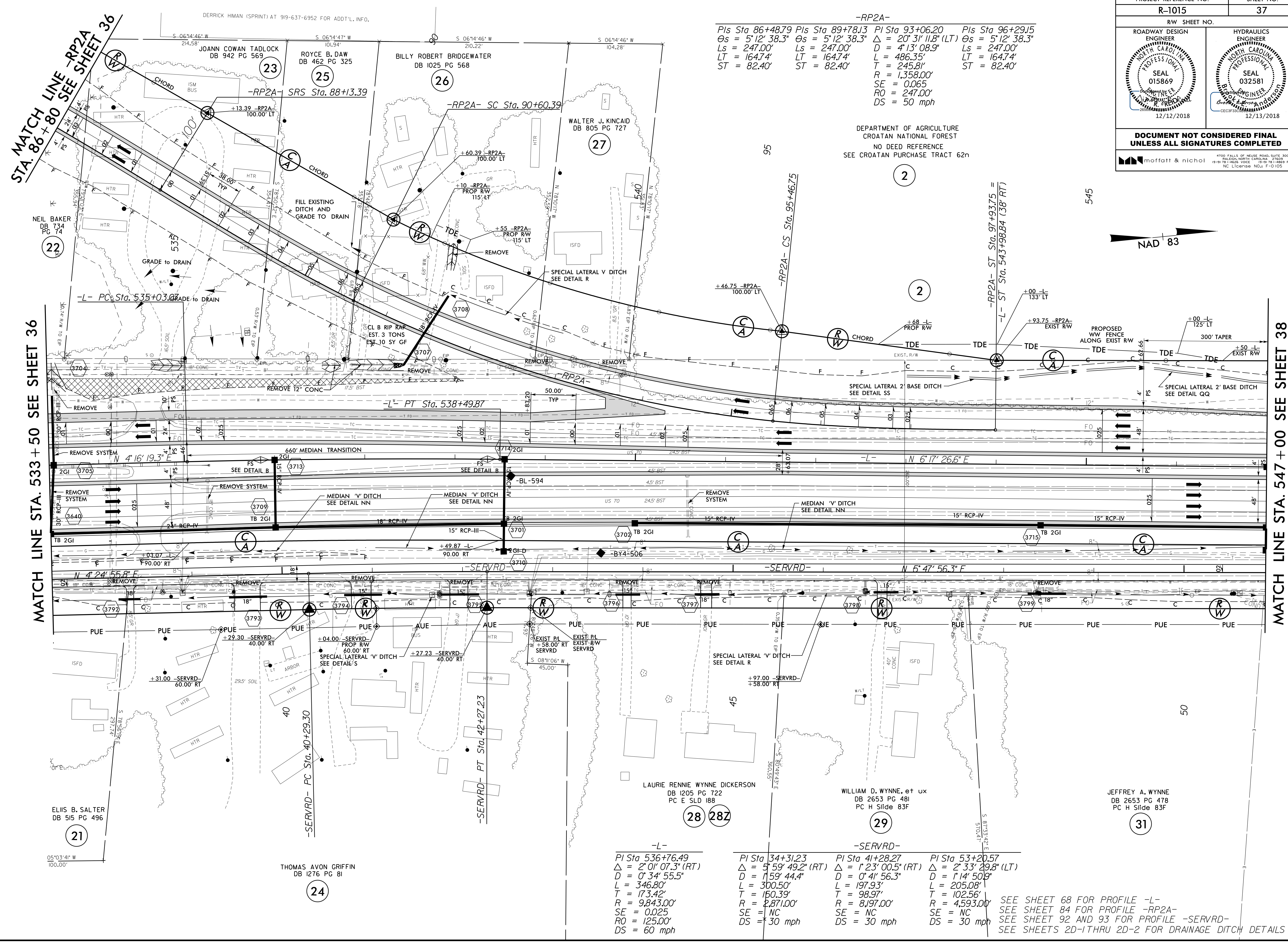


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and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

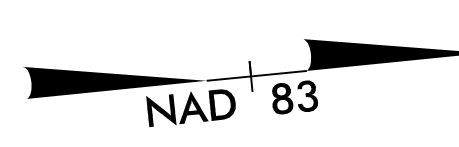
**This file or an individual page  
shall not be considered a certified document.**

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>37</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 015869 12/12/2018	HYDRAULICS ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX NC LICENSE NO. F-0105	



**-RP2A-**  
 Pls Sta 86+48.79 Pls Sta 89+78.13 Pls Sta 93+06.20 Pls Sta 96+29.15  
 $\Delta s = 5' 12'' 38.3''$   $\Delta s = 5' 12'' 38.3''$   $\Delta = 20' 31'' 11.8''$  (LT)  $\Delta s = 5' 12'' 38.3''$   
 $Ls = 247.00'$   $Ls = 247.00'$   $D = 4' 13'' 08.9''$   $Ls = 247.00'$   
 $LT = 164.74'$   $LT = 164.74'$   $L = 486.35'$   $LT = 164.74'$   
 $ST = 82.40'$   $ST = 82.40'$   $T = 245.81'$   $ST = 82.40'$   
 $R = 1,358.00'$   
 $SE = 0.065$   
 $RO = 247.00'$   
 $DS = 50$  mph

DEPARTMENT OF AGRICULTURE  
 CROATAN NATIONAL FOREST  
 NO DEED REFERENCE  
 SEE CROATAN PURCHASE TRACT 62n



MATCH LINE STA. 533 + 50 SEE SHEET 36

MATCH LINE STA. 547 + 00 SEE SHEET 38

**-L-**  
 PI Sta 536+76.49  
 $\Delta = 2' 01'' 07.3''$  (RT)  
 $D = 0' 34'' 55.5''$   
 $L = 346.80'$   
 $T = 173.42'$   
 $R = 9,843.00'$   
 $SE = 0.025$   
 $RO = 125.00'$   
 $DS = 60$  mph

**-SERVRD-**  
 PI Sta 34+31.23 PI Sta 41+28.27 PI Sta 53+20.57  
 $\Delta = 5' 59'' 49.2''$  (RT)  $\Delta = 1' 23'' 00.5''$  (RT)  $\Delta = 2' 33'' 29.8''$  (LT)  
 $D = 1' 59'' 44.4''$   $D = 0' 41'' 56.3''$   $D = 1' 14'' 50.9''$   
 $L = 300.50'$   $L = 197.93'$   $L = 205.08'$   
 $T = 160.39'$   $T = 98.97'$   $T = 102.56'$   
 $R = 2,871.00'$   $R = 8,197.00'$   $R = 4,593.00'$   
 $SE = NC$   $SE = NC$   $SE = NC$   
 $DS = 30$  mph  $DS = 30$  mph  $DS = 30$  mph

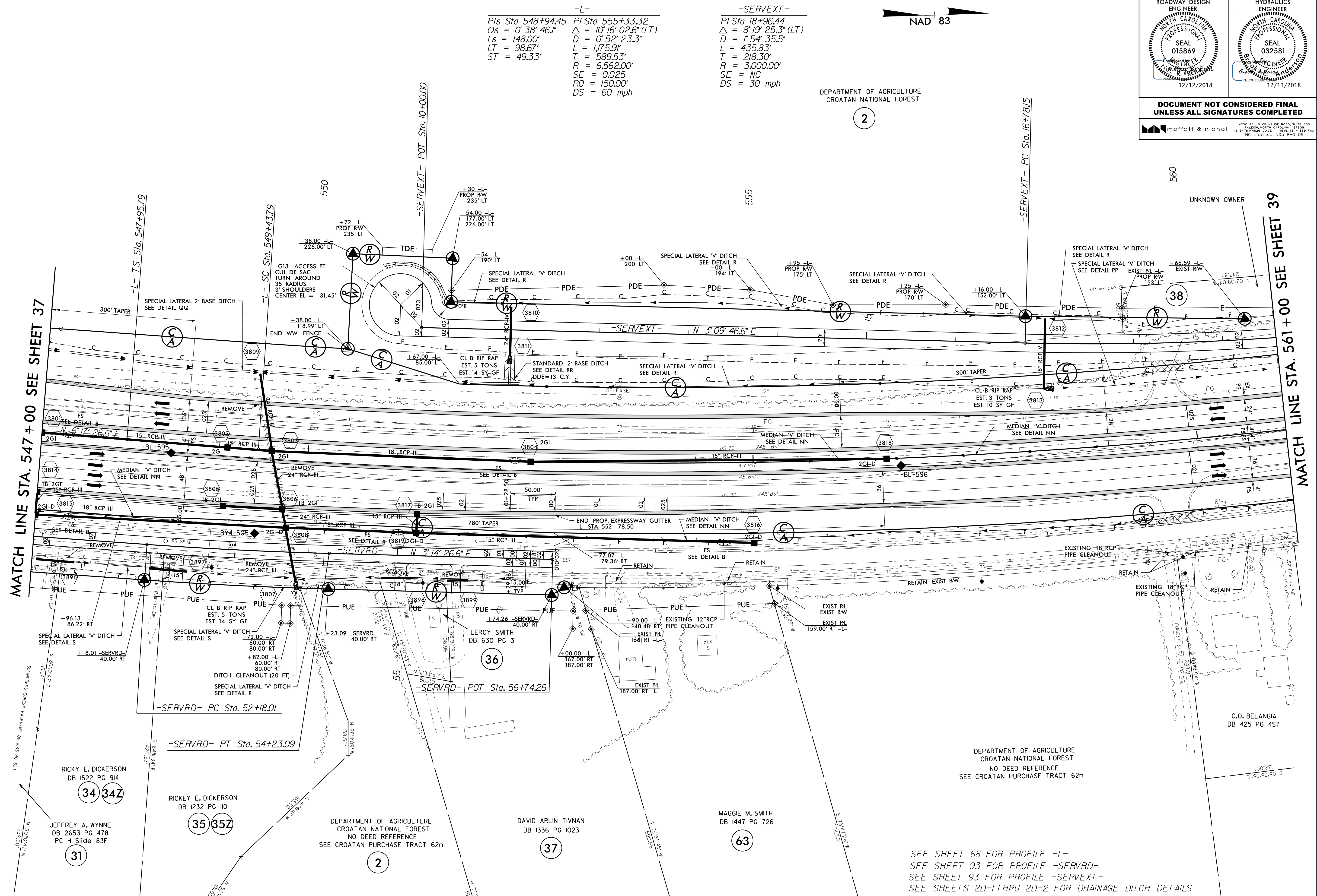
SEE SHEET 68 FOR PROFILE -L-  
 SEE SHEET 84 FOR PROFILE -RP2A-  
 SEE SHEET 92 AND 93 FOR PROFILE -SERVRD-  
 SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

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12/14/2018 10:51:29 AM C:\Users\10115\Roadway\Proj\10115\_rdl\_esh\_38.dgn

PROJECT REFERENCE NO. <b>R-1015</b>		SHEET NO. <b>38</b>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 		HYDRAULICS ENGINEER 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
moffatt & nichol		4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX NC License No. F-0105	



**-L-**

$PI Sta 548+94.45$	$PI Sta 555+33.32$
$\Delta s = 0^\circ 38' 46.1''$	$\Delta = 10^\circ 16' 02.6'' (LT)$
$Ls = 148.00'$	$D = 0^\circ 52' 23.3''$
$LT = 98.67'$	$L = 1,175.91'$
$ST = 49.33'$	$T = 589.53'$
	$R = 6,562.00'$
	$SE = 0.025$
	$RO = 150.00'$
	$DS = 60 mph$

**-SERVEXT-**

$PI Sta 18+96.44$	$\Delta = 8^\circ 19' 25.3'' (LT)$
	$D = 1^\circ 54' 35.5''$
	$L = 435.83'$
	$T = 218.30'$
	$R = 3,000.00'$
	$SE = NC$
	$DS = 30 mph$



DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST

2

MATCH LINE STA. 547 + 00 SEE SHEET 37

MATCH LINE STA. 561 + 00 SEE SHEET 39

RICKY E. DICKERSON  
DB 1522 PG 914

JEFFREY A. WYNNE  
DB 2653 PG 478  
PC H Slide 83F

RICKY E. DICKERSON  
DB 1232 PG 110

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST  
NO DEED REFERENCE  
SEE CROATAN PURCHASE TRACT 62n

DAVID ARLIN TIVNAN  
DB 1336 PG 1023

MAGGIE M. SMITH  
DB 1447 PG 726

C.O. BELANGIA  
DB 425 PG 457

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST  
NO DEED REFERENCE  
SEE CROATAN PURCHASE TRACT 62n

SEE SHEET 68 FOR PROFILE -L-  
SEE SHEET 93 FOR PROFILE -SERVRD-  
SEE SHEET 93 FOR PROFILE -SERVEXT-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

8/17/99  
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MATCH LINE STA. 561 + 00 SEE SHEET 38

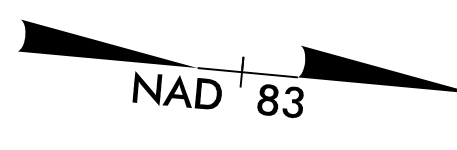
MATCH LINE STA. 575 + 00 SEE SHEET 40

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST  
NO DEED REFERENCE  
SEE CROATAN PURCHASE TRACT 62n

-L-  
 PI Sta 555+33.32 Δ = 10° 16' 02.6" (LT)  
 D = 0° 52' 23.3" L = 1,175.91'  
 T = 589.53' R = 6,562.00'  
 SE = 0.025  
 RO = 148.00'  
 DS = 60 mph

-SERVEXT-  
 PI Sta 561+69.03 Δ = 0° 38' 46.1"  
 Ls = 148.00' LT = 98.67'  
 ST = 49.33'

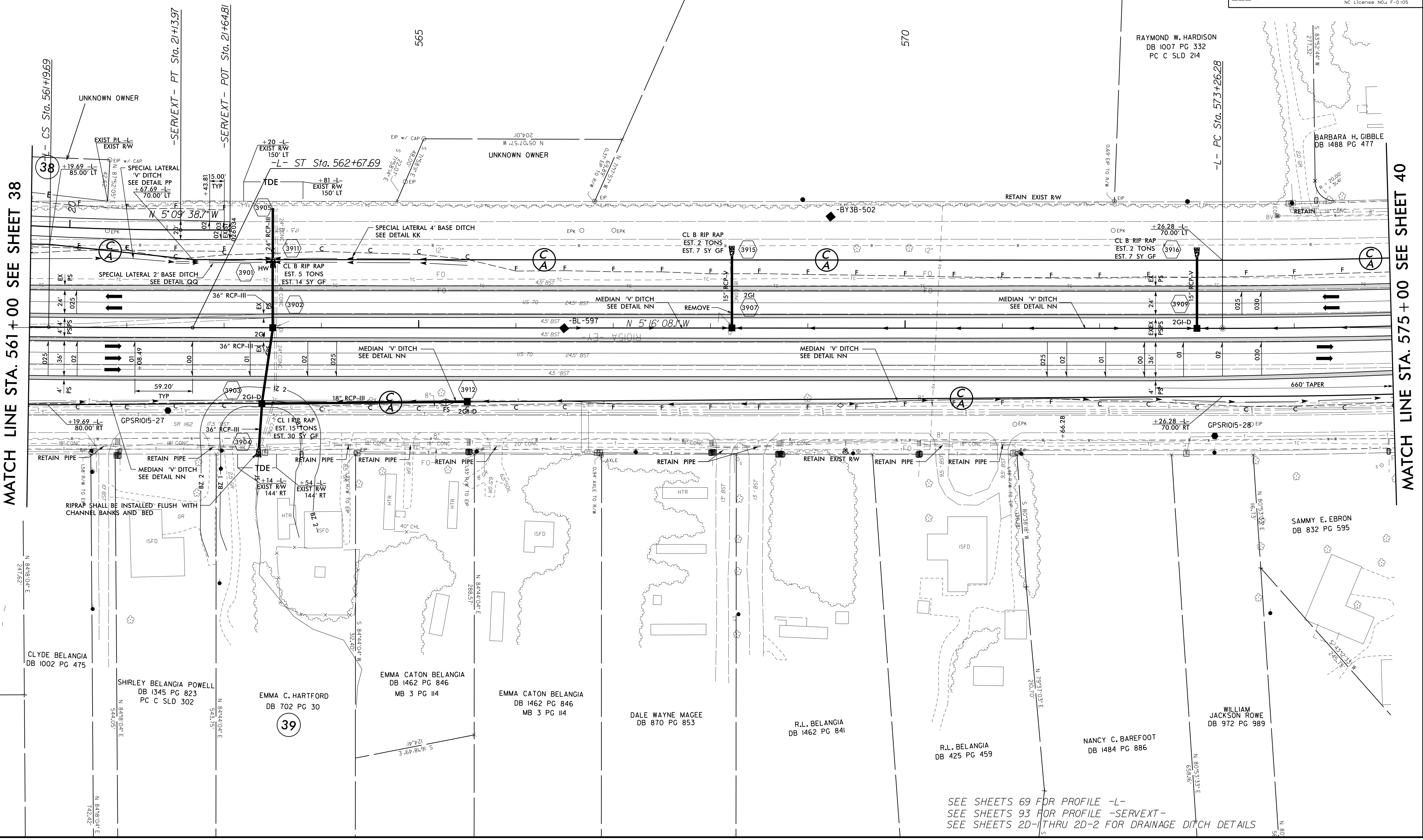
-SERVEXT-  
 PI Sta 18+96.44 Δ = 8° 19' 25.3" (LT)  
 D = 1° 54' 35.5" L = 435.83'  
 T = 218.30' R = 3,000.00'  
 SE = NC  
 DS = 30 mph



ROBERT B. HARDISON  
DB 1006 PG 50  
PC C SLD 214

RAYMOND W. HARDISON  
DB 1007 PG 332  
PC C SLD 214

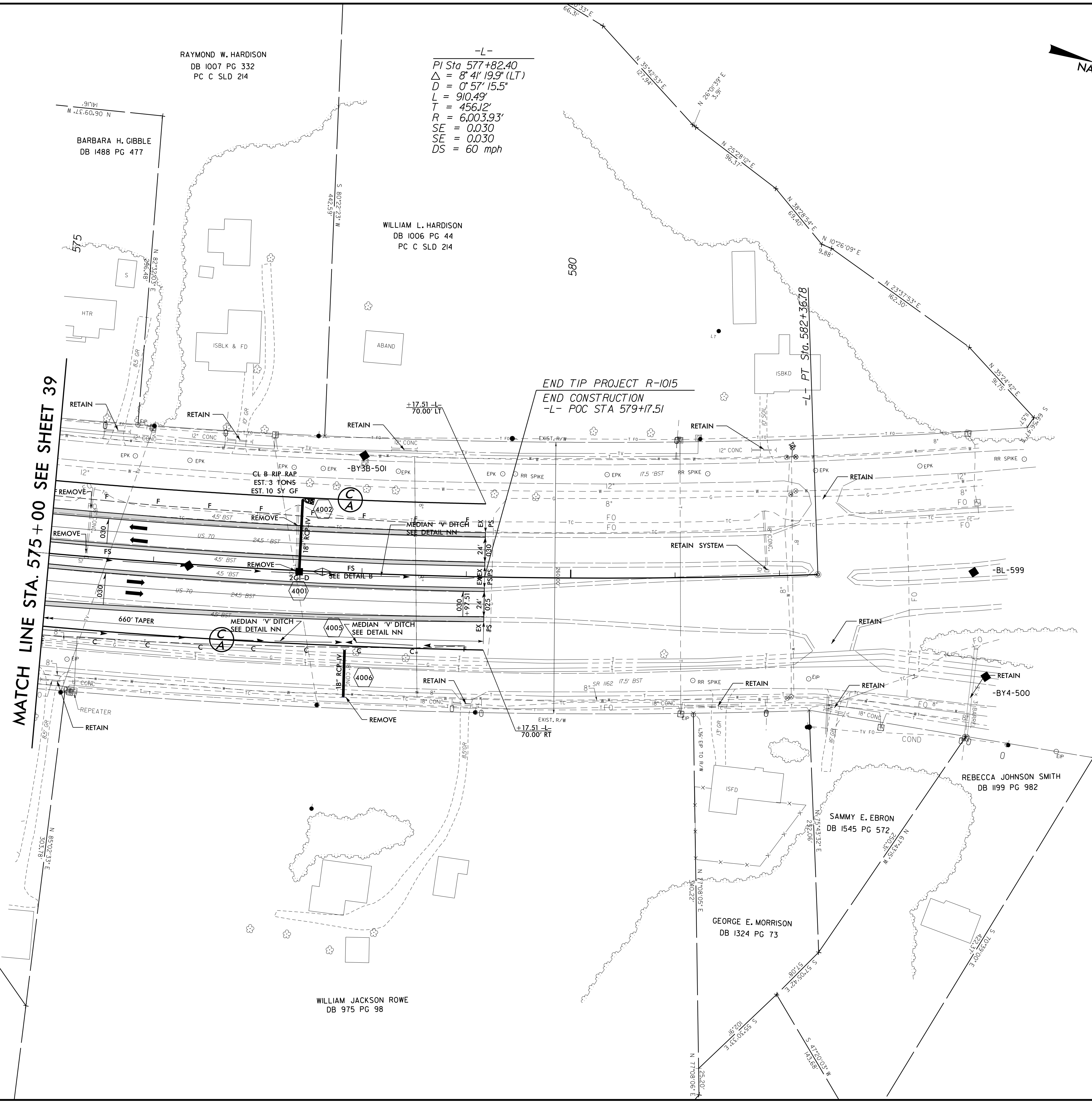
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>39</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>SEAL 015869</b> 12/12/2018	HYDRAULICS ENGINEER <b>SEAL 032581</b> 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
moffatt & nichol	



SEE SHEETS 69 FOR PROFILE -L-  
SEE SHEETS 93 FOR PROFILE -SERVEXT-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

8/17/19  
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MATCH LINE STA. 575+00 SEE SHEET 39



-L-  
 PI Sta 577+82.40  
 $\Delta = 8' 41'' 19.9''$  (LT)  
 $D = 0' 57'' 15.5''$   
 $L = 910.49'$   
 $T = 456.12'$   
 $R = 6,003.93'$   
 $SE = 0.030$   
 $SE = 0.030$   
 $DS = 60$  mph



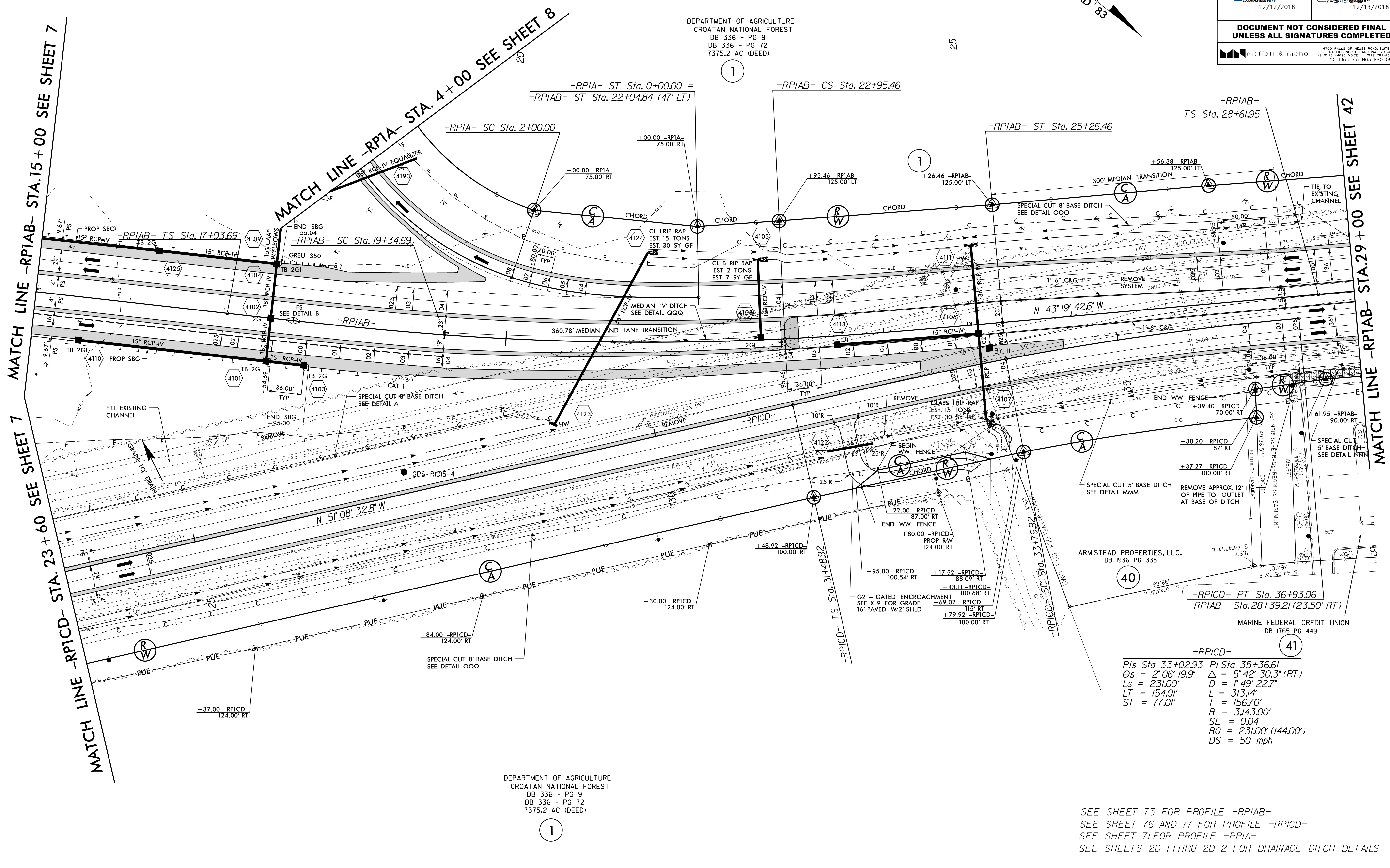
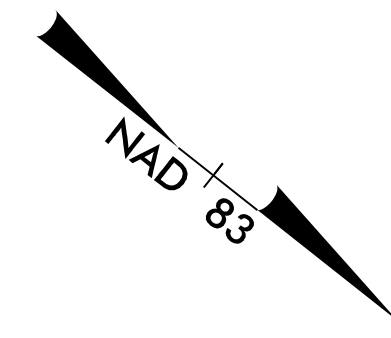
PROJECT REFERENCE NO.	SHEET NO.
R-1015	40
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SEE SHEET 70 FOR PROFILE -L-  
 SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

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PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>41</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 015869 12/12/2018	HYDRAULICS ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 032581 12/13/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

<b>-RPIA-</b>		<b>-RPIAB-</b>	
PIs Sta 1+27.46	PI Sta 6+08.39	PIs Sta 18+57.70	PI Sta 21+15.30
$\Theta_s = 1^{\circ}56'40.7''$	$\Delta = 102^{\circ}27'39.0''$ (RT)	$\Theta_s = 2^{\circ}14'27.6''$	$\Delta = 7^{\circ}00'00.0''$ (LT)
$\Theta_s = 17^{\circ}29'42.6''$	$D = 17^{\circ}28'05.6''$	$L_s = 231.00'$	$D = 1^{\circ}56'24.9''$
$L_s = 200.00'$	$L = 586.56'$	$LT = 154.01'$	$L = 360.78'$
$LT = 127.46'$	$T = 408.39'$	$T = 180.61'$	$T = 180.61'$
$ST = 74.24'$	$R = 328.00'$	$R = 2,953.00'$	$R = 2,953.00'$
	$SE = 0.08$	$SE = 0.035$	$SE = 0.035$
	$RO = 200.00'$	$RO = 144.00'$	$RO = 144.00'$
	$DS = 35$ mph	$DS = 50$ mph	$DS = 50$ mph



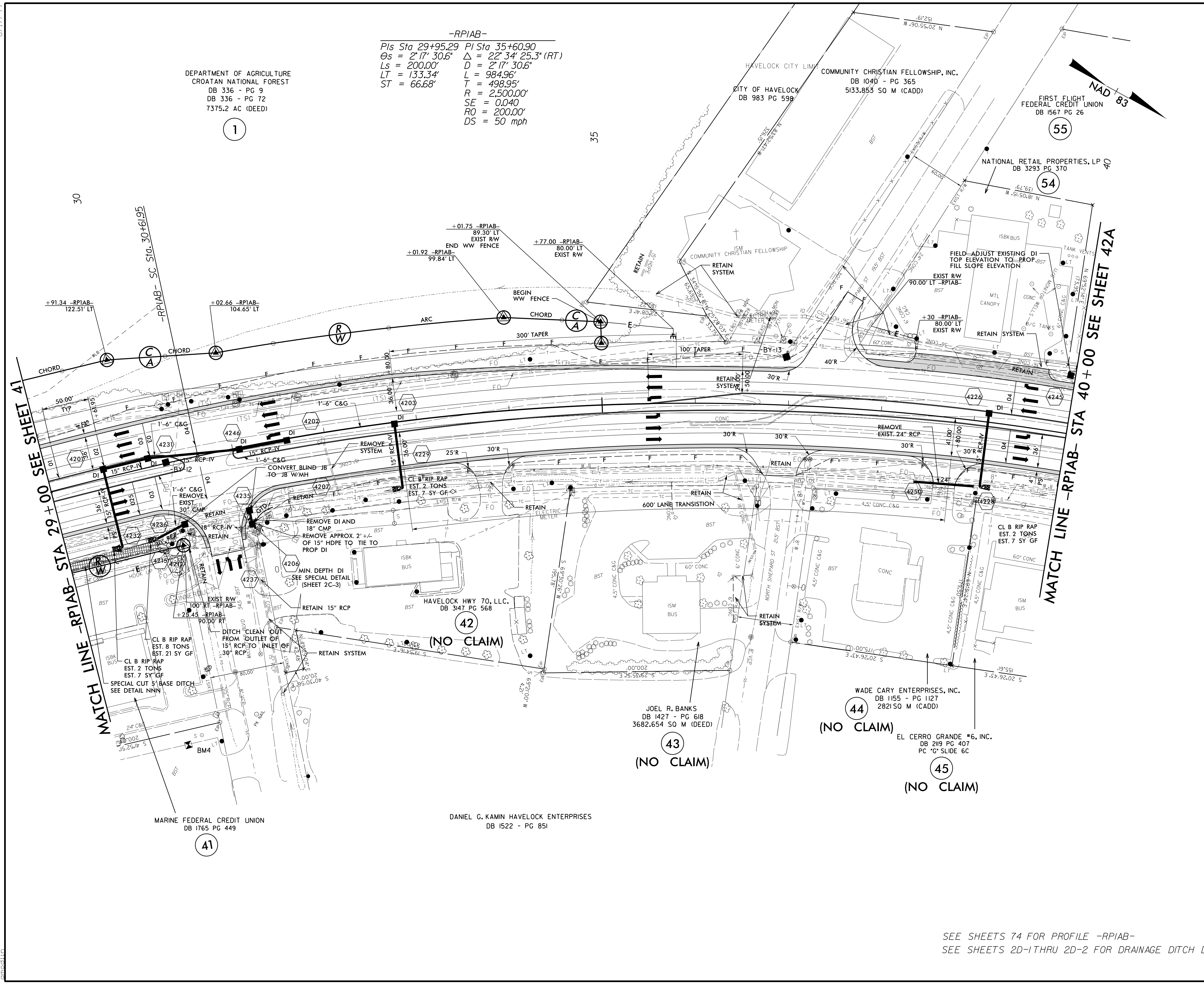
DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST  
DB 336 - PG 9  
DB 336 - PG 72  
7375.2 AC (DEED)

1

SEE SHEET 73 FOR PROFILE -RPIAB-  
SEE SHEET 76 AND 77 FOR PROFILE -RPICD-  
SEE SHEET 71 FOR PROFILE -RPIA-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

8/17/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>42</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 015869 12/12/2018	HYDRAULICS ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4669 FAX NC LICENSE NO. F-0105</small>	



DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST  
DB 336 - PG 9  
DB 336 - PG 72  
7375.2 AC (DEED)

-RPIAB-  
Pls Sta 29+95.29 PI Sta 35+60.90  
 $\theta_s = 2^\circ 17' 30.6''$   $\Delta = 22^\circ 34' 25.3''$  (RT)  
 $L_s = 200.00'$   $D = 2^\circ 17' 30.6''$   
 $LT = 133.34'$   $L = 984.96'$   
 $ST = 66.68'$   $T = 498.95'$   
 $R = 2,500.00'$   
 $SE = 0.040$   
 $RO = 200.00'$   
 $DS = 50$  mph

MATCH LINE -RPIAB- STA 29+00 SEE SHEET 41

MATCH LINE -RPIAB- STA 40+00 SEE SHEET 42A

MARINE FEDERAL CREDIT UNION  
DB 1765 PG 449

DANIEL G. KAMIN HAVELock ENTERPRISES  
DB 1522 - PG 851

JOEL R. BANKS  
DB 1427 - PG 618  
3682.654 SQ M (DEED)

WADE CARY ENTERPRISES, INC.  
DB 1155 - PG 1127  
2821 SQ M (CADD)

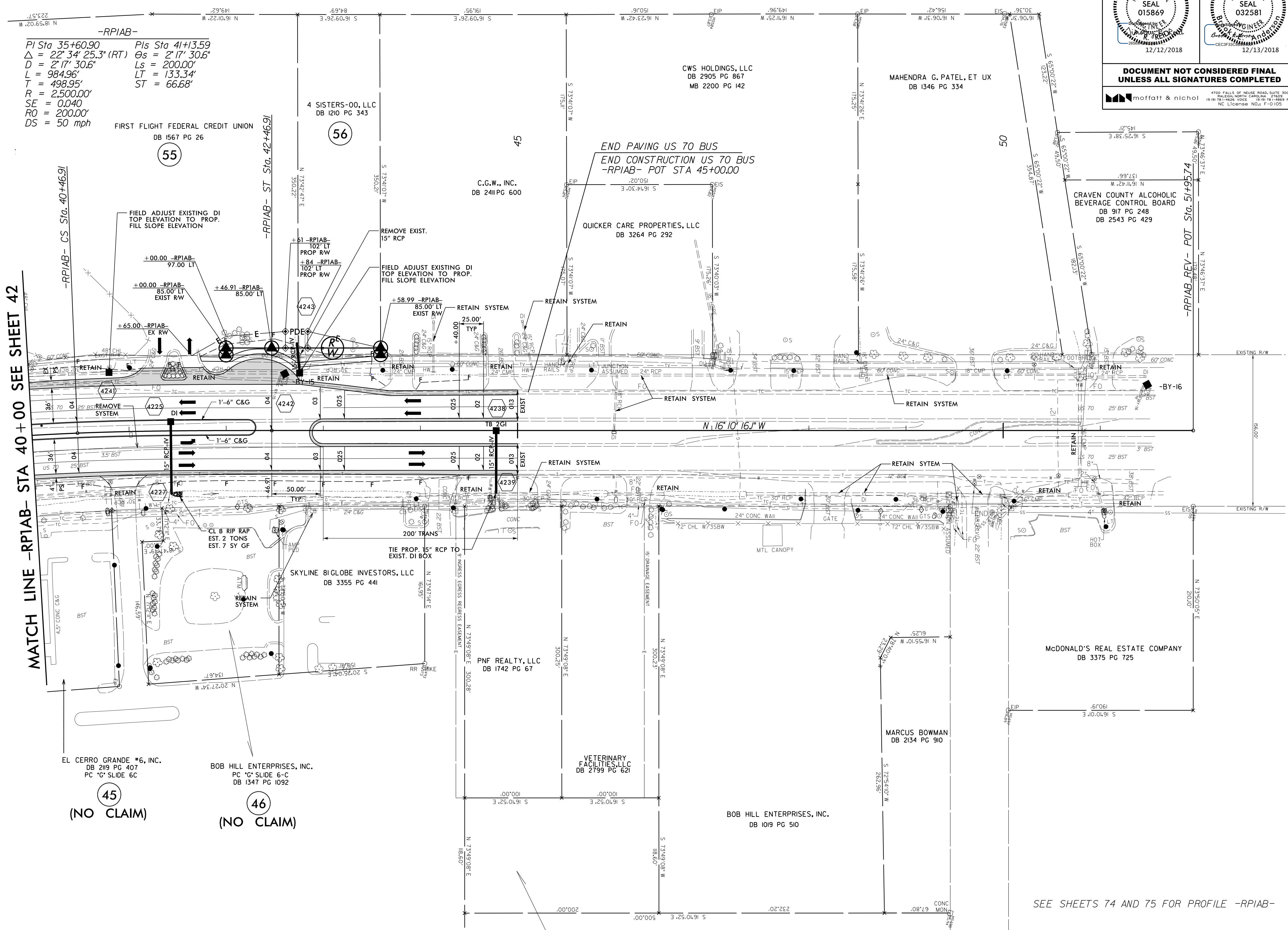
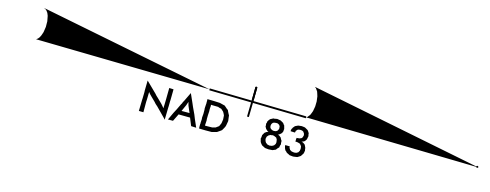
EL CERRO GRANDE #6, INC.  
DB 2119 PG 407  
PG \*G\* SLIDE 6C

SEE SHEETS 74 FOR PROFILE -RPIAB-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

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PROJECT REFERENCE NO. <b>R-1015</b>		SHEET NO. <b>42A</b>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 015869 12/12/2018		HYDRAULICS ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 032581 12/13/2018	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
moffatt & nichol		4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 761-4626 VOICE (919) 761-4669 FAX NC LICENSE NO. F-0105	



MATCH LINE -RPIAB- STA 40 + 00 SEE SHEET 42

**-RPIAB-**  
 PI Sta 35+60.90      Pls Sta 41+13.59  
 $\Delta = 22^\circ 34' 25.3''$  (RT)       $\Theta_s = 2^\circ 17' 30.6''$   
 $D = 2^\circ 17' 30.6''$        $L_s = 200.00'$   
 $L = 984.96'$        $LT = 133.34'$   
 $T = 498.95'$        $ST = 66.68'$   
 $R = 2,500.00'$   
 $SE = 0.040$   
 $RO = 200.00'$   
 $DS = 50$  mph

END PAVING US TO BUS  
END CONSTRUCTION US TO BUS  
-RPIAB- POT STA 45+00.00

(45) (NO CLAIM)  
 (46) (NO CLAIM)

SEE SHEETS 74 AND 75 FOR PROFILE -RPIAB-

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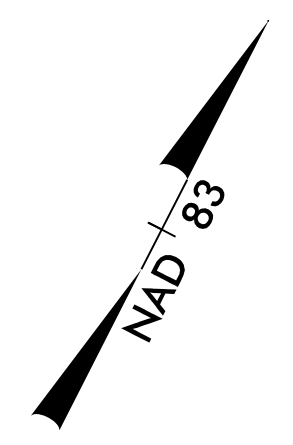


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16:\FA\9729-02\CA000\1015\Roadway\Proj\1015\_rdl\_psh43.dgn

