

USTANOVICH

COMPUTED BY: DJS DATE: 05/24/2023
CHECKED BY: JGD DATE: 05/24/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. SHEET NO.
U-5312 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".

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

Table with columns for Line & Station, Offset, Structure Number, Pipe Type (Side Drain, C.S., R.C. Class III/IV), Quantities for Drainage Structures, Frame/Grates, and Remarks. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS
C.A.A. CORRUGATED ALUMINIUM ALLOY
C.B. CATCH BASIN
C.S. CORRUGATED STEEL
D.I. DROP INLET
G.D.I. GRATED DROP INLET
H.D.P.E. HIGH DENSITY POLYETHYLENE
J.B. JUNCTION BOX
M.H. MANHOLE
N.S. NARROW SLOT
P.V.C. POLYVINYL CHLORIDE
R.C. REINFORCED CONCRETE
T.B.D.I. TRAFFIC BEARING DROP INLET
T.B.J.B. TRAFFIC BEARING JUNCTION BOX
W.S. WIDE SLOT

USTANOVICH

COMPUTED BY: _____ DATE: 05/24/2023
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PROJECT NO. U-5312 SHEET NO. 3D-9

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".

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

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Pipe Type (Side Drain, C.S., R.C. Class III/IV), Quantities for Drainage Structures, Frame/Grates, and Remarks. Includes a SHEET TOTALS row at the bottom.

ABBREVIATIONS table listing materials like CORRUGATED ALUMINIUM ALLOY, CORRUGATED STEEL, DROP INLET, etc.

SHEET TOTALS

USTANOVICH

COMPUTED BY: DJS DATE: 05/24/2023
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. SHEET NO.
U-5312 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".

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

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Pipe Material (Side Drain Pipe, C.S. PIPE, R.C. PIPE CLASS III/IV), Quantities for Drainage Structures, Frame/Grates/Hood, Concrete/Transitional Section, and Remarks. Includes a SHEET TOTALS row at the bottom.

USTANOVICH

COMPUTED BY: _____ DATE: 05/24/2023
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U-5312
SHEET NO. 3D-11

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".

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

Table with columns for Line & Station, Offset, Structure Number, Pipe Type (Side Drain, C.S., R.C. Class III/IV, R.C. Class V), Quantities for Drainage Structures, Frame/Grates/Hood, Concrete/Transitional Section, and Remarks. Includes a 'SHEET TOTALS' row at the bottom.

ABBREVIATIONS table listing items 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. with their corresponding descriptions.

SHEET TOTALS

24 0.065 3334

USTANOVICH

COMPUTED BY: _____ DATE: 05/24/2023
CHECKED BY: _____ DATE: 05/24/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U-5312
SHEET NO. 3D-12

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".

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

Table with columns for Line & Station, Offset, Structure Number, Pipe Type (Side Drain Pipe, C.S. PIPE, R.C. PIPE CLASS III/IV), Quantities for Drainage Structures, Frame/Grates/Hood, and Remarks. Includes a 'SHEET TOTALS' row at the bottom.

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 material descriptions.

REMARKS

USTANOVICH

COMPUTED BY: _____ DATE: 05/24/2023
CHECKED BY: _____ DATE: 05/24/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U-5312
SHEET NO. 3D-13

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".

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

Main data table with columns for Line & Station, Offset, Structure Number, Pipe Type (Side Drain Pipe, C.S. PIPE, R.C. PIPE CLASS III/IV), Quantities for Drainage Structures, Frame, Grates, and Hood, and Remarks. Includes sub-columns for various pipe sizes and materials.

SHEET TOTALS and PROJECT TOTALS summary rows at the bottom of the page.

ABBREVIATIONS table listing symbols and their corresponding material names (e.g., C.A.A. CORRUGATED ALUMINIUM ALLOY).

REMARKS

COMPUTED BY: Hunsberger, W. S. DATE: 03/09/23

CHECKED BY: Hamm, J. R. DATE: 03/09/23

(12-17-19)

PROJECT NO.
U-5312

SHEET NO.
3G-1

**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

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
-L-	1.5:1	170+50	1.5:1	172+00	LT	2		1200
-L-	1.5:1	186+75	1.5:1	188+00	LT	2		225
							TOTAL SY:	1425

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

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 Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
			CONTINGENCY	ASU(1)	12	1900	3800	3800	
			TOTAL CY/TONS/SY:		1900	3800**	3800**	0	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 Soil 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.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PARCEL INDEX SHEET

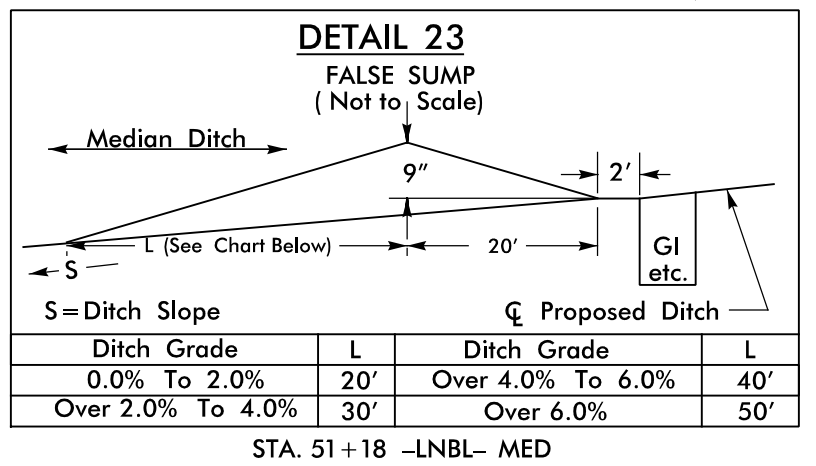
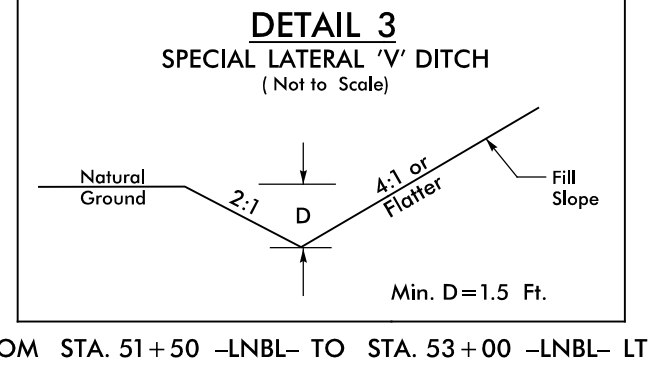
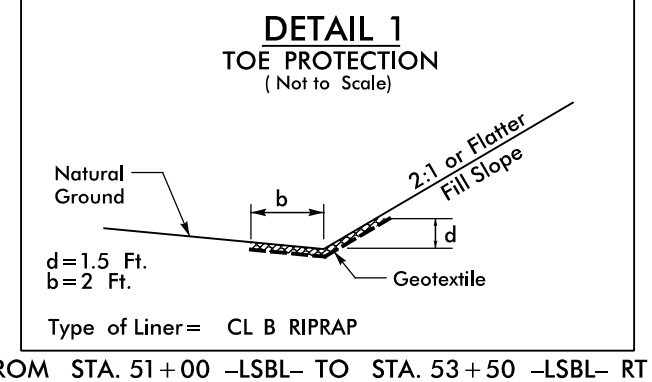
PARCEL No.	SHEET No.	PROPERTY OWNER NAME
6 (NO CLAIM)	6	FALL CREEK LAND & TIMBER, LLC
7 (NO CLAIM)	6	TOWN OF NORTH WILKESBORO
7A (NO CLAIM)	6	WILMA JEAN REYNOLDS RONALD REYNOLDS
9	6, 7	GRADY J. NICHOLS ELENA B. NICHOLS
10	6	WILLIAM ERIC JOHNSON
10A	6	DOROTHY N. JOHNSON
11	6, 7	THOMAS CAMERON FINLEY
12	7	WILLIAM BRYANT CHURCH
13	8, 9	PREMIER PROPERTY HOLDINGS, LLC
14	8, 9	MATHEW S MILLER
14A	8	LYNN ST. CLAIR DIXIE ST. CLAIR
15	9	BILLY HARRIS ELLIS
15A	9	B MYERS INVESTMENTS LLC
16	9	RALPH & MALINDA BROYHILL
17	10	CHARLES W. JOHNSON BARBARA L. JOHNSON
18	10	PMM WILKESBORO, LLC
19	10	LOWE'S HOME CENTERS, INC
20	10, 11	CMH HOMES INC
21	11	CAROLINA WEST WIRELESS INC.
22	11	FISHJIG HOLDINGS LLC
23	11, 12	SOFIELD CHILDREN'S LIMITED
24	12	PM RESTAURANT HOLDING, LLC
25	12	CS&G AAP WILKESBORO, LLC
26	12	ROCKET WASH EXPRESS 421, INC.
27	12	O'REILLY AUTOMOTIVE STORES, INC
27A	12	OVERMOUNTAIN STATION LLC
28	12	J & E VETERANS PARK, INC
29	12	WILKESBORO HOSPITALITY 1 LLC
30	13	H V W, LLC COLLETT & ASSOCIATES, INC
31	13	MCDONALDS REAL ESTATE COMPANY
32	13	EDWIN J. SWOPE
33	13	KLR REAL ESTATE LLC.
34	13	TKC CXXXIV, LLC
35	13	JAMES CLAYTON FAW SANDRA H. FAW
36	13	ROBERT W. RAASCH HEATHER J. RAASCH
37	13	TULSI B LLC
38	13	FIRST UNION NATIONAL BANK OF NC
39	13, 14	ESTATE OF JC FAW
40	13, 14	ESTATE OF JC FAW
41	14, 15	SPECTRUM HOSPITALITY VI, LLC
41A	15	T. CAMERON FINLEY
42	14, 15, 16	BILL MASTIN, ET AL
43 (NO CLAIM)	16	CAROLINA WEST INC.
44	16	JAMES L. LOWE, ET AL
45	14	HORNE PROPERTIES, INC
46	16	TWO RIVERS WILKESBORO II, LLC
46A	16	TINGEN BROADWELL FAMILY, LLC
47 (NO CLAIM)	16	JAMES H. CARTER

8/17/2023

-L-		-LSBL-		-LNBL-	
PI Sta 53+30.89	PI Sta 62+67.58	PI Sta 54+21.5	PI Sta 58+23.53	PI Sta 56+11.72	
$\Delta = 1' 22' 42.0''$ (LT)	$\Delta = 1' 22' 26.0''$ (RT)	$\Delta = 2' 5' 58.7''$ (LT)	$\Delta = 1' 44' 42.3''$ (RT)	$\Delta = 1' 07' 16.4''$ (LT)	
D = 0' 08' 48.9"	D = 0' 08' 48.9"	D = 0' 34' 22.6"	D = 0' 34' 22.6"	D = 0' 11' 27.5"	
L = 938.21'	L = 935.17'	L = 500.26'	L = 304.58'	L = 587.06'	
T = 469.13'	T = 467.61'	T = 250.18'	T = 152.30'	T = 293.54'	
R = 39,000.00'	R = 39,000.00'	R = 10,000.00'	R = 10,000.00'	R = 30,000.00'	
Se = N/A	Se = N/A	Se = EXIST.	Se = EXIST.	Se = EXIST.	

NOTE: SHEETS 4 & 5 NOT USED

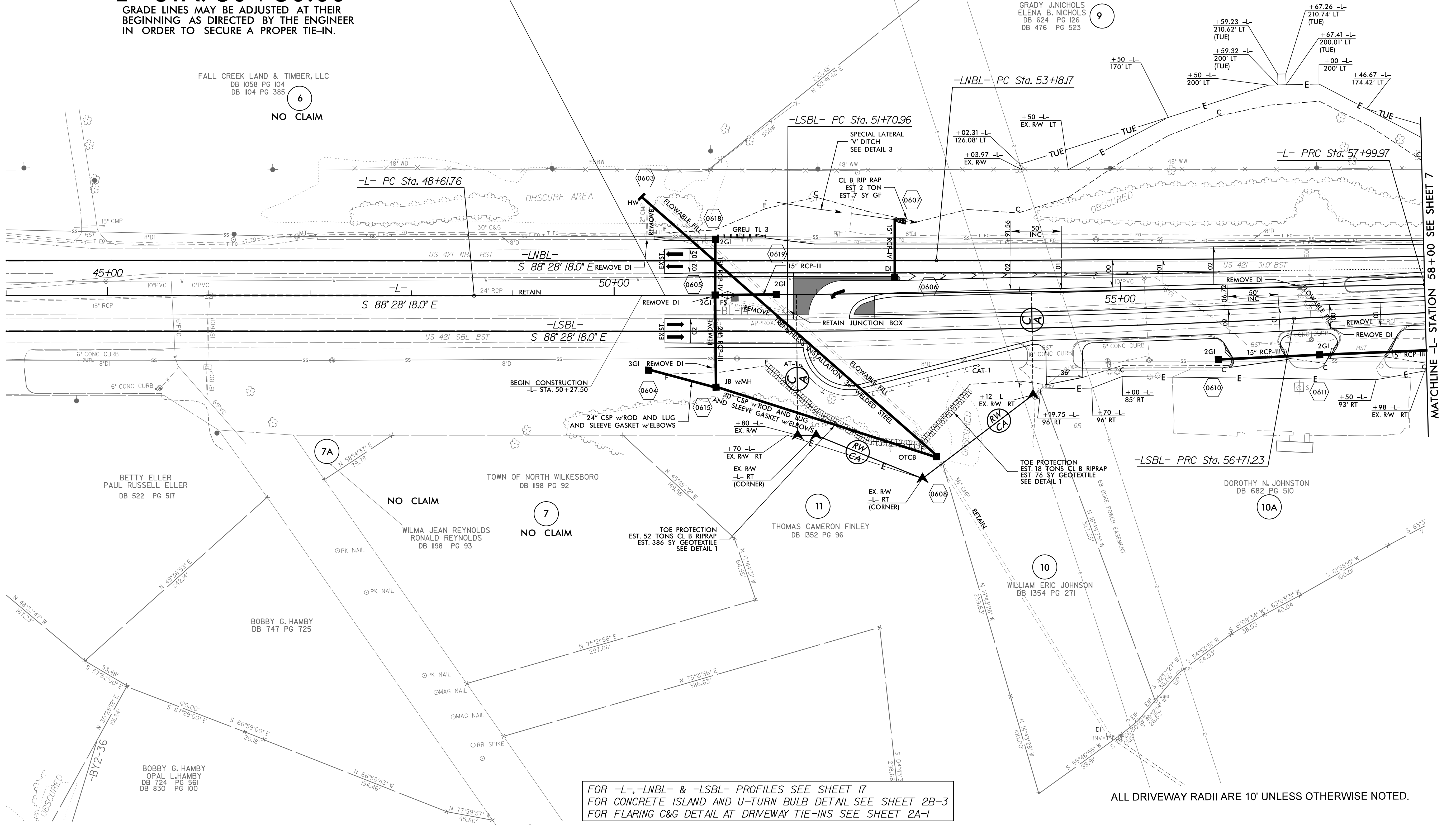
NAD 83/NSRS 2007



BEGIN TIP PROJECT U-5312

-L- STA. 50+50.00

GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.



FOR -L-, -LNBL- & -LSBL- PROFILES SEE SHEET 17
 FOR CONCRETE ISLAND AND U-TURN BULB DETAIL SEE SHEET 2B-3
 FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1

ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

PROJECT REFERENCE NO. U-5312	SHEET NO. 6
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	SEAL 014493
DocuSigned by: Jimmy Goodnight	DocuSigned by: Josh Dalton 7/12/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by: SUNGATE DESIGN GROUP, P.A.	

7/14/2023 1:53:12 pm psh06.dgn

8.17.23

-L-	-LSBL-	-LNBL-
PI Sta 62+67.58	PI Sta 58+23.53	PI Sta 56+11.72
$\Delta = 1' 22'' 26.0'' (RT)$	$\Delta = 1' 44'' 42.3'' (RT)$	$\Delta = 1' 07'' 16.4'' (LT)$
$D = 0' 08'' 48.9''$	$D = 0' 34'' 22.6''$	$D = 0' 11'' 27.5''$
$L = 935.17'$	$L = 304.58'$	$L = 587.06'$
$T = 467.61'$	$T = 152.30'$	$T = 293.54'$
$R = 39,000.00'$	$R = 10,000.00'$	$R = 30,000.00'$
Se = WC	Se = EXIST.	Se = EXIST.

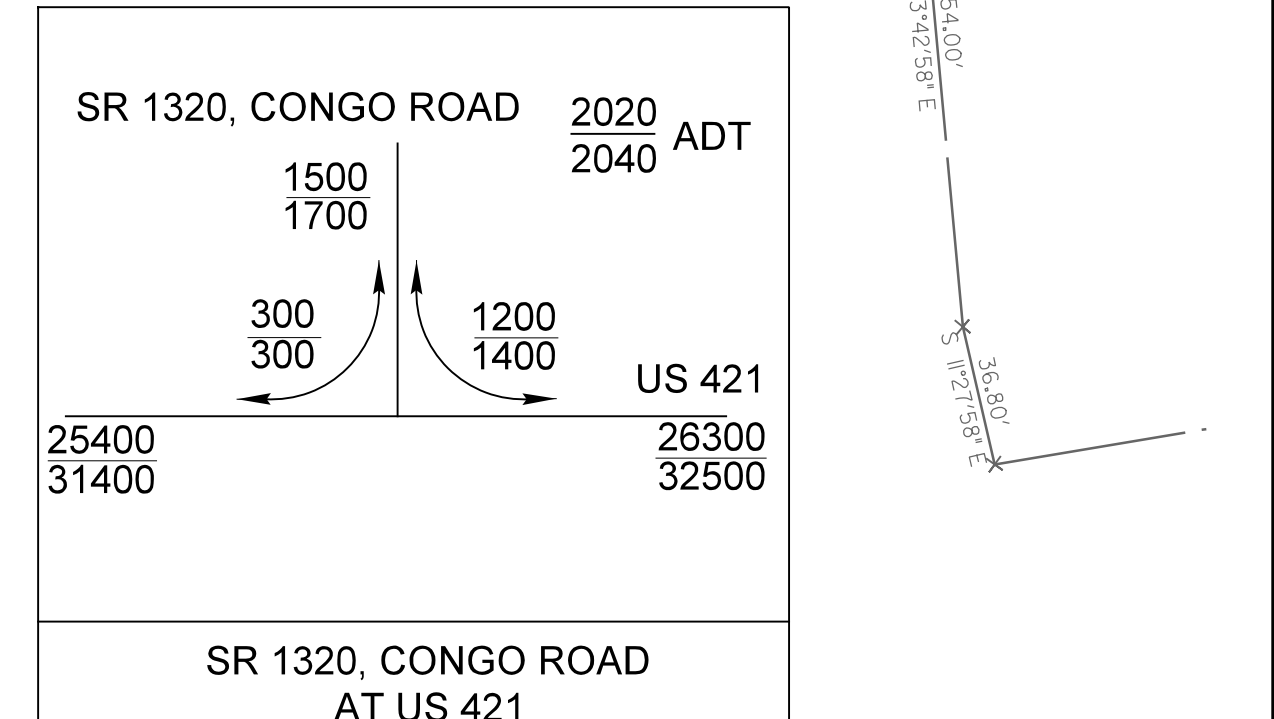
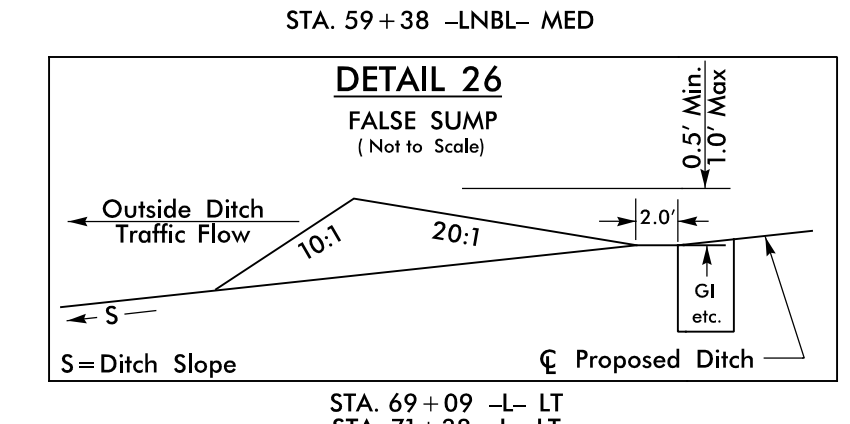
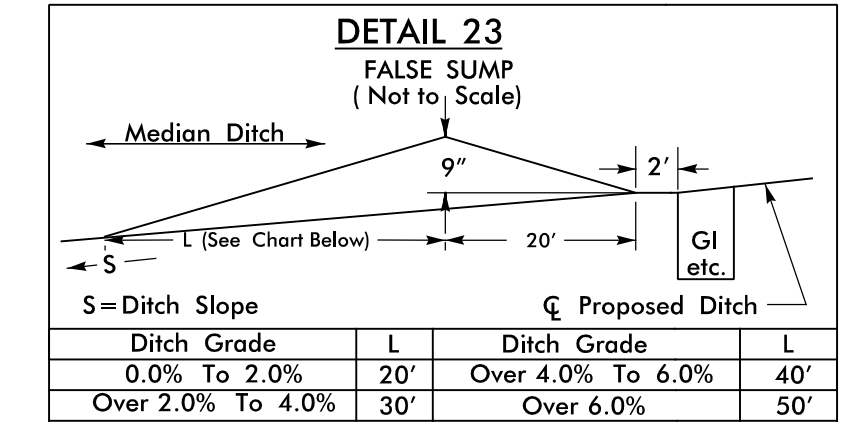
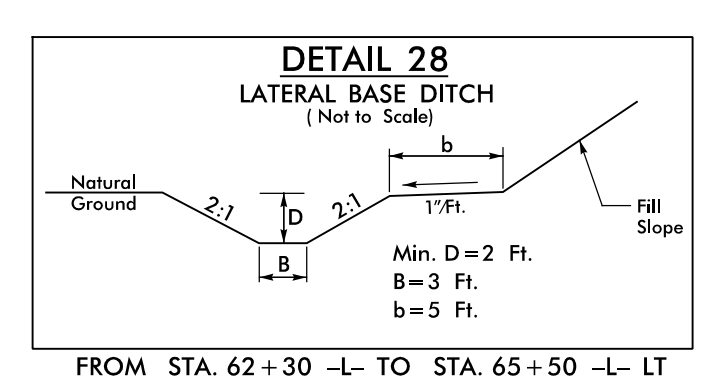
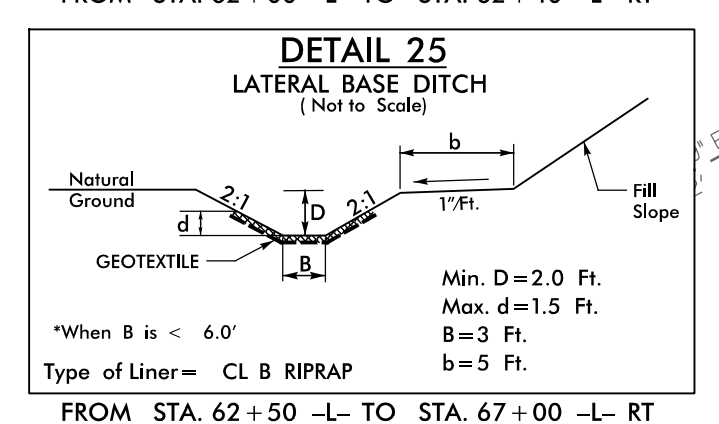
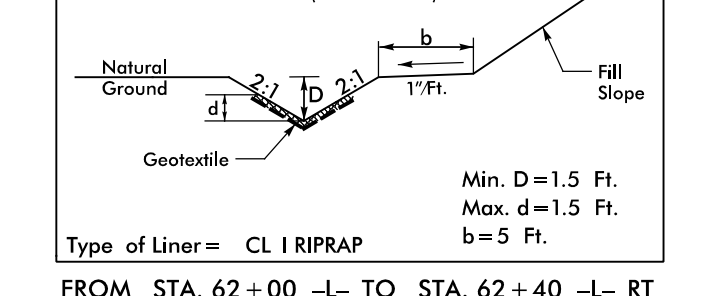
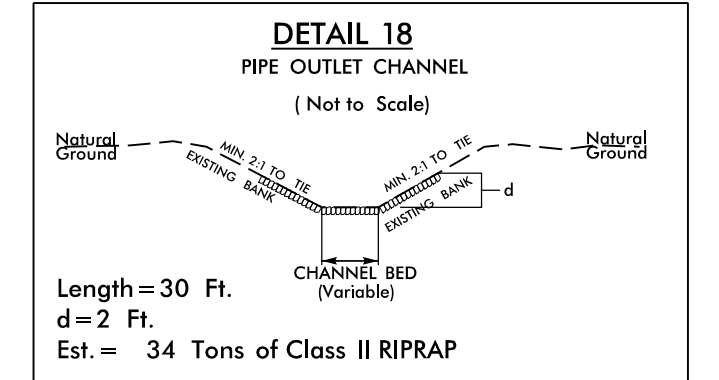
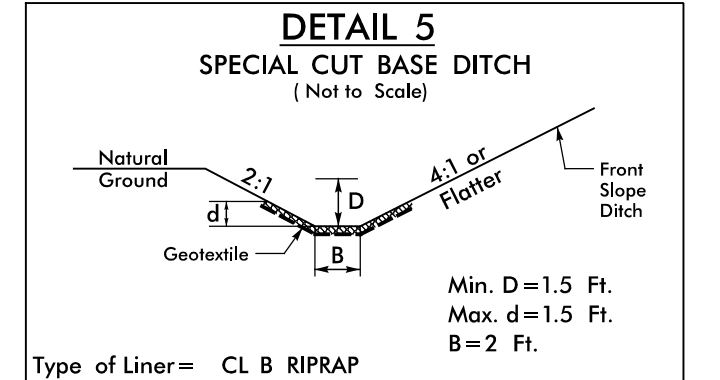
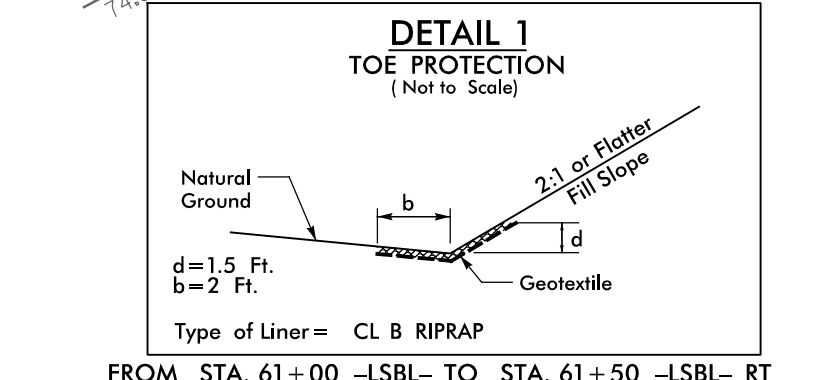
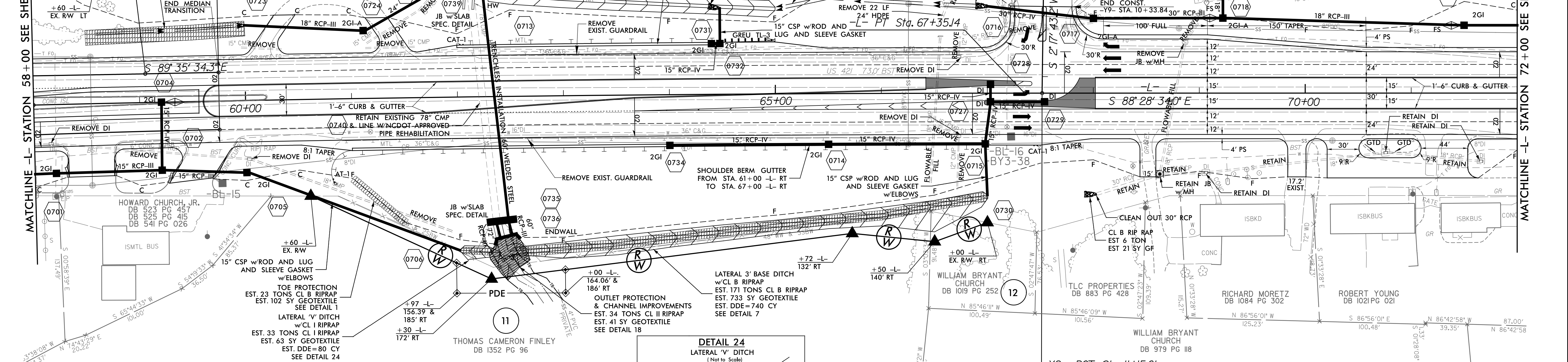
DEWEY W. ROYAL
DB 719 PG 247

