PROJECT REFERENCE NO.	SHEET NO.
R-2707C	15

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID — DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — DocuSigned by: Joshua G. Dalton 1089AD8C14994C3... 4/12/2017

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
PE (F-0105)

SDG Sungate Design Group, P.A.
Engineering - Landscape Architecture - Environmental
915-A Jones Franklin Rd.
Raleigh, N.C. 27606

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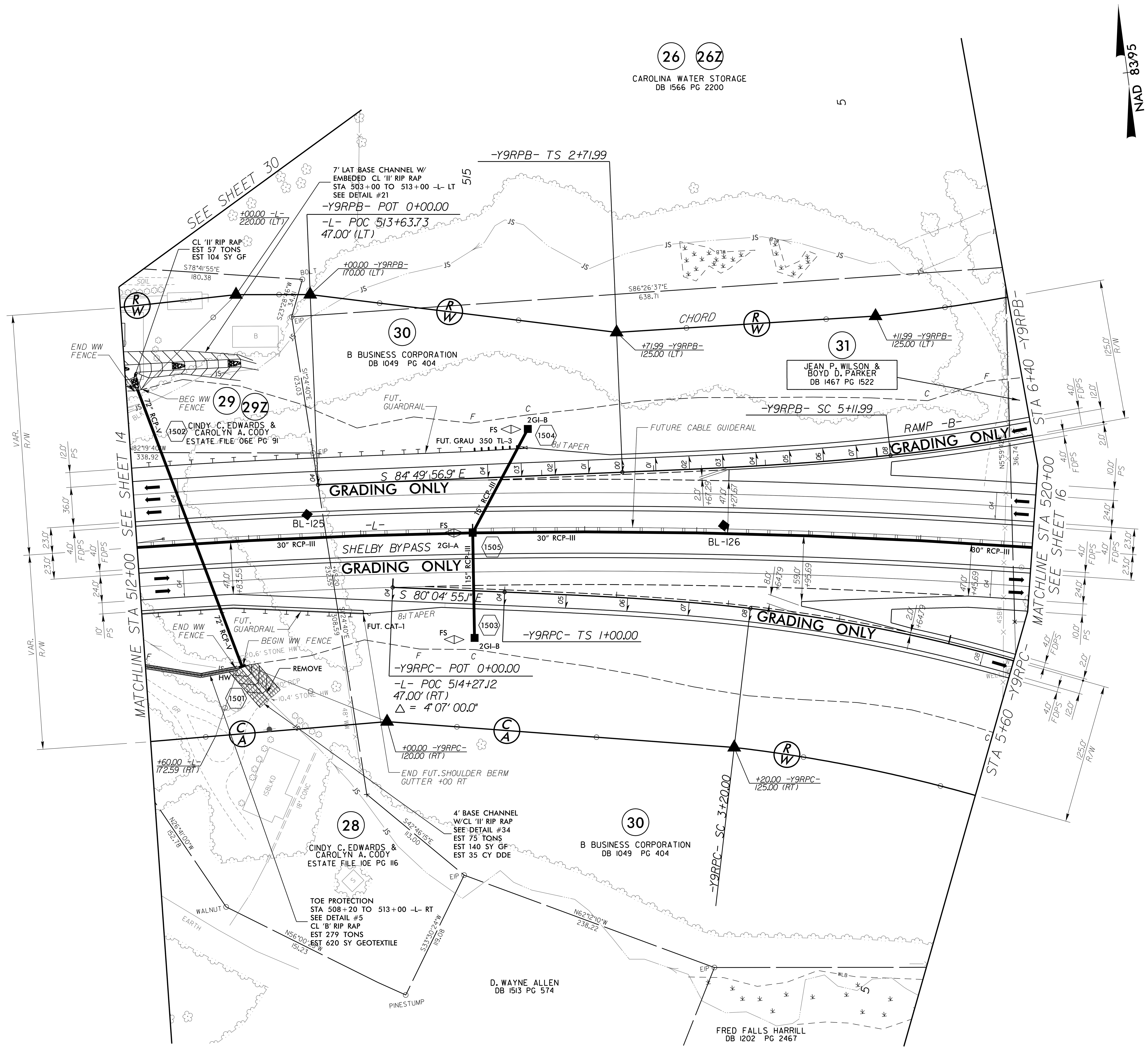
NAD 83/95
26 26Z
CAROLINA WATER STORAGE
DB 1566 PG 2200
-Y9RPB- TS 2+71.99
SEE SHEET 30
7' LAT BASE CHANNEL W/ EMBEDDED CL 'II' RIP RAP
STA 503+00 TO 513+00 -L- LT
SEE DETAIL #21
-Y9RPB- POT 0+00.00
-L- POC 513+63.73
47.00' (LT)
+00.00 -L-
220.00' (LT)
CL 'II' RIP RAP
EST 57 TONS
EST 104 SY GF
S78°41'55"E
180.38
+00.00 -Y9RPB-
170.00' (LT)
S86°26'37"E
638.71
CHORD
30
B BUSINESS CORPORATION
DB 1049 PG 404
+71.99 -Y9RPB-
125.00' (LT)
31
JEAN P. WILSON &
BOYD D. PARKER
DB 1467 PG 1522
+11.99 -Y9RPB-
125.00' (LT)
END WW FENCE
BEG WW FENCE
29 29Z
CINDY C. EDWARDS &
CAROLYN A. CODY
ESTATE FILE 06E PG 91
FUT. GUARDRAIL
FUT. GRAU 350 TL-3
2GI-B
1504
1502
-Y9RPB- SC 5+11.99
FUTURE CABLE GUIDERAIL
RAMP -B-
GRADING ONLY
S 84° 49' 56.9" E
BL-125
-L-
SHELBY BYPASS
2GI-A
1505
30" RCP-III
BL-126
15" RCP-III
S 80° 04' 55.1" E
1503
-Y9RPC- TS 1+00.00
-Y9RPC- POT 0+00.00
-L- POC 514+27.12
47.00' (RT)
△ = 4° 07' 00.0"
FUT. CAT-1
MATCHLINE STA 512+00 SEE SHEET 14
MATCHLINE STA 520+00 SEE SHEET 16
STA 6+40 -Y9RPB-
STA 5+60 -Y9RPC-
END WW FENCE
FUT. GUARDRAIL
BEGIN WW FENCE
REMOVE
HW
1501
+60.00 -L-
172.59' (RT)
+00.00 -Y9RPC-
120.00' (RT)
END FUT. SHOULDER BERM GUTTER +00 RT
+20.00 -Y9RPC-
125.00' (RT)
-Y9RPC- SC 3+20.00
28
CINDY C. EDWARDS &
CAROLYN A. CODY
ESTATE FILE 10E PG 116
4' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #34
EST 75 TONS
EST 140 SY GF
EST 35 CY DDE
30
B BUSINESS CORPORATION
DB 1049 PG 404
TOE PROTECTION
STA 508+20 TO 513+00 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 279 TONS
EST 620 SY GEOTEXTILE
WALNUT
N56°00'52"W
151.23
S33°30'24"W
119.08
N62°12'10"W
238.22
PINESTUMP
D. WAYNE ALLEN
DB 1513 PG 574
FRED FALLS HARRILL
DB 1202 PG 2467

-L-

PI Sta 520+51.16
△ = 26° 25' 21.1" (RT)
D = 1° 00' 00.0"
L = 2,642.25
T = 1,345.05'
R = 5,729.58'
SE = .04
RO = 200'

-Y9RPB-

PIs Sta 4+32.03	PI Sta 7+59.93
Θs = 3° 46' 39.9"	△ = 15° 30' 56.3" (LT)
Ls = 240.00'	D = 3° 08' 53.2"
LT = 160.04'	L = 492.85'
ST = 80.03'	T = 247.94'
	R = 1,820.00'
	SE = .08
	RO = 220'

-Y9RPC-

PIs Sta 2+46.71	PI Sta 6+42.46
Θs = 4° 14' 38.9"	△ = 24° 30' 08.9" (RT)
Ls = 220.00'	D = 3° 51' 29.9"
LT = 146.71'	L = 635.06'
ST = 73.37'	T = 322.46'
	R = 1,485.00'
	SE = .08
	RO = 220'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 49
FOR -Y9RPB- PROFILE SEE SHEET 62
FOR -Y9RPC- PROFILE SEE SHEET 63

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017 (SEAL 15869 T. R. REID)

DocuSigned by: Joshua G. Dalton 1089AD8C14994C3... 4/12/2017 (SEAL 26971 JOSHUA G. DALTON)

moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE (919) 781-4869 FAX, PE (F-0105)