WEYERHAEUSER COMPANY  
DB 1048 - PG 1014

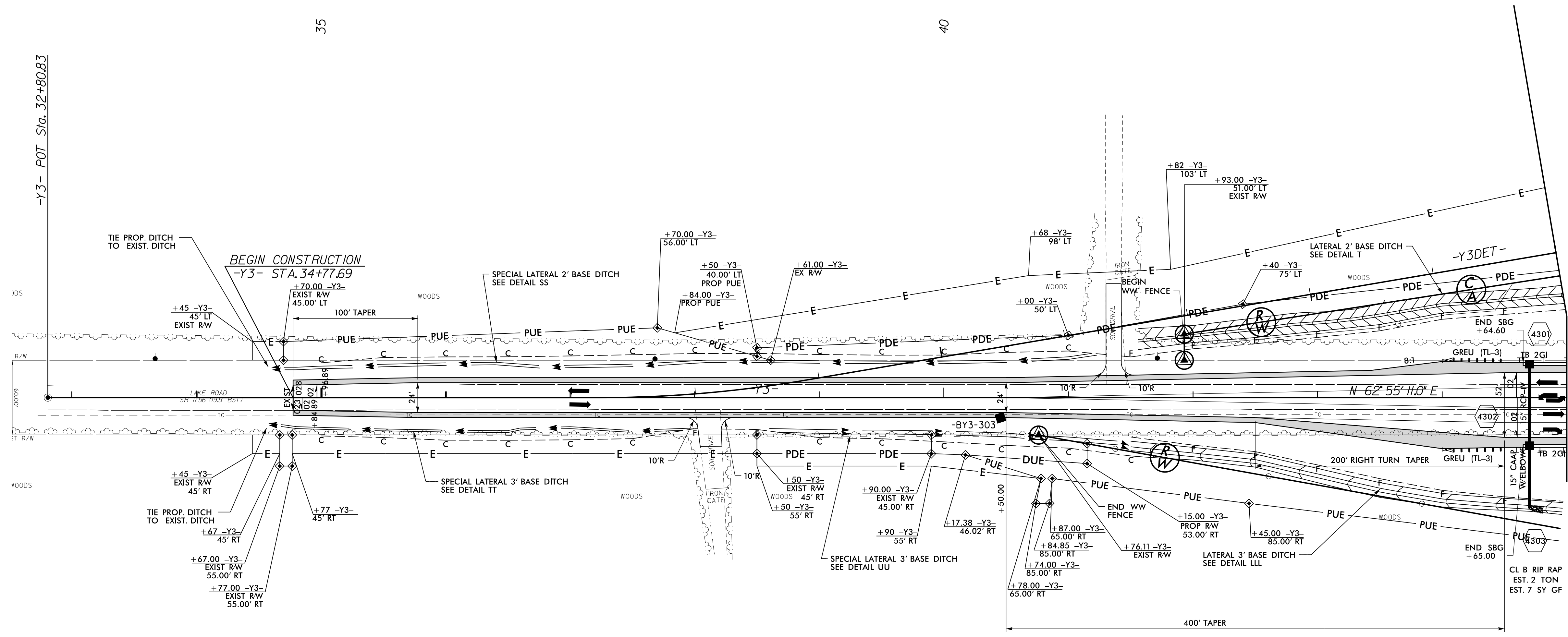
4



PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>43</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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UNLESS ALL SIGNATURES COMPLETED**

**moffatt & nichol**  
4100 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4669 FAX  
NC LICENSE NO. F-0105



MATCH LINE -Y3- STA. 45 + 00 SEE SHEET 17

WEYERHAEUSER COMPANY  
DB 1048 - PG 1014

4

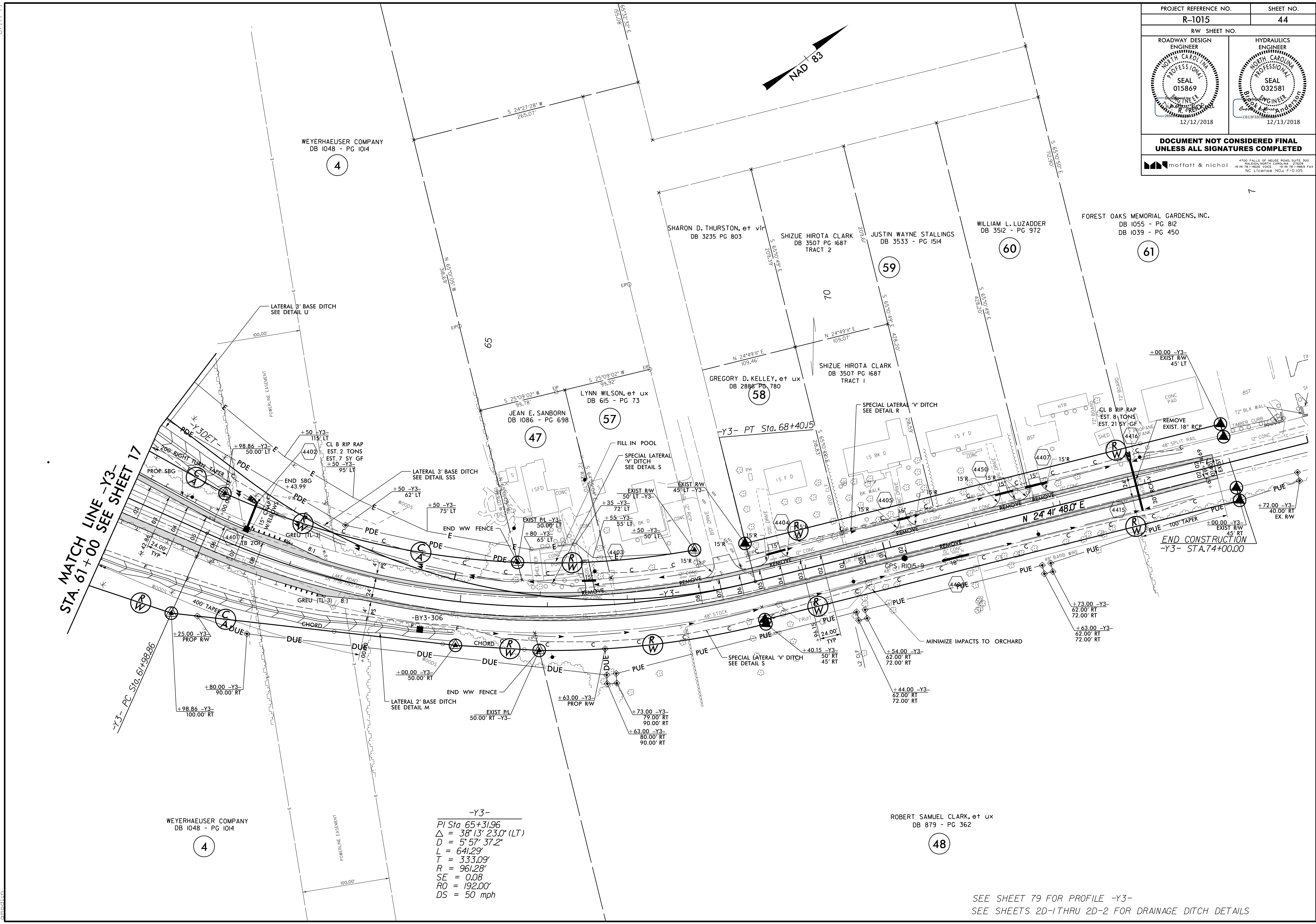
SEE SHEET 78 FOR PROFILE -Y3-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>44</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>SEAL 015869</b> 12/12/2018	HYDRAULICS ENGINEER <b>SEAL 032581</b> 12/13/2018

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

4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27603  
(919) 781-4626 VOICE (919) 781-4669 FAX  
NC LICENSE NO. F-0105

**moffatt & nichol**



**MATCH LINE -Y3-  
STA. 61+00 SEE SHEET 17**

**END CONSTRUCTION  
-Y3- STA. 74+00.00**

**-Y3-**  
 $PI\ Sta\ 65+31.96$   
 $\Delta = 38'13''23.0''\ (LT)$   
 $D = 5'57''37.2''$   
 $L = 641.29'$   
 $T = 333.09'$   
 $R = 961.28'$   
 $SE = 0.08$   
 $RO = 192.00'$   
 $DS = 50\ mph$

SEE SHEET 79 FOR PROFILE -Y3-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

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 moffatt & nichol

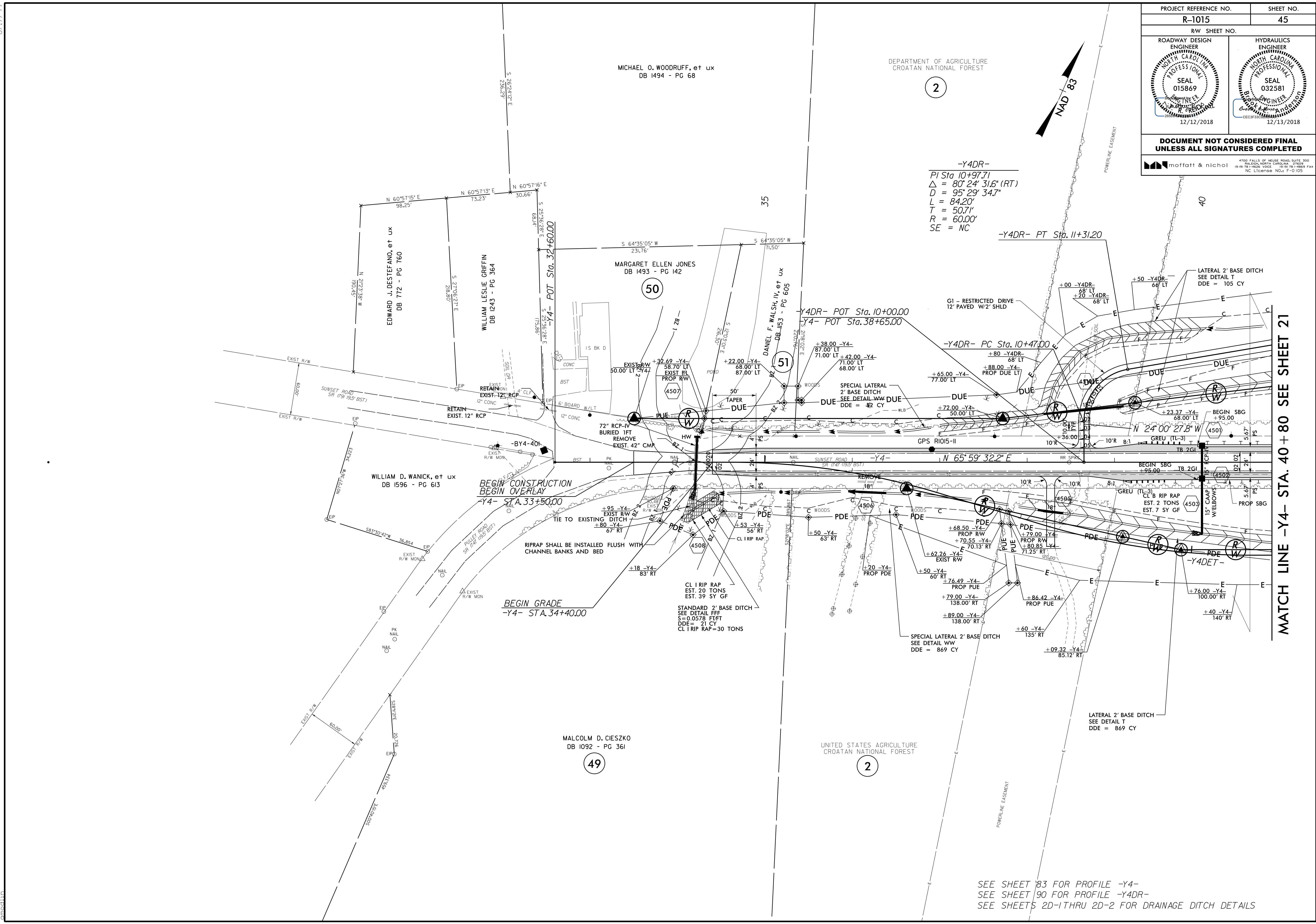
8/17/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>45</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 015869 12/12/2018	HYDRAULICS ENGINEER <b>MOFFATT &amp; NICHOL</b> SEAL 032581 12/13/2018

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

**moffatt & nichol**

4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4669 FAX  
NC LICENSE NO. F-0105



2

**-Y4DR-**  
 PI Sta 10+97.71  
 $\Delta = 80^\circ 24' 31.6''$  (RT)  
 $D = 95^\circ 29' 34.7''$   
 $L = 84.20'$   
 $T = 50.71'$   
 $R = 60.00'$   
 $SE = NC$

**-Y4DR- PT Sta. 11+31.20**

**Y4DR- POT Sta. 10+00.00**  
**Y4- POT Sta. 38+65.00**

**-Y4DR- PC Sta. 10+47.00**

**BEGIN CONSTRUCTION  
BEGIN OVERLAY**  
**-Y4- STA. 33+50.00**

**BEGIN GRADE**  
**-Y4- STA. 34+40.00**

STANDARD 2' BASE DITCH  
 SEE DETAIL FFF  
 $S = 0.0578$  FT/FT  
 $DDE = 21$  CY  
 CL 1 RIP RAP = 30 TONS

SPECIAL LATERAL 2' BASE DITCH  
 SEE DETAIL WW  
 $DDE = 869$  CY

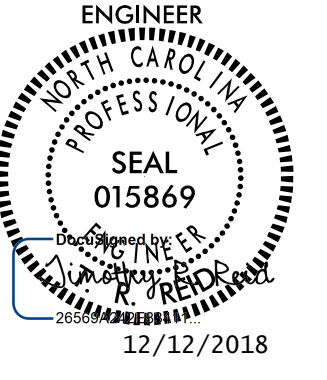


LATERAL 2' BASE DITCH  
 SEE DETAIL T  
 $DDE = 869$  CY

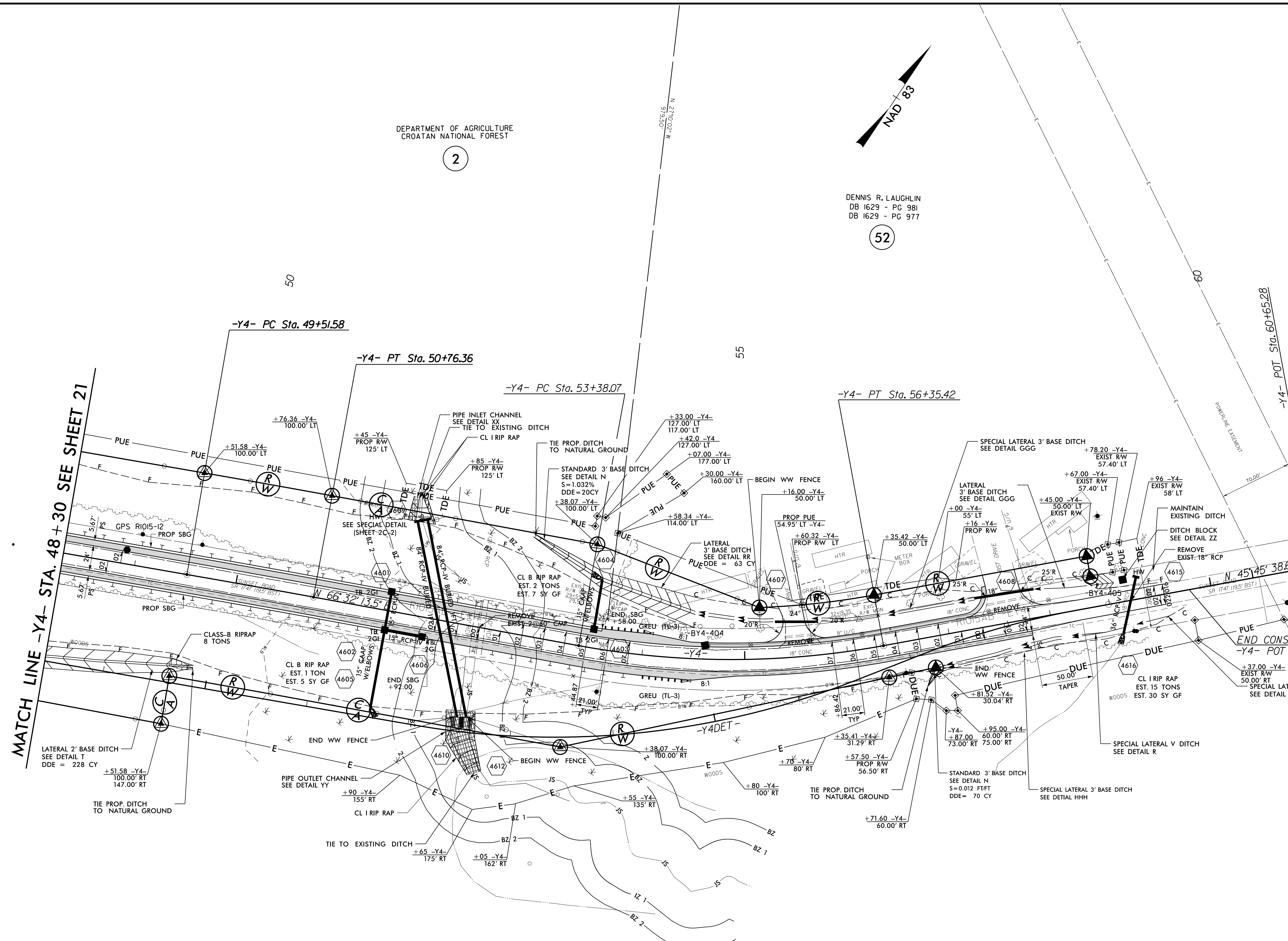
**MATCH LINE -Y4- STA. 40 + 80 SEE SHEET 21**

SEE SHEET 83 FOR PROFILE -Y4-  
 SEE SHEET 90 FOR PROFILE -Y4DR-  
 SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

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 moffatt

8/17/99

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>46</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4669 FAX NC LICENSE NO. F-0105	



MATCH LINE -Y4- STA. 48+30 SEE SHEET 21

-Y4-	
PI Sta 50+13.97	PI Sta 54+88.39
$\Delta = 0^\circ 32' 41.2" (RT)$	$\Delta = 20^\circ 46' 34.8" (LT)$
$D = 0' 26' 11.8"$	$D = 6' 59' 14.2"$
$L = 124.78'$	$L = 297.34'$
$T = 62.39'$	$T = 150.32'$
$R = 13123.00'$	$R = 820.00'$
$SE = NC$	$SE = 0.070$
	$RO = 147.00'$
	$DS = 40 \text{ mph}$

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST

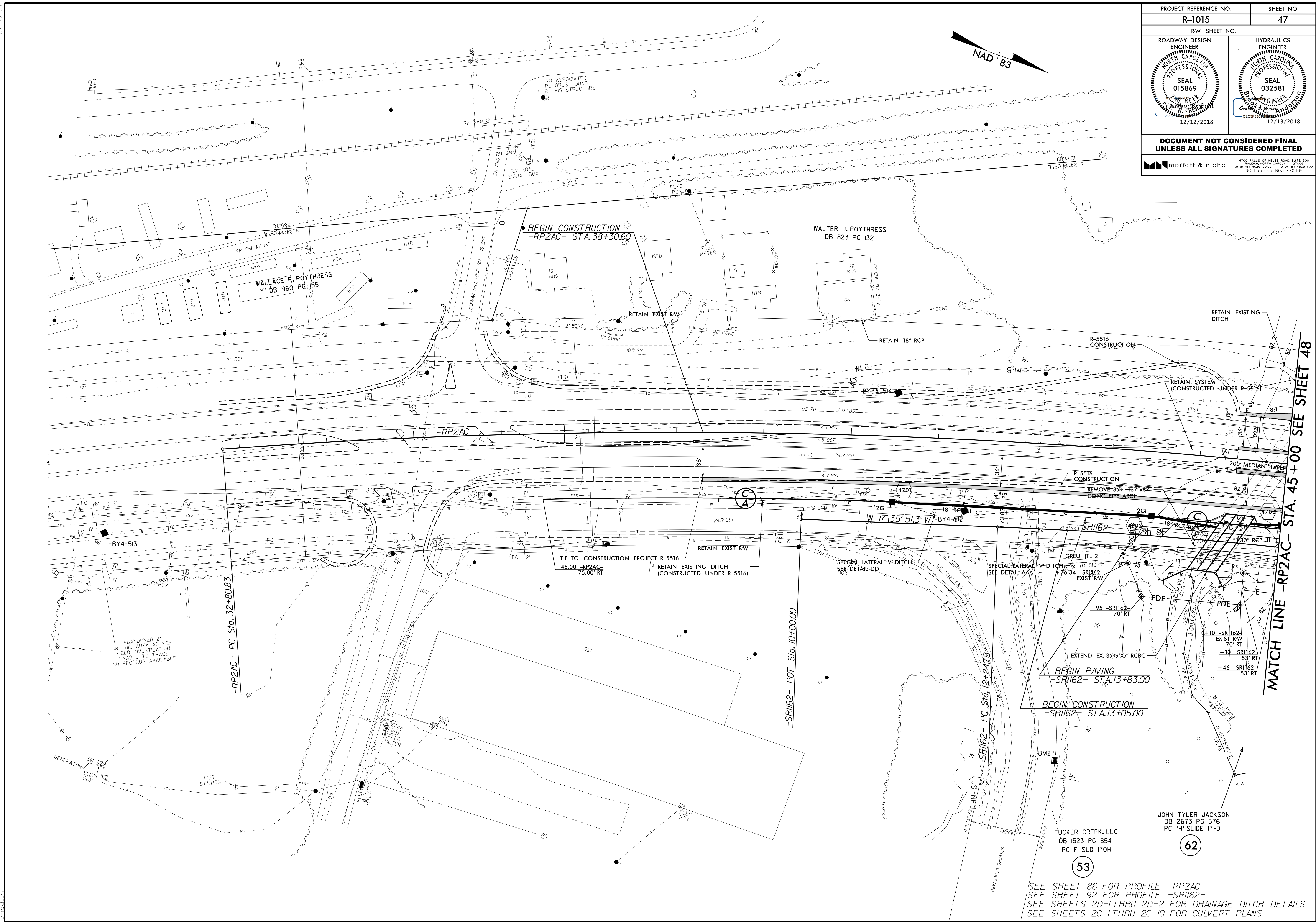
2

SEE SHEET 83 FOR PROFILE -Y4-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

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PROJECT REFERENCE NO. <b>R-1015</b>		SHEET NO. <b>47</b>	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		PROFESSIONAL SEAL <b>032581</b> 12/13/2018	
PROFESSIONAL SEAL <b>015869</b> 12/12/2018		PROFESSIONAL SEAL <b>032581</b> 12/13/2018	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
moftatt & nichol		4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4669 FAX NC LICENSE NO. F-0103	



I:\2018\10-28-19\2018\10-28-19-02\CADD\NRI\015\Roadway\Proj\1015\_rdi\_psh47.dgn

SEE SHEET 86 FOR PROFILE -RP2AC-  
SEE SHEET 92 FOR PROFILE -SRI162-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS  
SEE SHEETS 2C-1 THRU 2C-10 FOR CULVERT PLANS

53

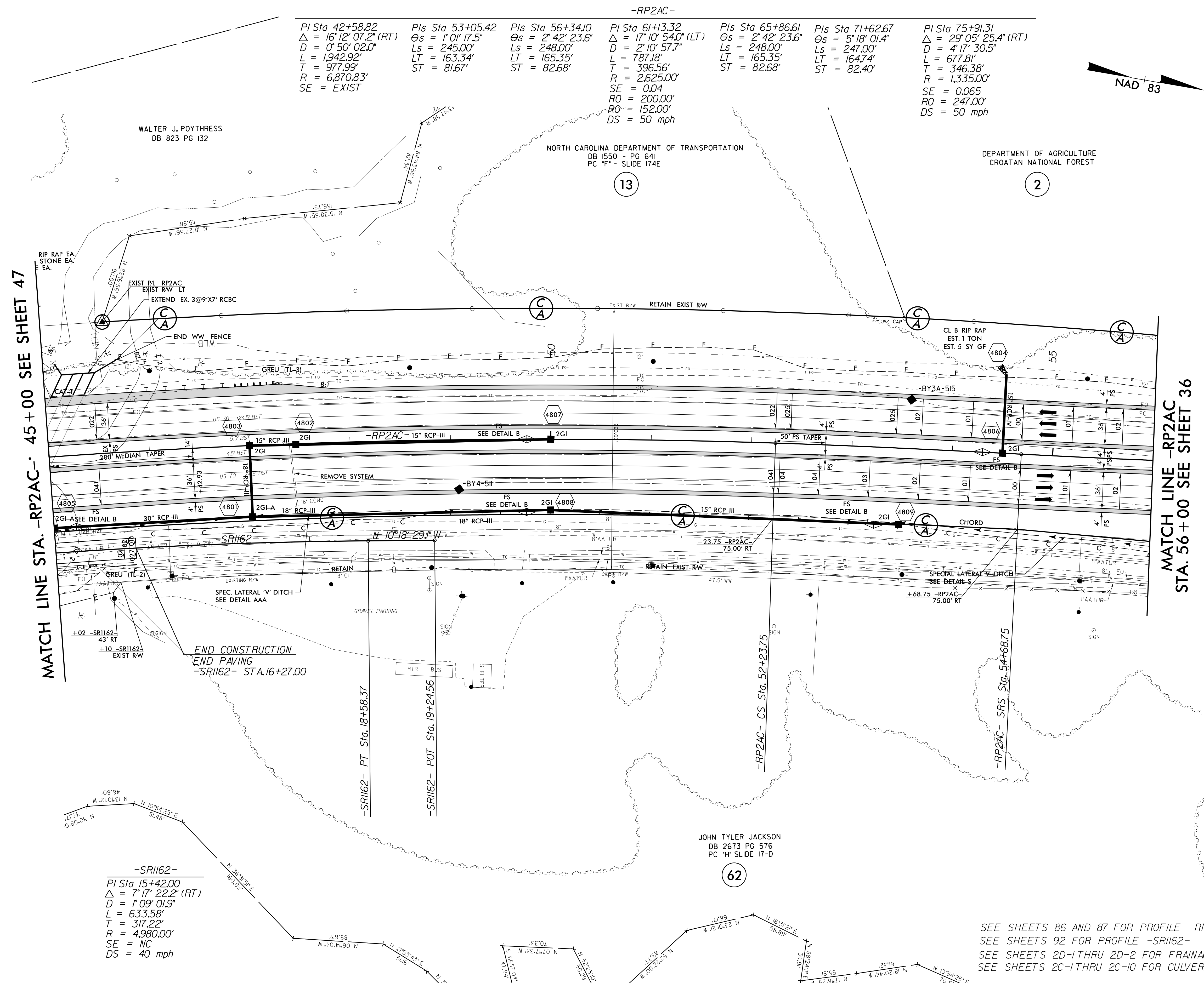
62

JOHN TYLER JACKSON  
DB 2673 PG 576  
PC F SLD 170H

TUCKER CREEK, LLC  
DB 1523 PG 854  
PC F SLD 170H

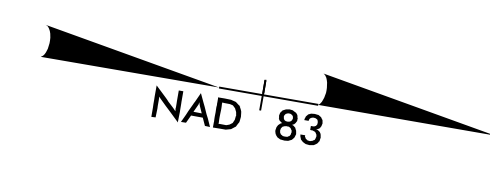
8/17/99

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>48</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER <b>SEAL 015869</b> 12/12/2018	HYDRAULICS ENGINEER <b>SEAL 032581</b> 12/13/2018
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4669 FAX NC LICENSE NO. F-0105	



-RP2AC-

PI Sta 42+58.82 Δ = 16°12'07.2" (RT) D = 0°50'02.0" L = 1,942.92' T = 977.99' R = 6,870.83' SE = EXIST	PIs Sta 53+05.42 Θs = 1°01'17.5" Ls = 245.00' LT = 163.34' ST = 81.67'	PIs Sta 56+34.10 Θs = 2°42'23.6" Ls = 248.00' LT = 165.35' ST = 82.68'	PI Sta 61+13.32 Δ = 17°10'54.0" (LT) D = 2°10'57.7" L = 787.18' T = 396.56' R = 2,625.00' SE = 0.04 RO = 200.00' RO' = 152.00' DS = 50 mph	PIs Sta 65+86.61 Θs = 2°42'23.6" Ls = 248.00' LT = 165.35' ST = 82.68'	PIs Sta 71+62.67 Θs = 5°18'01.4" Ls = 247.00' LT = 164.74' ST = 82.40'	PI Sta 75+91.31 Δ = 29°05'25.4" (RT) D = 4°17'30.5" L = 677.81' T = 346.38' R = 1,335.00' SE = 0.065 RO = 247.00' DS = 50 mph
--	--	--	---	--	--	---



MATCH LINE STA. -RP2AC- 45+00 SEE SHEET 47

MATCH LINE -RP2AC STA. 56+00 SEE SHEET 36

-SRI162-

PI Sta 15+42.00 Δ = 7°17'22.2" (RT) D = 1°09'01.9" L = 633.58' T = 317.22' R = 4,980.00' SE = NC DS = 40 mph
---

SEE SHEETS 86 AND 87 FOR PROFILE -RP2AC-  
SEE SHEETS 92 FOR PROFILE -SRI162-  
SEE SHEETS 2D-1 THRU 2D-2 FOR FRAINAGE DITCH DETAILS  
SEE SHEETS 2C-1 THRU 2C-10 FOR CULVERT PLANS

JOHN TYLER  
DB 2673 P  
PC 'H' SLID

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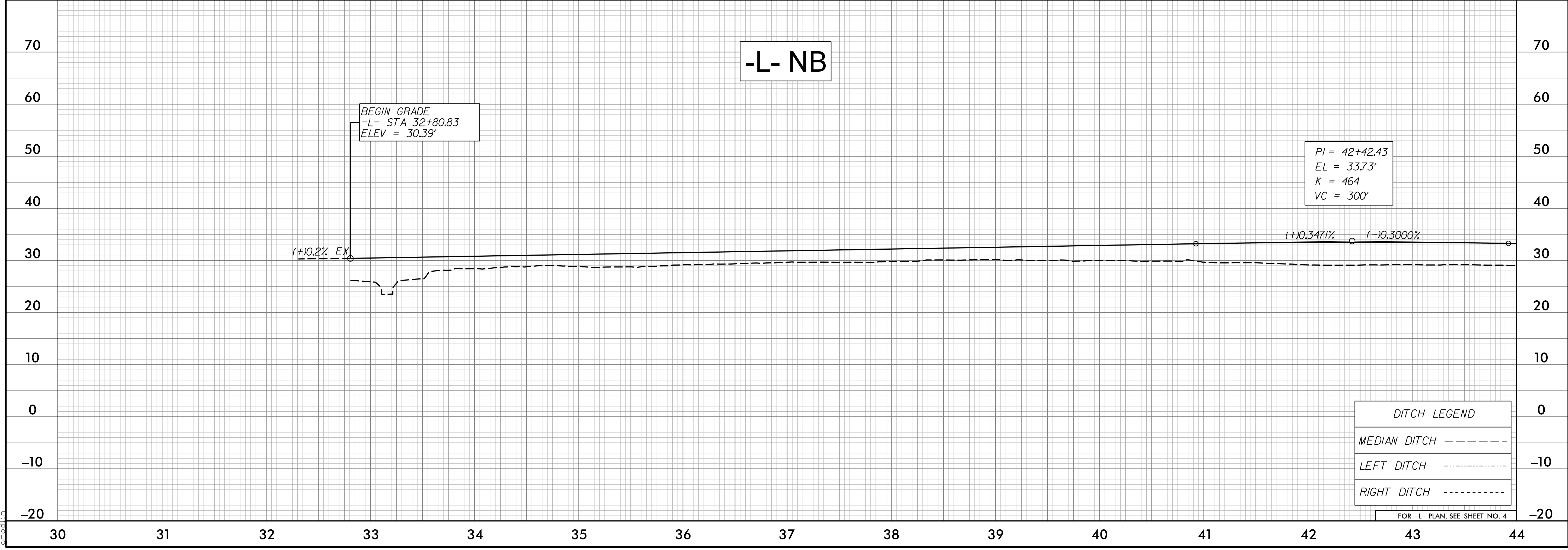
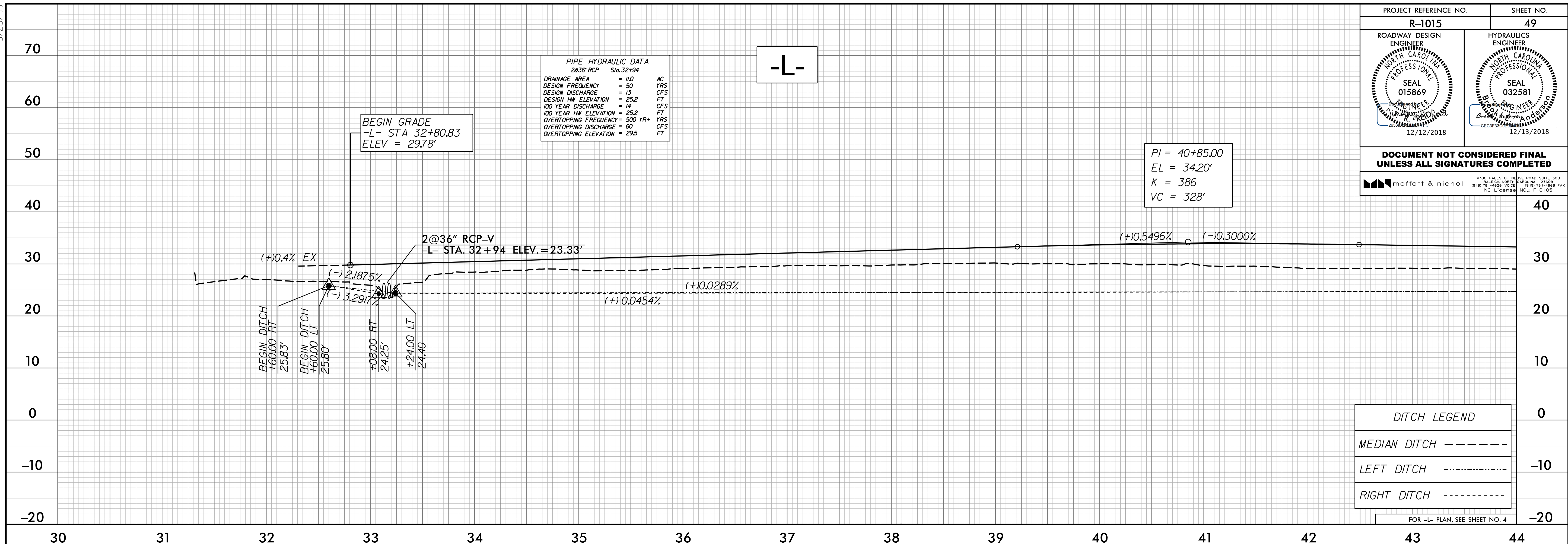
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>49</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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4700 FALLS OF THE ROADS, SUITE 300  
FALGOUT, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License NO.: F-0105

**moffatt & nichol**



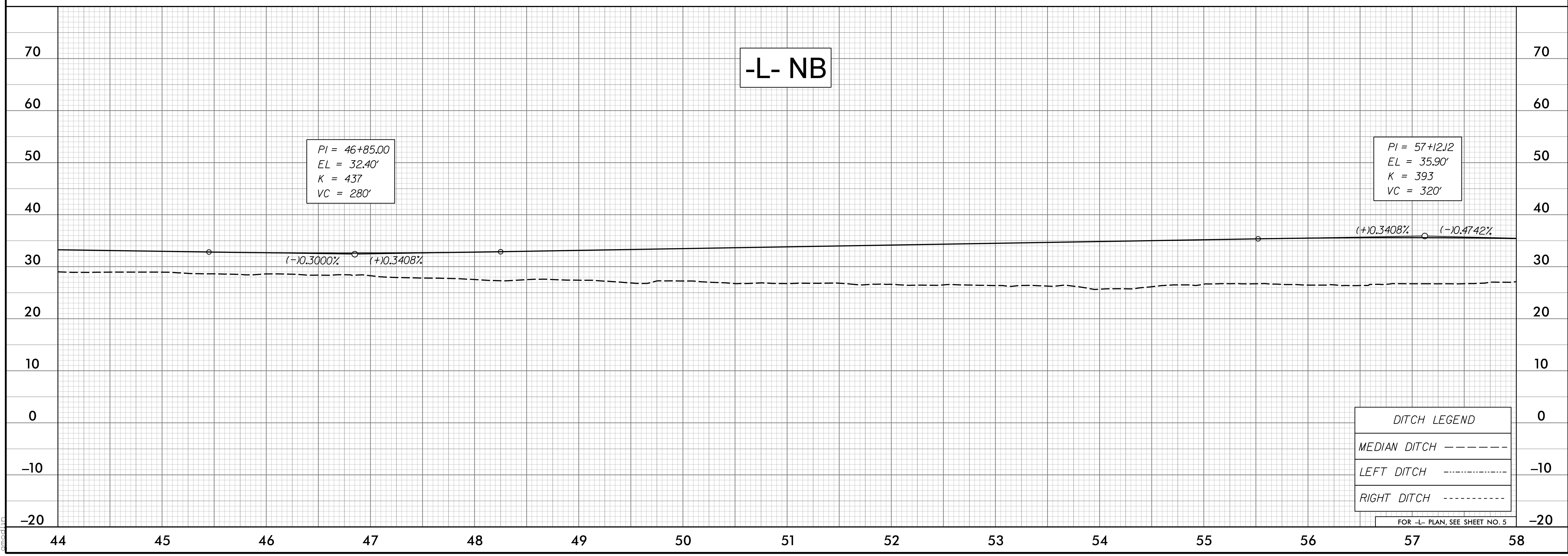
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 moffatt & nichol

5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>50</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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4700 FALLS OF THE ROADS, SUITE 100  
FALCON, NORTH CAROLINA 27629  
(919) 781-4626 VOICE (919) 781-4666 FAX  
NC License NO.: F-0105

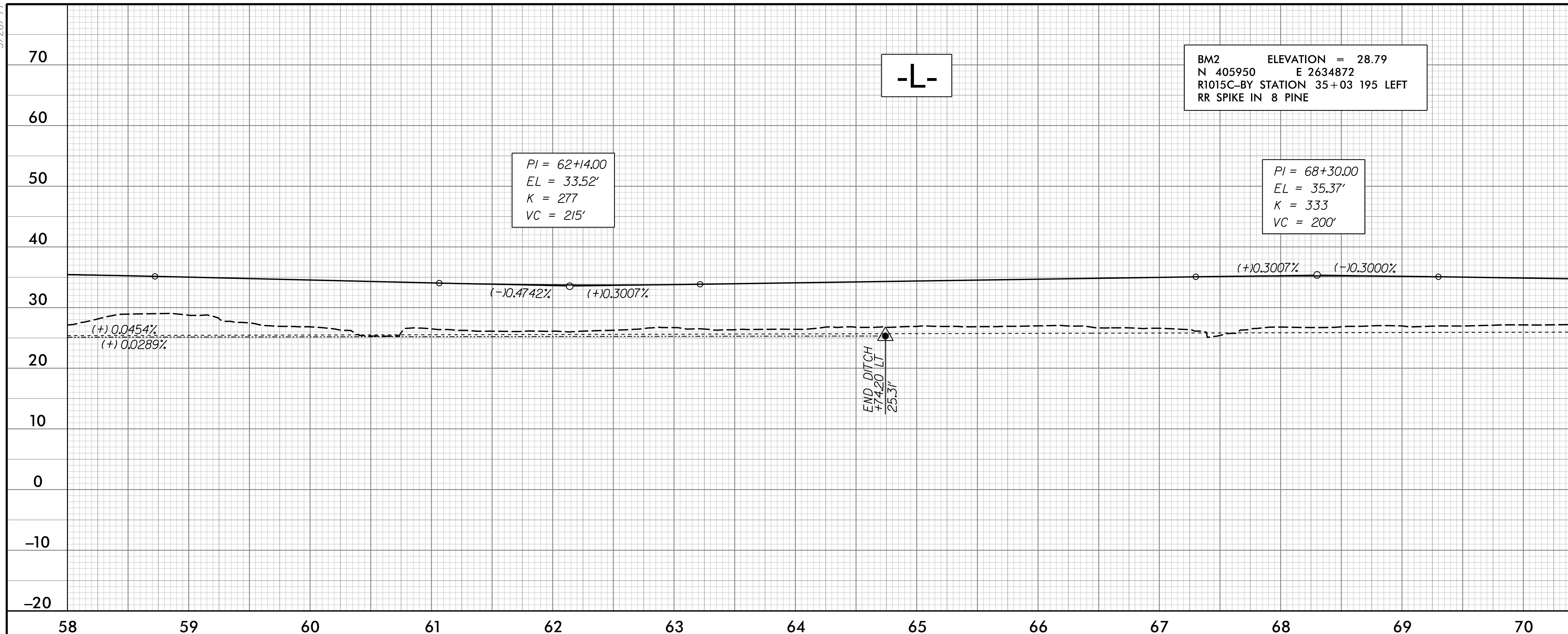


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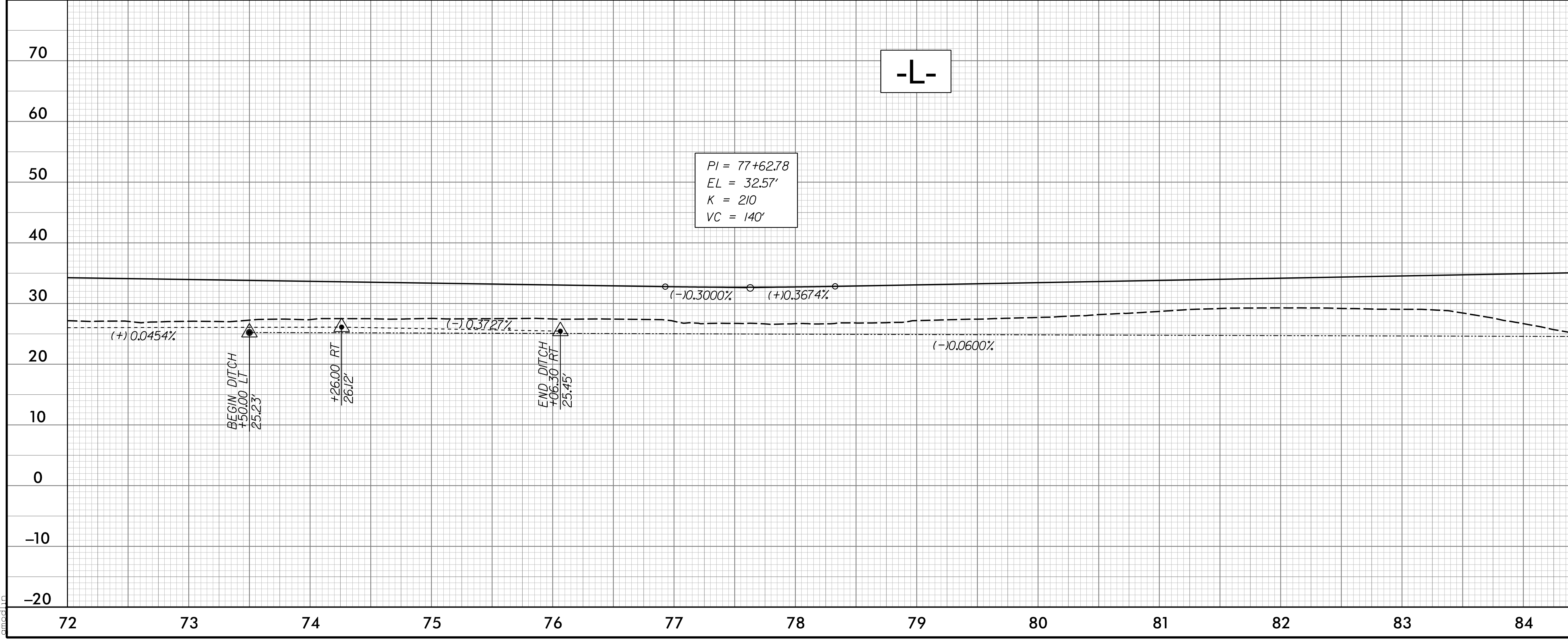
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>51</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF THE ROADS, SUITE 300 FALGOUT, NORTH CAROLINA 27629 (919) 781-4600 VOICE (919) 781-4666 FAX NC License NO.: F-0105</small> <b>moffatt &amp; nichol</b>	



