

12/06/07

COMPUTED BY: TJC DATE: 10/26/22
CHECKED BY: BCS DATE: 10/26/22

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. 1-2513AA/AB
SHEET NO. 3B-2

I-2513AA

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350.
NG = NON-GATING IMPACT ATTENUATOR TYPE 350.

Table with columns: SURVEY LINE, BEGIN STATION, END STATION, LOCATION, LENGTH, ANCHOR UNITS, WARRANT POINT, "N" DISTANCE FROM E.O.L., TOTAL SHOULDER WIDTH, FLARE LENGTH, W, ANCHORS, TEMP. CRASH CUSHIONS, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, GUARDRAIL TRANSITION, REMARKS. Includes rows for various stationing points and a summary table at the bottom.

I-2513AB

Table with columns: SURVEY LINE, BEGIN STATION, END STATION, LOCATION, LENGTH, ANCHOR UNITS, WARRANT POINT, "N" DISTANCE FROM E.O.L., TOTAL SHOULDER WIDTH, FLARE LENGTH, W, ANCHORS, TEMP. CRASH CUSHIONS, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, GUARDRAIL TRANSITION, REMARKS. Includes rows for various stationing points and a summary table at the bottom.

I-2513AA & I-2513AB

Summary table with columns: SURVEY LINE, BEGIN STATION, END STATION, LOCATION, LENGTH, ANCHOR UNITS, WARRANT POINT, "N" DISTANCE FROM E.O.L., TOTAL SHOULDER WIDTH, FLARE LENGTH, W, ANCHORS, TEMP. CRASH CUSHIONS, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, GUARDRAIL TRANSITION, REMARKS. Includes rows for I-2513AA TOTAL, I-2513AB TOTAL, and I-2513AA/AB GRAND TOTALS.

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12/06/07

COMPUTED BY: JLC DATE: 01/25/23
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STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. 1-2513AA/AB
 SHEET NO. 3B-3

I-2513AA

I-2513AB

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	AREA (SF)	ASPHALT REMOVAL (SY)	CONCRETE REMOVAL (SY)
-Y-	18+75.00	18+81.00	LT	221.00	24.56	
-Y-	18+75.00	18+76.00	RT	42.00	4.67	
-Y-	18+75.00	35+48.00	LT	7,449.00	827.67	
-Y-	18+75.00	35+84.00	RT	7,106.00	789.56	
-Y-	18+75.00	45+60.00	CL	11,831.00	1,314.56	
-Y-	18+75.00	45+50.00	CL	12,028.00	1,336.44	
-Y-	18+80.00	45+60.00	LT	113,437.00		12,604.11
-Y-	18+76.00	45+47.00	RT	105,793.00		11,754.78
-Y-	34+68.00	42+86.00	LT	4,042.00	449.11	
-Y-	35+86.00	45+27.00	RT	4,039.00	448.78	
-Y-	47+85.00	52+99.00	CL	2,243.00	249.22	
-Y-	47+75.00	52+88.00	CL	2,158.00	239.78	
-Y-	47+51.00	52+13.00	RT	1,157.00	128.56	
-Y-	47+88.00	53+44.00	LT	24,939.00		2,771.00
-Y-	47+54.00	52+50.00	RT	20,875.00		2,319.44
-YSRPD-	12+11.00	12+77.00	RT	268.00	29.78	
-YSRPD-	10+04.00	12+77.00	LT	1,068.00	118.67	
-Y-	48+15.00	53+52.00	LT	2,342.00	260.22	
-Y-	55+88.00	92+44.00	CL	16,196.00	1,799.56	
-Y-	55+77.00	92+44.00	CL	15,385.00	1,709.44	
-Y-	54+60.00	63+70.00	RT	3,693.00	410.33	
-Y-	55+28.00	92+44.00	RT	175,351.00		19,483.44
-Y-	56+03.00	92+44.00	LT	171,390.00		19,043.33
-Y-	63+70.00	92+44.00	RT	37,811.00	4,201.22	
-Y-	56+53.00	92+44.00	LT	43,762.00	4,862.44	
-Y-	81+39.00	81+74.00	LT	444.00	49.33	
-YSLPB-	10+00.00	12+84.00	RT	1,435.00	159.44	
-Y_WB-	10+44.00	18+70.00	LT	9,620.00	1,068.89	
-Y_WB-	13+56.00	18+70.00	RT	1,917.00	213.00	
-Y_WB-	18+70.00	20+82.00	RT	1,361.00	151.22	
-Y_EB-	10+44.00	15+08.00	RT	6,027.00	669.67	
-Y_EB-	13+54.00	15+08.00	LT	560.00	62.22	
-Y-	18+75.00	-YSRPB- 15+12.00	LT	20,345.00	2,260.56	
-Y-	23+23.00	-YSRPC- 18+25.00	RT	14,356.00	1,595.11	
-Y-	35+50.00	42+46.00	LT	6,816.00	757.33	
-YDET1-	12+38.00	24+57.00	CL	15,923.00	1,769.22	
-YDET2-	13+04.00	19+88.00	CL	10,847.00	1,205.22	
-Y-	42+30.00	92+44.00	LT	60,480.00	6,720.00	
-Y-	42+30.00	92+44.00	LT	25,920.00	2,880.00	
TOTAL:				38,765.78	67,976.11	
SAY:				38,800.00	68,000.00	

SUMMARY OF WOVEN WIRE FENCE, 47" FABRIC

STATION TO STATION	LT. OR RT.	FABRIC (LF)	4" POSTS (EA)	5" POSTS (EA)
-YSRPA- 15+05 TO 18+06	RT.	360	15	19
-Y- 62+62 TO 64+92	RT.	245	15	5
-Y- 65+70 TO -Y_EB- 22+25	RT.	3,985	240	82
-Y- 66+46 TO 66+46	LT.	10		2
-Y- 74+55 TO 74+90	LT.	40	1	4
-Y- 81+03 TO -YWB- 17+67	LT.	1,910	118	34
TOTAL:		6,550	389	146
SAY:		6,600	395	150

SUMMARY OF CONCRETE BARRIER

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SINGLE FACED BARRIER (LF)	SINGLE SLOPE BARRIER (LF)	CONC. BARRIER TRANSITION (EA)
-Y-	48+16.00	53+93.75	LT	578.0		
-Y-	56+32.00	57+94.00	LT	166.0		
-Y-	64+00.00	77+80.27	RT	1380.3		
-Y- /-Y_EB-	89+66.00	13+66.36	RT	599.0		
-YSRPA-	17+86.00	18+64.00	LT	80.0		
-Y-	63+85.00	64+60.63	CL		235.0	
-Y-	89+90.00	90+08.62	CL		180.0	
-Y-	18+76.00	45+47.00	RT			1
-Y-	34+68.00	42+86.00	LT			1
-Y-	35+86.00	45+27.00	RT			1
-Y-	47+85.00	52+99.00	CL			1
-Y-	47+75.00	52+88.00	CL			1
-Y-	47+51.00	52+13.00	RT			1
TOTAL:				2803.3	415.0	6
SAY:				2805	420	6

SUMMARY OF 4" SHOULDER DRAINS

LINE	BEG STATION	END STATION	SHOULDER DRAIN PIPE (LF)	SHOULDER DRAINS (LF)	OUTLET PIPE (LF)	CONC PADS (EA)
-Y- RT (EB, OUTSIDE)	18+80.00	-YSRPC- 15+65.00	1,690	1,690		
-Y- RT (EB, OUTSIDE)	35+75.00	45+46.00	971	971		
-Y- RT (EB, OUTSIDE)	47+70.00	49+40.00	170	170		
-YSRPD-	12+77.00	10+00.00	277	277		
-Y- RT (EB, OUTSIDE)	55+65.00	91+60.00	3,595	3,595	12	NA (1 @ DI)
					96	NA (8 @ 2GI)
					24	NA (2 @ CB)
-Y- LT (WB, OUTSIDE)	39+32.89	42+00.00	268	268		
-Y- LT (WB, OUTSIDE)	-YSLPB- 12+84.28	46+00.00	354	354		
-Y- LT (WB, OUTSIDE)	48+25.00	53+25.00	500	500		
-YSRPA-	18+00.00	10+00.00	800	800	24	2
					12	NA (1 @ 2GI)
-Y- LT (WB, OUTSIDE)	65+78.08	92+44.00	2,666	2,666	36	3
					60	NA (5 @ 2GI)
TOTAL:			11,291	11,291	264	5
SAY:			11,300	11,300	270	5

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	AREA (SF)	ASPHALT REMOVAL (SY)	CONCRETE REMOVAL (SY)
-YSLPB-	21+70.00	22+43.00	LT	840.80	93.42	
-RPC- / -L1_EB-	10+48.00	43+50.00	LT	109,299.00	12,144.33	
-L1_EB-	57+13.00	66+10.00	RT	3,207.00	356.33	
-L1_WB-	44+50.00	55+09.00	RT	5,185.00	576.11	
-L1_WB-	47+00.00	-RPDB- 20+70.00	LT	7,565.00	840.56	
-L1_WB-	52+50.00	66+00.00	RT	15,009.00	1,667.67	
-L1_WB-	62+00.00	66+00.00	LT	1,608.00	178.67	
-RPDB-	17+02.00	20+70.00	RT	3,637.00	404.11	
-YSRPA-	26+60.00	27+50.00	LT	1,782.00	198.00	
-YSRPD-	12+79.00	14+39.00	RT	915.00	101.67	
-RPD-	16+96.00	18+24.00	RT	543.00	60.33	
-L1_EB-	65+84.00	68+42.00	RT	3,480.00	386.67	
TOTAL:					17,007.87	
SAY:					17,050.00	

SUMMARY OF WOVEN WIRE FENCE, 47" FABRIC

STATION TO STATION	LT. OR RT.	FABRIC (LF)	4" POSTS (EA)	5" POSTS (EA)
-RPC- 22+70 TO 36+45	RT.	1,400	83	31
-RPC- 44+00 TO 46+63	RT.	280	15	10
-YSRPA- 21+68.42	RT.	8	1	
TOTAL:		1,688	98	41
SAY:		1,700	100	45

SUMMARY OF CONCRETE BARRIER

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SINGLE FACED BARRIER (LF)	SINGLE SLOPE BARRIER (LF)	CONC. BARRIER TRANSITION (EA)
-YSRPA-	21+56.84	26+60.00	LT	515.0		
-YSRPA-	21+27.98	23+50.00	RT	222.0		
-RPC-	18+13.15	21+36.15	RT	323.0		
-RPC-	33+78.15	39+95.15	RT	617.0		
TOTAL:				1677.0		
SAY:				1680		

GRAND TOTALS (I-2513AA & I-2513AB)

PAVEMENT REMOVAL SUMMARY

	ASPHALT REMOVAL (SY)	CONCRETE REMOVAL (SY)
I-2513AA	38,800.00	68,000.00
I-2513AB	17,050.00	
TOTAL	55,850.00	68,000.00

SUMMARY OF 4" SHOULDER DRAINS

	SHOULDER DRAIN PIPE (LF)	SHOULDER DRAINS (LF)	OUTLET PIPE (LF)	CONC PADS (EA)
I-2513AA	11,300	11,300	270	5
I-2513AB				
TOTAL	11,300	11,300	270	5

SUMMARY OF WOVEN WIRE FENCE, 47" FABRIC

	FABRIC (LF)	4" POSTS (EA)	5" POSTS (EA)
I-2513AA	6,600	395	150
I-2513AB	1,700	100	45
TOTAL	8,300	495	195

SUMMARY OF CONCRETE BARRIER

	SINGLE FACED BARRIER (LF)	SINGLE SLOPE BARRIER (LF)	CONC. BARRIER TRANSITION (EA)
I-2513AA	2805	420	6
I-2513AB	1680		
TOTAL	4485	420	6

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PROJECT NO. I-2513AA SHEET NO. 3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AA
DRAINAGE STRUCTURES

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

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing codes and their corresponding material or structure names, such as C.A.A. CORRUGATED ALUMINIUM ALLOY, C.B. CATCH BASIN, etc.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. I-2513AA SHEET NO. 3D-2

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AA
DRAINAGE STRUCTURES

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

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing codes and their corresponding materials or structures, such as C.A.A. CORRUGATED ALUMINIUM ALLOY, C.B. CATCH BASIN, etc.

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COMPUTED BY: mih DATE: 6/13/2022
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PROJECT NO. I-2513AA SHEET NO. 3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AA
DRAINAGE STRUCTURES
(TEMPORARY)

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

Main data table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, ELEVATIONS, PIPE TYPES (C.S., R.C. CLASS III/IV), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME/GRATES, and REMARKS. Includes a summary row at the bottom for SHEET TOTALS and PROJECT TOTALS.

ABBREVIATIONS table listing codes like C.A.A., C.B., C.S., D.I., G.D.I., H.D.P.E., J.B., M.H., N.S., P.V.C., R.C., T.B.D.I., T.B.J.B., W.S. and their corresponding descriptions.

SHEET TOTALS and PROJECT TOTALS summary row with numerical values for various categories.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. I-2513AB
SHEET NO. 3D-5

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AB
DRAINAGE STRUCTURES

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

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing codes and their corresponding material or structure names, such as C.A.A. CORRUGATED ALUMINIUM ALLOY, C.B. CATCH BASIN, etc.

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COMPUTED BY: mih DATE: 6/13/2022
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. I-2513AB
SHEET NO. 3D-6

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AB
DRAINAGE STRUCTURES

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

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing codes and their corresponding material or structure names, such as C.A.A. CORRUGATED ALUMINIUM ALLOY, C.B. CATCH BASIN, etc.

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COMPUTED BY: mih DATE: 6/13/2022
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. I-2513AB
SHEET NO. 3D-7

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AB
DRAINAGE STRUCTURES

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

Table with columns: LINE & STATION, SIZE, THICKNESS OR GAUGE, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a summary row at the bottom labeled 'SHEET TOTALS'.

ABBREVIATIONS table listing codes and their corresponding material or structure names, such as C.A.A. CORRUGATED ALUMINIUM ALLOY, C.B. CATCH BASIN, etc.

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COMPUTED BY: mih DATE: 6/13/2022
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. I-2513AB
SHEET NO. 3D-8

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AB
DRAINAGE STRUCTURES
(TEMPORARY)

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

Table with columns for LINE & STATION, SIZE, THICKNESS OR GAUGE, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE), C. S. PIPE, R. C. PIPE CLASS III, R. C. PIPE CLASS IV, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a summary row at the bottom for SHEET TOTALS and PROJECT TOTALS.

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COMPUTED BY: mih DATE: 8/15/2023
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. I-2513 AA/AB SHEET NO. 3D-10

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

I-2513AA AND I-2513AB
COMBINED GRAND TOTALS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54 INCHES & OVER)

Table with columns for Line & Station, Size, Thickness, Offset, Structure Number, Invert Elevation, Side Drain Pipe, C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, R.C. Pipe Class V, Structural Plate Pipe, Quantities for Drainage Structures, Frame, Grates, and Hood, and Remarks. Includes sub-totals for SHEET TOTALS and PROJECT TOTALS.

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

I-2513AA

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-Y-	55+00	72+00	LT to RT	SD	3400
-Y_WB-	10+44	11+75	LT	SD	150
-Y_EB-	10+44	13+25	RT	SD	300
CONTINGENCY				SD	1000
TOTAL LF:					4850

*UD = Underdrain
 *BD = Blind Drain
 *SD = Subsurface Drain

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
Y	18+00	93+44	ASU(2)	8		15675	34850		
Y_WB	10+00	13+25	ASU(2)	8		1860	4150		
Y_EB	10+00	15+00	ASU(2)	8		665	1500		
-Y5RPA-	10+00	18.19.60	ASU(2)	8		Quantities are included above in -Y-			
-Y5RPB-	10+00	13+15	ASU(2)	8					
-Y5RPC-	10+00	15+65	ASU(2)	8					
CONTINGENCY								500	
CONTINGENCY			1	12	1000	2000	3000		0
TOTAL CY/TONS/SY:					1000	20200**	43500**	500	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
 *AST = Aggregate Stabilization
 **Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-Y_WB-	1.5:1	29+00	1.5:1	36+00	LT	2/3		5200
							TOTAL SY:	5200

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF REINFORCED SOIL SLOPE

LINE	Approx. Begin Station	Approx. End Station	Location LT/RT	RSS QUANTITY SY
-Y-	59+50	61+50	LT	1375
				TOTAL SY: 1375

*Refer to Sheets 2G-2 and 2G-3.

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

I-2513AB

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-RPC-	22+25	29+00	LT to RT	SD	1350
CONTINGENCY					1000
TOTAL LF:					2350

*UD = Underdrain
 *BD = Blind Drain
 *SD = Subsurface Drain

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-L1 EB-	37+52	66+10	ASU(2)	8		2710	6010		
-L1 WB	38+02	66+00	ASU(2)	8		2730	6050		
-RPC-	10+00	48+68	ASU(2)	8		9030	20055		
-RPDB-	10+00	20+70	ASU(2)	8		1050	2330		
-RPD-	10+00	16+96	ASU(2)	8		760	1690		
-Y5RPA-	21+27.10	27+49	ASU(2)	8		1620	3590		
CONTINGENCY			AST	3				500	
CONTINGENCY			1	12	1000	2000	3000	0	0
TOTAL CY/TONS/SY:					1000	19900**	42725**	500	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
 *AST = Aggregate Stabilization

**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 902 on -Y5RPA- over Blue Ridge Southern RR	2	3

ESTIMATED QUANTITIES FOR ROCK FILL STEEPENED SLOPE SECTION**

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Geotextile for Drainage, Type 2 SY	RIPRIP Class 2 Tons*	Select Material Class IV Tons***
-L1_EB-	1.75:1	59+50	1.75:1	60+50	LT	1650	5500	65

*Based on Unit Weight of 105 pcf
 ** Refer to Sheet No. 2G-1
 ***Based on Minimum 18" depth.



**SUMMARY OF EMBANKMENT
 WAITING PERIODS**

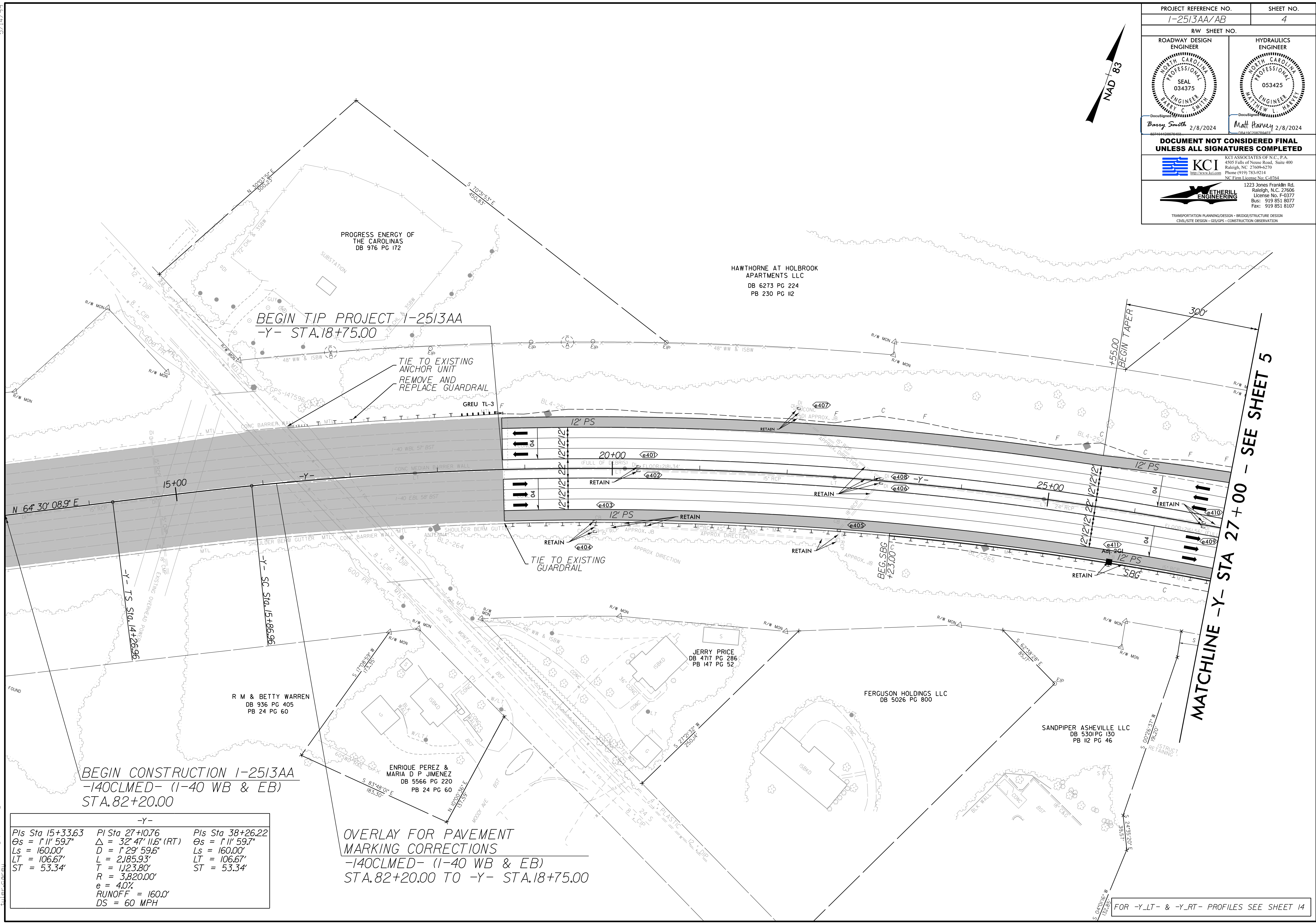
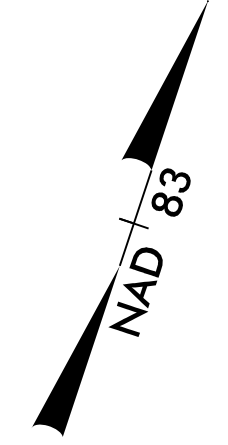
LINE	Station	Station	MONTHS
-RPC-	23+00	30+50	5

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
1	-RPC- 24+00	25	RT
2	-RPC- 26+00	25	RT
3	-RPC- 28+00	25	RT
4	-RPC- 30+00	0	RT
5	-Y5RPA- 21+50	25	RT
6	-Y5RPA- 21+65	25	RT
TOTAL GAUGES (EACH):			6

5/14/24

PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER BARRY C. SMITH SEAL 034375 NORTH CAROLINA PROFESSIONAL ENGINEER		HYDRAULICS ENGINEER MATTHEW L. HALEY SEAL 053425 NORTH CAROLINA PROFESSIONAL ENGINEER	
Barry Smith 2/8/2024		Matthew Haley 2/8/2024	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 KCI KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noce Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 NC Firm License No. C-0764		 ETHERILL ENGINEERING 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	



-Y-		
Pls Sta 15+33.63	Pls Sta 27+07.6	Pls Sta 38+26.22
Os = 1' 11" 59.7"	Δ = 32' 47" 11.6" (RT)	Os = 1' 11" 59.7"
Ls = 160.00'	D = 1' 29' 59.6"	Ls = 160.00'
LT = 106.67'	L = 2,185.93'	LT = 106.67'
ST = 53.34'	T = 1,123.80'	ST = 53.34'
	R = 3,820.00'	
	e = 4.0%	
	RUNOFF = 160.0'	
	DS = 60 MPH	