PROJECT REFERENCE NO. U-5312	SHEET NO. 7
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	SEAL 014493
DocuSign Jimmy Goodright 84C82C43AFE4E8	DocuSign Joshua Dalton 10B9A8C814994C3
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by SUNGATE DESIGN GROUP, P.A.	
VHB Engineering NC, P.C. (C-3705) 9400 Main Campus Drive, Suite 500 Raleigh, NC 27606	

-L- POC Sta. 59+75.00 =
-LNBL- PT Sta. 59+74.39 (27' LT) =
-LSBL- PT Sta. 59+75.80 (27' RT) =

SPECIAL CUT
2' BASE DITCH
w/ CL B RIPRAP
EST. 77 TONS CL B RIPRAP
EST. 352 SY GEOTEXTILE
SEE DETAIL 5

-LNBL-
PT Sta. 59+05.24

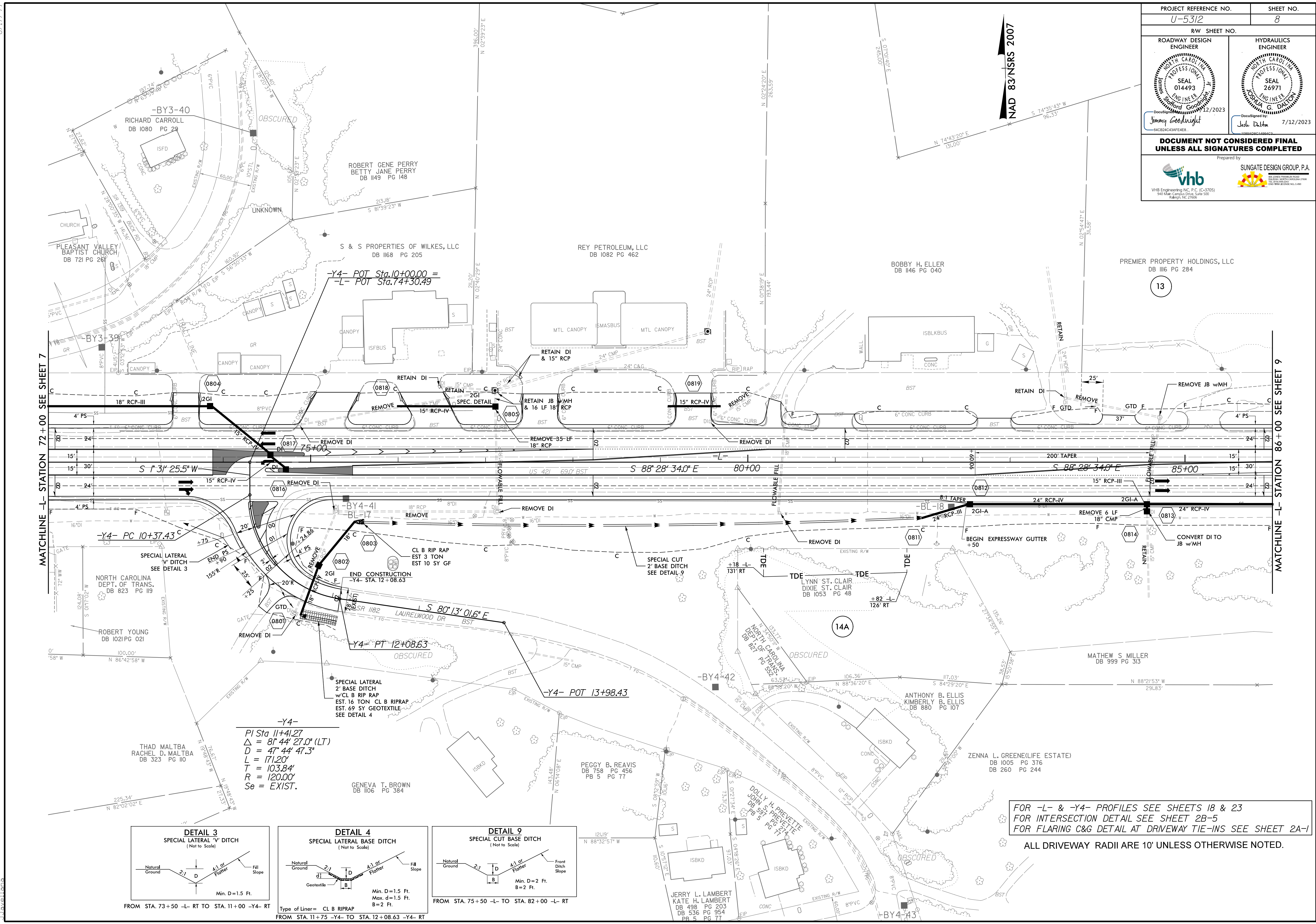


FOR -L-, -LNBL- & -LSBL- PROFILES SEE SHEET 18
FOR INTERSECTION DETAIL SEE SHEET 2B-4
FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1

ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

5/25/2023
16:52:04
psh07.dgn

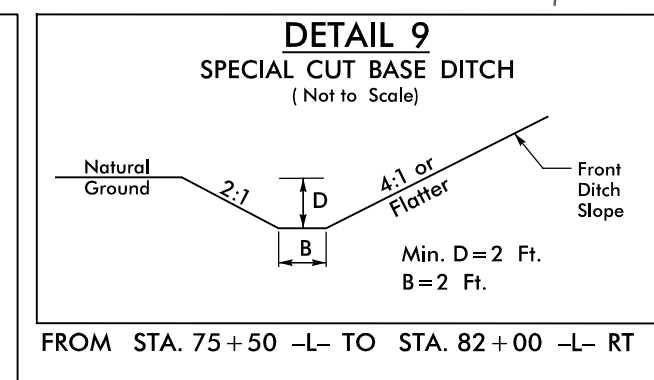
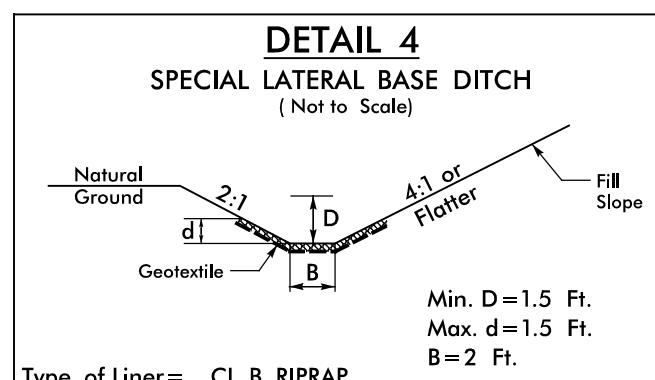
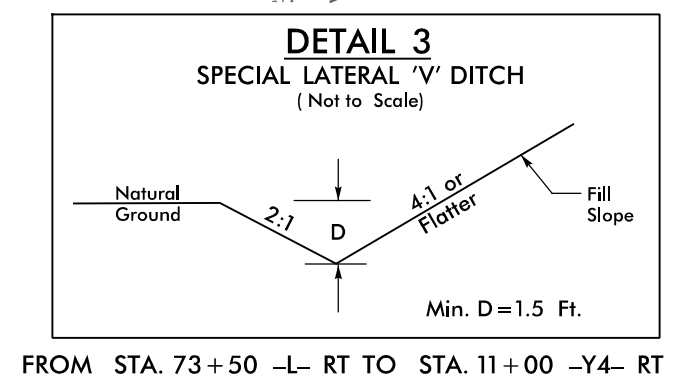
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RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by			



MATCHLINE -L- STATION 72+00 SEE SHEET 7

MATCHLINE -L- STATION 86+00 SEE SHEET 9

-Y4-
 $PI\ Sta\ 11+41.27$
 $\Delta = 81\ 44\ 27.0\ (LT)$
 $D = 47\ 44\ 47.3'$
 $L = 171.20'$
 $T = 103.84'$
 $R = 120.00'$
 $Se = EXIST.$

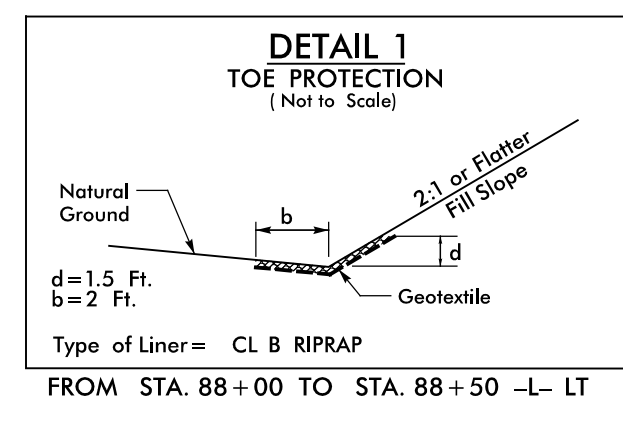
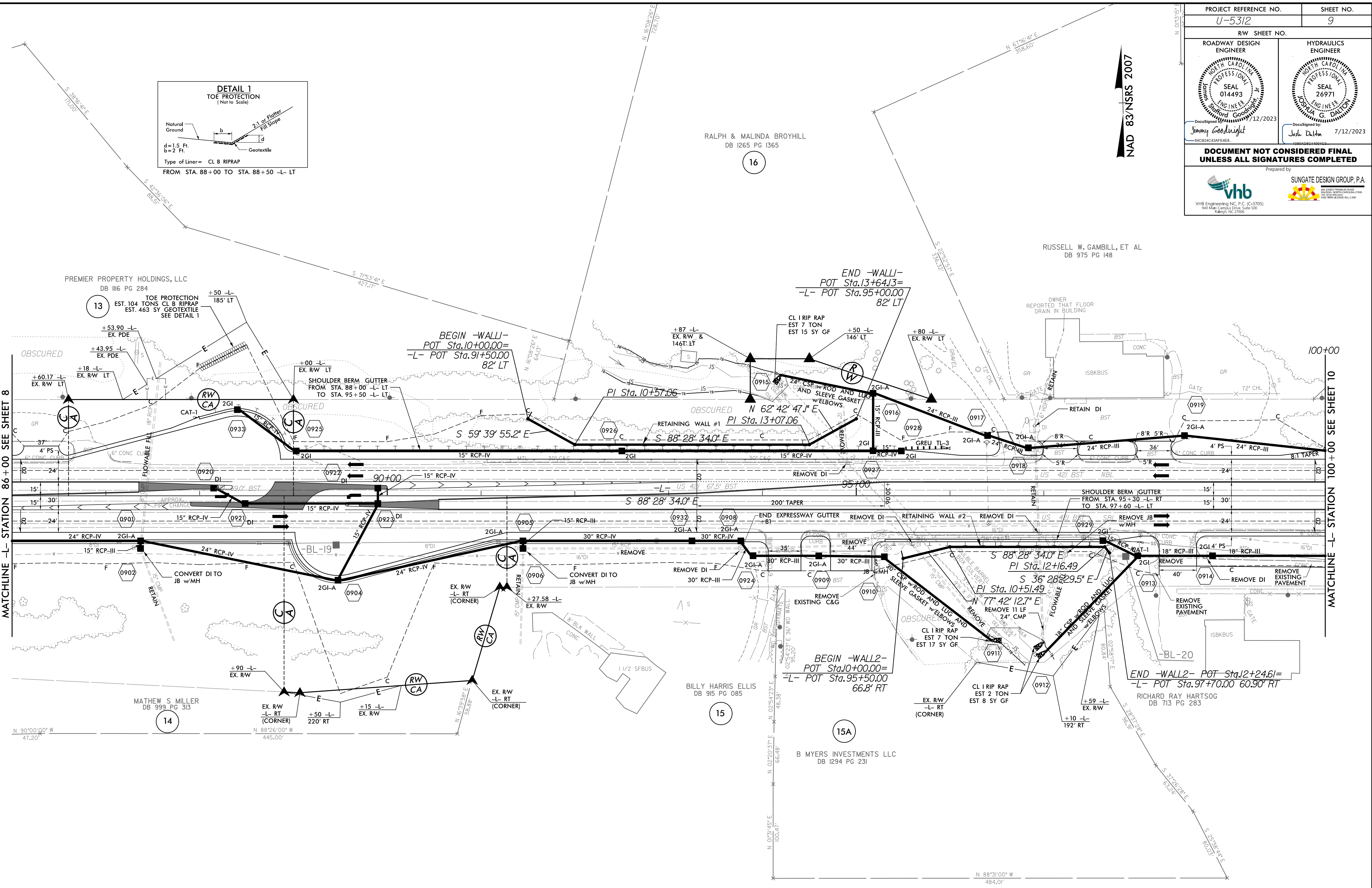


FOR -L- & -Y4- PROFILES SEE SHEETS 18 & 23
 FOR INTERSECTION DETAIL SEE SHEET 2B-5
 FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1
 ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

8/17/99
 7/14/2023
 16312.dwg
 ps-h08.dgn

8.17.19

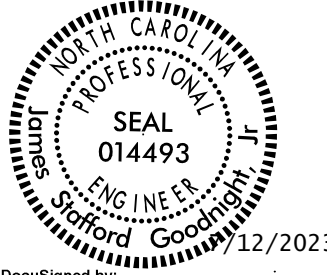
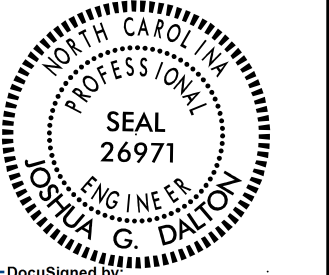

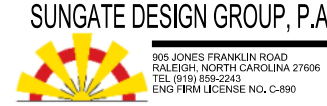
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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		NORTH CAROLINA PROFESSIONAL SEAL 26971 JOSH DELTON 7/12/2023	
NORTH CAROLINA PROFESSIONAL SEAL 014493 JIMMY GOODWRIGHT 12/2023		NORTH CAROLINA PROFESSIONAL SEAL 26971 JOSH DELTON 7/12/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
vhb VH8 Engineering NC, P.C. (C-3705) 940 Main Central Drive, Suite 300 Raleigh, NC 27606		SUNGATE DESIGN GROUP, P.A. 10804 HUNTERWOOD DRIVE Raleigh, NC 27606	

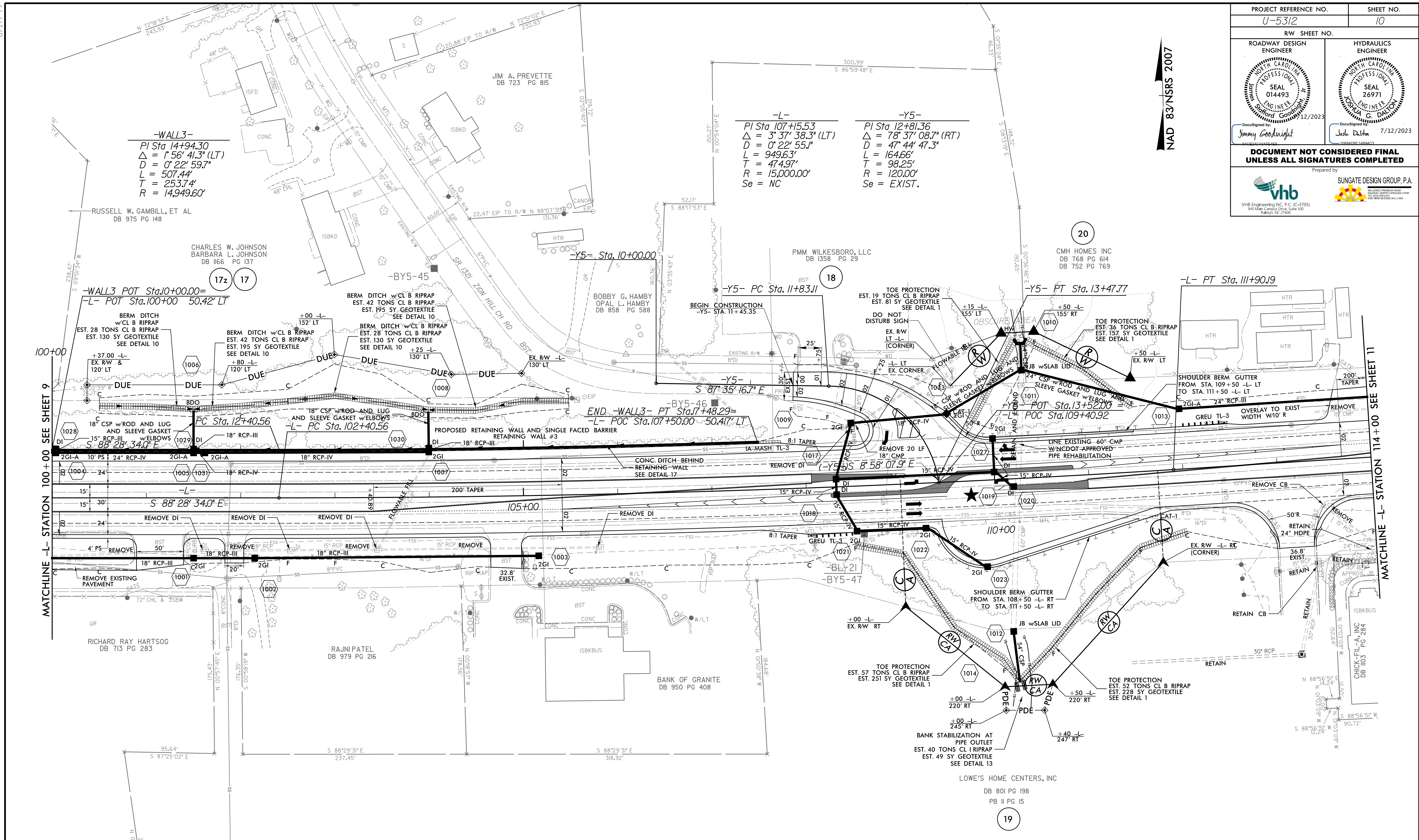


FOR -L- PROFILE SEE SHEET 19
FOR U-TURN BULBS DETAIL SEE SHEET 2B-6

ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

3/15/2023
16:52:02
c:\psh09.dgn
javelina

PROJECT REFERENCE NO. U-5312		SHEET NO. 10	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>Prepared by  </p>			