DITCH LEGEND	
MEDIAN DITCH	-----
LEFT DITCH	.....
RIGHT DITCH	.....
FOR -L- PLAN, SEE SHEET NO. 6	

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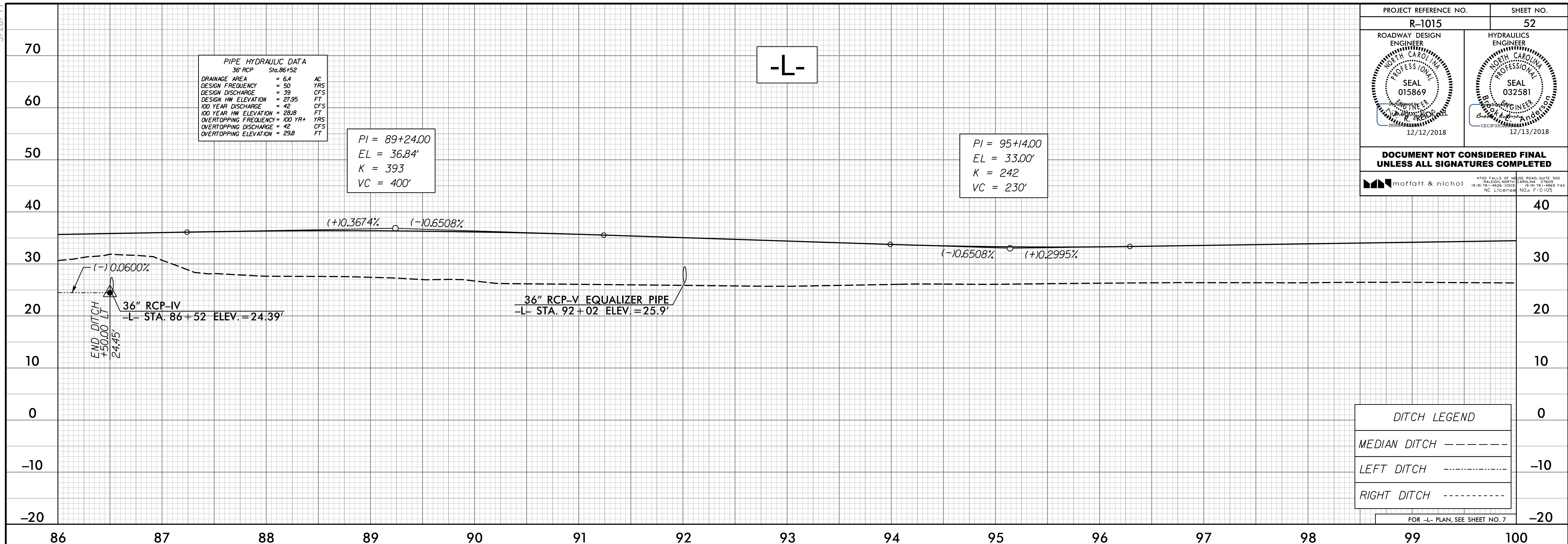
DITCH LEGEND	
MEDIAN DITCH	-----
LEFT DITCH	.....
RIGHT DITCH	.....
FOR -L- PLAN, SEE SHEET NO. 7	

5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>52</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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**DITCH LEGEND**

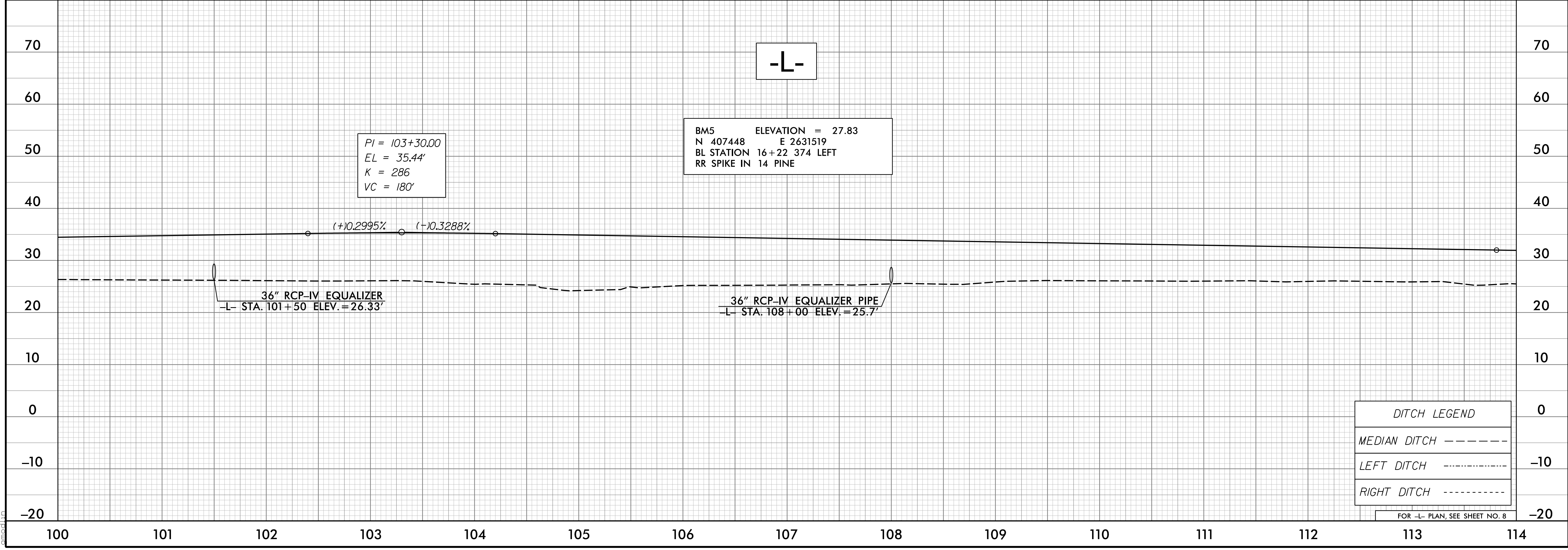
MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -L- PLAN, SEE SHEET NO. 7

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**DITCH LEGEND**

MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

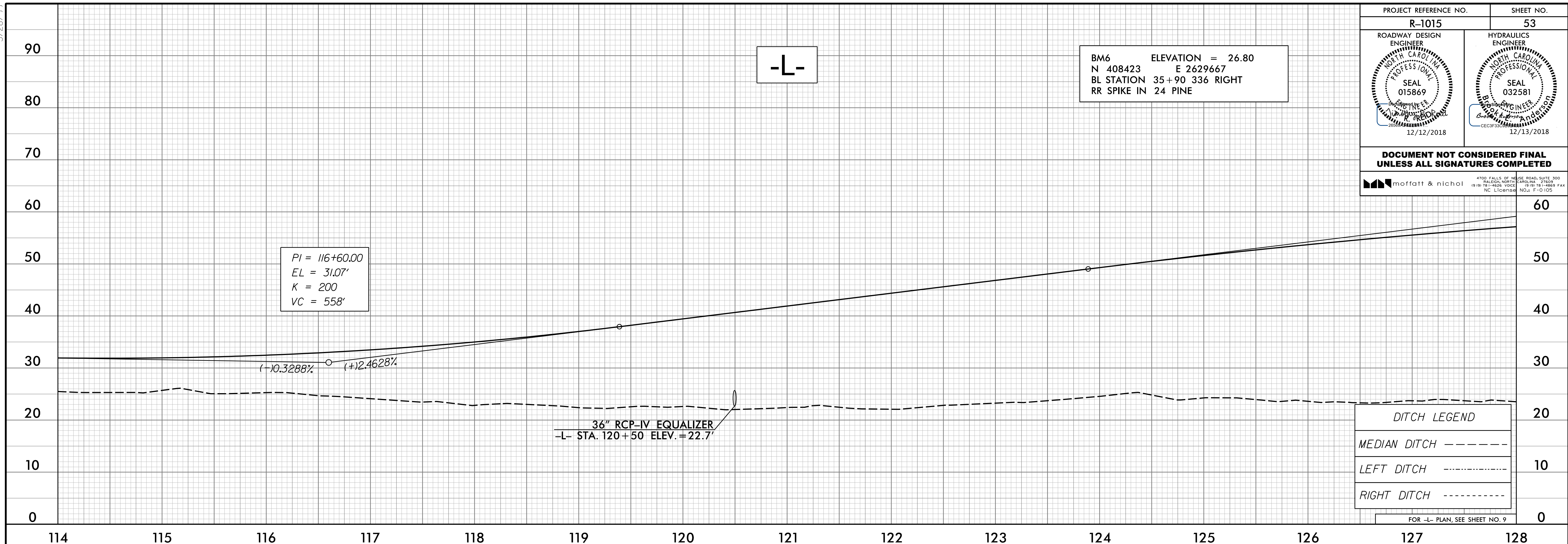
FOR -L- PLAN, SEE SHEET NO. 8

5/28/2018

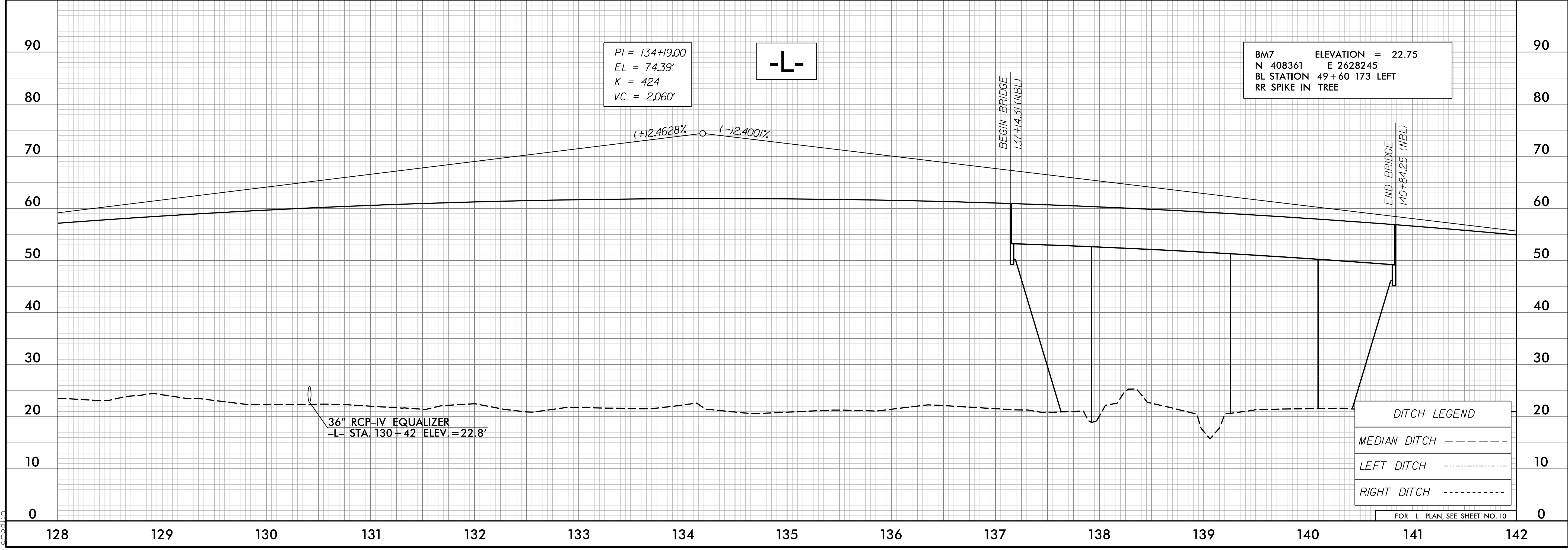
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>53</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 12/13/2018

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4700 FALLS OF THE ROADS, SUITE 100  
FALCON, NORTH CAROLINA 27629  
(919) 781-4626 VOICE (919) 781-4665 FAX  
NC License NO.: F-0105



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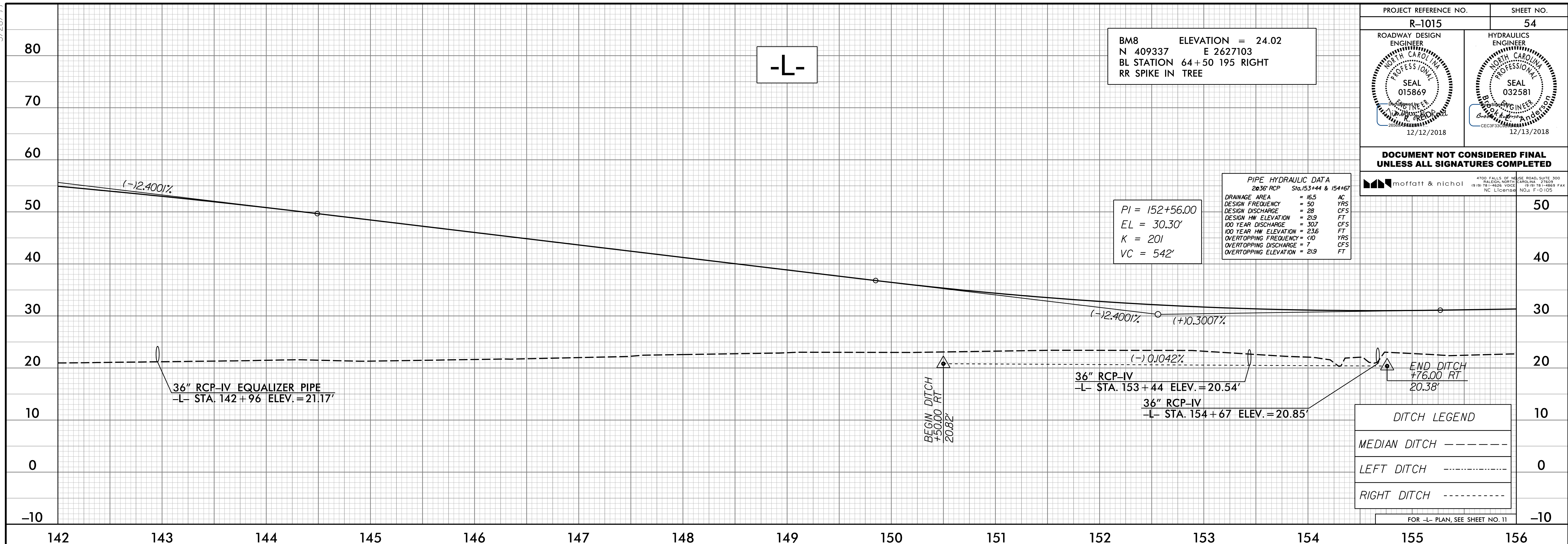


5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>54</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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FARGO, NORTH CAROLINA 27828  
(919) 781-4626 VOICE (919) 781-4666 FAX  
NC License NO. F-0105



BM8 ELEVATION = 24.02  
N 409337 E 2627103  
BL STATION 64+50 195 RIGHT  
RR SPIKE IN TREE

PI = 152+56.00  
EL = 30.30'  
K = 201  
VC = 542'

**PIPE HYDRAULIC DATA**  
20.36" RCP Sta. 153+44 & 154+67

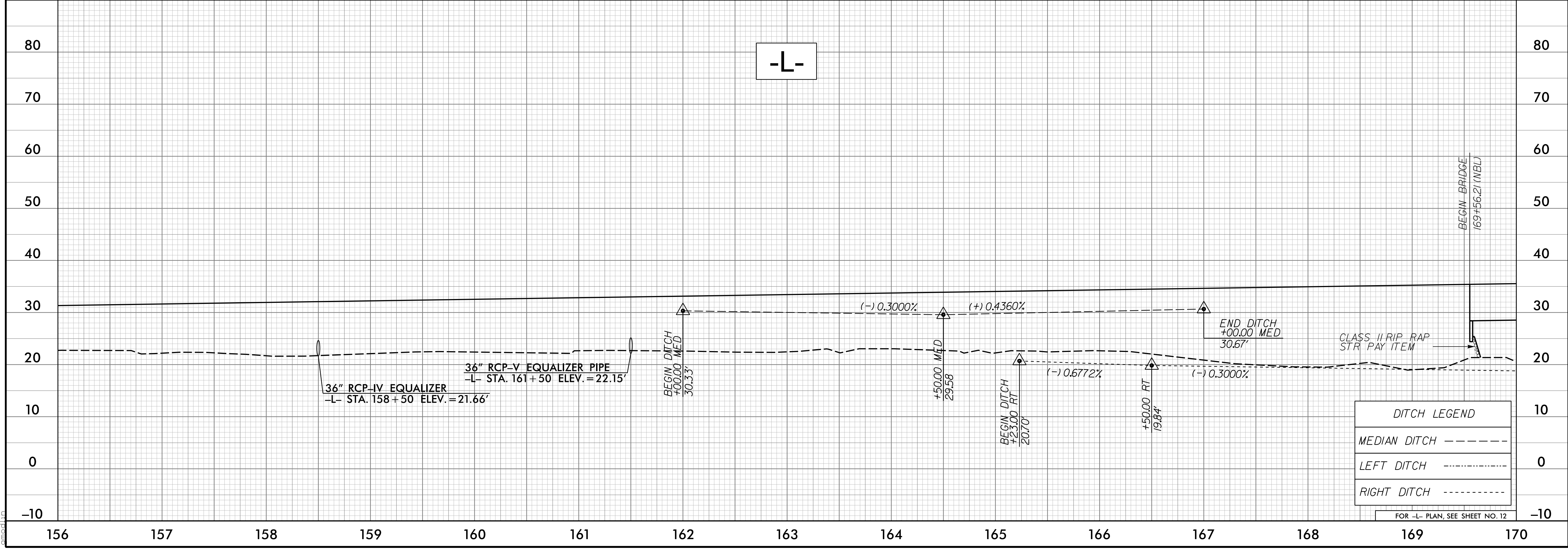
DRAINAGE AREA	= 16.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 28	CFS
DESIGN HW ELEVATION	= 21.9	FT
100 YEAR DISCHARGE	= 30.7	CFS
100 YEAR HW ELEVATION	= 23.6	FT
OVERTOPPING FREQUENCY	= 10	YRS
OVERTOPPING DISCHARGE	= 7	CFS
OVERTOPPING ELEVATION	= 21.9	FT

**DITCH LEGEND**

MEDIAN DITCH	---
LEFT DITCH	----
RIGHT DITCH	----

FOR -L- PLAN, SEE SHEET NO. 11

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**DITCH LEGEND**

MEDIAN DITCH	---
LEFT DITCH	----
RIGHT DITCH	----

FOR -L- PLAN, SEE SHEET NO. 12

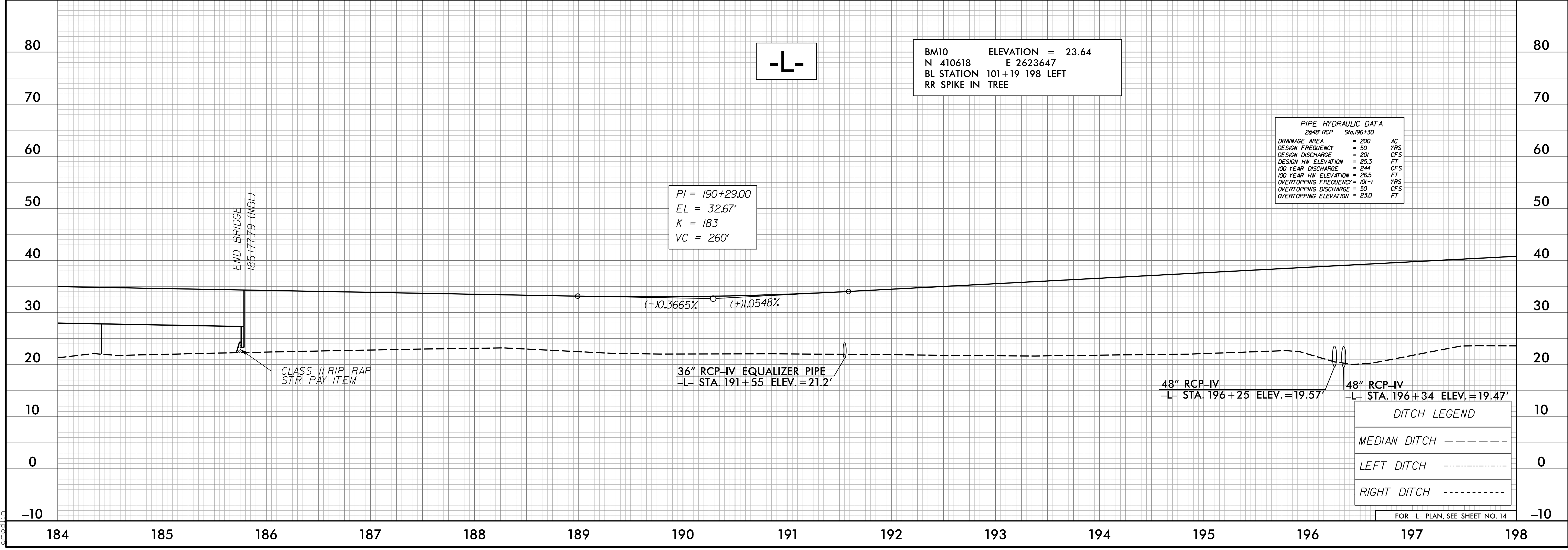
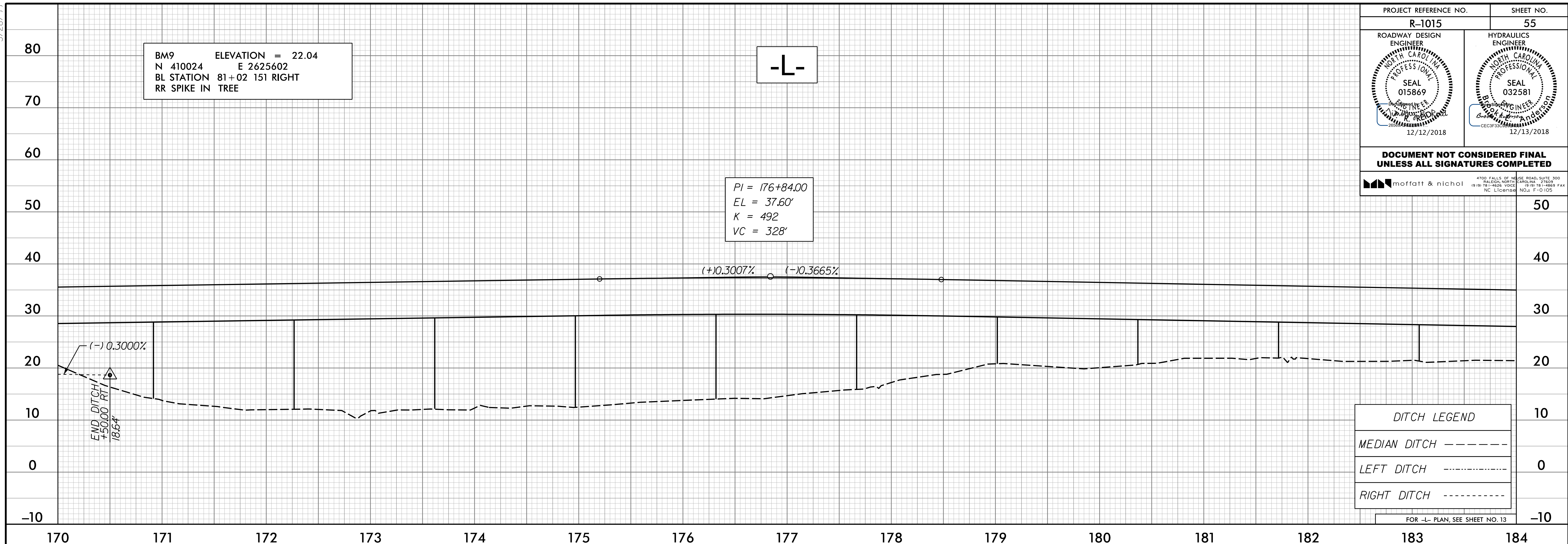
5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>55</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 12/13/2018

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FALGOUT, NORTH CAROLINA 27629  
(919) 781-4626 VOICE (919) 781-4666 FAX  
NC License NO.: F-0105



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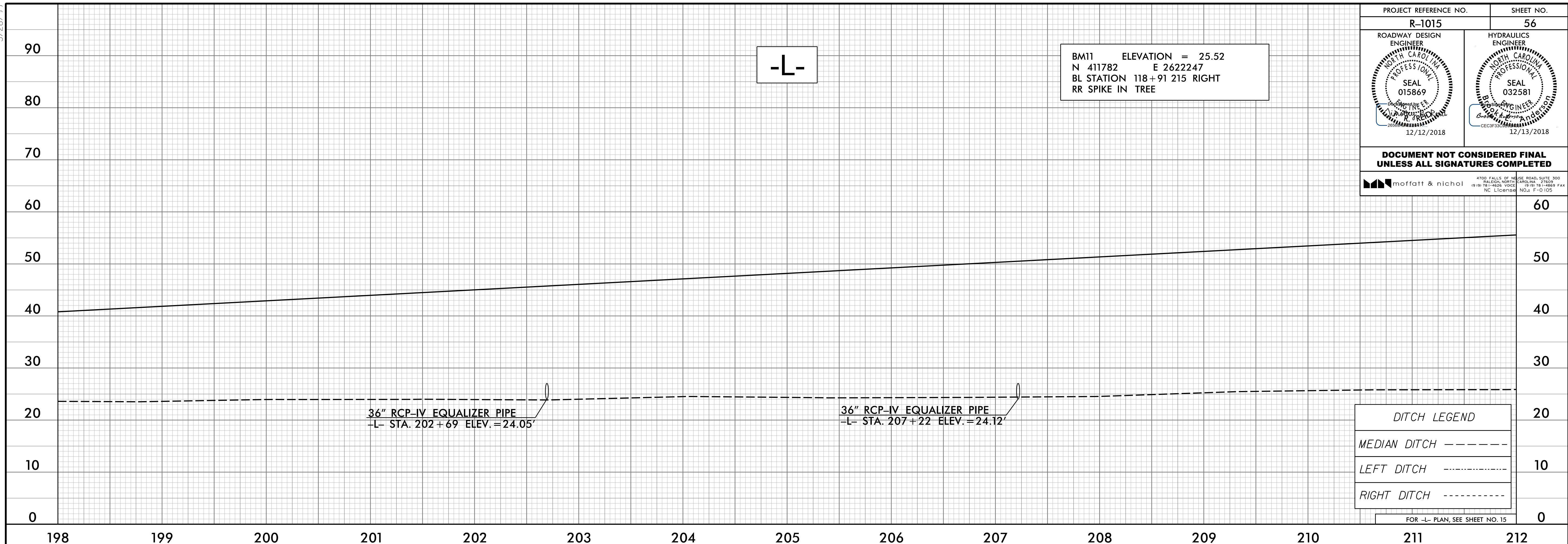
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>56</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

BM11 ELEVATION = 25.52  
 N 411782 E 2622247  
 BL STATION 118+91 215 RIGHT  
 RR SPIKE IN TREE

**DOCUMENT NOT CONSIDERED FINAL  
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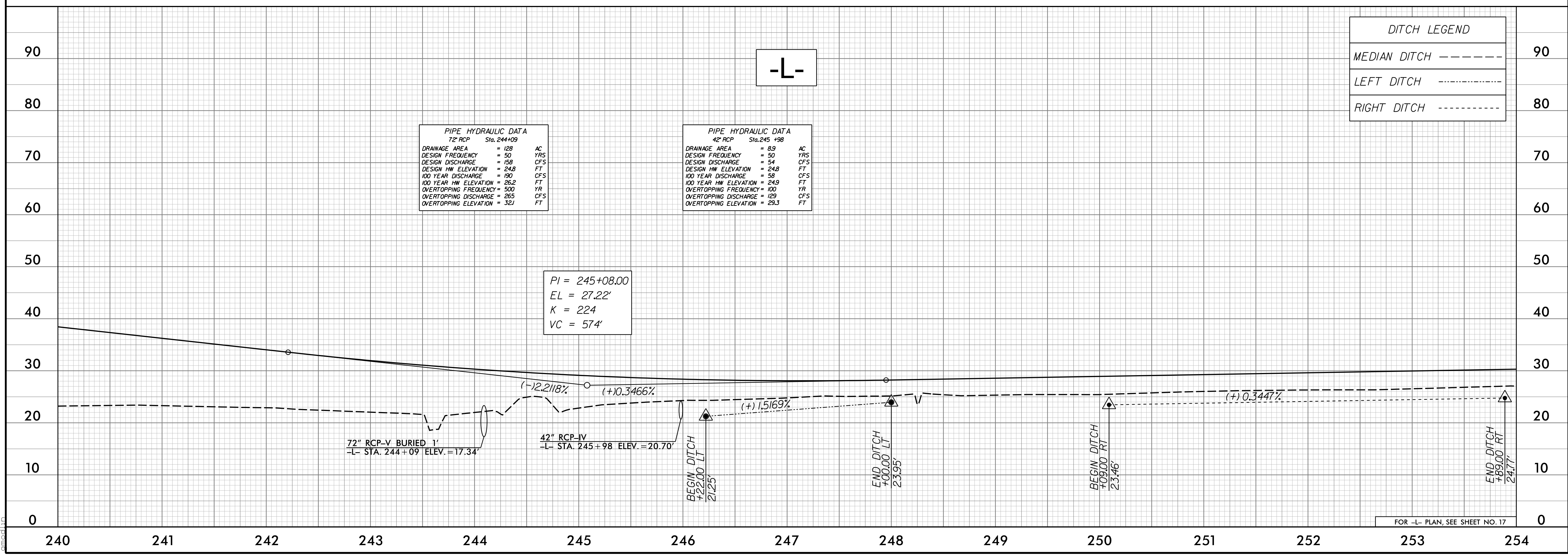
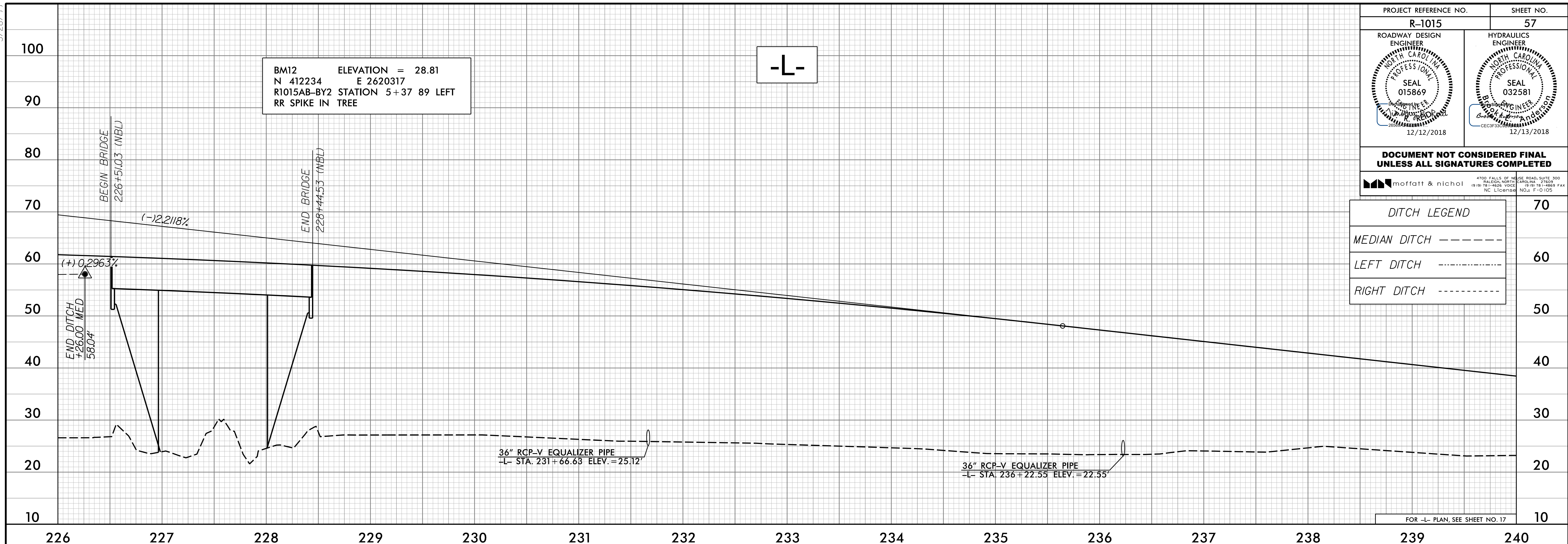
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5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>57</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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4705 FALLS OF THE ROADS, SUITE 100  
FALCON, NORTH CAROLINA 27629  
(919) 781-4600 VOIC (919) 781-4666 FAX  
NC License NO.: F-0105



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5/28/2018

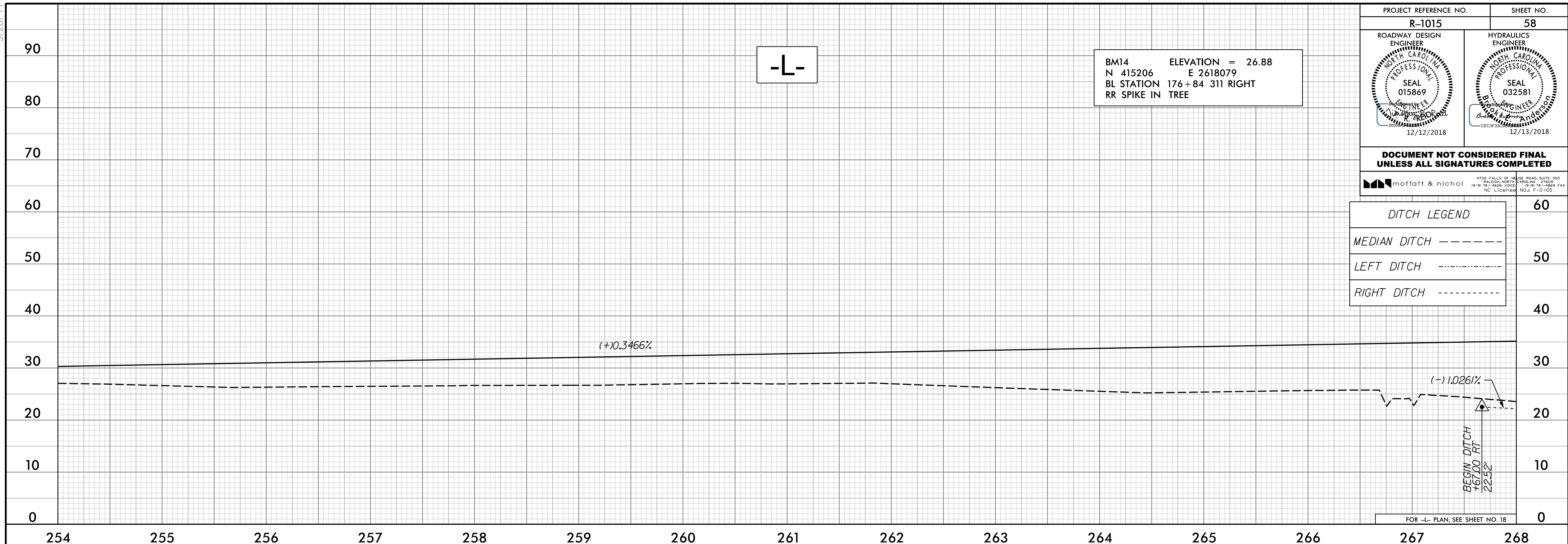
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>58</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

BM14 ELEVATION = 26.88  
N 415206 E 2618079  
BL STATION 176+84 311 RIGHT  
RR SPIKE IN TREE

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moftatt & nichol

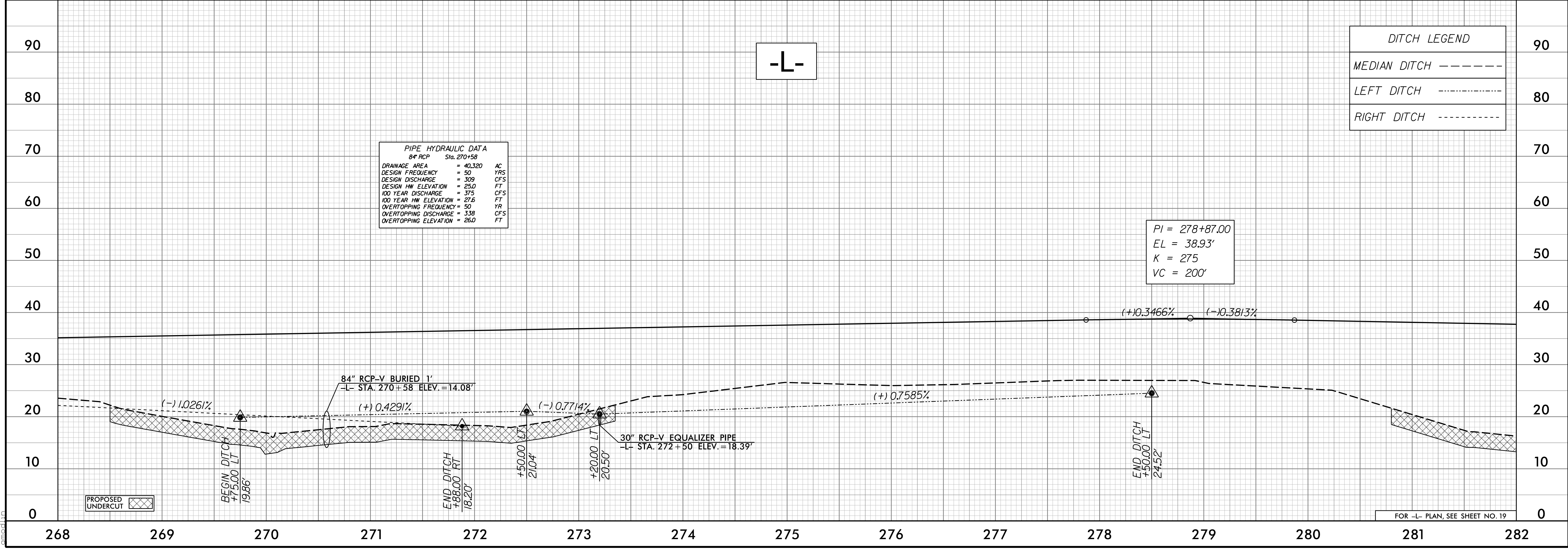
DITCH LEGEND	
MEDIAN DITCH	-----
LEFT DITCH	-----
RIGHT DITCH	-----



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

PIPE HYDRAULIC DATA		
84" RCP	Sta. 270+58	
DRAINAGE AREA	= 40.320	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 309	CFS
DESIGN HW ELEVATION	= 25.0	FT
100 YEAR DISCHARGE	= 375	CFS
100 YEAR HW ELEVATION	= 27.6	FT
OVERTOPPING FREQUENCY	= 50	YR
OVERTOPPING DISCHARGE	= 338	CFS
OVERTOPPING ELEVATION	= 26.0	FT