OVERLAY FOR PAVEMENT
MARKING CORRECTIONS
-140CLMED- (I-40 WB & EB)
STA.82+20.00 TO -Y- STA.18+75.00

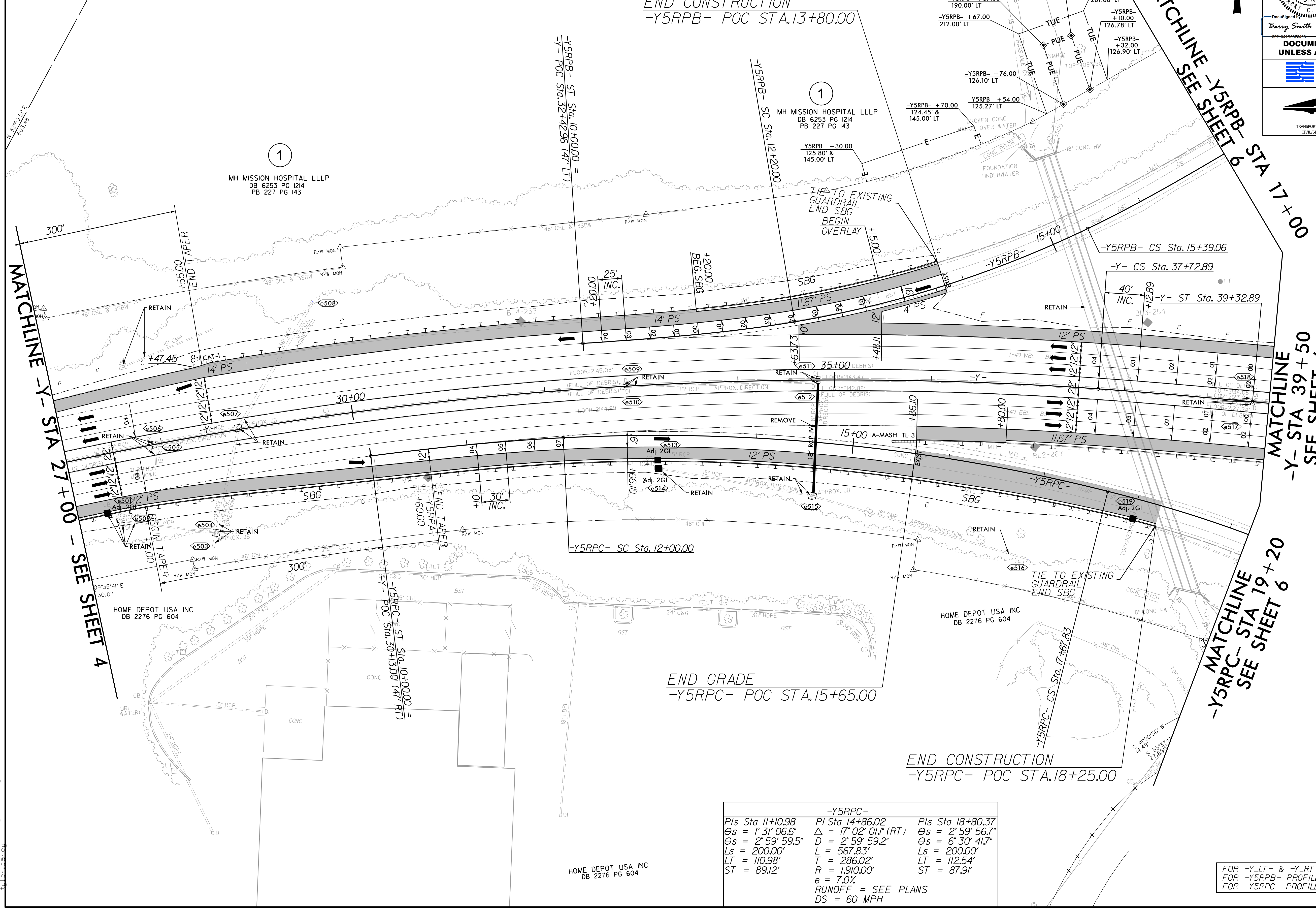
FOR -Y-LT- & -Y-RT- PROFILES SEE SHEET 14

12/1/2023 1-2513AA_rdy_psh_4.dgn
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-Y-		
PIs Sta 15+33.63	PI Sta 27+10.76	PIs Sta 38+26.22
$\Theta_s = 1' 11'' 59.7''$	$\Delta = 32' 47'' 11.6''$ (RT)	$\Theta_s = 1' 11'' 59.7''$
$L_s = 160.00'$	$D = 1' 29'' 59.6''$	$L_s = 160.00'$
$LT = 106.67'$	$L = 2,185.93'$	$LT = 106.67'$
$ST = 53.34'$	$R = 1,238.00'$	$ST = 53.34'$
	$e = 4.0\%$	
	$RUNOFF = 160.0'$	
	$DS = 60$ MPH	

-Y5RPB-		
PIs Sta 11+46.74	PI Sta 13+80.60	PIs Sta 16+05.78
$\Theta_s = 5' 34'' 38.9''$	$\Delta = 16' 10'' 40.3''$ (LT)	$\Theta_s = 5' 04'' 13.5''$
$L_s = 220.00'$	$D = 5' 04'' 13.5''$	$L_s = 200.00'$
$LT = 146.74'$	$L = 319.06'$	$LT = 133.39'$
$ST = 73.40'$	$T = 160.60'$	$ST = 66.72'$
	$R = 1,130.00'$	
	$e = 8.0\%$	
	$RUNOFF = SEE$ PLANS	
	$DS = 50$ MPH	

PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 5
ROADWAY DESIGN ENGINEER BARRY C. SMITH 034375	HYDRAULICS ENGINEER MATTHEW L. HARVEY 053425
DocuSign Barry Smith 2/8/2024	DocuSign Matt Harvey 2/8/2024
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noce Road, Suite 400 Raleigh, NC 27609-4270 Phone (919) 783-9214 NC Firm License No. C-0764	
 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	



-Y5RPC-		
PIs Sta 11+10.98	PI Sta 14+86.02	PIs Sta 18+80.37
$\Theta_s = 1' 31'' 06.6''$	$\Delta = 17' 02'' 01.1''$ (RT)	$\Theta_s = 2' 59'' 56.7''$
$L_s = 200.00'$	$D = 2' 59'' 59.2''$	$\Theta_s = 6' 30'' 41.7''$
$LT = 110.98'$	$L = 567.83'$	$L_s = 200.00'$
$ST = 89.12'$	$T = 286.02'$	$LT = 112.54'$
	$R = 1,910.00'$	$ST = 87.91'$
	$e = 7.0\%$	
	$RUNOFF = SEE$ PLANS	
	$DS = 60$ MPH	

FOR -Y_LT- & -Y_RT- PROFILES SEE SHEET 15
 FOR -Y5RPB- PROFILE SEE SHEET 23
 FOR -Y5RPC- PROFILE SEE SHEET 24

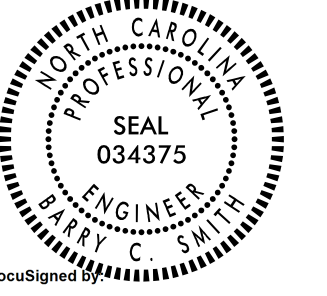
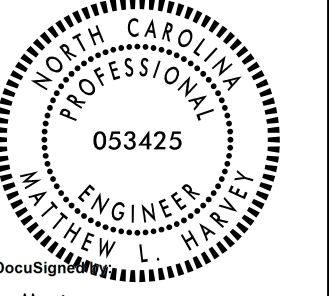


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5/14/2023

12/19/2023
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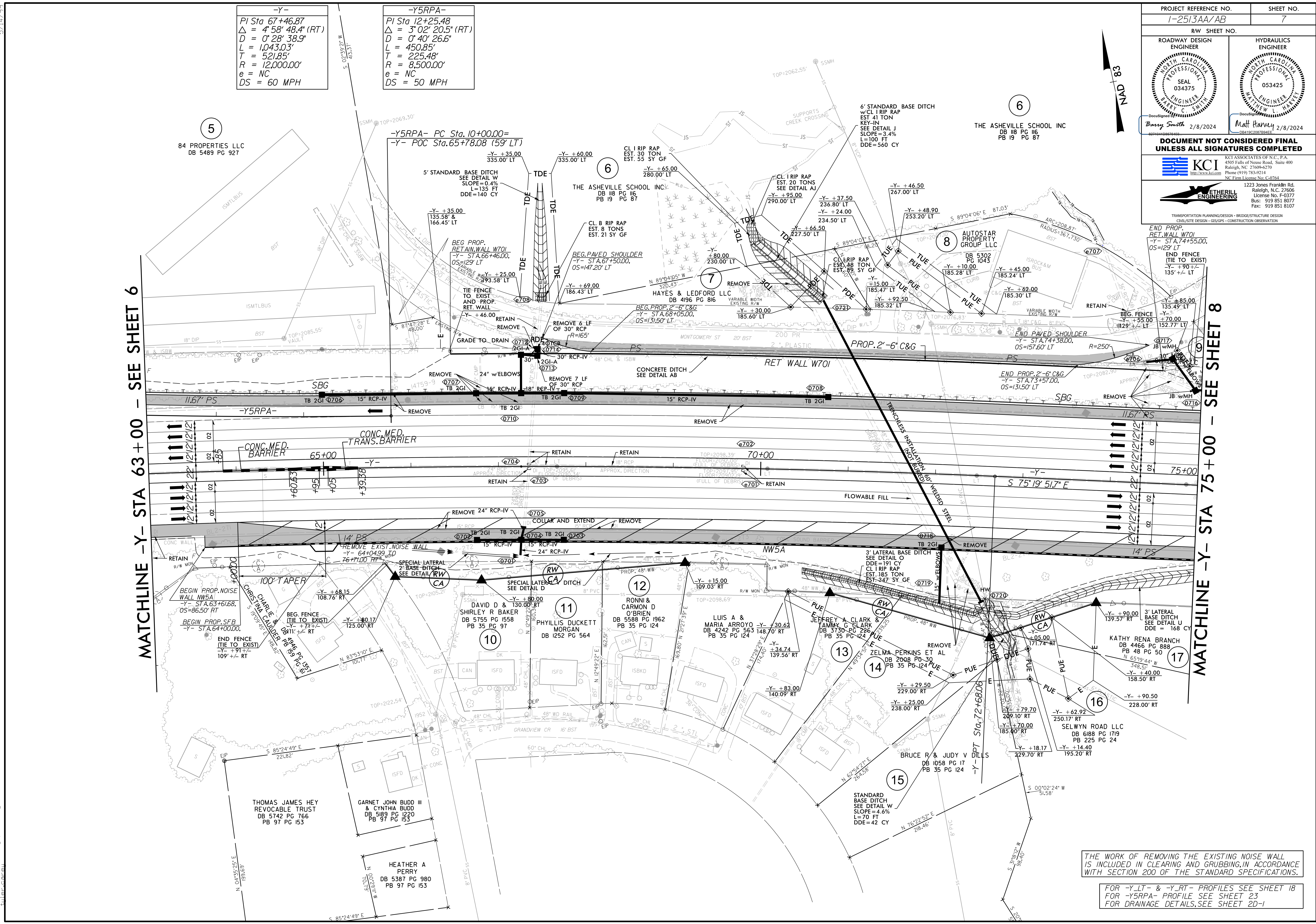
-Y-
 PI Sta 67+46.87
 $\Delta = 4' 58' 48.4" (RT)$
 $D = 0' 28' 38.9"$
 $L = 1,043.03'$
 $T = 521.85'$
 $R = 12,000.00'$
 $e = NC$
 $DS = 60 MPH$

-Y5RPA-
 PI Sta 12+25.48
 $\Delta = 3' 02' 20.5" (RT)$
 $D = 0' 40' 26.6"$
 $L = 450.85'$
 $T = 225.48'$
 $R = 8,500.00'$
 $e = NC$
 $DS = 50 MPH$

PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 7	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 Barry Smith 2/8/2024		 Matt Harvey 2/8/2024	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noce Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 733-9114 NC Firm License No. C-0764		1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	
 ETHERHILL ENGINEERING TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION			

MATCHLINE -Y- STA 63+00 - SEE SHEET 6

MATCHLINE -Y- STA 75+00 - SEE SHEET 8



THE WORK OF REMOVING THE EXISTING NOISE WALL IS INCLUDED IN CLEARING AND GRUBBING, IN ACCORDANCE WITH SECTION 200 OF THE STANDARD SPECIFICATIONS.

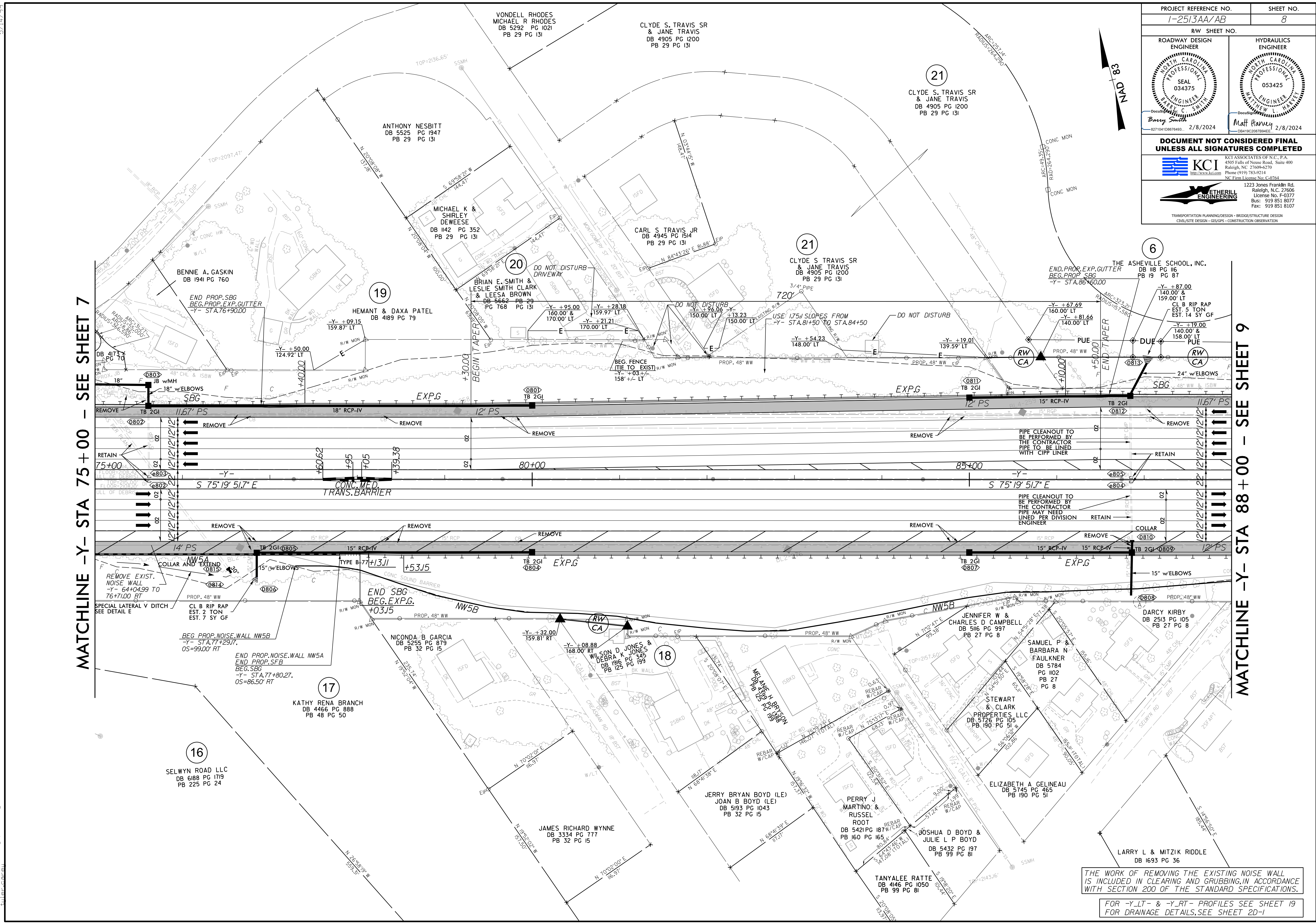
FOR -Y-LT- & -Y-RT- PROFILES SEE SHEET 18
 FOR -Y5RPA- PROFILE SEE SHEET 23
 FOR DRAINAGE DETAILS, SEE SHEET 20-1

5/14/2024

PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 8	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		SEAL 034375 Barry Smith 2/8/2024	
Professional Engineer Seal		Professional Engineer Seal 053425 Matt Harvey 2/8/2024	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noe Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9114 NC Firm License No. C-0764		1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	
ETHERILL ENGINEERING TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION			

MATCHLINE -Y- STA 75+00 - SEE SHEET 7

MATCHLINE -Y- STA 88+00 - SEE SHEET 9



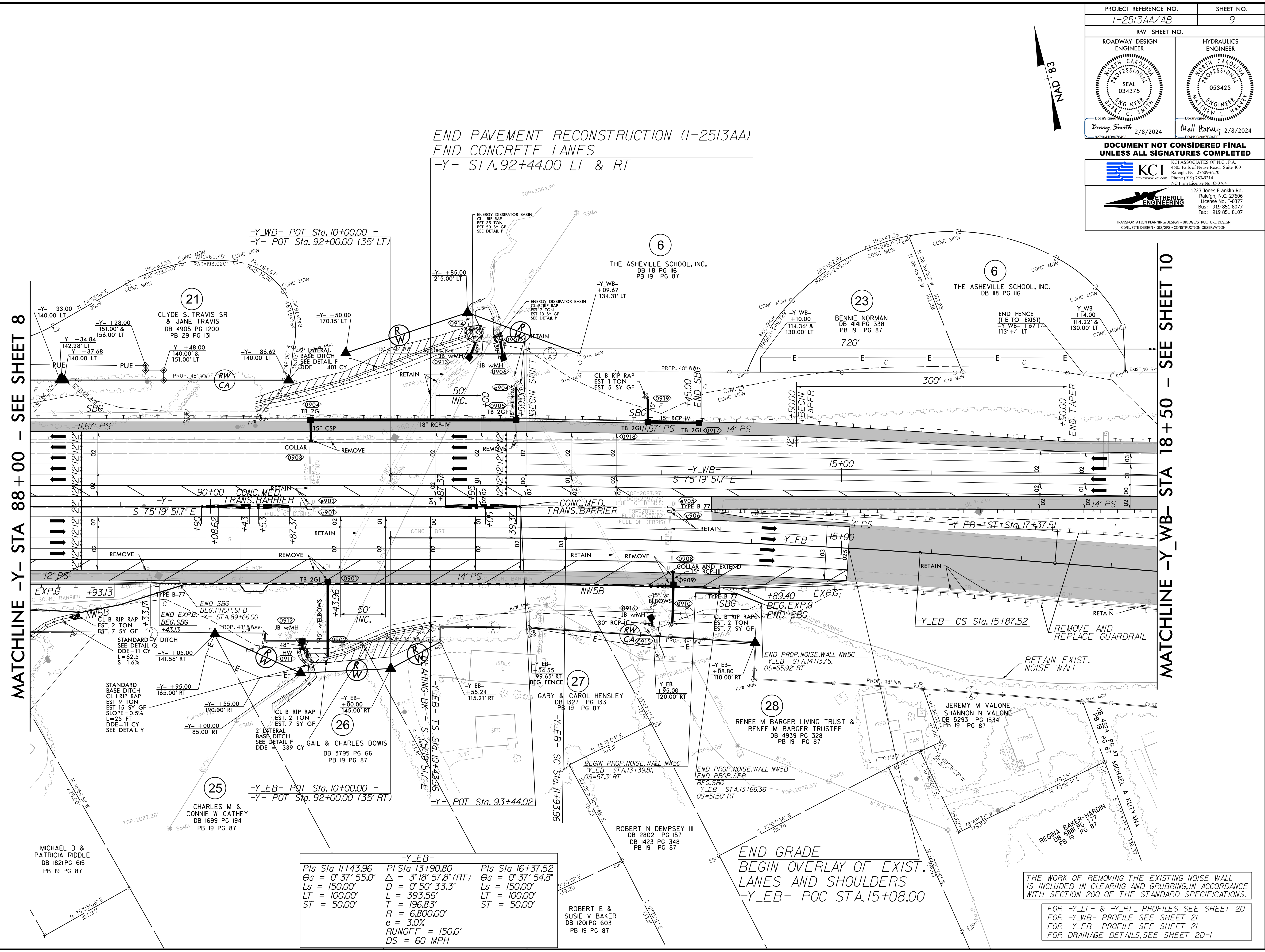
THE WORK OF REMOVING THE EXISTING NOISE WALL IS INCLUDED IN CLEARING AND GRUBBING IN ACCORDANCE WITH SECTION 200 OF THE STANDARD SPECIFICATIONS.

FOR -Y-LT- & -Y-RT- PROFILES SEE SHEET 19 FOR DRAINAGE DETAILS, SEE SHEET 2D-1

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PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 9	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER BARRY C SMITH SEAL 034375 2/8/2024		HYDRAULICS ENGINEER MATT HARRY SEAL 053425 2/8/2024	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
KCI KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noce Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 NC Firm License No. C-0764		ETHERILL ENGINEERING 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	

**END PAVEMENT RECONSTRUCTION (1-2513AA)
END CONCRETE LANES
-Y- STA.92+44.00 LT & RT**



MATCHLINE -Y- STA 88+00 - SEE SHEET 8

MATCHLINE -Y_WB- STA 18+50 - SEE SHEET 10

-Y_EB-

Pls Sta 11+43.96	Pl Sta 13+90.80	Pls Sta 16+37.52
Os = 0' 37' 55.0"	Δ = 3' 18' 57.8" (RT)	Os = 0' 37' 54.8"
Ls = 150.00'	D = 0' 50' 33.3"	Ls = 150.00'
LT = 100.00'	L = 393.56'	LT = 100.00'
ST = 50.00'	T = 196.83'	ST = 50.00'
	R = 6,800.00'	
	e = 3.0%	
	RUNOFF = 150.0'	
	DS = 60 MPH	

**END GRADE
BEGIN OVERLAY OF EXIST.
LANES AND SHOULDERS
-Y_EB- POC STA.15+08.00**

THE WORK OF REMOVING THE EXISTING NOISE WALL IS INCLUDED IN CLEARING AND GRUBBING, IN ACCORDANCE WITH SECTION 200 OF THE STANDARD SPECIFICATIONS.

