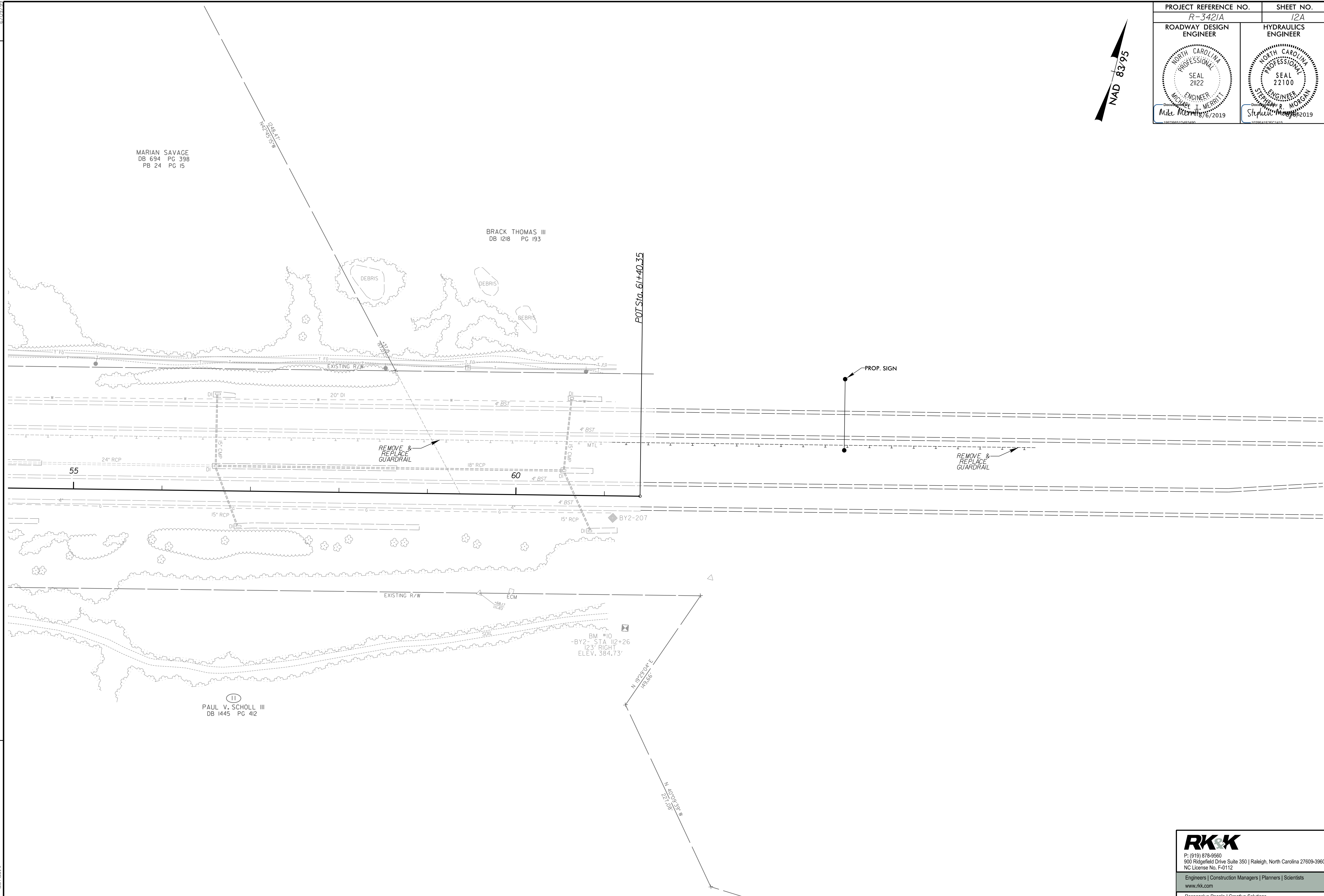


MARIAN SAVAGE
DB 694 PG 398
PB 24 PG 15

BRACK THOMAS III
DB 1218 PG 193

PAUL V. SCHOLL III
DB 1445 PG 412

REVISIONS



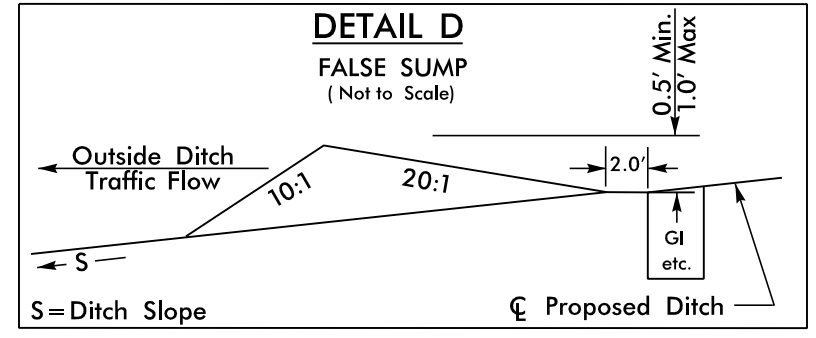
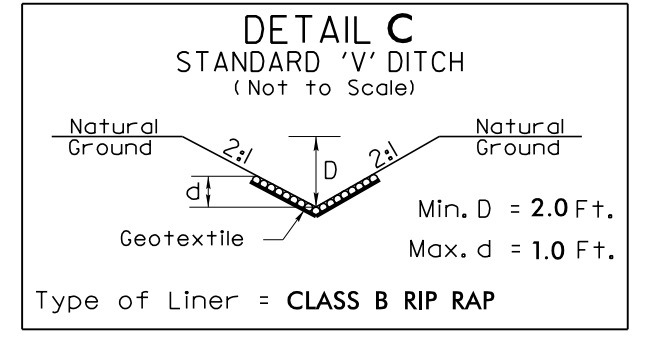
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 7/19/2019 10:08 AM

PROJECT REFERENCE NO. R-3421A	SHEET NO. 13
ROADWAY DESIGN ENGINEER MICHAEL T. MERRITT SEAL 2122 DocuSign Envelope ID: B21668A6-AEE2-485F-CB2DF562E559	HYDRAULICS ENGINEER STEPHEN R. MORGAN SEAL 22100 DocuSign Envelope ID: B21668A6-AEE2-485F-CB2DF562E559

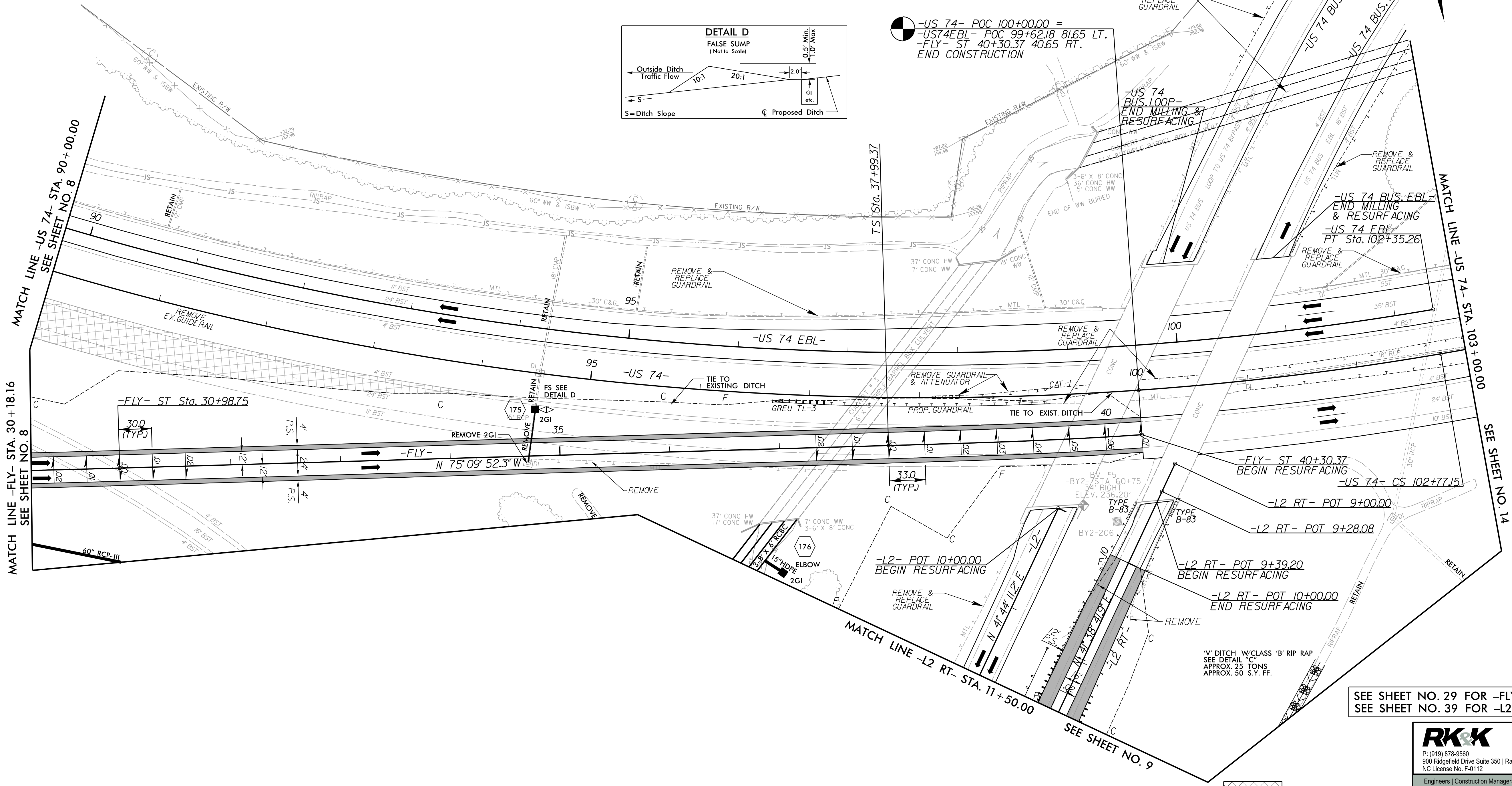
-FLY-
 PIs Sta 12+52.55 PIs Sta 21+55.94 PIs Sta 29+38.80 PIs Sta 39+53.39
 $\theta_s = 4' 11'' 32.5''$ $\Delta = 53' 19'' 18.0''$ (LT) $\theta_s = 4' 11'' 32.5''$ $\theta_s = 2' 20'' 16.3''$
 $L_s = 240.00'$ $D = 3' 29'' 37.1''$ $L_s = 240.00'$ $L_s = 231.00'$
 $LT = 160.04'$ $L = 1,526.25'$ $LT = 160.04'$ $LT = 154.01'$
 $ST = 80.04'$ $T = 823.43'$ $ST = 80.04'$ $ST = 77.01'$
 $R = 1,640.00'$ $S.E. = 0.08$

-US 74 EBL- **-US 74-** **-US 74-**
 PIs Sta 95+61.05 PIs Sta 91+42.64 PIs Sta 104+35.15
 $\Delta = 28' 43'' 16.5''$ (LT) $\Delta = 50' 02'' 26.6''$ (LT) $\theta_s = 5' 24'' 04.2''$
 $D = 2' 05'' 03.3''$ $D = 2' 03'' 13.0''$ $L_s = 360.00'$
 $L = 1,378.02'$ $L = 2,436.72'$ $ST = 158.00'$
 $T = 703.81'$ $T = 1,302.21'$ $LT = 202.26'$
 $R = 2,749.00'$ $R = 2,790.00'$ $D2 = 1' 42'' 16.3''$
 $S.E. = 0.08$ $S.E. = 0.07$ $R1 = 6,050.00'$
 $R2 = 2,790.00'$



10
 ZEBULON AND MAYNIE GIBSON ESTATE
 DB 231 PG 413

10
 -US 74- POC 100+00.00 =
 -US 74 EBL- POC 99+62.18 81.65 LT.
 -FLY- ST 40+30.37 40.65 RT.
 END CONSTRUCTION



SEE SHEET NO. 29 FOR -FLY- PROFILE.
 SEE SHEET NO. 39 FOR -L2 RT- PROFILE.

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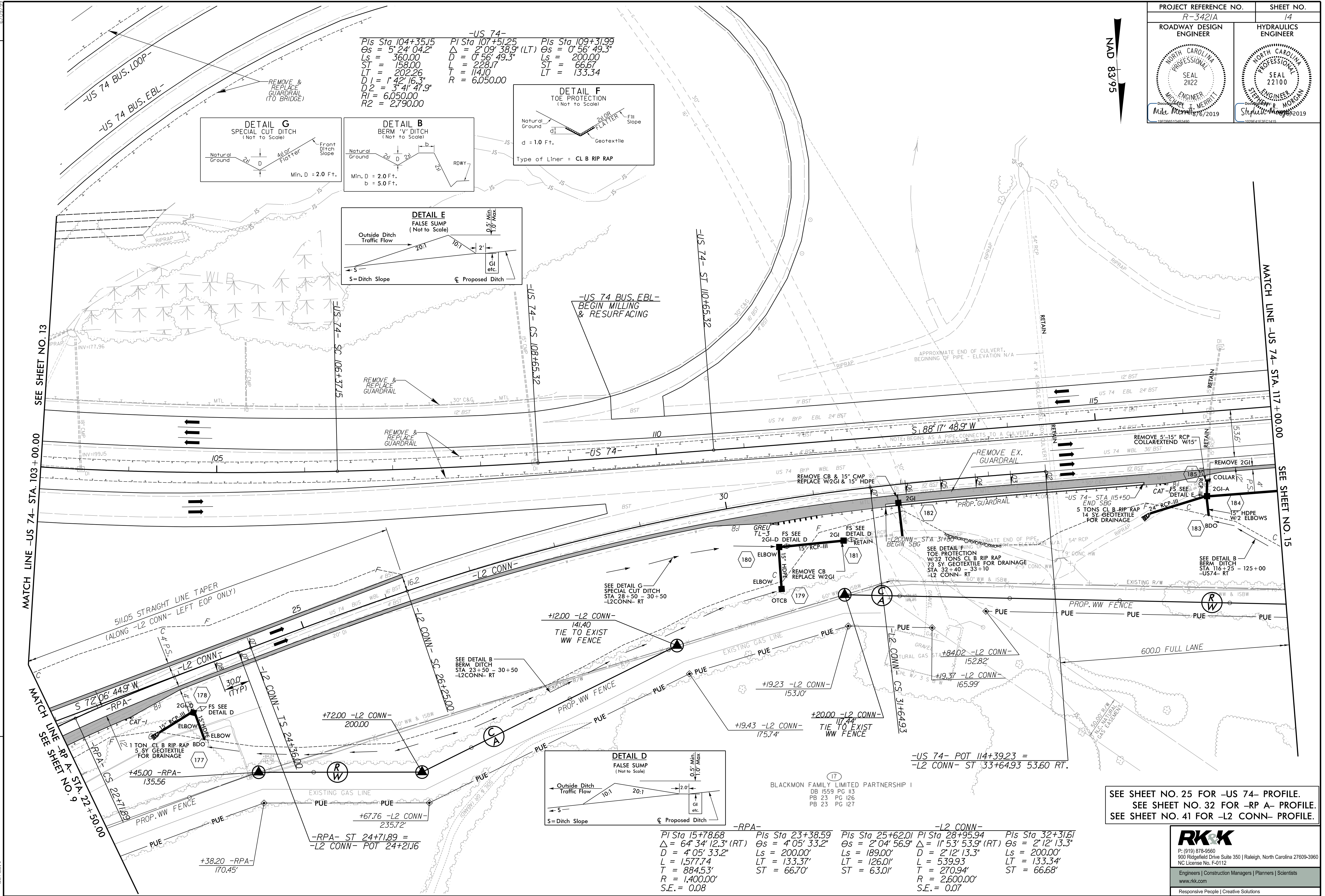
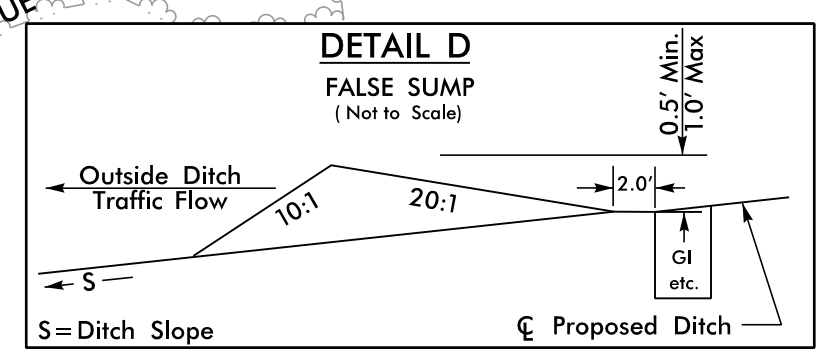
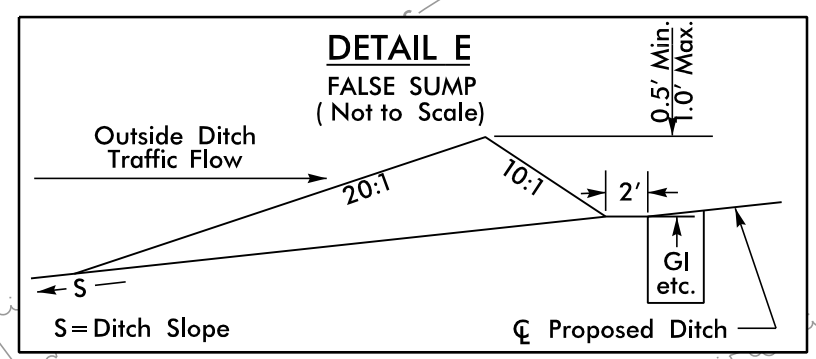
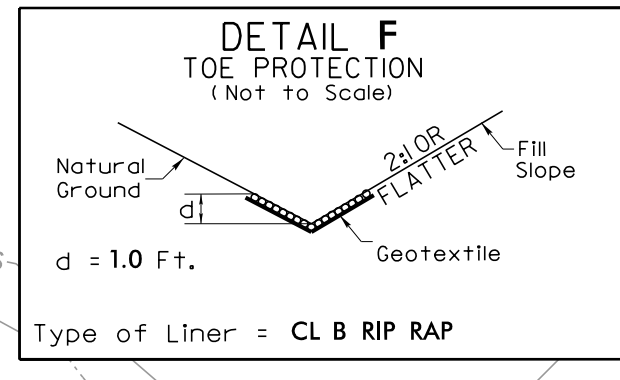
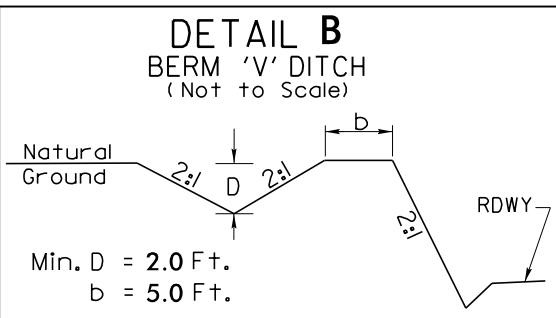
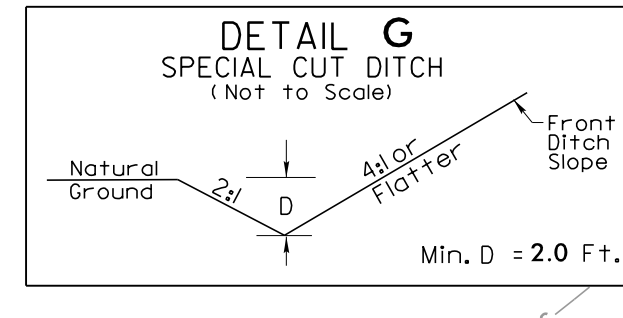
REVISIONS