PI = 278+87.00  
EL = 38.93'  
K = 275  
VC = 200'



PROPOSED UNDERCUT

FOR -L- PLAN, SEE SHEET NO. 19

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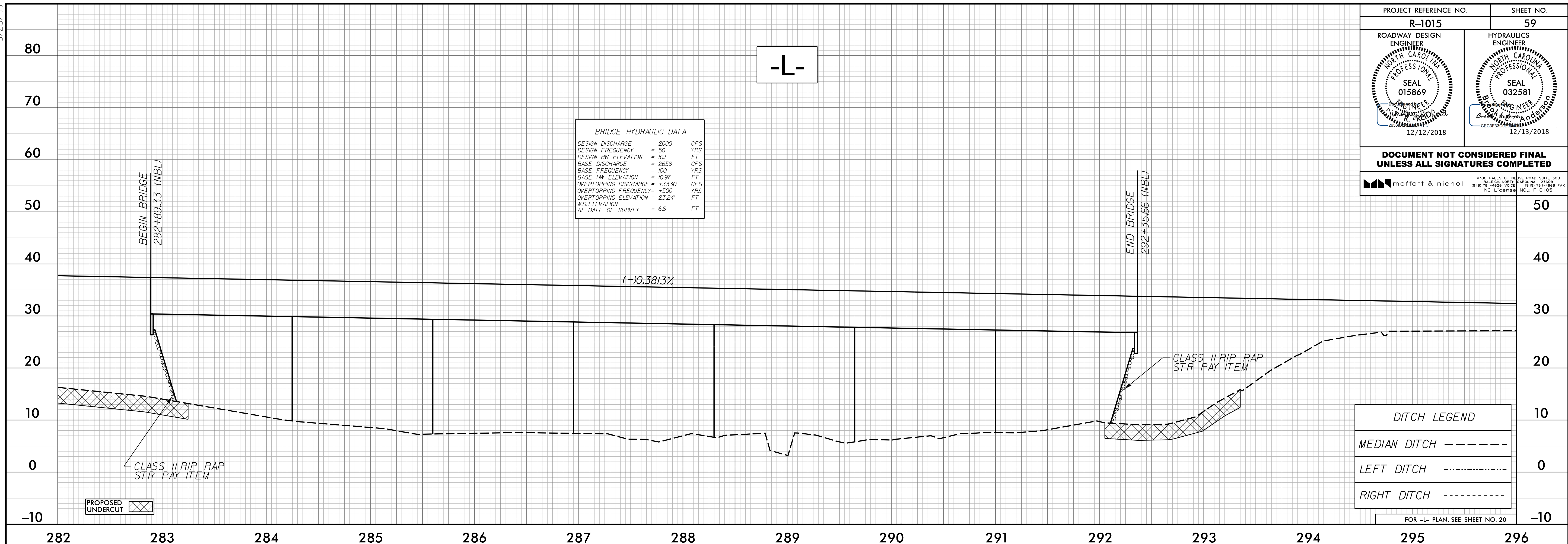


5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>59</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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MOFFATT & NICHOL  
4700 FALLS OF THE ROADS, SUITE 200  
FARGO, NORTH DAKOTA 58103  
701-781-4600 VOICE 701-781-4664 FAX  
NC License No. F-0105



**BRIDGE HYDRAULIC DATA**

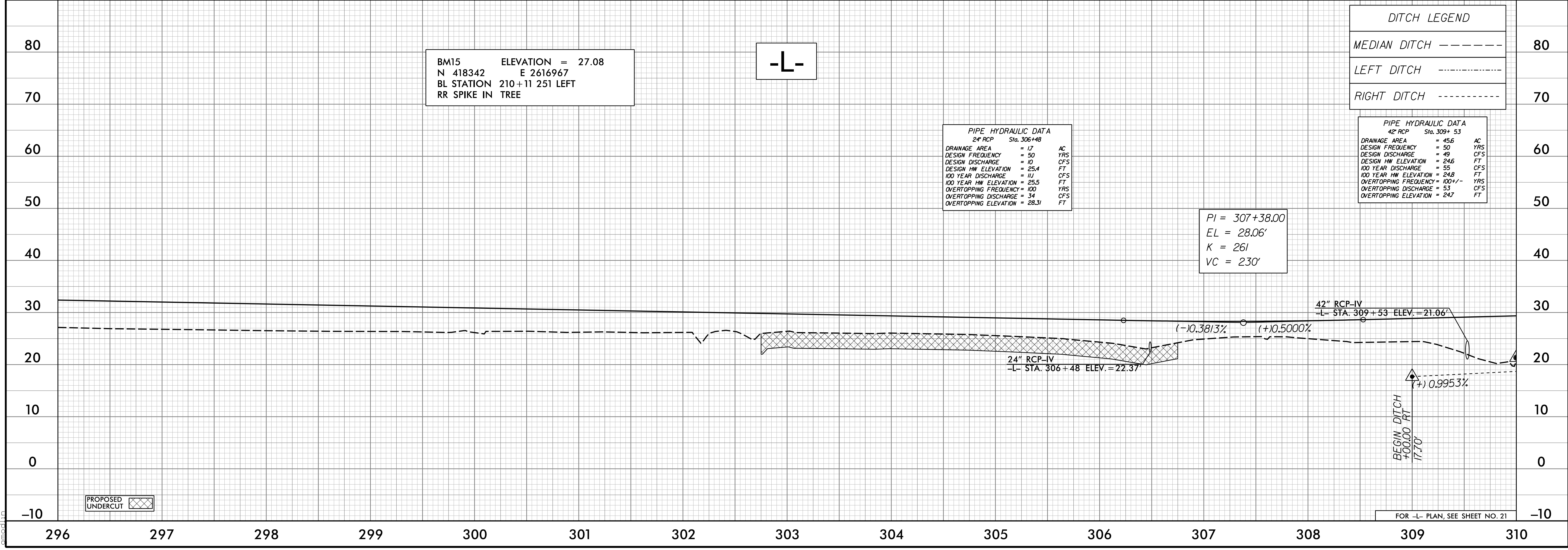
DESIGN DISCHARGE	= 2000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 10J	FT
BASE DISCHARGE	= 2658	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 10.97	FT
OVERTOPPING DISCHARGE	= +3330	CFS
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING ELEVATION	= 23.24	FT
W.S. ELEVATION AT DATE OF SURVEY	= 6.6	FT

**DITCH LEGEND**

MEDIAN DITCH	-----
LEFT DITCH	-----
RIGHT DITCH	-----

FOR -L- PLAN, SEE SHEET NO. 20

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**BM15** ELEVATION = 27.08  
N 418342 E 2616967  
BL STATION 210+11 251 LEFT  
RR SPIKE IN TREE

**PIPE HYDRAULIC DATA**

24" RCP	Sta. 306+48
DRAINAGE AREA	= 17 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 40 CFS
DESIGN HW ELEVATION	= 25.4 FT
100 YEAR DISCHARGE	= 111 CFS
100 YEAR HW ELEVATION	= 25.5 FT
OVERTOPPING FREQUENCY	= 100 YRS
OVERTOPPING DISCHARGE	= 34 CFS
OVERTOPPING ELEVATION	= 28.31 FT

**PIPE HYDRAULIC DATA**

42" RCP	Sta. 309+53
DRAINAGE AREA	= 45.6 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 49 CFS
DESIGN HW ELEVATION	= 24.6 FT
100 YEAR DISCHARGE	= 55 CFS
100 YEAR HW ELEVATION	= 24.8 FT
OVERTOPPING FREQUENCY	= 100 YRS
OVERTOPPING DISCHARGE	= 53 CFS
OVERTOPPING ELEVATION	= 24.7 FT

PI = 307+38.00  
EL = 28.06'  
K = 261  
VC = 230'

**DITCH LEGEND**

MEDIAN DITCH	-----
LEFT DITCH	-----
RIGHT DITCH	-----

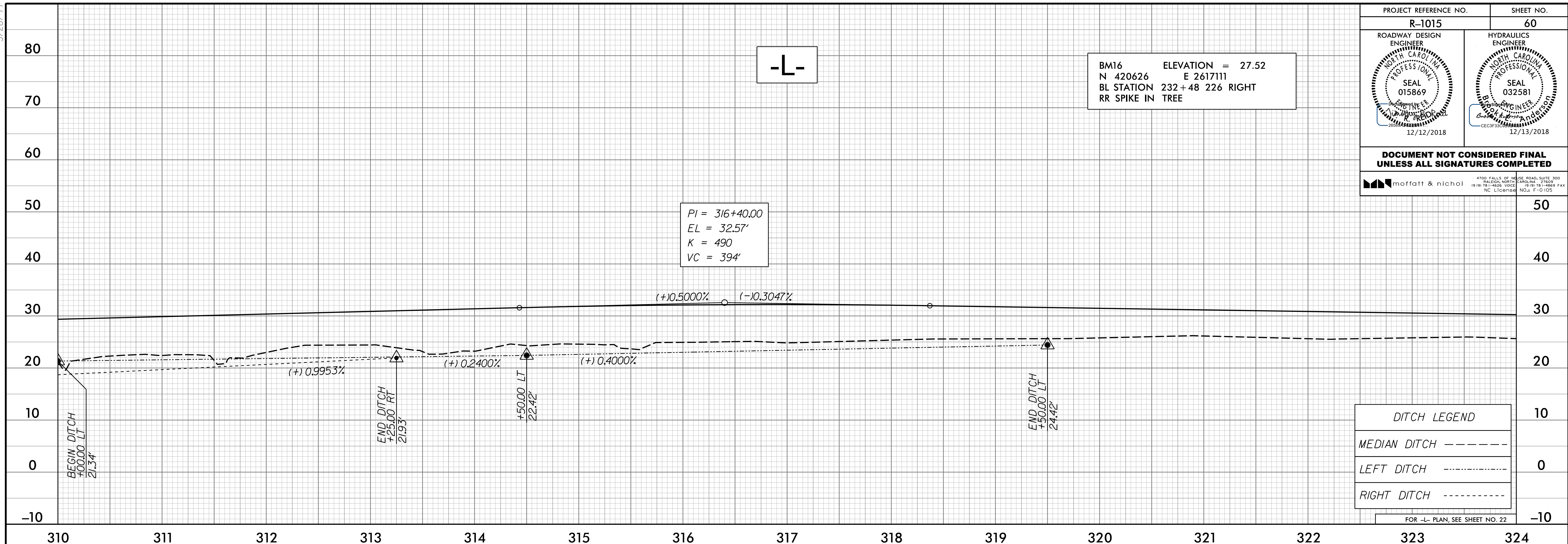
FOR -L- PLAN, SEE SHEET NO. 21

5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>60</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 12/13/2018

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moftatt & nichol



**DITCH LEGEND**

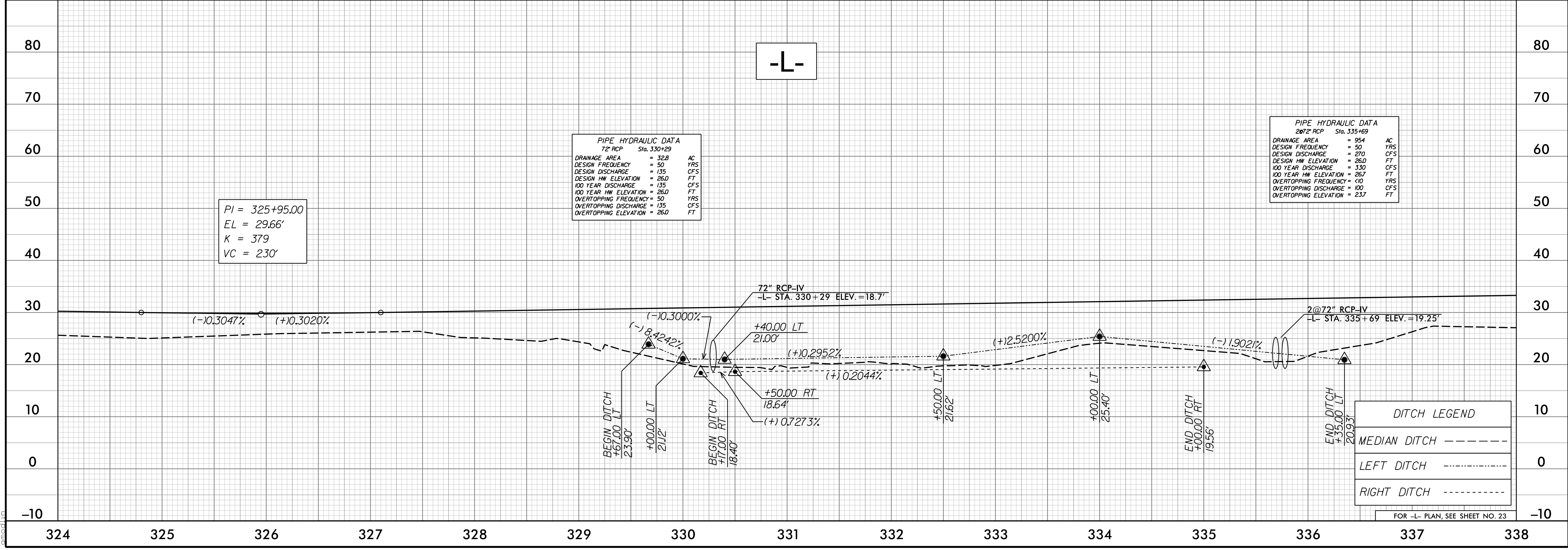
MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -L- PLAN, SEE SHEET NO. 22

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**PIPE HYDRAULIC DATA**  
72" RCP Sta. 330+29

DRAINAGE AREA = 328 AC  
DESIGN FREQUENCY = 50 YRS  
DESIGN DISCHARGE = 135 CFS  
DESIGN HW ELEVATION = 26.0 FT  
100 YEAR DISCHARGE = 135 CFS  
100 YEAR HW ELEVATION = 26.0 FT  
OVERTOPPING FREQUENCY = 50 YRS  
OVERTOPPING DISCHARGE = 135 CFS  
OVERTOPPING ELEVATION = 26.0 FT

**PIPE HYDRAULIC DATA**  
267" RCP Sta. 335+69

DRAINAGE AREA = 954 AC  
DESIGN FREQUENCY = 50 YRS  
DESIGN DISCHARGE = 270 CFS  
DESIGN HW ELEVATION = 26.0 FT  
100 YEAR DISCHARGE = 330 CFS  
100 YEAR HW ELEVATION = 26.7 FT  
OVERTOPPING FREQUENCY = 50 YRS  
OVERTOPPING DISCHARGE = 100 CFS  
OVERTOPPING ELEVATION = 23.7 FT

**DITCH LEGEND**

MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

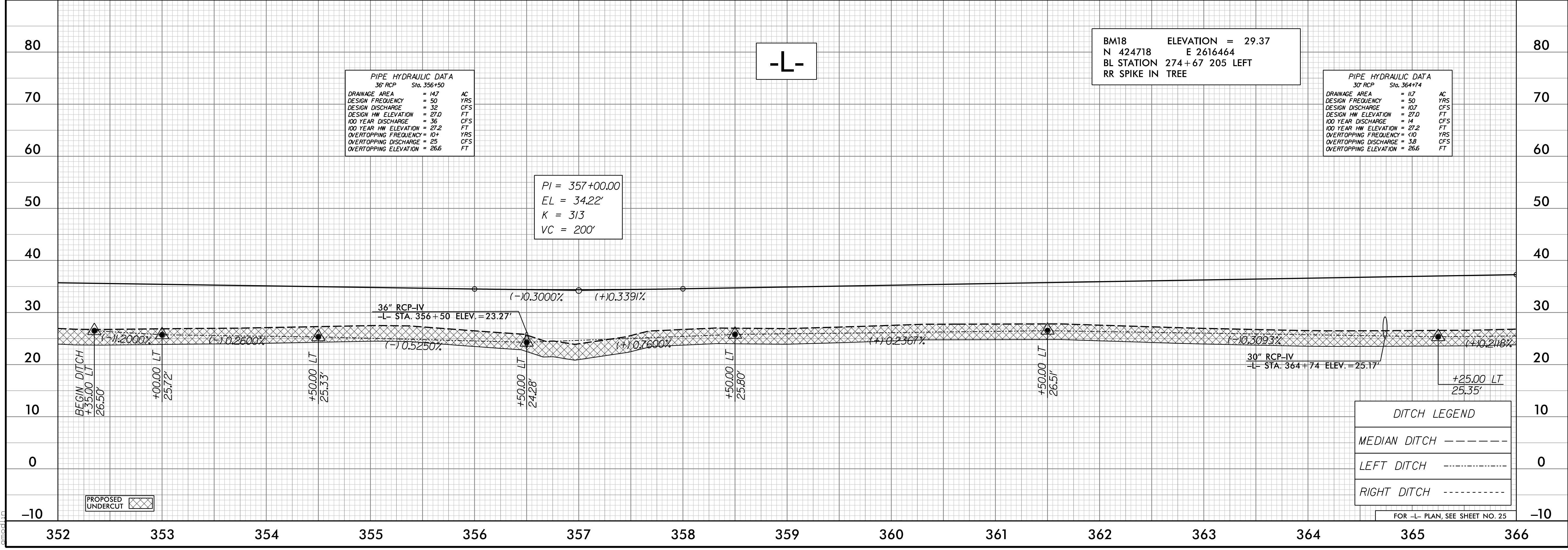
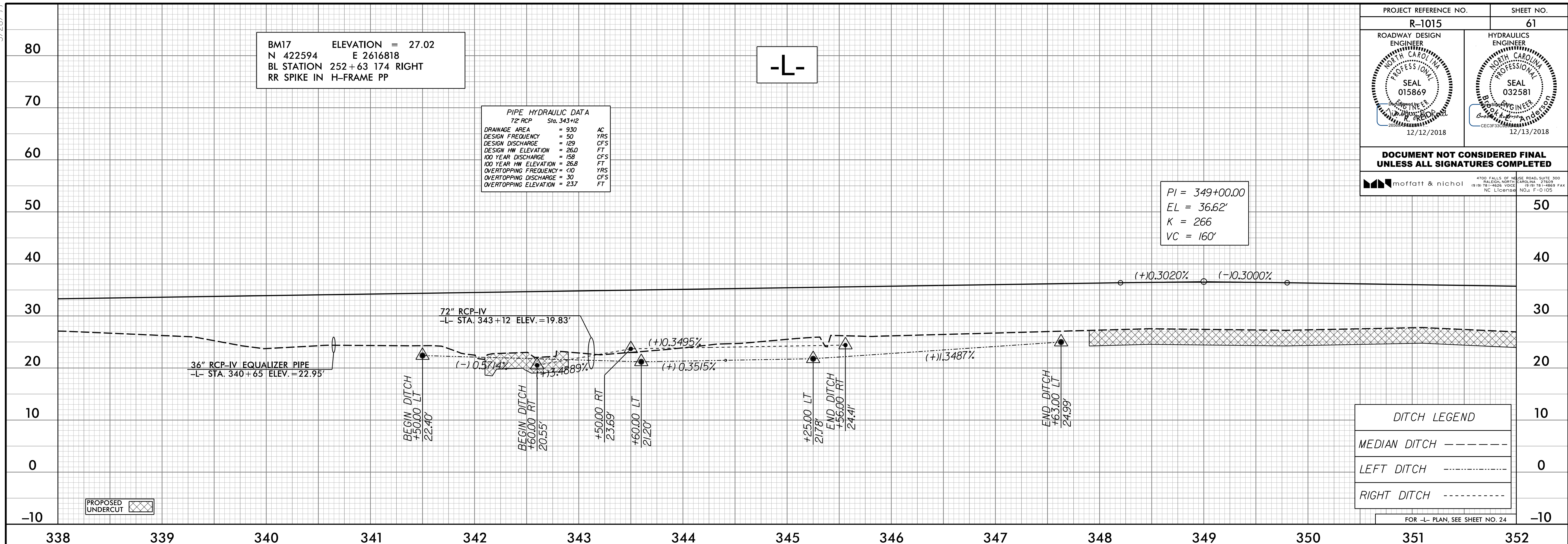
FOR -L- PLAN, SEE SHEET NO. 23

5/28/99

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>61</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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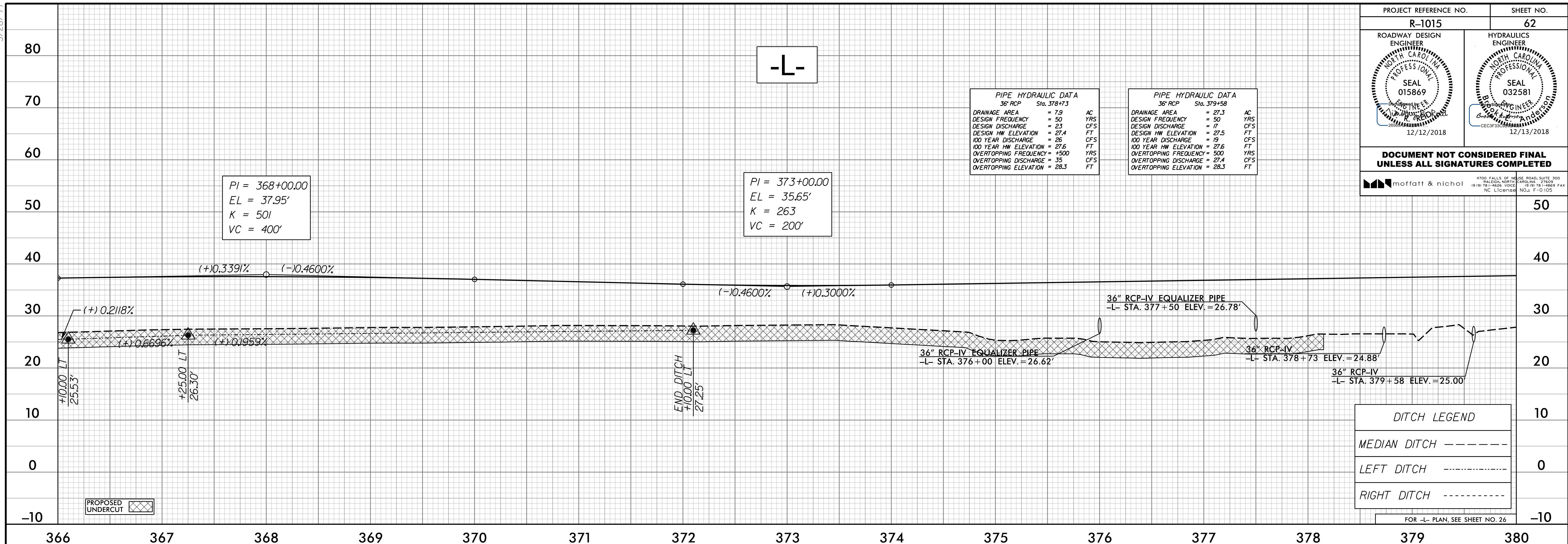
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5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>62</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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MOFFATT & NICHOL



PIPE HYDRAULIC DATA  
36" RCP Sta. 378+73

DRAINAGE AREA	= 7.9	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 27.4	FT
100 YEAR DISCHARGE	= 36	CFS
100 YEAR HW ELEVATION	= 27.6	FT
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= 35	CFS
OVERTOPPING ELEVATION	= 28.3	FT

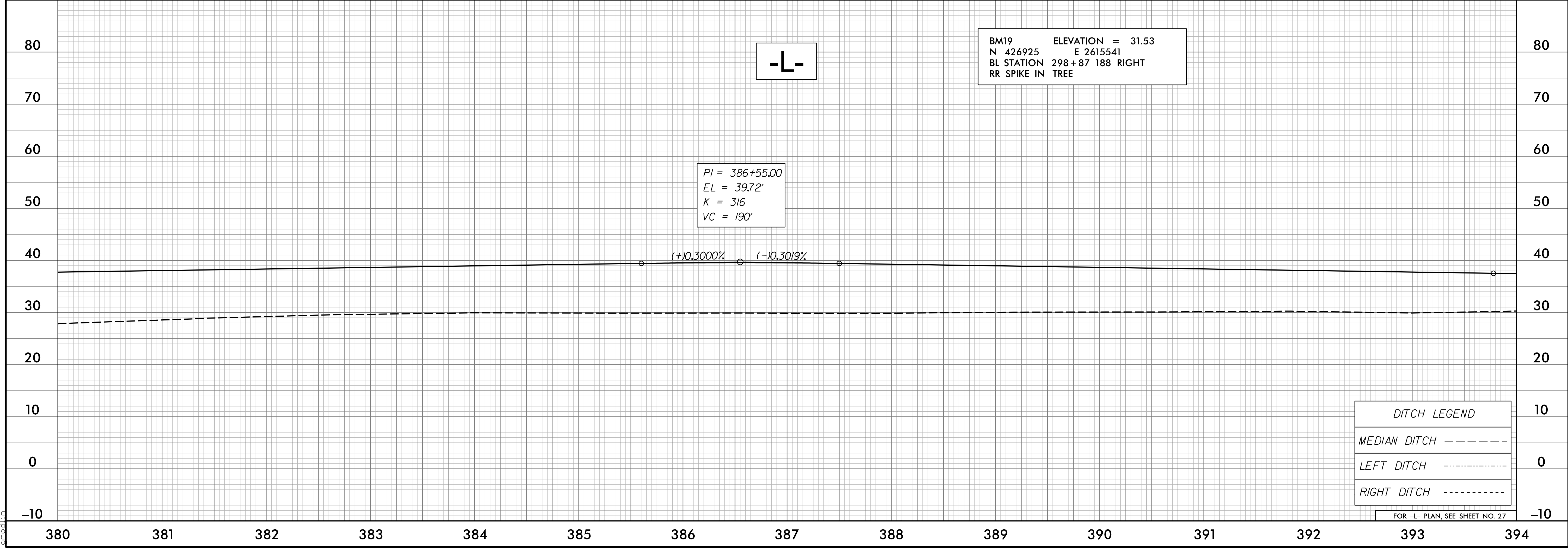
PIPE HYDRAULIC DATA  
36" RCP Sta. 379+58

DRAINAGE AREA	= 27.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 17	CFS
DESIGN HW ELEVATION	= 21.5	FT
100 YEAR DISCHARGE	= 19	CFS
100 YEAR HW ELEVATION	= 21.6	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 21.4	CFS
OVERTOPPING ELEVATION	= 28.3	FT

DITCH LEGEND

MEDIAN DITCH	---
LEFT DITCH	----
RIGHT DITCH	-----

FOR -L- PLAN, SEE SHEET NO. 26



BM19 ELEVATION = 31.53  
N 426925 E 2615541  
BL STATION 298+87 188 RIGHT  
RR SPIKE IN TREE

DITCH LEGEND

MEDIAN DITCH	---
LEFT DITCH	----
RIGHT DITCH	-----

FOR -L- PLAN, SEE SHEET NO. 27

I:\2018\10-28-18\1015\Roadway\Proc\1015\_rdy\_of162.dgn

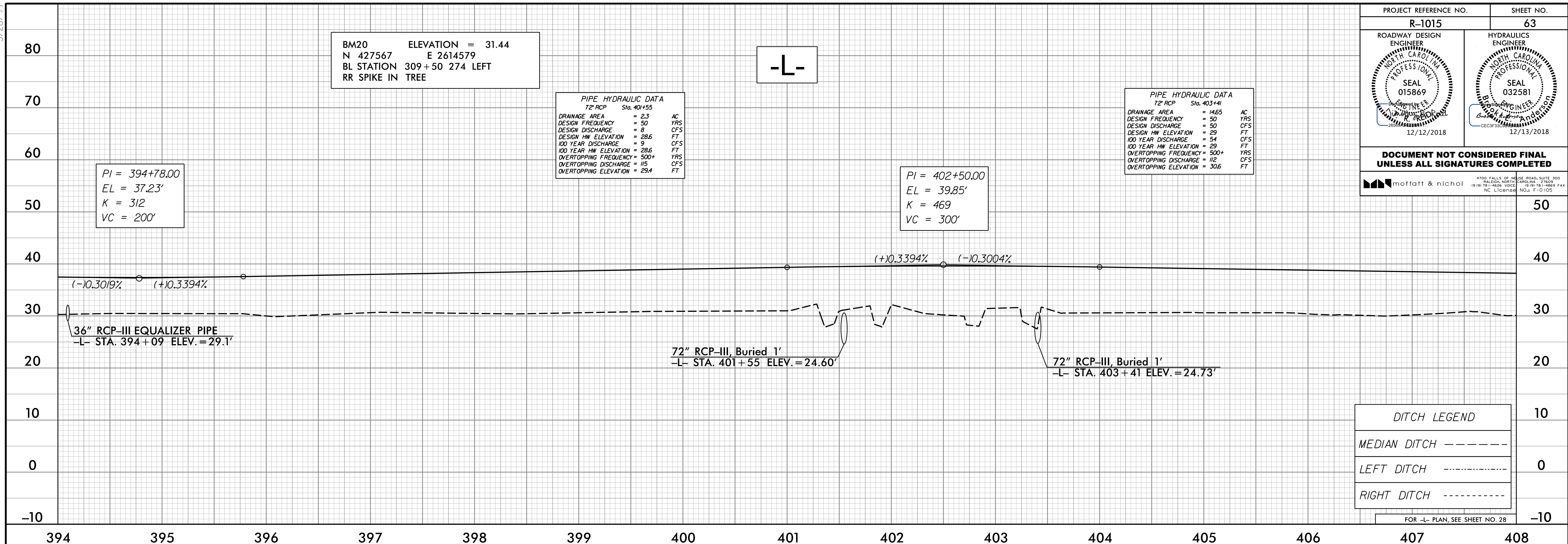
5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>63</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

4700 FALLS OF THE ROADS, SUITE 200  
ALEXANDRIA, NORTH CAROLINA 27609  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License NO. F-0105

**moffatt & nichol**



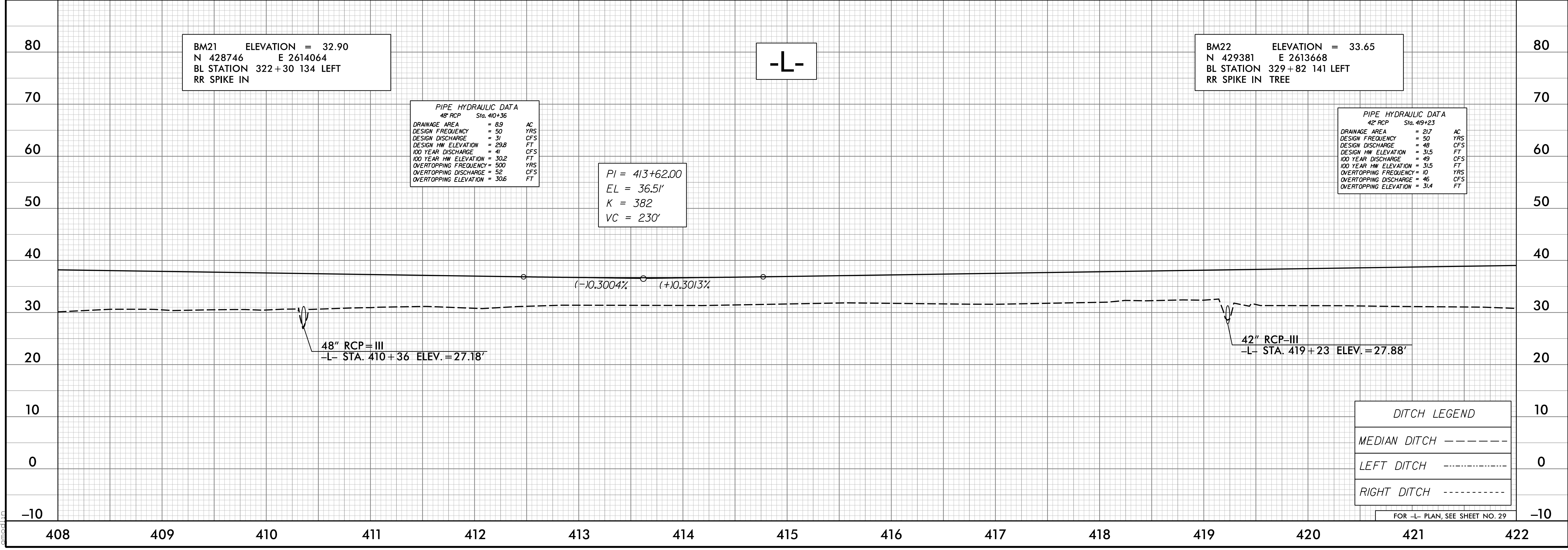
**DITCH LEGEND**

MEDIAN DITCH -----

LEFT DITCH -----

RIGHT DITCH -----

FOR -L- PLAN, SEE SHEET NO. 28



**DITCH LEGEND**

MEDIAN DITCH -----

LEFT DITCH -----

RIGHT DITCH -----

FOR -L- PLAN, SEE SHEET NO. 29

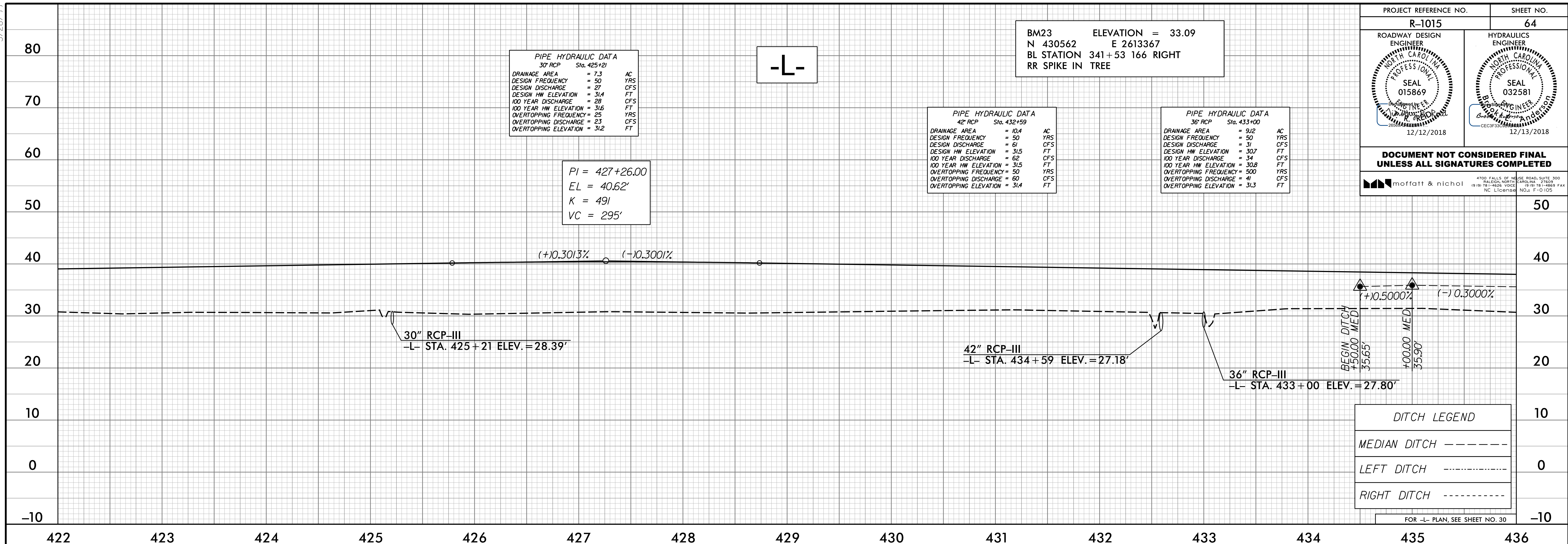
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5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>64</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 12/13/2018

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MOFFATT & NICHOL



PIPE HYDRAULIC DATA  
30" RCP Sta. 425+21

DRAINAGE AREA	= 7.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 27	CFS
DESIGN HW ELEVATION	= 31.4	FT
100 YEAR DISCHARGE	= 28	CFS
100 YEAR HW ELEVATION	= 31.6	FT
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING DISCHARGE	= 23	CFS
OVERTOPPING ELEVATION	= 31.2	FT

PIPE HYDRAULIC DATA  
42" RCP Sta. 434+59

DRAINAGE AREA	= 10.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 61	CFS
DESIGN HW ELEVATION	= 31.5	FT
100 YEAR DISCHARGE	= 62	CFS
100 YEAR HW ELEVATION	= 31.5	FT
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING DISCHARGE	= 60	CFS
OVERTOPPING ELEVATION	= 31.4	FT

PIPE HYDRAULIC DATA  
36" RCP Sta. 433+00

DRAINAGE AREA	= 9.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 31	CFS
DESIGN HW ELEVATION	= 30.7	FT
100 YEAR DISCHARGE	= 34	CFS
100 YEAR HW ELEVATION	= 30.8	FT
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING DISCHARGE	= 41	CFS
OVERTOPPING ELEVATION	= 31.3	FT

PI = 427+26.00  
EL = 40.62'  
K = 491  
VC = 295'

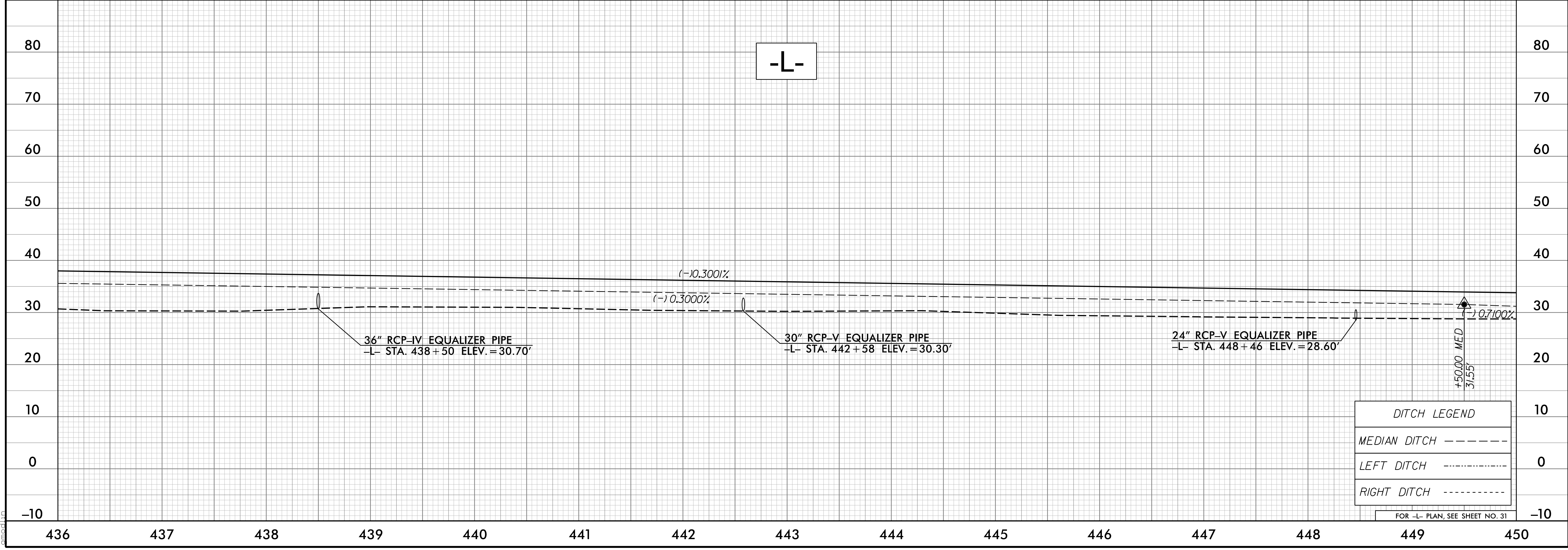
BM23 ELEVATION = 33.09  
N 430562 E 2613367  
BL STATION 341+53 166 RIGHT  
RR SPIKE IN TREE