-WALL3-
 PI Sta 14+94.30
 $\Delta = 1^{\circ} 56' 41.3''$ (LT)
 $D = 0^{\circ} 22' 59.7''$
 $L = 507.44'$
 $T = 253.74'$
 $R = 14,949.60'$

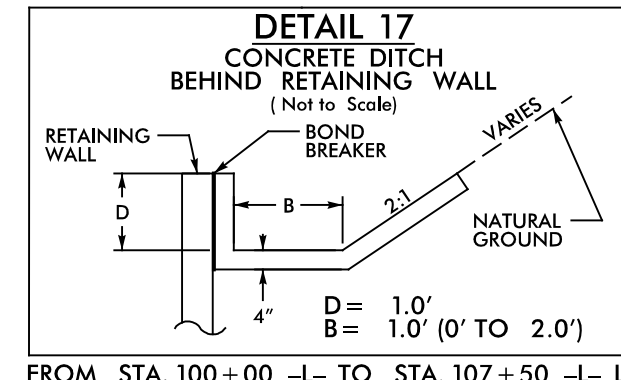
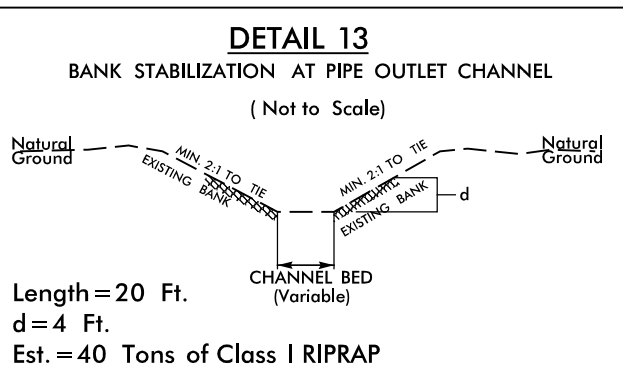
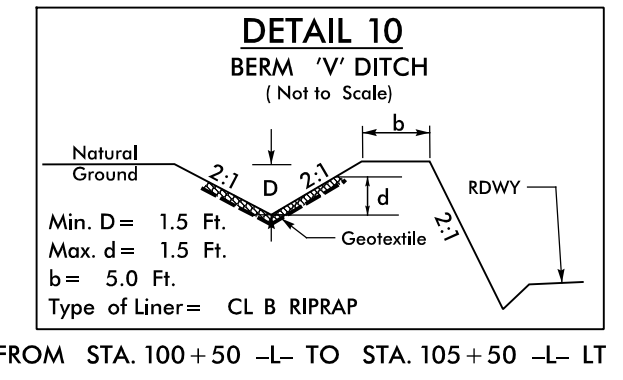
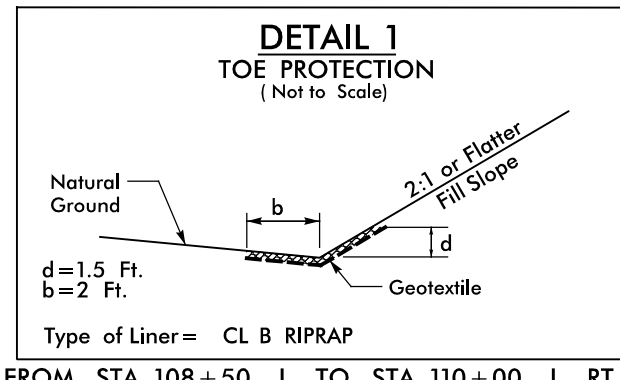
-L-
 PI Sta 107+15.53
 $\Delta = 3^{\circ} 37' 38.3''$ (LT)
 $D = 0^{\circ} 22' 55.1''$
 $L = 949.63'$
 $T = 474.97'$
 $R = 15,000.00'$
 $Se = NC$

-Y5-
 PI Sta 12+81.36
 $\Delta = 78^{\circ} 37' 08.7''$ (RT)
 $D = 47^{\circ} 44' 47.3''$
 $L = 164.66'$
 $T = 98.25'$
 $R = 120.00'$
 $Se = EXIST.$

NAD 83 NRS 2007

MATCHLINE -L- STATION 100+00 SEE SHEET 9

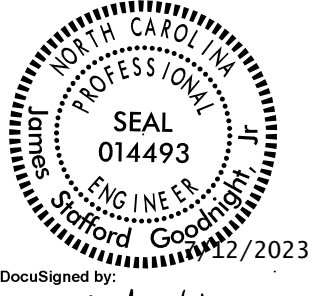
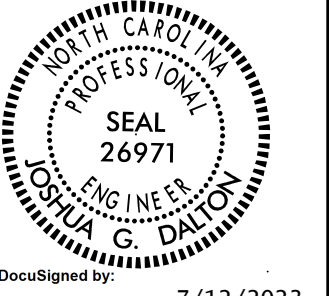

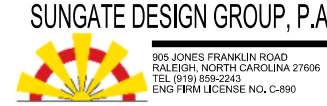
MATCHLINE -L- STATION 114+00 SEE SHEET 11

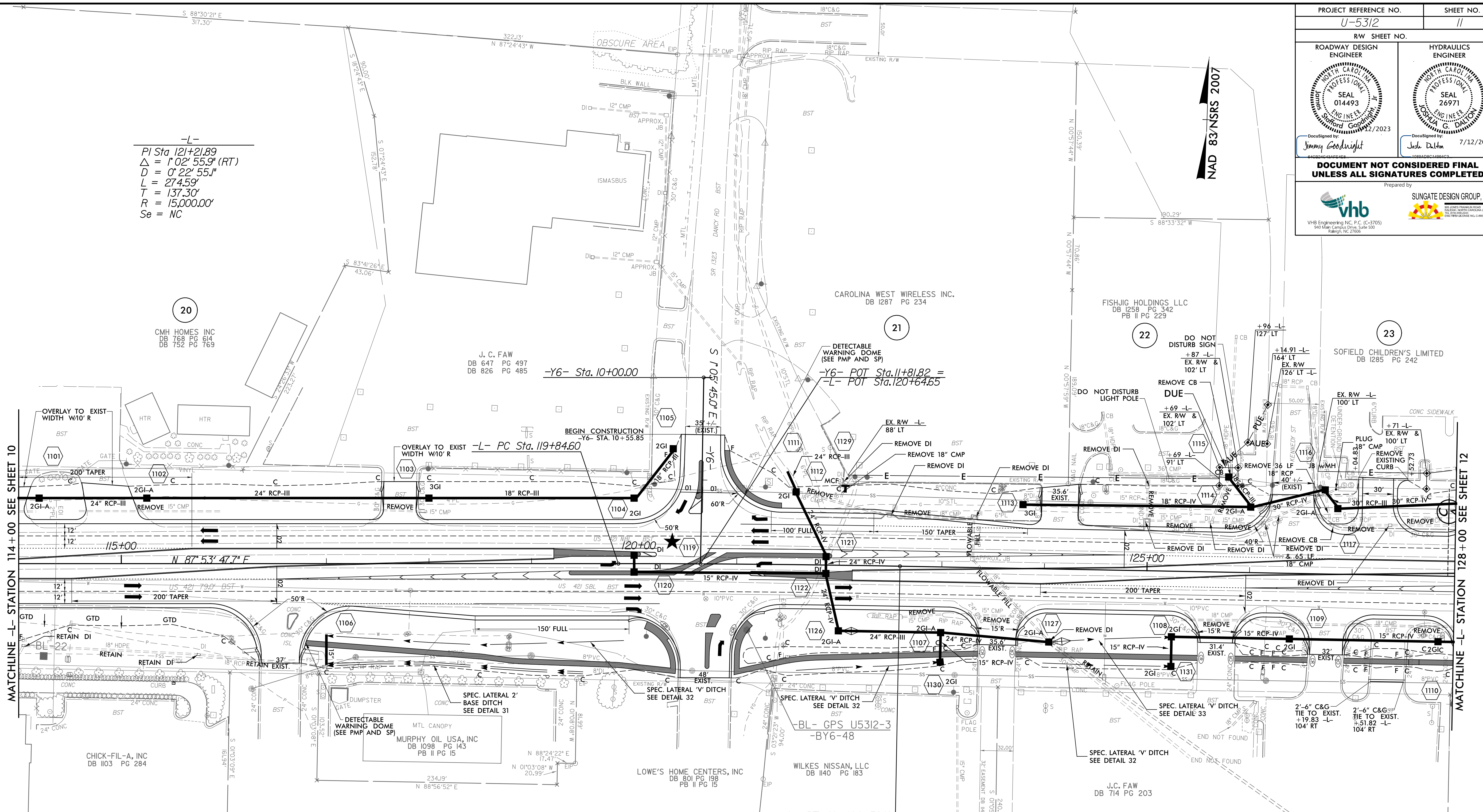


ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

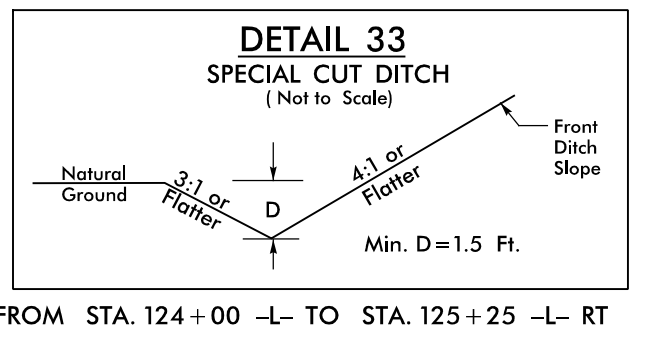
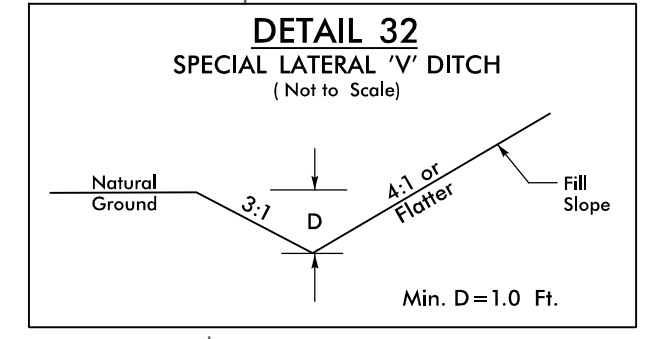
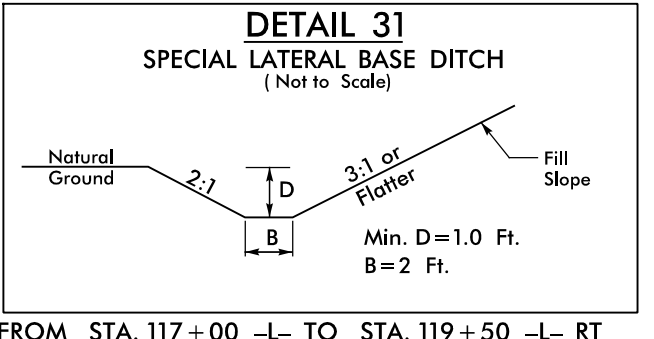
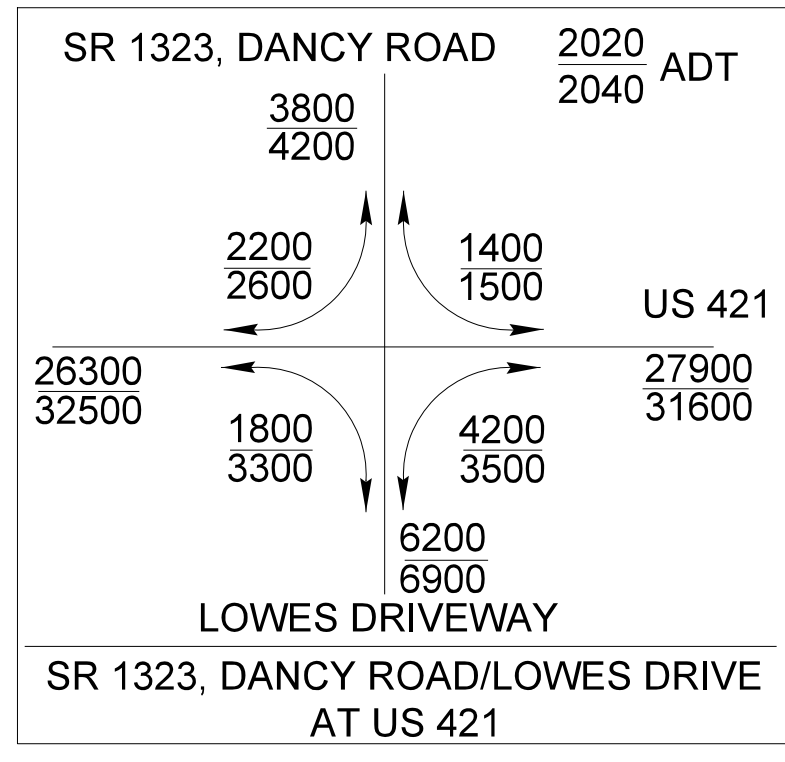
FOR -L- & -Y5- PROFILES SEE SHEETS 19 & 23
 FOR INTERSECTION DETAIL SEE SHEET 2B-7
 FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1

★ DENOTES PROPOSED SIGNALIZED INTERSECTION

PROJECT REFERENCE NO. U-5312		SHEET NO. 11	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>			
<p>Prepared by  </p>			



-L-
 PI Sta. 121+21.89
 $\Delta = 1^{\circ} 02' 55.9" (RT)$
 $D = 0^{\circ} 22' 55.1"$
 $L = 274.59'$
 $T = 137.30'$
 $R = 15,000.00'$
 $Se = NC$



FOR -L- & -Y6- PROFILES SEE SHEETS 20 & 23
 FOR INTERSECTION DETAIL SEE SHEET 2B-8
 FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1

ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

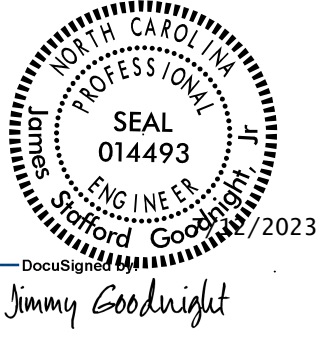
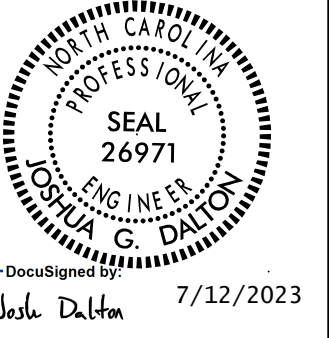


★ DENOTES PROPOSED SIGNALIZED INTERSECTION

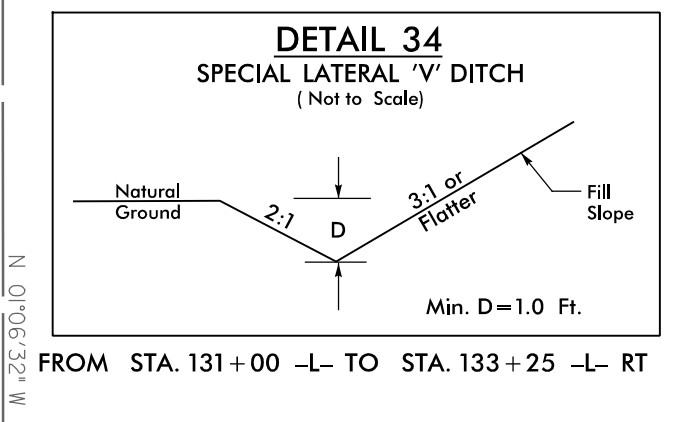
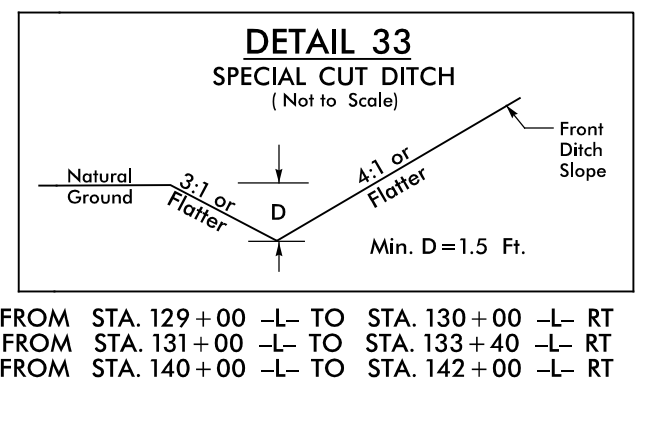
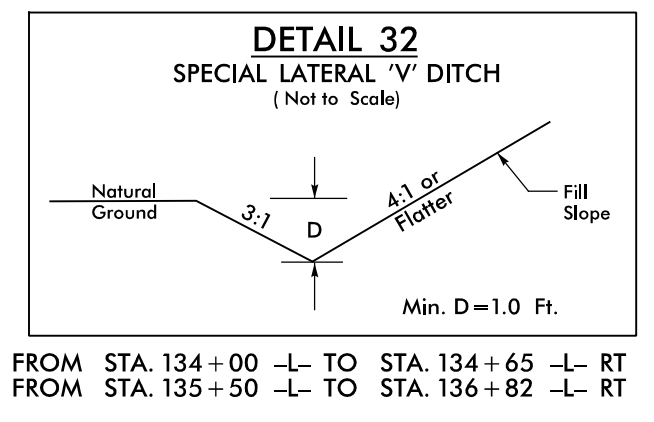
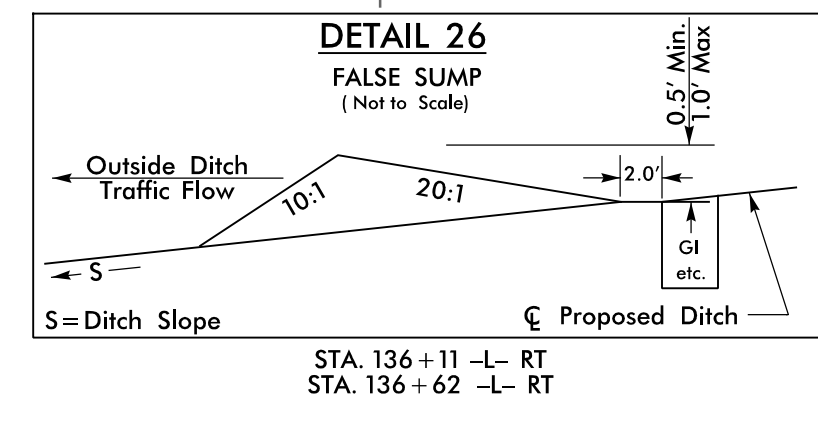
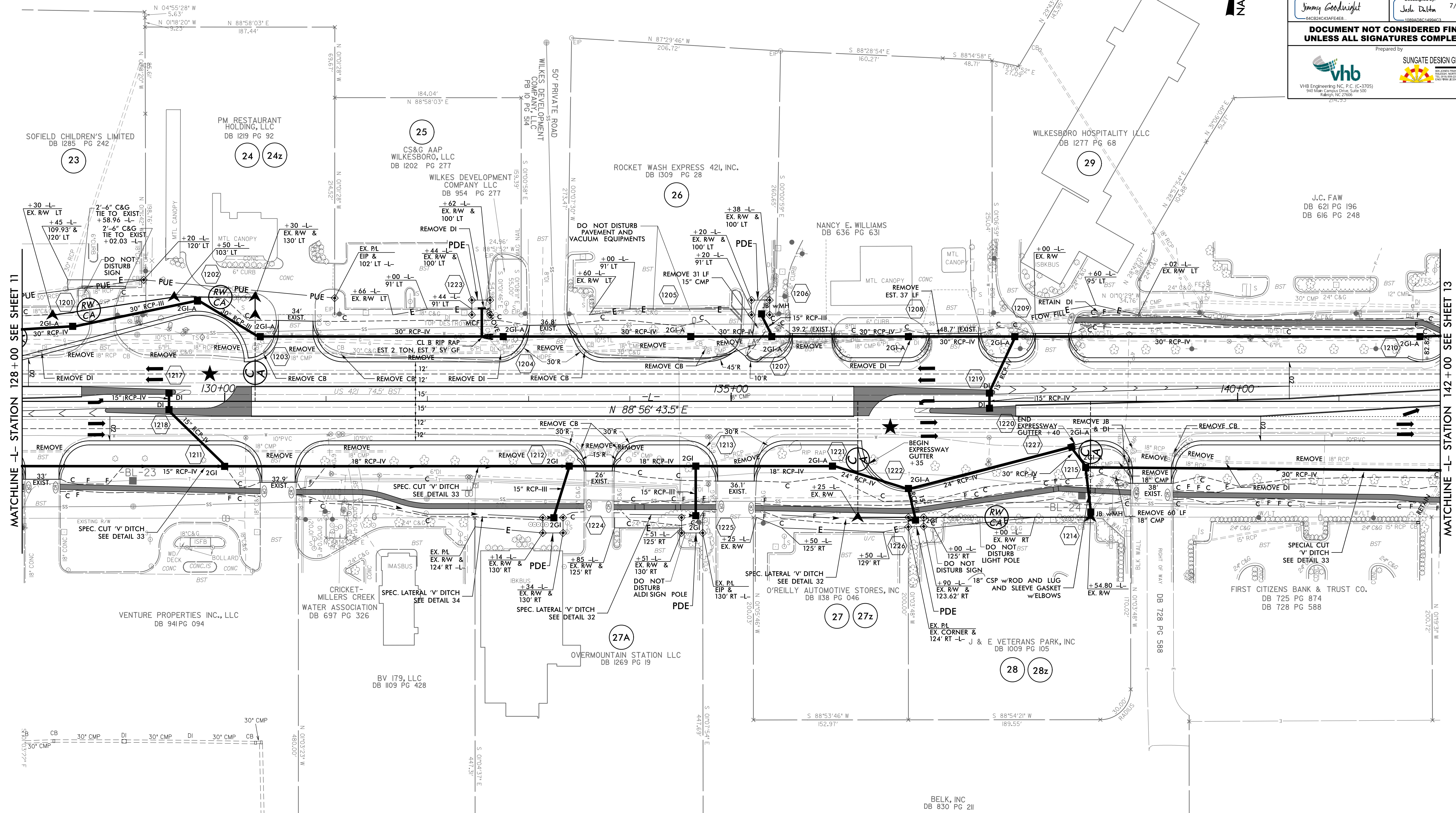
8.17.2023
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 11/11/2023