7/26/2019
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 User: merritt

PROJECT REFERENCE NO. R-3421A	SHEET NO. 14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/95

-US 74-
 Pls Sta 104+35.15 PI Sta 107+51.25 Pls Sta 109+31.99
 $\Delta = 5^{\circ} 24' 04.2''$ $\Delta = 2^{\circ} 09' 38.9''$ (LT) $\Delta = 0^{\circ} 56' 49.3''$
 $L_s = 360.00$ $L = 0^{\circ} 56' 49.3''$ $L_s = 200.00$
 $ST = 158.00$ $L = 228.17$ $LT = 66.67$
 $LT = 202.26$ $L = 114.10$ $LT = 133.34$
 $D1 = 1^{\circ} 42' 16.3''$ $R = 6,050.00$
 $D2 = 3^{\circ} 41' 47.9''$
 $R1 = 6,050.00$
 $R2 = 2,790.00$



REVISIONS

SEE SHEET NO. 13

MATCH LINE -US 74- STA. 103+00.00

MATCH LINE -RPA- STA. 22+50.00

MATCH LINE -US 74- STA. 117+00.00

SEE SHEET NO. 15

SEE SHEET NO. 25 FOR -US 74- PROFILE.
 SEE SHEET NO. 32 FOR -RPA- PROFILE.
 SEE SHEET NO. 41 FOR -L2 CONN- PROFILE.

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-RPA-
 Pls Sta 15+78.68 PI Sta 23+38.59 Pls Sta 25+62.01 PI Sta 28+95.94 Pls Sta 32+31.61
 $\Delta = 64^{\circ} 34' 12.3''$ (RT) $\Delta = 4^{\circ} 05' 33.2''$ $\Delta = 2^{\circ} 04' 56.9''$ $\Delta = 11^{\circ} 53' 53.9''$ (RT) $\Delta = 2^{\circ} 12' 13.3''$
 $D = 4^{\circ} 05' 33.2''$ $L_s = 200.00'$ $L_s = 189.00'$ $D = 2^{\circ} 12' 13.3''$ $L_s = 200.00'$
 $L = 1,577.74$ $LT = 133.37'$ $LT = 126.01'$ $L = 539.93$ $LT = 133.34'$
 $T = 884.53'$ $ST = 66.70'$ $ST = 63.01'$ $T = 270.94'$ $ST = 66.68'$
 $R = 1,400.00'$ $R = 2,600.00'$
 $S.E. = 0.08$ $S.E. = 0.07$

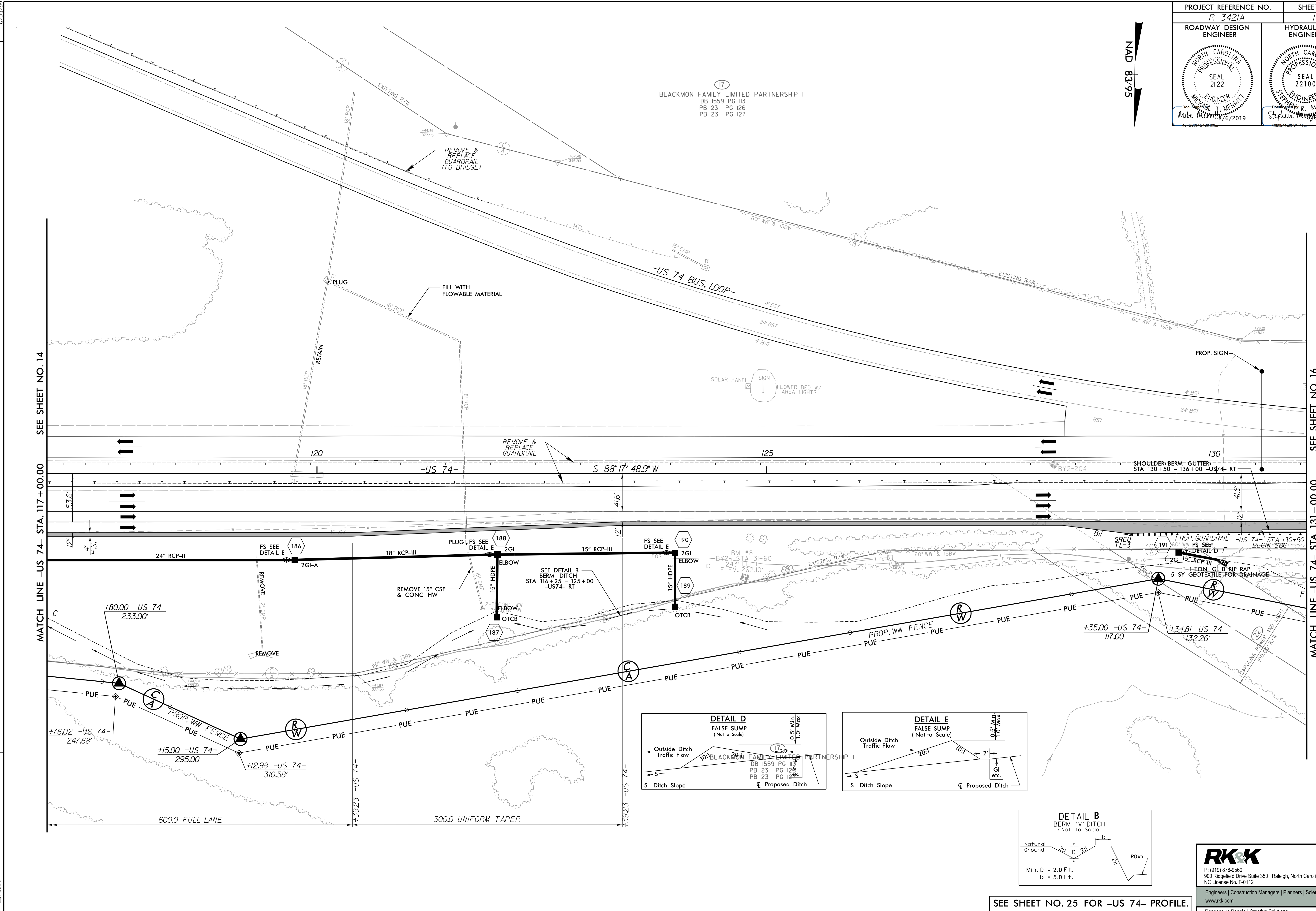
BLACKMON FAMILY LIMITED PARTNERSHIP I
 DB 1559 PG 113
 PB 23 PG 126
 PB 23 PG 127

7/28/2019
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 User: jash14

PROJECT REFERENCE NO. R-3421A	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

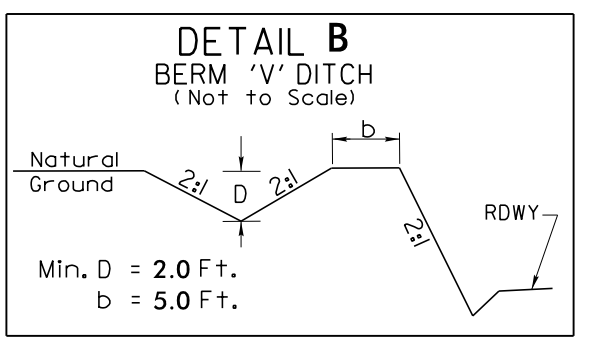
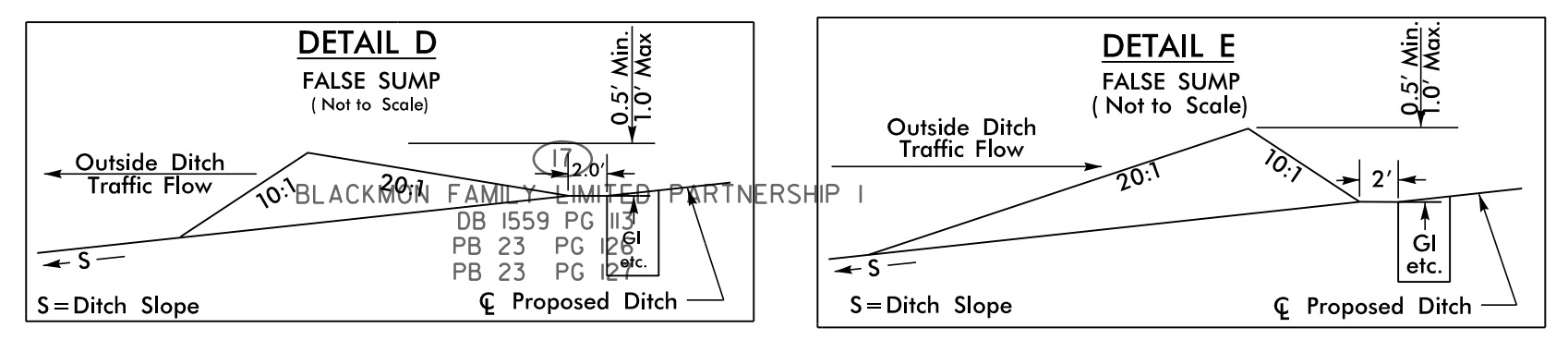
NAD 83/95

BLACKMON FAMILY LIMITED PARTNERSHIP I
DB 1559 PG 113
PB 23 PG 126
PB 23 PG 127



MATCH LINE -US 74- STA. 117+00.00 SEE SHEET NO. 14

MATCH LINE -US 74- STA. 131+00.00 SEE SHEET NO. 16



SEE SHEET NO. 25 FOR -US 74- PROFILE.

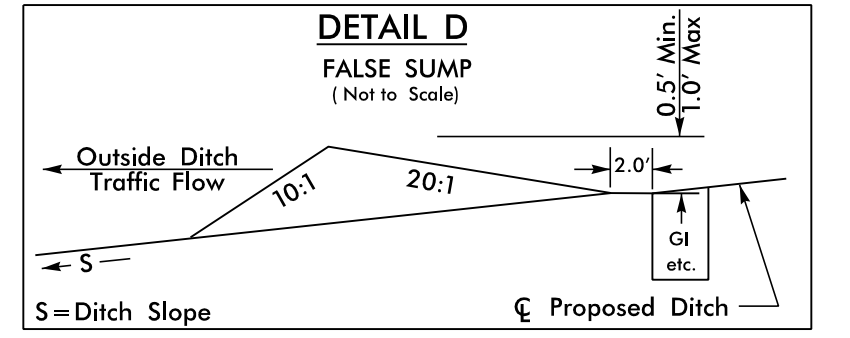
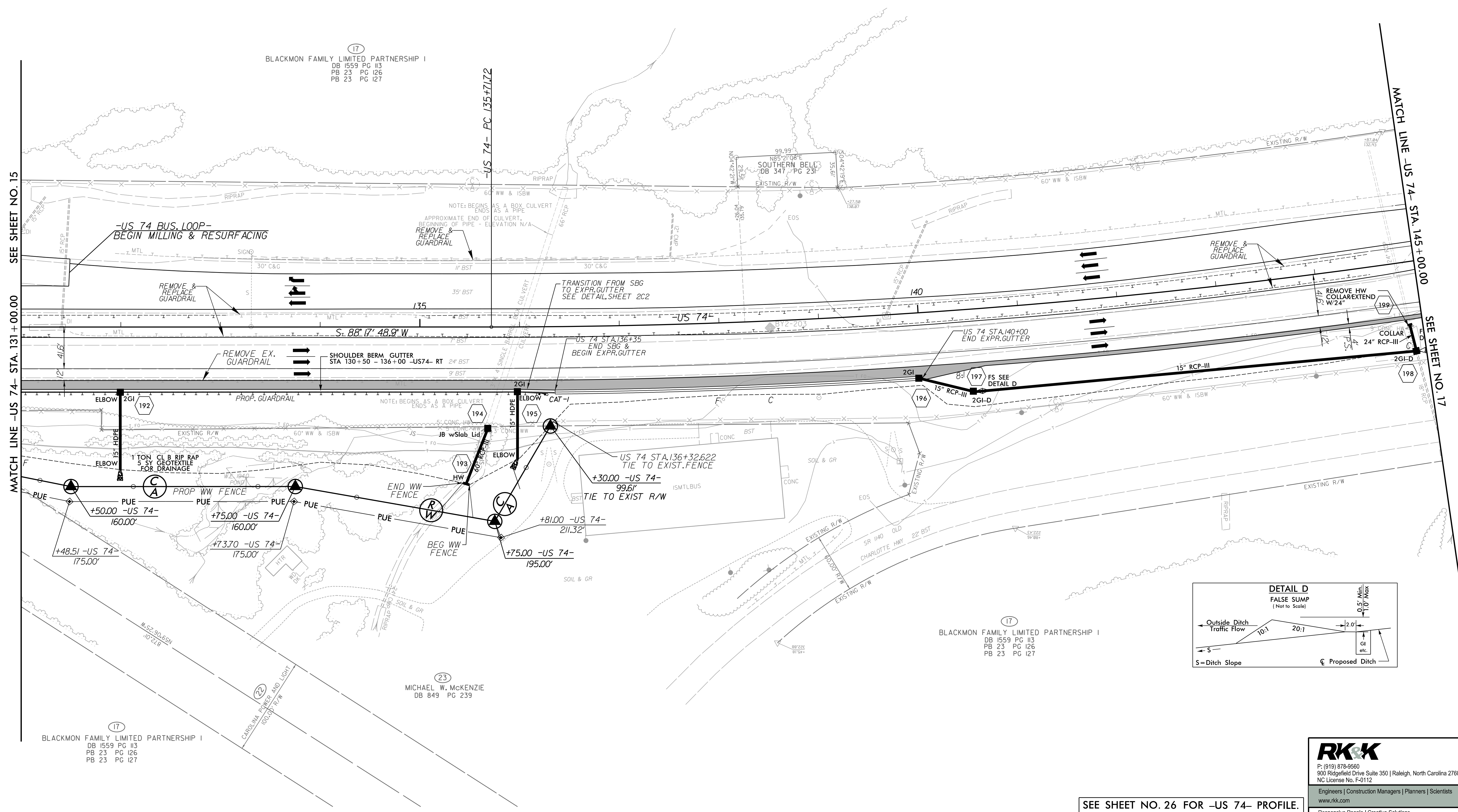
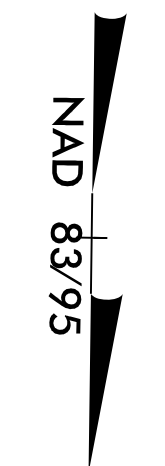
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REVISIONS

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-US 74-
 PI Sta 140+67.57
 $\Delta = 8' 43" 28.9" (LT)$
 $D = 0' 52" 53.3"$
 $L = 989.786$
 $T = 495.85$
 $R = 6,500.00$