FOR -Y_LT- & -Y_RT- PROFILES SEE SHEET 20
FOR -Y_WB- PROFILE SEE SHEET 21
FOR -Y_EB- PROFILE SEE SHEET 21
FOR DRAINAGE DETAILS, SEE SHEET 20-1

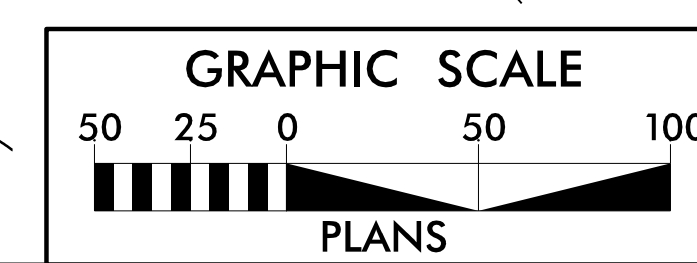
REVISIONS	

-Y_WB-		
Pis Sta 23+74.37	PI Sta 28+28.43	Pis Sta 31+93.29
Os = 5' 58" 05.5"	Δ = 13' 39" 51.0" (LT)	Os = 2' 51" 52.8"
Ls = 500.00'	D = 2' 23" 14.4"	Ls = 239.99'
LT = 333.52'	L = 67.643'	LT = 160.00'
ST = 166.84'	T = 287.58'	ST = 80.02'
	R = 2,400.00'	

-RPDB-		
Pis Sta 26+03.71	PI Sta 32+50.38	Pis Sta 38+51.86
Os = 3' 30" 00.0"	Δ = 39' 07" 06.9" (LT)	Os = 3' 30" 00.0"
Ls = 200.00'	D = 3' 30" 00.0"	Ls = 200.00'
LT = 133.36'	L = 114.82'	LT = 133.36'
ST = 66.69'	T = 590.00'	ST = 66.69'
	R = 1637.02'	e = EXIST.

-Y_EB-		
Pis Sta 36+12.71	PI Sta 47+49.64	Pis Sta 58+31.93
Os = 0' 42" 58.3"	Δ = 31' 26" 20.7" (LT)	Os = 0' 56" 39.7"
Ls = 150.00'	D = 1' 29" 17.5"	Ls = 159.99'
LT = 106.66'	L = 219.55'	LT = 150.00'
ST = 53.33'	T = 1083.60'	ST = 53.33'
	R = 3,850.00'	e = EXIST.

-RPC-					
Pis Sta 11+00.00	PI Sta 13+15.53	Pis Sta 15+30.97	Pis Sta 20+72.89	PI Sta 34+51.05	Pis Sta 41+68.46
Os = 0' 42" 58.3"	Δ = 3' 09" 38.0" (RT)	Os = 0' 42" 58.3"	Os = 0' 58" 40.0"	Δ = 32' 41" 04.5" (RT)	Os = 0' 56" 39.7"
Ls = 150.00'	D = 1' 11" 26.0"	Ls = 149.99'	D = 1' 15" 33.3"	D = 1' 15" 33.3"	Ls = 150.00'
LT = 100.00'	L = 330.97'	L = 130.97'	L = 100.00'	L = 2,595.57'	LT = 100.00'
T = 165.53'	T = 99.99'	ST = 50.00'	ST = 50.00'	R = 4,550.00'	ST = 50.00'
R = 6,000.00'					
e = 3.00'					
RUNOFF = 15.00'				RUNOFF = 20.00'	
OS = 60 MPH				OS = 60 MPH	



FOR -Y_WB- PROFILE SEE SHEET 2/ FOR -RPC- PROFILE SEE SHEET 2/ FOR DRAINAGE DETAILS SEE SHEETS 2D-1 TO 2D-4 FOR MEDIA FILTER BASINS SEE SHEETS 2D-5 TO 2D-6 FOR CULVERT SEE CULVERT PLANS C2

LOCATION:

TIP NO. COUNTY:

DESIGNED BY: DATE:

CHECKED BY: DATE:

PROJECT REFERENCE NO. 1-2513AA/AB SHEET NO. 10

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PROFESSIONAL SEAL 034375

PROFESSIONAL SEAL 053425

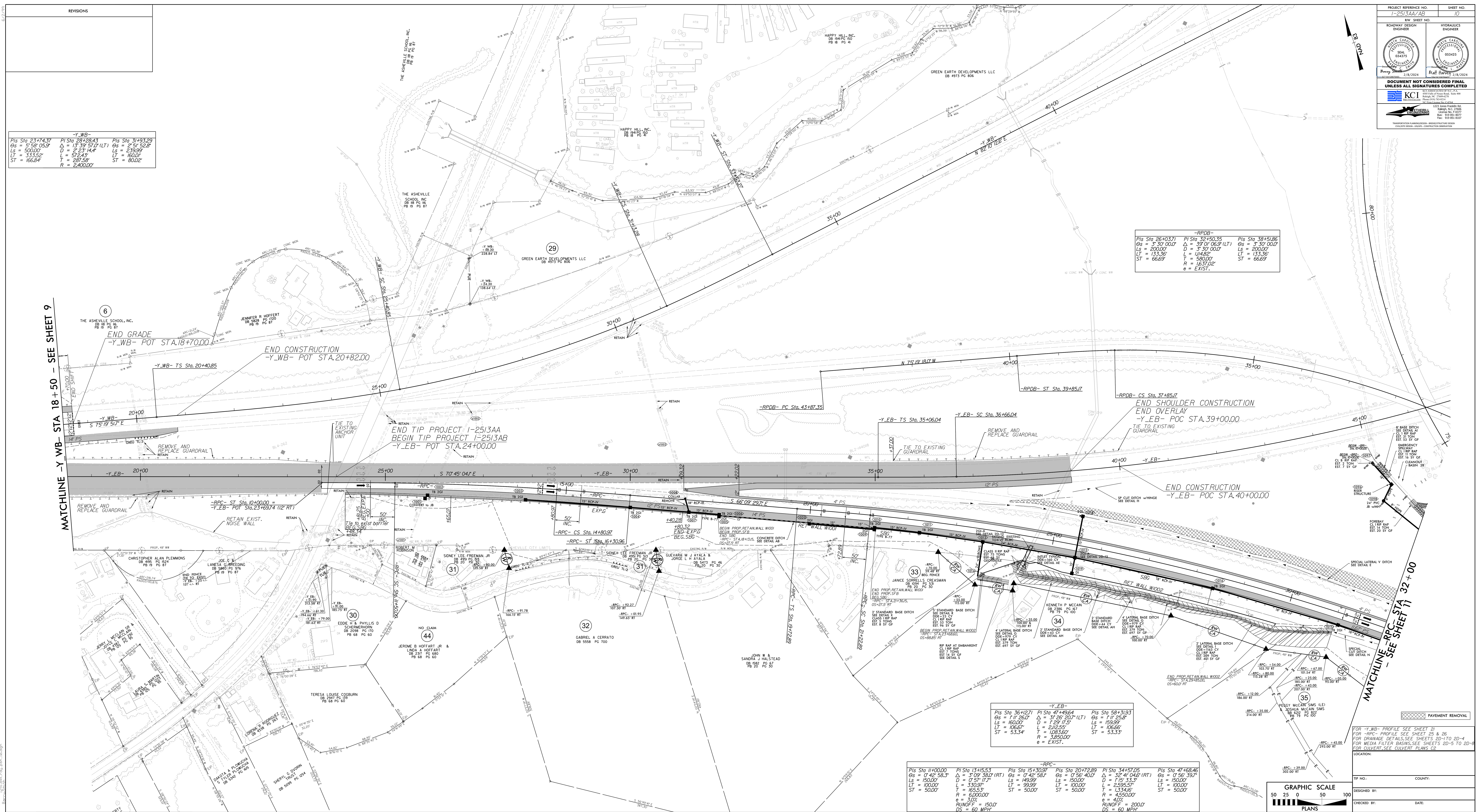
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCI

1223 Jones Farm Rd. Raleigh, NC 27605

PH: 919 851 8277

FAX: 919 851 8267



MATCHLINE -Y_WB- STA 18+50 - SEE SHEET 9

MATCHLINE -RPC- STA 32+00 - SEE SHEET 11

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-Y_EB-

PI Sta 50+80.91
$\Delta = 19^{\circ} 00' 54.7" (LT)$
$D = 1^{\circ} 29' 59.3"$
$L = 1,267.85'$
$T = 639.81'$
$R = 3,820.22'$
e = EXIST.

-RPDB-

PI Sta 21+60.54	PI Sta 23+33.75	PIs Sta 26+03.71	PI Sta 32+50.35
$\Delta = 0^{\circ} 39' 41.8" (LT)$	$\Delta = 0^{\circ} 39' 41.8" (RT)$	$\Theta_s = 3^{\circ} 30' 00.0"$	$\Delta = 39^{\circ} 01' 06.9" (LT)$
$D = 0^{\circ} 22' 55.1"$	$D = 0^{\circ} 22' 55.1"$	$L_s = 200.00'$	$D = 3^{\circ} 30' 00.0"$
$L = 173.21'$	$L = 173.21'$	$LT = 133.36'$	$L = 1,114.82'$
$T = 86.60'$	$T = 86.60'$	$ST = 66.69'$	$T = 580.00'$
$R = 15,000.00'$	$R = 15,000.00'$		$R = 1,637.02'$
e = EXIST.	e = EXIST.		e = EXIST.

-RPD-

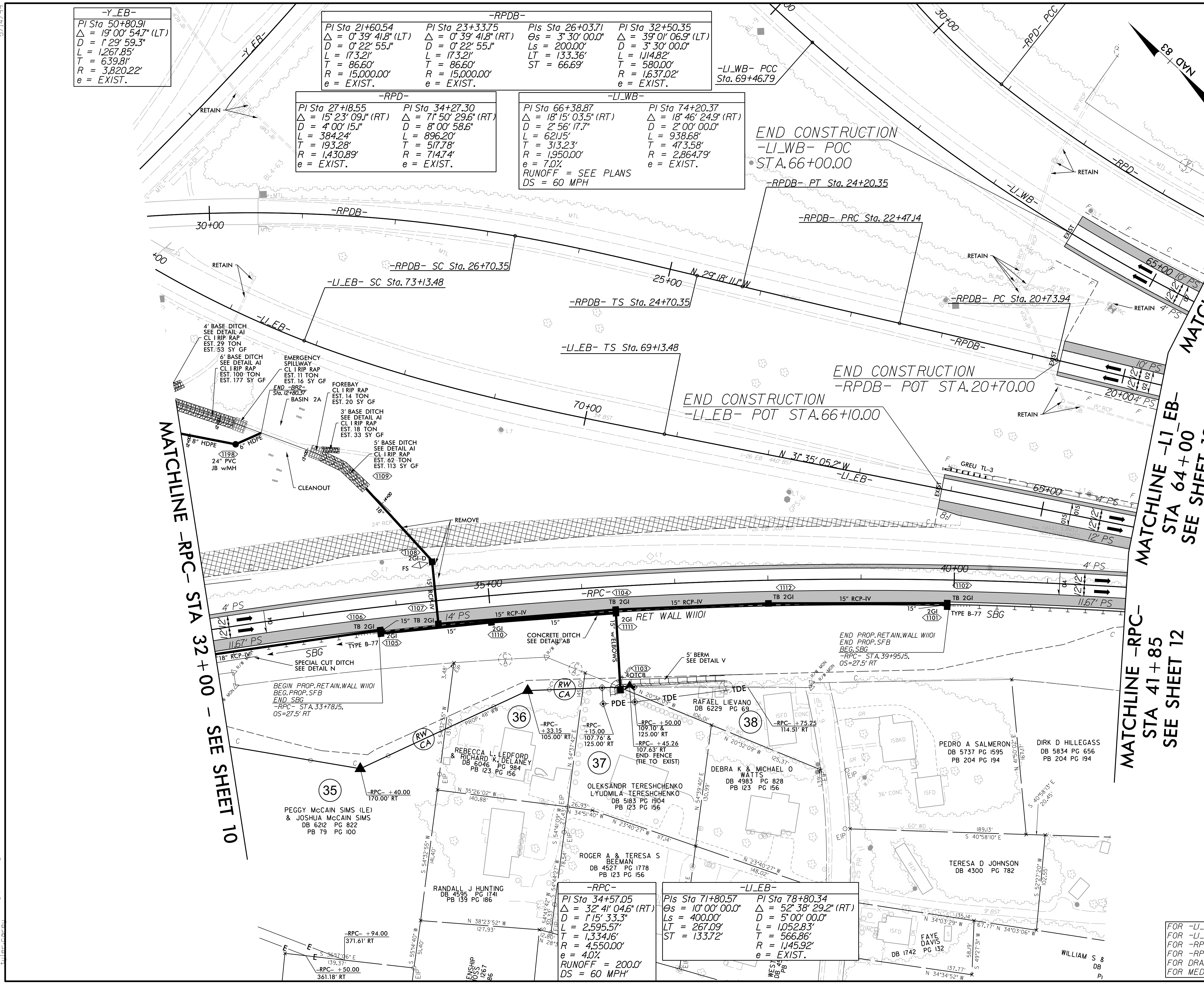
PI Sta 27+18.55	PI Sta 34+27.30
$\Delta = 15^{\circ} 23' 09.1" (RT)$	$\Delta = 7^{\circ} 50' 29.6" (RT)$
$D = 4^{\circ} 00' 15.1"$	$D = 8^{\circ} 00' 58.6"$
$L = 384.24'$	$L = 896.20'$
$T = 193.28'$	$T = 517.78'$
$R = 1,430.89'$	$R = 714.74'$
e = EXIST.	e = EXIST.

-LI_WB-

PI Sta 66+38.87	PI Sta 74+20.37
$\Delta = 18^{\circ} 15' 03.5" (RT)$	$\Delta = 18^{\circ} 46' 24.9" (RT)$
$D = 2^{\circ} 56' 17.7"$	$D = 2^{\circ} 00' 00.0"$
$L = 621.15'$	$L = 938.68'$
$T = 313.23'$	$T = 473.58'$
$R = 1,950.00'$	$R = 2,864.79'$
e = EXIST.	e = EXIST.

-LI_WB- PCC
Sta. 69+46.79

PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER BARRY C. SMITH SEAL 034375 2/8/2024	HYDRAULICS ENGINEER MATTHEW L. HALEY SEAL 053425 2/8/2024
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
ETHERILL ENGINEERING 1223 Jones Franklin Rd. Raleigh, N.C. 27606 Licenses No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	



12/1/2023 1-2513AA_rdy_psh_11.dgn

-RPC-

PI Sta 34+57.05
$\Delta = 32^{\circ} 41' 04.6" (RT)$
$D = 1^{\circ} 15' 33.3"$
$L = 2,595.57'$
$T = 1,334.16'$
$R = 4,550.00'$
e = 4.0'
RUNOFF = 200.0'
DS = 60 MPH

-LI_EB-

PIs Sta 71+80.57	PI Sta 78+80.34
$\Theta_s = 10^{\circ} 00' 00.0"$	$\Delta = 52^{\circ} 38' 29.2" (RT)$
$L_s = 400.00'$	$D = 5^{\circ} 00' 00.0"$
$LT = 267.09'$	$L = 1,052.83'$
$ST = 133.72'$	$T = 566.86'$
	$R = 1,145.92'$
	e = EXIST.

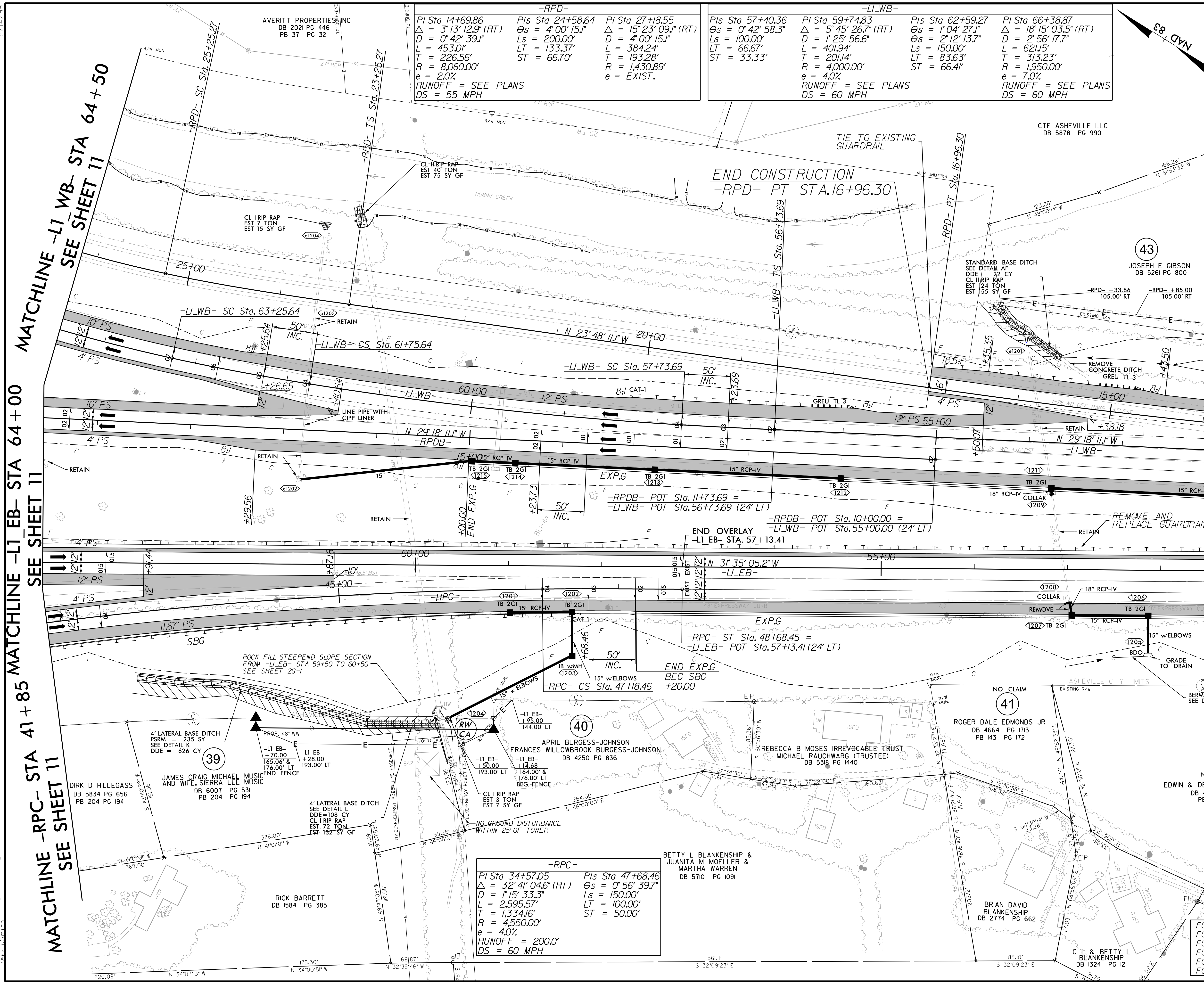
FOR -LI_EB- PROFILE SEE SHEET 28
 FOR -LI_WB- PROFILE SEE SHEET 29
 FOR -RPC- PROFILE SEE SHEET 26
 FOR -RPDB- PROFILE SEE SHEET 30
 FOR DRAINAGE DETAILS, SEE SHEETS 20-1 & 20-5
 FOR MEDIA FILTER BASINS, SEE SHEETS 20-5 TO 20-8



5/21/24

PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 12	
ROADWAY DESIGN ENGINEER BARRY C. SMITH SEAL 034375 DocuSign: Barry Smith 2/8/2024		HYDRAULICS ENGINEER MATT HANNEY SEAL 053425 DocuSign: Matt Hanney 2/8/2024	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
KCI KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noe Road, Suite 400 Raleigh, NC 27609-4270 Phone (919) 783-9914 NC Firm License No. C-0764		ETHERILL ENGINEERING 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-3377 Bus: 919 851 8077 Fax: 919 851 8107	

-RPD-			-LI-WB-			
PI Sta 14+69.86	PIs Sta 24+58.64	PI Sta 27+18.55	PIs Sta 57+40.36	PI Sta 59+74.83	PIs Sta 62+59.27	PI Sta 66+38.87
$\Delta = 3^{\circ}13'12.9"$ (RT)	$\Delta = 4^{\circ}00'15.1"$	$\Delta = 15^{\circ}23'09.1"$ (RT)	$\Delta = 0^{\circ}42'58.3"$	$\Delta = 5^{\circ}45'26.7"$ (RT)	$\Delta = 1^{\circ}04'27.1"$	$\Delta = 18^{\circ}15'03.5"$ (RT)
$D = 0^{\circ}42'39.1"$	$Ls = 200.00'$	$D = 4^{\circ}00'15.1"$	$Ls = 100.00'$	$D = 1^{\circ}25'56.6"$	$Ls = 212'13.7"$	$D = 2^{\circ}56'17.7"$
$L = 453.01'$	$LT = 133.37'$	$L = 384.24'$	$L = 66.67'$	$L = 401.94'$	$L = 150.00'$	$L = 621.15'$
$T = 226.56'$	$ST = 66.70'$	$T = 193.28'$	$ST = 33.33'$	$T = 201.4'$	$LT = 83.63'$	$T = 313.23'$
$R = 8,060.00'$		$R = 1,430.89'$		$R = 4,000.00'$	$ST = 66.41'$	$R = 1,950.00'$
$e = 2.0\%$		$e = EXIST.$		$e = 4.0\%$		$e = 7.0\%$
RUNOFF = SEE PLANS DS = 55 MPH			RUNOFF = SEE PLANS DS = 60 MPH			



MATCHLINE -LI-WB- STA 64+50 SEE SHEET 11

MATCHLINE -LI-EB- STA 64+00 SEE SHEET 11

MATCHLINE -RPC- STA 41+85 SEE SHEET 11

MATCHLINE -LI-EB- STA 50+00 - SEE SHEET 13

-RPC-	
PI Sta 34+57.05	PIs Sta 47+68.46
$\Delta = 32^{\circ}41'04.6"$ (RT)	$\Delta = 0^{\circ}56'39.7"$
$D = 1^{\circ}15'33.3"$	$Ls = 150.00'$
$L = 2,595.57'$	$LT = 100.00'$
$T = 1,334.16'$	$ST = 50.00'$
$R = 4,550.00'$	
$e = 4.0\%$	
RUNOFF = 200.0'	
DS = 60 MPH	