DITCH LEGEND

MEDIAN DITCH	---
LEFT DITCH	.....
RIGHT DITCH	-.-.-.-

FOR -L- PLAN, SEE SHEET NO. 30

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DITCH LEGEND

MEDIAN DITCH	---
LEFT DITCH	.....
RIGHT DITCH	-.-.-.-

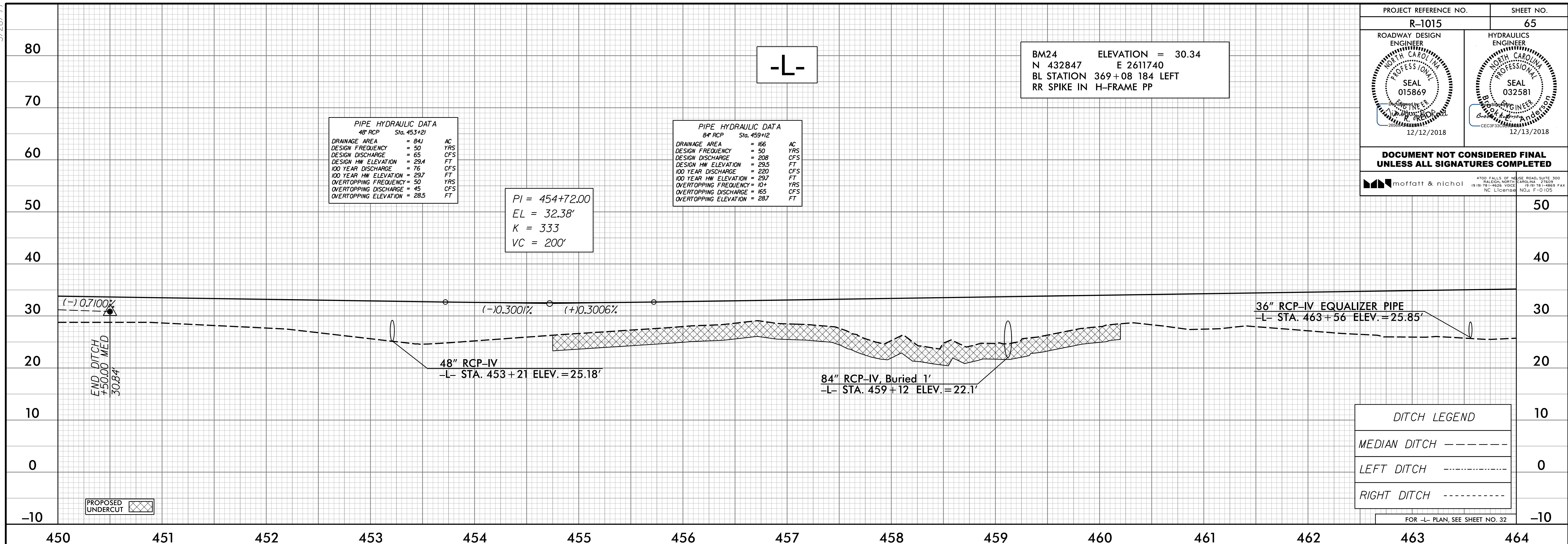
FOR -L- PLAN, SEE SHEET NO. 31

5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>65</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018


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UNLESS ALL SIGNATURES COMPLETED**

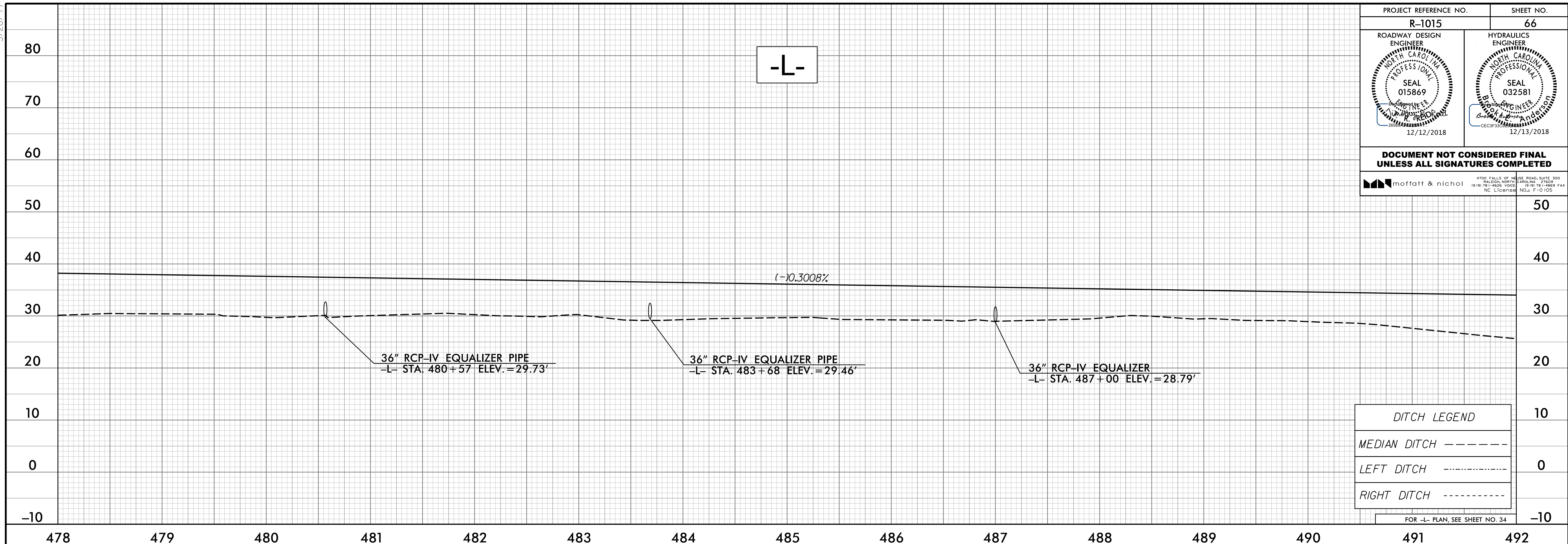
MOFFATT & NICHOL  
4700 FALLS OF THE ROADS, SUITE 200  
FALGOUT, NORTH CAROLINA 27629  
(919) 781-4000 VOICE (919) 781-4868 FAX  
NC License No. F-0 105



I:\2018\12\13\1015\Roadway\Proc\1015\_rdy\_of165.dgn

5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>66</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <small>4700 FALLS OF THE ROADS, SUITE 100 FALGOUT, NORTH CAROLINA 27629 (919) 781-4626 VOICE (919) 781-4664 FAX NC License NO.: F-0105</small>	



**DITCH LEGEND**

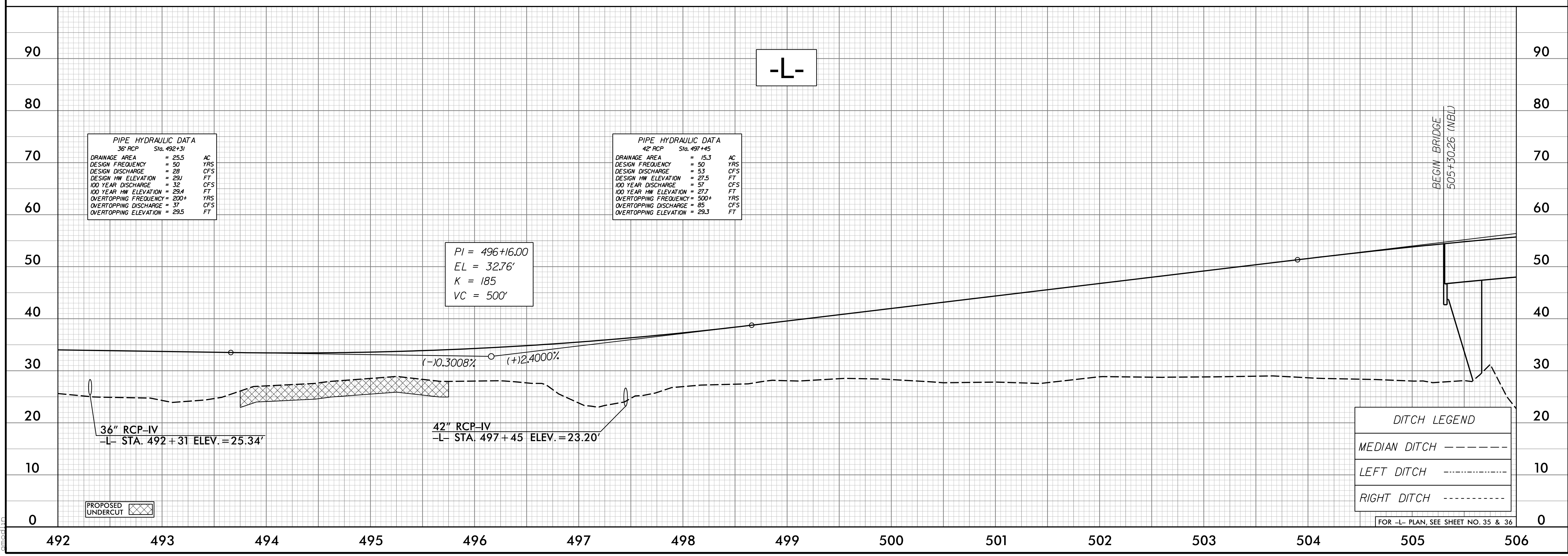
MEDIAN DITCH -----

LEFT DITCH .....0

RIGHT DITCH .....0

FOR -L- PLAN, SEE SHEET NO. 34

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**PIPE HYDRAULIC DATA**  
36" RCP Sta. 492+31

DRAINAGE AREA	= 25.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 28	CFS
DESIGN HW ELEVATION	= 29J	FT
100 YEAR DISCHARGE	= 32	CFS
100 YEAR HW ELEVATION	= 29.4	FT
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING DISCHARGE	= 37	CFS
OVERTOPPING ELEVATION	= 29.5	FT

**PIPE HYDRAULIC DATA**  
42" RCP Sta. 497+45

DRAINAGE AREA	= 15.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 53	CFS
DESIGN HW ELEVATION	= 27.5	FT
100 YEAR DISCHARGE	= 57	CFS
100 YEAR HW ELEVATION	= 27.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 65	CFS
OVERTOPPING ELEVATION	= 29.3	FT

PI = 496+16.00  
EL = 32.76'  
K = 185  
VC = 500'

**DITCH LEGEND**

MEDIAN DITCH -----

LEFT DITCH .....10

RIGHT DITCH .....10

FOR -L- PLAN, SEE SHEET NO. 35 & 36

PROPOSED UNDERCUT

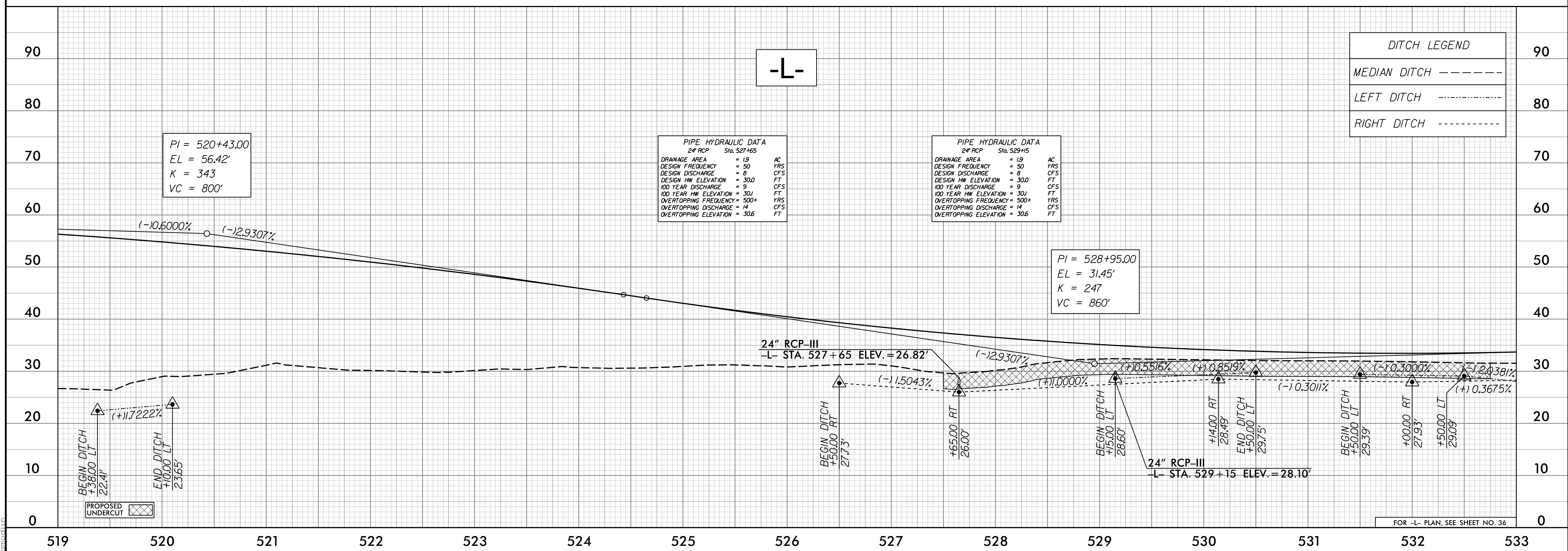
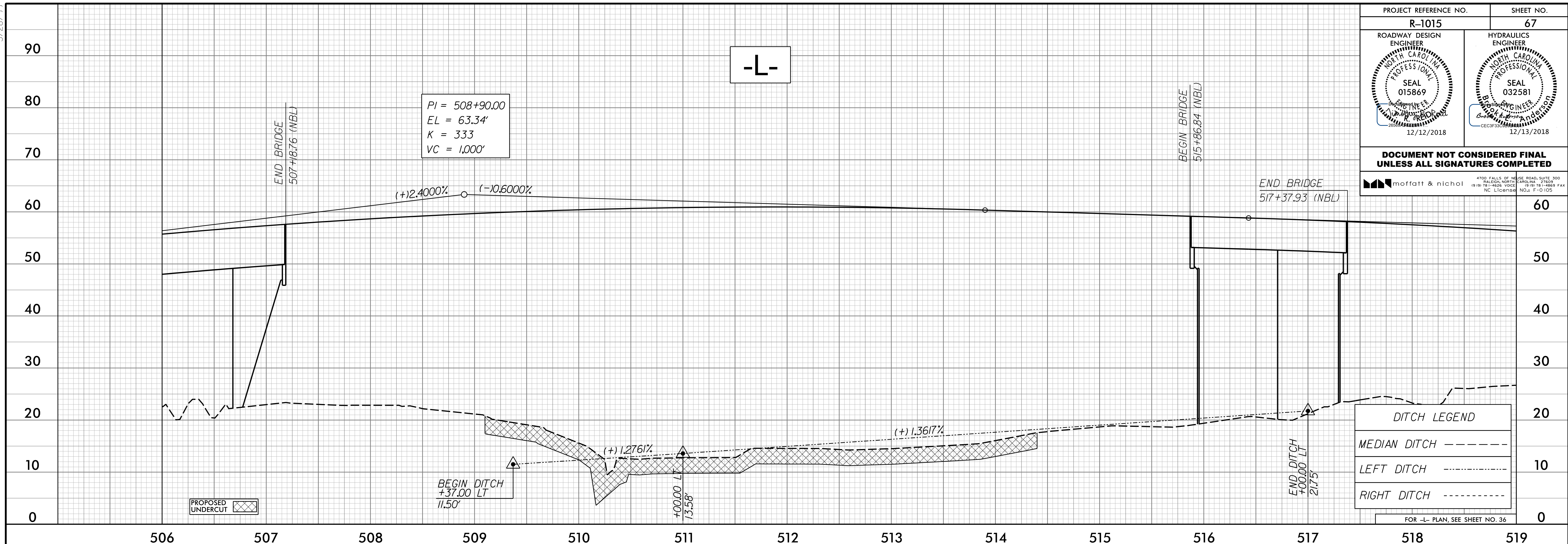


5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>67</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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moftatt & nichol



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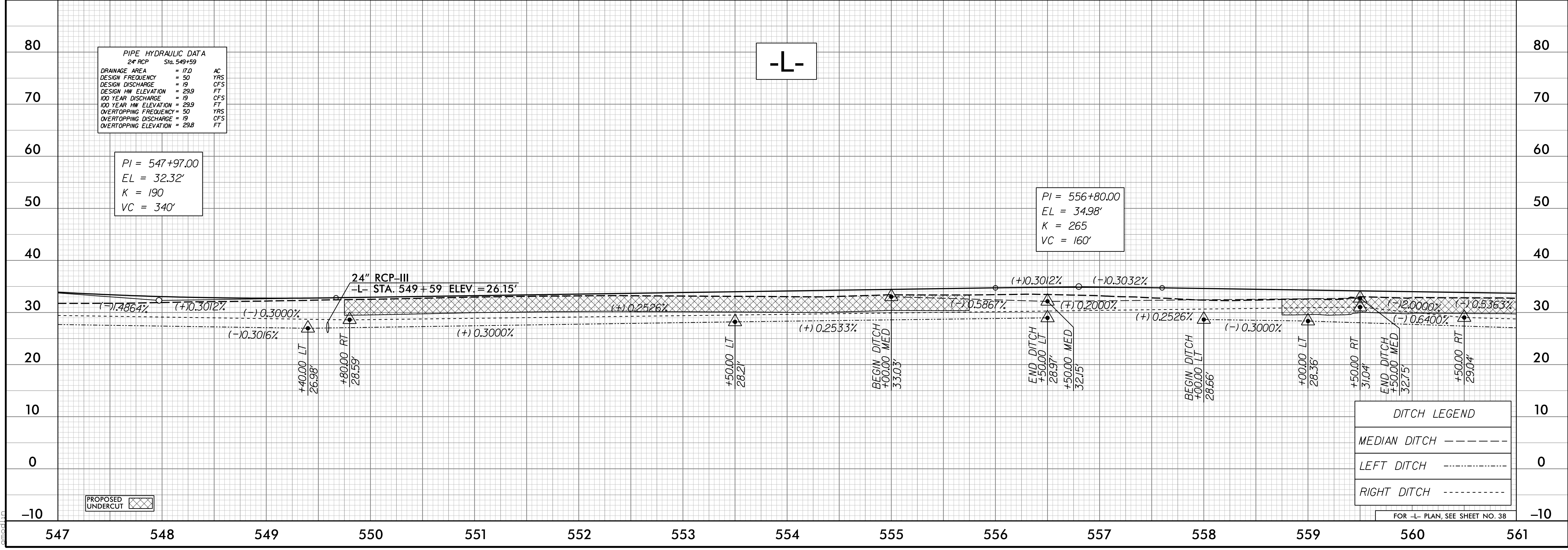
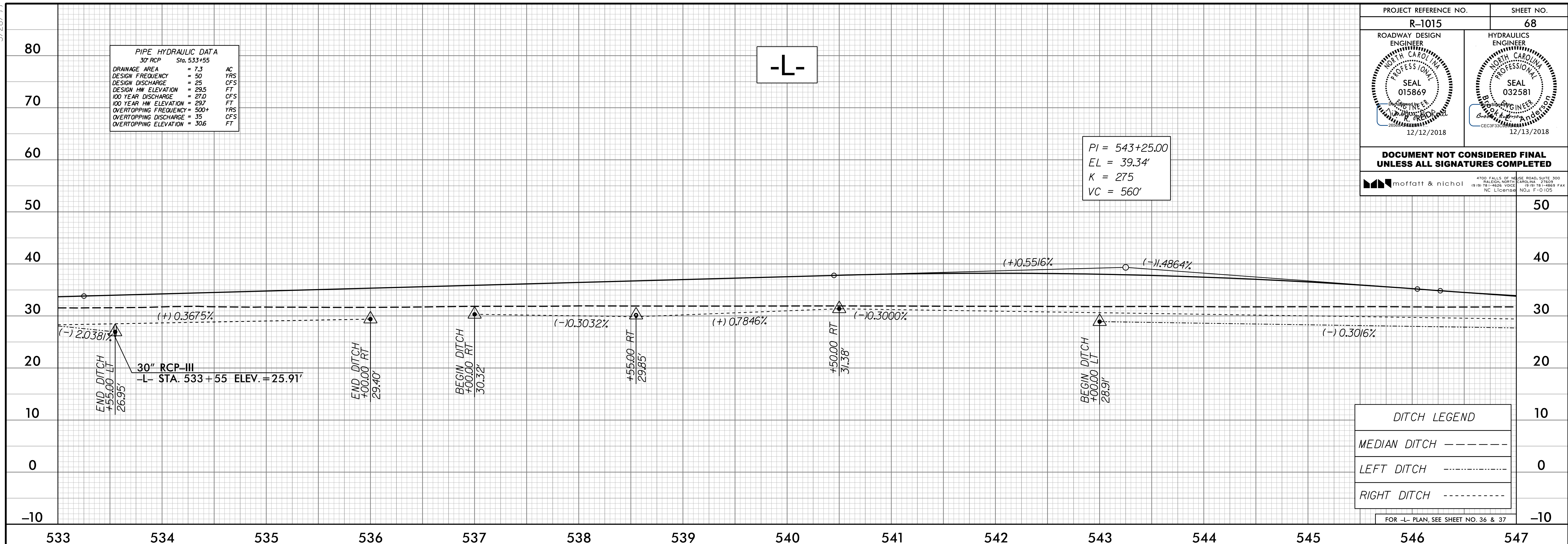
5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>68</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

**DOCUMENT NOT CONSIDERED FINAL  
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4700 FALLS OF THE ROADS, SUITE 200  
FALGOUT, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License No. F-0105

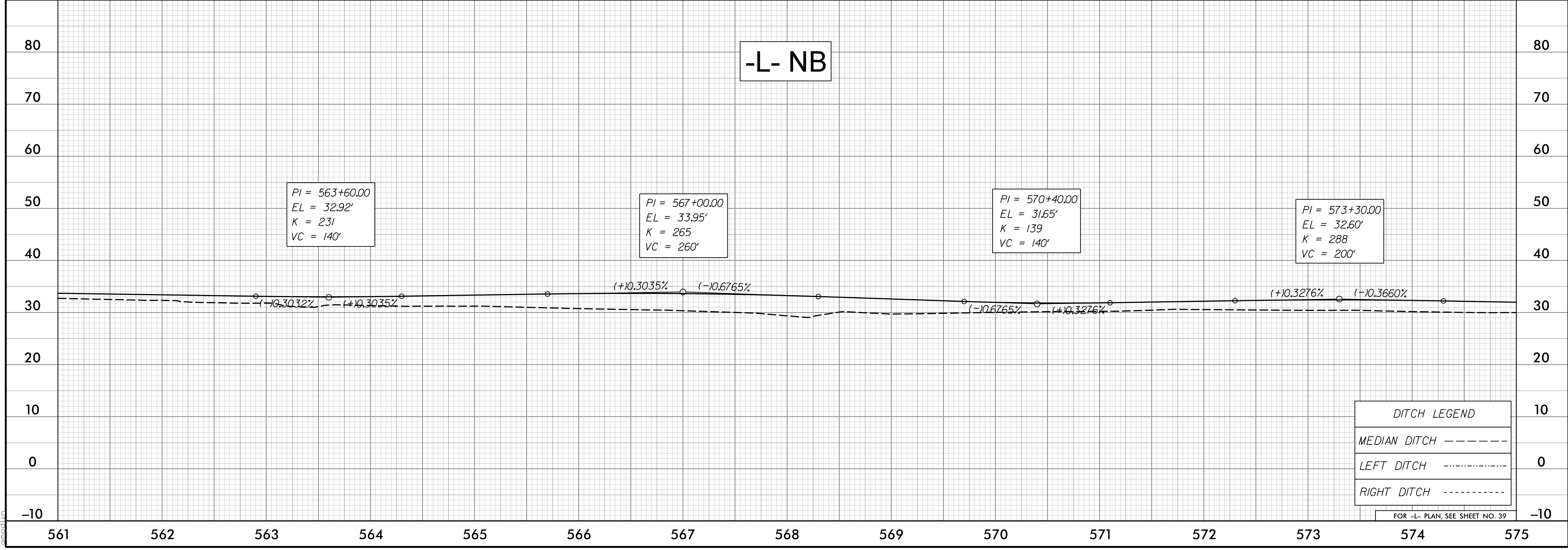
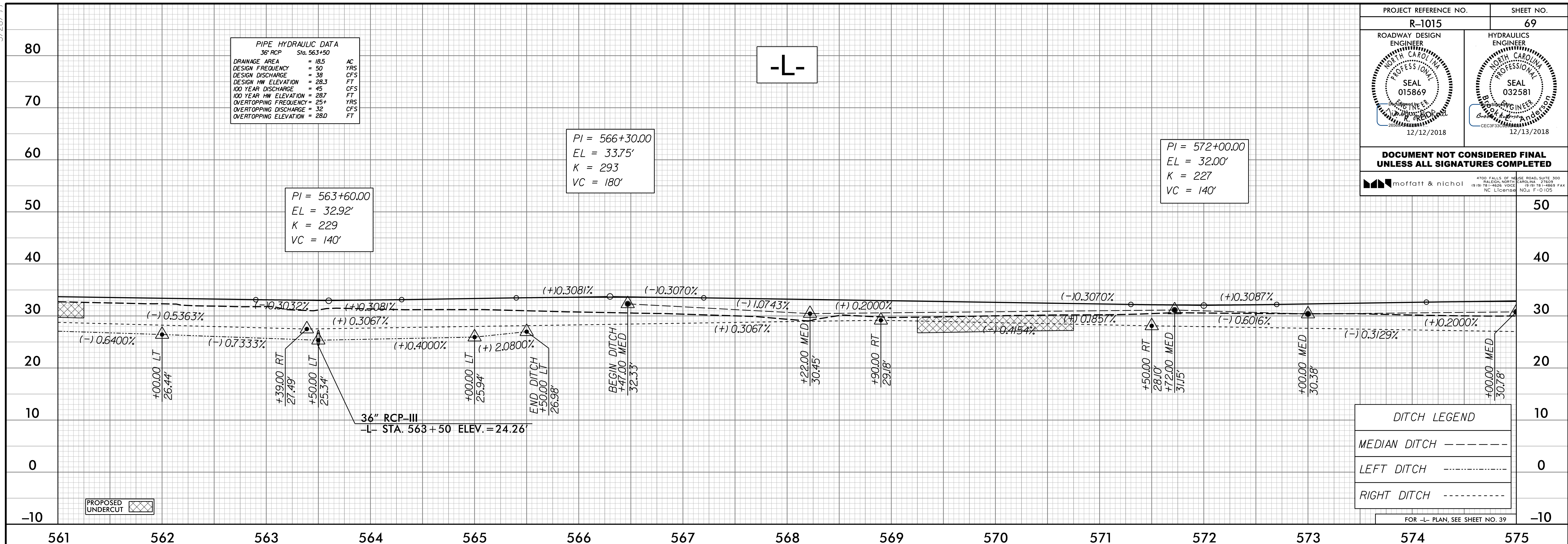
**moffatt & nichol**



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 10/28/2018 9:02 AM  
 10/28/2018 9:02 AM

5/28/2018

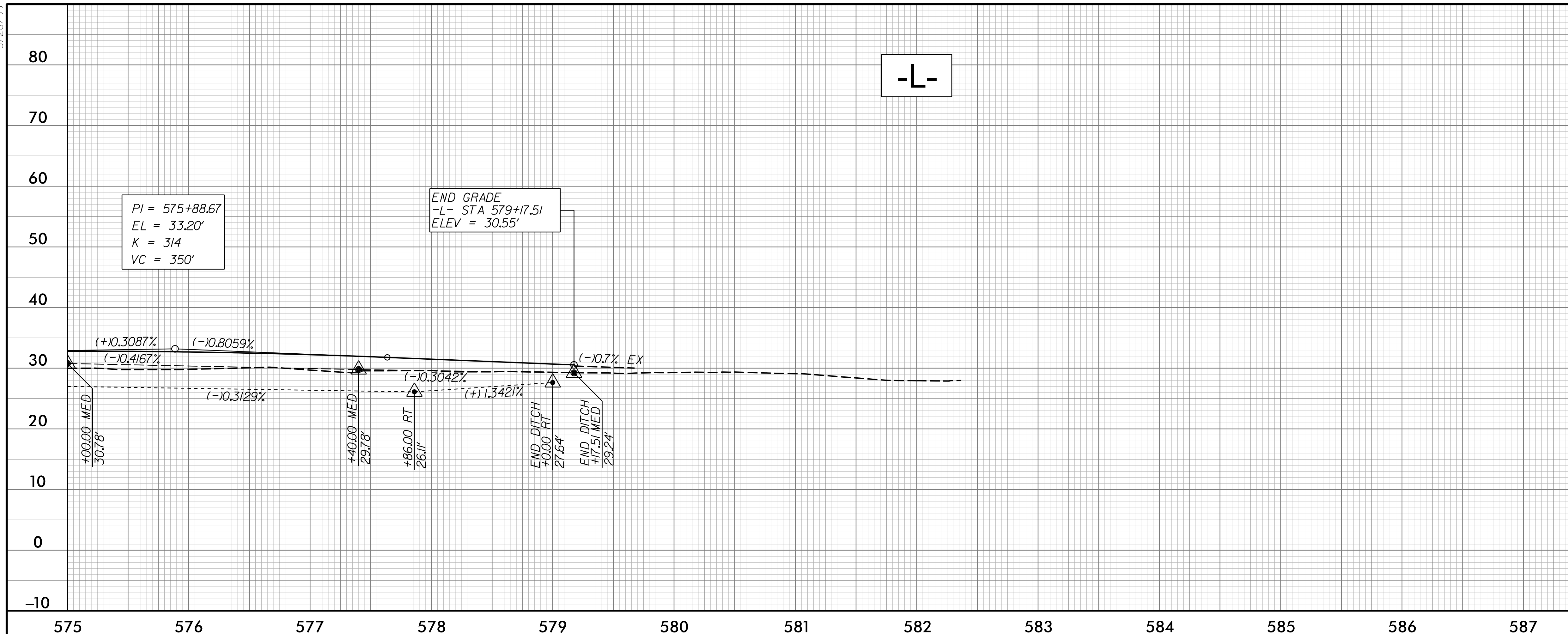
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>69</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF THE ROADS, SUITE 300 FALCON, NORTH CAROLINA 27629 (919) 781-4600 VOICE (919) 781-4666 FAX NC License NO.: F-0105</small>	



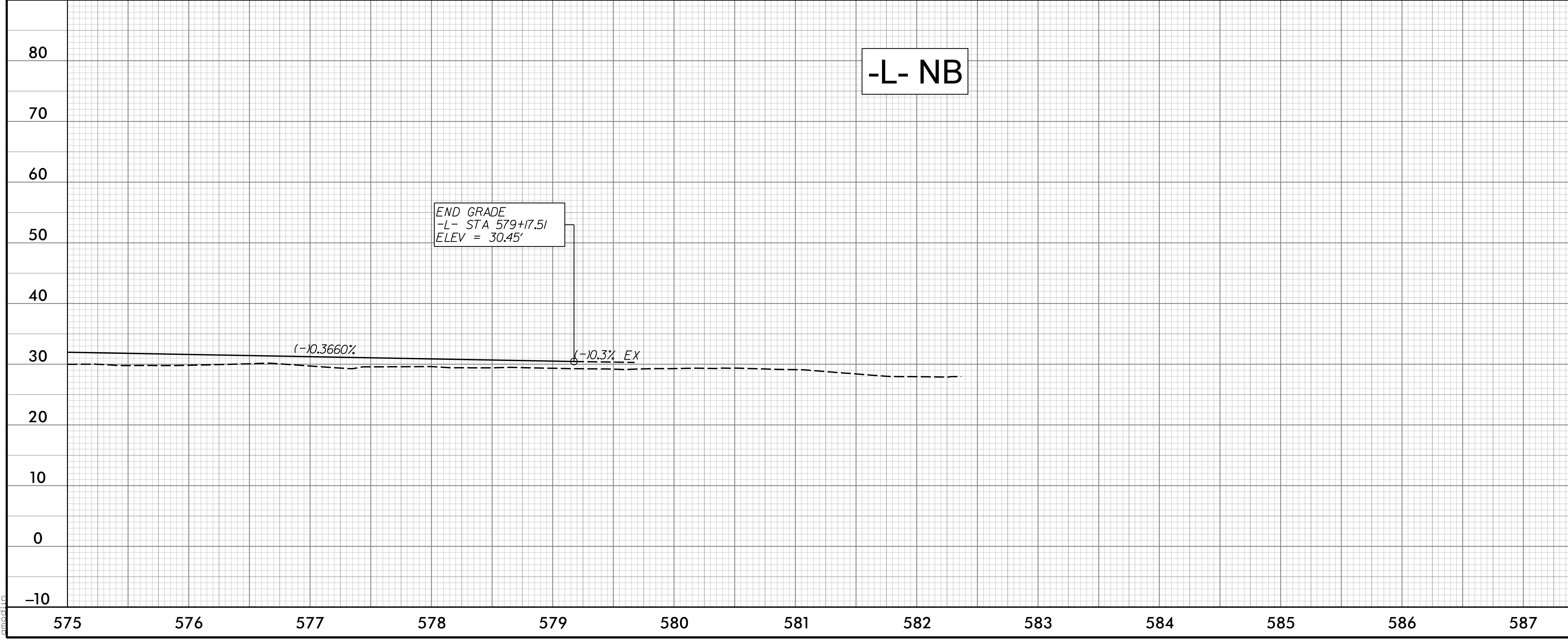
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5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>70</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF THE ROADS, SUITE 100          FALCON, NORTH CAROLINA 27629          (919) 781-4600 VOICE (919) 781-4666 FAX          NC License NO.: F-0105</small>	



<b>DITCH LEGEND</b>	
MEDIAN DITCH	----
LEFT DITCH	-----
RIGHT DITCH	-----
FOR -L- PLAN, SEE SHEET NO. 40	

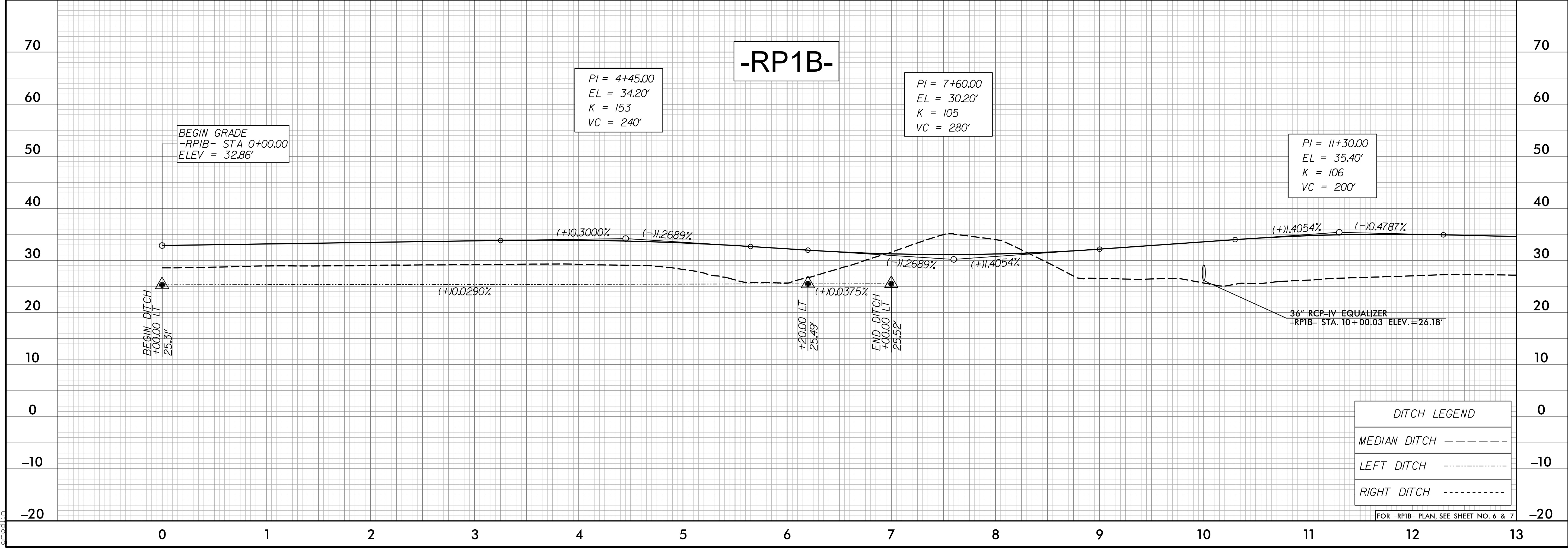
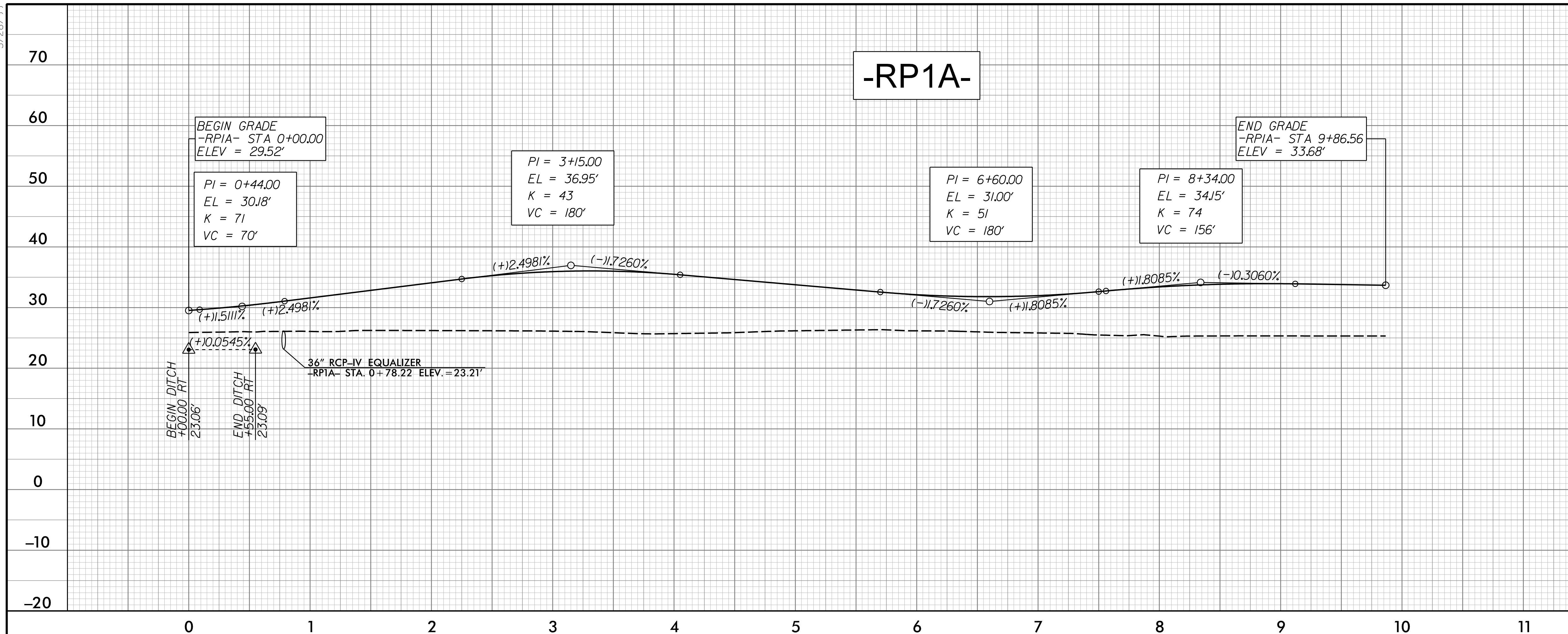