REVISIONS

SEE SHEET NO. 15

MATCH LINE -US 74- STA. 131+00.00

MATCH LINE -US 74- STA. 145+00.00

MATCH LINE -US 74- STA. 145+00.00

SEE SHEET NO. 17



(17)
 BLACKMON FAMILY LIMITED PARTNERSHIP I
 DB 1559 PG 113
 PB 23 PG 126
 PB 23 PG 127

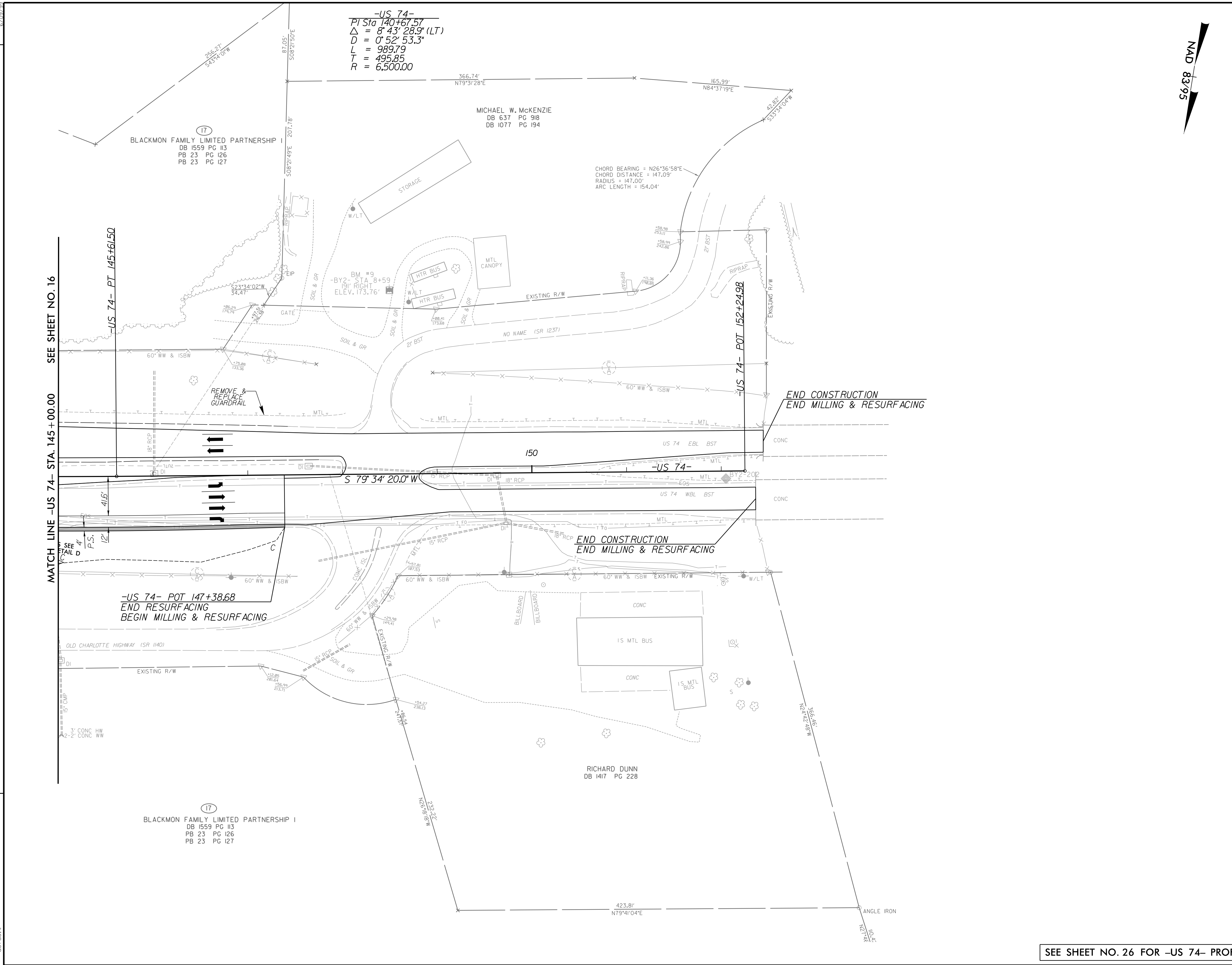
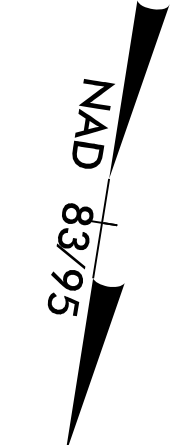
(23)
 MICHAEL W. MCKENZIE
 DB 849 PG 239

(17)
 BLACKMON FAMILY LIMITED PARTNERSHIP I
 DB 1559 PG 113
 PB 23 PG 126
 PB 23 PG 127

SEE SHEET NO. 26 FOR -US 74- PROFILE.

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PROJECT REFERENCE NO.	SHEET NO.
R-3421A	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	
Mike McWilliams/6/2019	Stephen R. Morgan/6/2019



REVISIONS

MATCH LINE -US 74- STA. 145 + 00.00 SEE SHEET NO. 16

-US 74- POT 147+38.68
END RESURFACING
BEGIN MILLING & RESURFACING

END CONSTRUCTION
END MILLING & RESURFACING

END CONSTRUCTION
END MILLING & RESURFACING

BLACKMON FAMILY LIMITED PARTNERSHIP I
DB 1559 PG 113
PB 23 PG 126
PB 23 PG 127

RICHARD DUNN
DB 1417 PG 228



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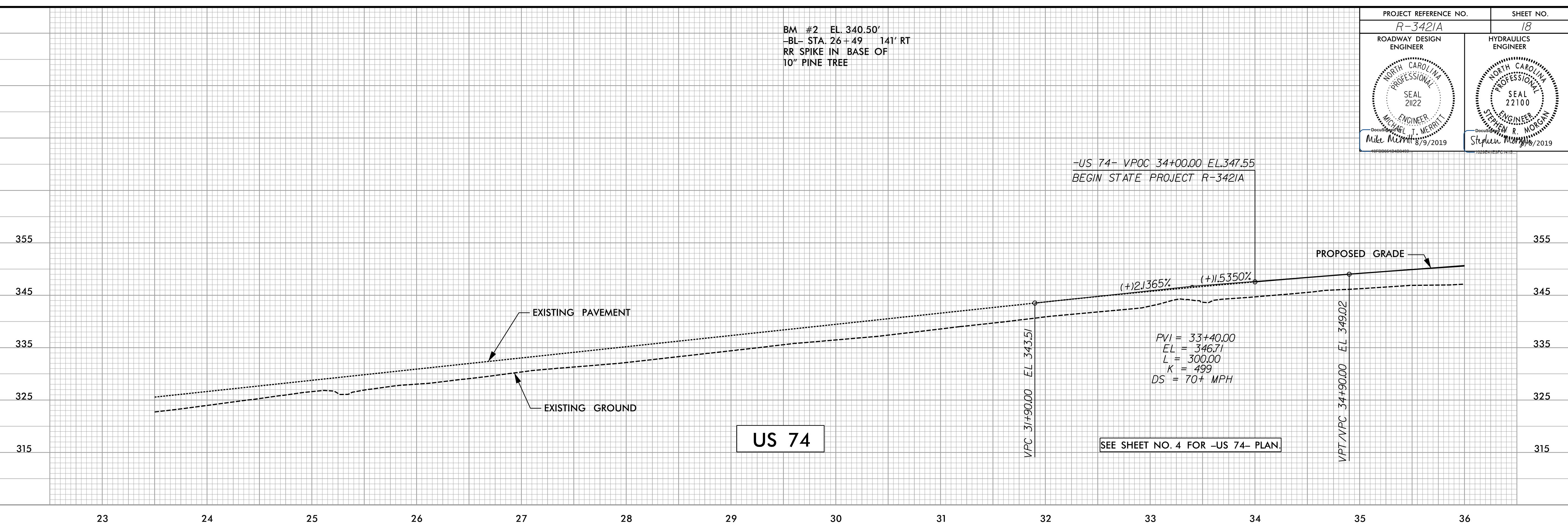
SEE SHEET NO. 26 FOR -US 74- PROFILE.

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

BM #2 EL. 340.50'
 -BL- STA. 26+49 141' RT
 RR SPIKE IN BASE OF
 10" PINE TREE

-US 74- VPOC 34+00.00 EL.347.55
 BEGIN STATE PROJECT R-3421A

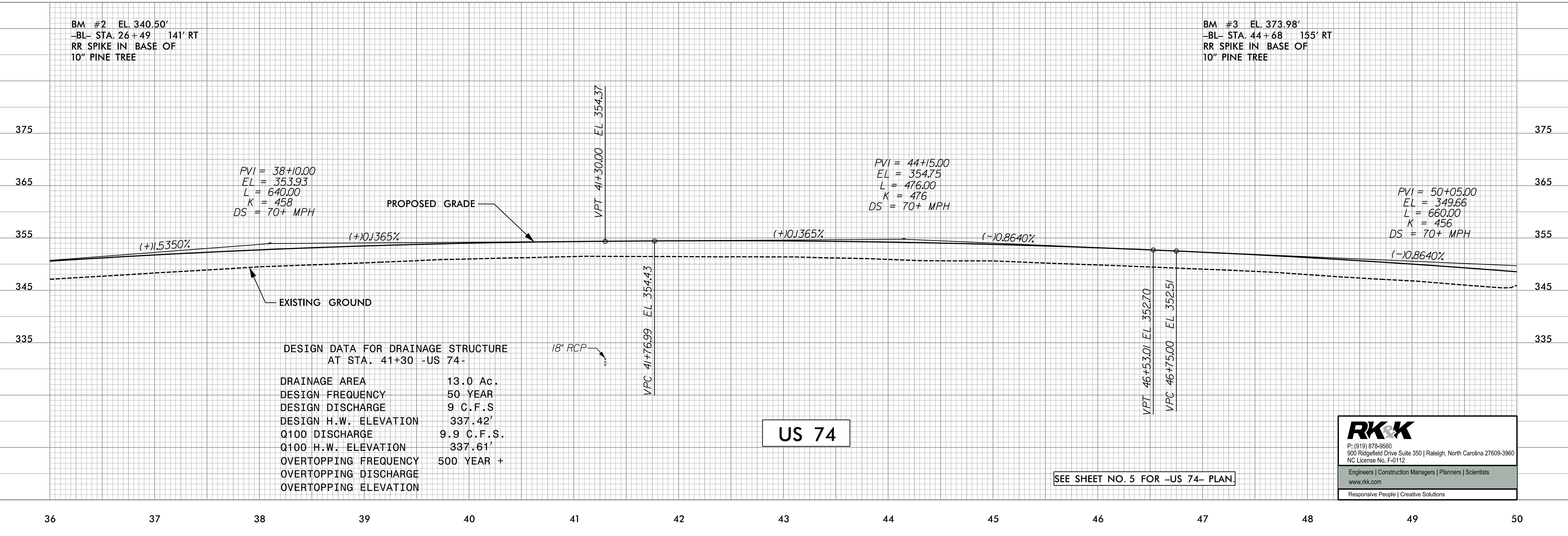


PVI = 33+40.00
 EL = 346.71
 L = 300.00
 K = 499
 DS = 70+ MPH

SEE SHEET NO. 4 FOR -US 74- PLAN.

BM #2 EL. 340.50'
 -BL- STA. 26+49 141' RT
 RR SPIKE IN BASE OF
 10" PINE TREE

BM #3 EL. 373.98'
 -BL- STA. 44+68 155' RT
 RR SPIKE IN BASE OF
 10" PINE TREE



PVI = 38+10.00
 EL = 353.93
 L = 640.00
 K = 458
 DS = 70+ MPH

PVI = 44+15.00
 EL = 354.75
 L = 476.00
 K = 476
 DS = 70+ MPH

PVI = 50+05.00
 EL = 349.66
 L = 660.00
 K = 456
 DS = 70+ MPH

DESIGN DATA FOR DRAINAGE STRUCTURE
 AT STA. 41+30 -US 74-

DRAINAGE AREA	13.0 Ac.
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	9 C.F.S
DESIGN H.W. ELEVATION	337.42'
Q100 DISCHARGE	9.9 C.F.S.
Q100 H.W. ELEVATION	337.61'
OVERTOPPING FREQUENCY	500 YEAR +
OVERTOPPING DISCHARGE	
OVERTOPPING ELEVATION	

18" RCP

SEE SHEET NO. 5 FOR -US 74- PLAN.

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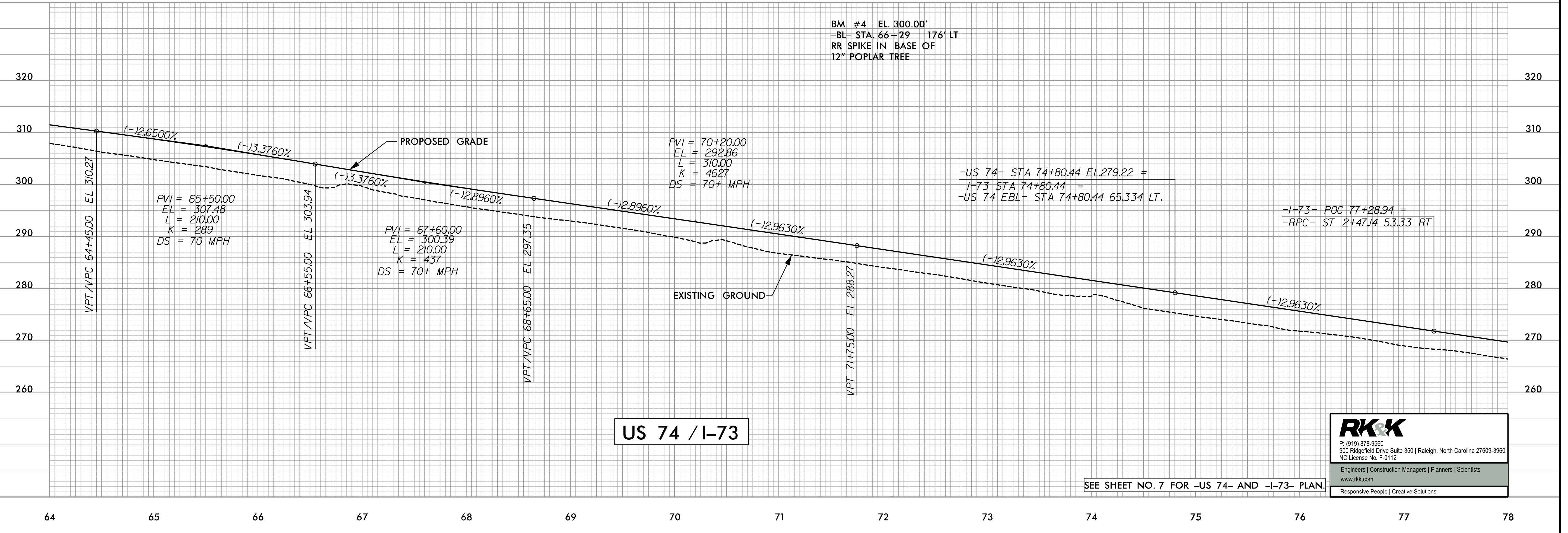
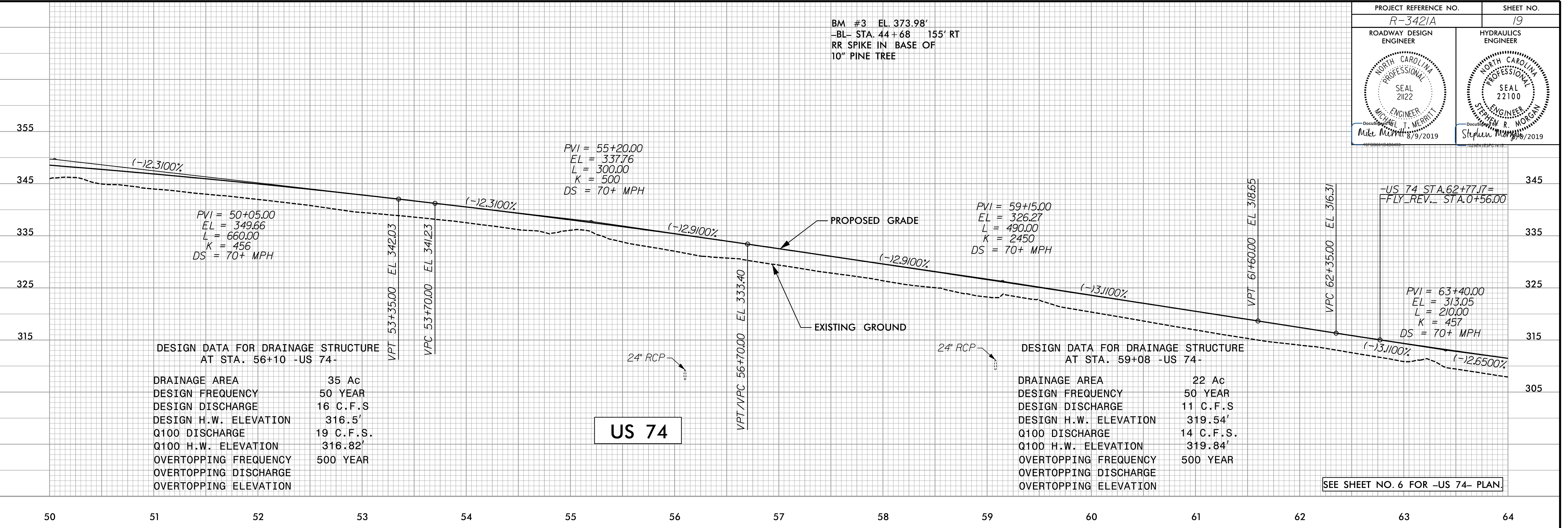
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7/18/2019 1:48:00 PM \\p01\proj\3421a_rdy\p119.dgn