SDG Sungate Design Group, P.A. — Engineering · Landscape Architecture · Environmental — 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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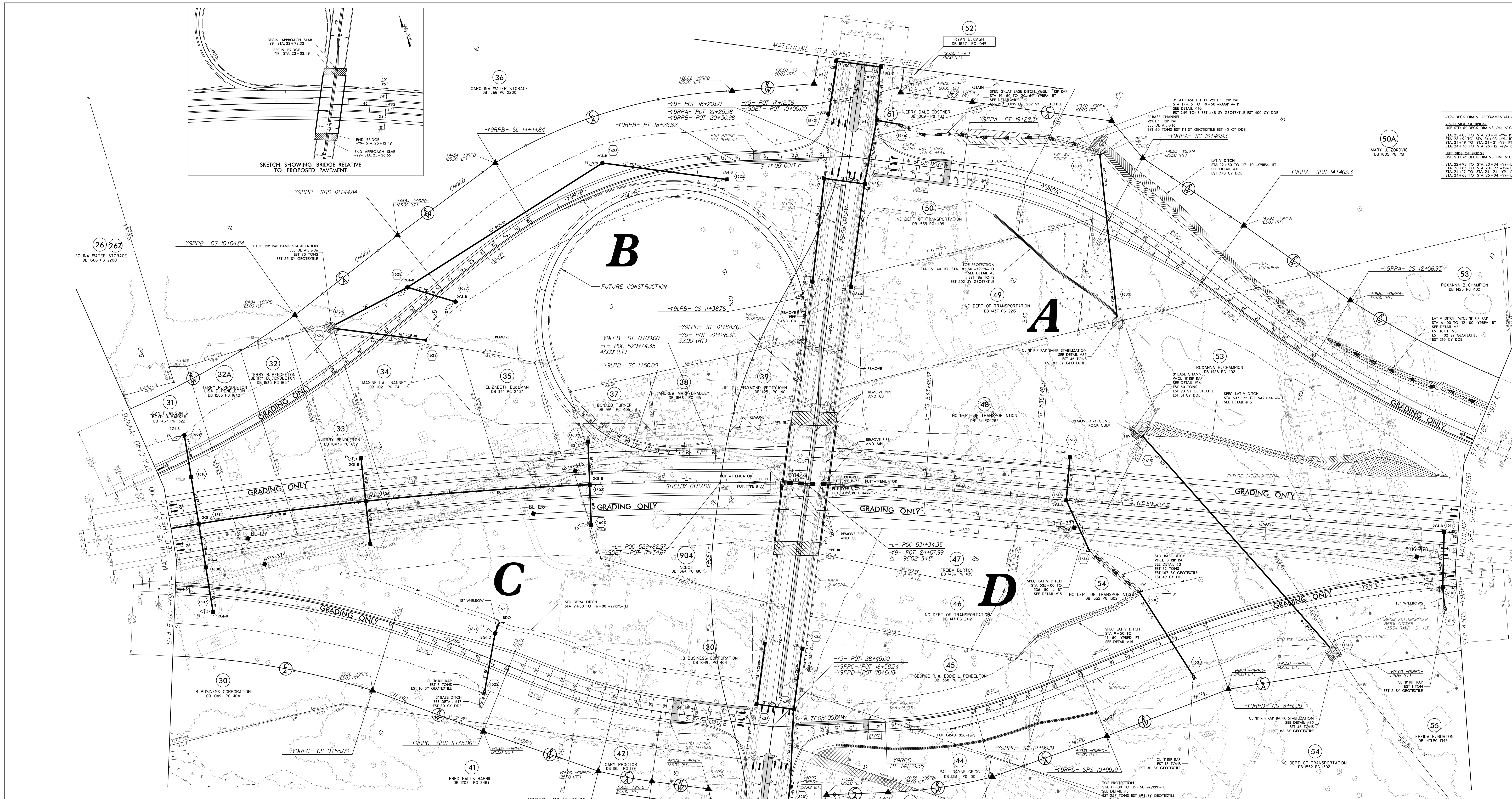


-Y9- DECK DRAIN RECOMMENDATIONS:

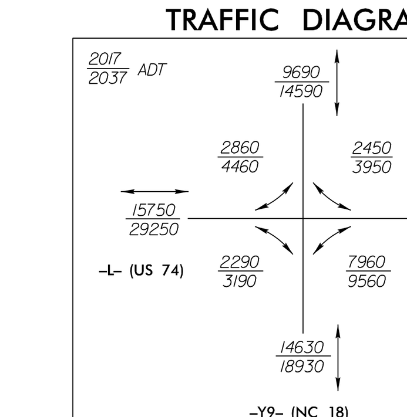
RIGHT SIDE OF BRIDGE
USE STD. 6" DECK DRAINS ON 6' CENTERS

STA. 23+05 TO STA. 23+41 -Y9- RT
STA. 23+91 TO STA. 24+03 -Y9- RT
STA. 24+19 TO STA. 24+31 -Y9- RT
STA. 24+76 TO STA. 25+12 -Y9- RT

LEFT SIDE OF BRIDGE
USE STD. 6" DECK DRAINS ON 6' CENTERS

STA. 22+98 TO STA. 23+34 -Y9- LT
STA. 23+85 TO STA. 23+97 -Y9- LT
STA. 24+12 TO STA. 24+24 -Y9- LT
STA. 24+68 TO STA. 25+04 -Y9- LT

TRAFFIC DIAGRAM



FOR -Y9- DETOUR DETAILS SEE SHEETS 2B-1 & 2B-2
FOR INTERSECTION DETAILS SEE SHEETS 2B-3 & 2B-4
FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 50
FOR -Y9- PROFILE SEE SHEET 60
FOR -Y9RPA- PROFILE SEE SHEET 61
FOR -Y9RPB- PROFILE SEE SHEET 62
FOR -Y9RPC- PROFILE SEE SHEET 63
FOR -Y9RPD- PROFILE SEE SHEET 64
FOR -Y9LPB- PROFILE SEE SHEET 65
FOR STRUCTURE PLANS SEE

-L-

PI Sta 520+51.16	PIs Sta 534+15.04
△ = 26° 25' 21.1" (RT)	Θs = 1° 00' 00.0"
D = 1° 00' 00.0"	Ls = 200.00'
L = 2,642.25	LT = 133.34'
T = 1,345.05'	ST = 66.67'
R = 5,729.58'	
SE = .04	
RO = 200'	

-Y9RPB-

PI Sta 7+59.93	PIs Sta 10+84.88	PIs Sta 13+78.30	PI Sta 16+40.07
△ = 15° 30' 56.3" (LT)	Θs = 3° 46' 39.9"	Θs = 7° 38' 22.0"	△ = 29° 10' 51.0" (RT)
D = 3° 08' 53.2"	Ls = 240.00'	Ls = 200.00'	D = 7° 38' 22.0"
L = 492.85'	LT = 160.04'	LT = 133.46'	L = 381.98'
T = 247.94'	ST = 80.03'	ST = 66.78'	T = 195.23'
R = 1,820.00'			R = 750.00'
SE = .08			SE = .08
RO = 240'			RO = 220'

-Y9RPA-

PI Sta 8+93.97	PIs Sta 12+86.96	PIs Sta 15+80.39	PI Sta 17+86.19
△ = 19° 54' 27.3" (RT)	Θs = 3° 46' 39.9"	Θs = 7° 38' 22.0"	△ = 21° 02' 14.9" (LT)
D = 3° 08' 53.2"	Ls = 240.00'	Ls = 200.00'	D = 7° 38' 22.0"
L = 632.36'	LT = 160.04'	LT = 133.46'	L = 275.38'
T = 319.40'	ST = 80.03'	ST = 66.78'	T = 139.26'
R = 1,820.00'			R = 750.00'
SE = .08			SE = .08
RO = 240'			RO = 220'

-Y9RPC-

PI Sta 6+42.46	PIs Sta 10+28.43	PIs Sta 13+08.52	PI Sta 14+16.68
△ = 24° 30' 08.9" (RT)	Θs = 4° 14' 38.9"	Θs = 7° 38' 22.0"	△ = 6° 21' 09.6" (LT)
D = 3° 51' 29.9"	Ls = 220.00'	Ls = 200.00'	D = 7° 38' 22.0"
L = 635.06'	LT = 146.71'	LT = 133.46'	L = 83.16'
T = 322.46'	ST = 73.37'	ST = 66.78'	T = 41.62'
R = 1,485.00'			R = 750.00'
SE = .08			SE = .08
RO = 240'			RO = 220'

-Y9RPD-

PI Sta 5+52.62	PIs Sta 9+39.23	PIs Sta 12+32.65	PI Sta 13+80.09
△ = 19° 29' 34.6" (LT)	Θs = 3° 46' 39.9"	Θs = 7° 38' 22.0"	△ = 12° 18' 42.5" (RT)
D = 3° 08' 53.2"	Ls = 240.00'	Ls = 200.00'	D = 7° 38' 22.0"
L = 619.19'	LT = 160.04'	LT = 133.46'	L = 161.16'
T = 312.62'	ST = 80.03'	ST = 66.78'	T = 80.89'
R = 1,820.00'			R = 750.00'
SE = .08			SE = .08
RO = 240'			RO = 220'

FUTURE -Y9LPB-

PIs Sta 1+00.54	PI Sta 5+48.38	PIs Sta 11+89.25
Θs = 18° 17' 09.2"	△ = 24° 04' 16.5" (RT)	Θs = 18° 17' 09.2"
Ls = 150.00'	D = 24° 22' 52.3"	Ls = 150.00'
LT = 100.54'	L = 988.76	LT = 100.54'
ST = 50.49'	T = 398.38'	ST = 50.49'
	R = 235.00'	
	SE = .08	
	RO = 150'	

-Y9-

PIs Sta 31+11.21
Θs = 1° 48' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'

-Y9- DETOUR

PI Sta 11+53.28	PI Sta 15+66.99	PI Sta 19+70.65	PI Sta 23+74.52
△ = 21° 10' 35.3" (RT)	△ = 21° 18' 31.7" (LT)	△ = 22° 10' 23.2" (LT)	△ = 25° 07' 00.2" (RT)
D = 6° 59' 14.2"	D = 6° 59' 14.2"	D = 6° 59' 14.2"	D = 6° 59' 14.2"
L = 303.07'	L = 304.97'	L = 317.34'	L = 359.46'
T = 153.28'	T = 154.26'	T = 160.68'	T = 182.67'
R = 820.00'	R = 820.00'	R = 820.00'	R = 820.00'

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:	INTERCHANGE AT -L- US 74 BYPASS AND -Y9- NC 18		
TIP NO.:	R-2707C	COUNTY:	CLEVELAND
DESIGNED BY:	T. HUFFMAN		
CHECKED BY:	T. REID	DATE:	12/13/12

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	17
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017

moffatt & nichol — Sungate Design Group, P.A.