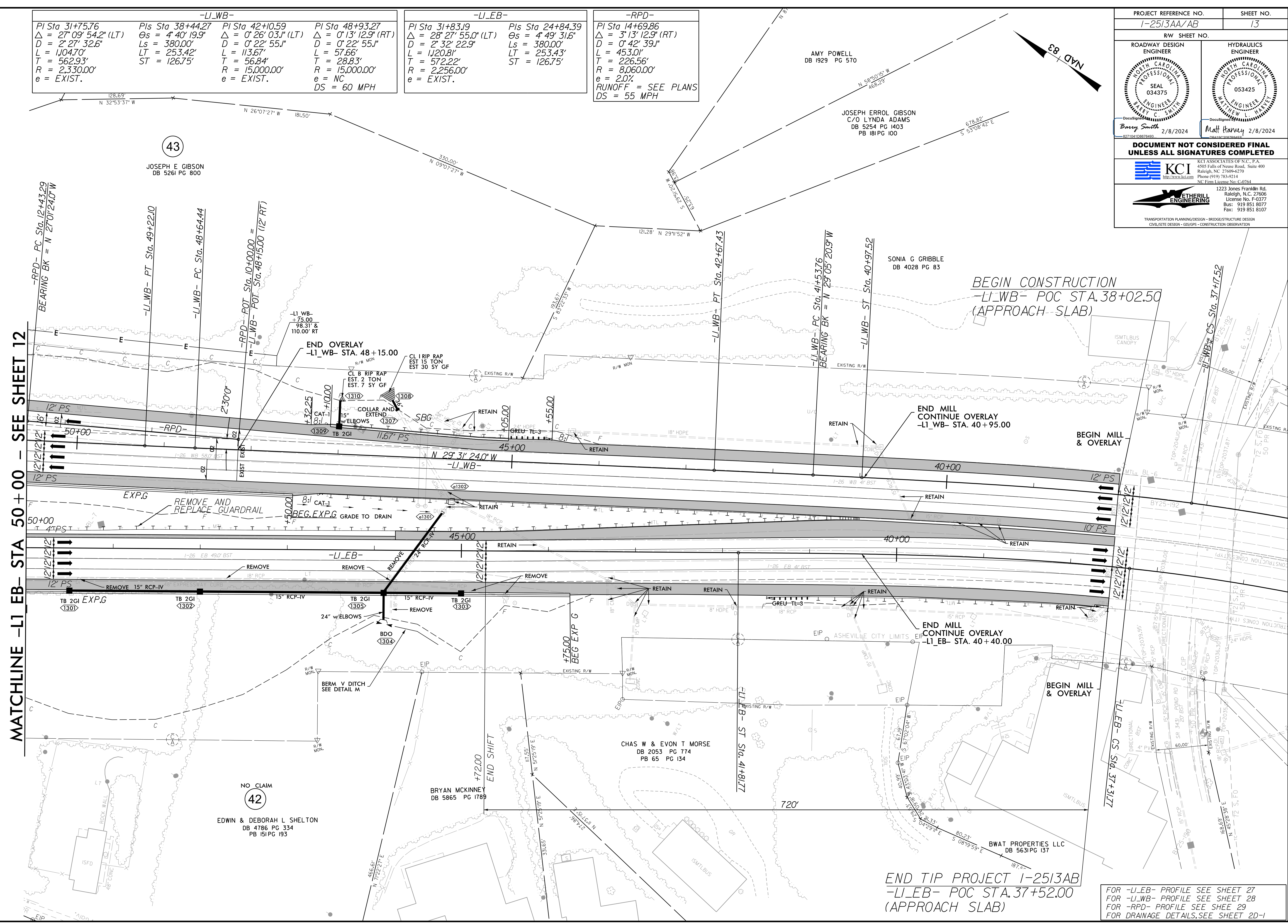
FOR -LI-EB- PROFILE SEE SHEET 27 & 28
 FOR -LI-WB- PROFILE SEE SHEET 28 & 29
 FOR -RPC- PROFILE SEE SHEET 26
 FOR -RPD- PROFILE SEE SHEET 29
 FOR -RPDB- PROFILE SEE SHEET 30
 FOR DRAINAGE DETAILS, SEE SHEET 2D-1

1/24/2024 1-2513AA-rdy_psh_12.dgn
Barry Smith

5/7/14/99

-LI_WB-				-LI_EB-		-RPD-	
PI Sta 31+75.76	PIs Sta 38+44.27	PI Sta 42+10.59	PI Sta 48+93.27	PI Sta 31+83.19	PIs Sta 24+84.39	PI Sta 14+69.86	
$\Delta = 27^{\circ}09'54.2"$ (LT)	$\Delta = 4^{\circ}40'19.9"$	$\Delta = 0^{\circ}26'03.1"$ (LT)	$\Delta = 0^{\circ}13'12.9"$ (RT)	$\Delta = 28^{\circ}27'55.0"$ (LT)	$\Delta = 4^{\circ}49'31.6"$	$\Delta = 3^{\circ}13'12.9"$ (RT)	
$D = 2^{\circ}27'32.6"$	$Ls = 380.00'$	$D = 0^{\circ}22'55.1"$	$D = 0^{\circ}22'55.1"$	$D = 2^{\circ}32'22.9"$	$Ls = 380.00'$	$D = 0^{\circ}42'39.1"$	
$L = 11047.0'$	$LT = 253.42'$	$L = 113.67'$	$L = 57.66'$	$L = 1120.81'$	$T = 253.43'$	$L = 453.01'$	
$T = 562.93'$	$ST = 126.75'$	$T = 56.84'$	$T = 28.83'$	$T = 572.22'$	$R = 15,000.00'$	$T = 226.56'$	
$R = 2,330.00'$		$R = 15,000.00'$	$R = 15,000.00'$	$R = 2,256.00'$	$e = EXIST.$	$R = 8,060.00'$	
$e = EXIST.$		$e = EXIST.$	$e = NC$	$e = EXIST.$	$DS = 60$ MPH	$e = 2.0\%$	
						$RUNOFF = SEE PLANS$	
						$DS = 55$ MPH	

PROJECT REFERENCE NO. I-2513AA/AB	SHEET NO. 13
ROADWAY DESIGN ENGINEER BARRY C SMITH NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034375 2/8/2024	HYDRAULICS ENGINEER MATT HARVEY NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053425 2/8/2024
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9314 NC Firm License No. C-0764	
ETHERILL ENGINEERING 1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-43377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION DESIGN/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	



MATCHLINE -LI_EB- STA 50+00 - SEE SHEET 12

12/1/2023
I-2513AA_rdy_psh_13.dgn
TULLER.CORP

43

NO CLAIM
42

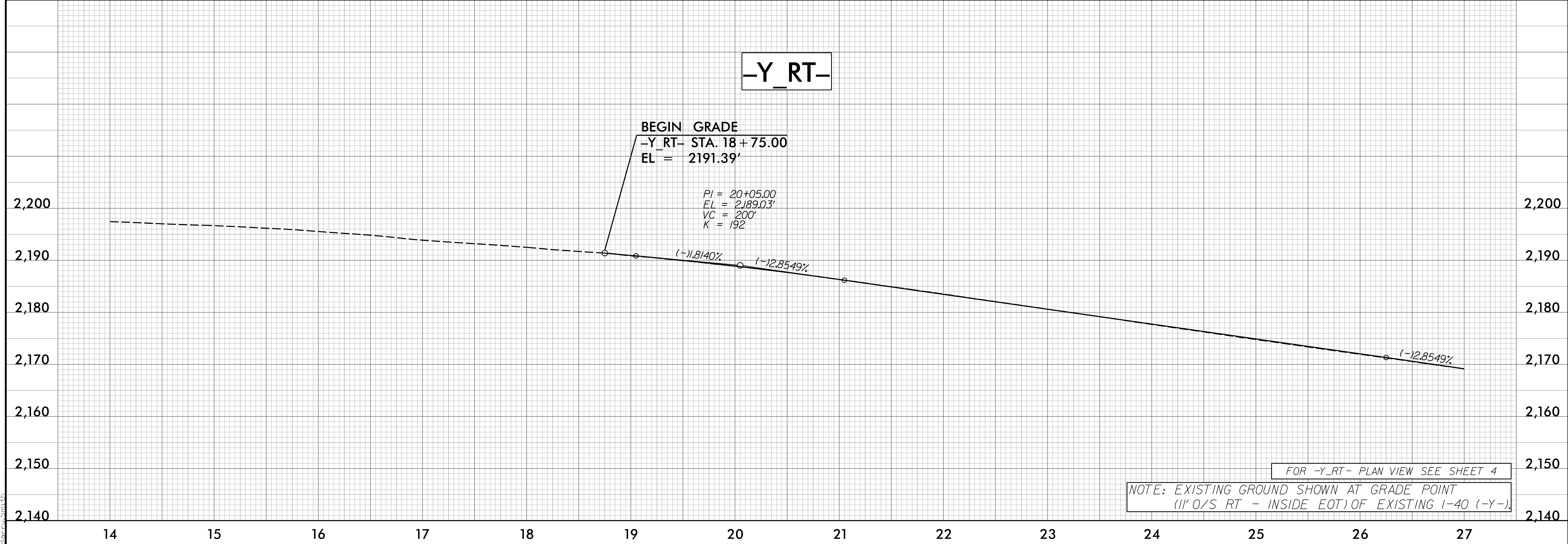
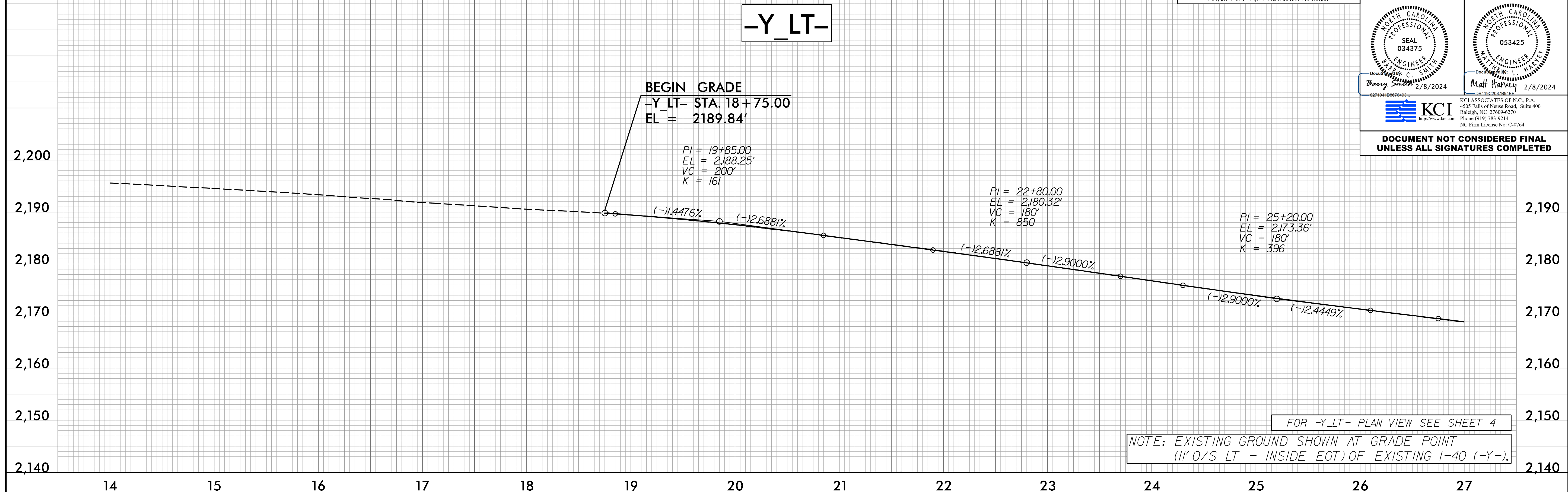
FOR -LI_EB- PROFILE SEE SHEET 27
FOR -LI_WB- PROFILE SEE SHEET 28
FOR -RPD- PROFILE SEE SHEET 29
FOR DRAINAGE DETAILS, SEE SHEET 20-1

5/28/24

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 Fax: 919 851 8107

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 CIVIL/SITE DESIGN • GIS/GPS • CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 14
ROADWAY DESIGN ENGINEER Barry Smith 2/8/2024	HYDRAULICS ENGINEER Matt Harvey 2/8/2024
 KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	
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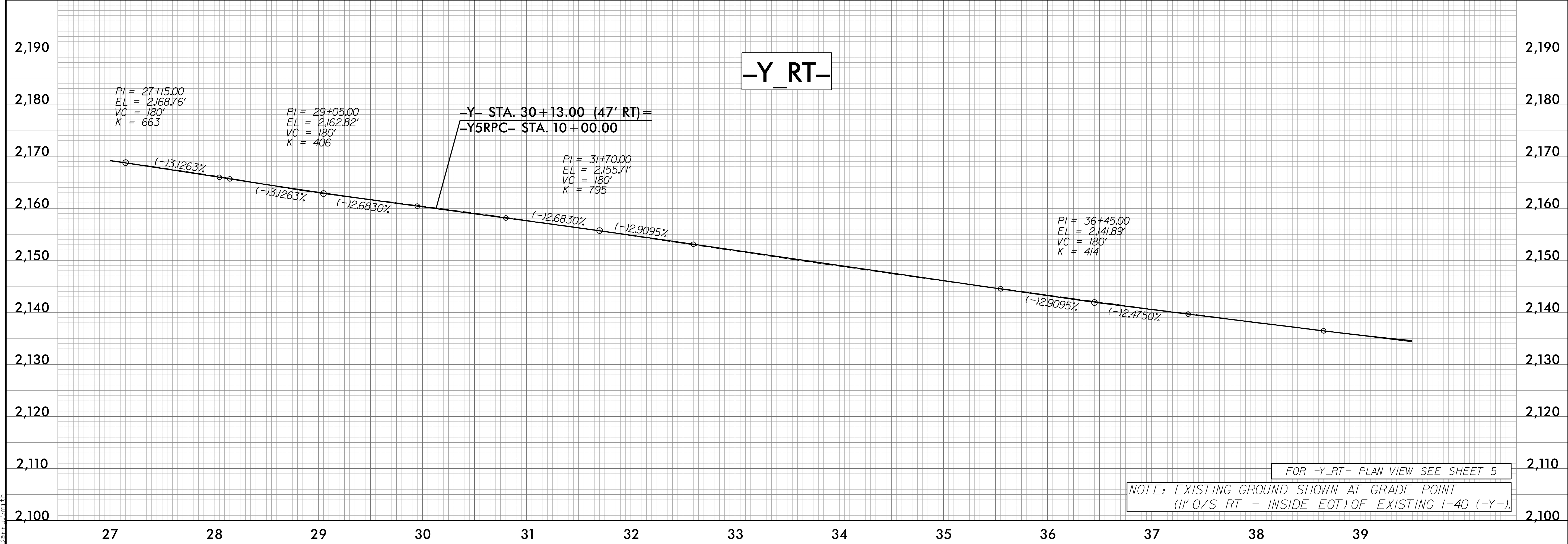
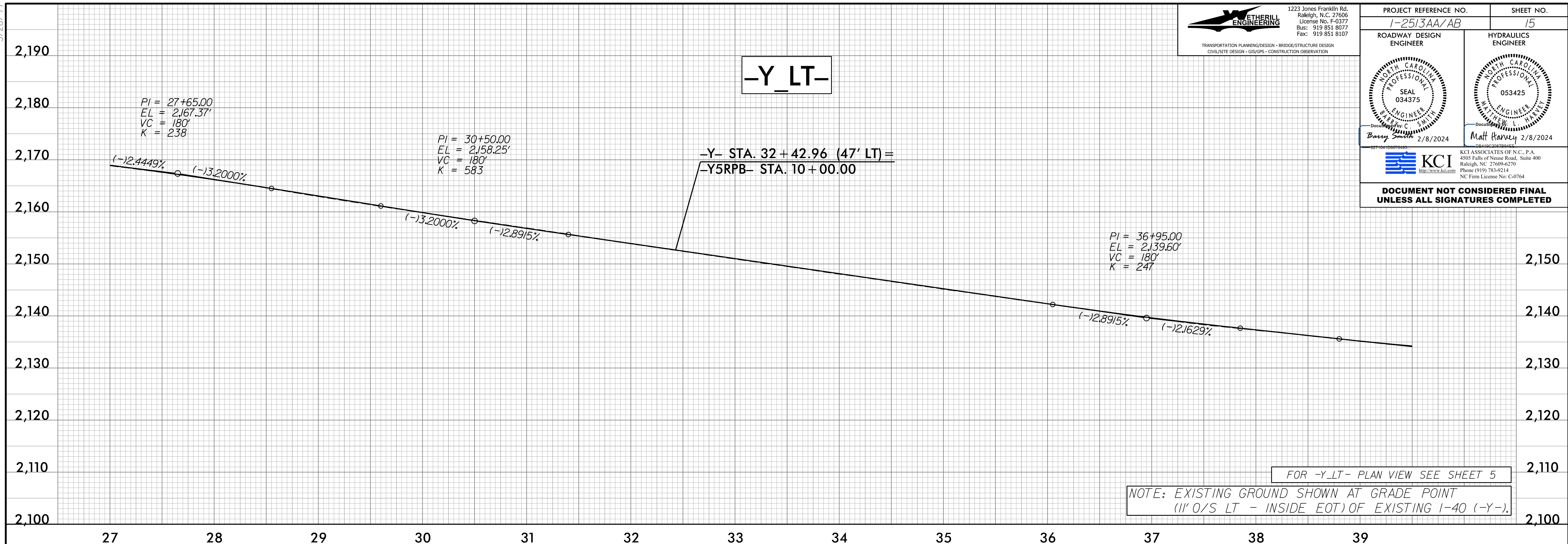
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Barry Smith

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 CIVIL/SITE DESIGN • GIS/GPS • CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 15
ROADWAY DESIGN ENGINEER BARRY SMITH	HYDRAULICS ENGINEER MATT HARVEY
DocuSign for C. Barry Smith 2/8/2024	DocuSign for L. Matt Harvey 2/8/2024
 KCI ASSOCIATES OF N.C., P.A. 4505 Falls of News Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 NC Firm License No. C-0764	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



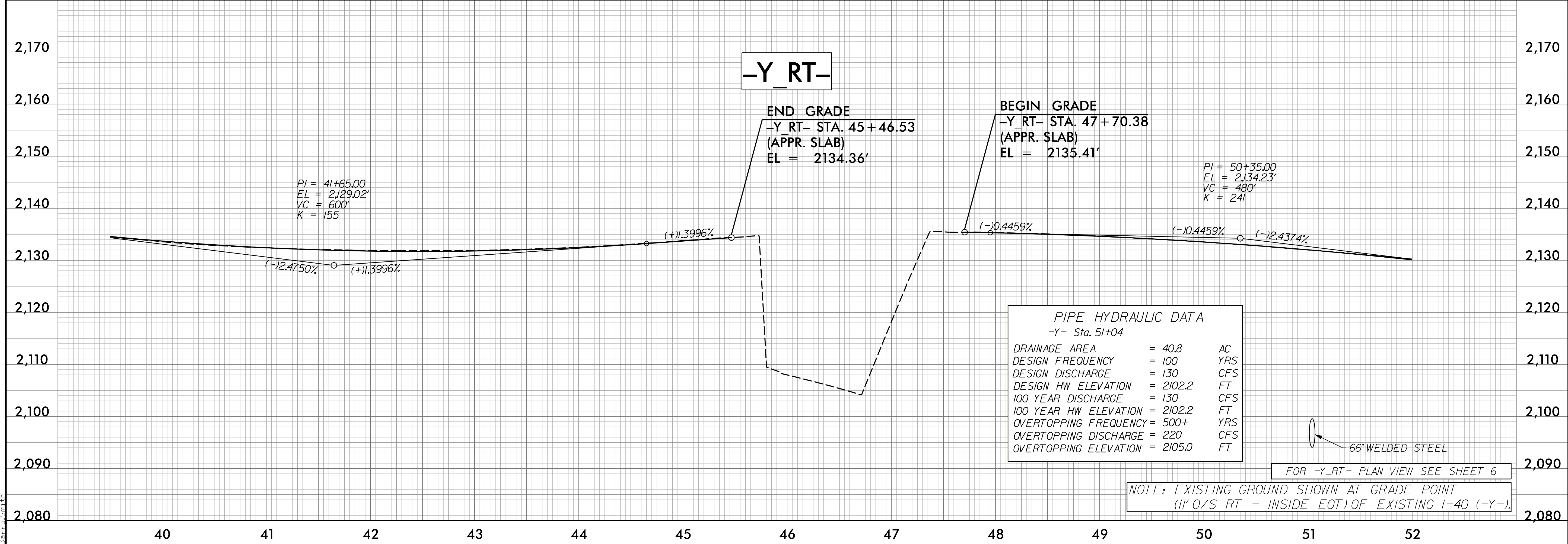
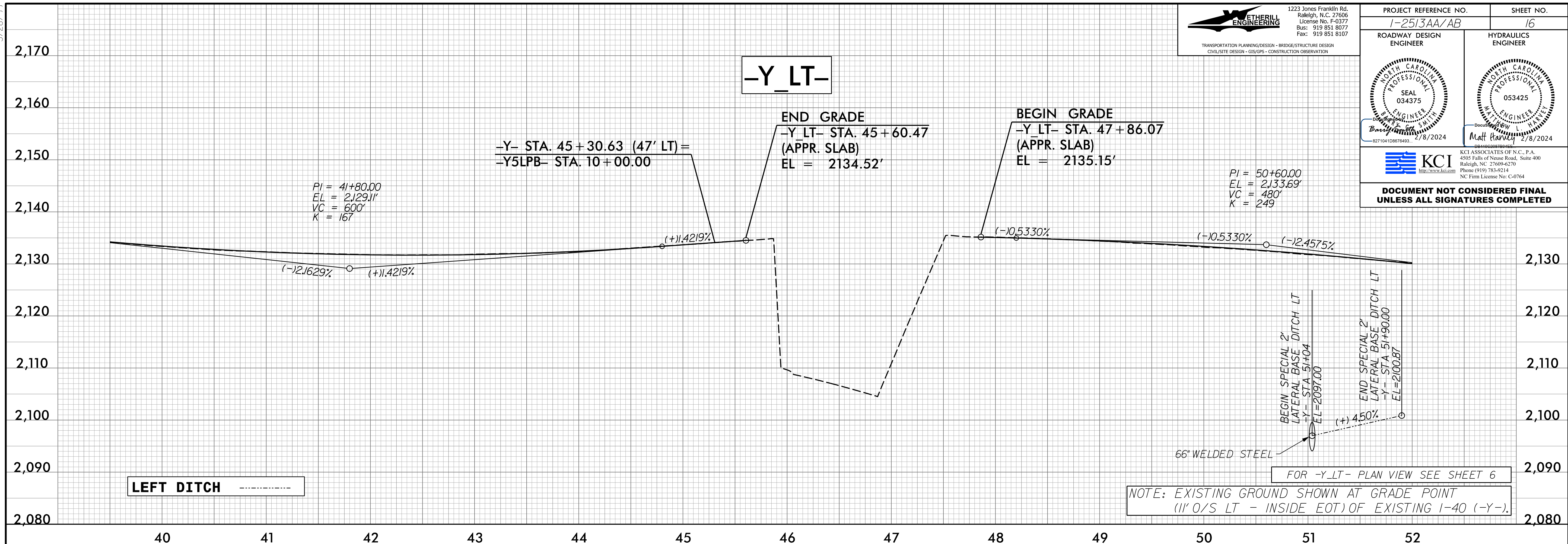
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2/8/2024
Barry Smith