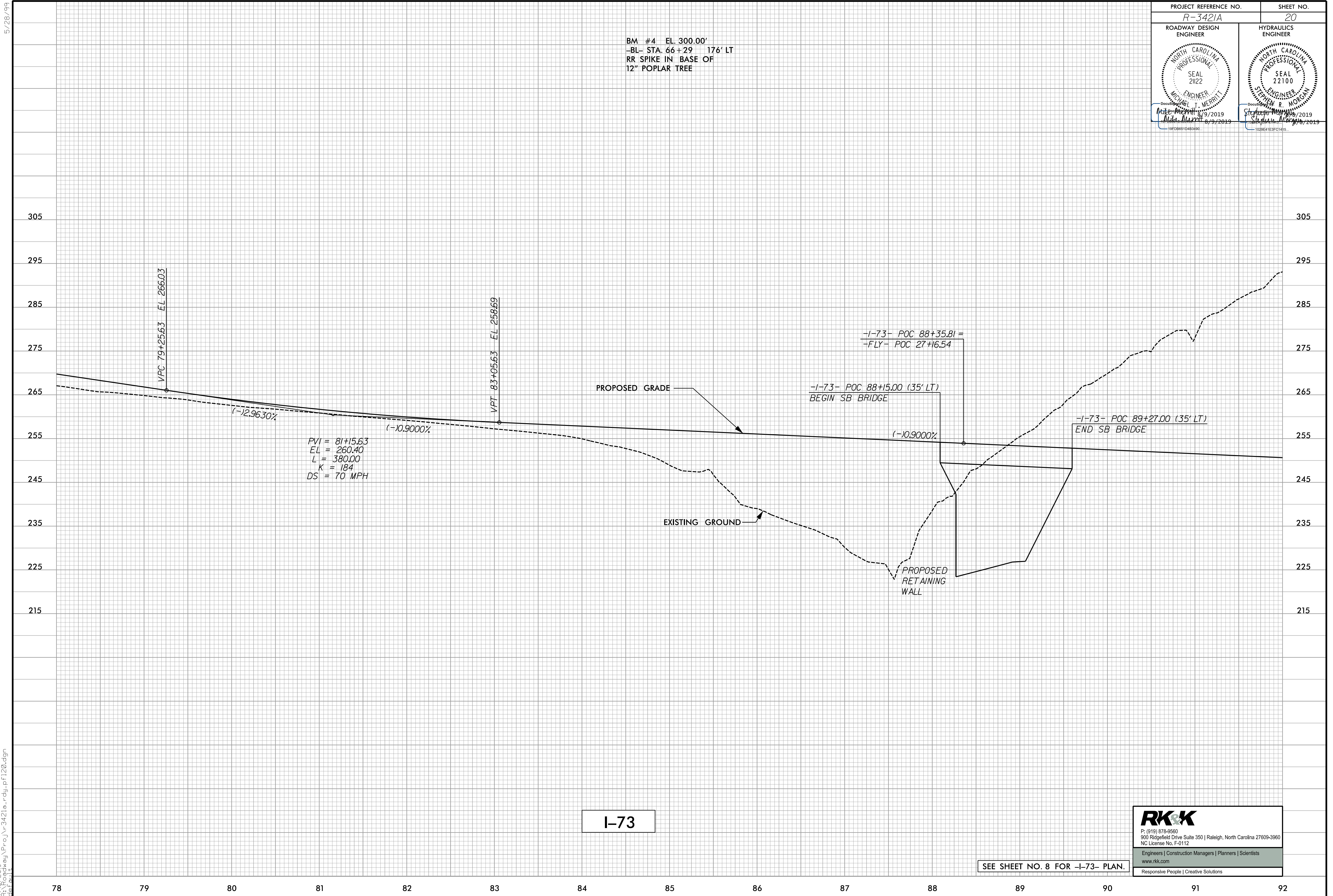
PROJECT REFERENCE NO. R-3421A	SHEET NO. 19
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER



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PROJECT REFERENCE NO. R-3421A	SHEET NO. 20
ROADWAY DESIGN ENGINEER Michael J. Merritt	HYDRAULICS ENGINEER Stephen R. Morgan
DocuSign Michael J. Merritt 8/9/2019 19FD861C4B3400	DocuSign Stephen R. Morgan 8/9/2019 1029E41E3FC1415

BM #4 EL. 300.00'
 -BL- STA. 66+29 176' LT
 RR SPIKE IN BASE OF
 12" POPLAR TREE

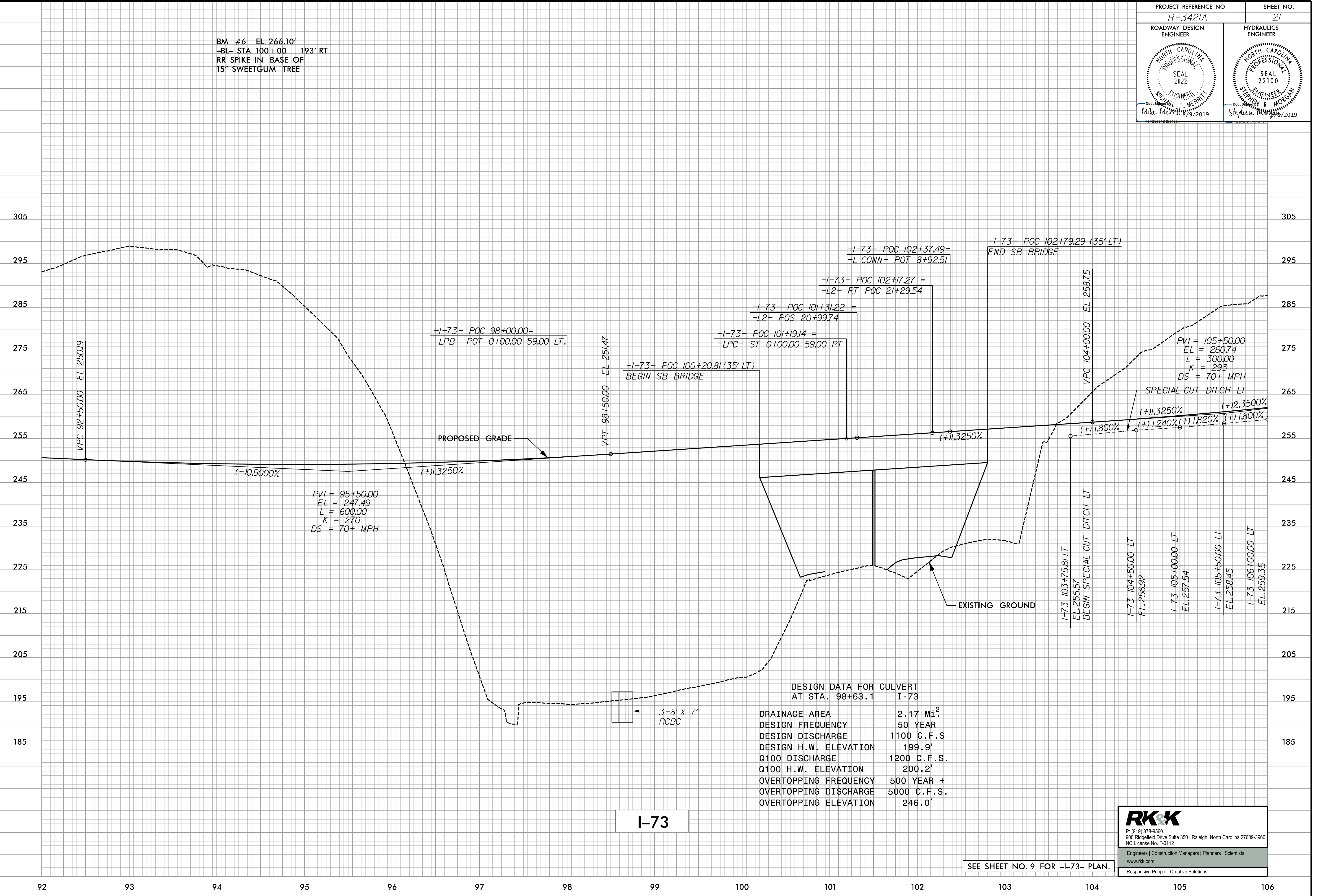


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PROJECT REFERENCE NO. R-3421A	SHEET NO. 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Michael J. Merritt	Stephen R. Morgan

BM #6 EL. 266.10'
 -BL- STA. 100+00 193' RT
 RR SPIKE IN BASE OF
 15" SWEETGUM TREE



PVI = 95+50.00
 EL = 247.49
 L = 600.00
 K = 270
 DS = 70+ MPH

DESIGN DATA FOR CULVERT
 AT STA. 98+63.1 I-73

DRAINAGE AREA	2.17 Mi. ²
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	1100 C.F.S.
DESIGN H.W. ELEVATION	199.9'
Q100 DISCHARGE	1200 C.F.S.
Q100 H.W. ELEVATION	200.2'
OVERTOPPING FREQUENCY	500 YEAR +
OVERTOPPING DISCHARGE	5000 C.F.S.
OVERTOPPING ELEVATION	246.0'

I-73

SEE SHEET NO. 9 FOR I-73- PLAN.

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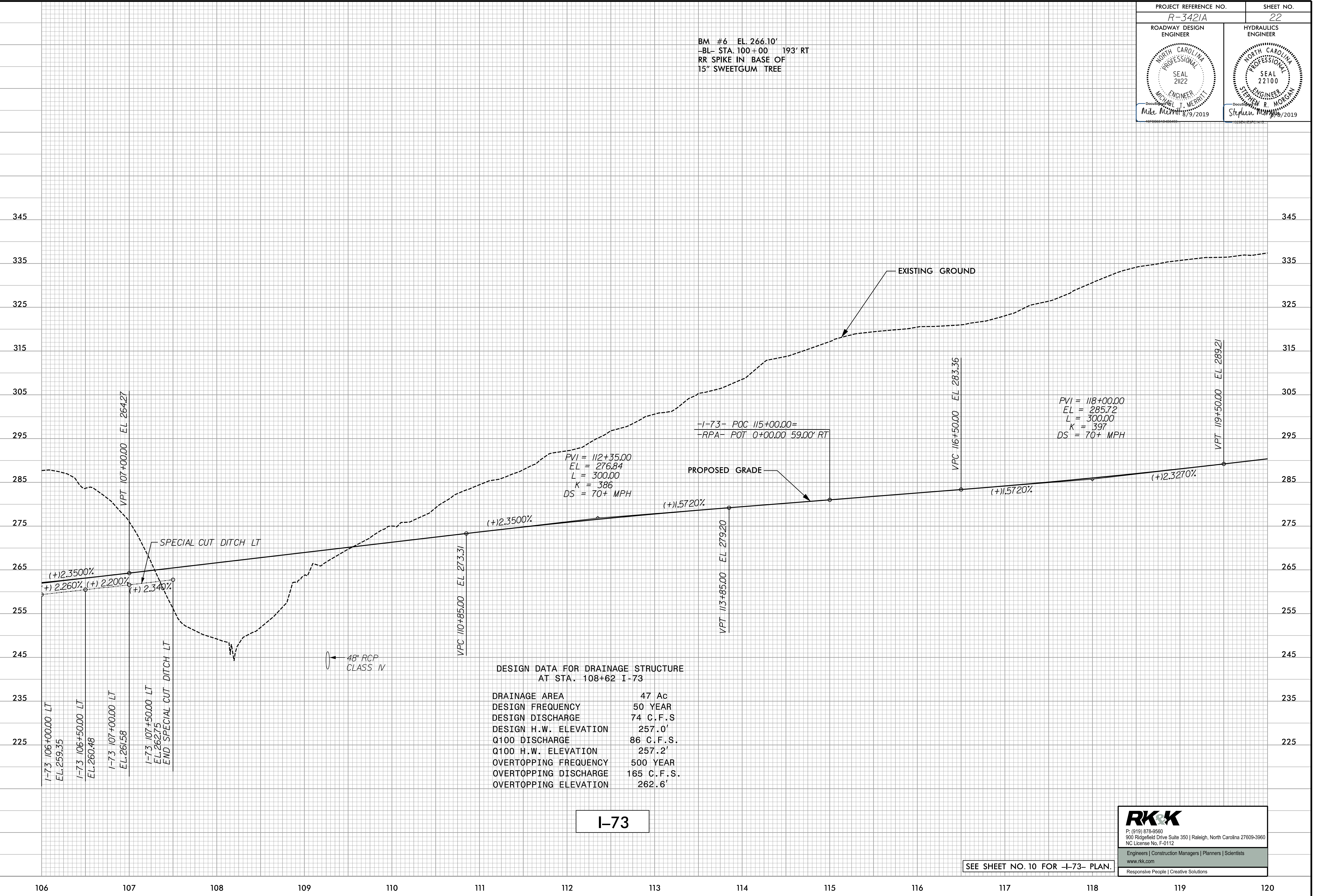
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 180821.dgn

PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>22</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Michael J. Merritt 8/9/2019	Stephen R. Morgan 8/9/2019

BM #6 EL. 266.10'
 -BL- STA. 100+00 193' RT
 RR SPIKE IN BASE OF
 15" SWEETGUM TREE

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MJE



I-73

SEE SHEET NO. 10 FOR -I-73- PLAN.

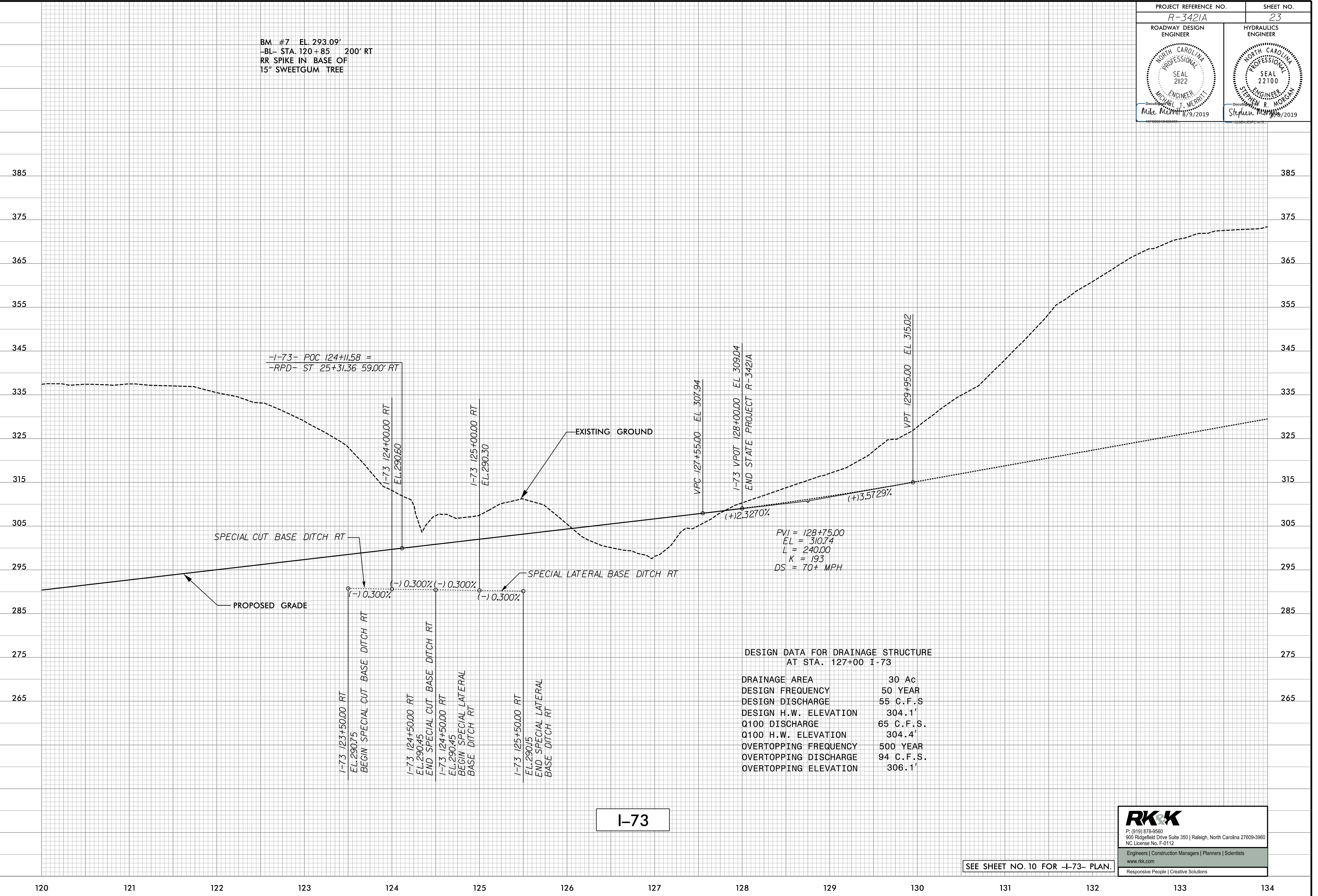
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PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>23</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Michael J. Merritt</i> 8/9/2019	<i>Stephen R. Morgan</i> 8/2019

BM #7 EL. 293.09'
 -BL- STA. 120+85 200' RT
 RR SPIKE IN BASE OF
 15" SWEETGUM TREE

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PVI = 128+75.00
 EL = 310.74
 L = 240.00
 K = 193
 DS = 70+ MPH

DESIGN DATA FOR DRAINAGE STRUCTURE
 AT STA. 127+00 I-73

DRAINAGE AREA	30 Ac
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	55 C.F.S.
DESIGN H.W. ELEVATION	304.1'
Q100 DISCHARGE	65 C.F.S.
Q100 H.W. ELEVATION	304.4'
OVERTOPPING FREQUENCY	500 YEAR
OVERTOPPING DISCHARGE	94 C.F.S.
OVERTOPPING ELEVATION	306.1'