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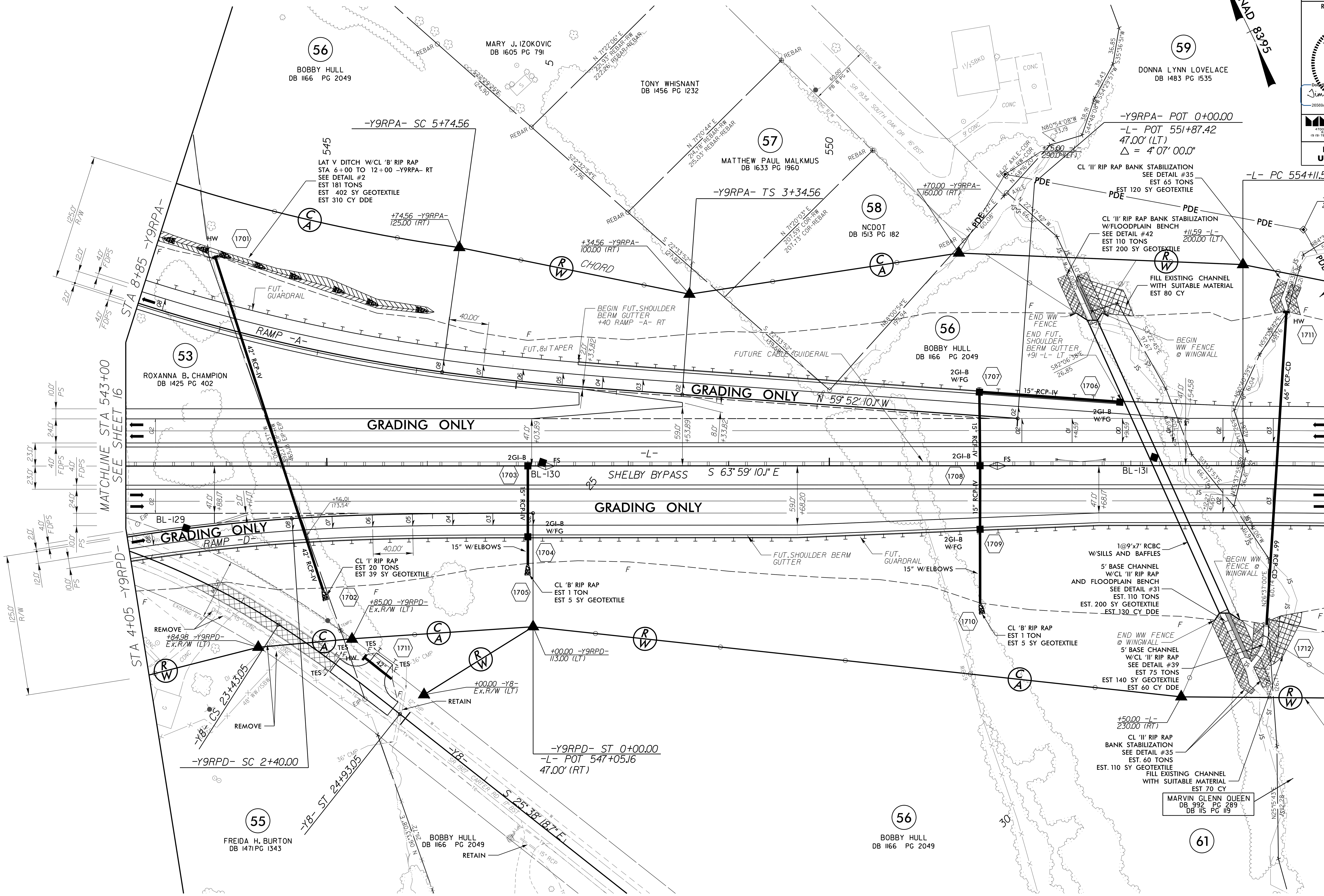

NAD 83/95
56
BOBBY HULL
DB 1166 PG 2049
MARY J. IZOKOVIC
DB 1605 PG 791
TONY WHISNANT
DB 1456 PG 1232
57
MATTHEW PAUL MALKMUS
DB 1633 PG 1960
58
NCDOT
DB 1513 PG 182
59
DONNA LYNN LOVELACE
DB 1483 PG 1535
60
HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827
53
ROXANNA B. CHAMPION
DB 1425 PG 402
55
FREIDA H. BURTON
DB 1471 PG 1343
61
MARVIN GLENN QUEEN
DB 992 PG 289
DB 115 PG 119
-Y9RPA- SC 5+74.56
-Y9RPA- TS 3+34.56
-Y9RPA- POT 0+00.00
-L- POT 551+87.42
47.00' (LT)
△ = 4° 07' 00.0"
-L- PC 554+11.59
LAT V DITCH W/CL 'B' RIP RAP
STA 6+00 TO 12+00 -Y9RPA- RT
SEE DETAIL #2
EST 181 TONS
EST 402 SY GEOTEXTILE
EST 310 CY DDE
CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 65 TONS
EST 120 SY GEOTEXTILE
CL 'II' RIP RAP BANK STABILIZATION
W/FLOODPLAIN BENCH
SEE DETAIL #42
EST 110 TONS
EST 200 SY GEOTEXTILE
FILL EXISTING CHANNEL
WITH SUITABLE MATERIAL
EST 80 CY
BEGIN FUT. SHOULDER
BERM GUTTER
+40 RAMP -A- RT
RAMP -A-
FUTURE CABLE GUIDERAIL
GRADING ONLY
N 59° 52' 10.1" W
-L-
SHELBY BYPASS
S 63° 59' 10.1" E
BL-129
BL-130
BL-131
RAMP -D-
MATCHLINE STA 543+00 SEE SHEET 16
MATCHLINE STA 555+00 SEE SHEET 18
STA 8+85 -Y9RPA-
STA 4+05 -Y9RPD-
CL 'I' RIP RAP
EST 20 TONS
EST 39 SY GEOTEXTILE
CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE
15" W/ELBOWS
FUT. SHOULDER BERM GUTTER
FUT. GUARDRAIL
1@9'x7' RCBC
W/SILLS AND BAFFLES
5' BASE CHANNEL
W/CL 'II' RIP RAP
AND FLOODPLAIN BENCH
SEE DETAIL #31
EST. 110 TONS
EST. 200 SY GEOTEXTILE
EST 130 CY DDE
5' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #39
EST 75 TONS
EST 140 SY GEOTEXTILE
EST 60 CY DDE
CL 'II' RIP RAP
BANK STABILIZATION
SEE DETAIL #35
EST. 60 TONS
EST. 110 SY GEOTEXTILE
FILL EXISTING CHANNEL
WITH SUITABLE MATERIAL
EST 70 CY
PROP. R/W
REMOVE
RETAIN
-Y8- CS 23+43.05
-Y9RPD- SC 2+40.00
-Y9RPD- ST 0+00.00
-L- POT 547+05.16
47.00' (RT)
-Y8- ST 24+93.05
-Y8-
S 25° 38' 18.7" E

-L-	-Y9RPA-		-Y9RPD-		-Y8-	
PI Sta 563+32.45	PIs Sta 4+94.60	PI Sta 8+93.97	PIs Sta 1+60.04	PI Sta 5+52.62	PI Sta 21+71.57	PIs Sta 23+93.09
△ = 13° 44' 47.7" (RT)	θs = 3° 46' 39.9"	△ = 19° 54' 27.3" (RT)	θs = 3° 46' 39.9"	△ = 19° 29' 34.6" (LT)	△ = 26° 47' 34.0" (RT)	θs = 5° 45' 00.0"
D = 0° 45' 00.0"	Ls = 240.00'	D = 3° 08' 53.2"	Ls = 240.00'	D = 3° 08' 53.2"	D = 7° 40' 00.0"	Ls = 150.00'
L = 1,832.88'	LT = 160.04'	L = 632.36'	LT = 160.04'	L = 619.19'	L = 349.47'	LT = 100.05'
T = 920.86'	ST = 80.03'	T = 319.40'	ST = 80.03'	T = 312.62'	T = 177.99'	ST = 50.05'
R = 7,639.44'		R = 1,820.00'		R = 1,820.00'	R = 747.34'	
SE = .03		SE = .08		SE = .08		
RO = 150.00'		RO = 240'		RO = 240'		

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 51
FOR -Y9RPA- PROFILE SEE SHEET 61
FOR -Y9RPD- PROFILE SEE SHEET 64

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	18

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 15869 — 4/12/2017

HYDRAULICS ENGINEER — SEAL 26971 — 4/12/2017

moffatt & nichol

Sungate Design Group, P.A.