5/28/24

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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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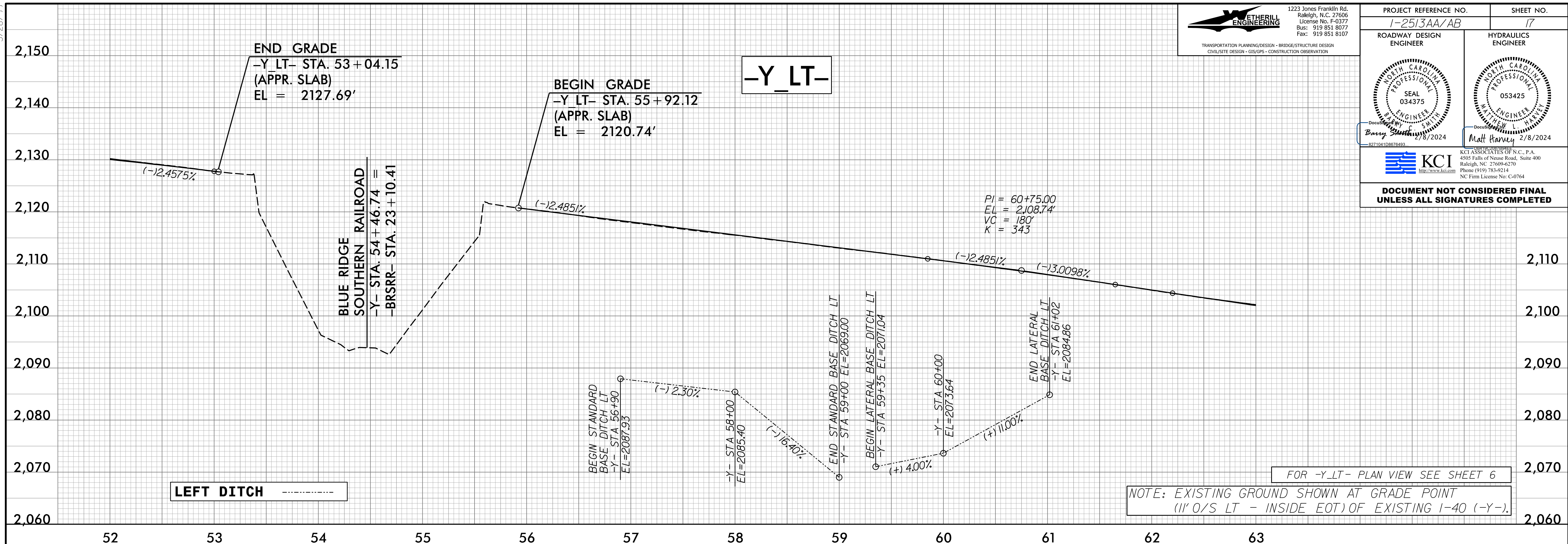
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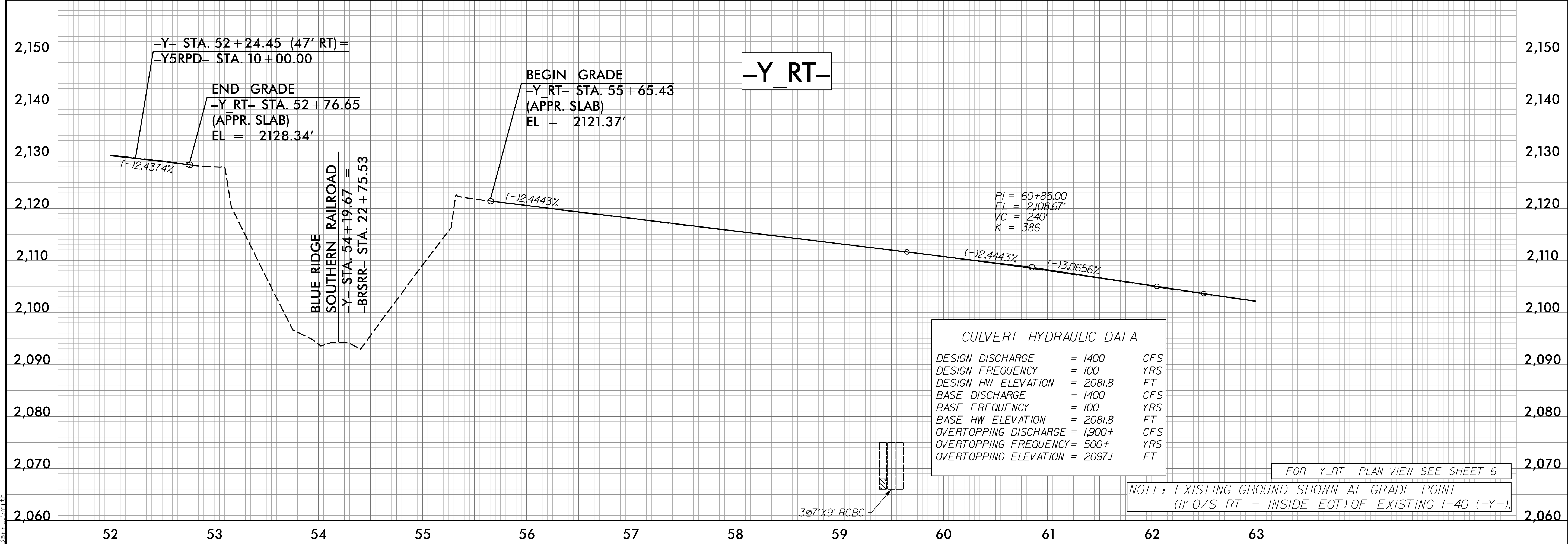
PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 17
ROADWAY DESIGN ENGINEER <i>Barry Smith</i> 2/8/2024	HYDRAULICS ENGINEER <i>Matt Harvey</i> 2/8/2024
 KCI <small>KCI ASSOCIATES OF N.C., P.A. 4505 Falls of News Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764</small>	

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FOR -Y LT- PLAN VIEW SEE SHEET 6

NOTE: EXISTING GROUND SHOWN AT GRADE POINT (I' O/S LT - INSIDE EOT) OF EXISTING I-40 (-Y-).



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1400	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 2081.8	FT
BASE DISCHARGE	= 1400	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2081.8	FT
OVERTOPPING DISCHARGE	= 1900+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2097.1	FT

FOR -Y RT- PLAN VIEW SEE SHEET 6

NOTE: EXISTING GROUND SHOWN AT GRADE POINT (I' O/S RT - INSIDE EOT) OF EXISTING I-40 (-Y-).

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5/28/24

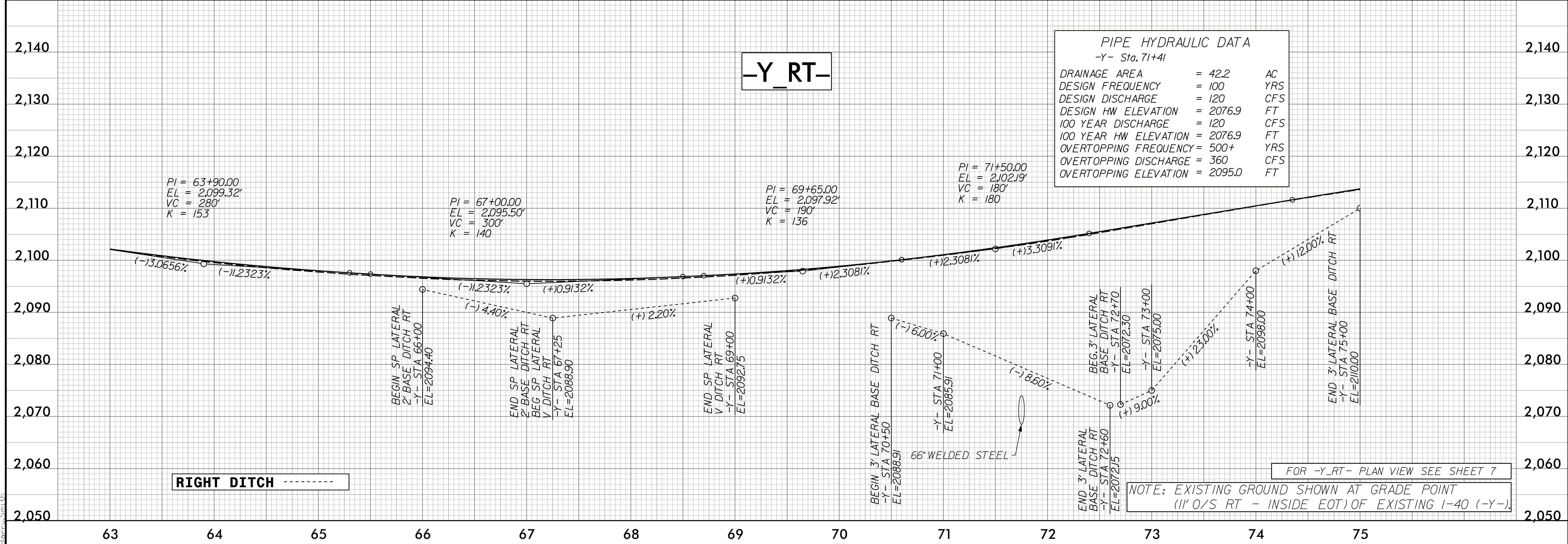
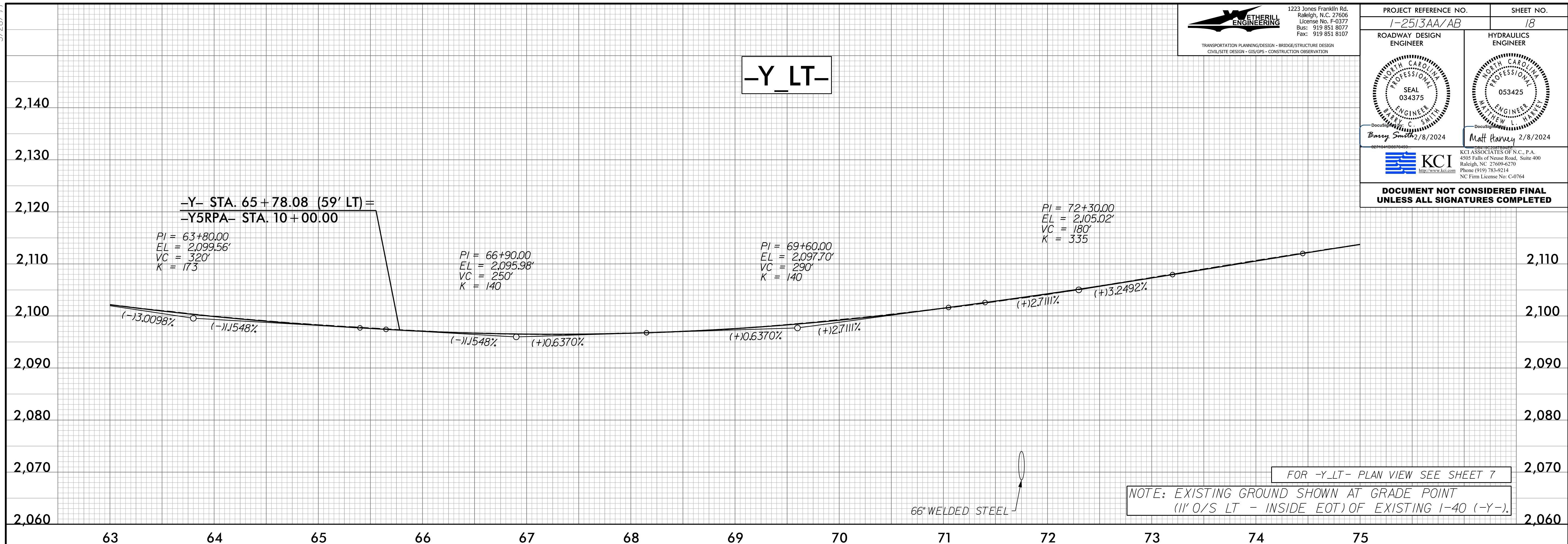
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 Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN • BRIDGE/STRUCTURE DESIGN
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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 18
ROADWAY DESIGN ENGINEER BARRY C SMITH SEAL 034375 DocuSign Barry Smith 2/8/2024	HYDRAULICS ENGINEER MATT HARVEY SEAL 053425 DocuSign Matt Harvey 2/8/2024

KCI KCI ASSOCIATES OF N.C., P.A.
 4905 Falls of Neuse Road, Suite 400
 Raleigh, NC 27609-6370
 Phone (919) 783-9214
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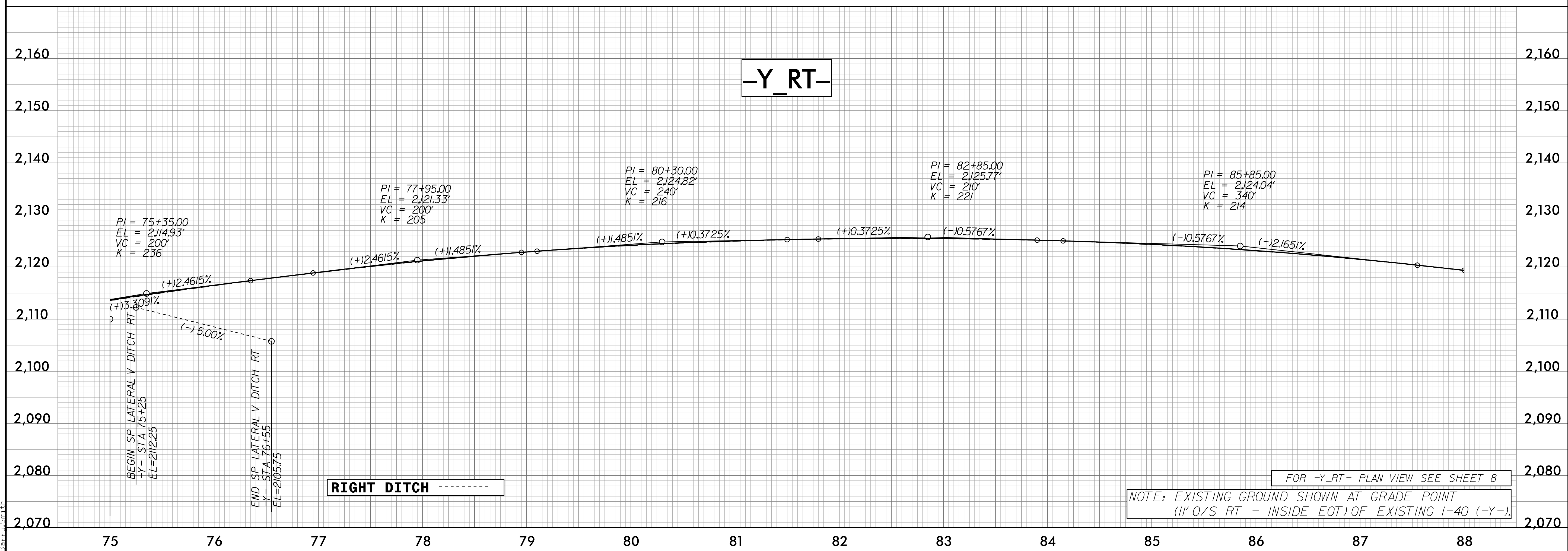
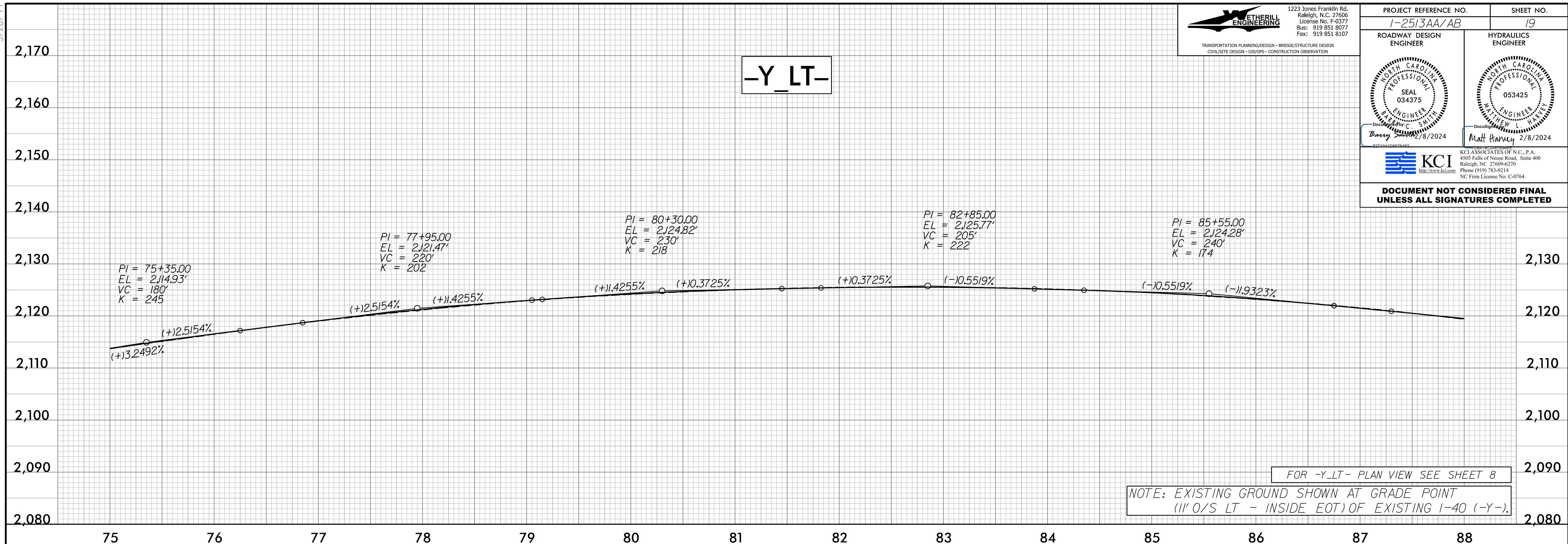
1/25/2023 du-pfl_18.dgn
Barry C Smith

5/28/24

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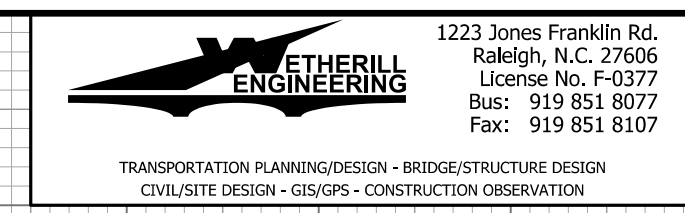
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PROJECT REFERENCE NO. I-25/3AA/AB	SHEET NO. 19
ROADWAY DESIGN ENGINEER BARRY SWANN 2/8/2024	HYDRAULICS ENGINEER MATT HARVEY 2/8/2024
 KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

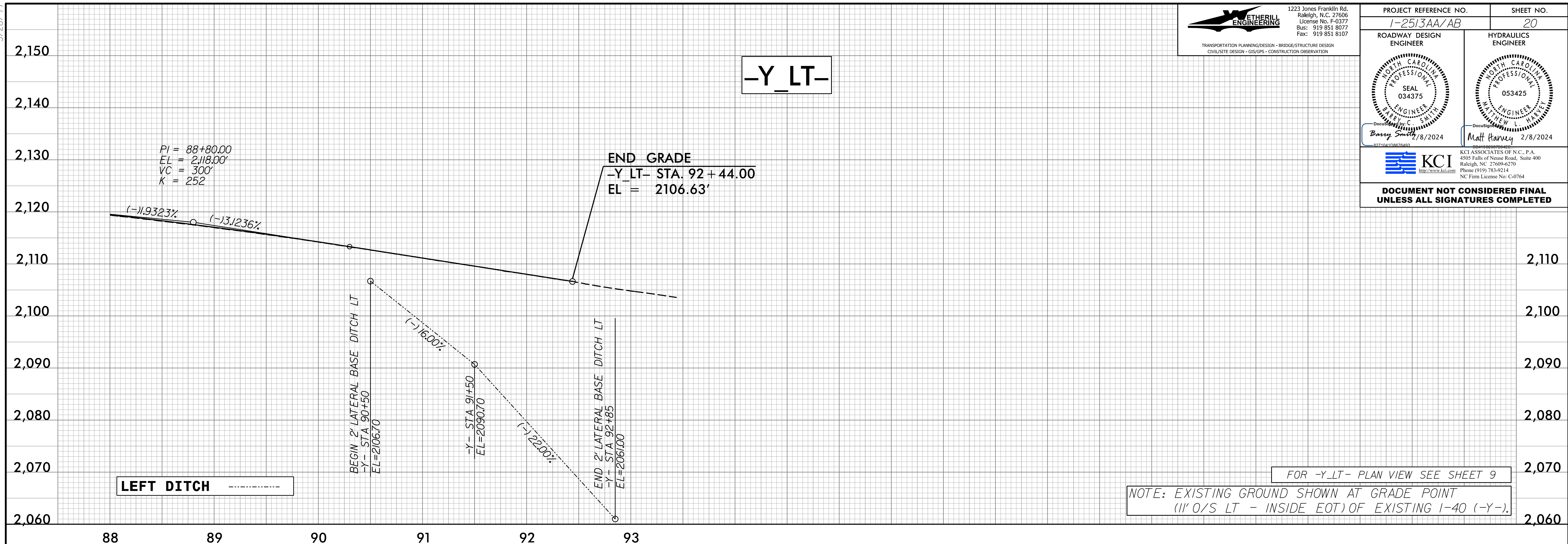


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5/28/24



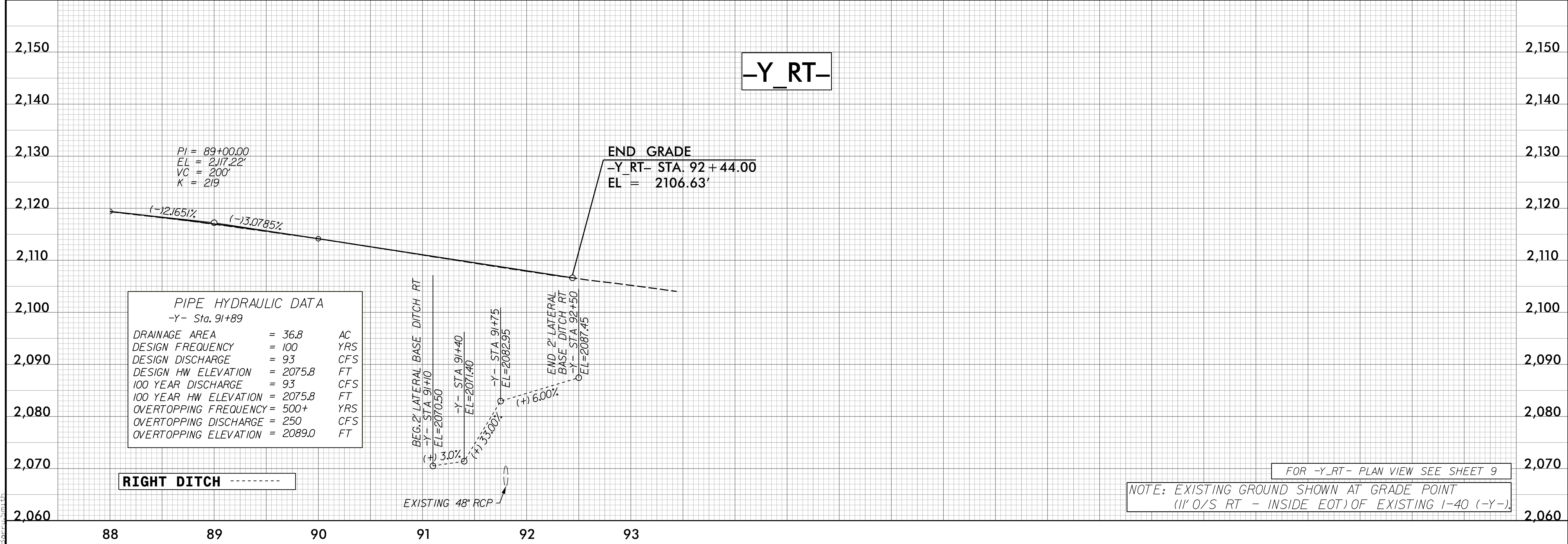
PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 20
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 	
DocuSign Barry C. Smith 8/28/2024	DocuSign Matt Haney 2/8/2024	
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LEFT DITCH -----

FOR -Y_LT- PLAN VIEW SEE SHEET 9

NOTE: EXISTING GROUND SHOWN AT GRADE POINT (11' O/S LT - INSIDE EOT) OF EXISTING I-40 (-Y-).