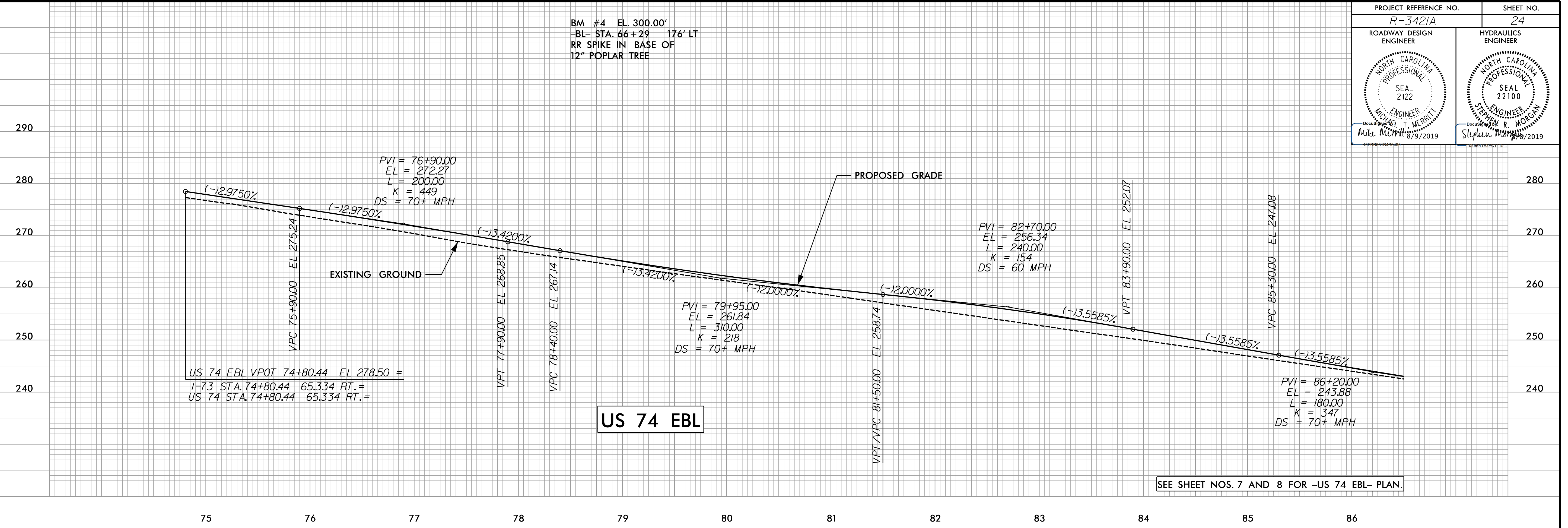
I-73

SEE SHEET NO. 10 FOR -I-73- PLAN.

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Michael T. Merritt	Stephen R. Morgan

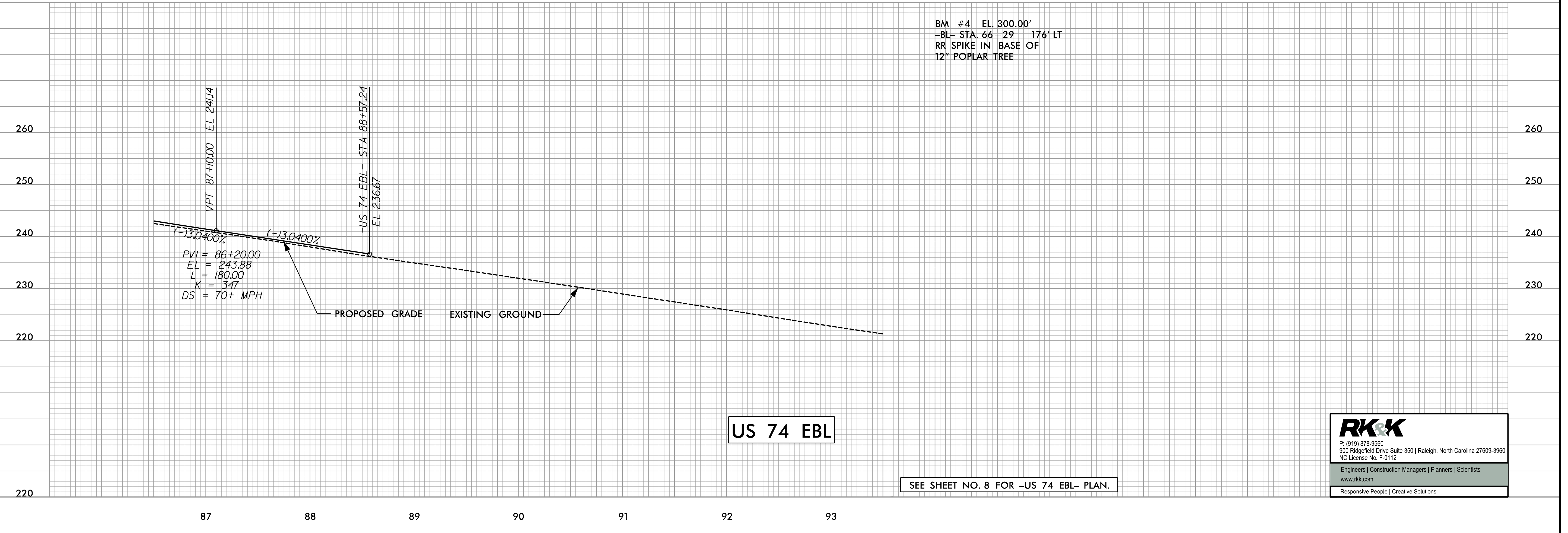
5/28/19



BM #4 EL. 300.00'
 -BL- STA. 66+29 176' LT
 RR SPIKE IN BASE OF
 12" POPLAR TREE

US 74 EBL

SEE SHEET NOS. 7 AND 8 FOR -US 74 EBL- PLAN.



BM #4 EL. 300.00'
 -BL- STA. 66+29 176' LT
 RR SPIKE IN BASE OF
 12" POPLAR TREE

US 74 EBL

SEE SHEET NO. 8 FOR -US 74 EBL- PLAN.

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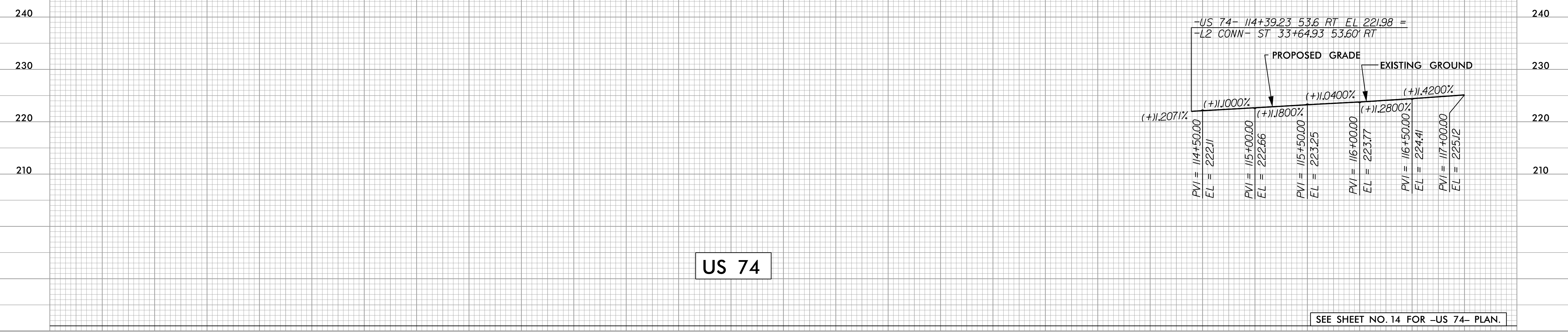
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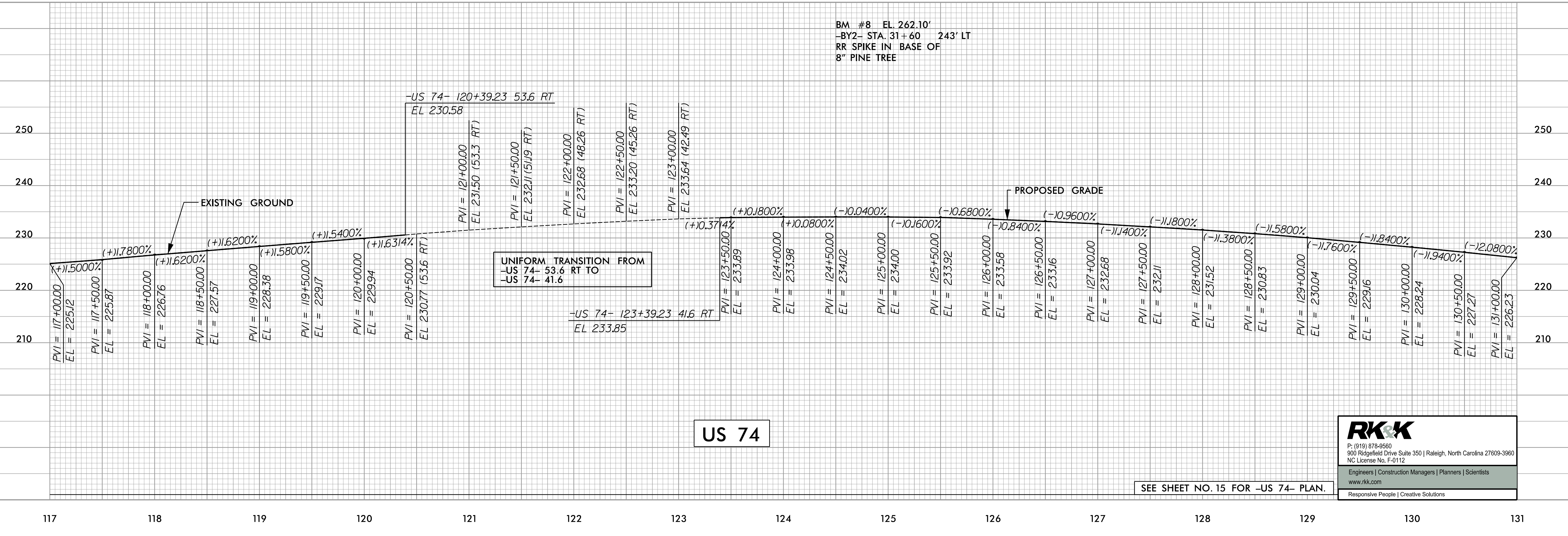
BM #8 EL. 262.10'
-BY2- STA. 31+60 243' LT
RR SPIKE IN BASE OF
8" PINE TREE

PROJECT REFERENCE NO. R-3421A	SHEET NO. 25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



US 74

BM #8 EL. 262.10'
-BY2- STA. 31+60 243' LT
RR SPIKE IN BASE OF
8" PINE TREE



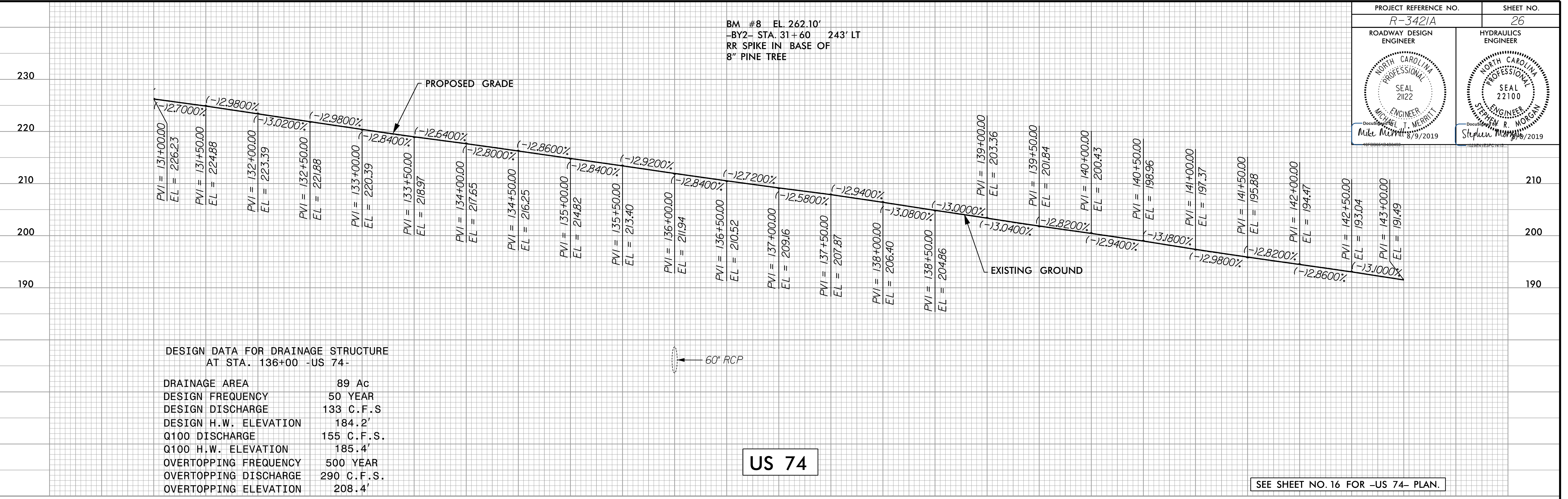
US 74

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SEE SHEET NO. 15 FOR -US 74- PLAN.

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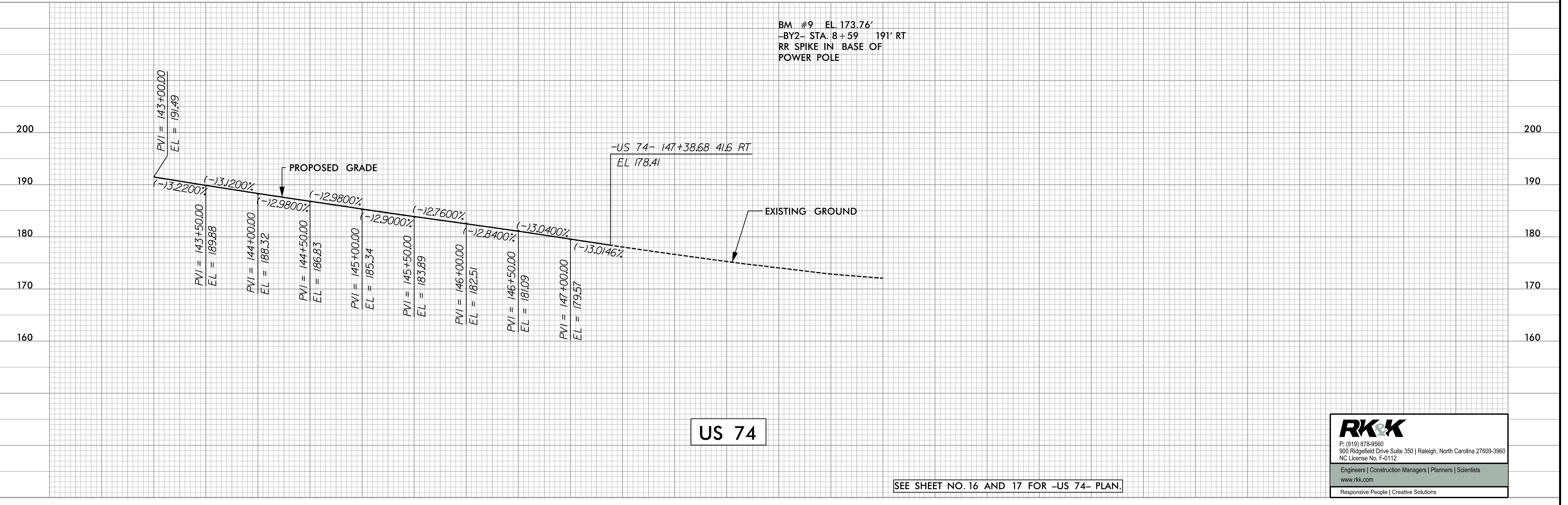
PROJECT REFERENCE NO. R-3421A	SHEET NO. 26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



DESIGN DATA FOR DRAINAGE STRUCTURE
AT STA. 136+00 -US 74-

DRAINAGE AREA	89 Ac
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	133 C.F.S.
DESIGN H.W. ELEVATION	184.2'
Q100 DISCHARGE	155 C.F.S.
Q100 H.W. ELEVATION	185.4'
OVERTOPPING FREQUENCY	500 YEAR
OVERTOPPING DISCHARGE	290 C.F.S.
OVERTOPPING ELEVATION	208.4'

SEE SHEET NO. 16 FOR -US 74- PLAN.