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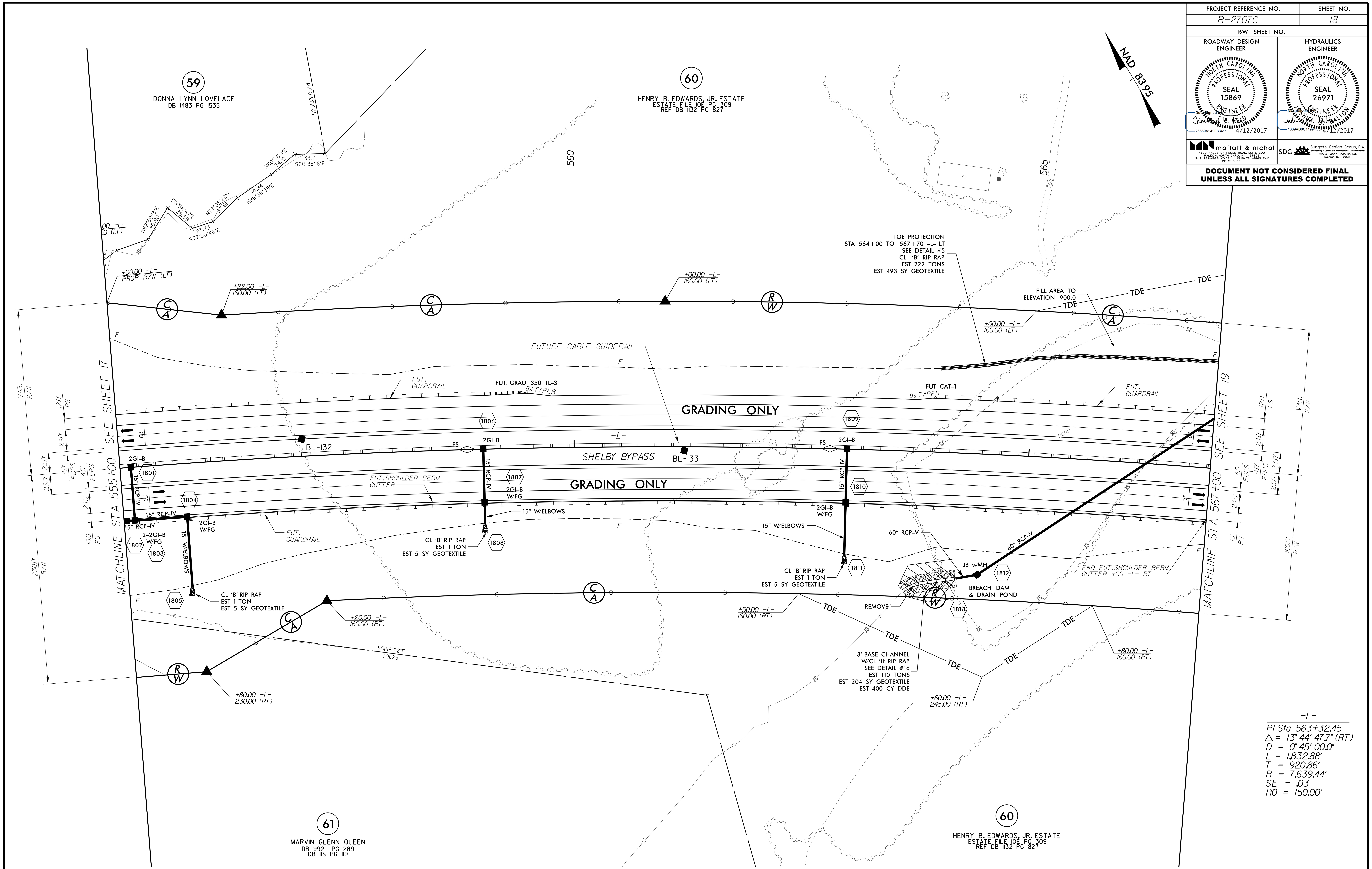

NAD 83/95
59
DONNA LYNN LOVELACE
DB 1483 PG 1535
60
HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827
61
MARVIN GLENN QUEEN
DB 992 PG 289
DB 115 PG 119
TOE PROTECTION
STA 564+00 TO 567+70 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 222 TONS
EST 493 SY GEOTEXTILE
FILL AREA TO ELEVATION 900.0
FUTURE CABLE GUIDERAIL
FUT. GRAU 350 TL-3
FUT. CAT-1
GRADING ONLY
SHELBY BYPASS
BL-132
BL-133
FUT. SHOULDER BERM GUTTER
15" W/ELBOWS
CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE
60" RCP-V
JB w/MH
BREACH DAM & DRAIN POND
REMOVE
END FUT. SHOULDER BERM GUTTER +00 -L- RT
3' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #16
EST 110 TONS
EST 204 SY GEOTEXTILE
EST 400 CY DDE
MATCHLINE STA 555+00 SEE SHEET 17
MATCHLINE STA 567+00 SEE SHEET 19

-L-

PI Sta 563+32.45
△ = 13° 44' 47.7" (RT)
D = 0° 45' 00.0"
L = 1,832.88'
T = 920.86'
R = 7,639.44'
SE = .03
RO = 150.00'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 51

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	19
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER

DocuSigned by: James R. Reid 26569A242EB3411...

4/12/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER

DocuSigned by: Joshua M. Dalton 1089AD8C1488464...

4/12/2017

moffatt & nichol
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Planning, Landscape Architecture, Environmental
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Raleigh, N.C. 27606

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62

NAD 83/95

60

HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827

TOE PROTECTION
STA 564+00 TO 567+70 –L– LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 222 TONS
EST 493 SY GEOTEXTILE

FILL AREA TO ELEVATION 900.0

3' BASE CHANNEL
W/CL 'I' RIP RAP
SEE DETAIL #16
EST 65 TONS
EST 120 SY GEOTEXTILE
EST 45 CY DDE

TOE PROTECTION
STA 567+95 TO 568+70 –L– LT
SEE DETAIL #5
EST 23 TONS CL 'B' RIP RAP
EST 50 SY GEOTEXTILE

BERM DITCH LINED W/CL 'B' RIP RAP
STA 572+50 TO 576+00 –L– LT
SEE DETAIL #1
SEE PROFILE FOR GRADE
EST 360 TONS
EST 800 SY GEOTEXTILE

+24.00
220.00 (LT)

TDE

+40.00 –L–
160.00 (LT)

END WW FENCE

+97.00 –L–
160.00 (LT)

–L– PT 572+44.47

+44.47 –L–
160.00 (LT)

BEGIN WW FENCE

FUT.GUARDRAIL

FUT. GRAU 350 TL-3

FUTURE CABLE GUIDERAIL

50.00'

GRADING ONLY

SHELBY BYPASS

–L–

S 50°14'22.4" E

BL-134

FUT. CAT-1

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

CL 'B' RIP RAP
EST 5 TONS
EST 14 SY GEOTEXTILE

SPEC LAT V DITCH
W/CL B RIP RAP
STA 578+50 TO 579+50 –L– RT
SEE DETAIL #20
EST 50 TONS
EST 180 SY GEOTEXTILE

60" RCP-V

18" RCP-III

24" RCP-III

18" W/ELBOW

BDO

2GI-B

FS

FL HW

MATCHLINE STA 567+00 SEE SHEET 18

MATCHLINE STA 579+00 SEE SHEET 20

VAR. R/W

160.0' R/W

12.0' PS

24.0'

23.0'

40' FDPS

10.0' PS

–L–
PI Sta 563+32.45
△ = 13° 44' 47.7" (RT)
D = 0° 45' 00.0"
L = 1,832.88'
T = 920.86'
R = 7,639.44'
SE = .03
RO = 150.00'

60

HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR –L– PROFILE SEE SHEET 52

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	20
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 15869, NORTH CAROLINA PROFESSIONAL ENGINEER — 4/12/2017

HYDRAULICS ENGINEER — SEAL 26971, NORTH CAROLINA PROFESSIONAL ENGINEER — 4/12/2017

moffatt & nichol

SDG Sungate Design Group, P.A.