8.17.23

FOR -L- PROFILE SEE SHEET 20
FOR CONCRETE ISLANDS AND U-TURN BULB DETAILS SEE SHEETS 2B-9 & 2B-10
FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1

★ DENOTES PROPOSED SIGNALIZED INTERSECTION

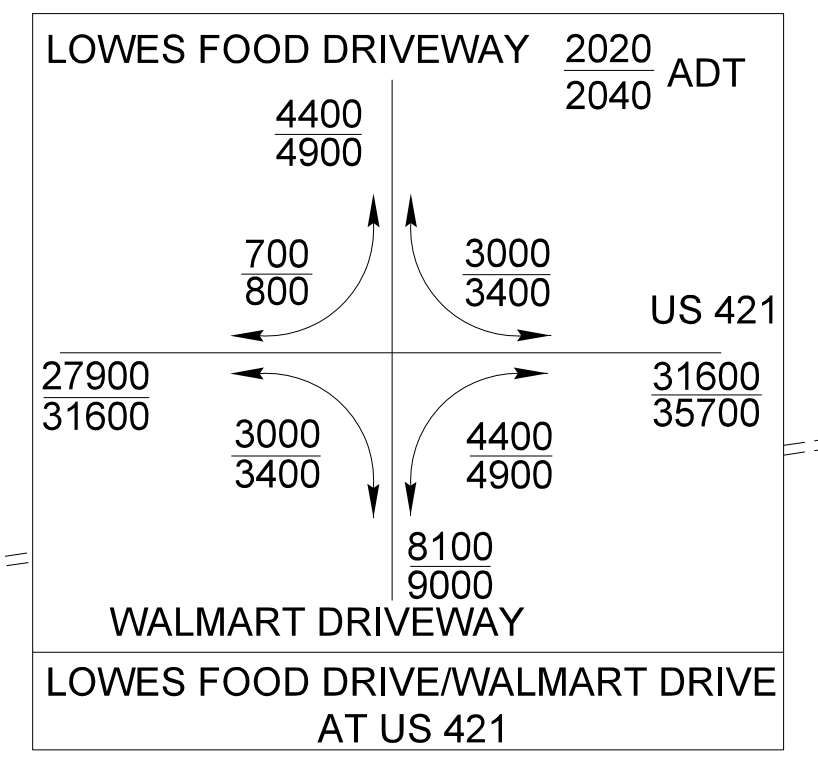
PROJECT REFERENCE NO. U-5312		SHEET NO. 12	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		ENGINEER	
			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by			
			



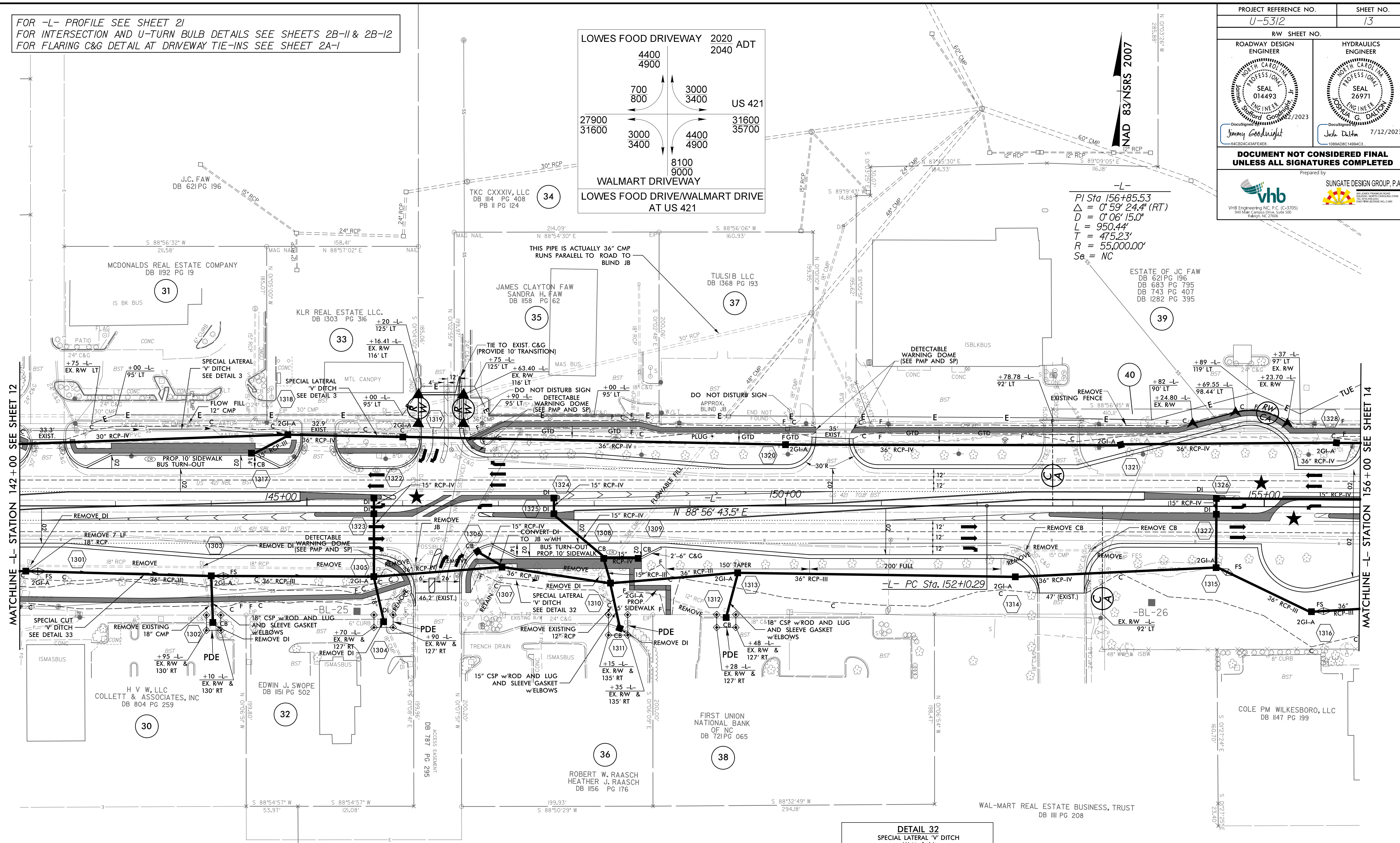
1/6/23
1/6/23
1/6/23

FOR -L- PROFILE SEE SHEET 21
FOR INTERSECTION AND U-TURN BULB DETAILS SEE SHEETS 2B-II & 2B-12
FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1

PROJECT REFERENCE NO. U-5312		SHEET NO. 13	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

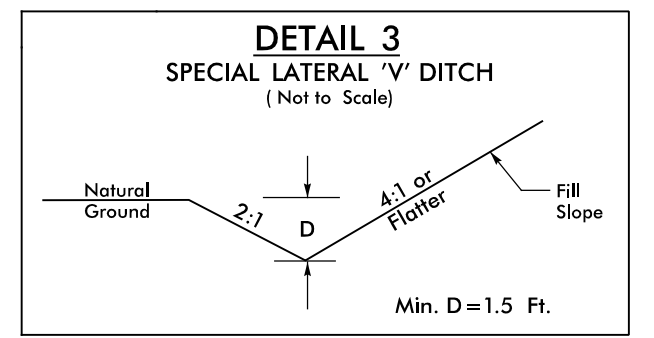


-L-
 PI Sta 156+85.53
 $\Delta = 0^{\circ} 59' 24.4''$ (RT)
 $D = 0^{\circ} 06' 15.0''$
 $L = 950.44'$
 $T = 475.23'$
 $R = 55,000.00'$
 $S_e = NC$

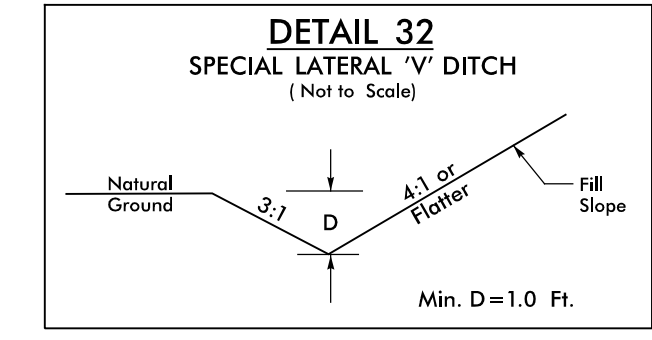


MATCHLINE -L- STATION 142+00 SEE SHEET 12

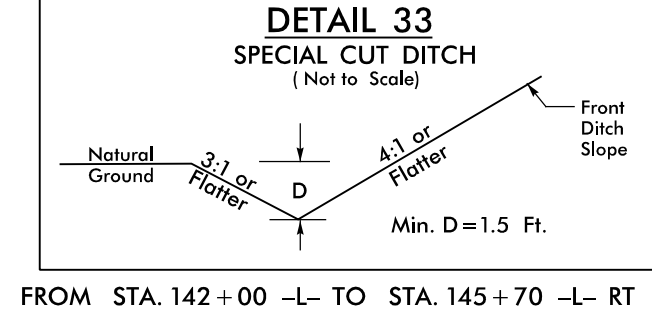
MATCHLINE -L- STATION 156+00 SEE SHEET 14



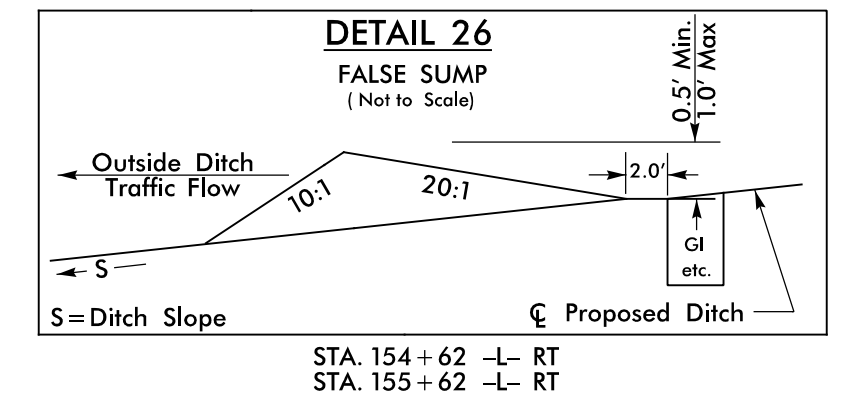
FROM STA. 143+00 -L- TO STA. 144+75 -L- LT
FROM STA. 145+60 -L- TO STA. 146+00 -L- LT



FROM STA. 147+00 -L- TO STA. 148+00 -L- RT



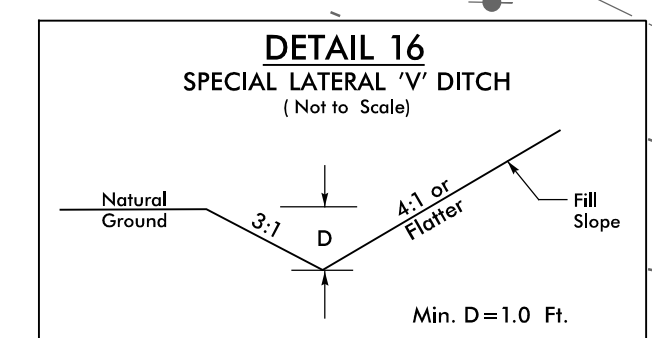
FROM STA. 142+00 -L- TO STA. 145+70 -L- RT



STA. 154+62 -L- RT
STA. 155+62 -L- RT

★ DENOTES PROPOSED SIGNALIZED INTERSECTION

PROJECT REFERENCE NO. U-5312		SHEET NO. 14	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
Documented by Jimmy Goodnight		Documented by Josh Dalton 7/12/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by 		SUNGATE DESIGN GROUP, P.A. 	



FROM STA. 155+50 -L- TO STA. 155+75 -L- LT
FROM STA. 157+00 -L- TO STA. 162+50 -L- LT

-L-
 PI Sta 156+85.53
 $\Delta = 0' 59' 24.4''$ (RT)
 $D = 0' 06' 15.0''$
 $L = 950.44'$
 $T = 475.23'$
 $R = 55,000.00'$
 $Se = NC$

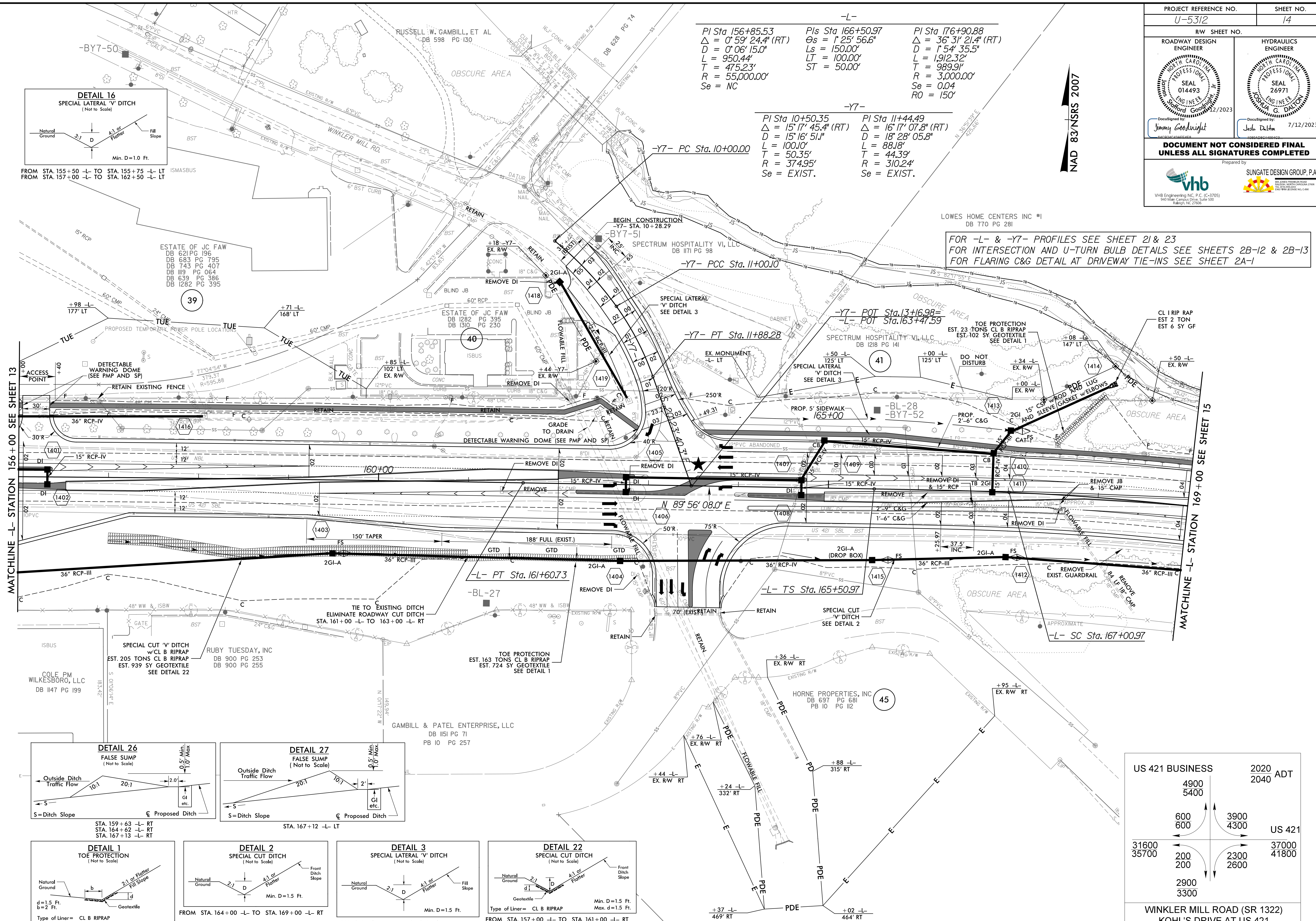
PIs Sta 166+50.97
 $\Delta s = 1' 25' 56.6''$
 $Ls = 150.00'$
 $LT = 100.00'$
 $ST = 50.00'$

PI Sta 176+90.88
 $\Delta = 36' 31' 21.4''$ (RT)
 $D = 1' 54' 35.5''$
 $L = 1912.32'$
 $T = 989.9'$
 $R = 3,000.00'$
 $Se = 0.04$
 $RO = 150'$

-Y7-
 PI Sta 10+50.35
 $\Delta = 15' 17' 45.4''$ (RT)
 $D = 15' 16' 51.1''$
 $L = 100.10'$
 $T = 50.35'$
 $R = 374.95'$
 $Se = EXIST.$

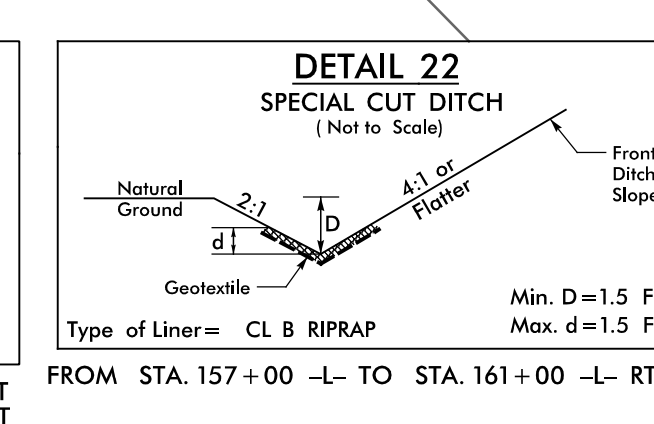
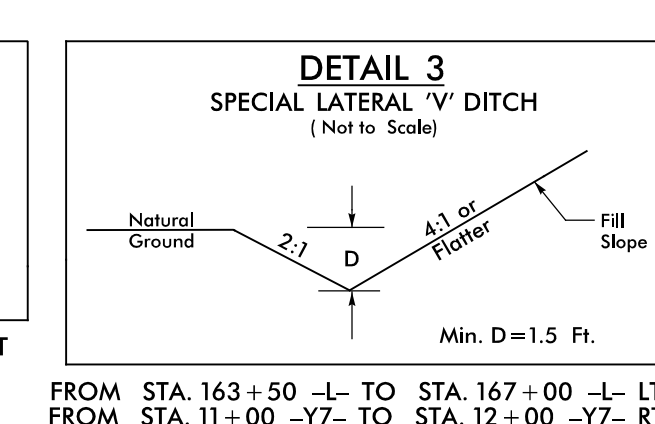
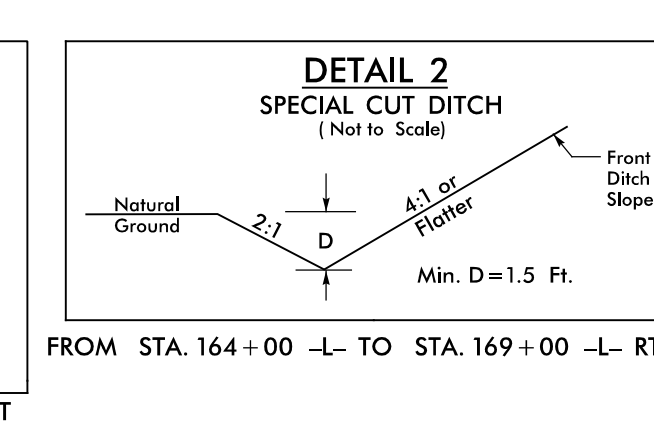
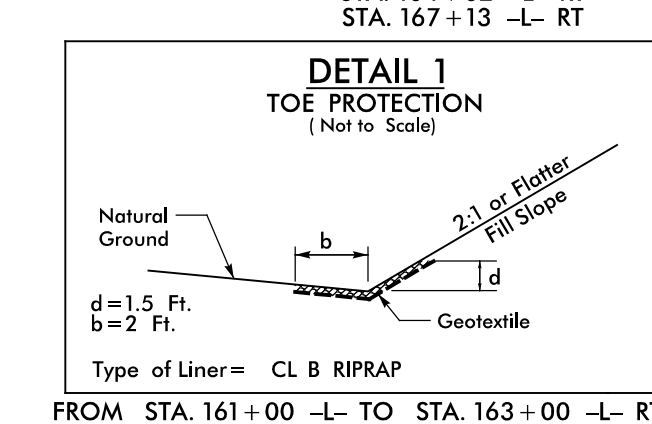
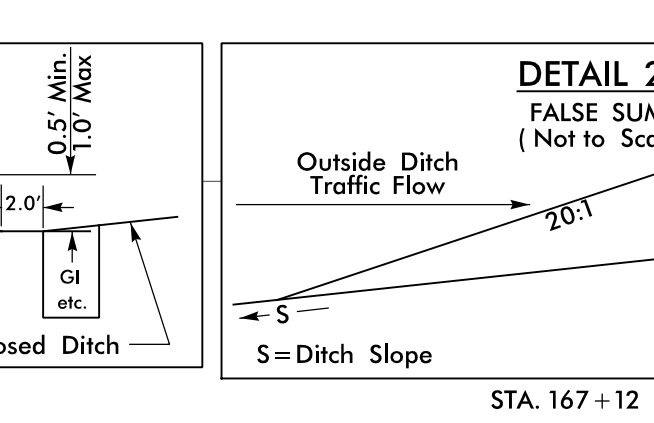
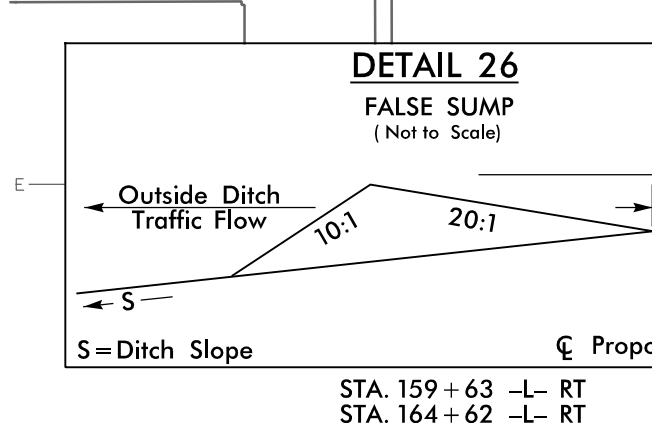
PI Sta 11+44.49
 $\Delta = 16' 17' 07.8''$ (RT)
 $D = 18' 28' 05.8''$
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 $T = 44.39'$
 $R = 310.24'$
 $Se = EXIST.$