<b>DITCH LEGEND</b>	
MEDIAN DITCH	----
LEFT DITCH	-----
RIGHT DITCH	-----
FOR -L- PLAN, SEE SHEET NO. 40	

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5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>71</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF THE ROADS, SUITE 200 FALGOUT, NORTH CAROLINA 27629 (919) 781-4600 VOICE (919) 781-4666 FAX NC License NO.: F-0105</small>	



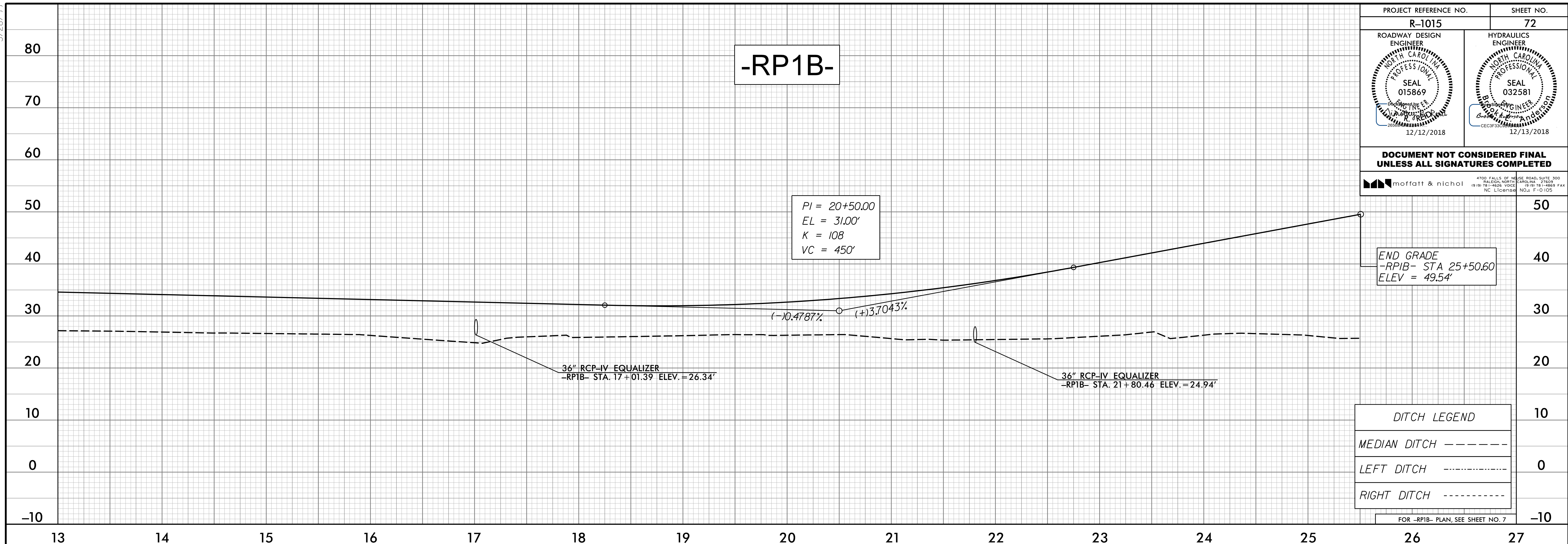
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5/28/19

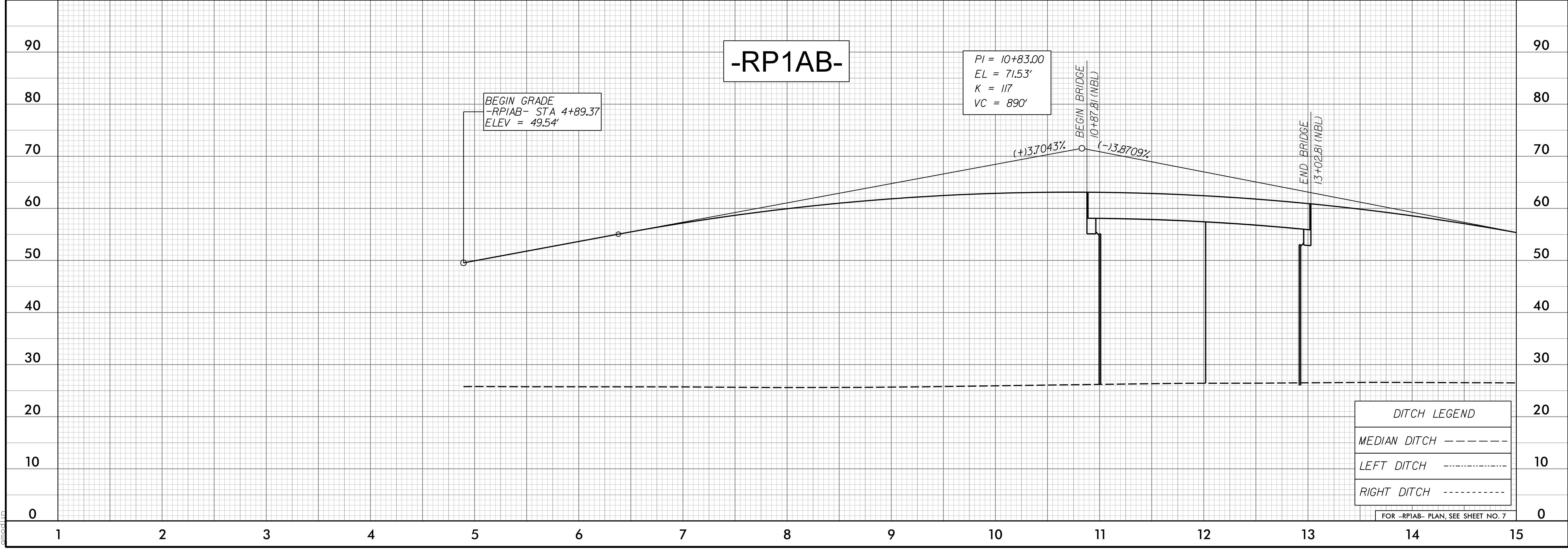
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>72</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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moftatt & nichol



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5/28/2018

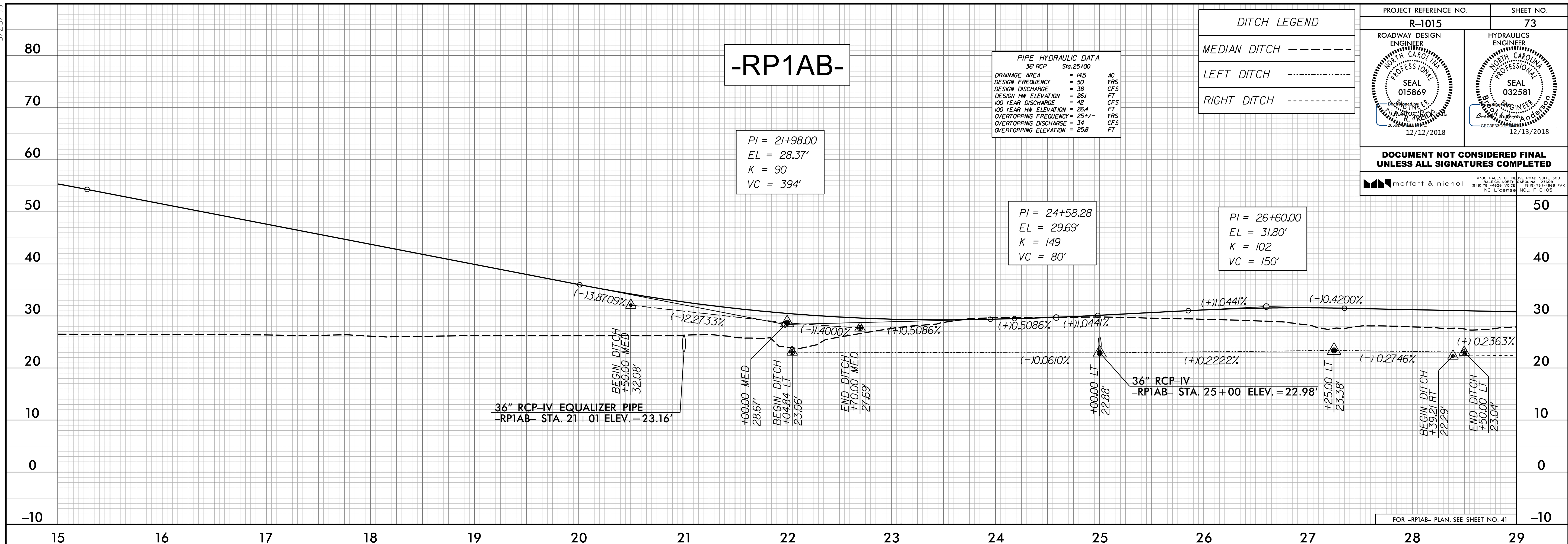
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>73</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
moffatt & nichol	

**PIPE HYDRAULIC DATA**  
36" RCP Sta. 25+00

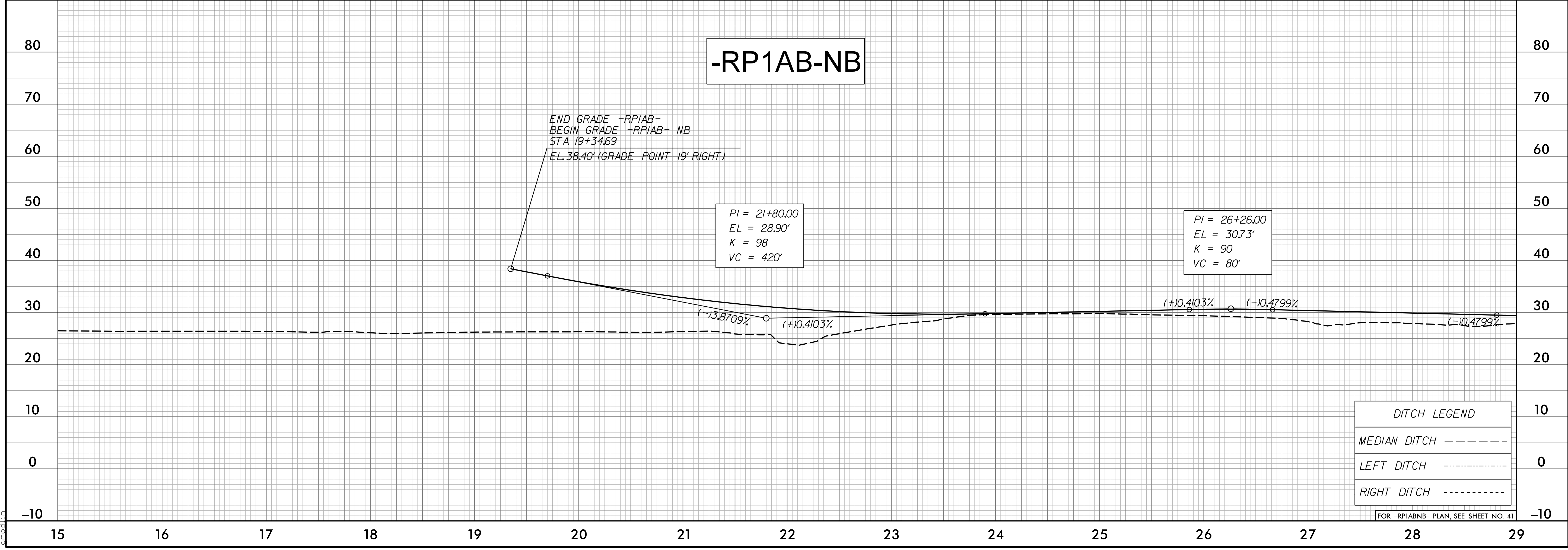
DRAINAGE AREA	= 14.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 38	CFS
DESIGN HW ELEVATION	= 26.1	FT
100 YEAR DISCHARGE	= 42	CFS
100 YEAR HW ELEVATION	= 26.4	FT
OVERTOPPING FREQUENCY	= 25+/-	YRS
OVERTOPPING DISCHARGE	= 34	CFS
OVERTOPPING ELEVATION	= 25.8	FT

**DITCH LEGEND**

MEDIAN DITCH	---
LEFT DITCH	- - - - -
RIGHT DITCH	- - - - -



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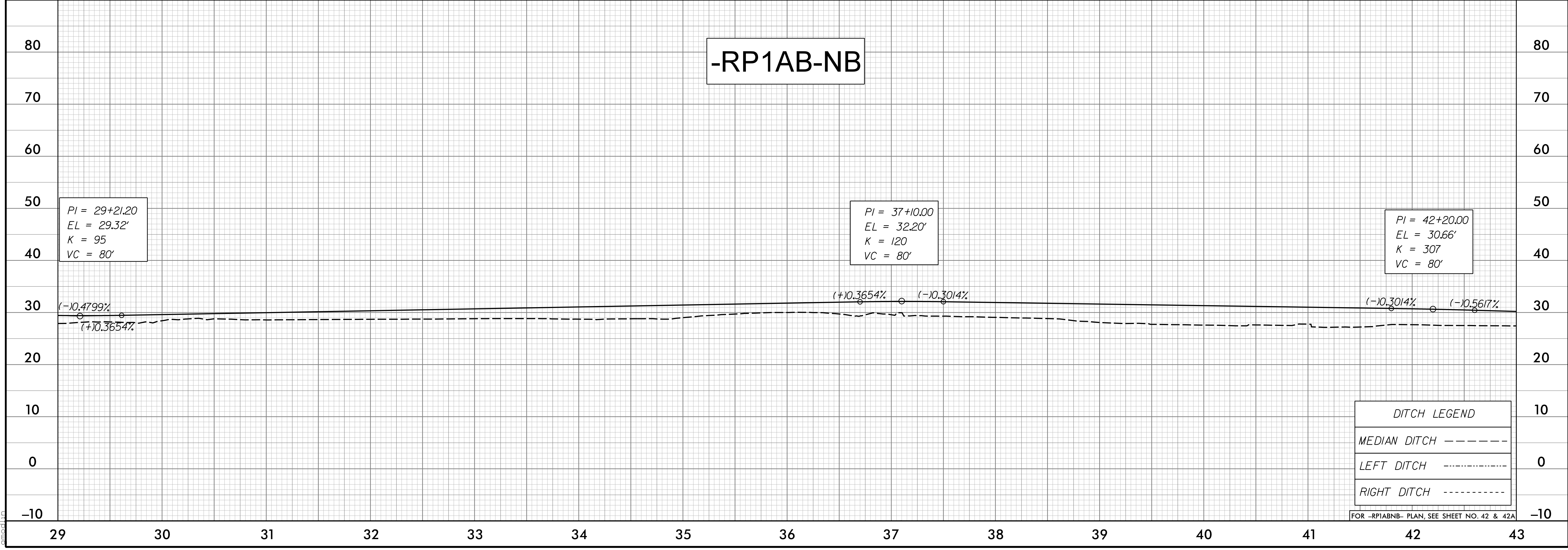
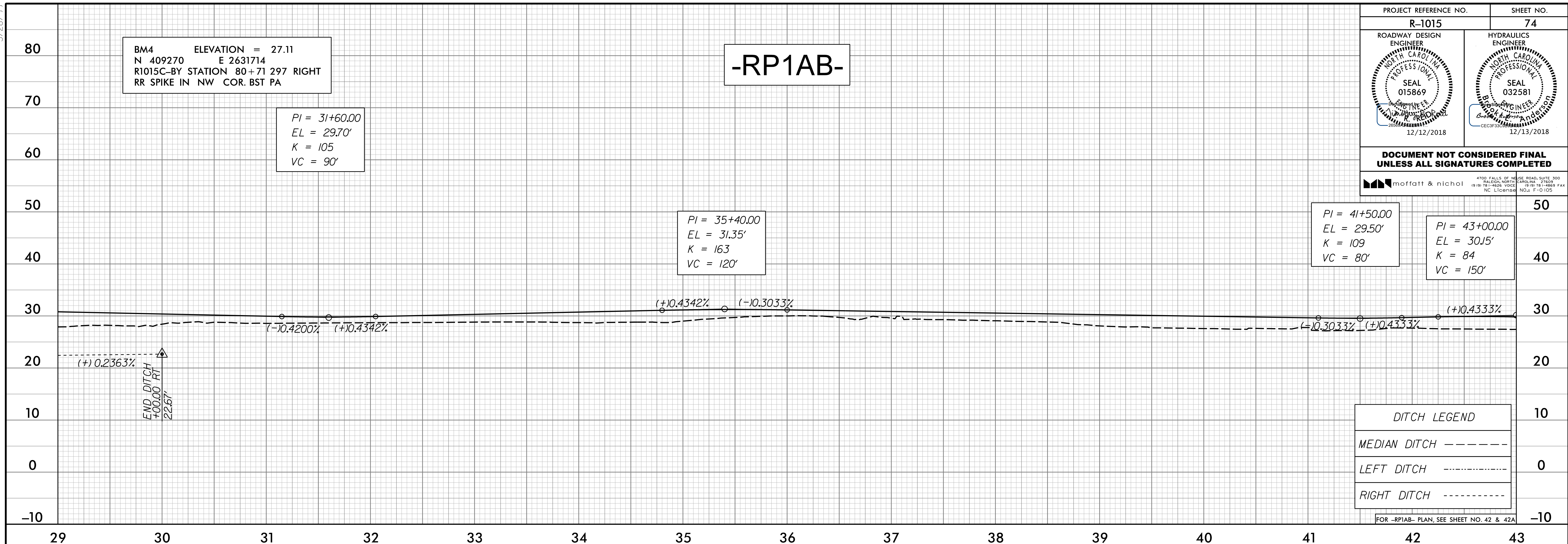


5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>74</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

**DOCUMENT NOT CONSIDERED FINAL  
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moffatt & nichol  
4700 FALLS OF THE ROADS, SUITE 300  
FALLEN, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License NO.: F-0105



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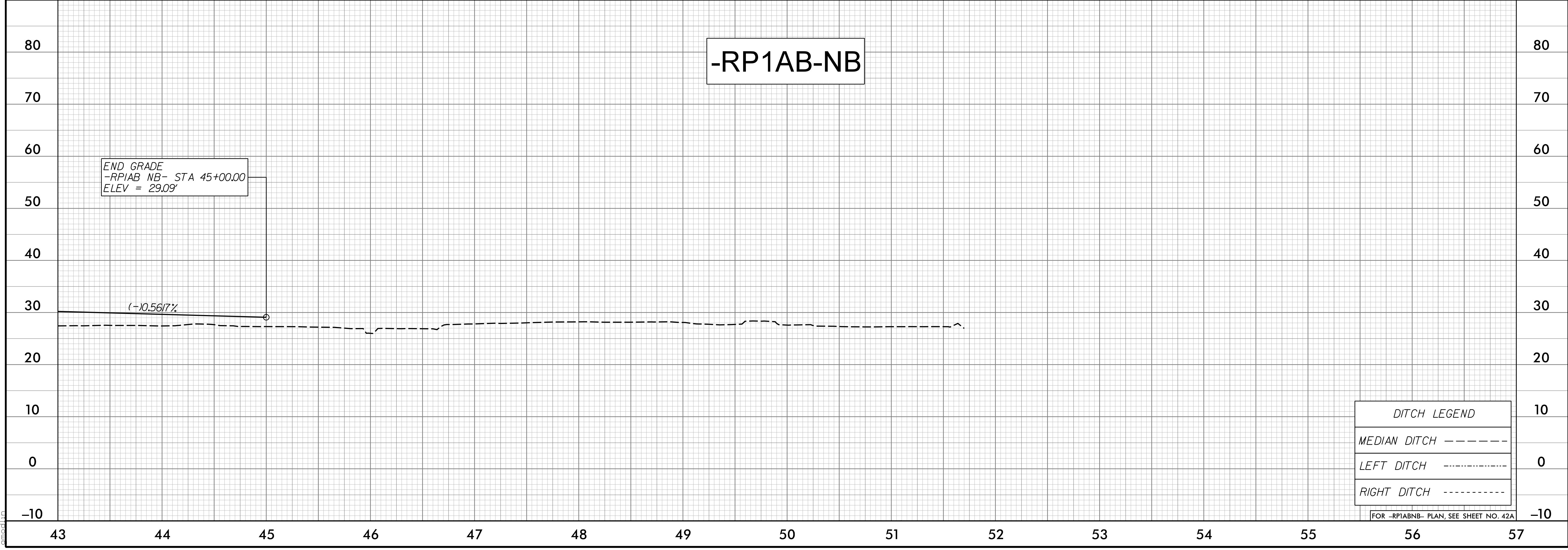
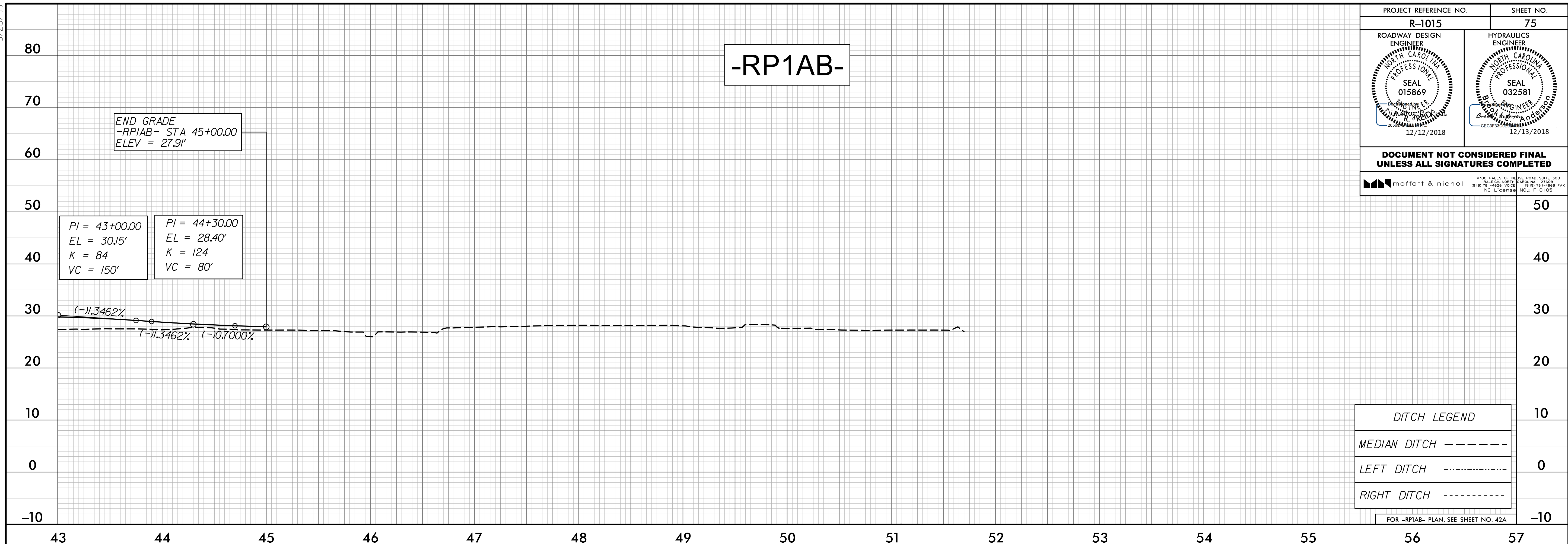
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>75</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

**moffatt & nichol**

4700 FALLS OF THE ROADS, SUITE 300  
FALCON, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License NO. F-0105



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5/28/19

80

70

60

50

40

30

20

10

0

-10

0

1

2

3

4

5

6

7

8

9

10

### -RP1CD-

BEGIN GRADE  
-RP1CD- STA 0+00.00  
ELEV = 33.64'

PI = 1+70.00  
EL = 33.00'  
K = 141  
VC = 220'

PI = 7+00.00  
EL = 39.25'  
K = 220  
VC = 440'

BEGIN DITCH  
+00.00 RT  
25.45'

+02.00 RT  
24.51'

(-)0.3772%

(+)1.789%

(+)1.789%

(-)0.8179%

(-)0.1873%

(-)0.0498%

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

FOR -RP1CD- PLAN, SEE SHEET NO. 7

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

PROJECT REFERENCE NO.	SHEET NO.
R-1015	76
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

75% FALLS OF THESE ROAD, SURF, DIP  
TOLERANCE: NORTH CAROLINA 27629  
1919 TELEPHONE VOICE 919.741.4868 FAX  
NC License NO. F-10105

80

70

60

50

40

30

20

10

0

-10

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

### -RP1CD-

BM3 ELEVATION = 28.54  
N 407844 E 2633270  
R1015C-BY STATION 59+45 211 RIGHT  
RR SPIKE IN 12 PINE

PI = 18+55.00  
EL = 29.80'  
K = 125  
VC = 140'

PI = 23+30.00  
EL = 31.25'  
K = 116  
VC = 80'

BEGIN DITCH  
+75.00 LT  
24.32'

(-)0.0498%

(-)0.0603%

(-)0.8179%

(+)0.3053%

(+)0.3053%

(-)0.3816%

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

FOR -RP1CD- PLAN, SEE SHEET NO. 7 & 41

80

70

60

50

40

30

20

10

0

-10

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

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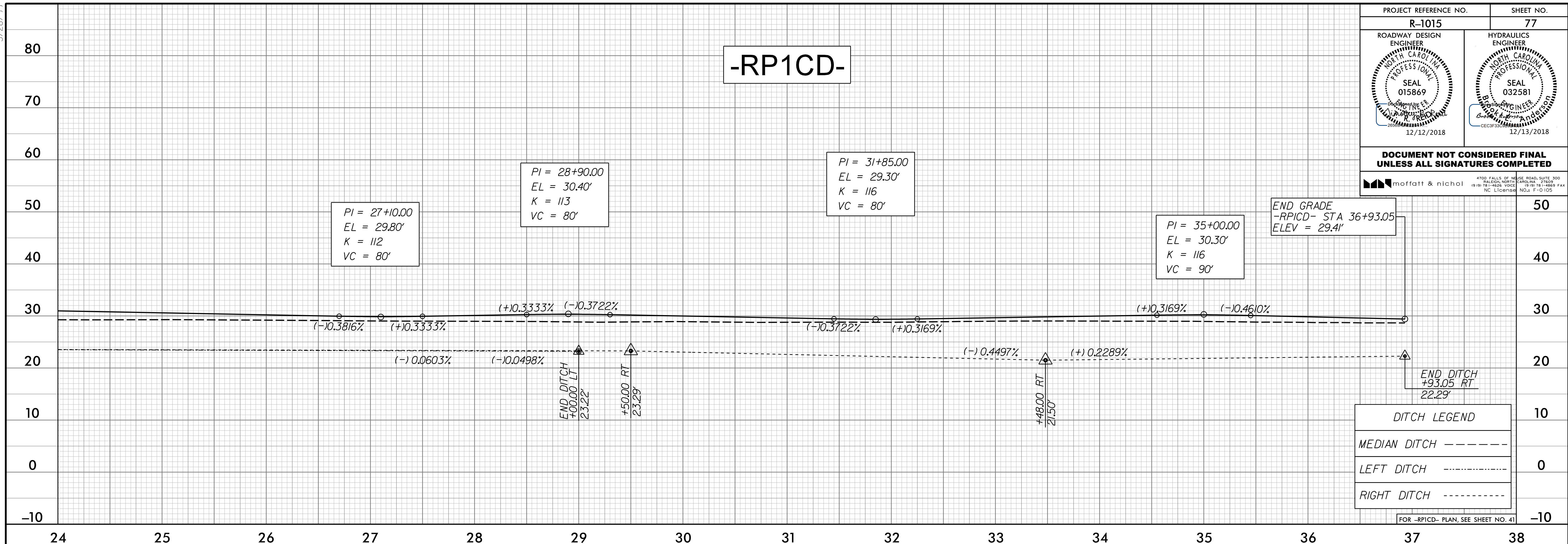
5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>77</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

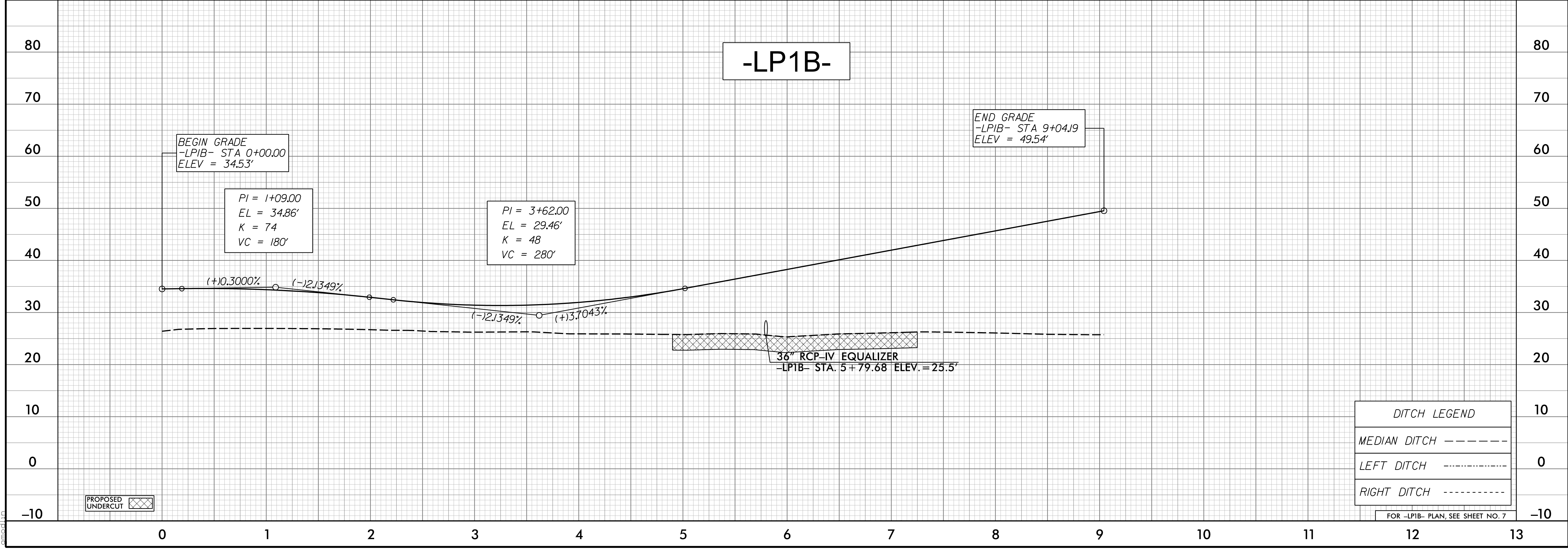
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

MOFFATT & NICHOL

4700 FALLS OF THE ROADS, SUITE 300  
FALCON, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License NO. F-0105



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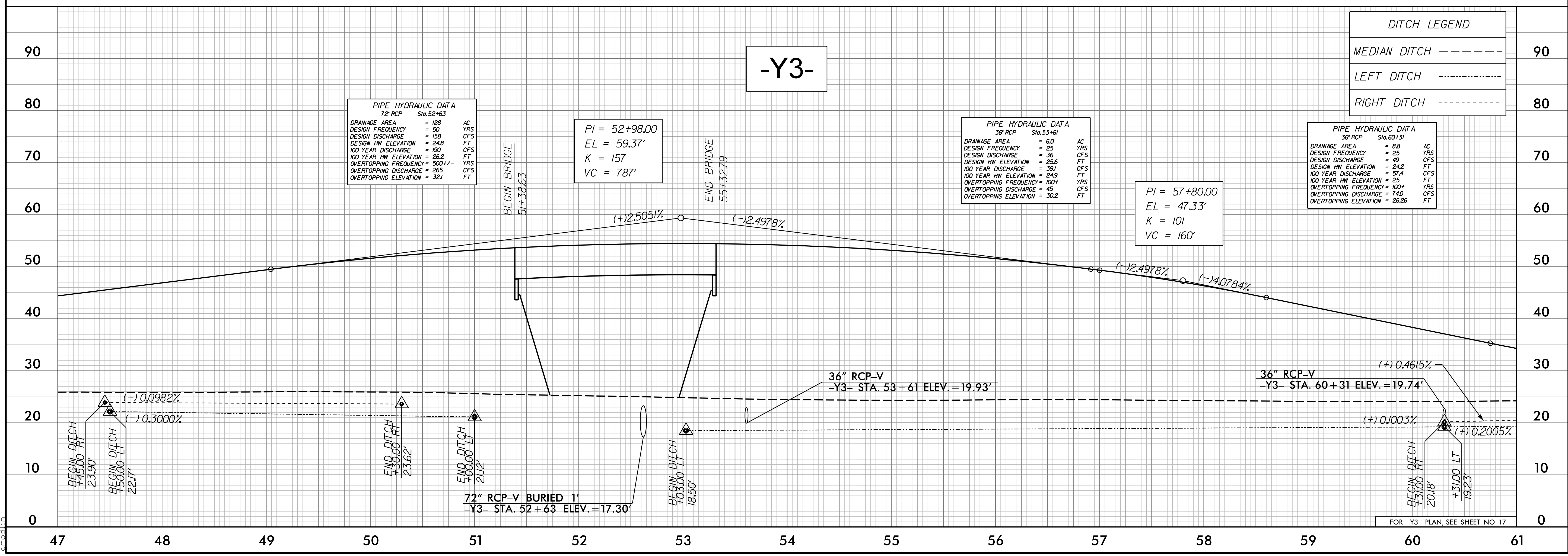
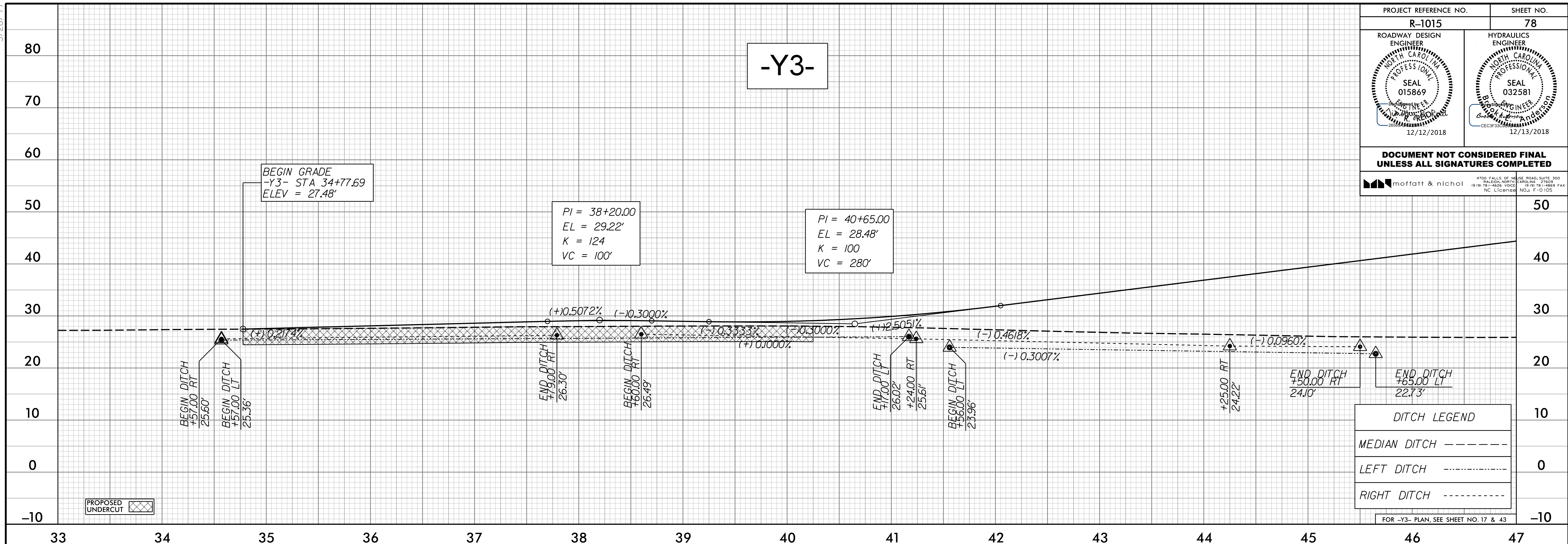
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>78</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

4700 FALLS OF THE ROADS, SUITE 100  
FALCON, NORTH CAROLINA 27629  
(919) 781-4600 VOICEMAIL (919) 781-4666 FAX  
NC License No. F-0105