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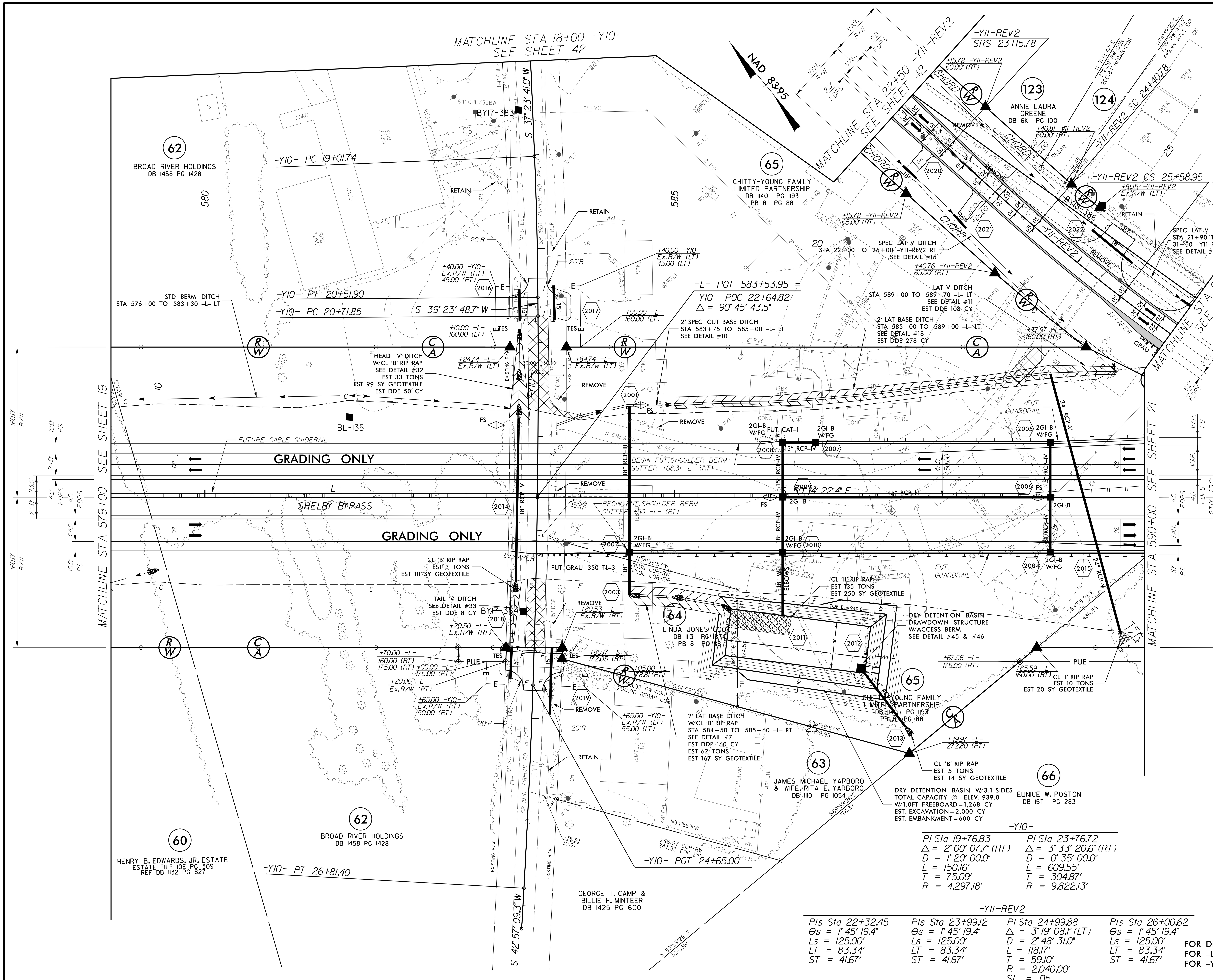

MATCHLINE STA 18+00 -Y10-
SEE SHEET 42
MATCHLINE STA 22+50 -Y11-REV2
SEE SHEET 42
MATCHLINE STA 26+25 -Y11-REV2
SEE SHEET 21
MATCHLINE STA 579+00 SEE SHEET 19
MATCHLINE STA 590+00 SEE SHEET 21
NAD 83/95
-Y11-REV2
SRS 23+15.78
-Y11-REV2 SC 24+40.78
-Y11-REV2 CS 25+58.95
-Y10- PC 19+01.74
-Y10- PT 20+51.90
-Y10- PC 20+71.85
S 39° 23' 48.7" W
S 37° 23' 41.0" W
-L- POT 583+53.95 =
-Y10- POC 22+64.82
△ = 90° 45' 43.5"
-Y10- POT 24+65.00
-Y10- PT 26+81.40
S 42° 57' 09.3" W
GRADING ONLY
-L-
SHELBY BYPASS
FUTURE CABLE GUIDERAIL
BEGIN FUT. SHOULDER BERM GUTTER +68.31 -L- (RT)
BEGIN FUT. SHOULDER BERM GUTTER +50 -L- (RT)
FUT. GRAU 350 TL-3
BL-135
BY17-383
BY17-384
BY18-386
62
BROAD RIVER HOLDINGS
DB 1458 PG 1428
65
CHITTY-YOUNG FAMILY LIMITED PARTNERSHIP
DB 1140 PG 1193
PB 8 PG 88
123
ANNIE LAURA GREENE
DB 6K PG 100
124
67
64
LINDA JONES COOK
DB 1113 PG 1876
PB 8 PG 88
63
JAMES MICHAEL YARBORO & WIFE, RITA E. YARBORO
DB 1110 PG 1054
66
EUNICE W. POSTON
DB 15T PG 283
60
HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827
GEORGE T. CAMP & BILLIE H. MINTEER
DB 1425 PG 600
STD BERM DITCH
STA 576+00 TO 583+30 -L- LT
HEAD 'V' DITCH
W/CL 'B' RIP RAP
SEE DETAIL #32
EST 33 TONS
EST 99 SY GEOTEXTILE
EST DDE 50 CY
2' SPEC CUT BASE DITCH
STA 583+75 TO 585+00 -L- LT
SEE DETAIL #10
SPEC LAT V DITCH
STA 22+00 TO 26+00 -Y11-REV2 RT
SEE DETAIL #15
LAT V DITCH
STA 589+00 TO 589+70 -L- LT
SEE DETAIL #11
EST DDE 108 CY
2' LAT BASE DITCH
STA 585+00 TO 589+00 -L- LT
SEE DETAIL #18
EST DDE 278 CY
SPEC LAT V DITCH
STA 21+90 TO 31+50 -Y11-REV2 LT
SEE DETAIL #15
CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE
TAIL 'V' DITCH
SEE DETAIL #33
EST DDE 8 CY
CL 'II' RIP RAP
EST 135 TONS
EST 250 SY GEOTEXTILE
DRY DETENTION BASIN DRAWDOWN STRUCTURE
W/ACCESS BERM
SEE DETAIL #45 & #46
CL 'I' RIP RAP
EST 10 TONS
EST 20 SY GEOTEXTILE
2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 584+50 TO 585+60 -L- RT
SEE DETAIL #7
EST DDE 160 CY
EST 62 TONS
EST 167 SY GEOTEXTILE
CL 'B' RIP RAP
EST. 5 TONS
EST. 14 SY GEOTEXTILE
DRY DETENTION BASIN W/3:1 SIDES
TOTAL CAPACITY @ ELEV. 939.0
W/1.0FT FREEBOARD=1,268 CY
EST. EXCAVATION=2,000 CY
EST. EMBANKMENT=600 CY
-Y10-
PI Sta 19+76.83
△ = 2° 00' 07.7" (RT)
D = 1° 20' 00.0"
L = 150.16'
T = 75.09'
R = 4,297.18'
PI Sta 23+76.72
△ = 3° 33' 20.6" (RT)
D = 0° 35' 00.0"
L = 609.55'
T = 304.87'
R = 9,822.13'
-Y11-REV2
PIs Sta 22+32.45
θs = 1° 45' 19.4"
Ls = 125.00'
LT = 83.34'
ST = 41.67'
PIs Sta 23+99.12
θs = 1° 45' 19.4"
Ls = 125.00'
LT = 83.34'
ST = 41.67'
PI Sta 24+99.88
△ = 3° 19' 08.1" (LT)
D = 2° 48' 31.0"
L = 118.17'
T = 59.10'
R = 2,040.00'
SE = .05
PIs Sta 26+00.62
θs = 1° 45' 19.4"
Ls = 125.00'
LT = 83.34'
ST = 41.67'
FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 52
FOR -Y11-REV2 PROFILE SEE SHEET 66

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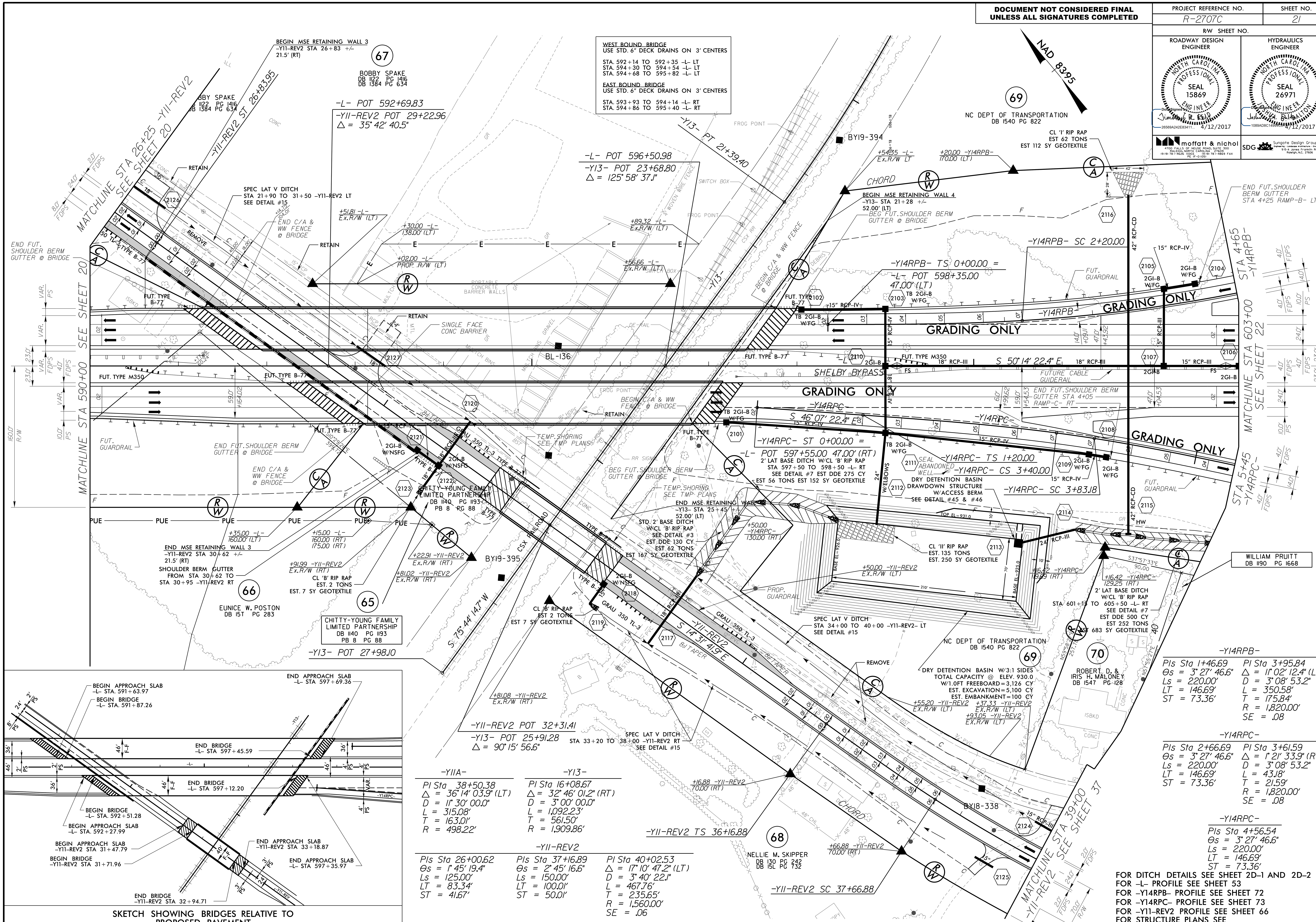
PROJECT REFERENCE NO.	SHEET NO.
R-2707C	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 15869 — 4/12/2017