PIPE HYDRAULIC DATA
-Y- Sta. 91+89

DRAINAGE AREA	= 36.8	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 93	CFS
DESIGN HW ELEVATION	= 2075.8	FT
100 YEAR DISCHARGE	= 93	CFS
100 YEAR HW ELEVATION	= 2075.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 250	CFS
OVERTOPPING ELEVATION	= 2089.0	FT

RIGHT DITCH -----

FOR -Y_RT- PLAN VIEW SEE SHEET 9

NOTE: EXISTING GROUND SHOWN AT GRADE POINT (11' O/S RT - INSIDE EOT) OF EXISTING I-40 (-Y-).

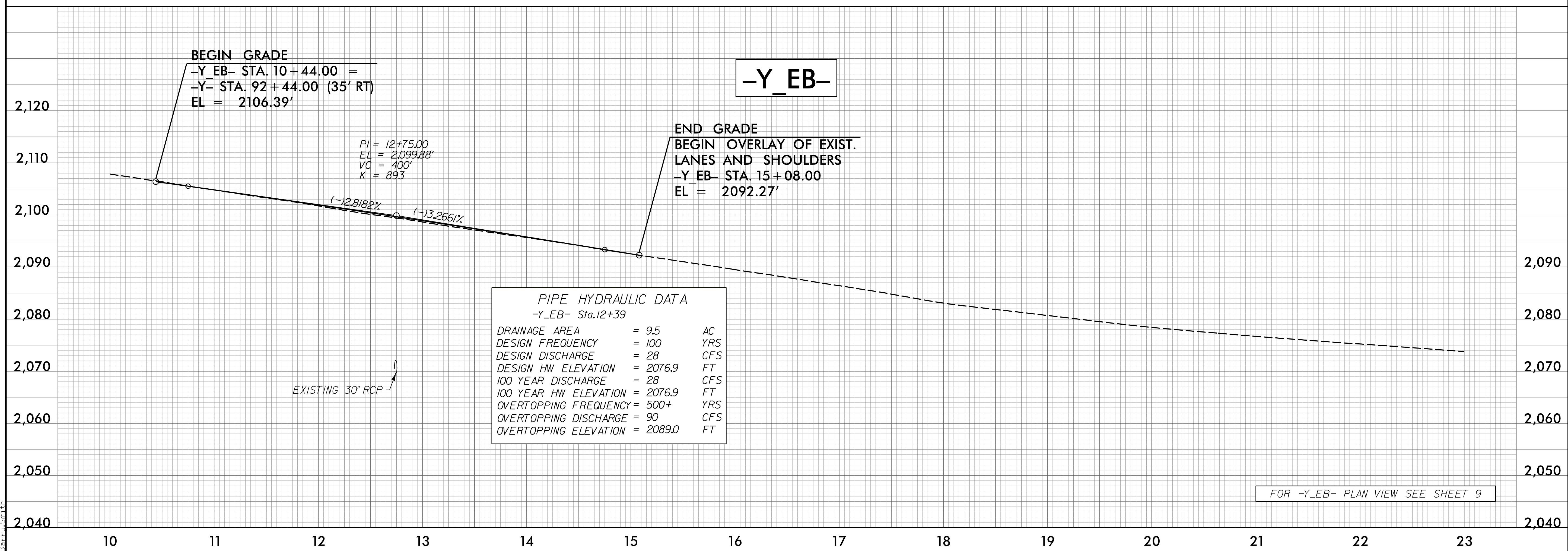
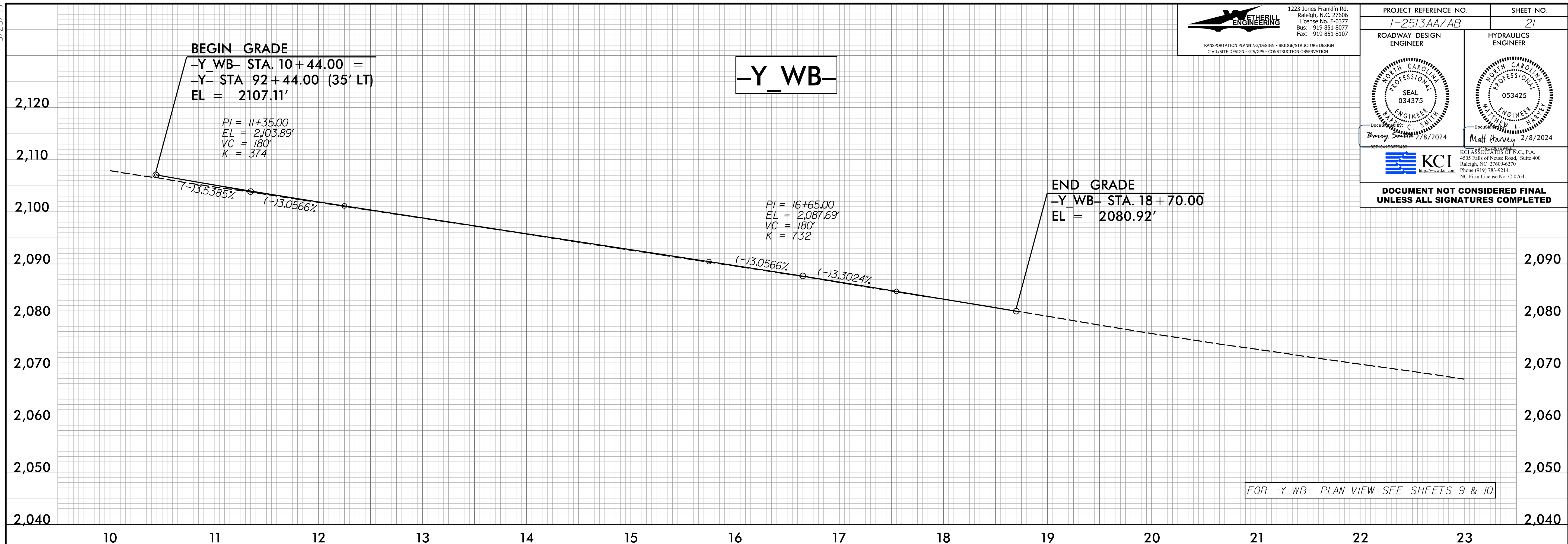
9/5/2023 12:56:26 PM pfl_20.dgn Barry C. Smith

5/28/24

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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 21
ROADWAY DESIGN ENGINEER <i>Barry Smith</i> 2/8/2024	HYDRAULICS ENGINEER <i>Matt Hanvey</i> 2/8/2024
 KCI <small>KCI ASSOCIATES OF N.C., P.A. 4503 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764</small>	
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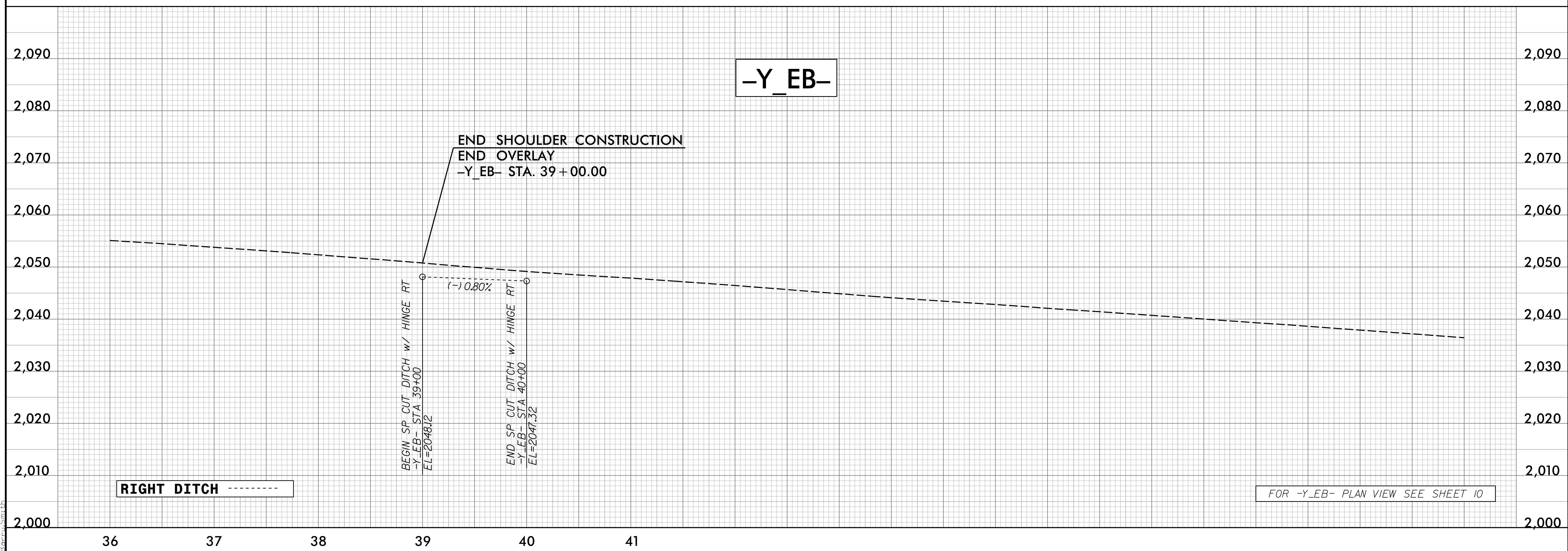
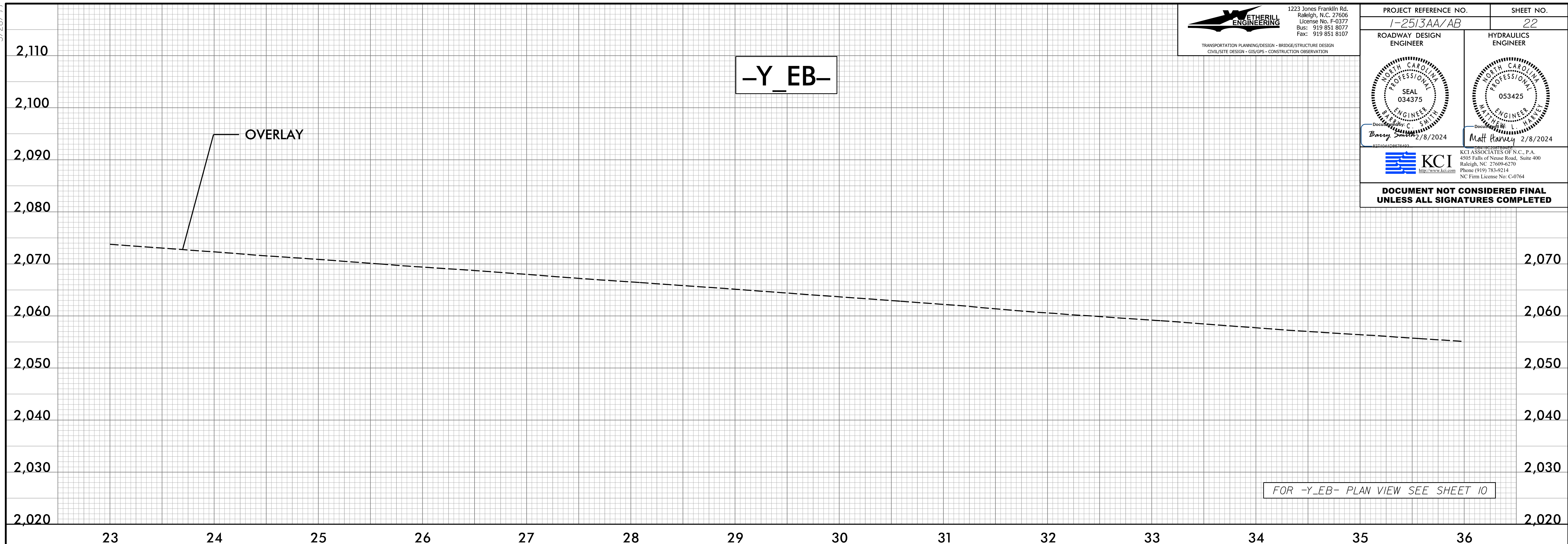
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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Barry Smith 2/8/2024	Matt Kanvey 2/8/2024
 KCI <small>KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



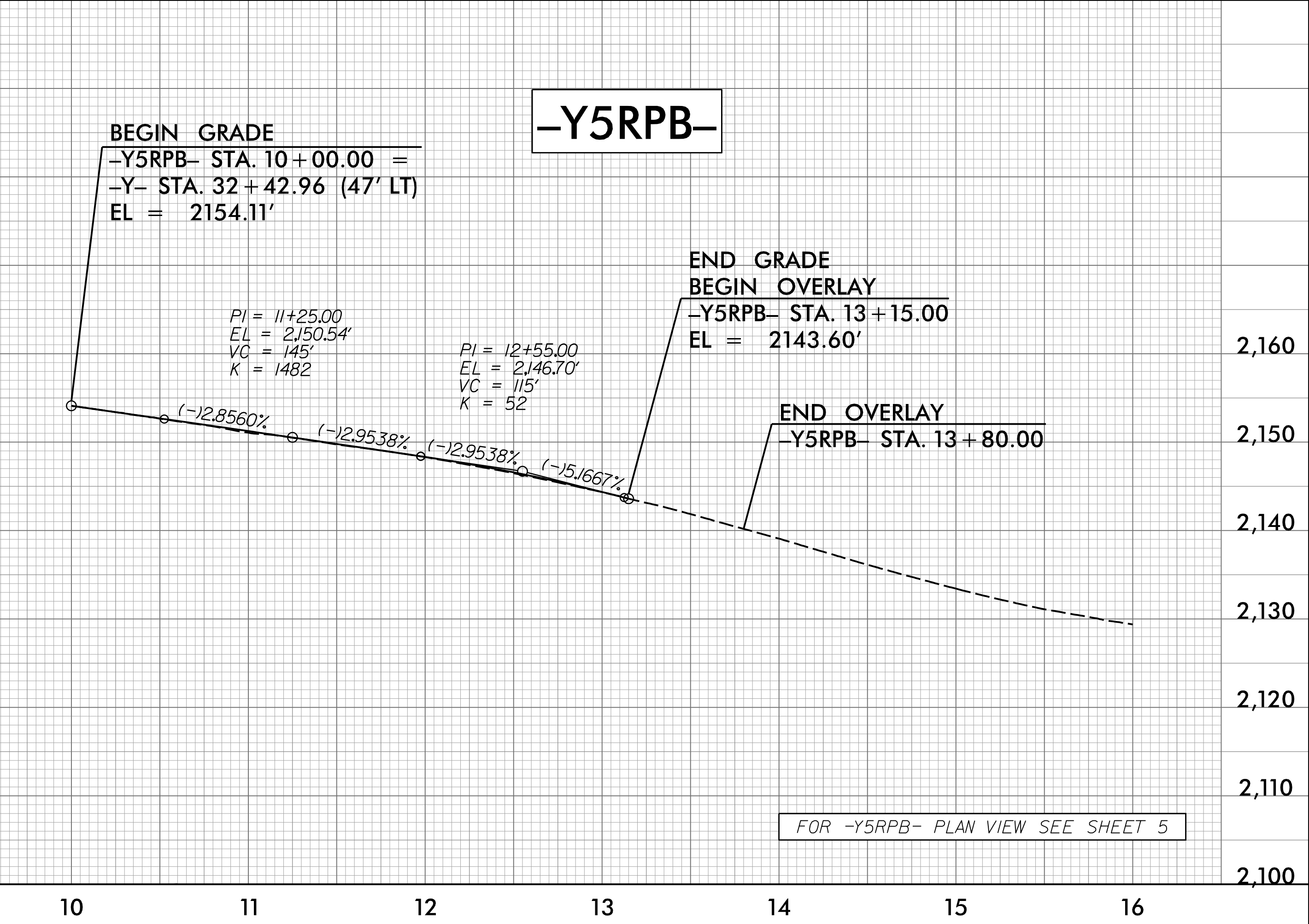
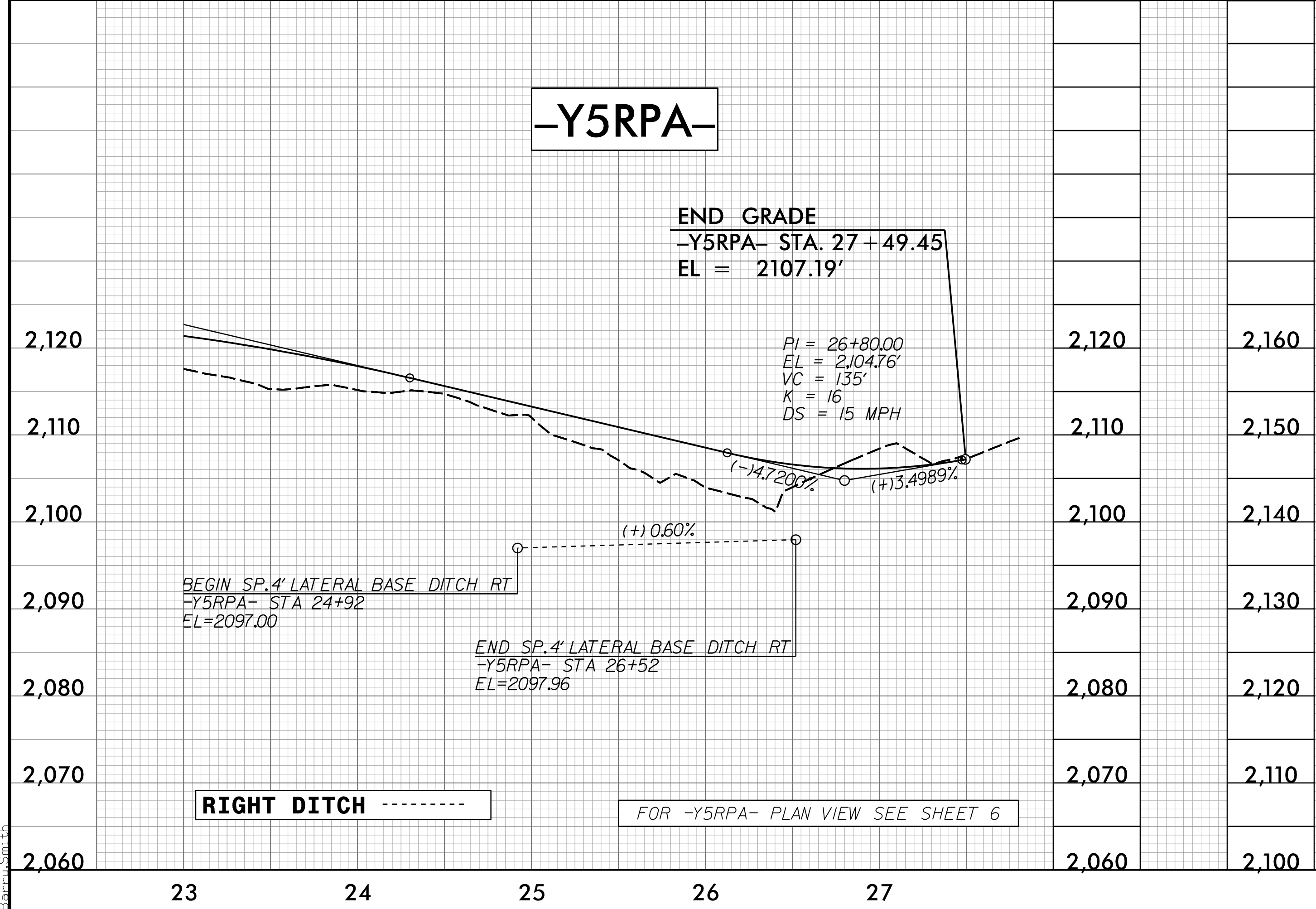
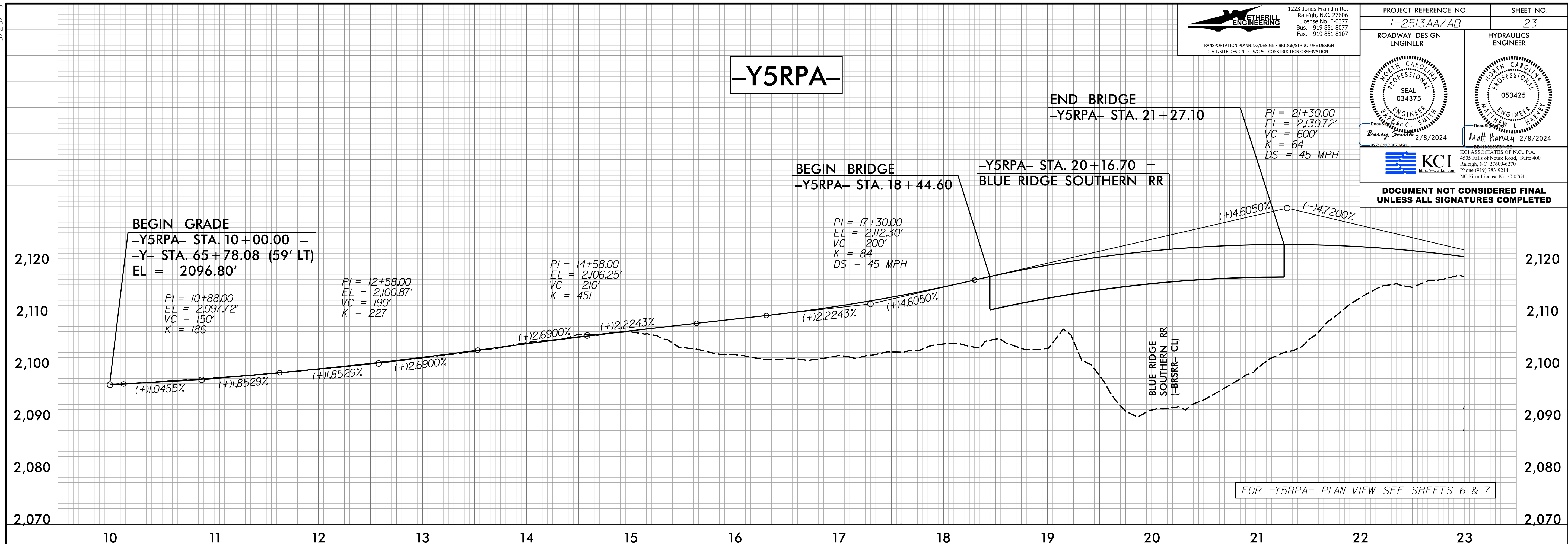
9/5/2023
12:51:30
Barry Smith

5/28/24

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 Raleigh, N.C. 27606
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 Fax: 919 851 8107

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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 23
ROADWAY DESIGN ENGINEER Barry Smith 2/8/2024	HYDRAULICS ENGINEER Matt Harvey 2/8/2024
 KCI ASSOCIATES OF N.C., P.A. 4905 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	