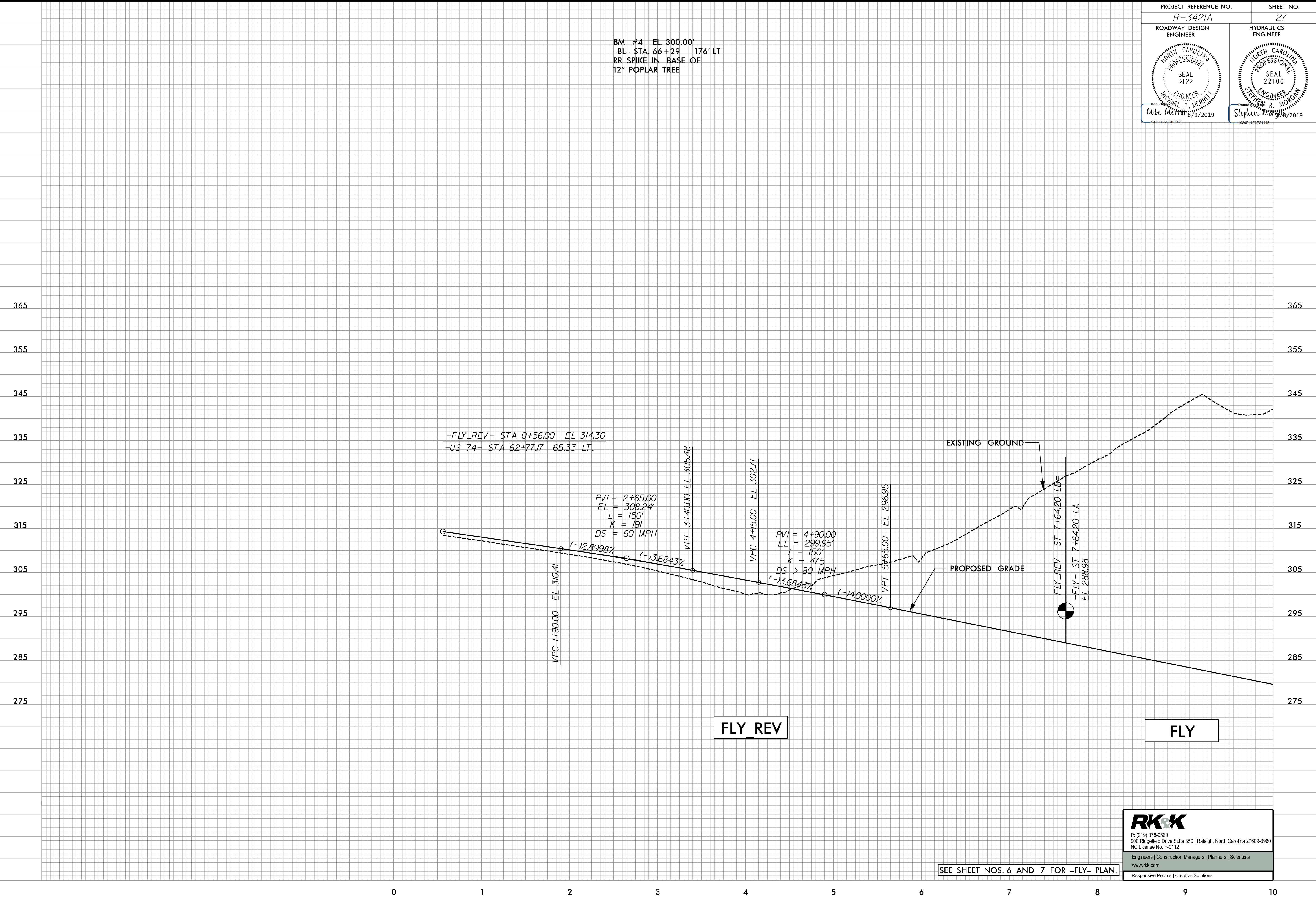
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PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>27</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Michael J. Merritt</i>	<i>Stephen R. Morgan</i>

BM #4 EL. 300.00'
 -BL- STA. 66+29 176' LT
 RR SPIKE IN BASE OF
 12" POPLAR TREE



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FLY_REV

FLY

SEE SHEET NOS. 6 AND 7 FOR -FLY- PLAN.

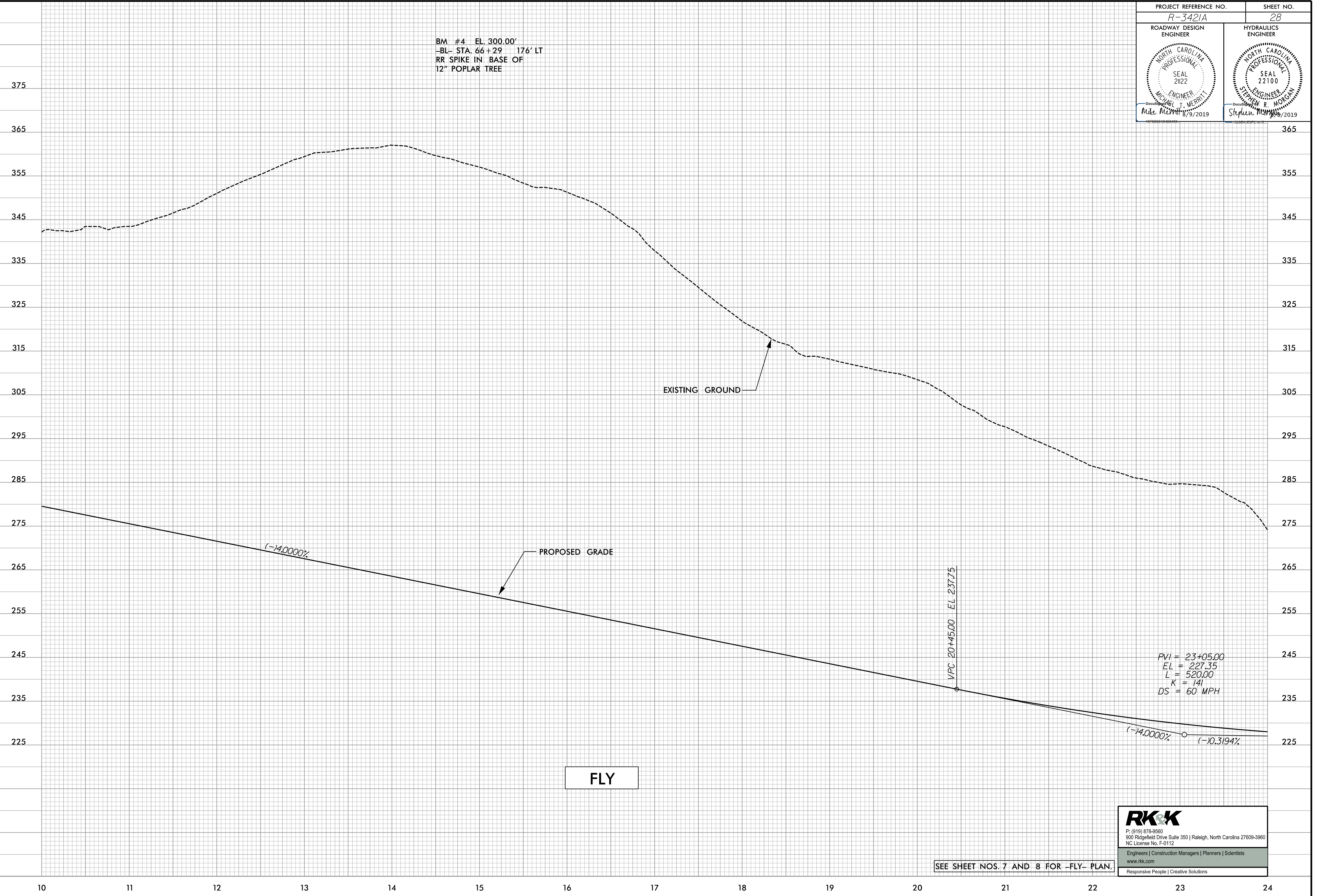
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BM #4 EL. 300.00'
-BL- STA. 66+29 176' LT
RR SPIKE IN BASE OF
12" POPLAR TREE

PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>28</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Michael J. Merritt 8/9/2019	Stephen R. Morgan 8/2019



PVI = 23+05.00
EL = 227.35
L = 520.00
K = 141
DS = 60 MPH

FLY

SEE SHEET NOS. 7 AND 8 FOR -FLY- PLAN.

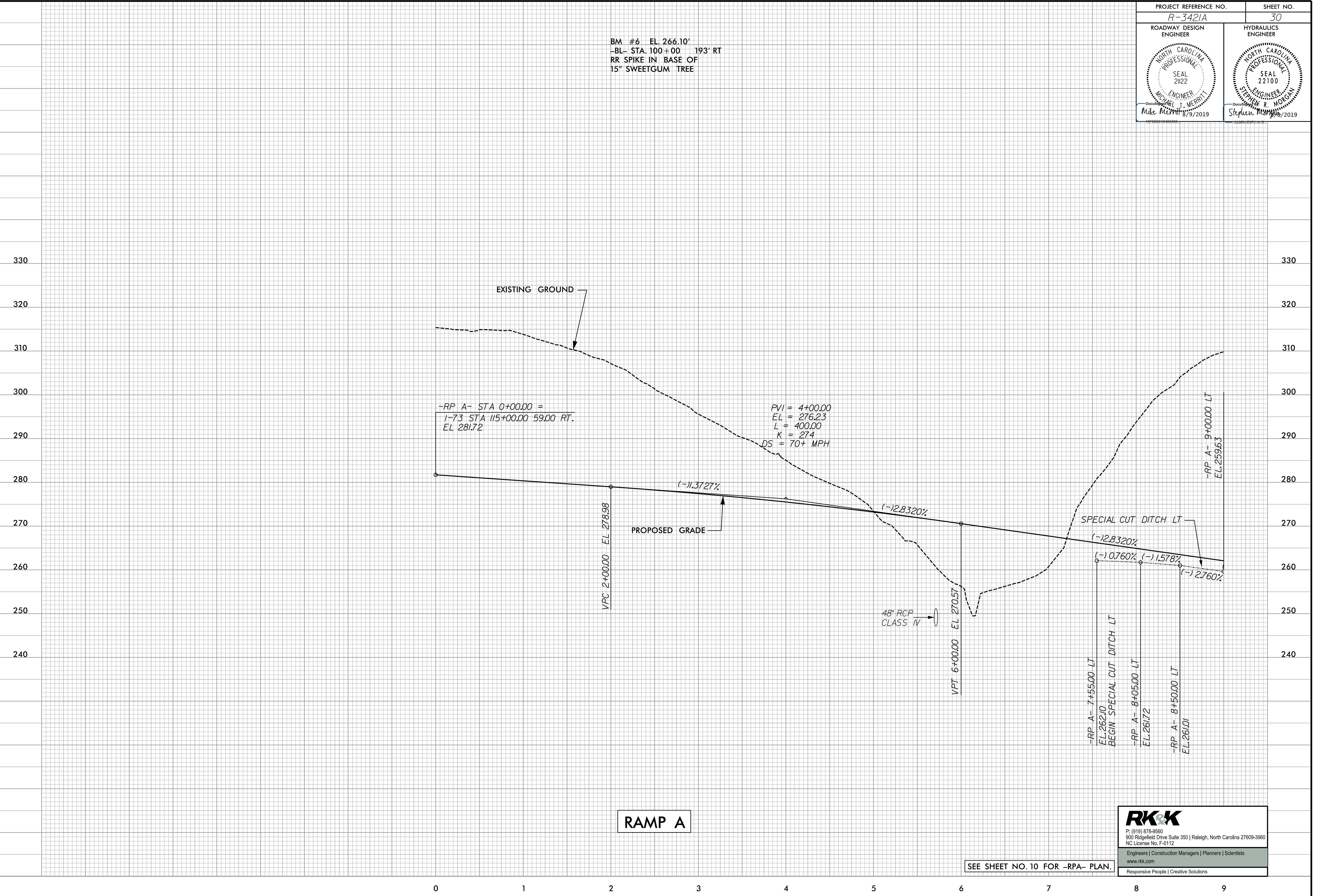
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PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>30</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Michael J. Merritt</i> 8/9/2019	<i>Stephen R. Morgan</i> 8/9/2019

BM #6 EL. 266.10'
 -BL- STA. 100+00 193' RT
 RR SPIKE IN BASE OF
 15" SWEETGUM TREE

5/28/19

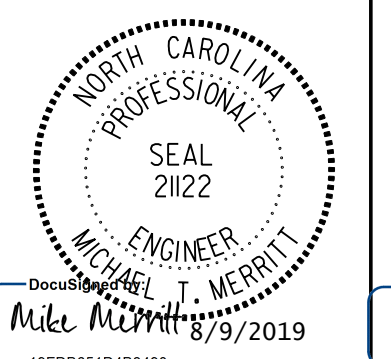

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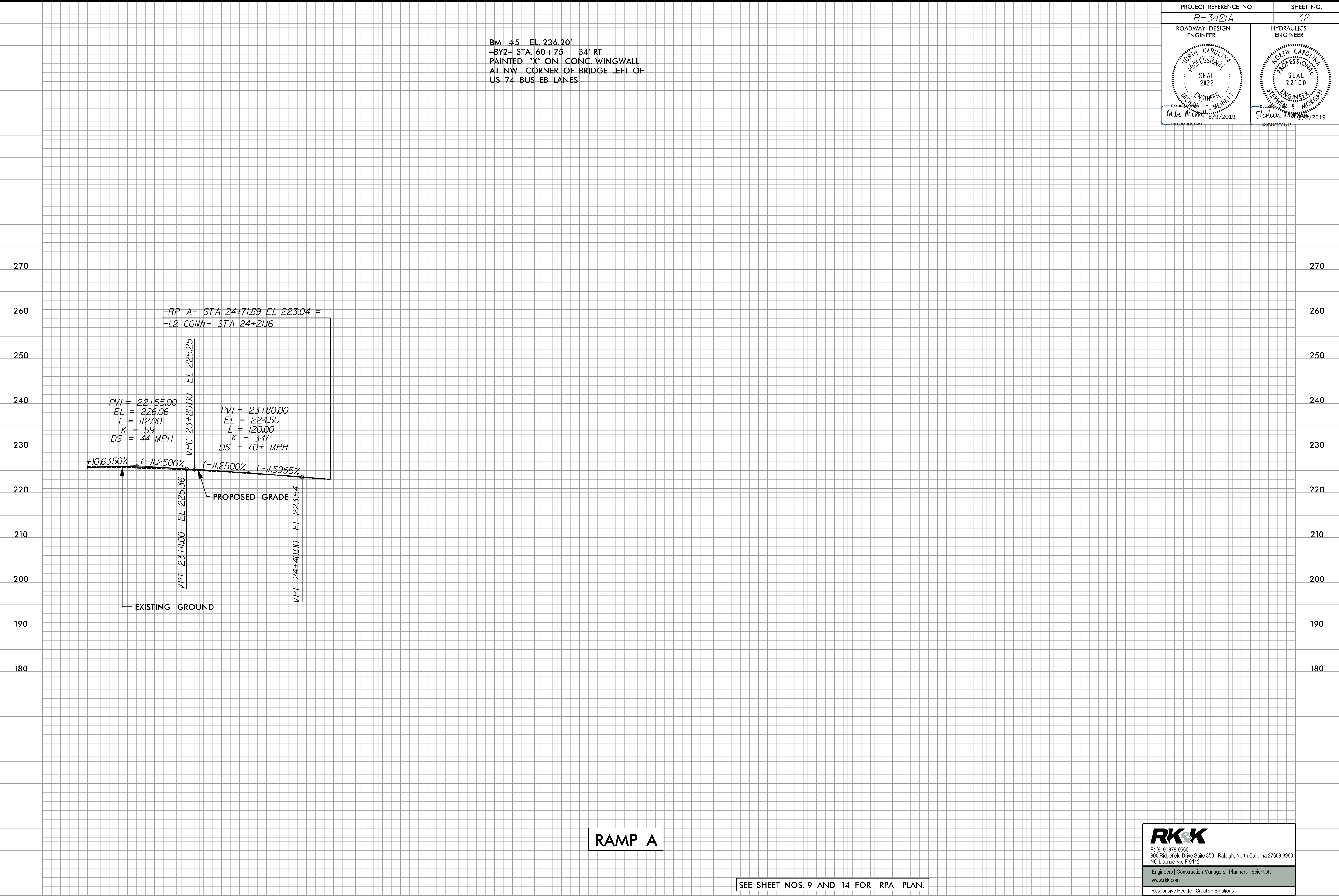
RAMP A

SEE SHEET NO. 10 FOR -RPA- PLAN.

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PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>32</i>
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 

BM #5 EL. 236.20'
 -BY2- STA. 60+75 34' RT
 PAINTED "X" ON CONC. WINGWALL
 AT NW CORNER OF BRIDGE LEFT OF
 US 74 BUS EB LANES



RAMP A

SEE SHEET NOS. 9 AND 14 FOR -RPA- PLAN.