HYDRAULICS ENGINEER — SEAL 26971 — 4/12/2017

moffatt & nichol — Sungate Design Group, P.A.



-YIIA-
PI Sta 38+50.38
Δ = 36° 14' 03.9" (LT)
D = 11° 30' 00.0"
L = 315.08'
T = 163.01'
R = 498.22'

-YI3-
PI Sta 16+08.67
Δ = 32° 46' 01.2" (RT)
D = 3° 00' 00.0"
L = 1,092.23'
T = 561.50'
R = 1,909.86'

-YII-REV2

PIs Sta 26+00.62	PIs Sta 37+16.89	PI Sta 40+02.53
Θs = 1° 45' 19.4"	Θs = 2° 45' 16.6"	Δ = 17° 10' 47.2" (LT)
Ls = 125.00'	Ls = 150.00'	D = 3° 40' 22.1"
LT = 83.34'	LT = 100.01'	L = 467.76'
ST = 41.67'	ST = 50.01'	T = 235.65'
		R = 1,560.00'
		SE = .06

-YI4RPB-

PIs Sta 1+46.69	PI Sta 3+95.84
Θs = 3° 27' 46.6"	Δ = 11° 02' 12.4" (LT)
Ls = 220.00'	D = 3° 08' 53.2"
LT = 146.69'	L = 350.58'
ST = 73.36'	T = 175.84'
	R = 1,820.00'
	SE = .08

-YI4RPC-

PIs Sta 2+66.69	PI Sta 3+61.59
Θs = 3° 27' 46.6"	Δ = 1° 21' 33.9" (RT)
Ls = 220.00'	D = 3° 08' 53.2"
LT = 146.69'	L = 43.18'
ST = 73.36'	T = 21.59'
	R = 1,820.00'
	SE = .08

-YI4RPC-
PIs Sta 4+56.54
Θs = 3° 27' 46.6"
Ls = 220.00'
LT = 146.69'
ST = 73.36'

FOR DITCH DETAILS SEE SHEET 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 53
FOR -Y14RPB- PROFILE SEE SHEET 72
FOR -Y14RPC- PROFILE SEE SHEET 73
FOR -Y11-REV2 PROFILE SEE SHEET 66
FOR STRUCTURE PLANS SEE

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	22

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 15869 — DocuSigned by: Timothy R. Reid — 26569A242E83411... — 4/12/2017

HYDRAULICS ENGINEER — SEAL 26971 — DocuSigned by: Joshua G. Dalton — 1089AD8C14994C3... — 4/12/2017

moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4869 FAX, PE (F-0105)

Sungate Design Group, P.A., 915-A Jones Franklin Rd., Raleigh, N.C. 27606

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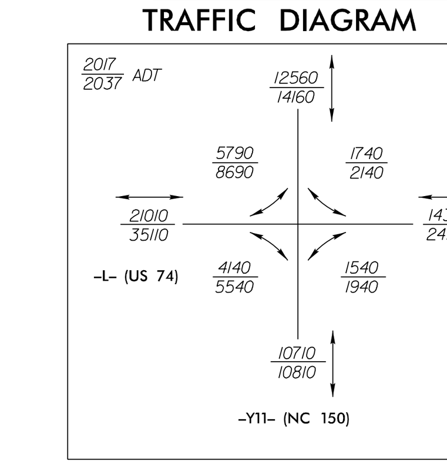
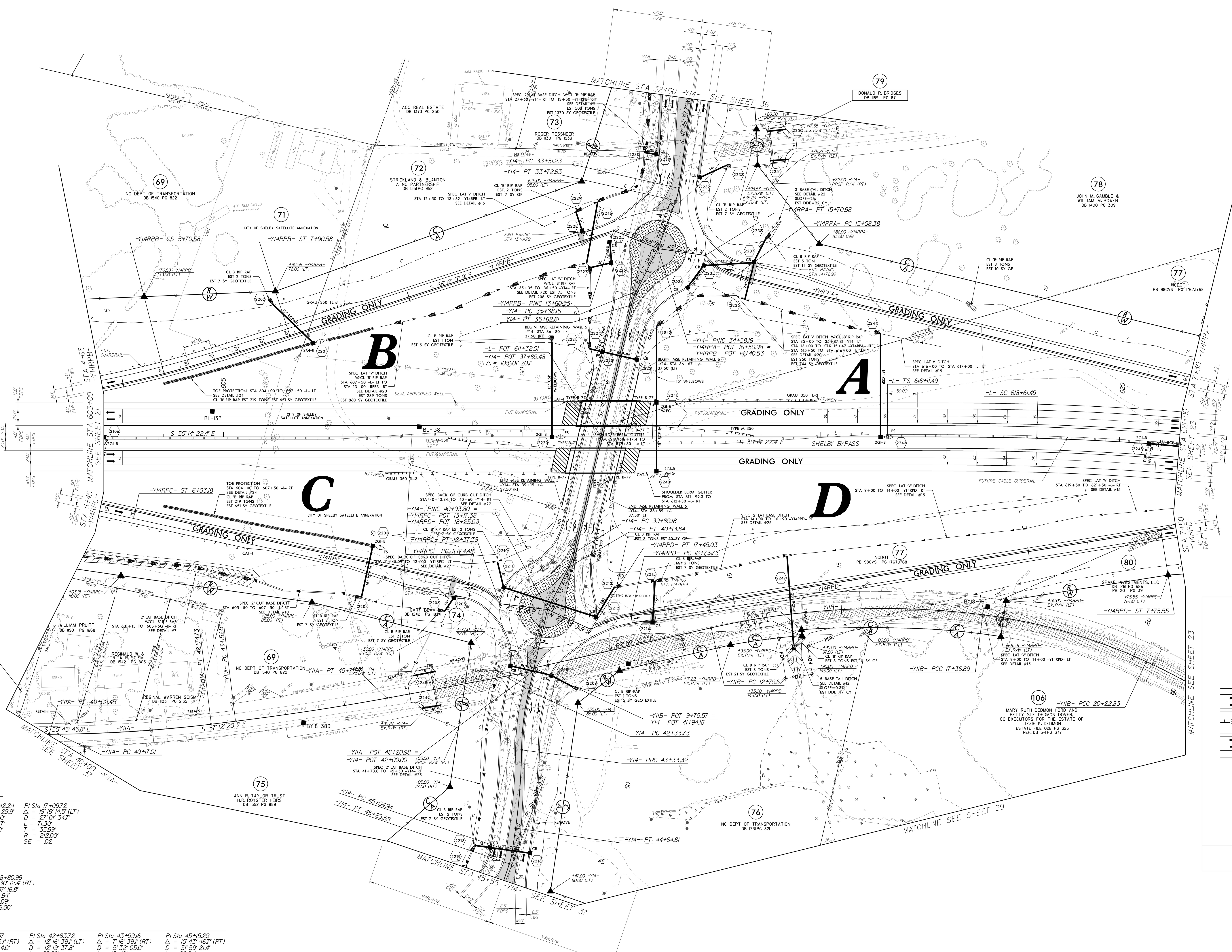
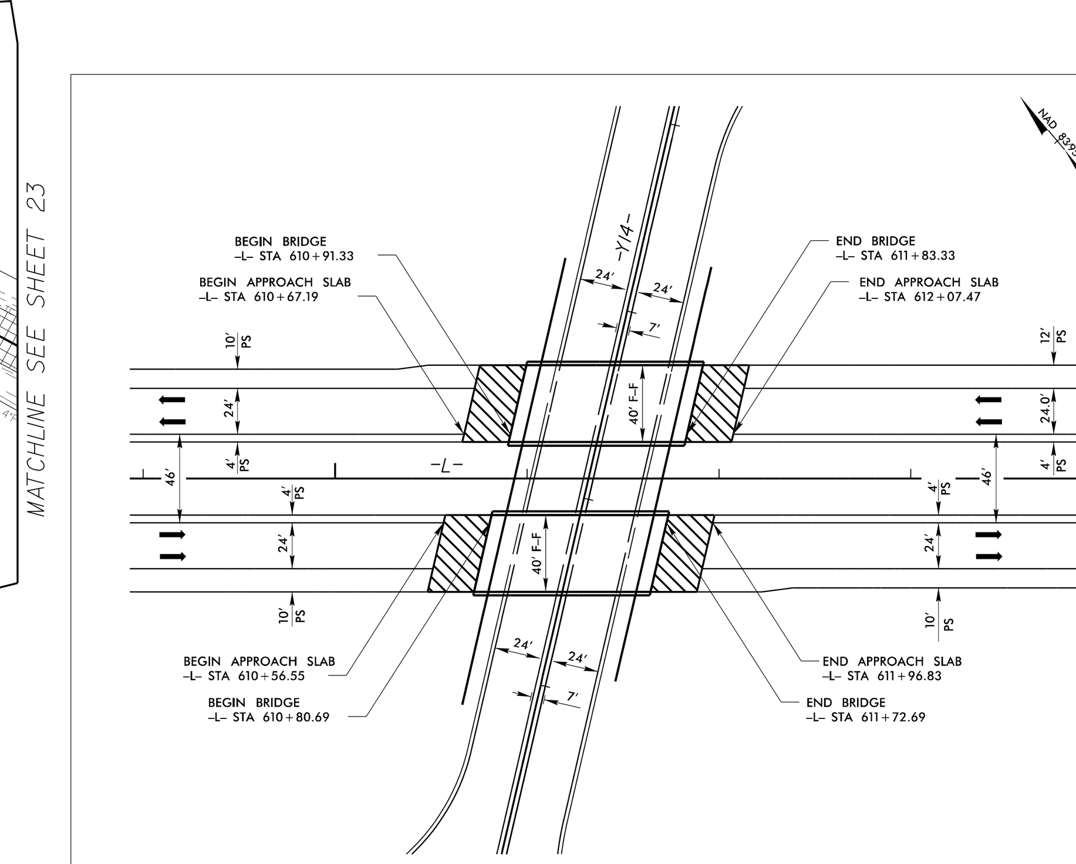
TRAFFIC DIAGRAM