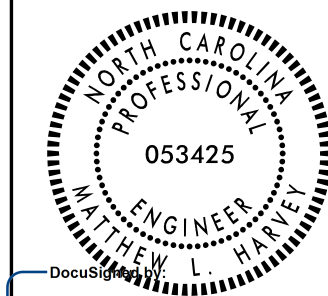



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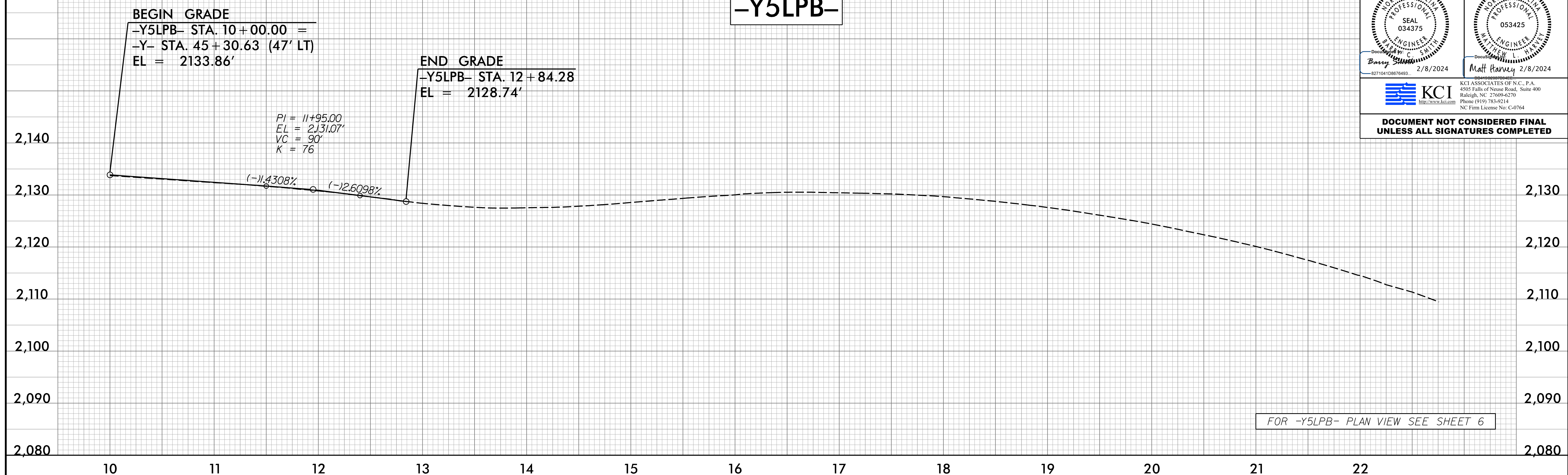
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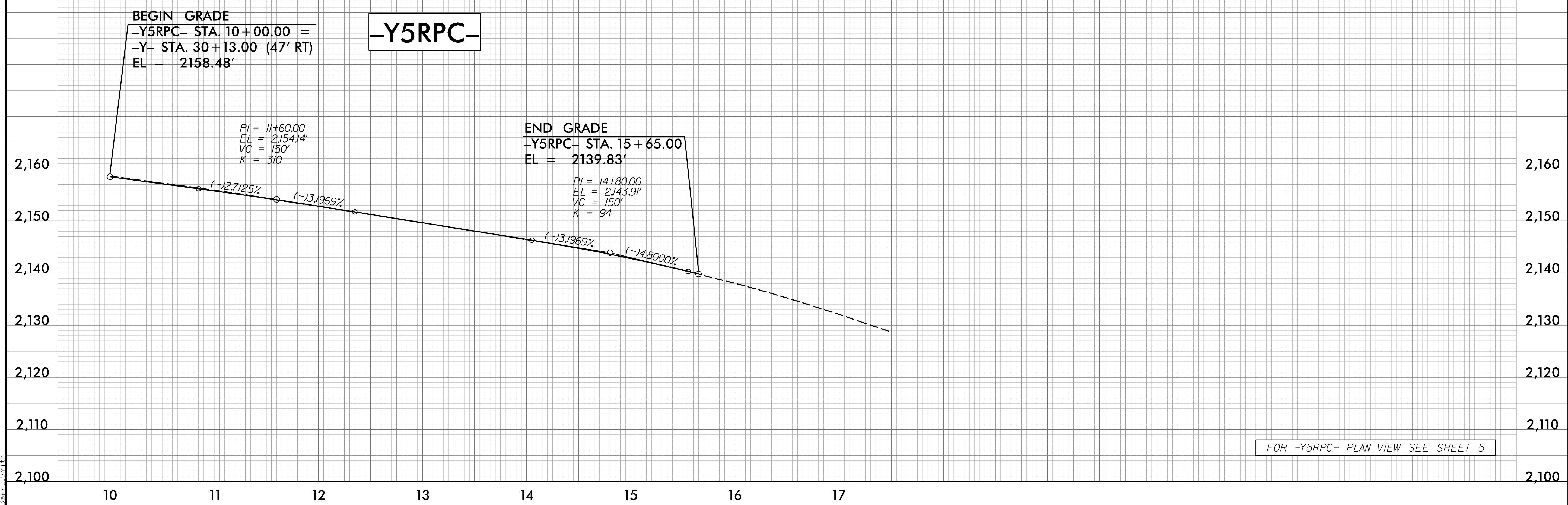
TRANSPORTATION PLANNING/DESIGN • BRIDGE/STRUCTURE DESIGN
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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 24
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
DocuSign Barry Smith 2/8/2024	DocuSign Matt Harvey 2/8/2024
 KCI <small>KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764</small>	
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-Y5LPB-



-Y5RPC-



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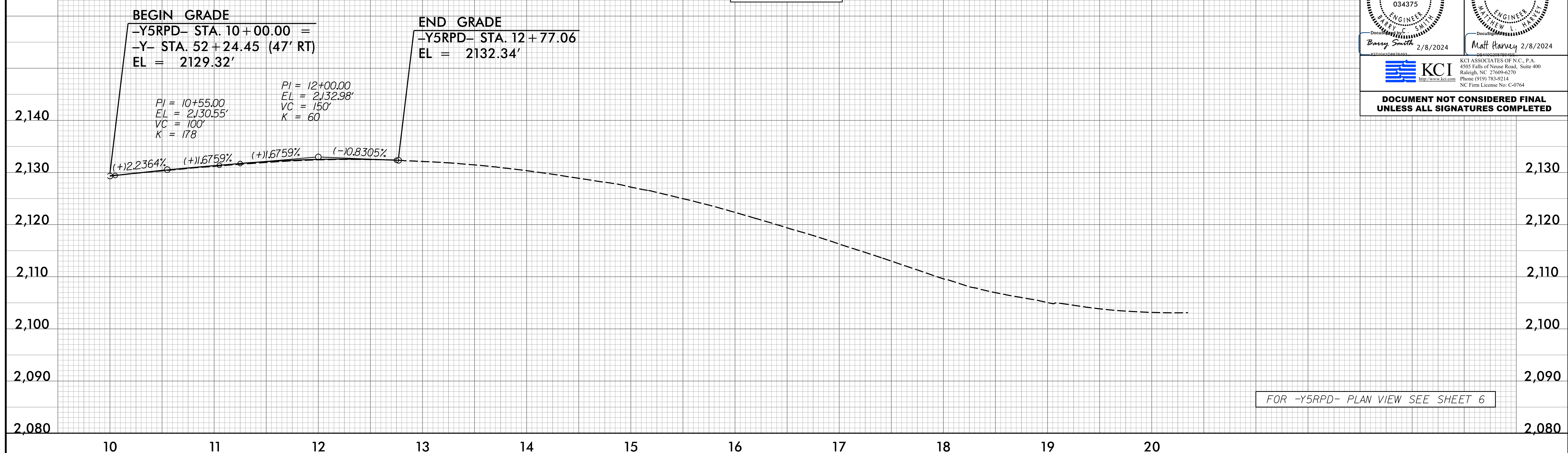
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 Fax: 919 851 8107

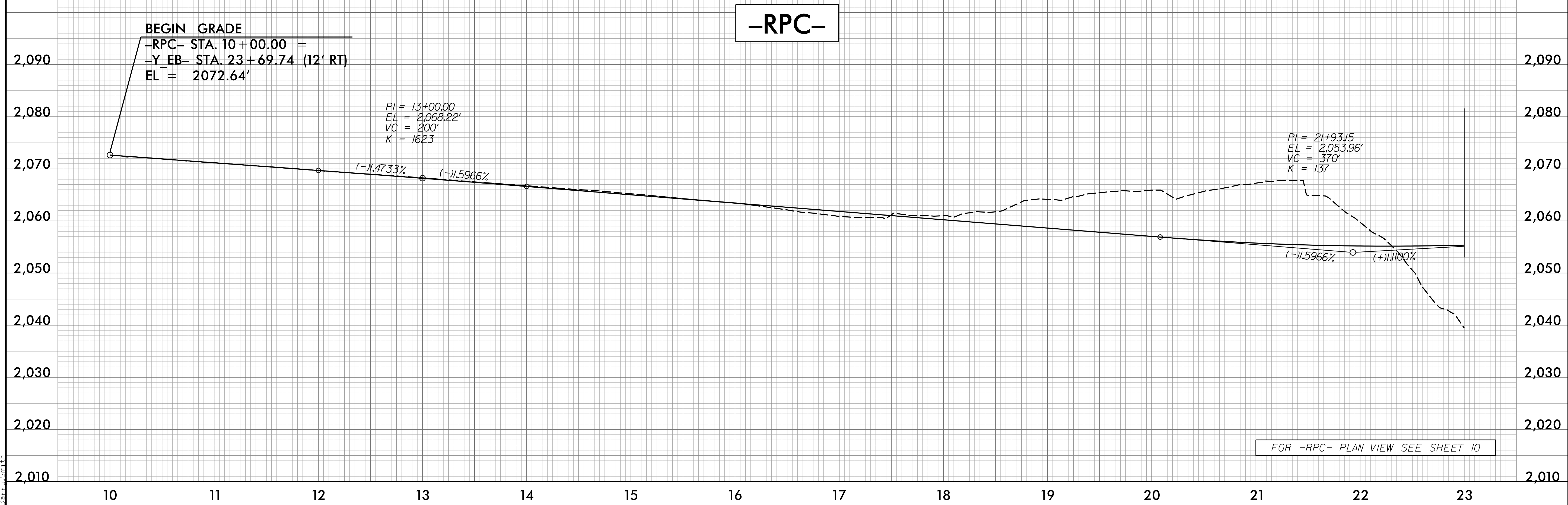
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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 25
ROADWAY DESIGN ENGINEER Barry Smith 2/8/2024	HYDRAULICS ENGINEER Matt Harvey 2/8/2024
 KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noe Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	
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-Y5RPD-



-RPC-



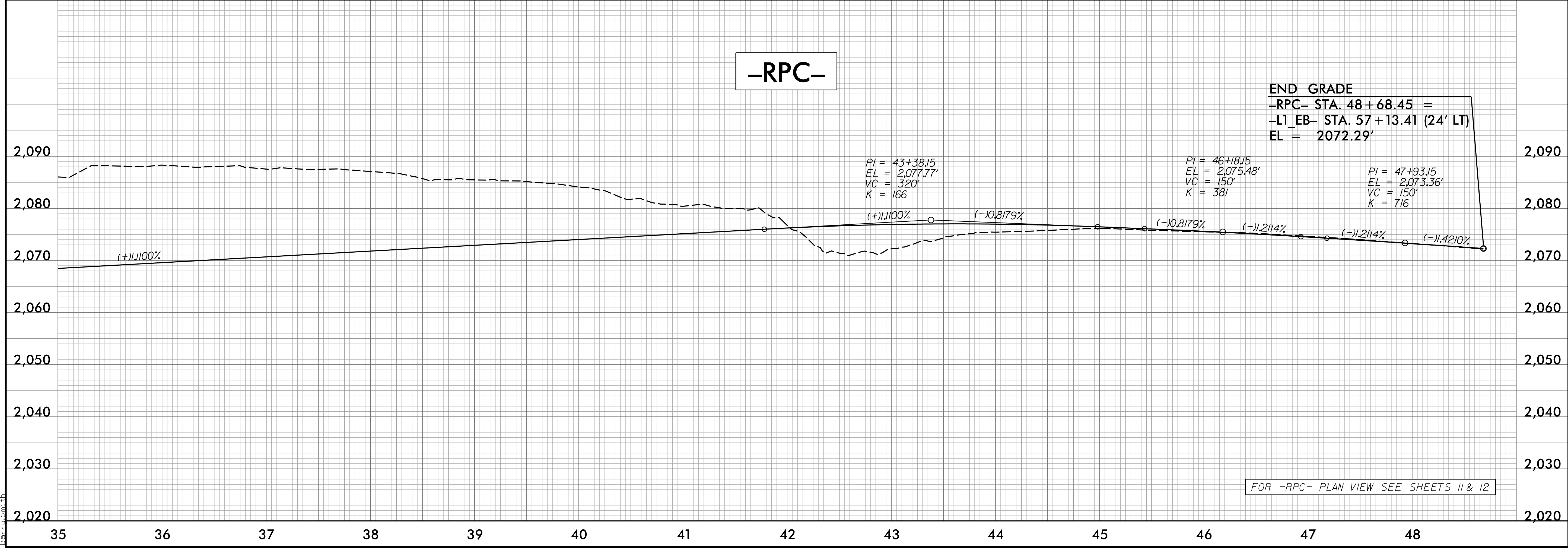
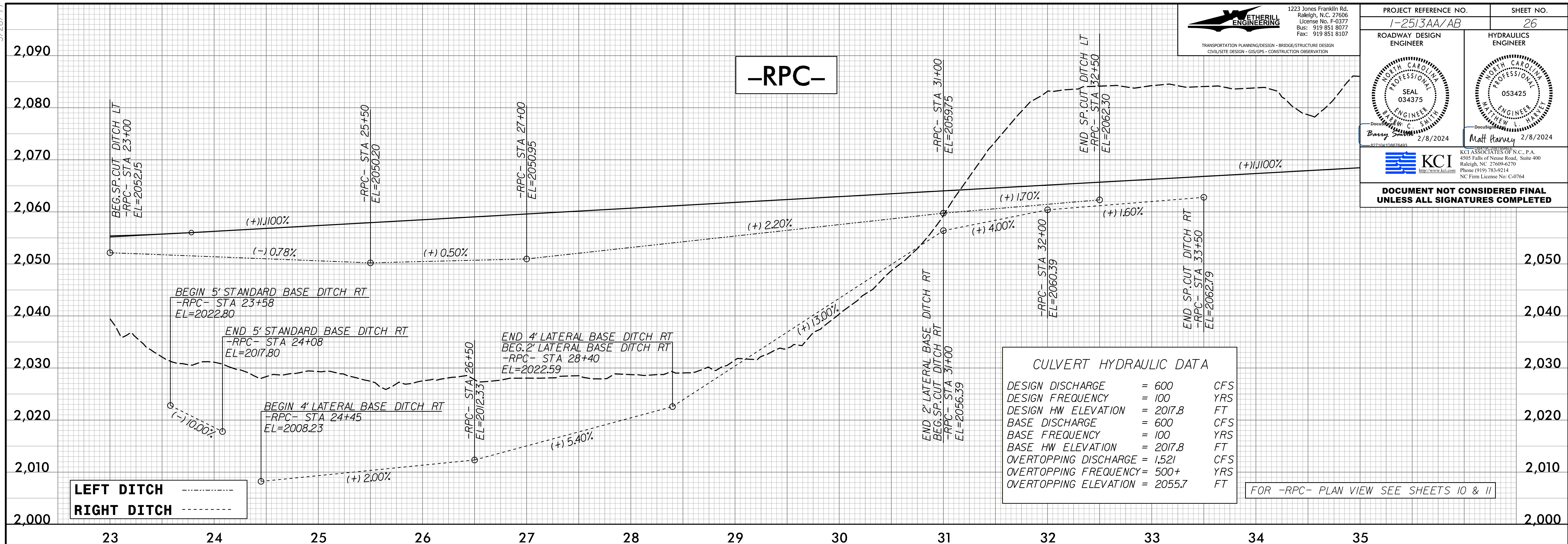
9/5/2023
12:51:26
Barry Smith

5/28/24

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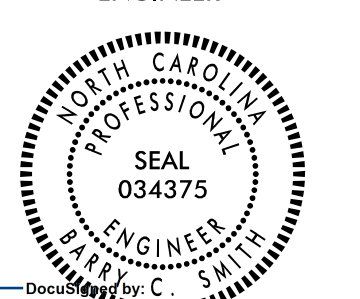
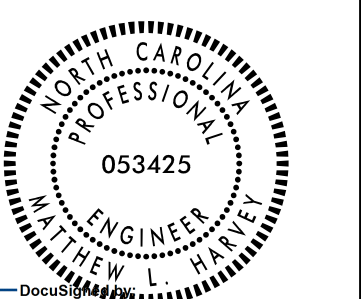

PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 26
ROADWAY DESIGN ENGINEER Barry Smith 2/8/2024	HYDRAULICS ENGINEER Matt Harvey 2/8/2024
 KCI <small>KCI ASSOCIATES OF N.C., P.A. 4905 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-4270 Phone (919) 783-9214 NC Firm License No. C-0764</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

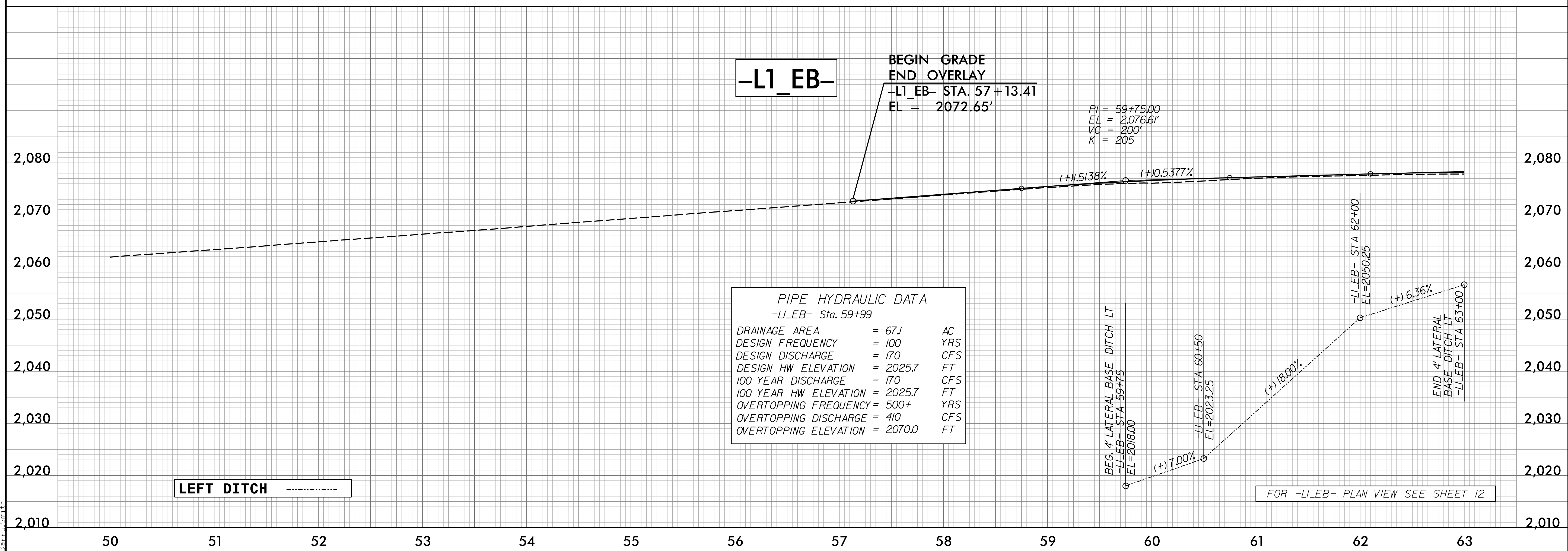
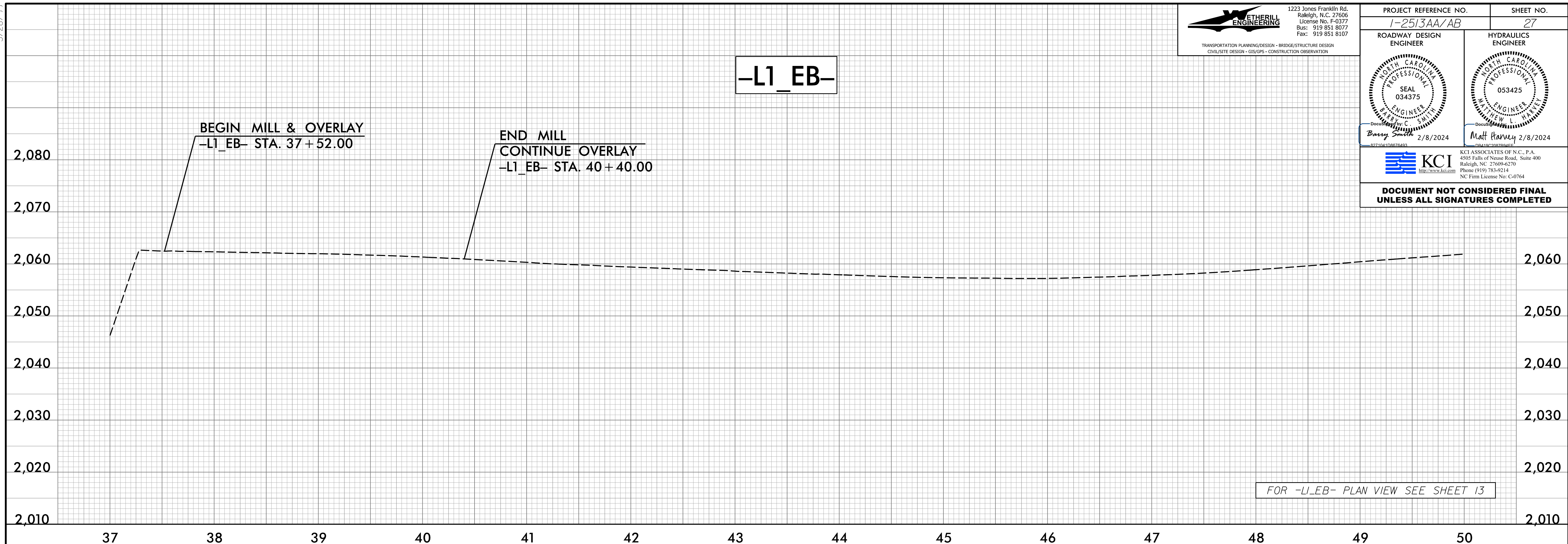