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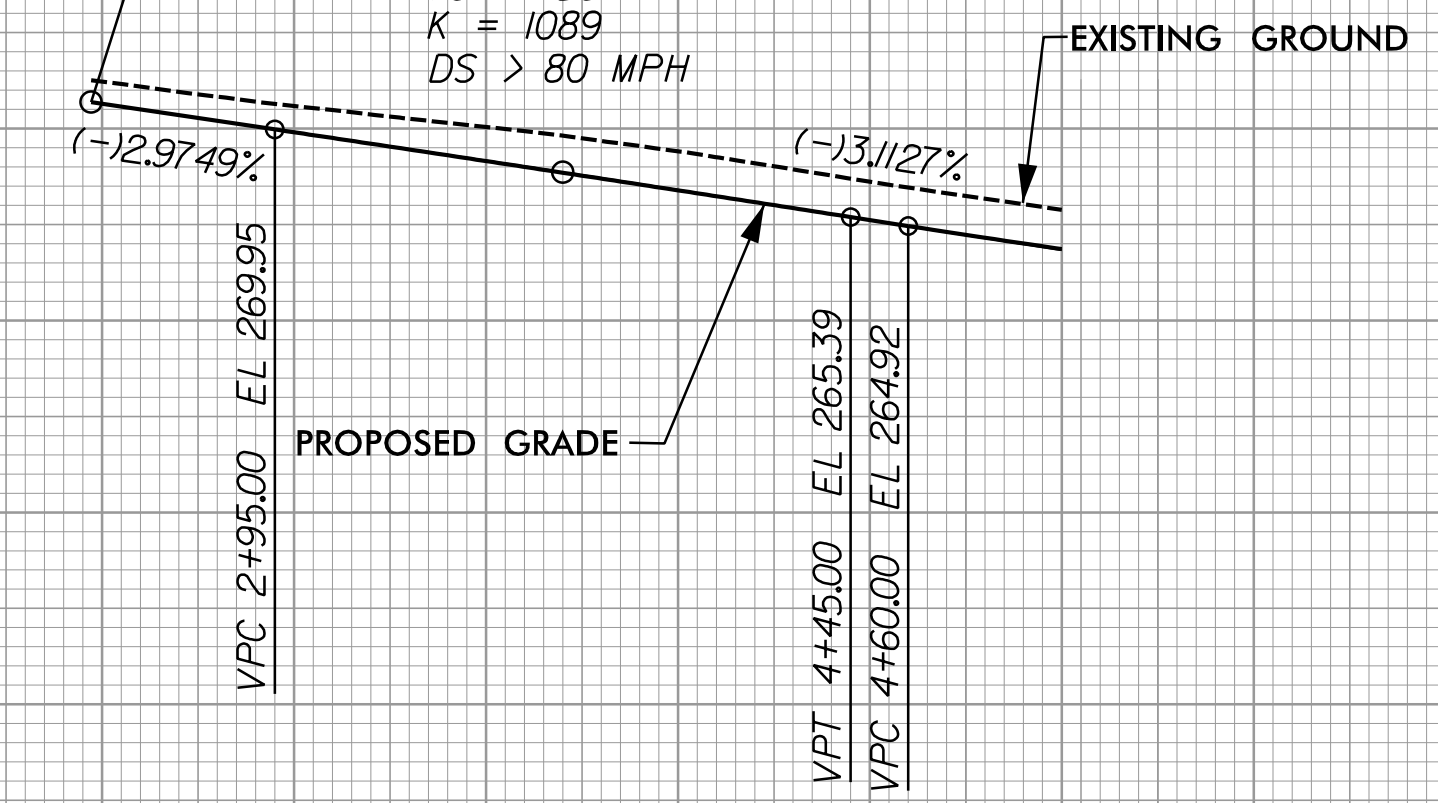
22 23 24

PROJECT REFERENCE NO. R-3421A	SHEET NO. 33
ROADWAY DESIGN ENGINEER Michael J. Merritt	HYDRAULICS ENGINEER Stephen R. Morgan

BM #4 EL. 300.00'
 -BL- STA. 66+29 176' LT
 RR SPIKE IN BASE OF
 12" POPLAR TREE

-RPC- VPC 2+47.14 EL. 271.38' =
 I-73 STA. 77+28.94 53.33 LT.

PI = 3+70.00
 EL = 267.72'
 VC = 150'
 K = 1089
 DS > 80 MPH



RAMP C

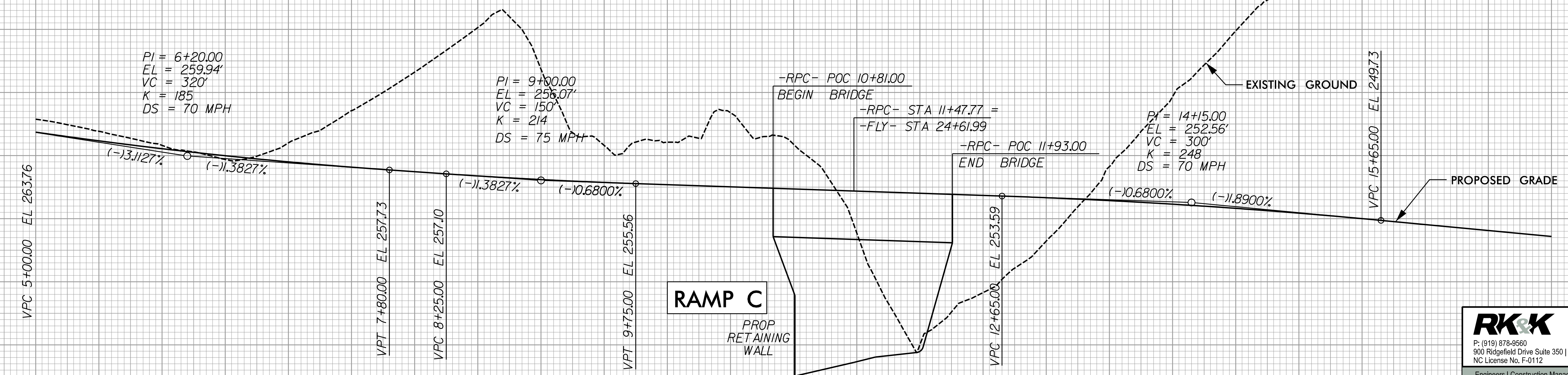
SEE SHEET NOS. 7 AND 8 FOR -RPC- PLAN.

BM #4 EL. 300.00'
 -BL- STA. 66+29 176' LT
 RR SPIKE IN BASE OF
 12" POPLAR TREE

PI = 6+20.00
 EL = 259.94'
 VC = 320'
 K = 185
 DS = 70 MPH

PI = 9+00.00
 EL = 258.07'
 VC = 150'
 K = 214
 DS = 75 MPH

PI = 14+15.00
 EL = 252.56'
 VC = 300'
 K = 248
 DS = 70 MPH


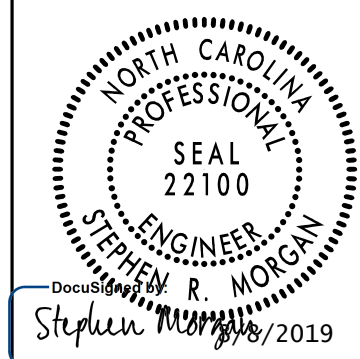


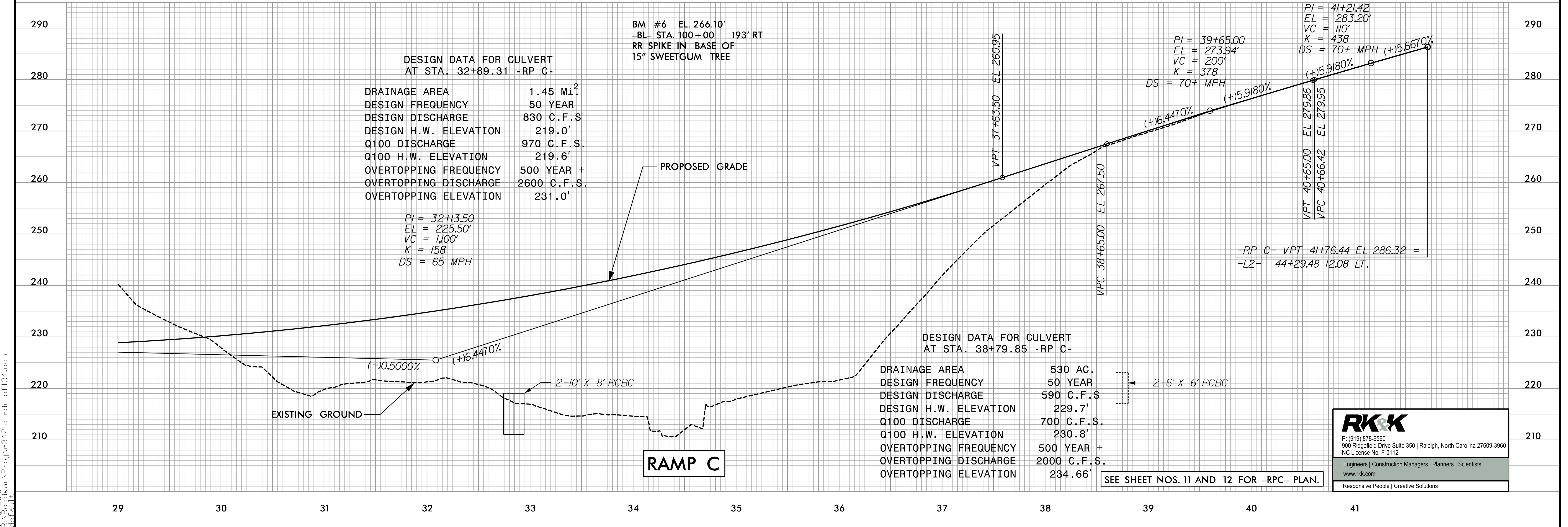
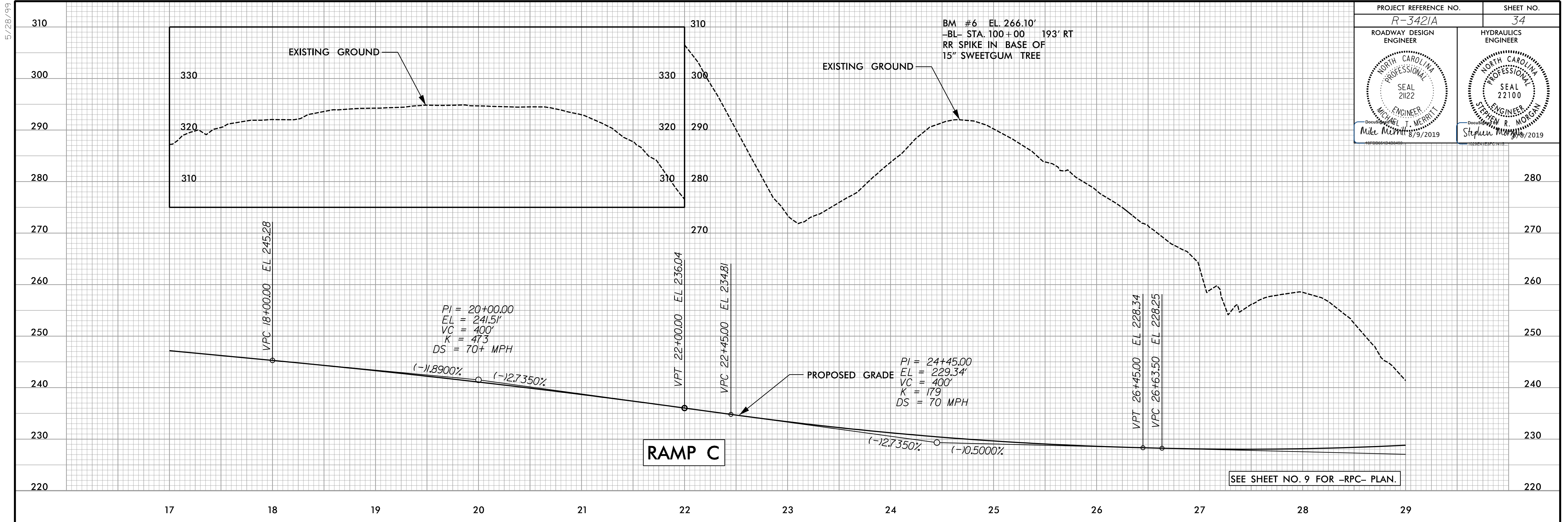
RAMP C
 PROP
 RETAINING
 WALL

SEE SHEET NO. 8 FOR -RPC- PLAN.

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 34
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 



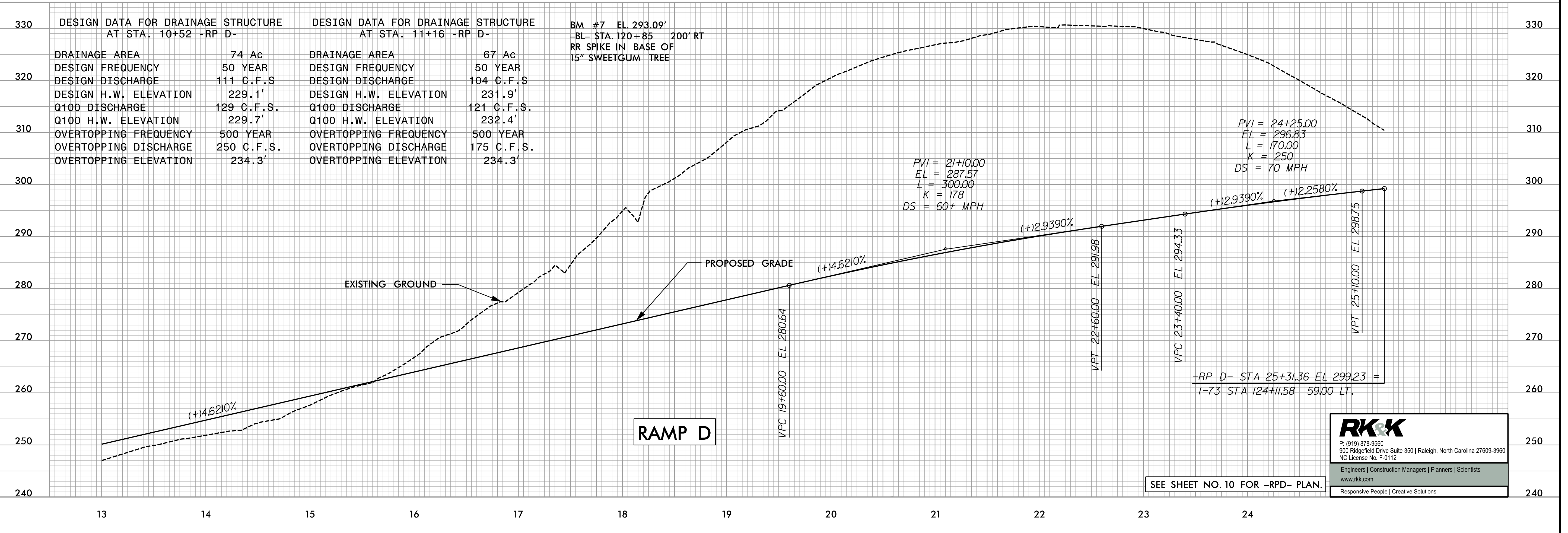
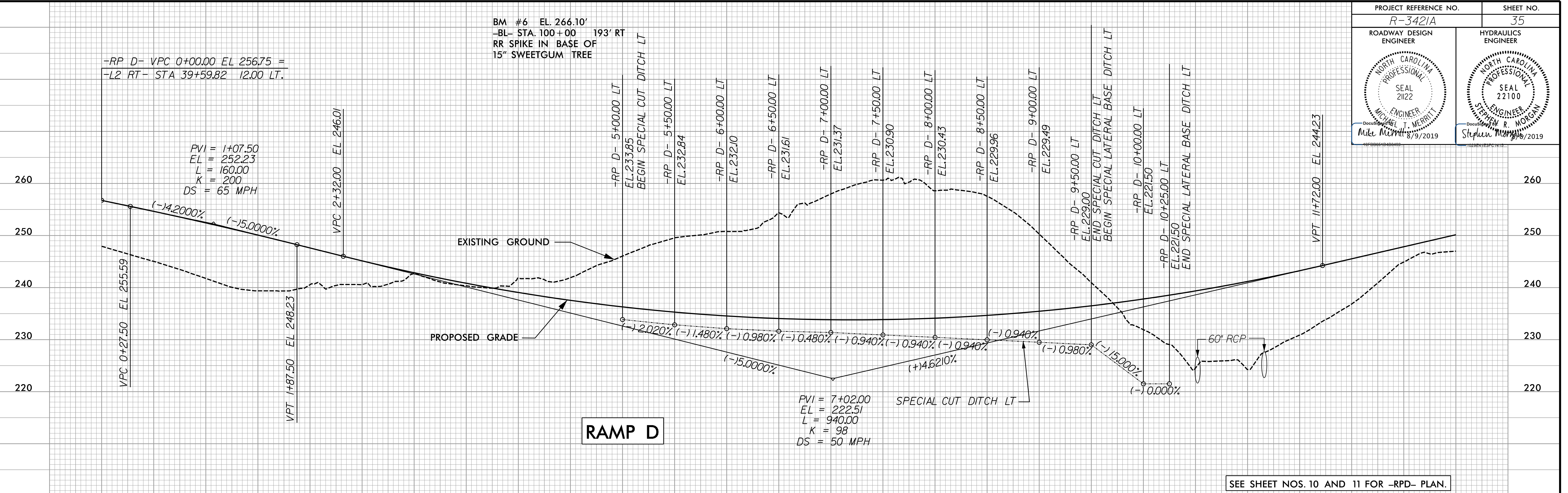

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 35
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER

5/28/19



DESIGN DATA FOR DRAINAGE STRUCTURE AT STA. 10+52 -RP D-		DESIGN DATA FOR DRAINAGE STRUCTURE AT STA. 11+16 -RP D-	
DRAINAGE AREA	74 Ac	DRAINAGE AREA	67 Ac
DESIGN FREQUENCY	50 YEAR	DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	111 C.F.S.	DESIGN DISCHARGE	104 C.F.S.
DESIGN H.W. ELEVATION	229.1'	DESIGN H.W. ELEVATION	231.9'
Q100 DISCHARGE	129 C.F.S.	Q100 DISCHARGE	121 C.F.S.
Q100 H.W. ELEVATION	229.7'	Q100 H.W. ELEVATION	232.4'
OVERTOPPING FREQUENCY	500 YEAR	OVERTOPPING FREQUENCY	500 YEAR
OVERTOPPING DISCHARGE	250 C.F.S.	OVERTOPPING DISCHARGE	175 C.F.S.
OVERTOPPING ELEVATION	234.3'	OVERTOPPING ELEVATION	234.3'