SKETCH SHOWING BRIDGES RELATIVE TO PROPOSED PAVEMENT

-L-

PIs Sta 617+78.16	PI Sta 640+73.56
Θs = 1° 33′ 45.0"	Δ = 51° 31′ 25.8" (RT)
Ls = 250.00′	D = 1° 15′ 00.0"
LT = 166.67′	L = 4,121.91
ST = 83.34′	T = 2,212.07′
	R = 4,583.66′
	SE = .05
	RO = 250′

-Y14RPA-

PI Sta 15+40.81
Δ = 36° 58′ 21.0" (RT)
D = 59° 04′ 04.1"
L = 62.59′
T = 32.43′
R = 97.00′
SE = .02

-Y14RPB-

PI Sta 3+95.84	PIs Sta 6+43.94
Δ = 11° 02′ 12.4" (LT)	Θs = 3° 27′ 46.6"
D = 3° 08′ 53.2"	Ls = 220.00′
L = 350.58′	LT = 146.69′
T = 175.84′	ST = 73.36′
R = 1,820.00′	
SE = .07	
RO = 220	

-Y14RPC-

PIs Sta 4+56.54	PI Sta 12+07.08
Θs = 3° 27′ 46.6"	Δ = 37° 09′ 11.7" (RT)
Ls = 220.00′	D = 59° 04′ 04.1"
LT = 146.69′	L = 62.90′
ST = 73.36′	T = 32.60′
	R = 97.00′
	SE = .07
	RO = 220

-Y14RPD-

PI Sta 3+98.63	PIs Sta 6+42.24	PI Sta 17+09.72
Δ = 13° 43′ 05.4" (LT)	Θs = 3° 51′ 29.9"	Δ = 19° 16′ 14.5" (LT)
D = 3° 51′ 29.9"	Ls = 200.00′	D = 27° 01′ 34.7"
L = 355.55′	LT = 133.37′	L = 71.30′
T = 178.63′	ST = 66.70′	T = 35.99′
R = 1,485.00′		R = 212.00′
SE = .08		SE = .02
RO = 200		

-Y11A-

PI Sta 41+46.01	PI Sta 44+43.85
Δ = 6° 26′ 34.8" (LT)	Δ = 3° 25′ 03.5" (LT)
D = 2° 30′ 00.0"	D = 1° 20′ 00.0"
L = 257.72′	L = 256.32′
T = 129.00′	T = 128.20′
R = 2,291.83′	R = 4,297.18′

-Y11B-

PI Sta 15+10.60	PI Sta 18+80.99
Δ = 20° 00′ 00.0" (RT)	Δ = 17° 30′ 12.4" (RT)
D = 4° 22′ 25.4"	D = 6° 07′ 16.8"
L = 457.28′	L = 285.94′
T = 230.99′	T = 144.09′
R = 1,310.00′	R = 936.00′

-Y14-

PI Sta 29+70.06	PI Sta 33+61.97	PI Sta 35+50.54	PI Sta 40+01.57	PI Sta 42+83.72	PI Sta 43+99.16	PI Sta 45+15.29
Δ = 5° 00′ 00.0" (LT)	Δ = 12° 15′ 39.5" (RT)	Δ = 13° 46′ 54.8" (LT)	Δ = 13° 46′ 55.1" (RT)	Δ = 12° 16′ 39.1" (LT)	Δ = 7° 16′ 39.1" (RT)	Δ = 10° 43′ 46.7" (RT)
D = 1° 53′ 31.9"	D = 57° 17′ 44.8"	D = 55° 53′ 54.0"	D = 55° 53′ 54.0"	D = 12° 19′ 37.8"	D = 5° 32′ 05.0"	D = 51° 59′ 21.4"
L = 264.24′	L = 21.40′	L = 24.66′	L = 24.66′	L = 99.60′	L = 131.49′	L = 20.64′
T = 132.21′	T = 10.74′	T = 12.39′	T = 12.39′	T = 49.99′	T = 65.83′	T = 10.35′
R = 3,028.00′	R = 100.00′	R = 102.50′	R = 102.50′	R = 464.79′	R = 1,035.21′	R = 110.21′
SE = .02	SE = .02	SE = .02	SE = .02	SE = .02	SE = .02	SE = .02

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR ROUNDABOUT DETAILS SEE SHEETS 2B-5 & 2B-6
FOR -L- PROFILE SEE SHEET 54
FOR -Y14- PROFILE SEE SHEET 69
FOR -Y14RPA- PROFILE SEE SHEET 71
FOR -Y14RPB- PROFILE SEE SHEET 72
FOR -Y14RPC- PROFILE SEE SHEET 73
FOR -Y14RPD- PROFILE SEE SHEETS 73 & 74
FOR STRUCTURE PLANS SEE

GRAPHIC SCALE: 50 25 0 50 100 — PLANS

LOCATION:	INTERCHANGE AT -L- US 74 BYPASS AND -Y14- NC 150
TIP NO.: R-2707C	COUNTY: CLEVELAND
DESIGNED BY:	T. HUFFMAN
CHECKED BY: T. REID	DATE: 7/7/15