FOR -L- & -Y7- PROFILES SEE SHEET 21 & 23
 FOR INTERSECTION AND U-TURN BULB DETAILS SEE SHEETS 2B-12 & 2B-13
 FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1



MATCHLINE -L- STATION 156+00 SEE SHEET 13

MATCHLINE -L- STATION 169+00 SEE SHEET 15



US 421 BUSINESS		2020 ADT	
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600	600	4300	37000
31600	35700	2300	41800
2900	3300	2600	

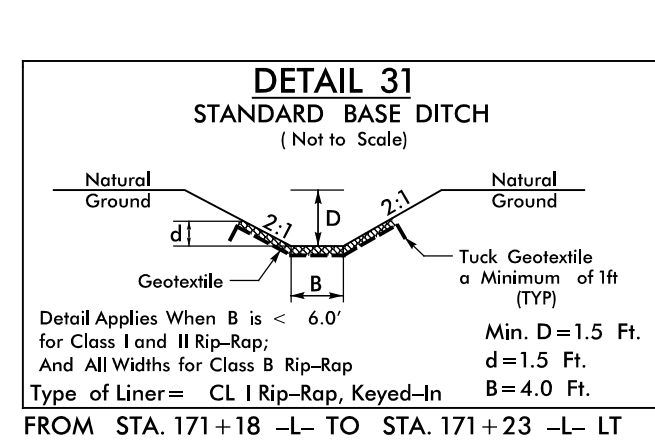
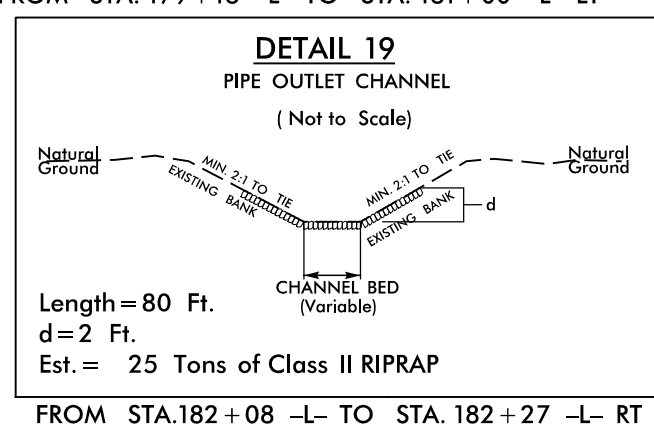
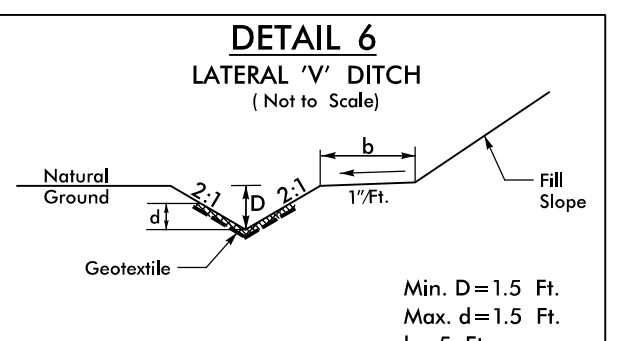
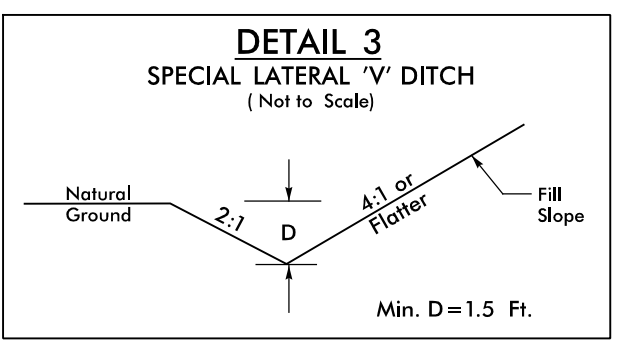
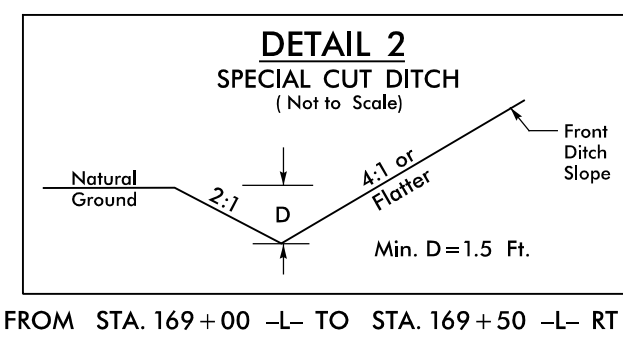
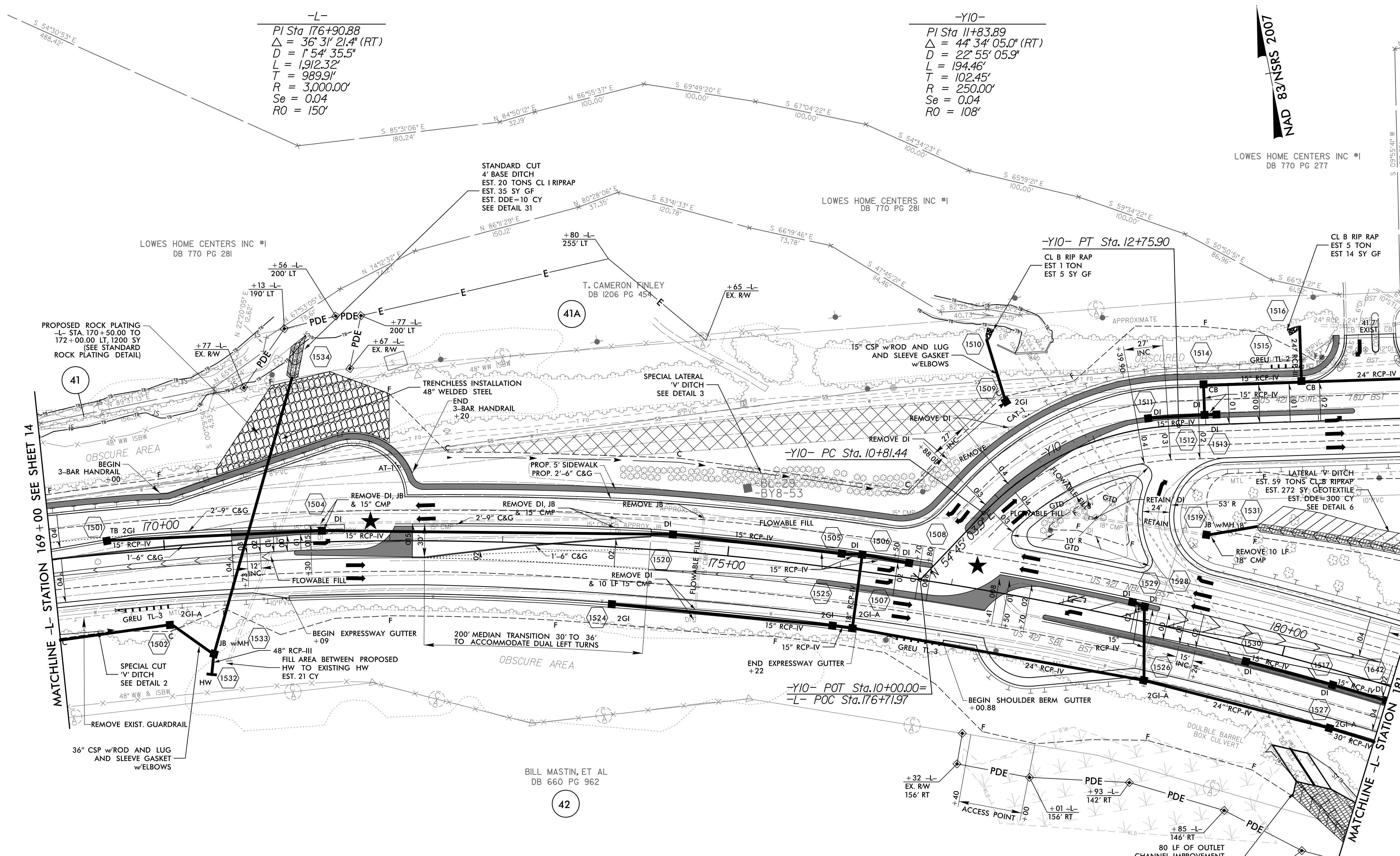
WINKLER MILL ROAD (SR 1322)
 KOHL'S DRIVE AT US 421

★ DENOTES PROPOSED SIGNALIZED INTERSECTION

1/6/2023 10:14:14 AM

8.17.23

PROJECT REFERENCE NO. U-5312		SHEET NO. 15	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		ENGINEER	
Documented by Jimmy Goodnight		Documented by Jesse D. Hottel	
Date: 12/2/2023		Date: 7/12/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by vhb SUNGATE DESIGN GROUP, P.A.			



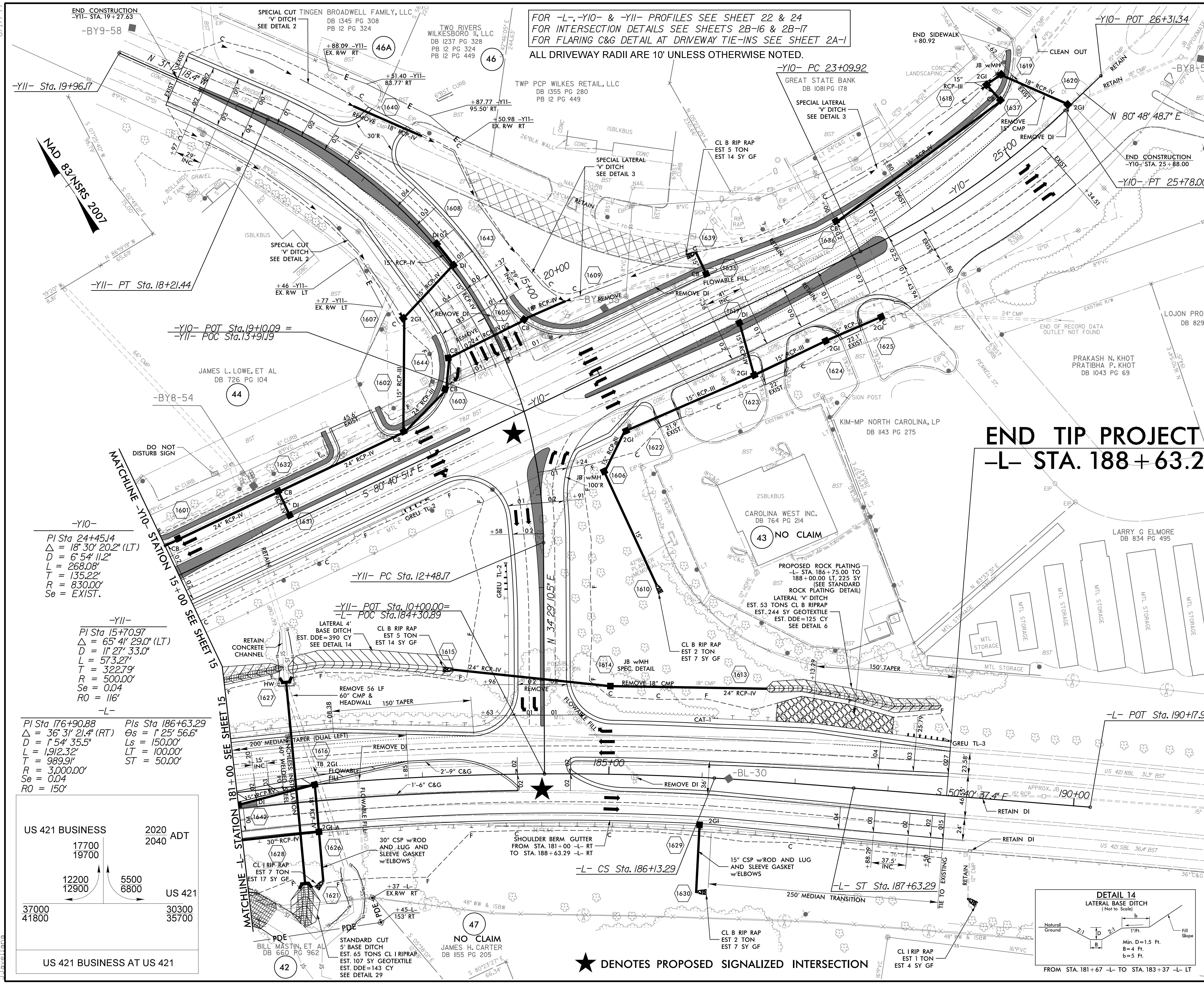
FOR -L- & -Y10- PROFILES SEE SHEETS 22 & 24
FOR INTERSECTION AND U-TURN BULB DETAILS SEE SHEETS 2B-14 & 2B-15

★ DENOTES PROPOSED SIGNALIZED INTERSECTION

12/2/2023
15312.dwg
psh15.dgn

PROJECT REFERENCE NO. U-5312		SHEET NO. 16	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared by SUNGATE DESIGN GROUP, P.A. VHB Engineering NC, P.C. (C-3705) 9401 Main Central Drive, Suite 500 Raleigh, NC 27606			

FOR -L-, -Y10- & -Y11- PROFILES SEE SHEET 22 & 24
 FOR INTERSECTION DETAILS SEE SHEETS 2B-16 & 2B-17
 FOR FLARING C&G DETAIL AT DRIVEWAY TIE-INS SEE SHEET 2A-1
 ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.

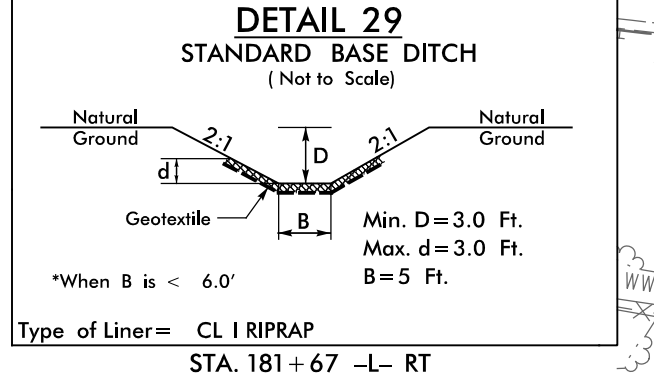
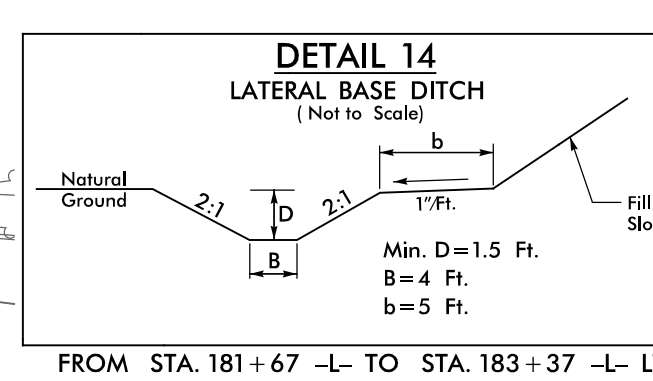
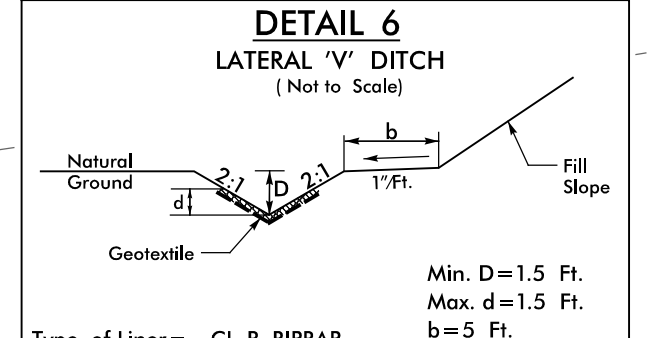
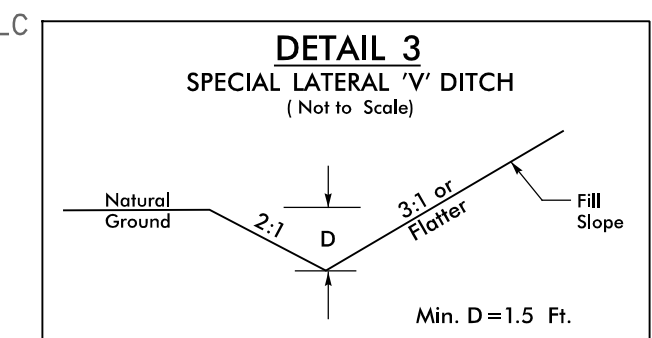
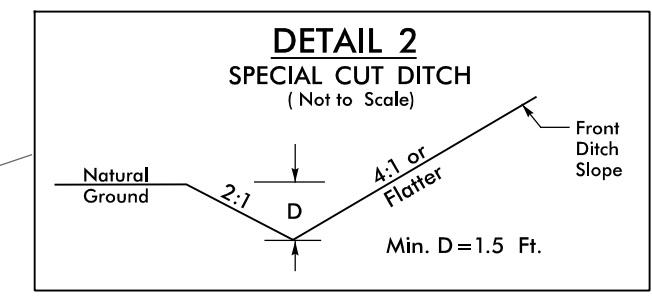


-Y10-
 PI Sta 24+45.14
 $\Delta = 18^\circ 30' 20.2''$ (LT)
 $D = 6' 54' 11.2''$
 $L = 268.08'$
 $T = 135.22'$
 $R = 830.00'$
 $Se = EXIST.$

-Y11-
 PI Sta 15+70.97
 $\Delta = 65^\circ 4' 29.0''$ (LT)
 $D = 1' 27' 33.0''$
 $L = 573.27'$
 $T = 322.79'$
 $R = 500.00'$
 $Se = 0.04$
 $RO = 116'$

PIs Sta 176+90.88 PIs Sta 186+63.29
 $\Delta = 36^\circ 3' 21.4''$ (RT) $\Theta_s = 1^\circ 25' 56.6''$
 $D = 1' 54' 35.5''$ $Ls = 150.00'$
 $L = 1912.32'$ $LT = 100.00'$
 $T = 989.91'$ $ST = 50.00'$
 $R = 3,000.00'$
 $Se = 0.04$
 $RO = 150'$

US 421 BUSINESS	2020 ADT
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19700	2040
12200	5500
12900	6800
37000	US 421
41800	30300
	35700
US 421 BUSINESS AT US 421	

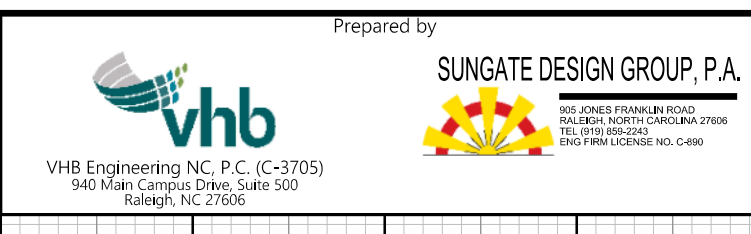


END TIP PROJECT U-5312

-L- STA. 188+63.29

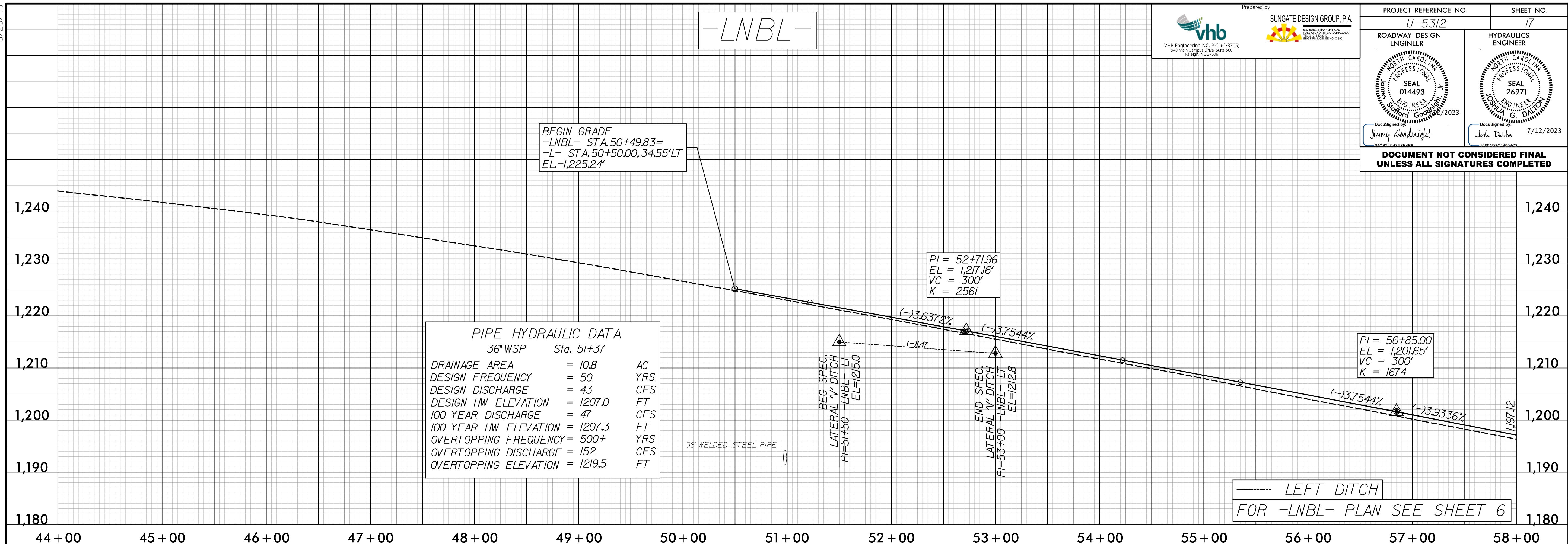
★ DENOTES PROPOSED SIGNALIZED INTERSECTION

5/28/23



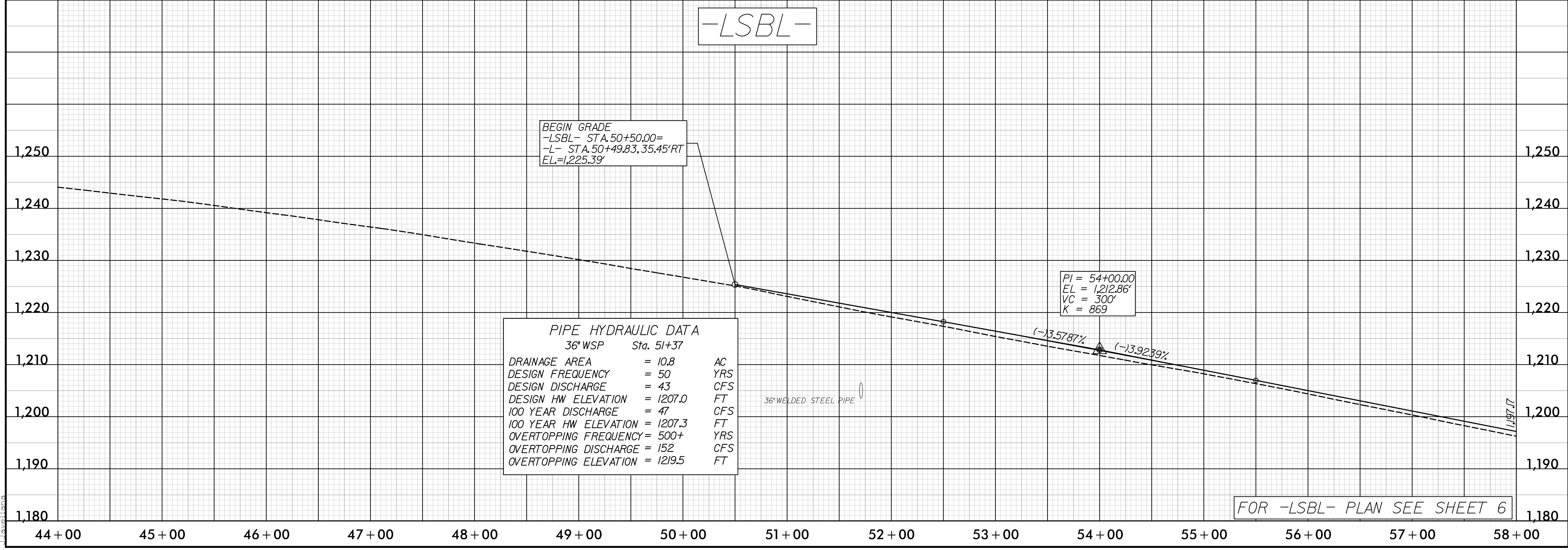
PROJECT REFERENCE NO. U-5312	SHEET NO. 17
ROADWAY DESIGN ENGINEER JIMMY GOODWRIGHT Professional Seal 014493	HYDRAULICS ENGINEER JOSH DALTON Professional Seal 26971
DocuSigned by: Jimmy Goodwright	DocuSigned by: Josh Dalton 7/12/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PIPE HYDRAULIC DATA
36" WSP Sta. 51+37