**moffatt & nichol**



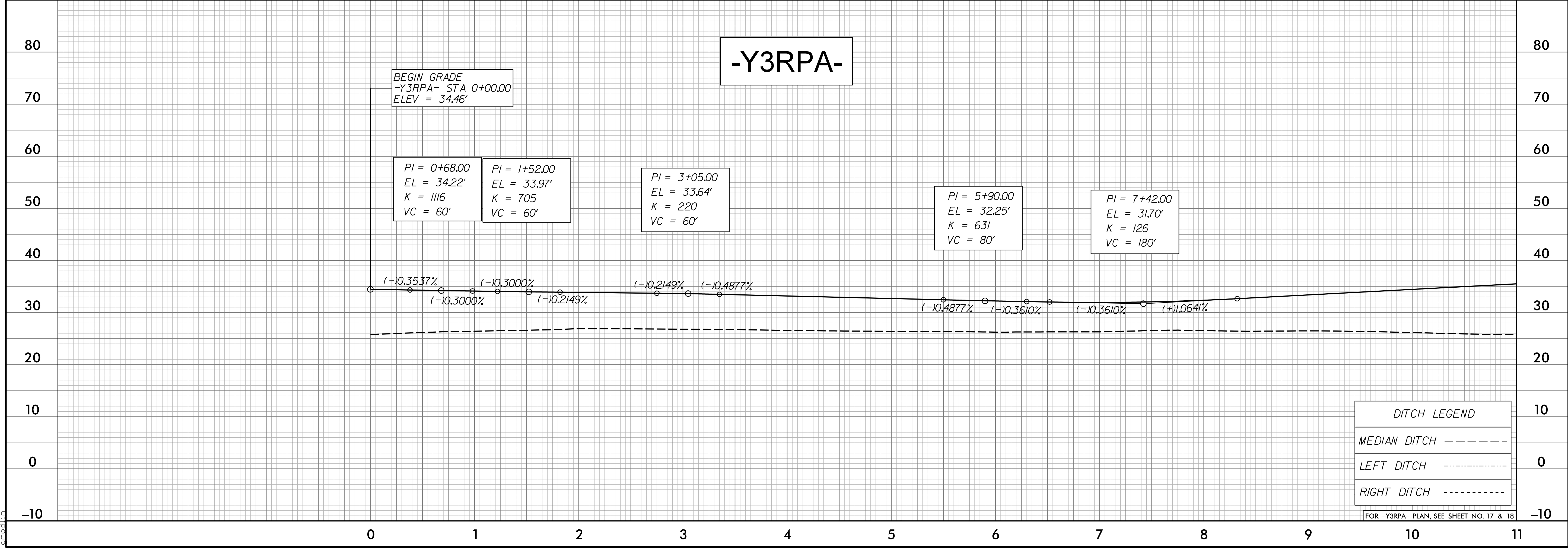
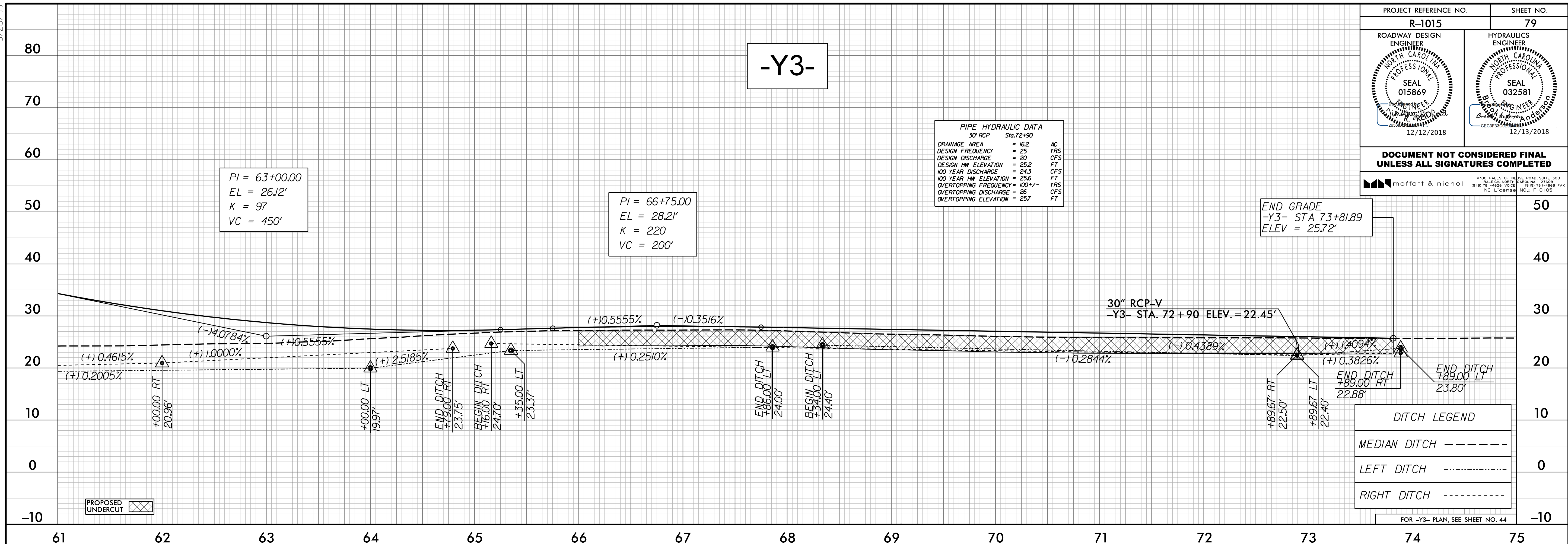
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5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>79</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

moftatt & nichol



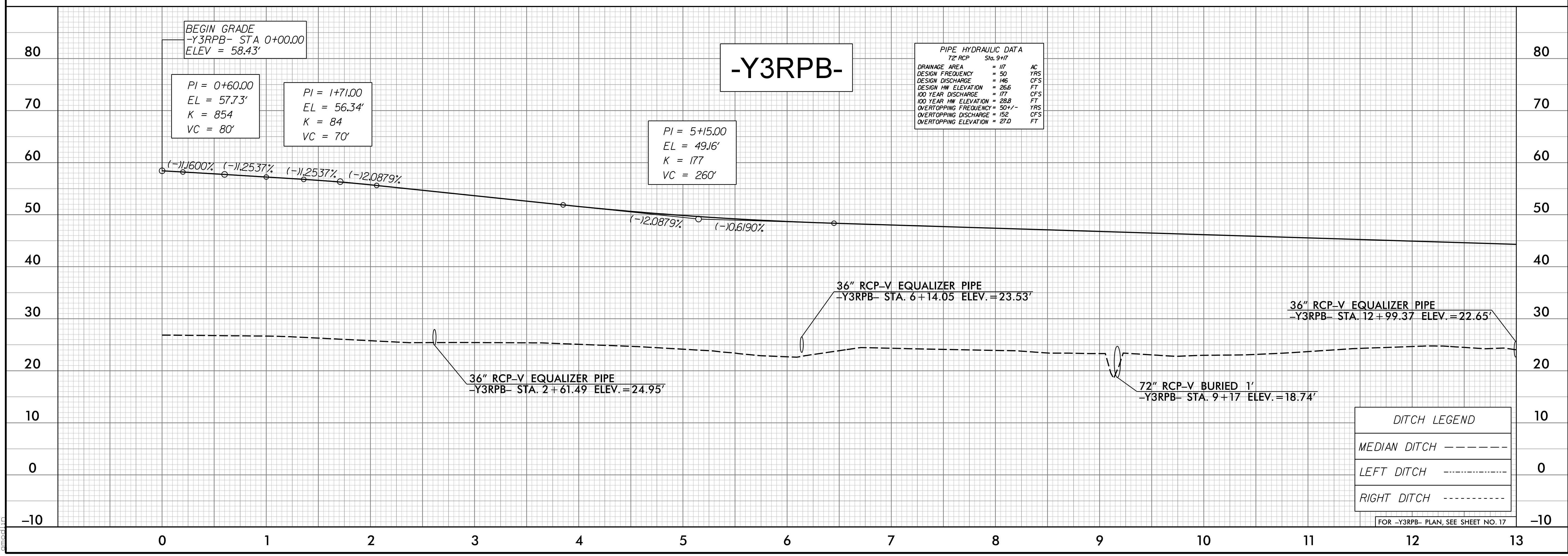
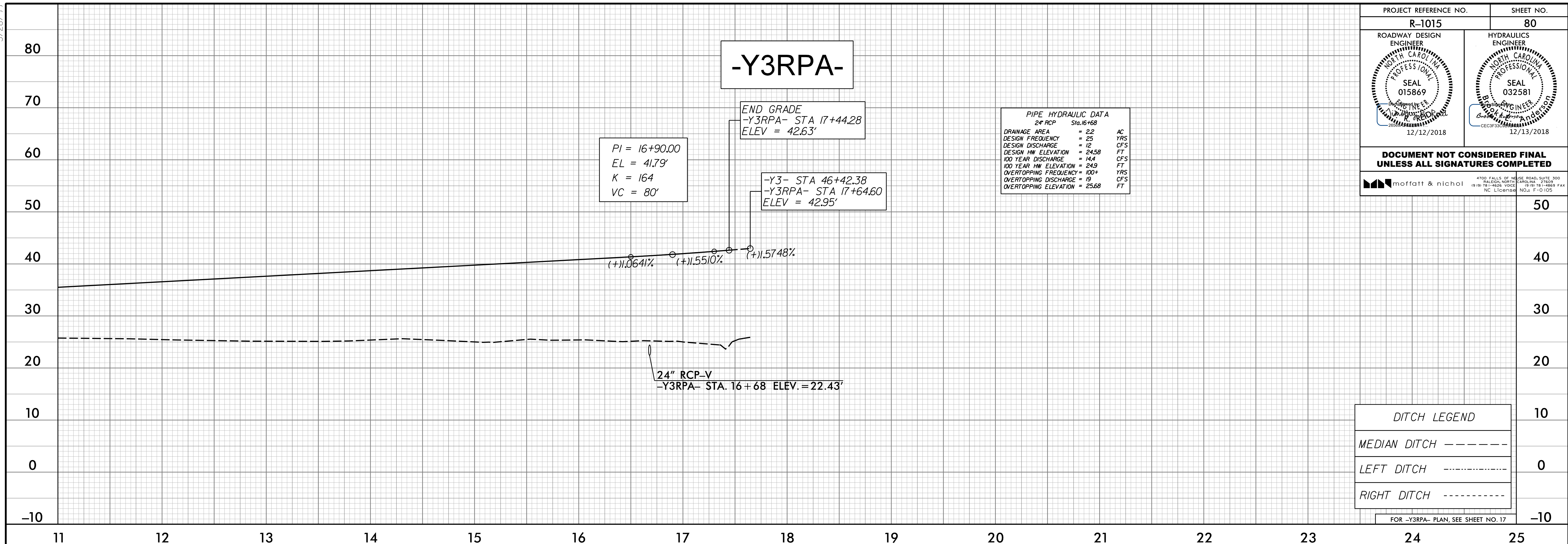
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5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>80</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

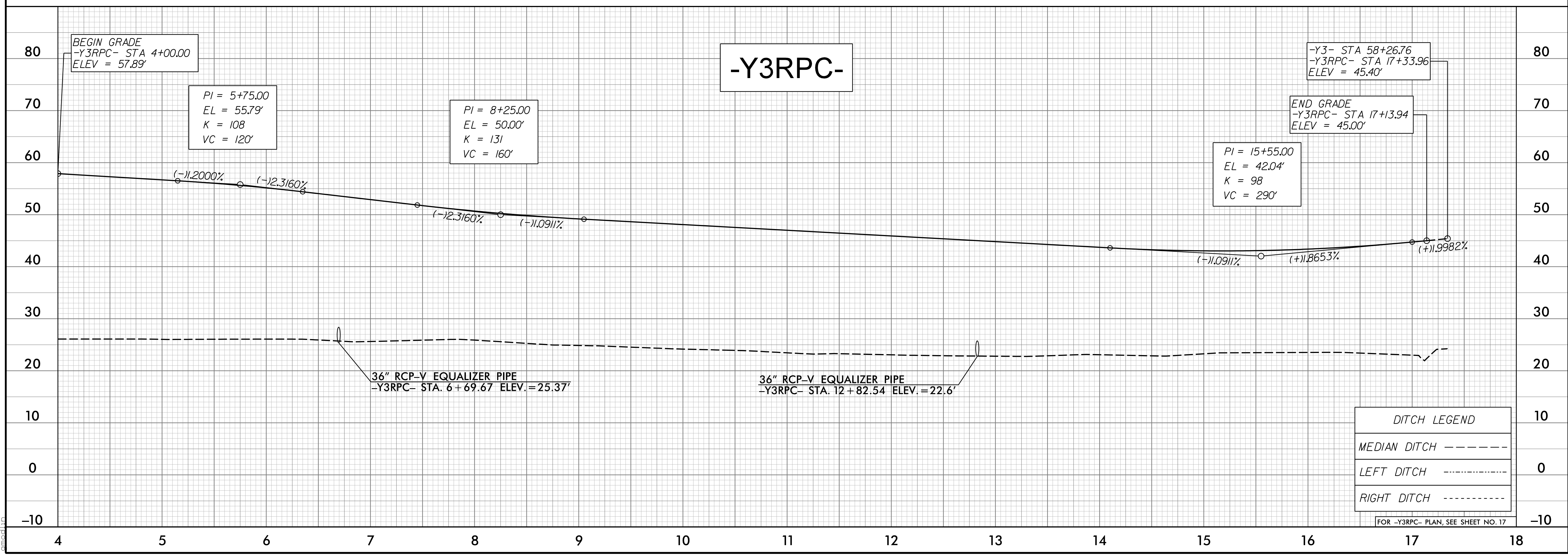
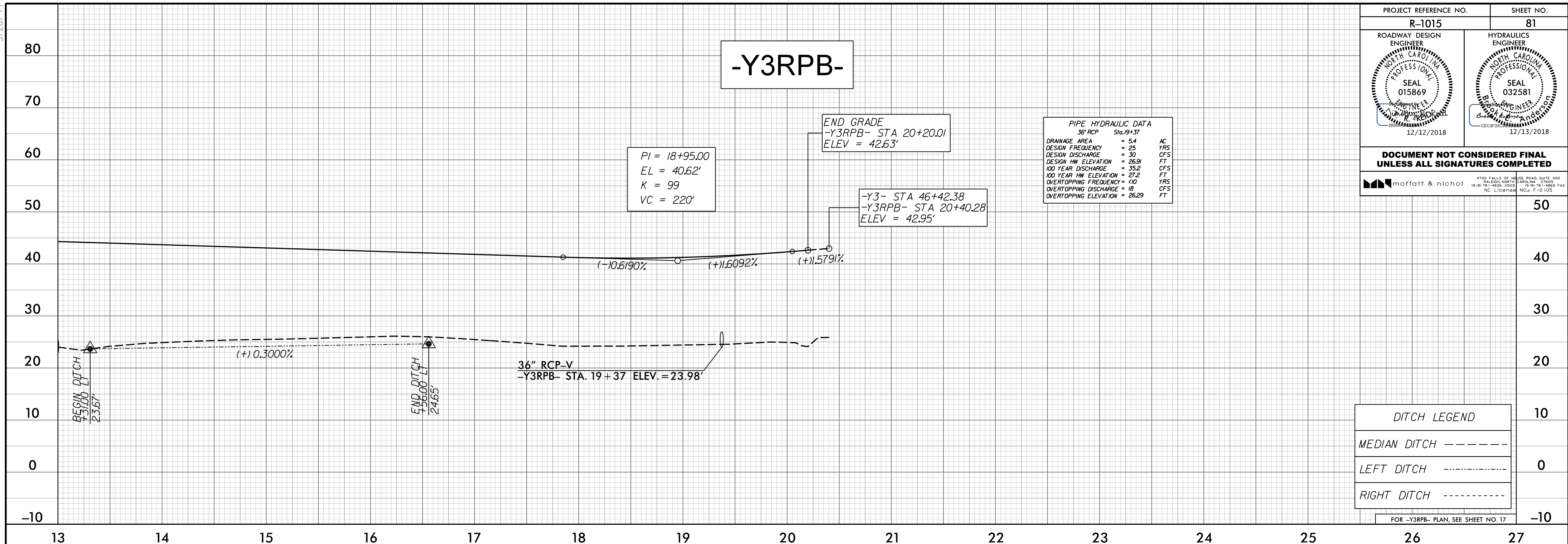
MOFFATT & NICHOL



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5/28/19

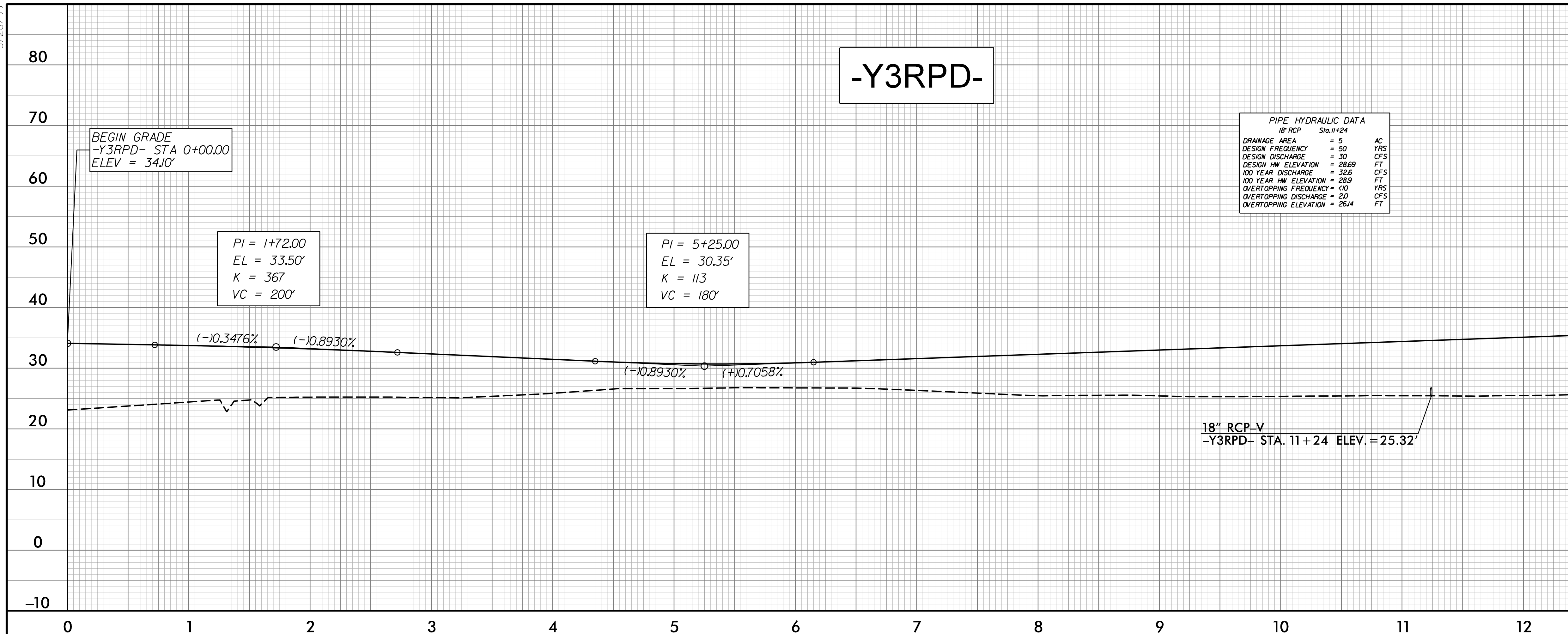
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>81</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>MOFFATT &amp; NICHOL ENGINEERS, INC. 4700 FALLS OF THE ROADS, SUITE 300 FALCON, NORTH CAROLINA 27629 (919) 781-4600 VOICE (919) 781-4666 FAX NC License No. F-0105</small>	



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5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>82</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>4700 FALLS OF THE ROADS, SUITE 300 FALCON, NORTH CAROLINA 27629 (919) 781-4626 VOICE (919) 781-4664 FAX NC License NO.: F-0105</small>	



**DITCH LEGEND**

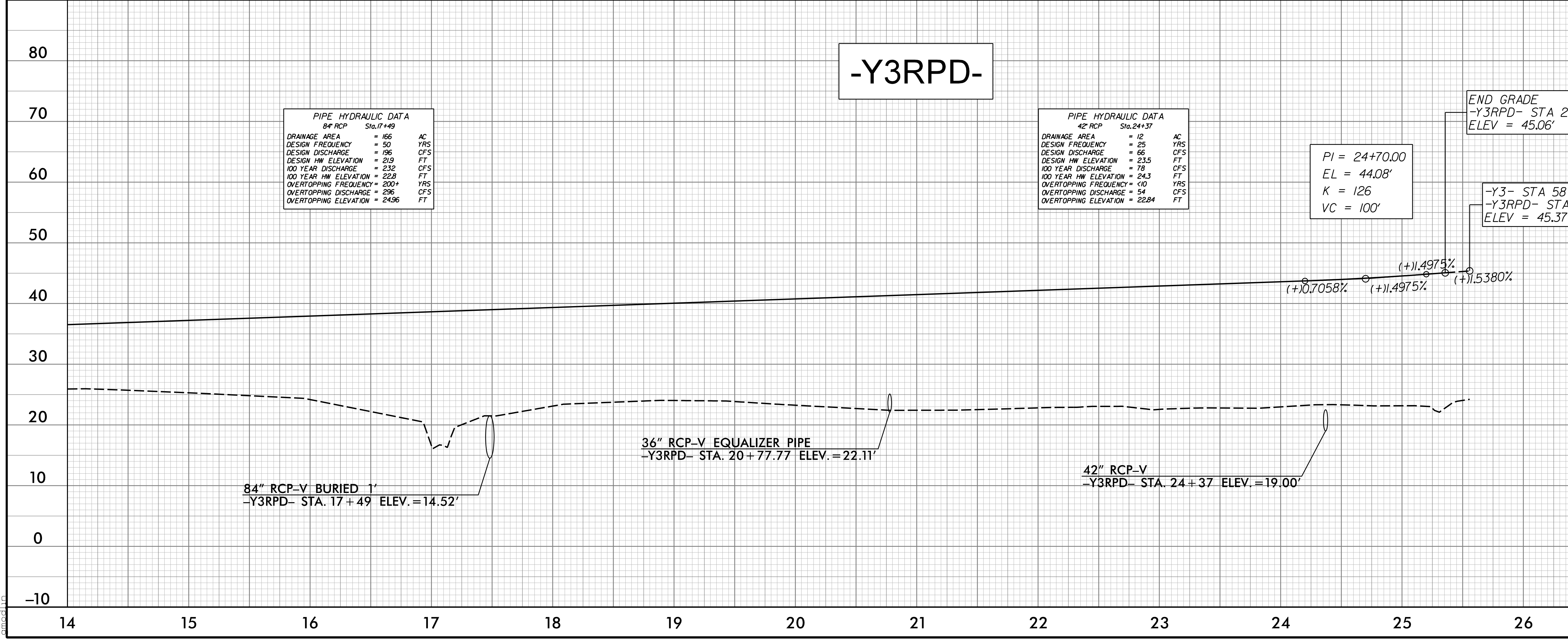
MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -Y3RPD- PLAN, SEE SHEET NO. 18

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**DITCH LEGEND**

MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

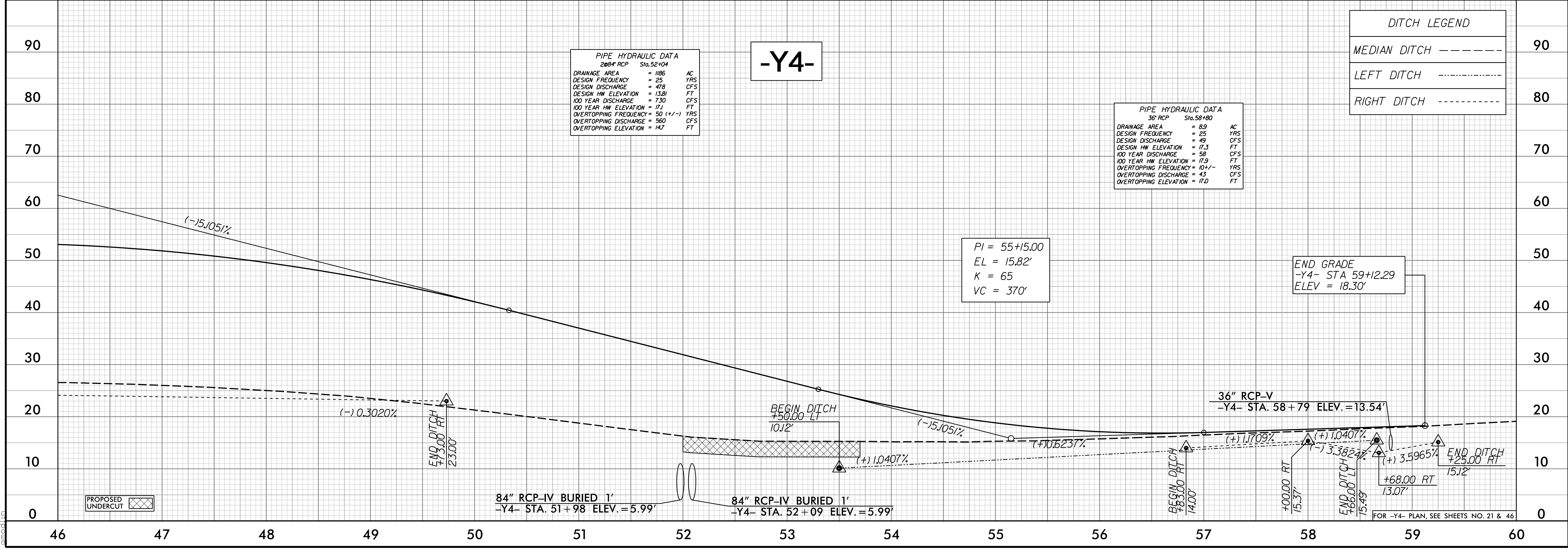
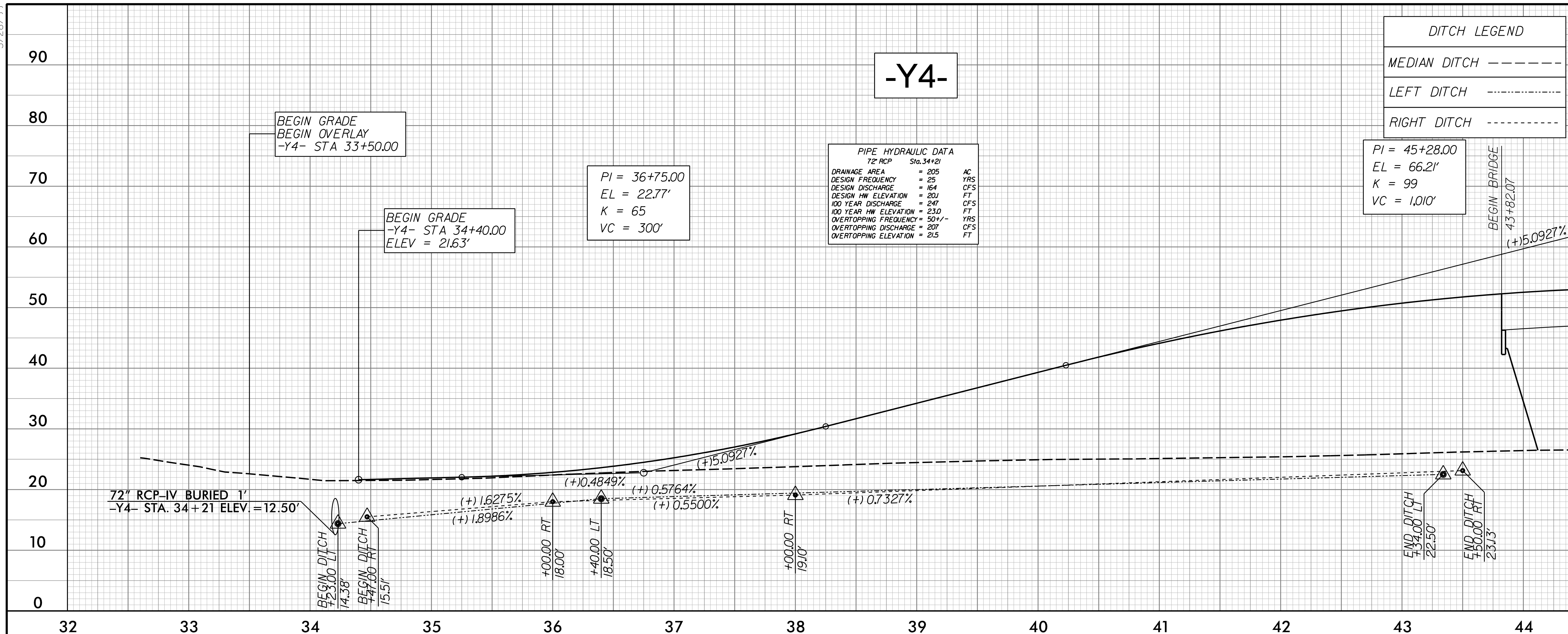
RIGHT DITCH - - - - -

FOR -Y3RPD- PLAN, SEE SHEET NO. 17



5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>83</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<small>10% FALLS OF THESE ROADWAYS 100' W/ALIGNED NORTH CAROLINA 27629 19 19 78 14666 FAX NC License NO. F-0 105</small>	



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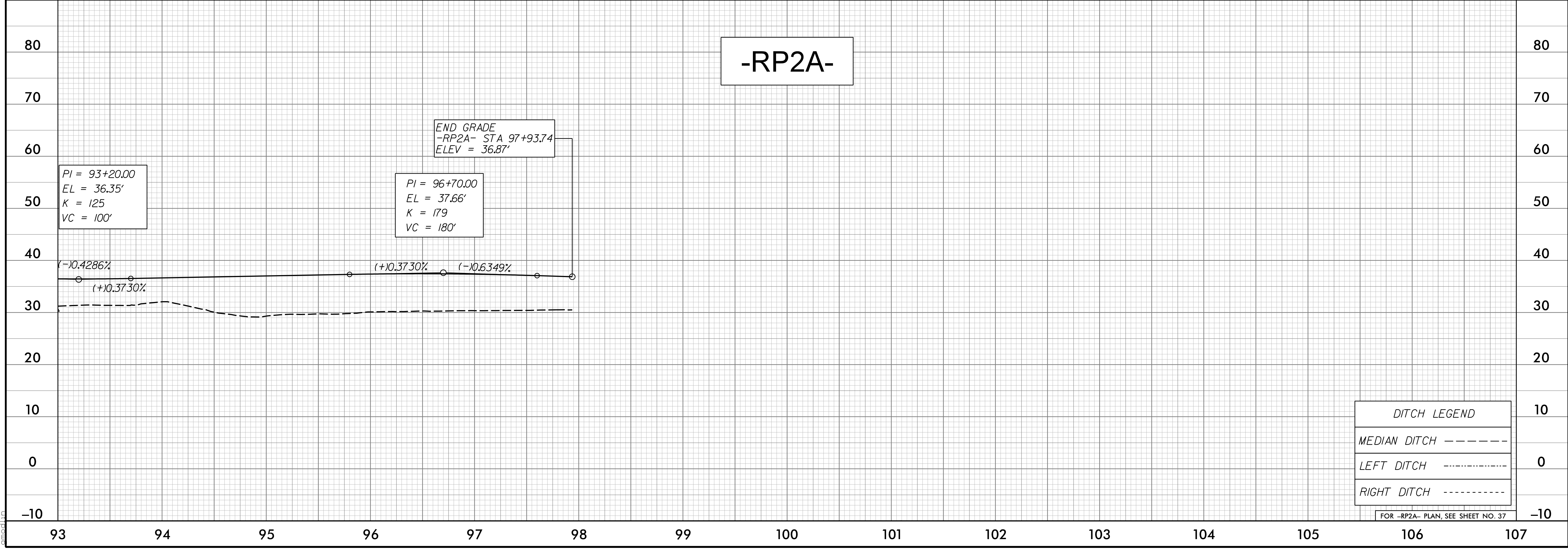
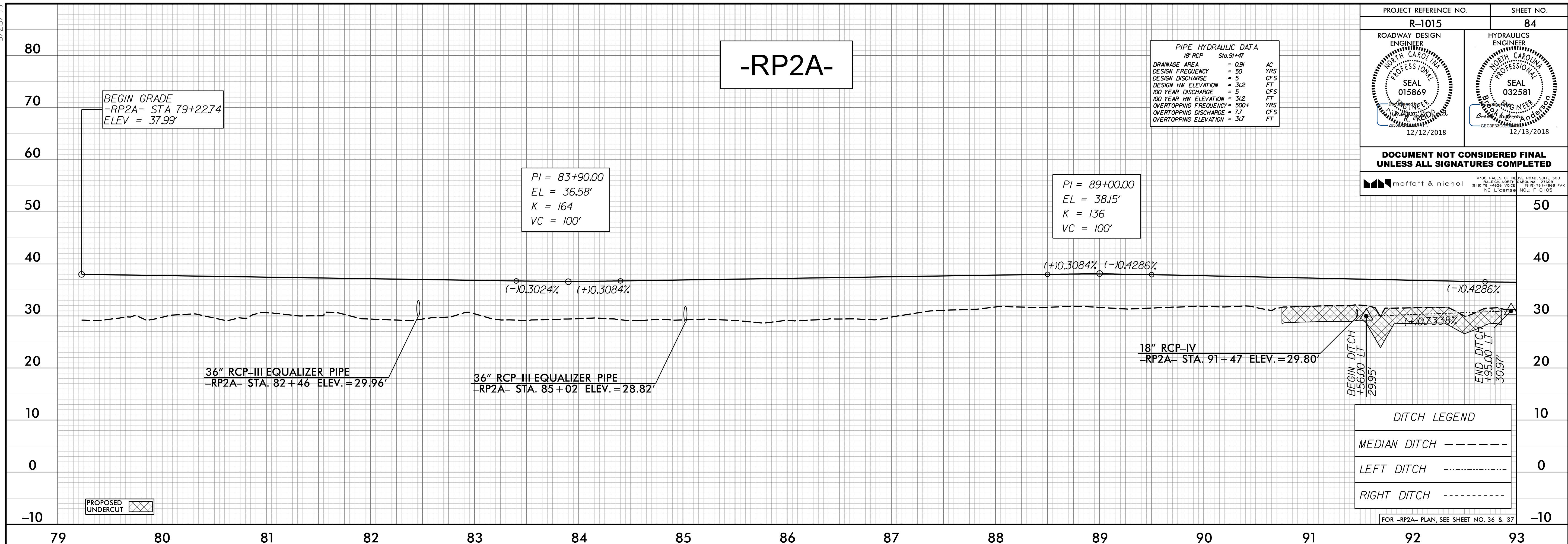
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>84</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

PIPE HYDRAULIC DATA		
18" RCP	Sta. 91+47	AC
DRAINAGE AREA	= 0.91	YRS
DESIGN FREQUENCY	= 50	CFS
DESIGN DISCHARGE	= 5	FT
DESIGN HW ELEVATION	= 31.2	FT
100 YEAR DISCHARGE	= 5	CFS
100 YEAR HW ELEVATION	= 31.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 1.7	CFS
OVERTOPPING ELEVATION	= 31.7	FT

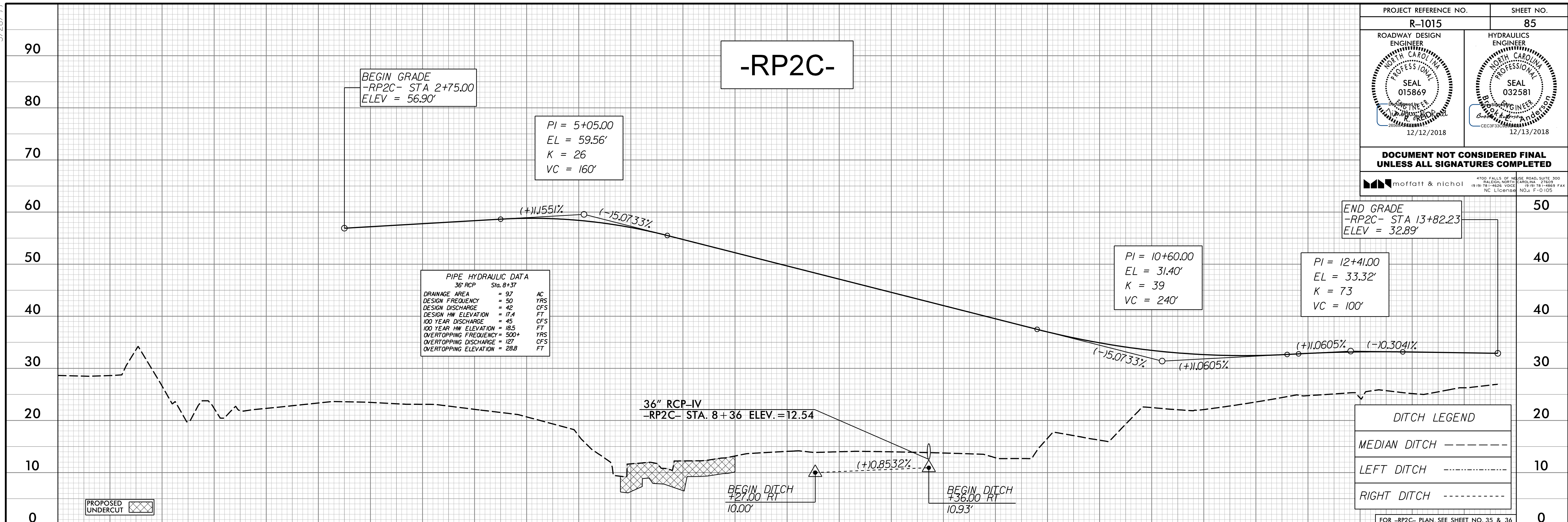
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

MOFFATT & NICHOL



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5/28/2018



PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>85</b>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL SEAL 015869 12/12/2018	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL SEAL 032581 12/13/2018

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

*moffatt & nichol*

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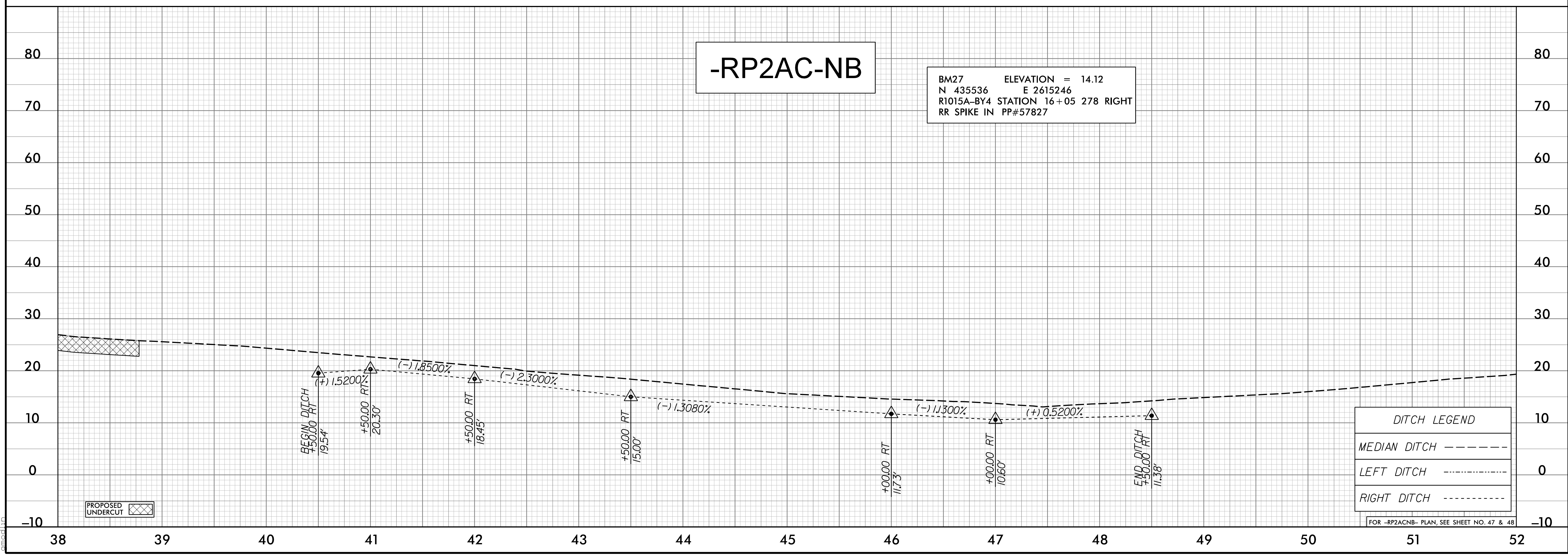
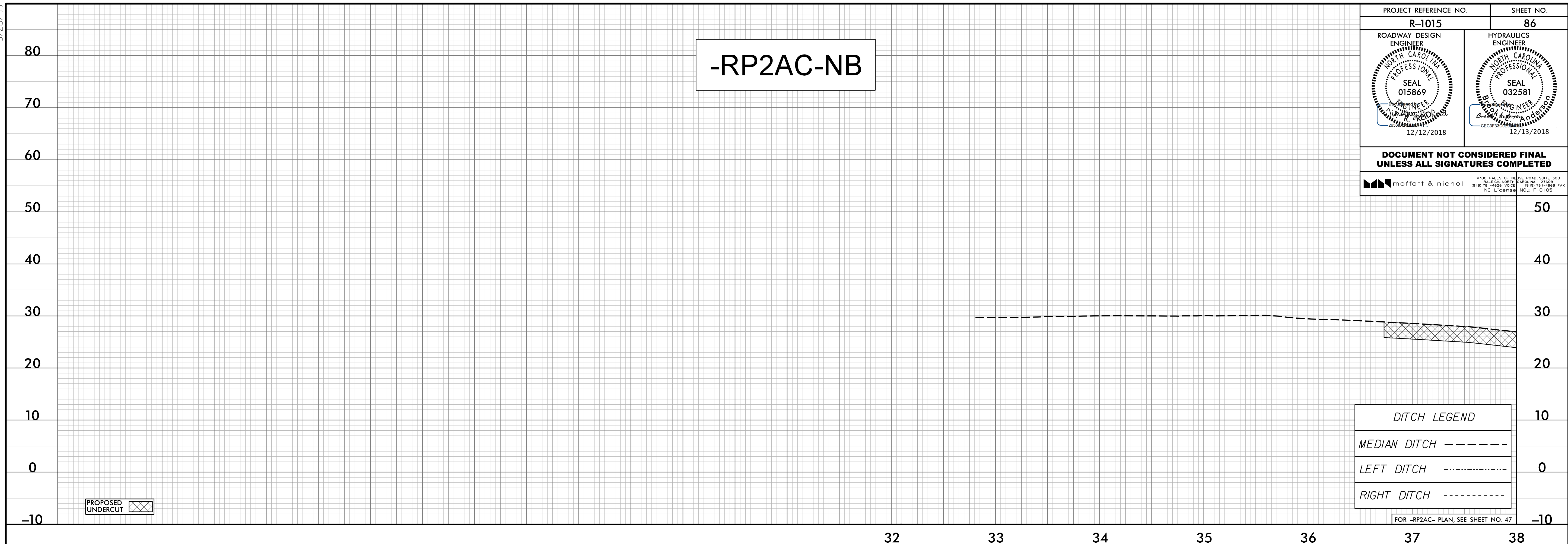
5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>86</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

**DOCUMENT NOT CONSIDERED FINAL  
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moffatt & nichol

4700 FALLS OF THE ROADS, SUITE 300  
FALGOUT, NORTH CAROLINA 27629  
(919) 781-4625 VOICE (919) 781-4666 FAX  
NC License NO. F-0105