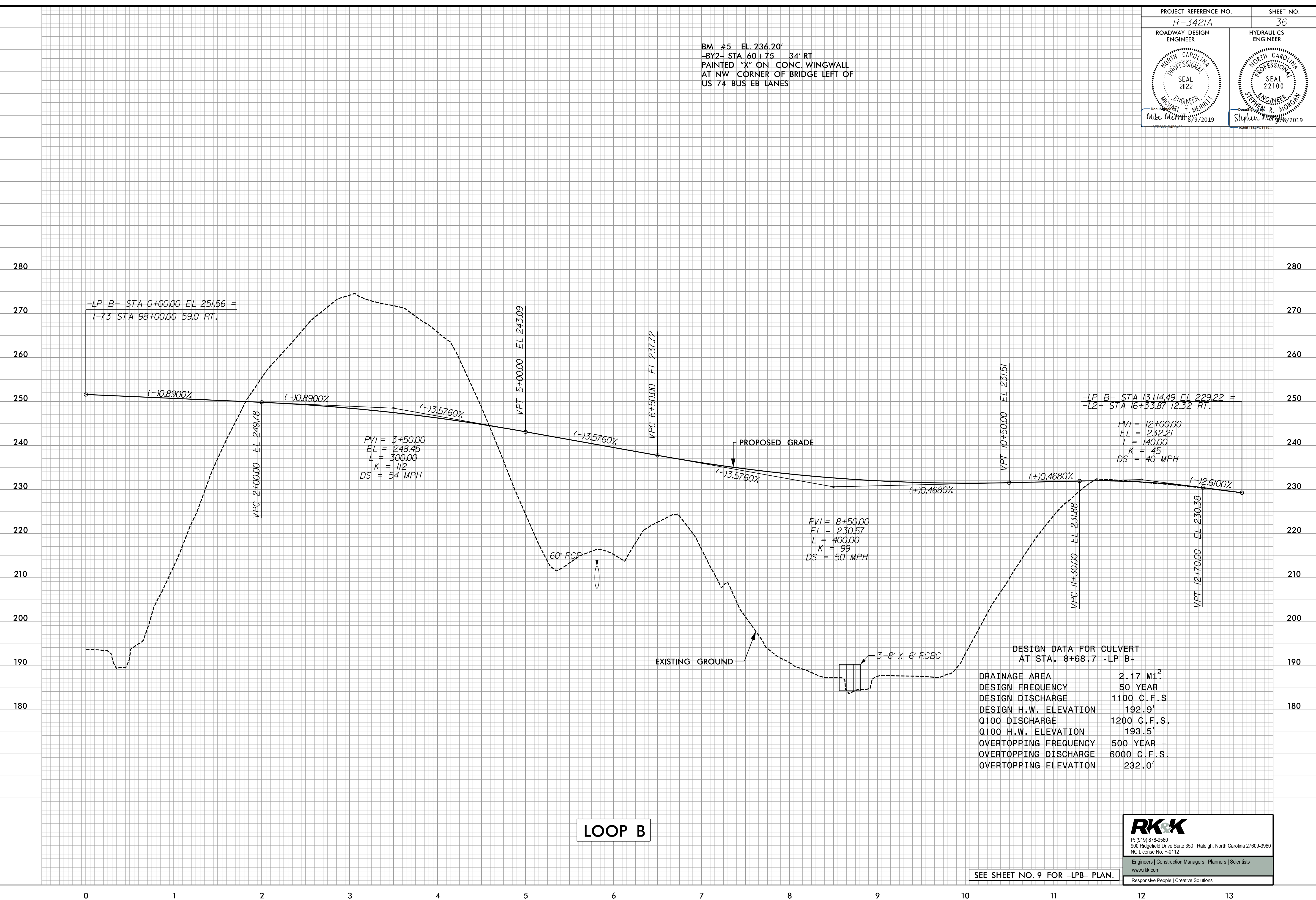
BM #7 EL. 293.09'
-BL- STA. 120+85' 200' RT
RR SPIKE IN BASE OF
15" SWEETGUM TREE

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PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>36</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Michael J. Merritt</i> 8/9/2019	<i>Stephen R. Morgan</i> 8/9/2019

BM #5 EL. 236.20'
 -BY2- STA. 60+75 34' RT
 PAINTED "X" ON CONC. WINGWALL
 AT NW CORNER OF BRIDGE LEFT OF
 US 74 BUS EB LANES



LOOP B

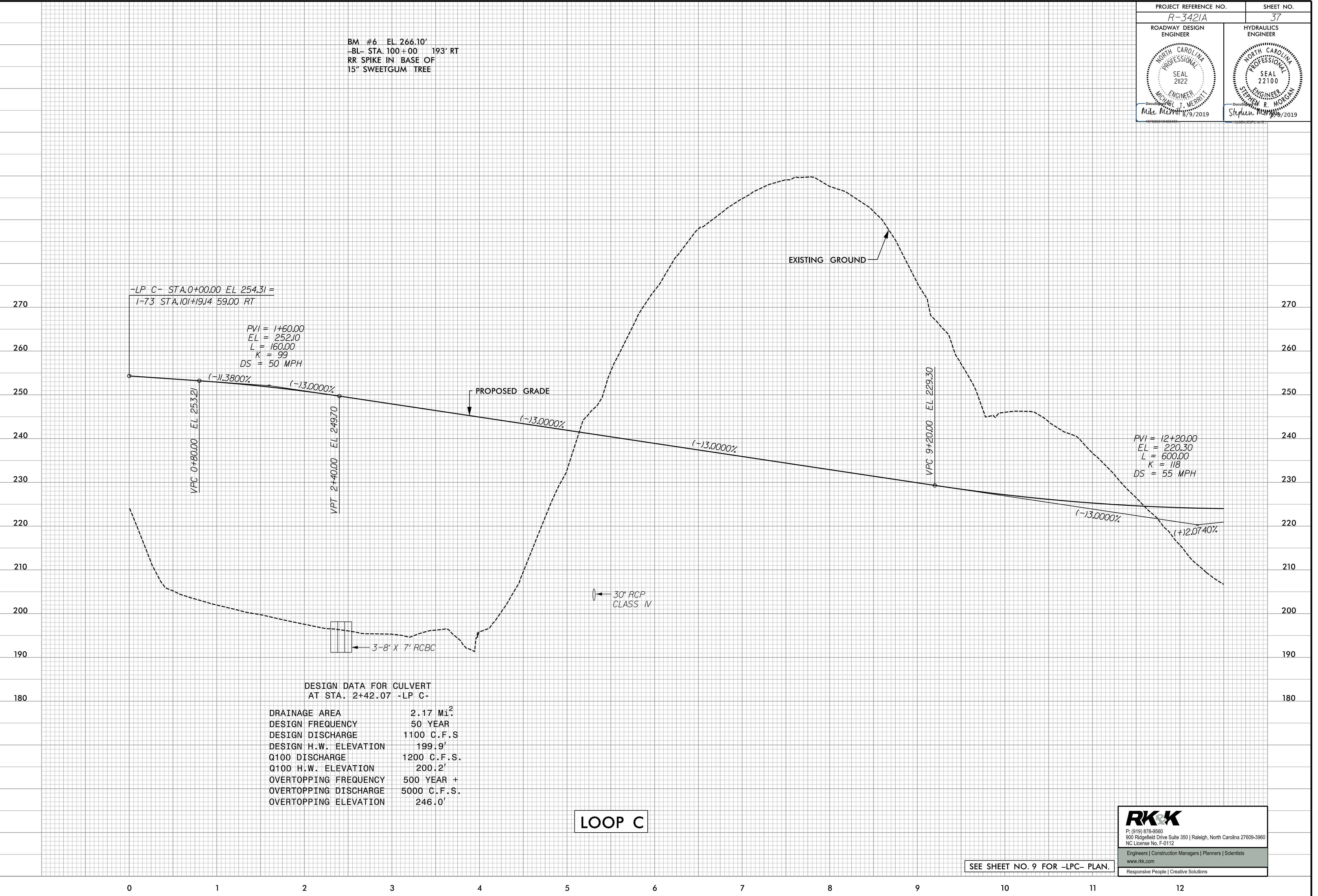
SEE SHEET NO. 9 FOR -LPB- PLAN.

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PROJECT REFERENCE NO. R-3421A	SHEET NO. 37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Michael J. Merritt 8/9/2019	Stephen R. Morgan 8/2019

BM #6 EL. 266.10'
 -BL- STA. 100+00 193' RT
 RR SPIKE IN BASE OF
 15" SWEETGUM TREE



-LP C- STA. 0+00.00 EL. 254.31 =
 I-73 STA. 101+19.14 59.00 RT

PVI = 1+60.00
 EL = 252.10
 L = 160.00
 K = 99
 DS = 50 MPH

PVI = 12+20.00
 EL = 220.30
 L = 600.00
 K = 118
 DS = 55 MPH

DESIGN DATA FOR CULVERT
 AT STA. 2+42.07 -LP C-

DRAINAGE AREA	2.17 Mi ²
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	1100 C.F.S
DESIGN H.W. ELEVATION	199.9'
Q100 DISCHARGE	1200 C.F.S.
Q100 H.W. ELEVATION	200.2'
OVERTOPPING FREQUENCY	500 YEAR +
OVERTOPPING DISCHARGE	5000 C.F.S.
OVERTOPPING ELEVATION	246.0'

LOOP C

SEE SHEET NO. 9 FOR -LPC- PLAN.

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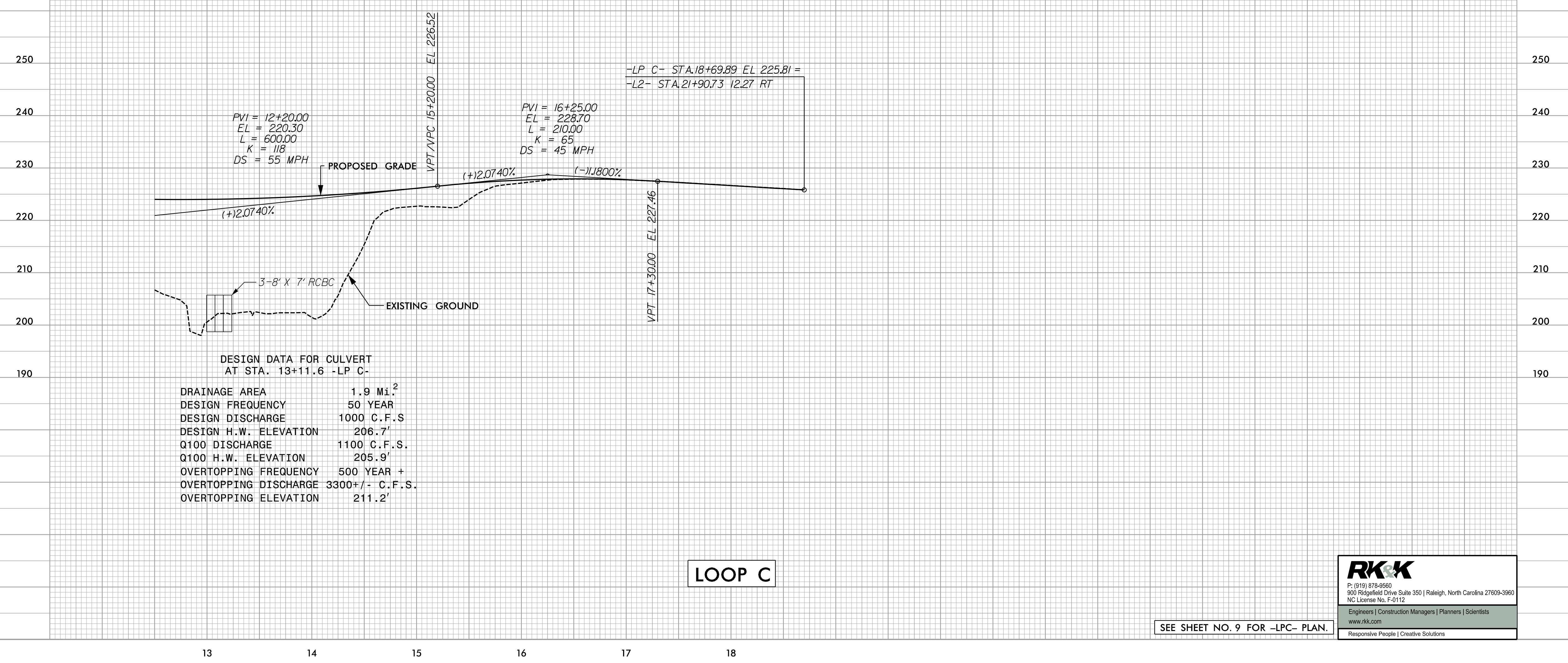
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BM #6 EL. 266.10'
-BL- STA. 100+00 193' RT
RR SPIKE IN BASE OF
15" SWEETGUM TREE

PROJECT REFERENCE NO. <i>R-3421A</i>	SHEET NO. <i>38</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Michael J. Merritt</i>	<i>Stephen R. Morgan</i>



LOOP C

SEE SHEET NO. 9 FOR -LPC- PLAN.

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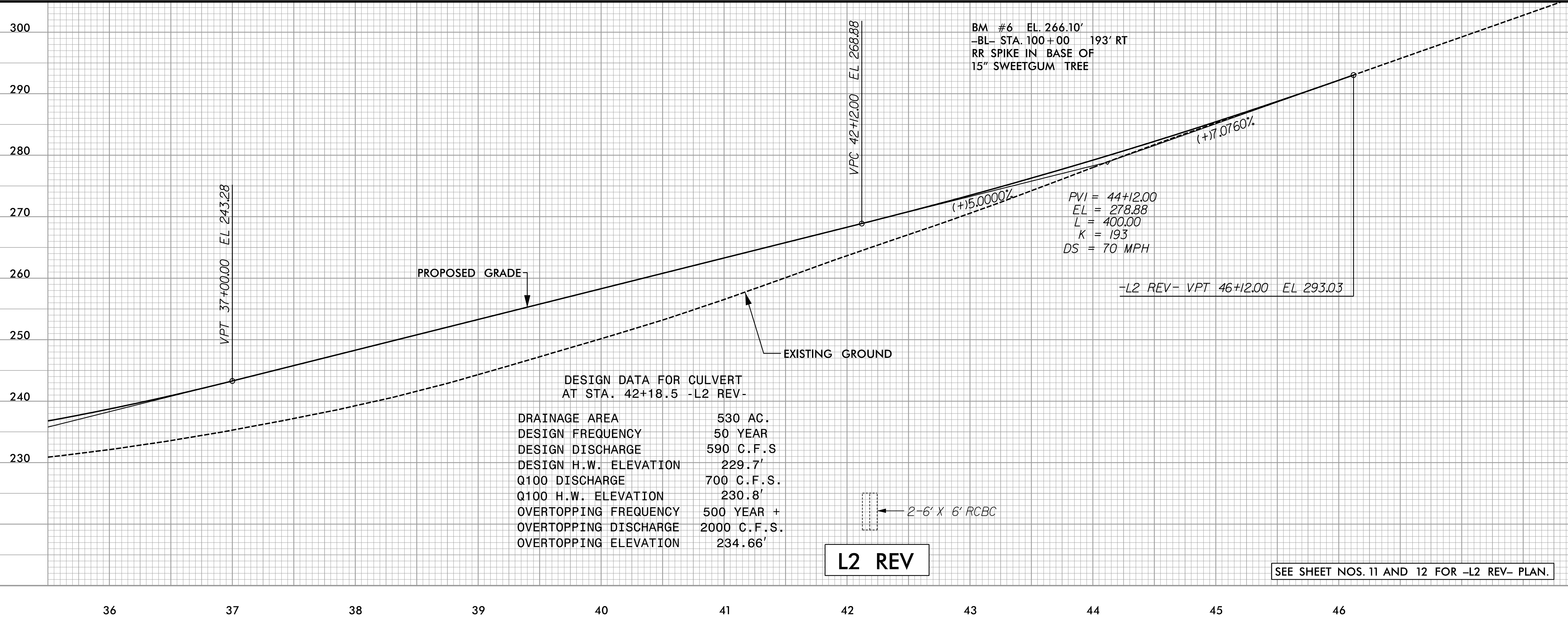
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BM #6 EL. 266.10'
 -BL- STA. 100+00 193' RT
 RR SPIKE IN BASE OF
 15" SWEETGUM TREE

PVI = 44+12.00
 EL = 278.88
 L = 400.00
 K = 193
 DS = 70 MPH

PROPOSED GRADE

EXISTING GROUND

DESIGN DATA FOR CULVERT
 AT STA. 42+18.5 -L2 REV-

DRAINAGE AREA	530 AC.
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	590 C.F.S.
DESIGN H.W. ELEVATION	229.7'
Q100 DISCHARGE	700 C.F.S.
Q100 H.W. ELEVATION	230.8'
OVERTOPPING FREQUENCY	500 YEAR +
OVERTOPPING DISCHARGE	2000 C.F.S.
OVERTOPPING ELEVATION	234.66'

2'-6" X 6' RCBC

L2 REV

SEE SHEET NOS. 11 AND 12 FOR -L2 REV- PLAN.

PROJECT REFERENCE NO. R-3421A	SHEET NO. 40
ROADWAY DESIGN ENGINEER Michael T. Merritt SEAL 2122 8/9/2019	HYDRAULICS ENGINEER Stephen R. Morgan SEAL 22100 8/9/2019

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