DRAINAGE AREA	= 10.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 43	CFS
DESIGN HW ELEVATION	= 1207.0	FT
100 YEAR DISCHARGE	= 47	CFS
100 YEAR HW ELEVATION	= 1207.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 152	CFS
OVERTOPPING ELEVATION	= 1219.5	FT

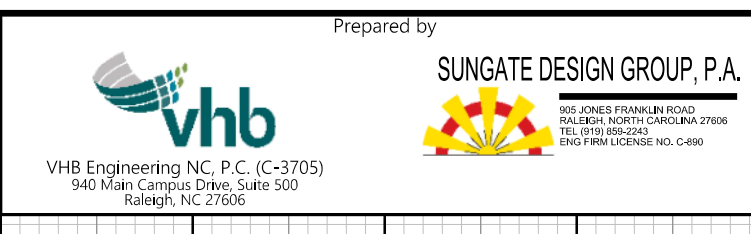


PIPE HYDRAULIC DATA
36" WSP Sta. 51+37

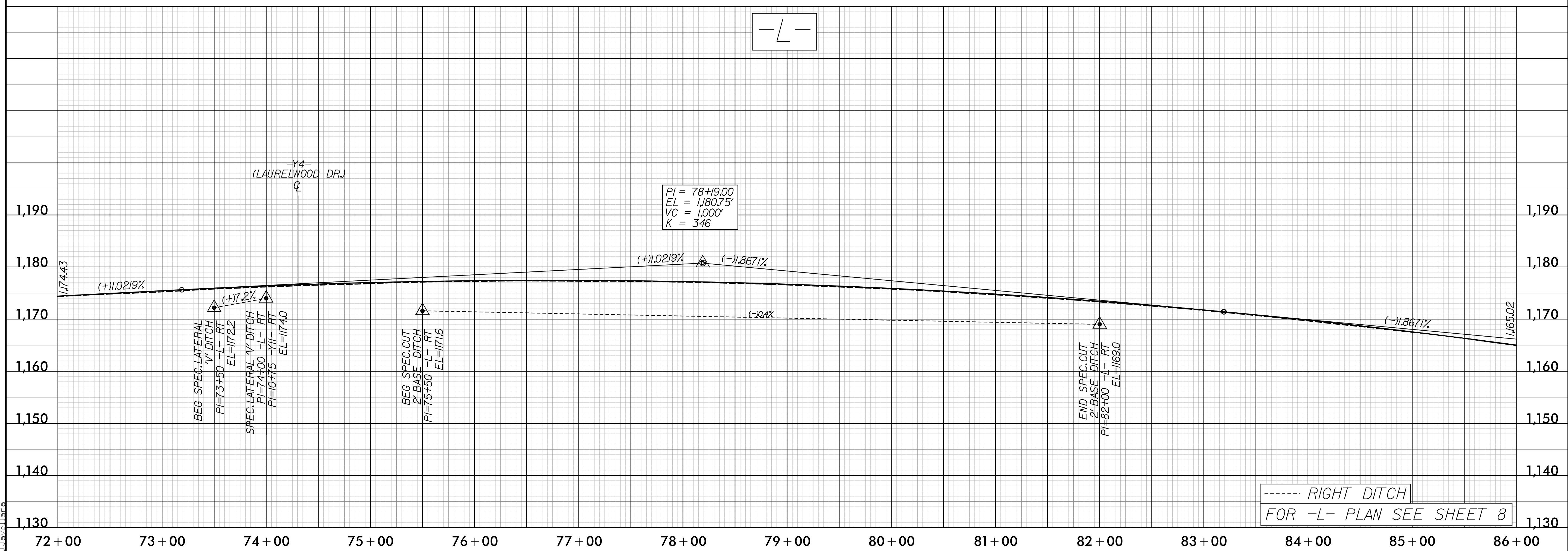
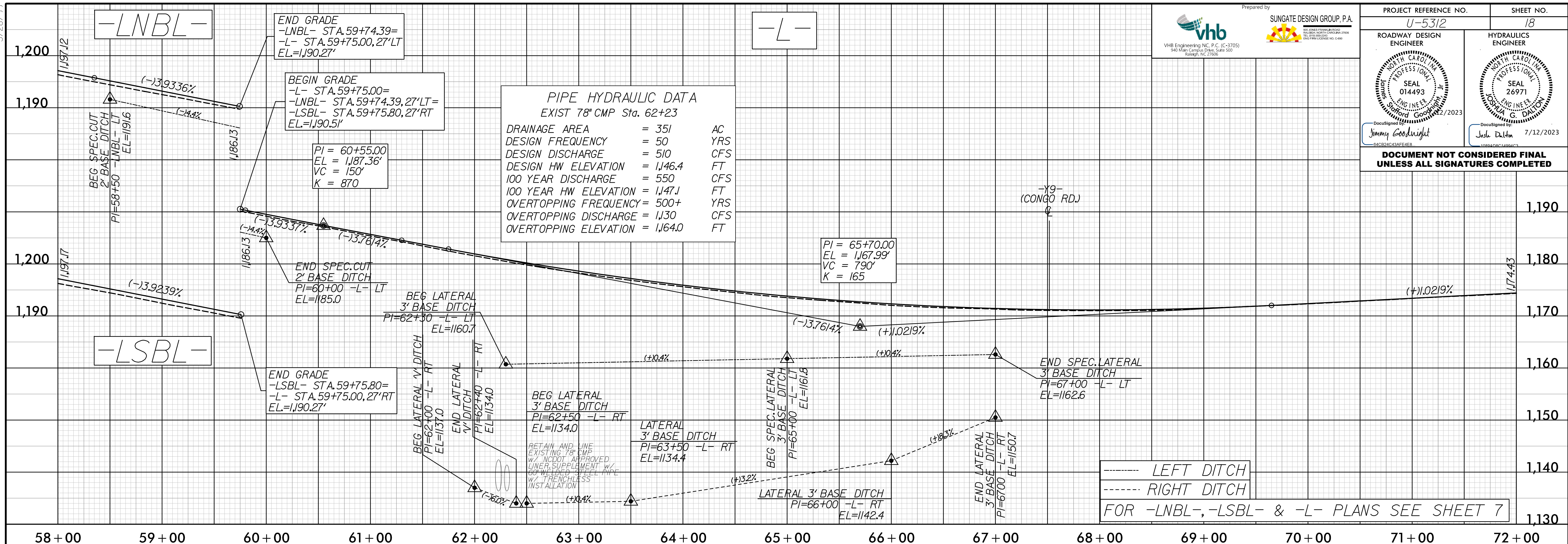
DRAINAGE AREA	= 10.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 43	CFS
DESIGN HW ELEVATION	= 1207.0	FT
100 YEAR DISCHARGE	= 47	CFS
100 YEAR HW ELEVATION	= 1207.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 152	CFS
OVERTOPPING ELEVATION	= 1219.5	FT

7/12/2023
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5/28/2018

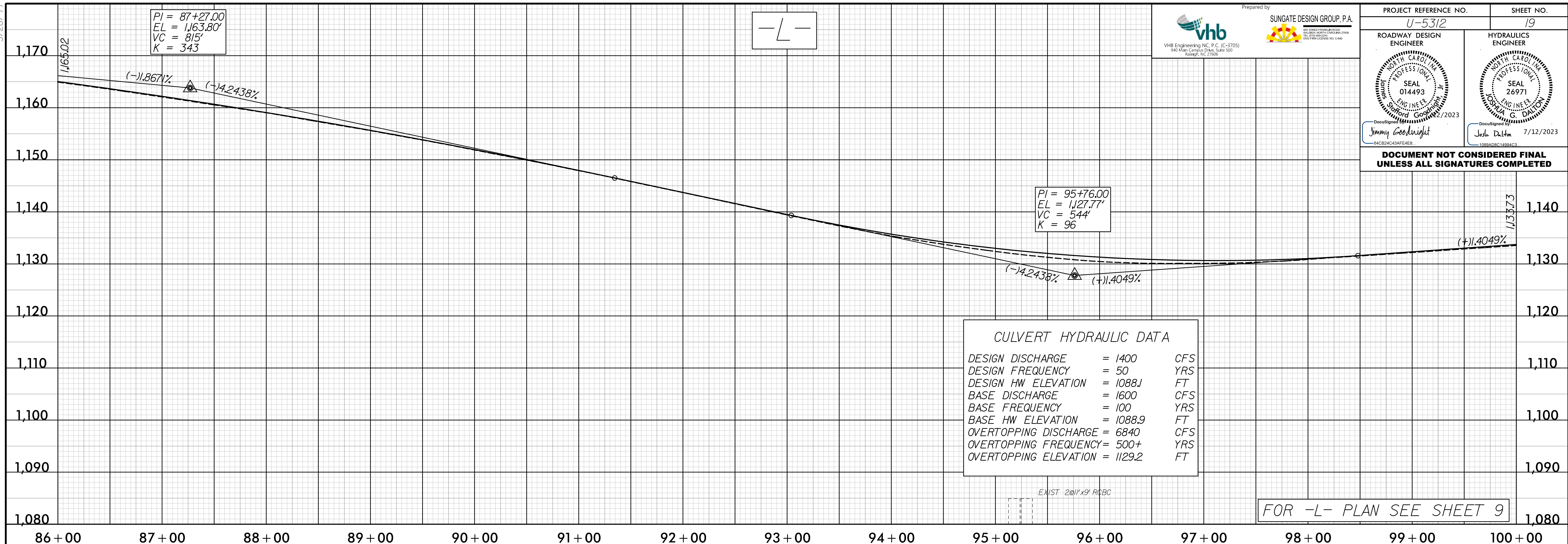


PROJECT REFERENCE NO. U-5312	SHEET NO. 18
ROADWAY DESIGN ENGINEER SEAL 014493 JIMMY GOODRIGHT	HYDRAULICS ENGINEER SEAL 26971 JOSH D. LITA
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



3/21/2023
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5/28/23

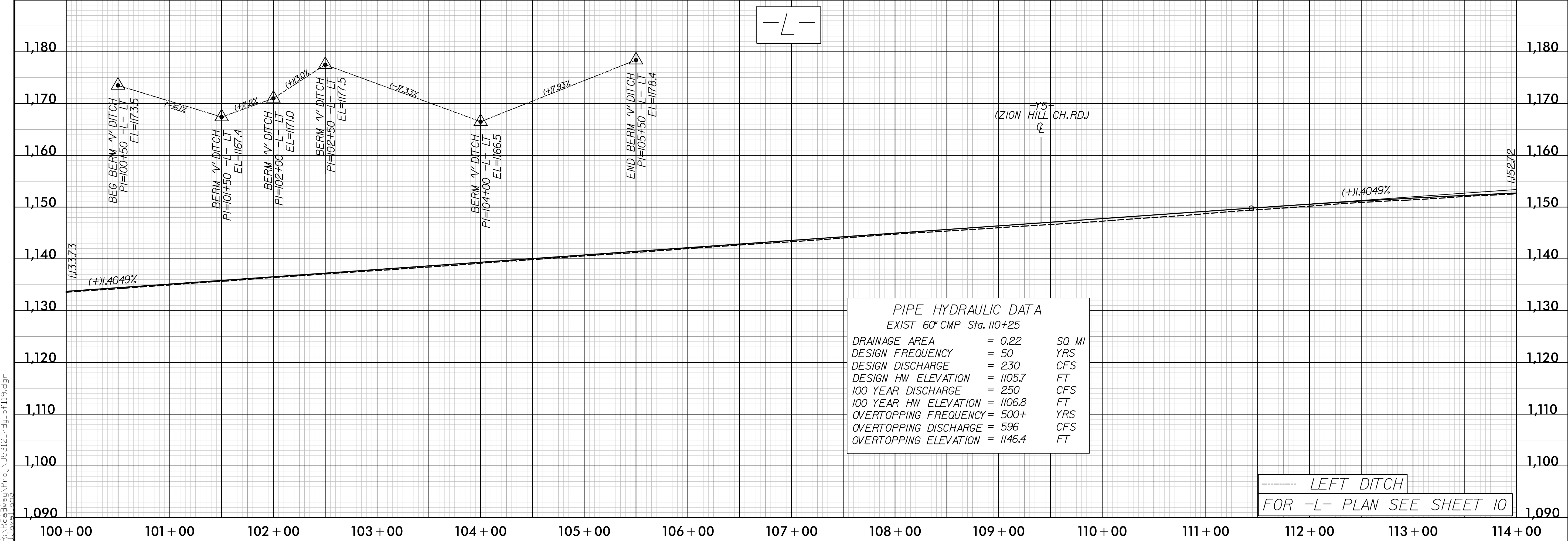


VHB Engineering NC, P.C. (C-2705)
940 Main Campus Drive, Suite 300
Raleigh, NC 27606

Prepared by
SUNGATE DESIGN GROUP, P.A.


PROJECT REFERENCE NO. U-5312	SHEET NO. 19
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED


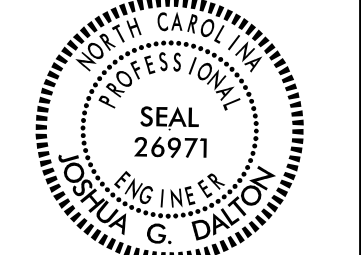


7/11/2023
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 jgood

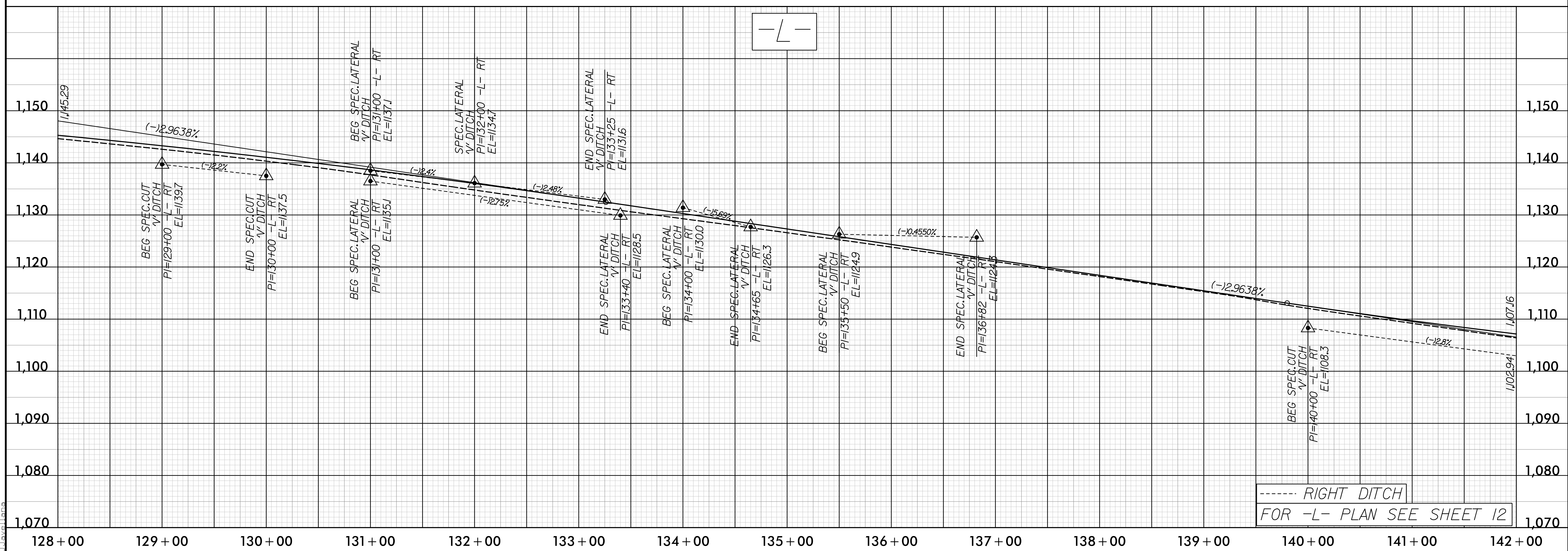
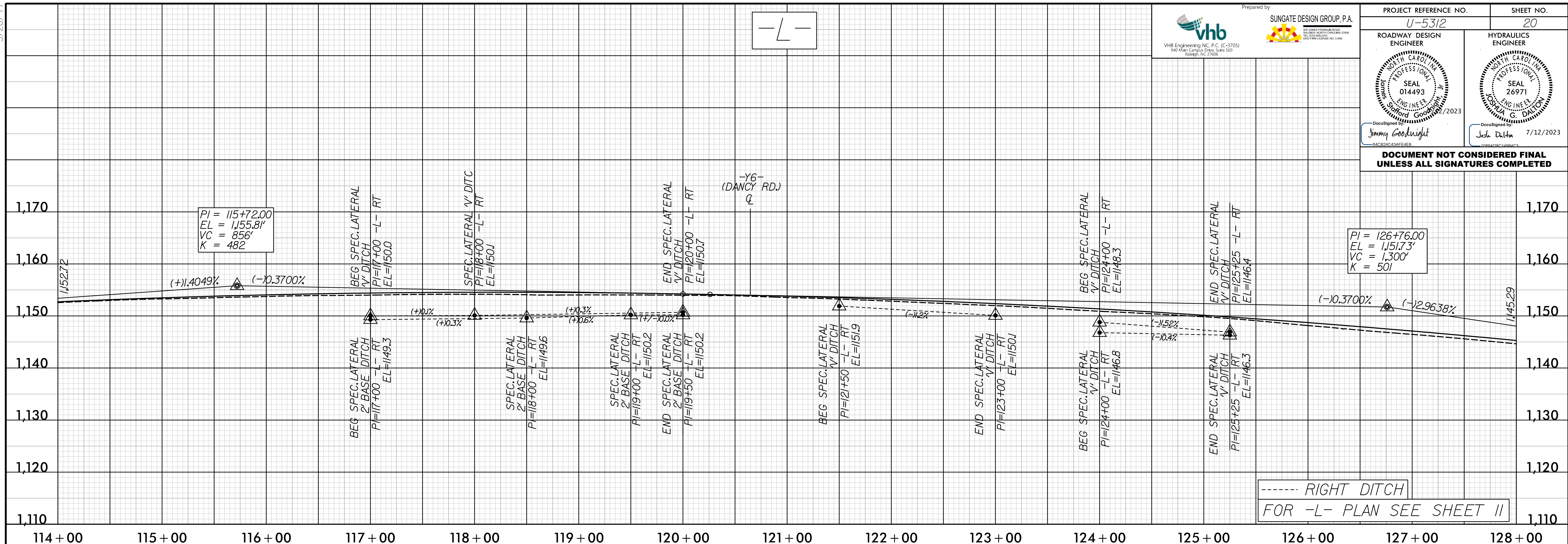
5/28/2023

Prepared by
 **VHB**
 VHB Engineering NC, P.C. (C-2705)
 940 Main Campus Drive, Suite 300
 Raleigh, NC 27606

 **SUNGATE DESIGN GROUP, P.A.**
 10000 W. Hargett Street, Suite 100
 Raleigh, NC 27615

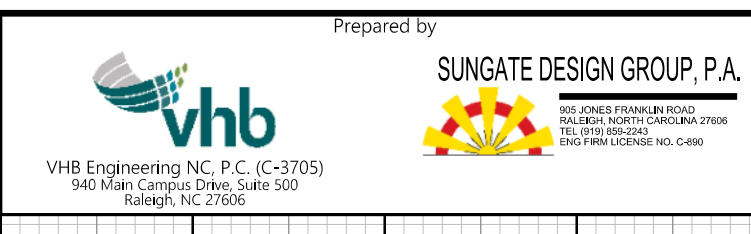
PROJECT REFERENCE NO. U-5312	SHEET NO. 20
ROADWAY DESIGN ENGINEER  SEAL 014493 7/12/2023	HYDRAULICS ENGINEER  SEAL 26971 7/12/2023