BM27 ELEVATION = 14.12  
N 435536 E 2615246  
R1015A-BY4 STATION 16+05 278 RIGHT  
RR SPIKE IN PP#57827

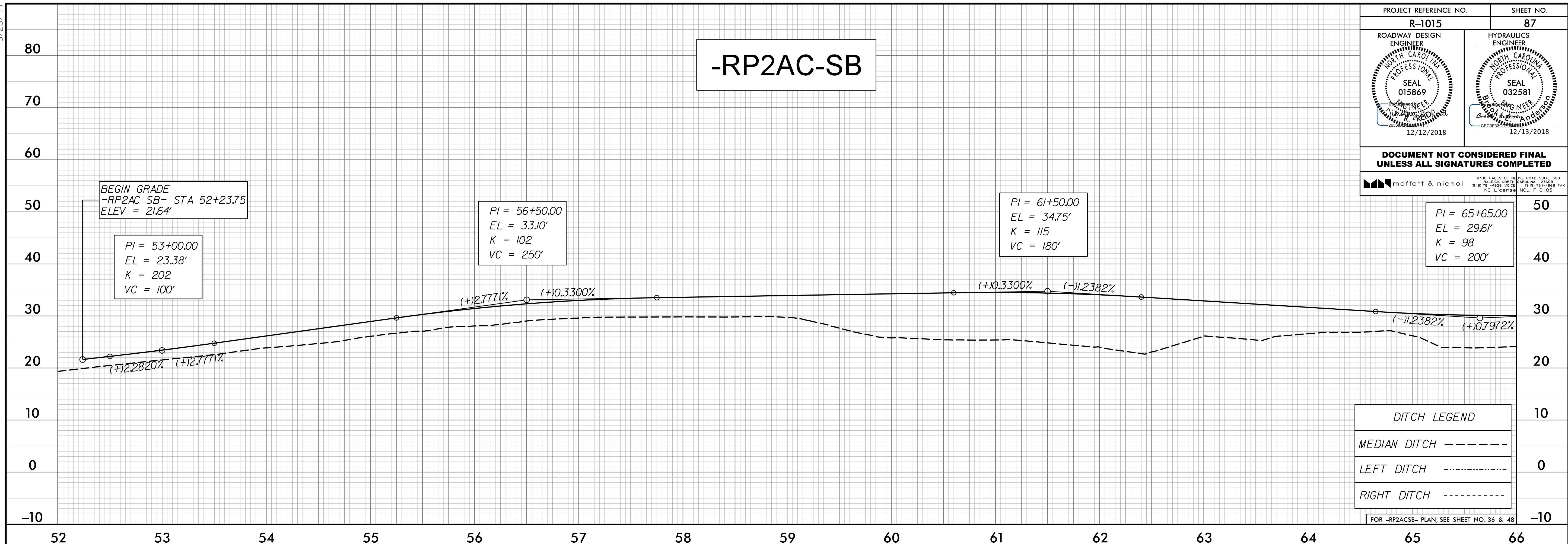
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5/28/19

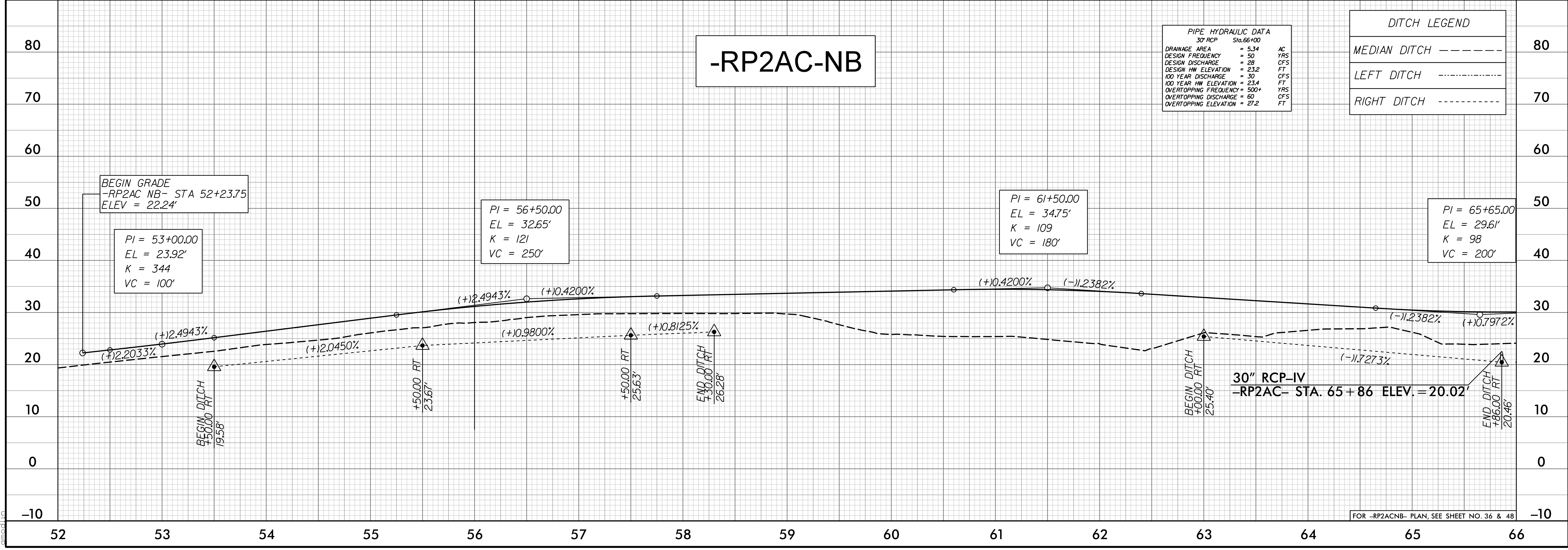
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>87</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

MOFFATT & NICHOL



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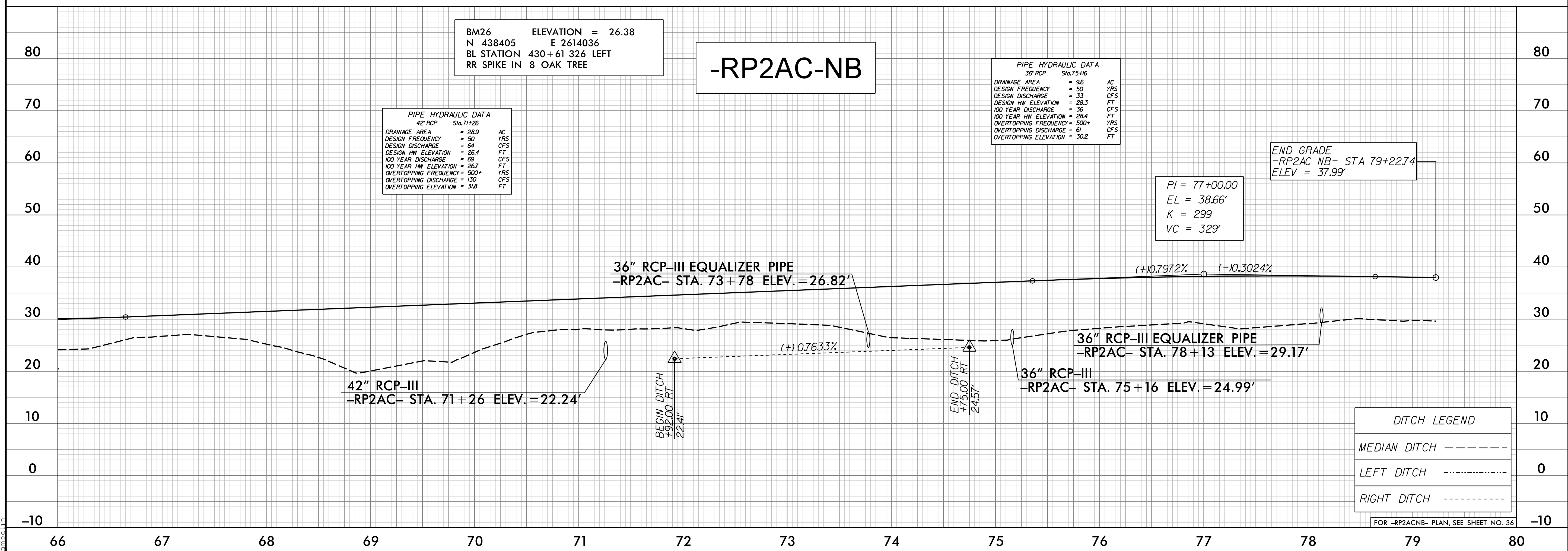
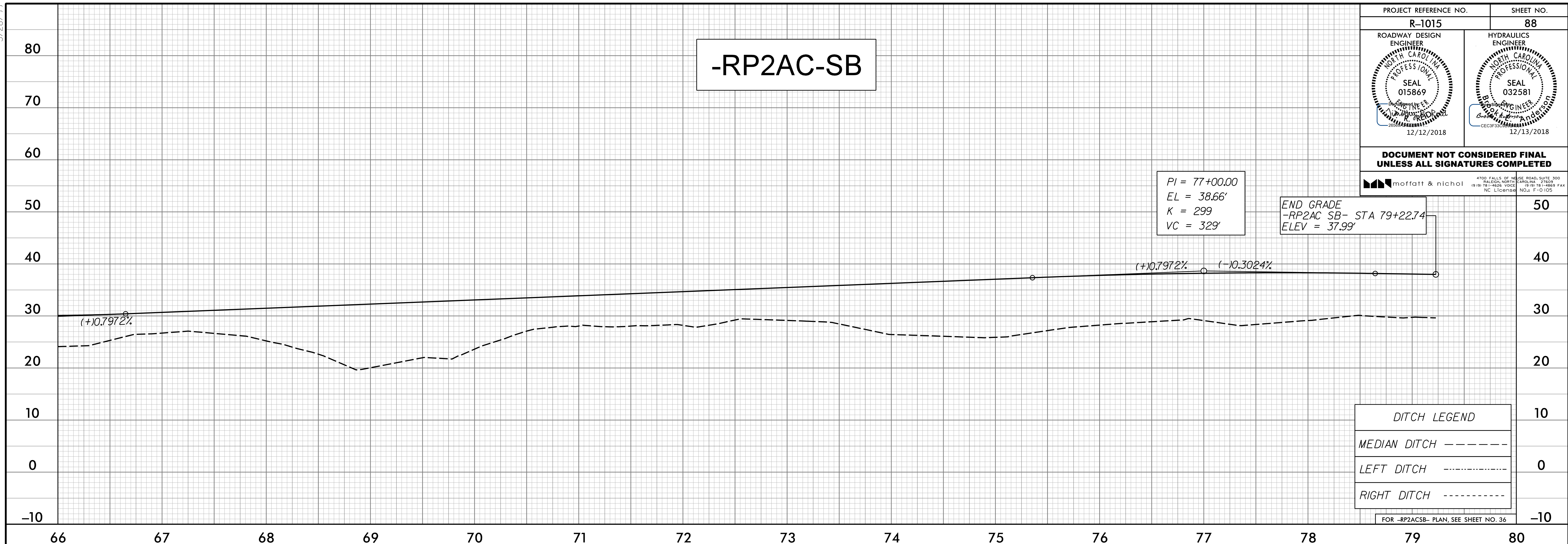


5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>88</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

MOFFATT & NICHOL



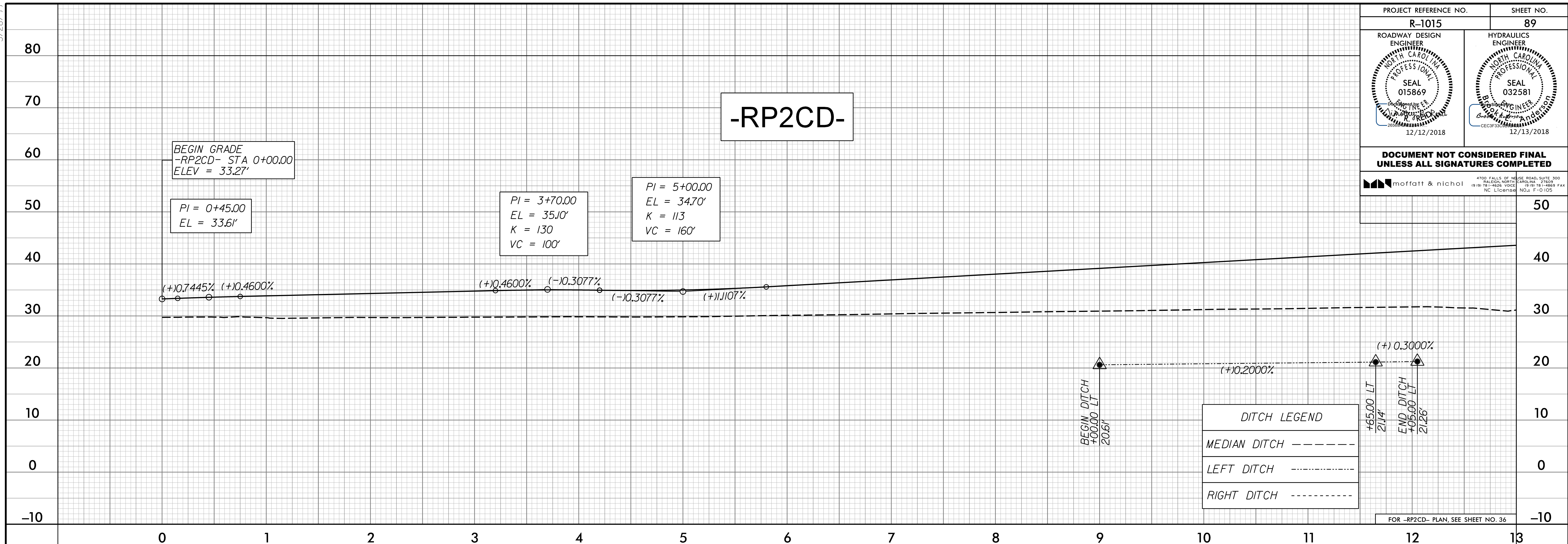
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 1015

5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>89</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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MOFFATT & NICHOL  
4700 FALLS OF THE ROADS, SUITE 200  
FALCON, NORTH CAROLINA 27629  
919 781-4600 VOICE 919 781-4666 FAX  
NC License NO. F-0105



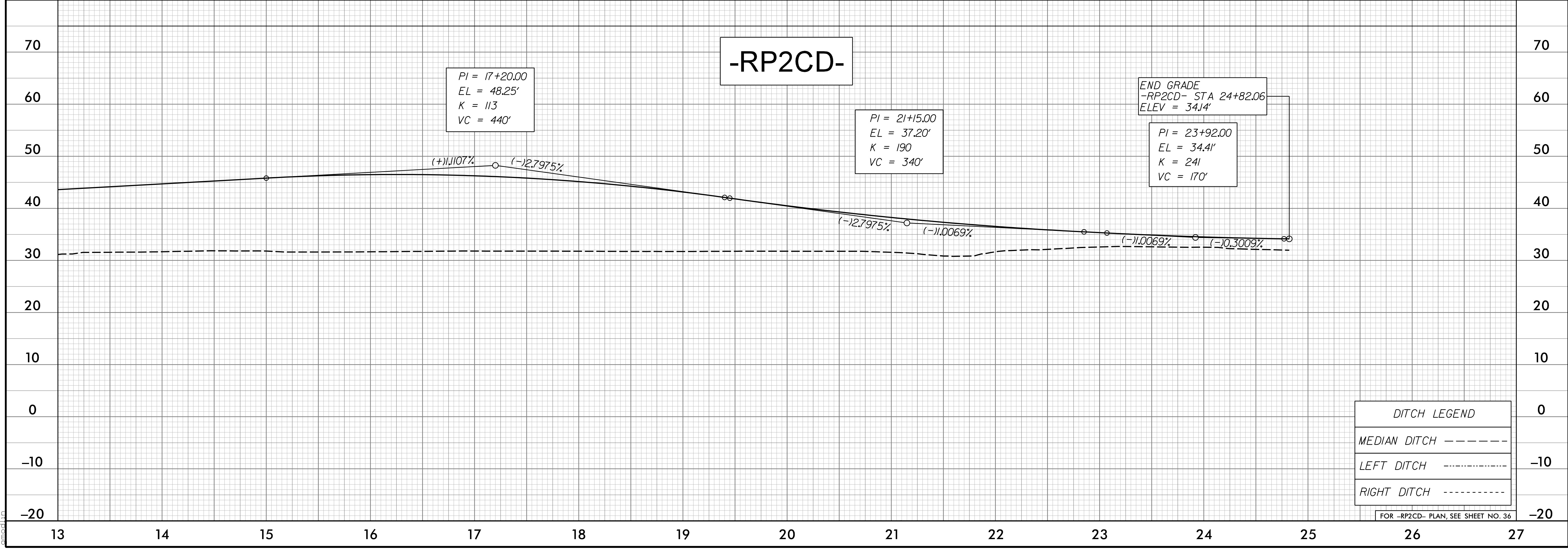
**DITCH LEGEND**

MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -RP2CD- PLAN, SEE SHEET NO. 36



**DITCH LEGEND**

MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -RP2CD- PLAN, SEE SHEET NO. 36

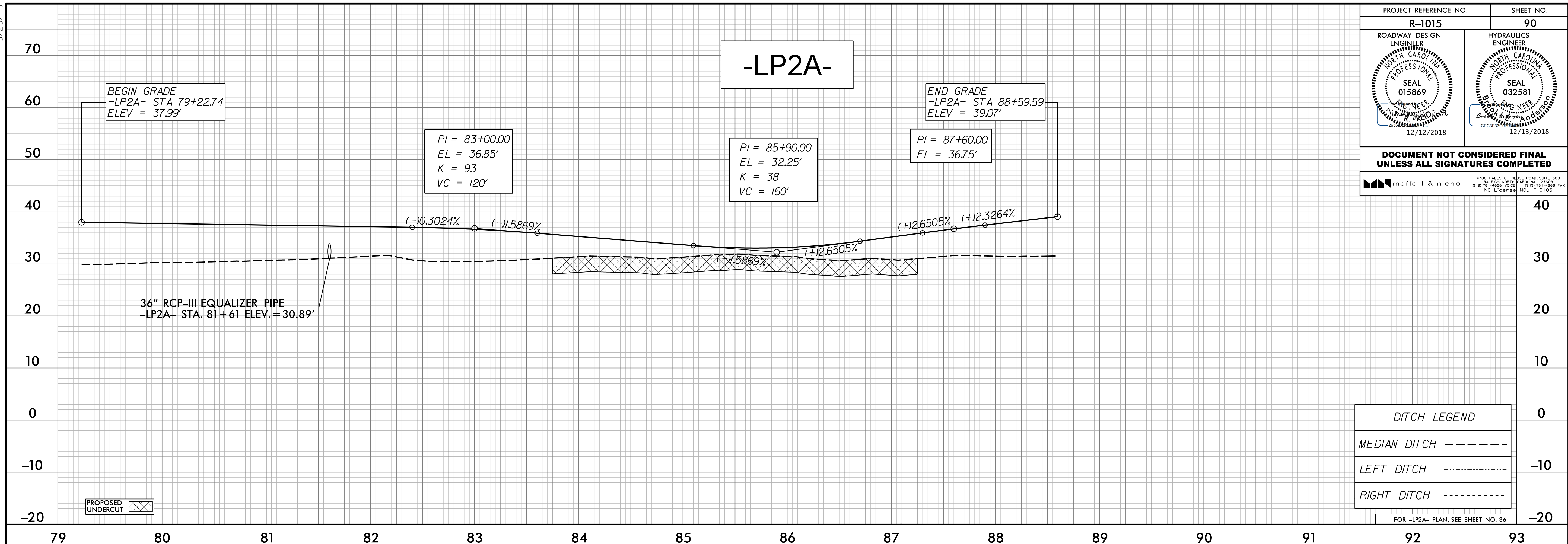
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5/28/19

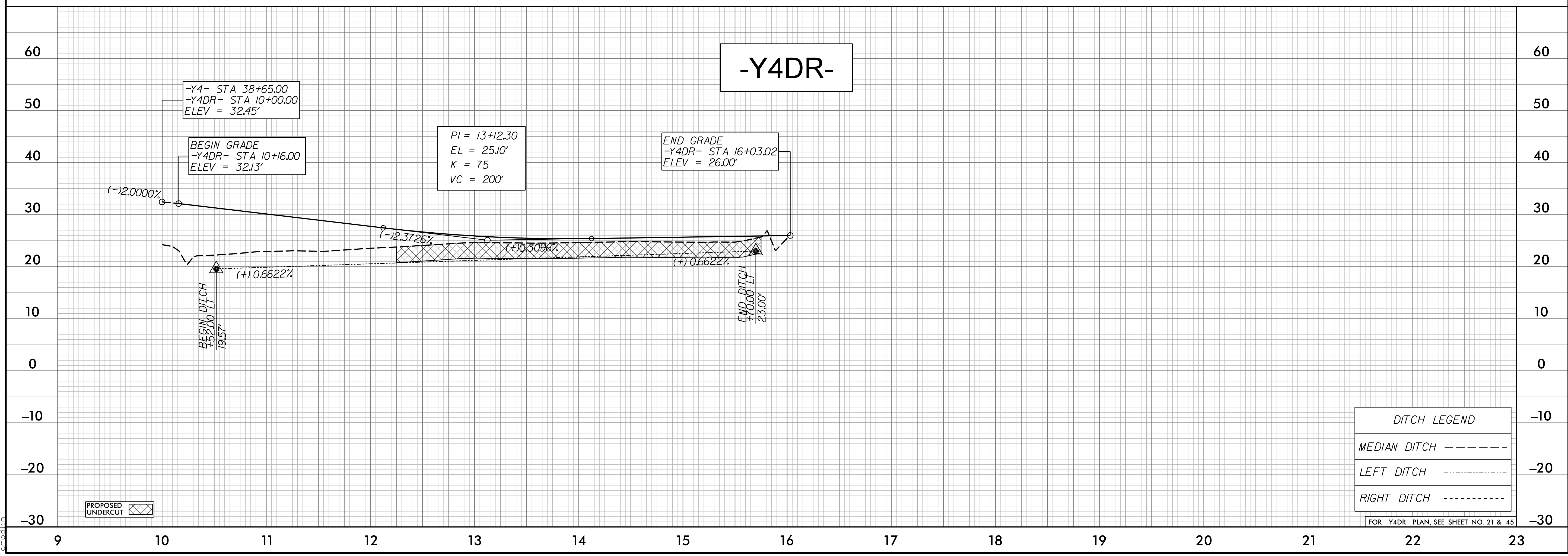
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>90</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

4700 FALLS OF THE ROADS, SUITE 300  
FALCON, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4666 FAX  
NC License No. F-0105



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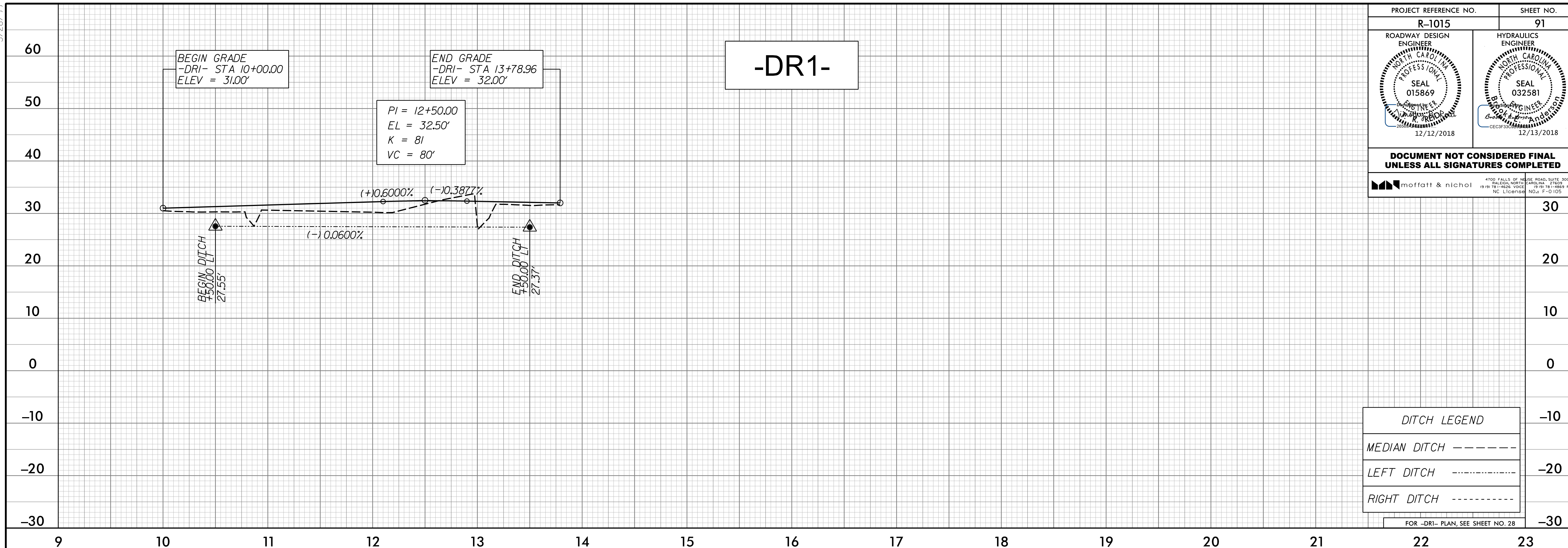


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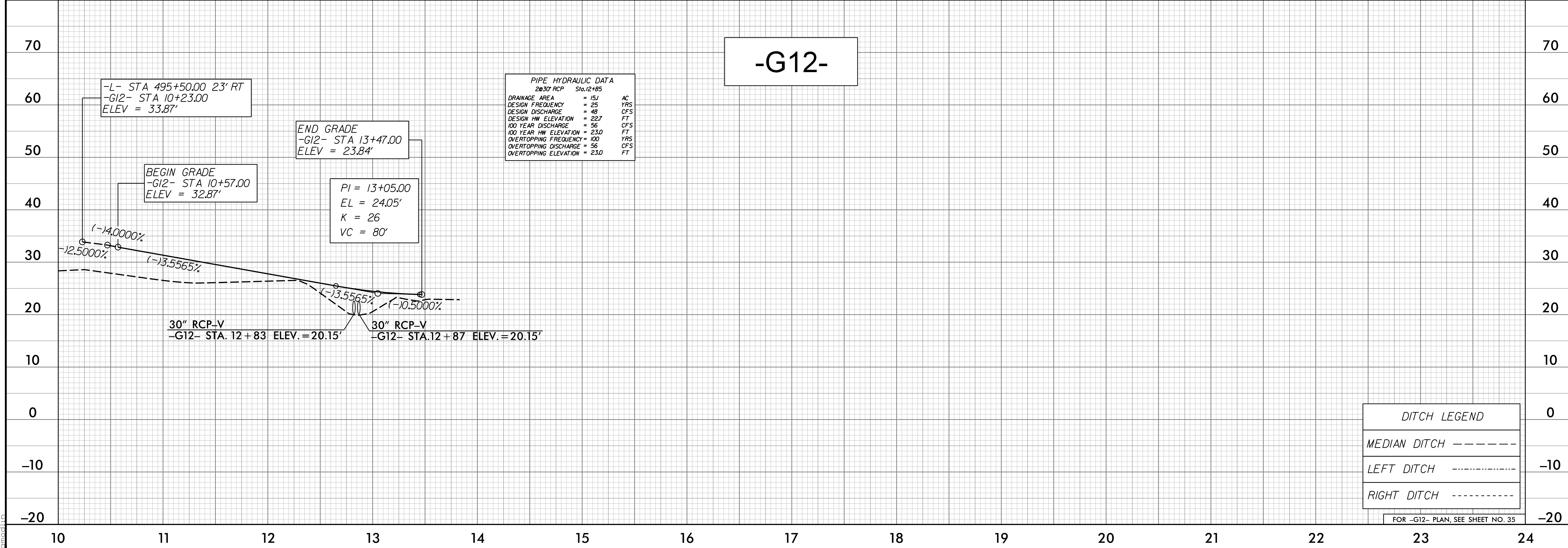
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>91</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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4700 FALLS OF THE ROADS, SUITE 300  
FALCON, NORTH CAROLINA 27629  
(919) 781-4600 VOICE (919) 781-4665 FAX  
NC License NO.: F-0105

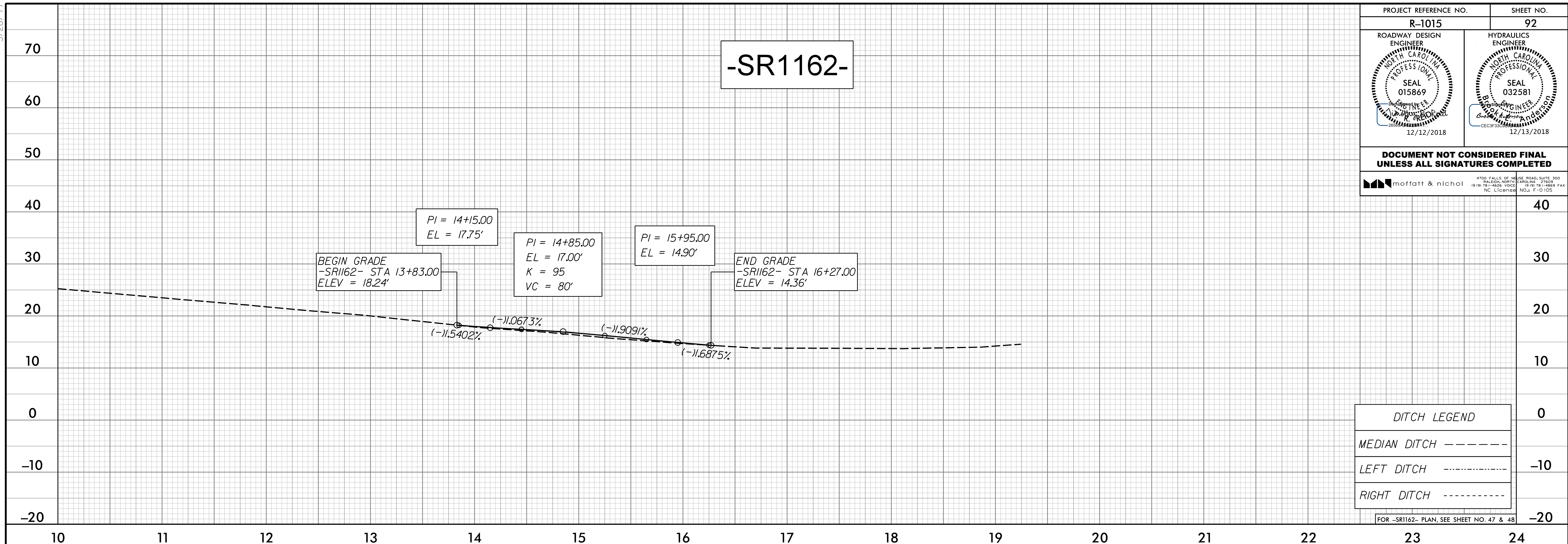


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5/28/19

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>92</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
moffatt & nichol <small>4700 FALLS OF THE ROADS, SUITE 300 FALGOUT, NORTH CAROLINA 27629 (919) 781-4626 VOICE (919) 781-4666 FAX NC License NO.: F-0105</small>	



**DITCH LEGEND**

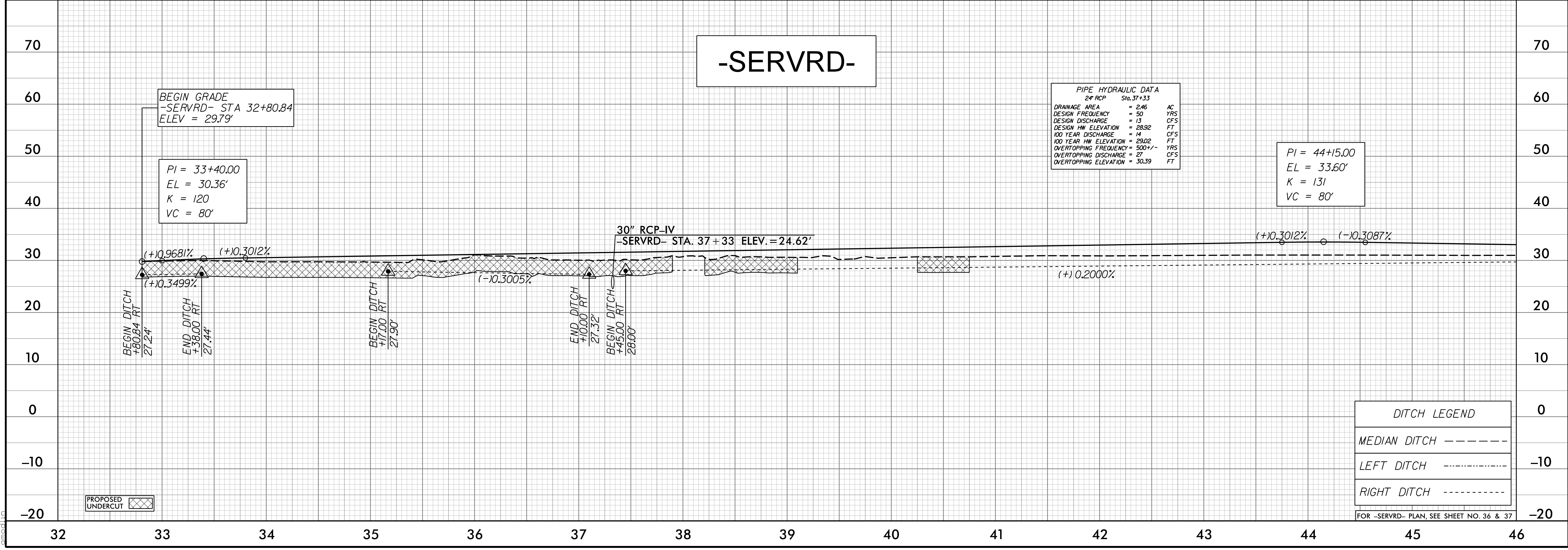
MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -SR1162- PLAN, SEE SHEET NO. 47 & 48

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**PIPE HYDRAULIC DATA**

24" RCP S16.37+33

DRAINAGE AREA	= 2.46	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 28.92	FT
100 YEAR DISCHARGE	= 14	CFS
100 YEAR HW ELEVATION	= 29.02	FT
OVERTOPPING FREQUENCY	= 500+/-	YRS
OVERTOPPING DISCHARGE	= 27	CFS
OVERTOPPING ELEVATION	= 30.39	FT

PI = 44+15.00  
EL = 33.60'  
K = 131  
VC = 80'

**DITCH LEGEND**

MEDIAN DITCH - - - - -

LEFT DITCH - . . . . .

RIGHT DITCH - - - - -

FOR -SERVRD- PLAN, SEE SHEET NO. 36 & 37

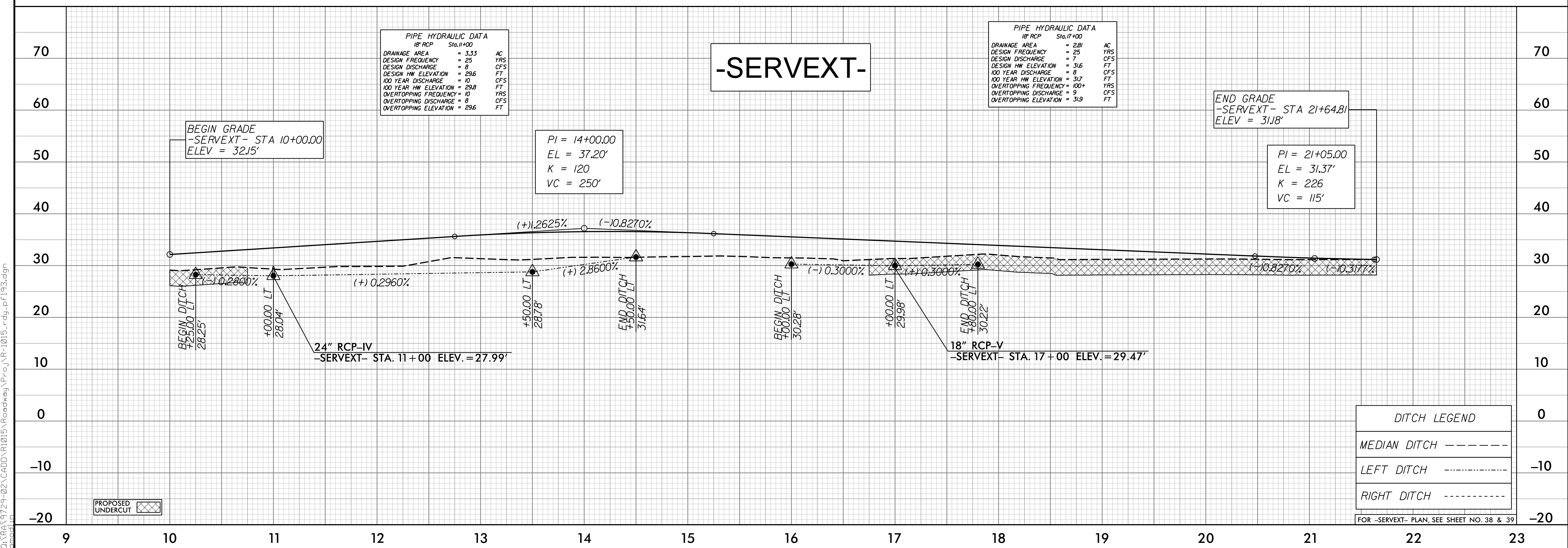
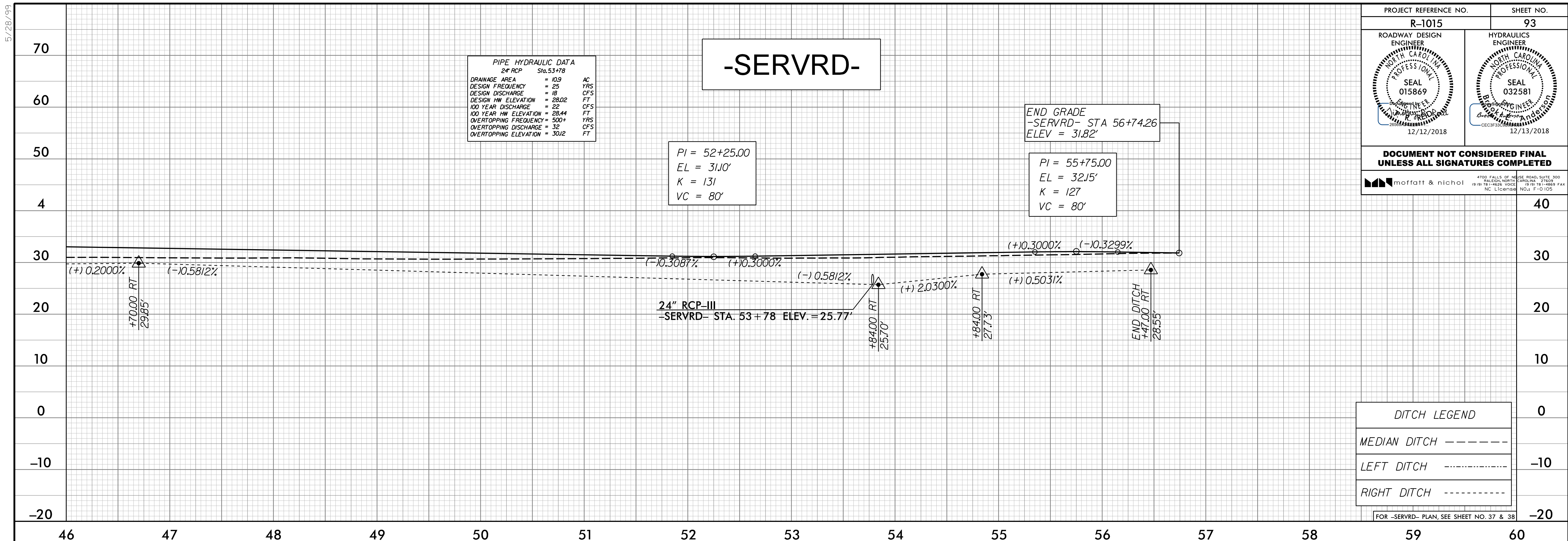
PROPOSED UNDERCUT

5/28/2018

PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>93</b>
ROADWAY DESIGN ENGINEER SEAL 015869 12/12/2018	HYDRAULICS ENGINEER SEAL 032581 12/13/2018

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

MOFFATT & NICHOL



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