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Raleigh, N.C. 27606
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PROJECT REFERENCE NO. 1-2513AA/AB		SHEET NO. 27
ROADWAY DESIGN ENGINEER  Barry C. Smith 2/8/2024	HYDRAULICS ENGINEER  Matthew Harvey 2/8/2024	
 KCI ASSOCIATES OF N.C., P.A. 4503 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764		
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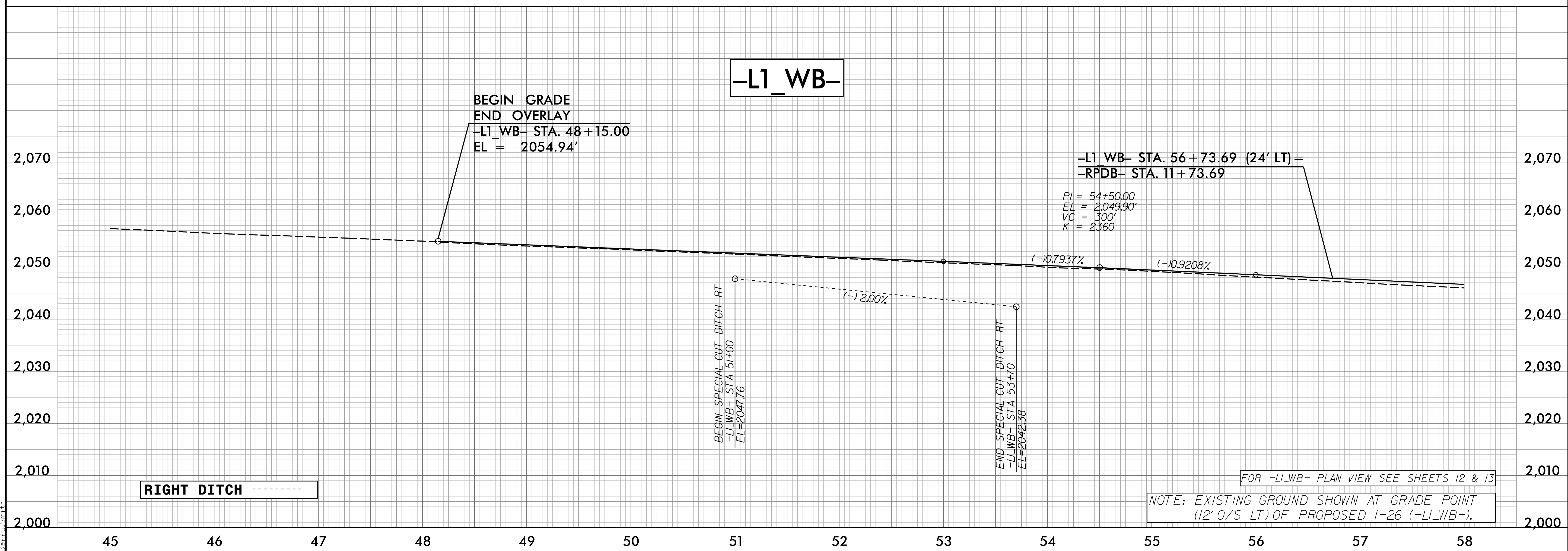
9/5/2023
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Barry C. Smith

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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 28
ROADWAY DESIGN ENGINEER Barry Smith 2/8/2024	HYDRAULICS ENGINEER Matthew Harvey 2/8/2024
 KCI KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Noe Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 NC Firm License No. C-0764	
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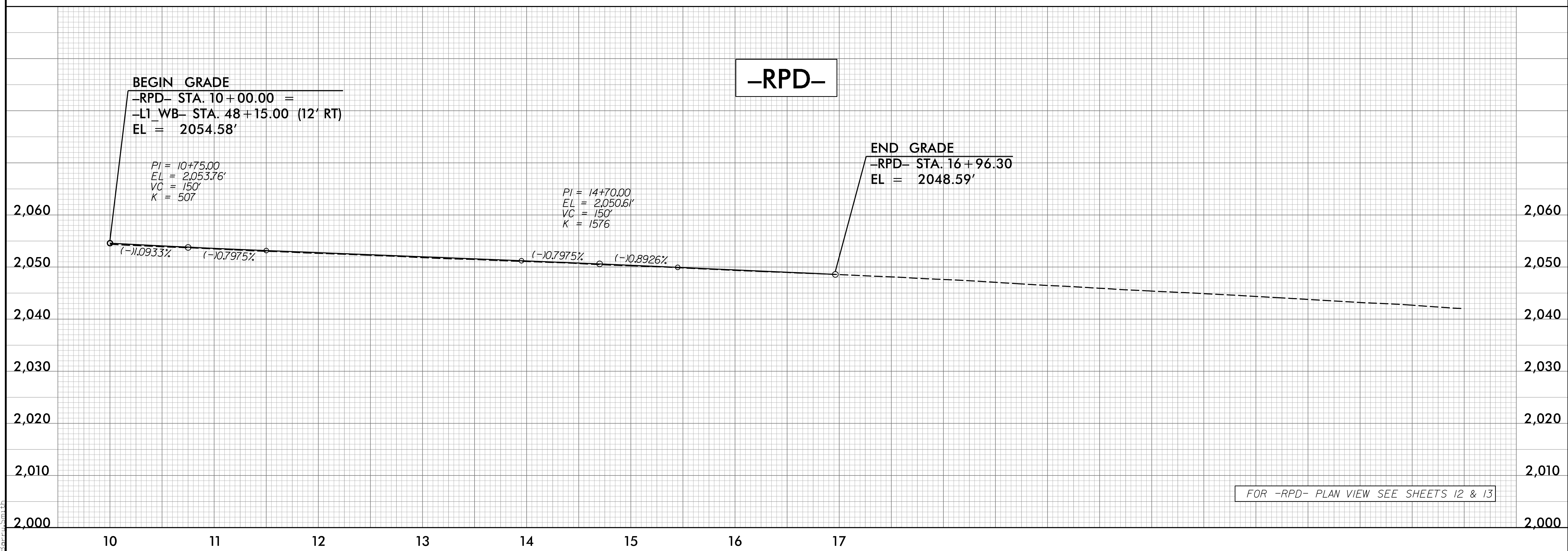
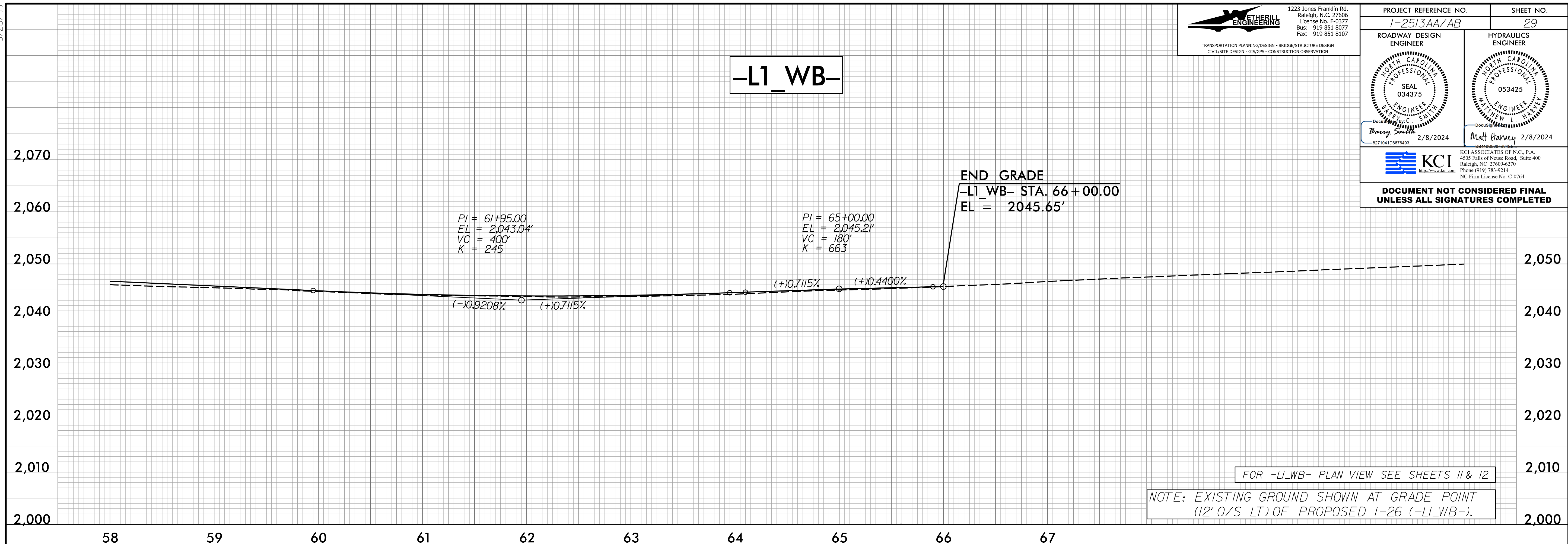
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Barry Smith

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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 29
ROADWAY DESIGN ENGINEER SEAL 034375 Barry Smith 2/8/2024	HYDRAULICS ENGINEER 053425 Matt Harvey 2/8/2024
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



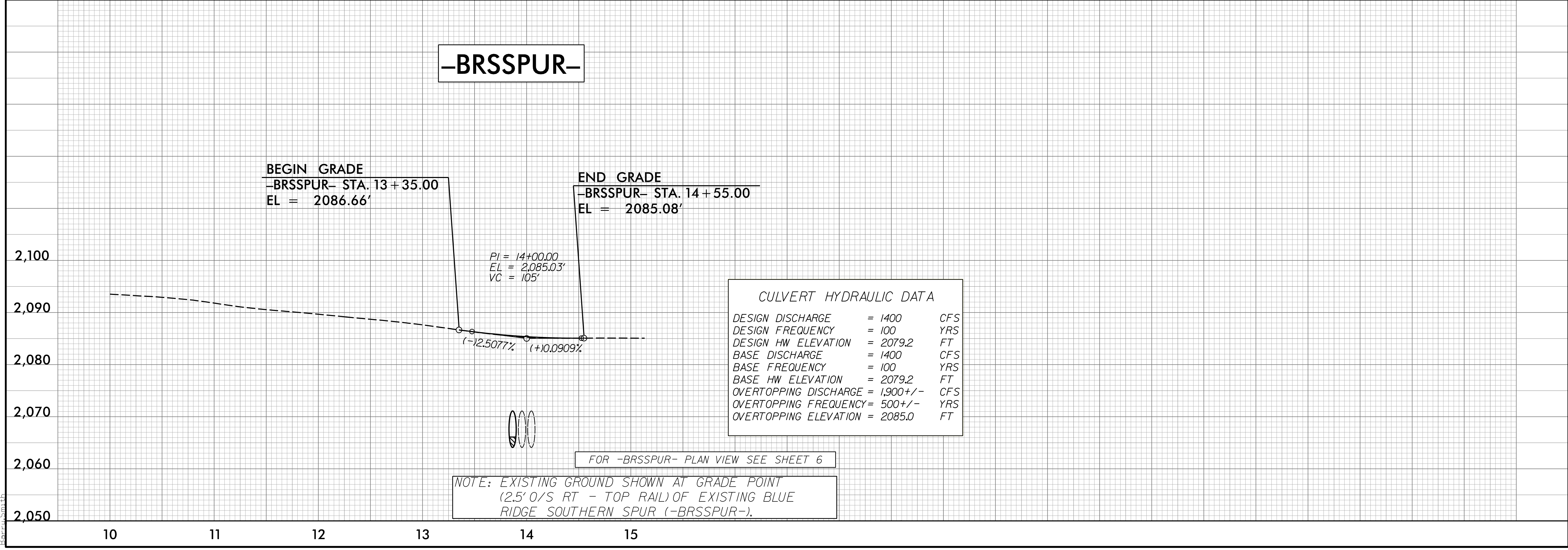
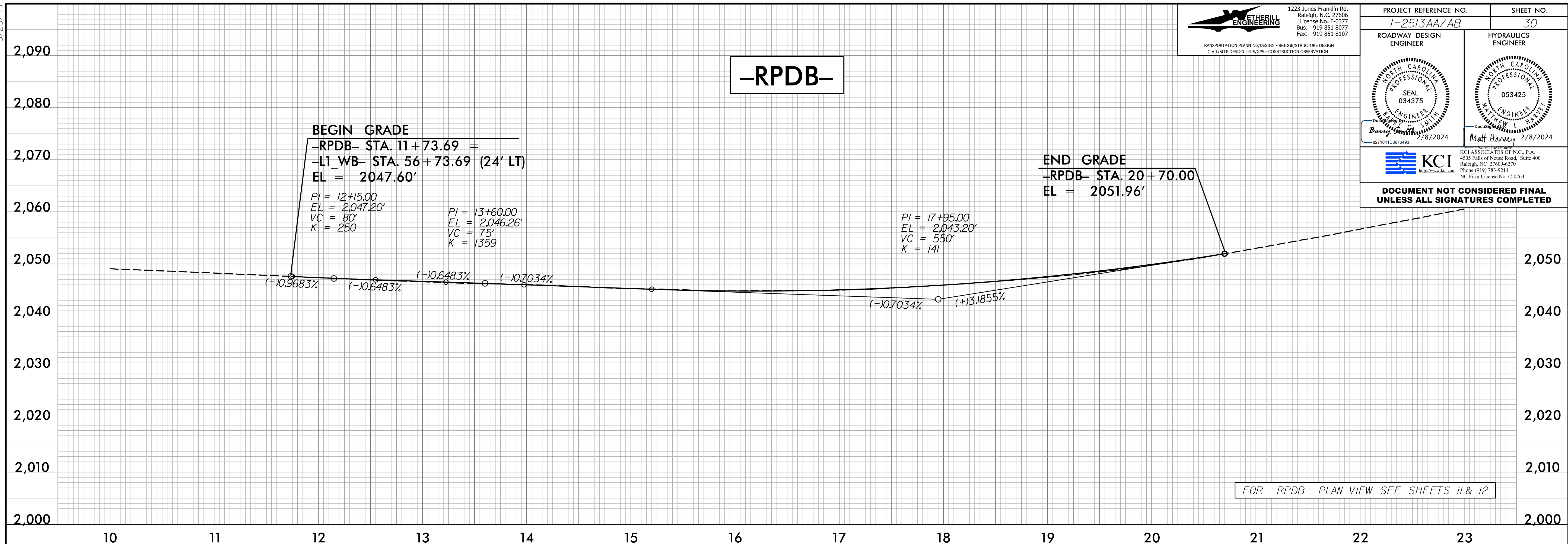
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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 30
ROADWAY DESIGN ENGINEER <i>Barry Smith</i> 2/8/2024	HYDRAULICS ENGINEER <i>Matt Harvey</i> 2/8/2024
 KCI ASSOCIATES OF N.C., P.A. 4905 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	
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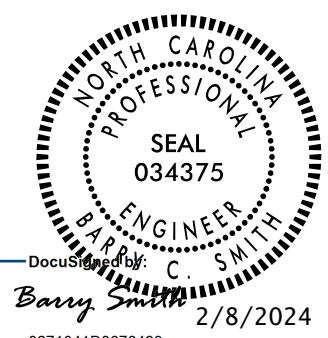
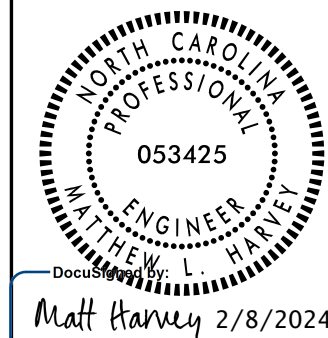



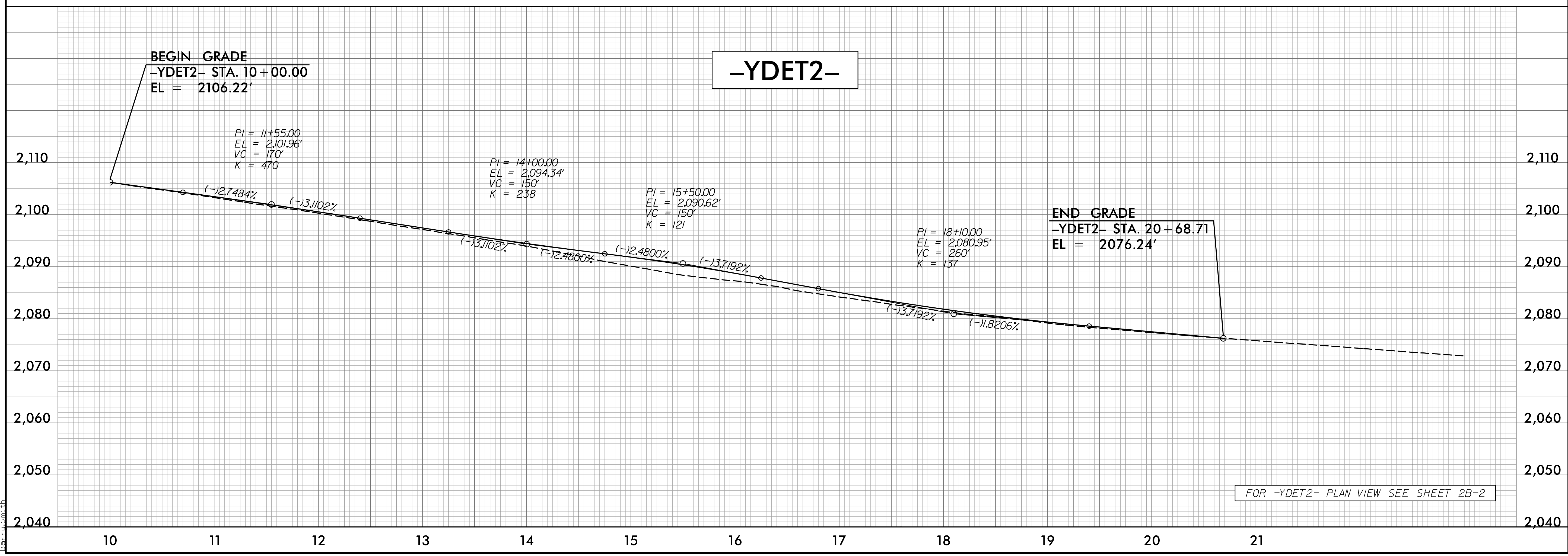
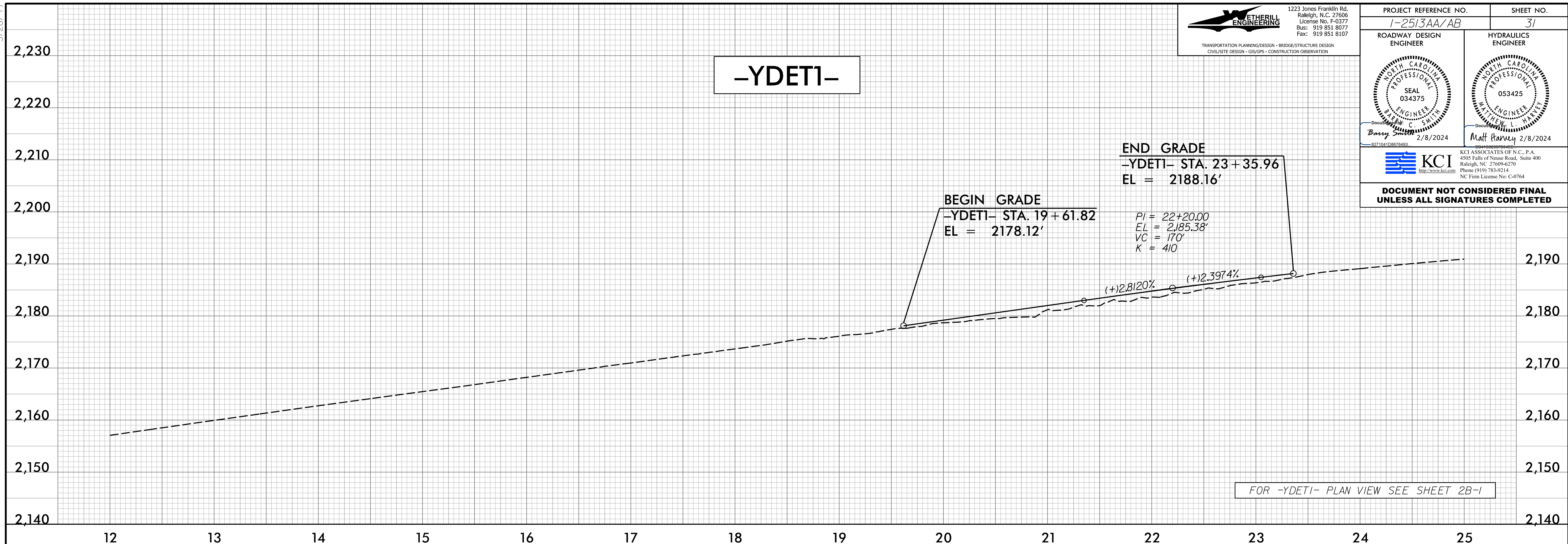
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PROJECT REFERENCE NO. 1-2513AA/AB	SHEET NO. 31
ROADWAY DESIGN ENGINEER  Barry Smith 2/8/2024	HYDRAULICS ENGINEER  Matt Harvey 2/8/2024
 KCI KCI ASSOCIATES OF N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	
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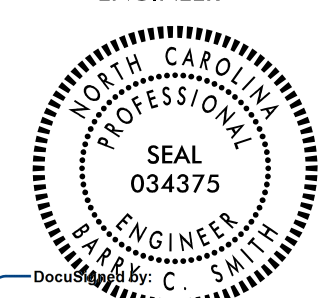




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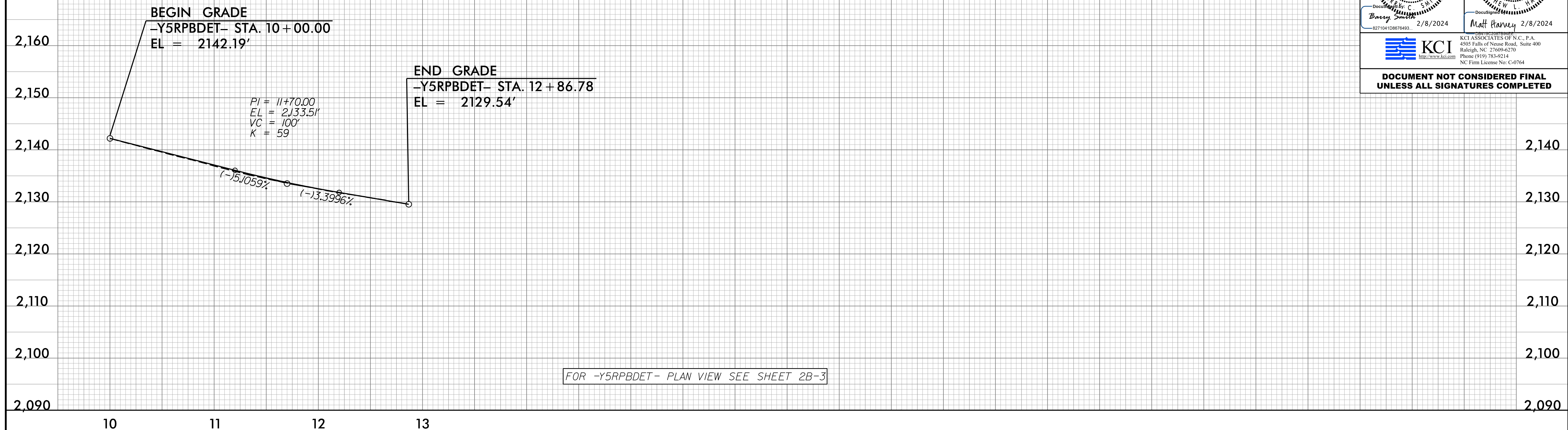
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PROJECT REFERENCE NO. <i>1-2513AA/AB</i>		SHEET NO. <i>32</i>	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 Barry Smith 2/8/2024		 Matt Harvey 2/8/2024	
 KCI http://www.kci.com		KCI ASSOCIATES OF N.C., P.A. 4503 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 783-9214 NC Firm License No. C-0764	
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9/5/2023 12:51:36 PM Barry Smith