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



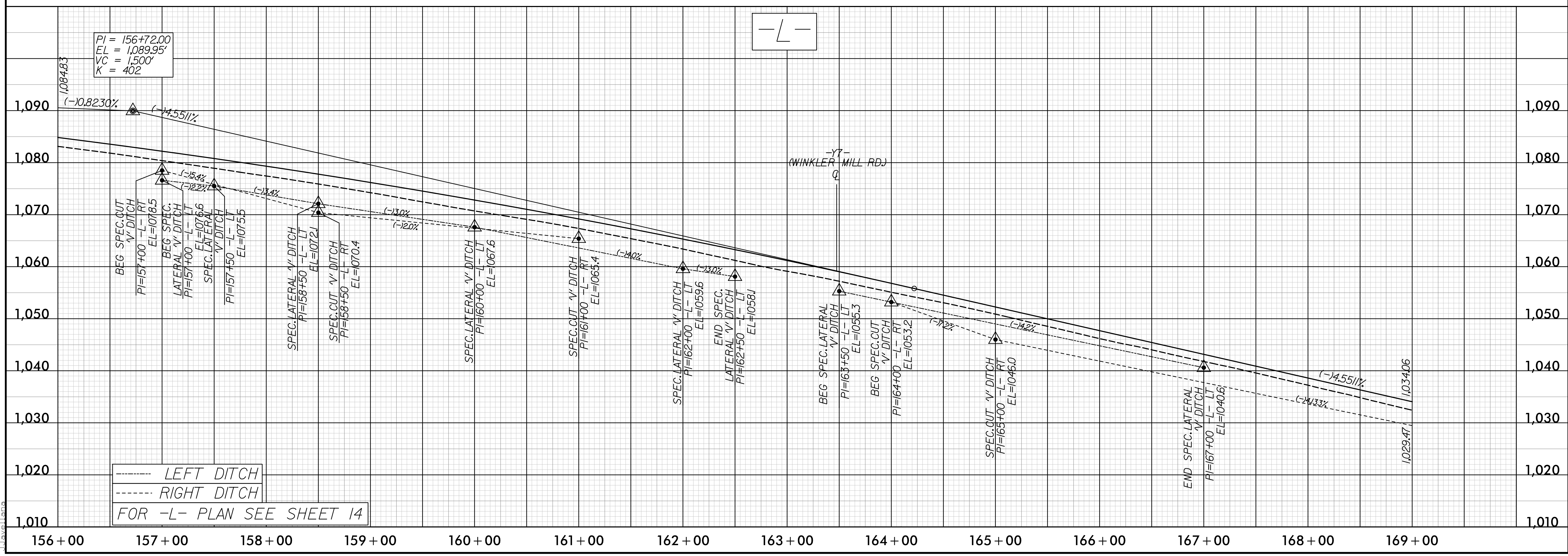
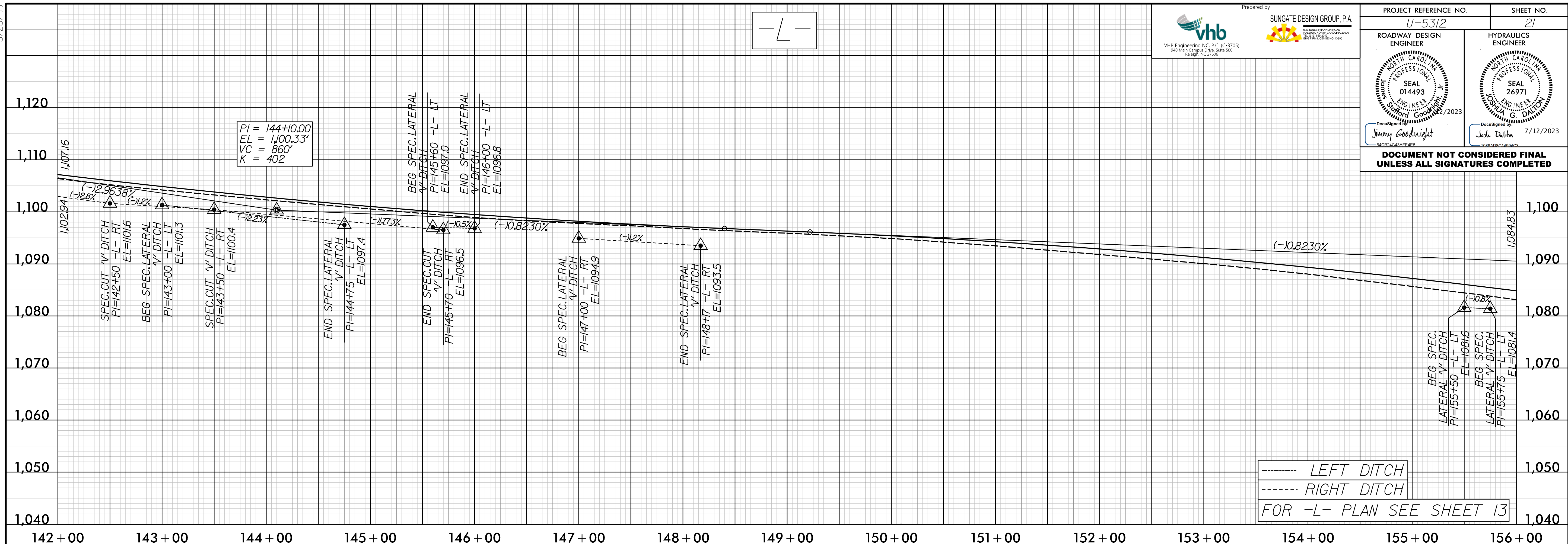
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5/28/24



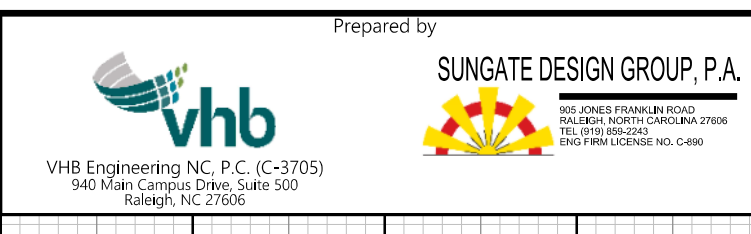
PROJECT REFERENCE NO. U-5312	SHEET NO. 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Professional Engineer Seal SEAL 014493 Jimmy Goodnight 7/12/2023	Professional Engineer Seal SEAL 26971 Julie Dalton 7/12/2023

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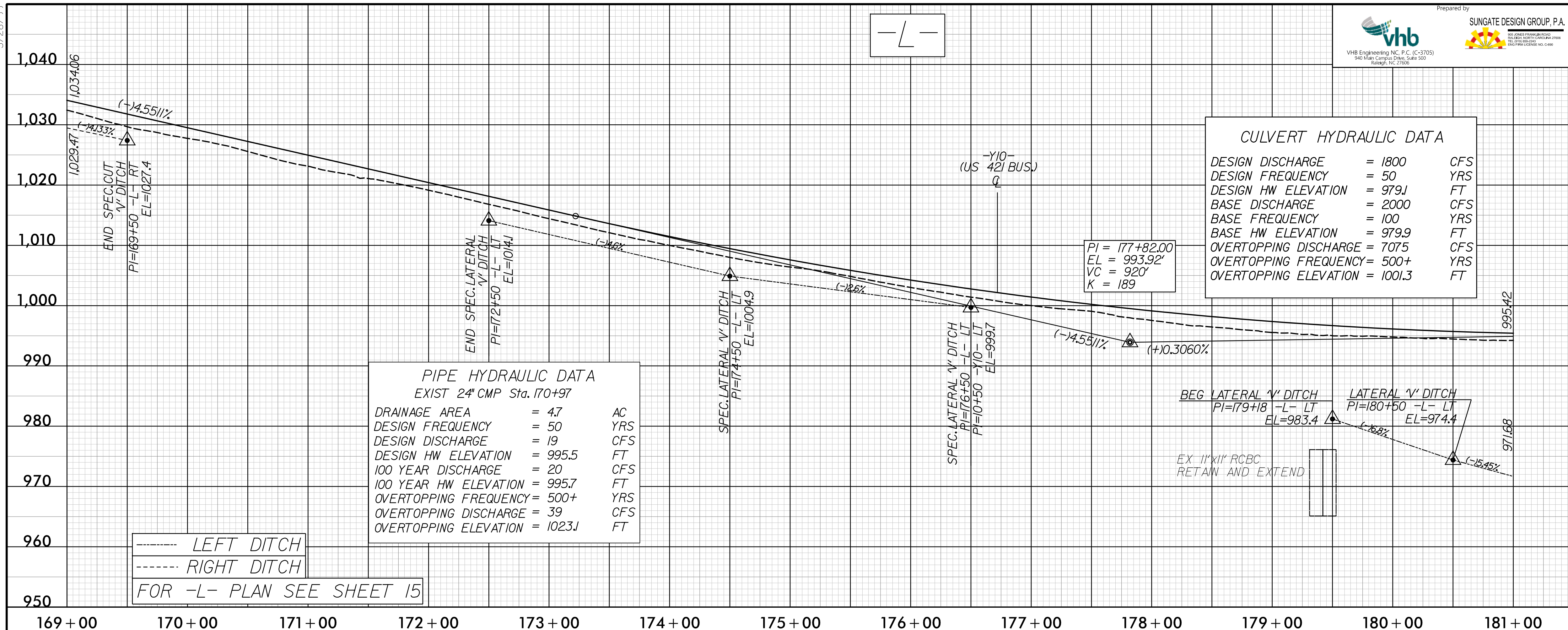


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PROJECT REFERENCE NO. U-5312	SHEET NO. 22
ROADWAY DESIGN ENGINEER SEAL 014493 Jimmy Goodnight	HYDRAULICS ENGINEER SEAL 26971 Josh Dalton
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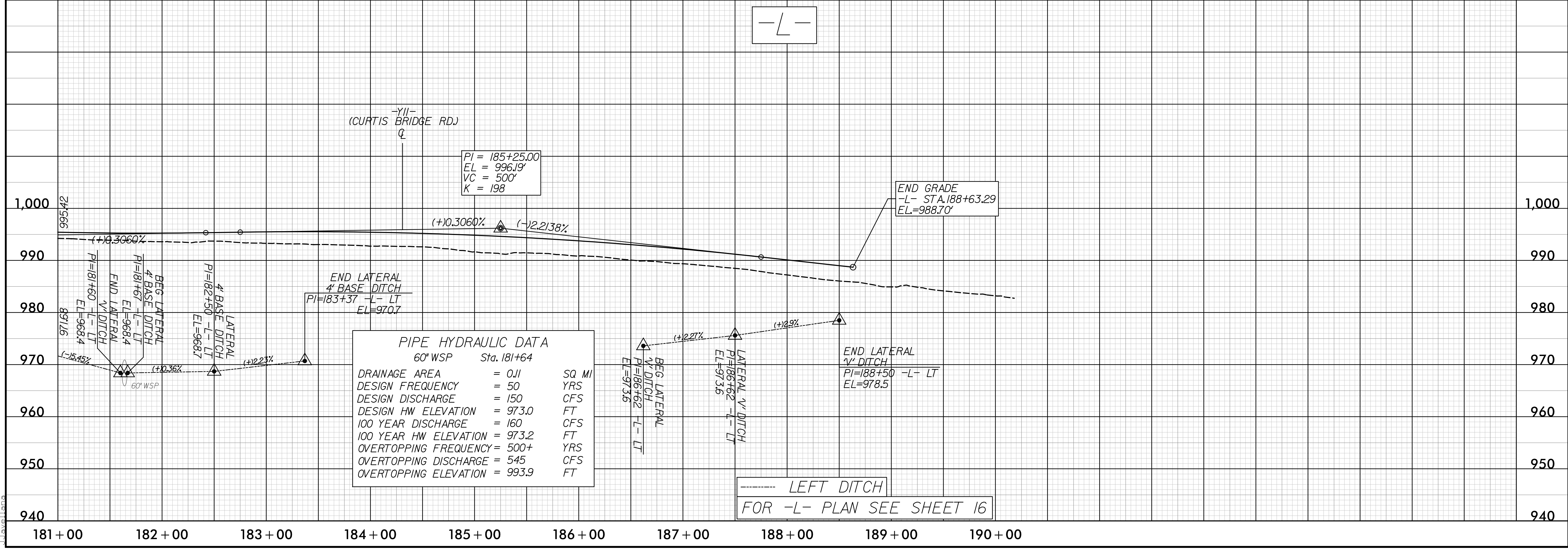
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1800	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 979J	FT
BASE DISCHARGE	= 2000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 979.9	FT
OVERTOPPING DISCHARGE	= 7075	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 1001.3	FT

PIPE HYDRAULIC DATA
EXIST 24" CMP Sta. 170+97

DRAINAGE AREA	= 4.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 19	CFS
DESIGN HW ELEVATION	= 995.5	FT
100 YEAR DISCHARGE	= 20	CFS
100 YEAR HW ELEVATION	= 995.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 39	CFS
OVERTOPPING ELEVATION	= 1023J	FT

----- LEFT DITCH
 ----- RIGHT DITCH
 FOR -L- PLAN SEE SHEET 15



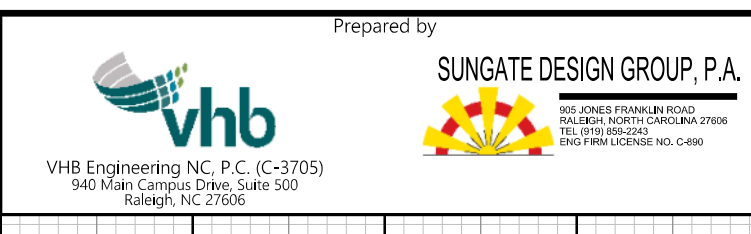
PIPE HYDRAULIC DATA
60" WSP Sta. 181+64

DRAINAGE AREA	= 0.11	SQ MI
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 150	CFS
DESIGN HW ELEVATION	= 973.0	FT
100 YEAR DISCHARGE	= 160	CFS
100 YEAR HW ELEVATION	= 973.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 545	CFS
OVERTOPPING ELEVATION	= 993.9	FT

----- LEFT DITCH
 FOR -L- PLAN SEE SHEET 16

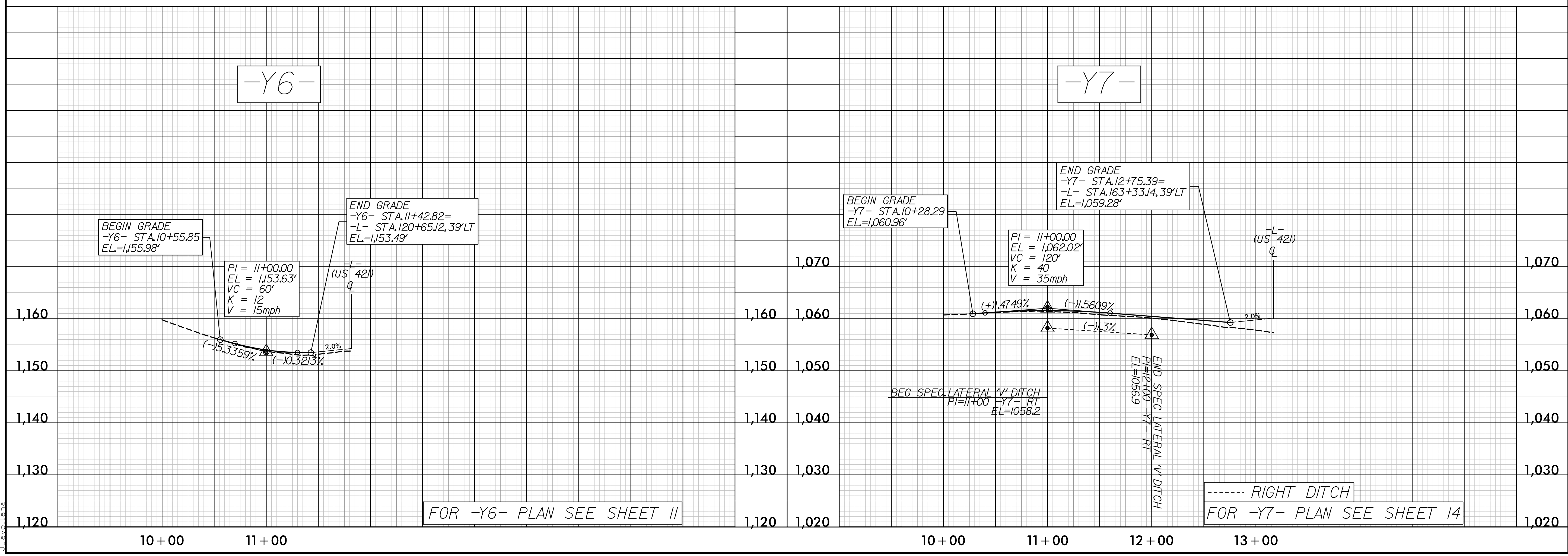
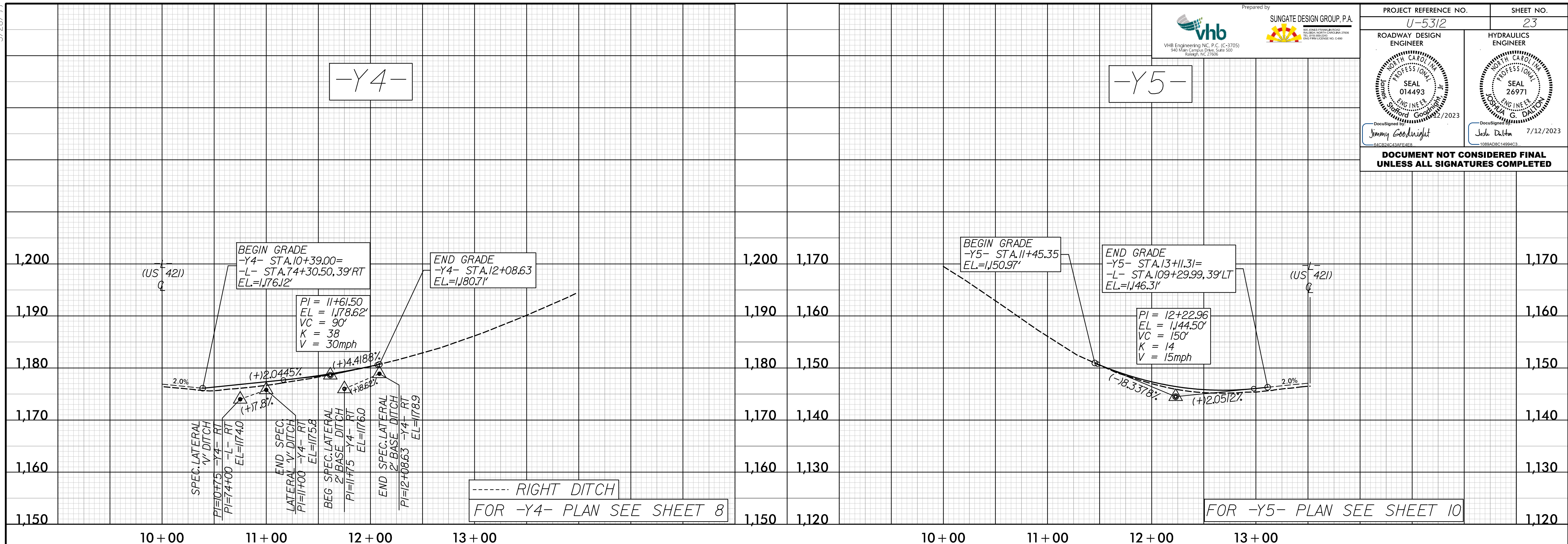
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5/28/2023



PROJECT REFERENCE NO. U-5312	SHEET NO. 23
ROADWAY DESIGN ENGINEER Professional Seal: 014493	HYDRAULICS ENGINEER Professional Seal: 26971
DocuSigned by: Jimmy Goodnight	DocuSigned by: Jesse Dalton


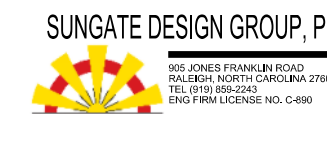
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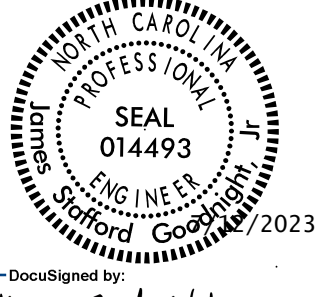
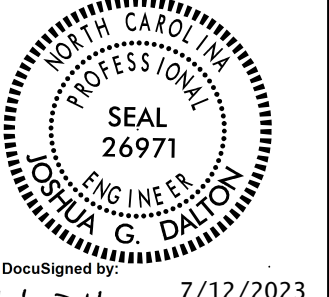
5/28/2023

Prepared by

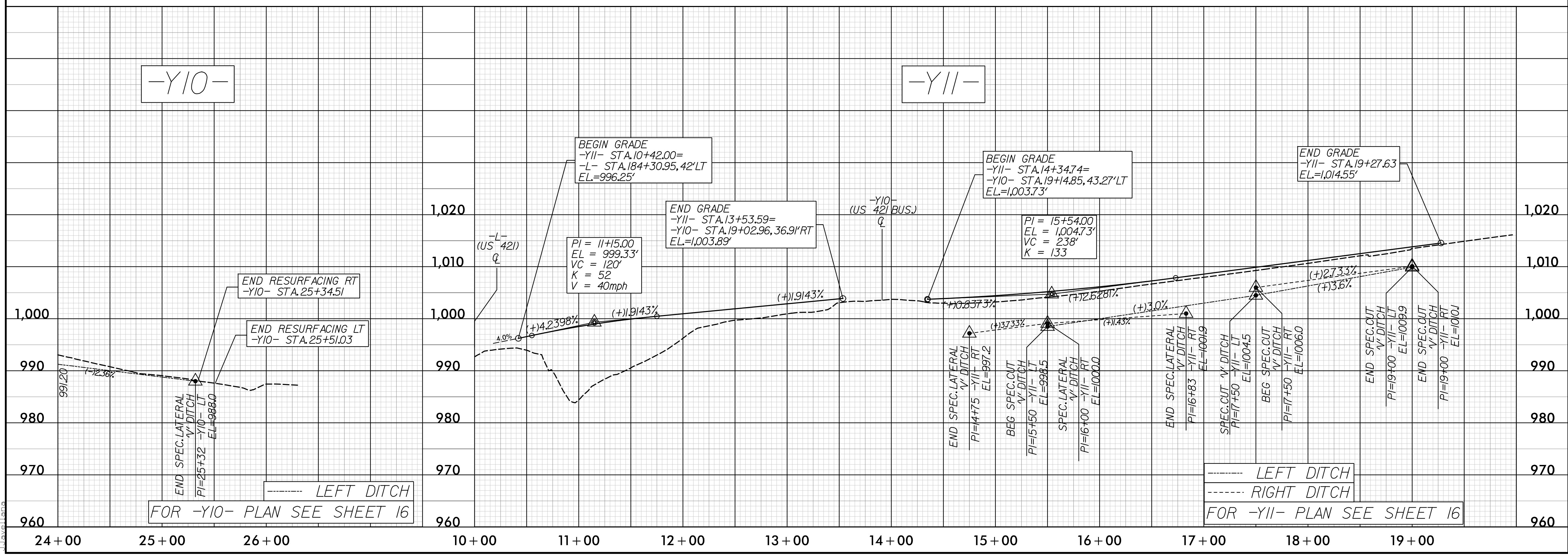
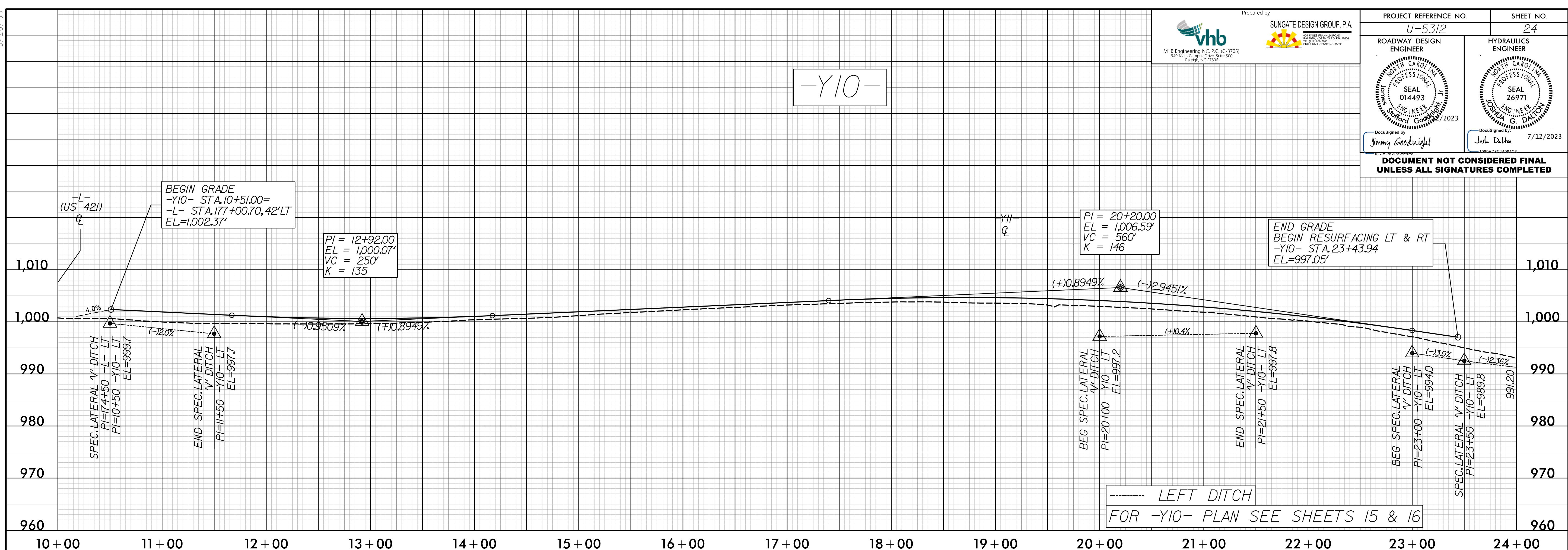



VHB Engineering NC, P.C. (C-2705)
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SUNGATE DESIGN GROUP, P.A.
10000 W. GARDNER ROAD
SUITE 1000
DURHAM, NC 27703

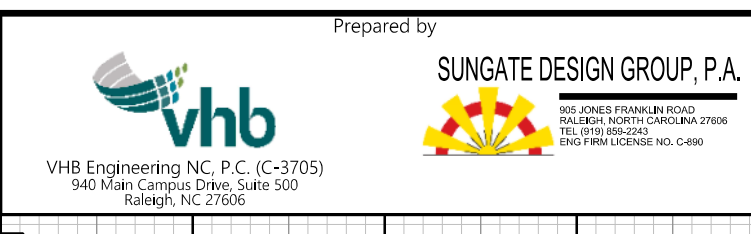
PROJECT REFERENCE NO. U-5312	SHEET NO. 24
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
DocuSigned by: Jimmy Goodnight	DocuSigned by: Josh Dalton 7/12/2023

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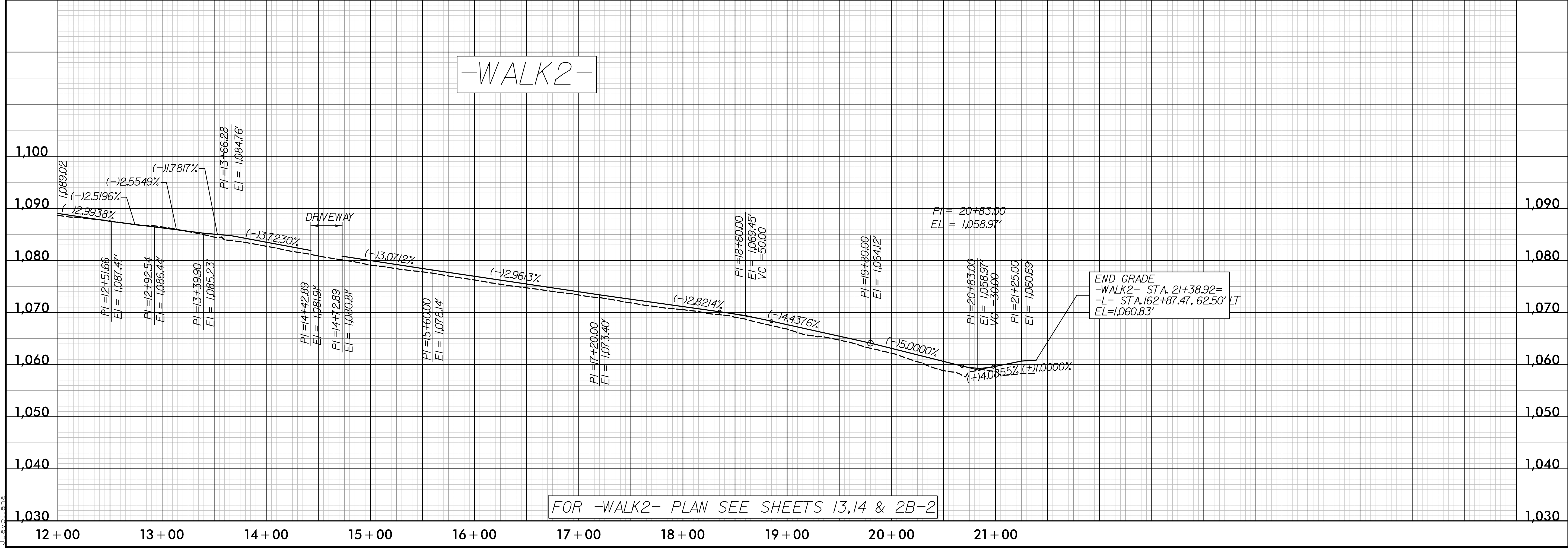
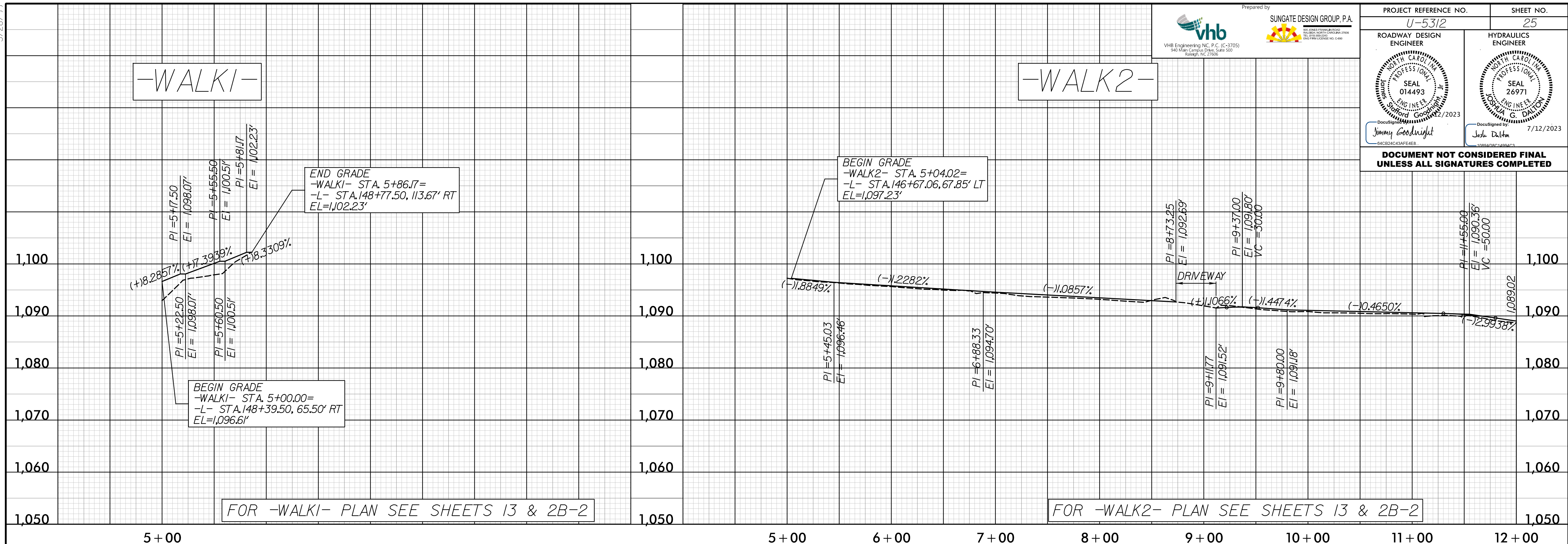
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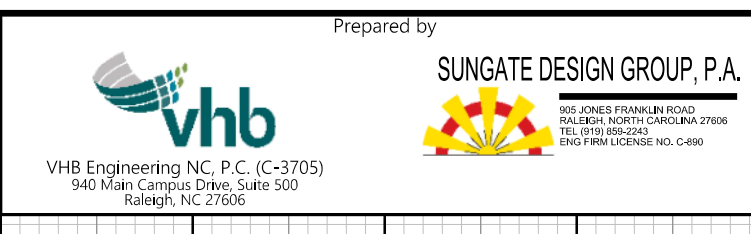
PROJECT REFERENCE NO. U-5312	SHEET NO. 25
ROADWAY DESIGN ENGINEER JIMMY GOODNIGHT SEAL 014493 Professional Engineer North Carolina Exp. 12/2023	HYDRAULICS ENGINEER JOSH DALTON SEAL 26971 Professional Engineer North Carolina Exp. 7/12/2023

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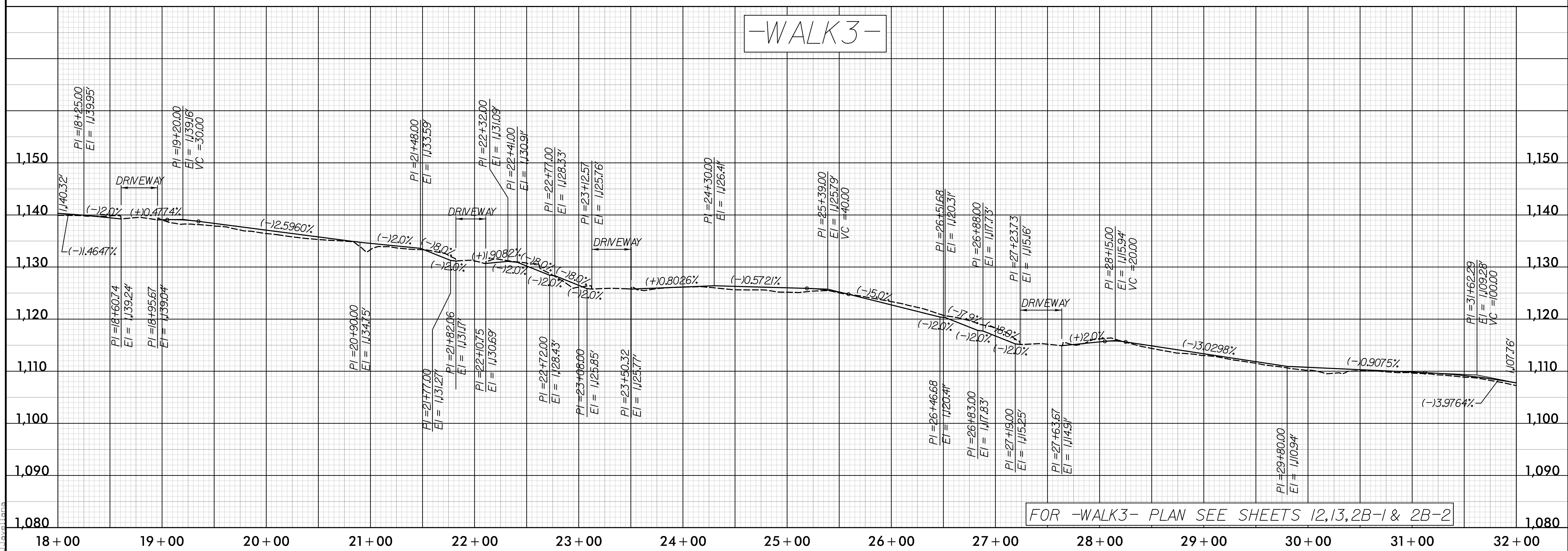
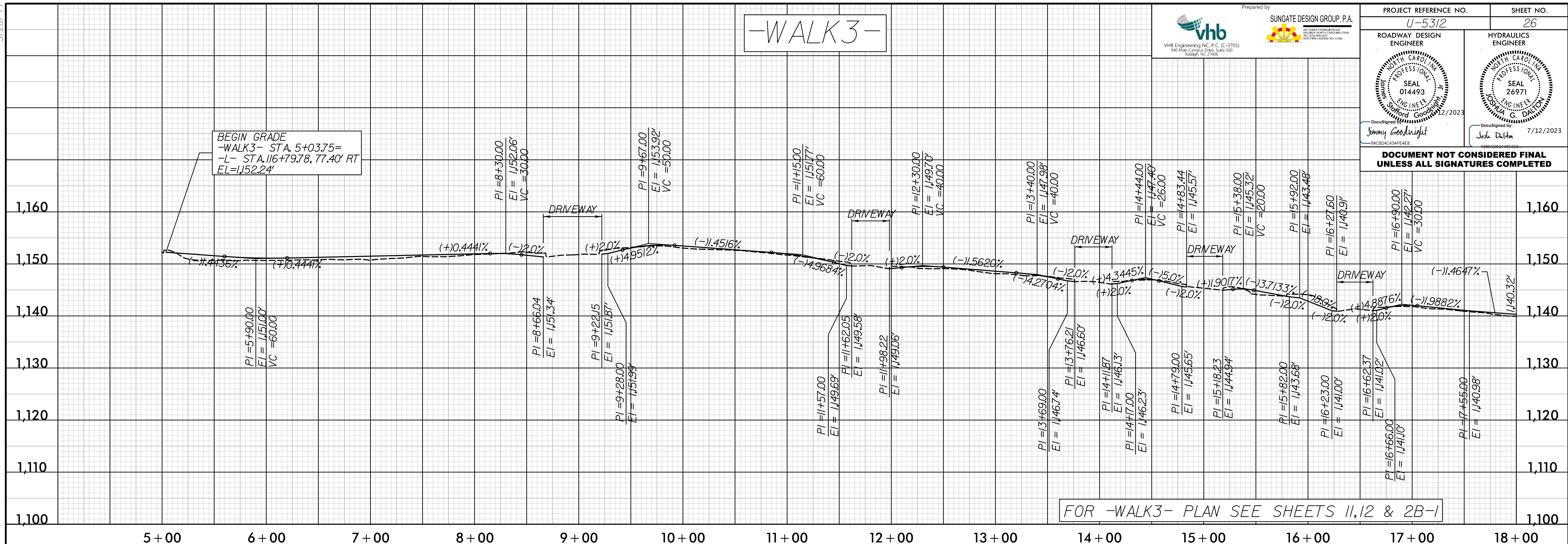


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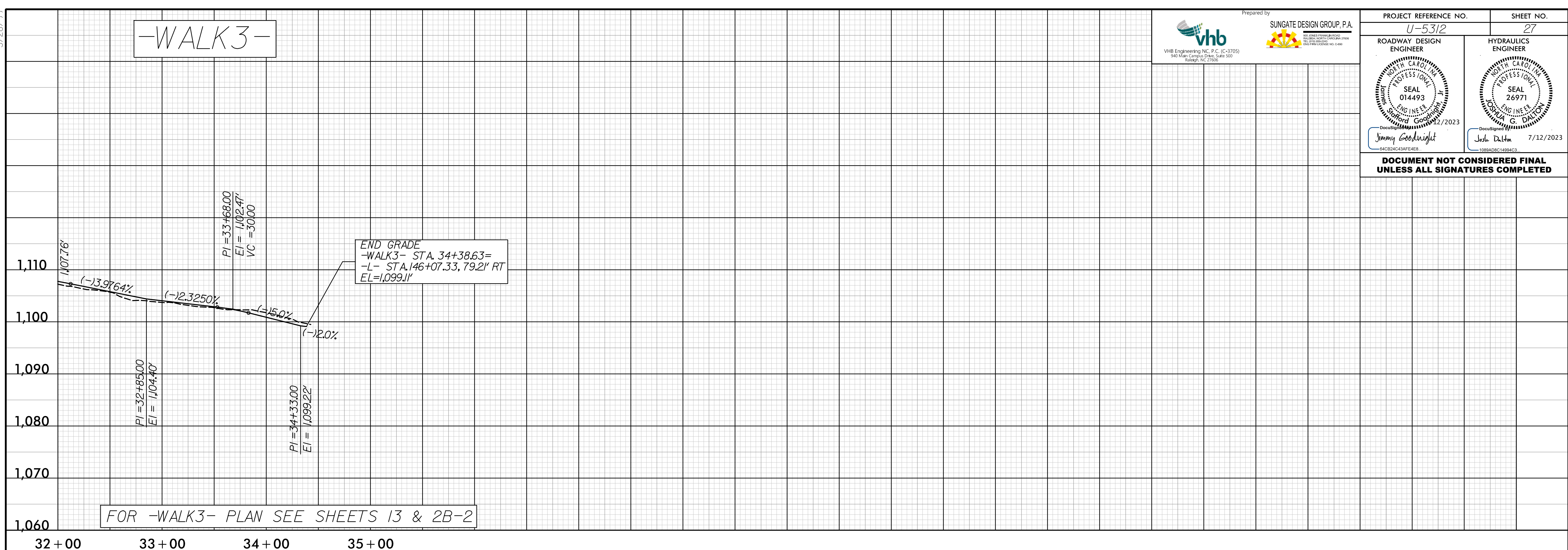
PROJECT REFERENCE NO. U-5312	SHEET NO. 26
ROADWAY DESIGN ENGINEER SEAL 014493 JIMMY GOODNIGHT	HYDRAULICS ENGINEER SEAL 26971 JULIE D. LON
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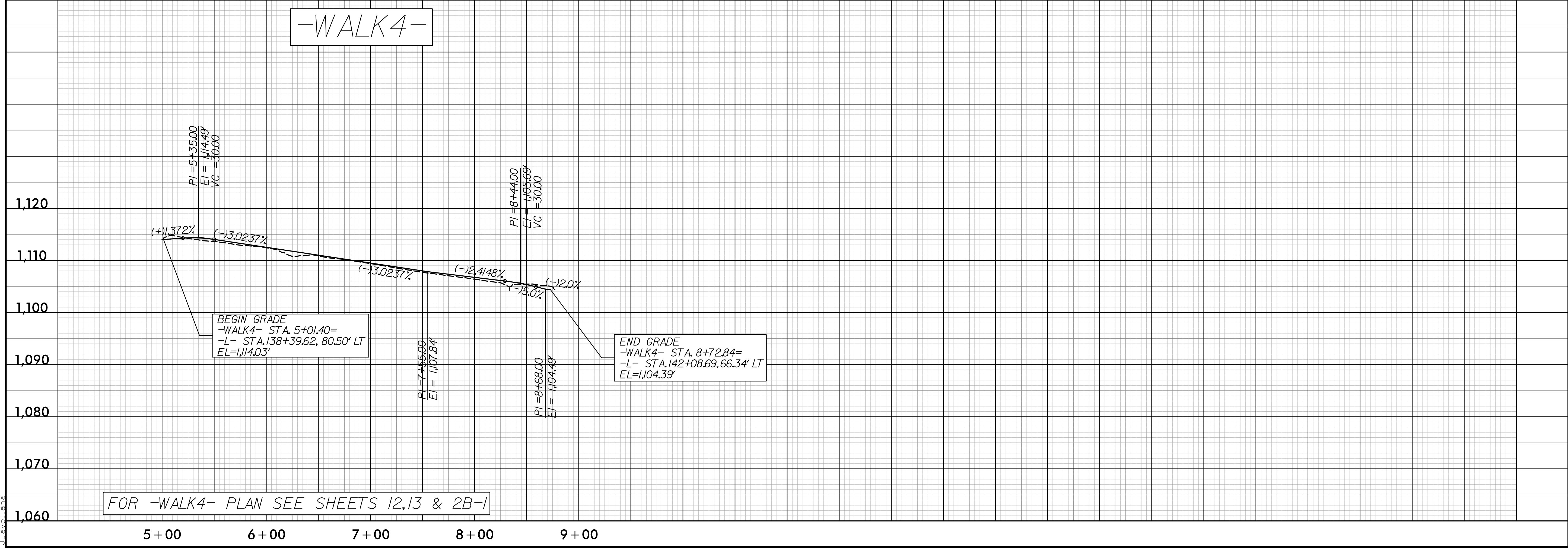
7/1/2023
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5/28/23

-WALK3-



-WALK4-



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10000 University City Blvd., Suite 100
Charlotte, NC 28213

PROJECT REFERENCE NO. U-5312	SHEET NO. 27
ROADWAY DESIGN ENGINEER SEAL 014493 Jimmy Goodnight 7/12/2023	HYDRAULICS ENGINEER SEAL 26971 Jesse Dalton 7/12/2023

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