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	23

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017

moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609

SDG Sungate Design Group, P.A. — 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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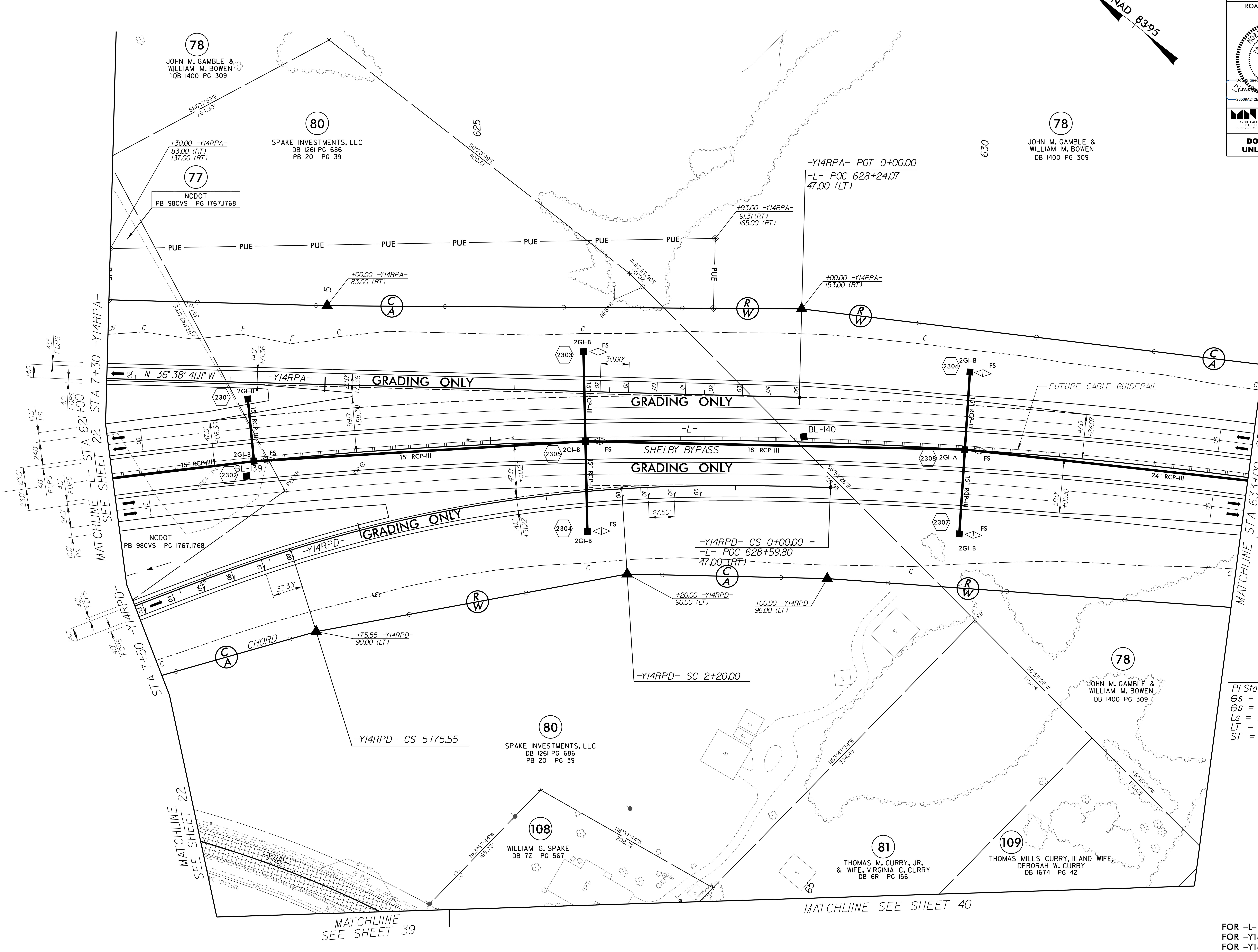
NAD 83/95



-L-
PI Sta 640+73.56
Δ = 51° 31' 25.8" (RT)
D = 1° 15' 00.0"
L = 4,121.91
T = 2,212.07'
R = 4,583.66'
SE = .05

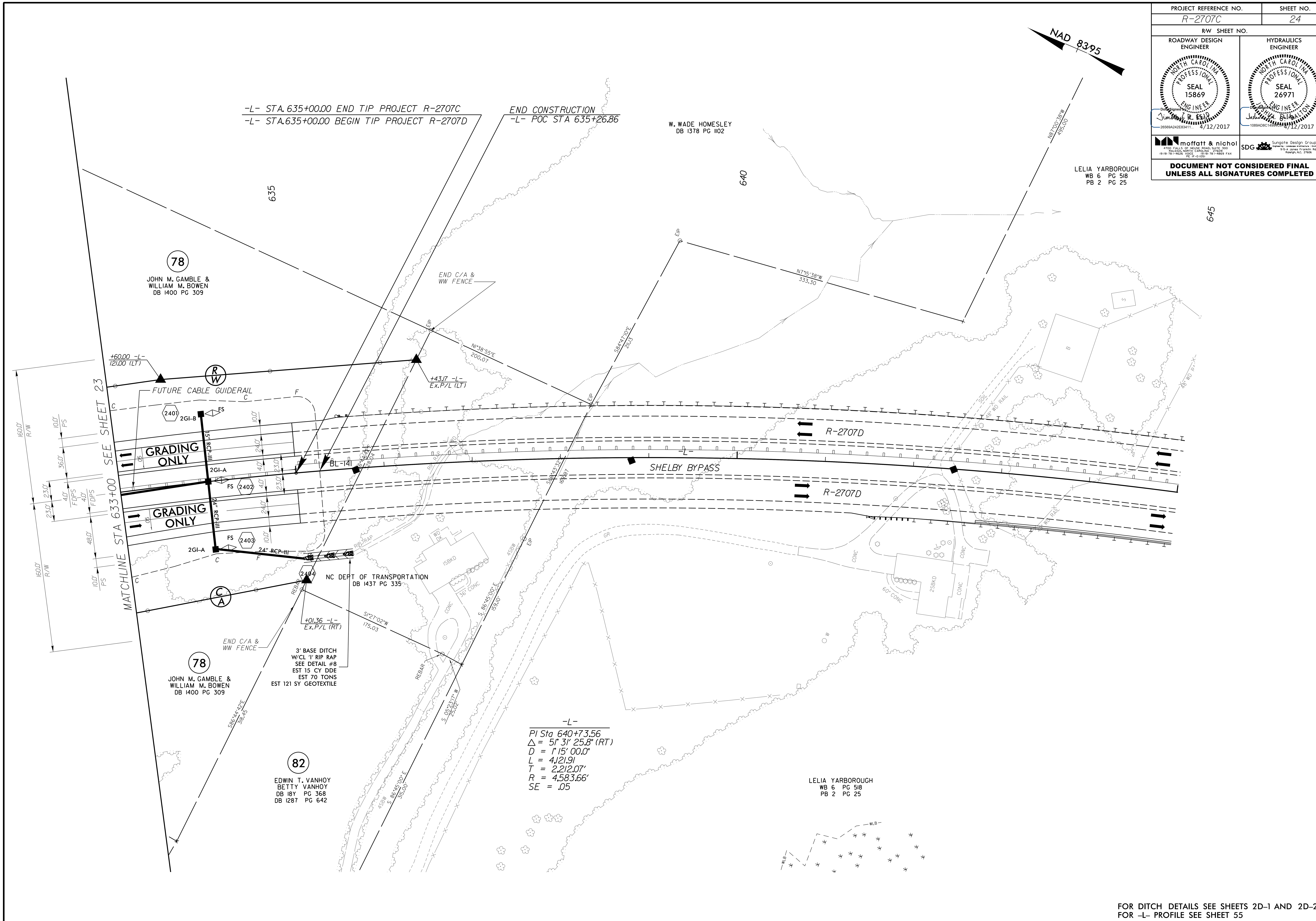
-Y14RPD-

PI Sta 1+28.67	PI Sta 3+98.63
θs = 1° 15' 46.6"	Δ = 13° 43' 05.4" (LT)
θs = 3° 51' 29.9"	D = 3° 51' 29.9"
Ls = 220.00'	L = 355.55'
LT = 128.67'	T = 178.63'
ST = 91.50'	R = 1,485.00'
	SE = .08
	RO = 200'

-Y14RPD-
PI Sta 6+42.24
θs = 3° 51' 29.9"
Ls = 200.00'
LT = 133.37'
ST = 66.70'

-Y11B-
PI Sta 22+25.61
Δ = 20° 00' 00.0" (RT)
D = 4° 58' 56.1"
L = 401.43'
T = 202.78'
R = 1,150.00'

FOR -L- PROFILE SEE SHEET 55
FOR -Y14RPA- PROFILE SEE SHEET 71
FOR -Y14RPD- PROFILE SEE SHEET 73


PROJECT REFERENCE NO.
SHEET NO.
R-2707C
24
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER
4/12/2017
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER
4/12/2017
moffatt & nichol
Sungate Design Group, P.A.
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NAD 83/95
-L- STA. 635+00.00 END TIP PROJECT R-2707C
-L- STA. 635+00.00 BEGIN TIP PROJECT R-2707D
END CONSTRUCTION
-L- POC STA 635+26.86
W. WADE HOMESLEY
DB 1378 PG 1102
LELIA YARBOROUGH
WB 6 PG 518
PB 2 PG 25
635
640
645
78
JOHN M. GAMBLE &
WILLIAM M. BOWEN
DB 1400 PG 309
END C/A &
WW FENCE
+60.00 -L-
121.00 (LT)
+43.17 -L-
Ex.P/L (LT)
FUTURE CABLE GUIDERAIL
SEE SHEET 23
MATCHLINE STA 633+00
GRADING ONLY
GRADING ONLY
2GI-B
2GI-A
2GI-A
FS
2401
2402
2403
2404
15" RCP-III
24" RCP-III
24" RCP-III
BL-141
R-2707D
R-2707D
-L-
SHELBY BYPASS
160.0' R/W
160.0' R/W
NC DEPT OF TRANSPORTATION
DB 1437 PG 335
+01.36 -L-
Ex.P/L (RT)
END C/A &
WW FENCE
3' BASE DITCH
W/CL 'I' RIP RAP
SEE DETAIL #8
EST 15 CY DDE
EST 70 TONS
EST 121 SY GEOTEXTILE
78
JOHN M. GAMBLE &
WILLIAM M. BOWEN
DB 1400 PG 309
82
EDWIN T. VANHOY
BETTY VANHOY
DB 18Y PG 368
DB 1287 PG 642
-L-
PI Sta 640+73.56
△ = 51° 31' 25.8" (RT)
D = 1° 15' 00.0"
L = 4,121.91
T = 2,212.07'
R = 4,583.66'
SE = .05
LELIA YARBOROUGH
WB 6 PG 518
PB 2 PG 25
FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -L- PROFILE SEE SHEET 55

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017
moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE (919) 781-4869 FAX, PE (F-0105)	SDG Sungate Design Group, P.A., Engineering - Landscape Architecture - Environmental, 915-A Jones Franklin Rd., Raleigh, N.C. 27606

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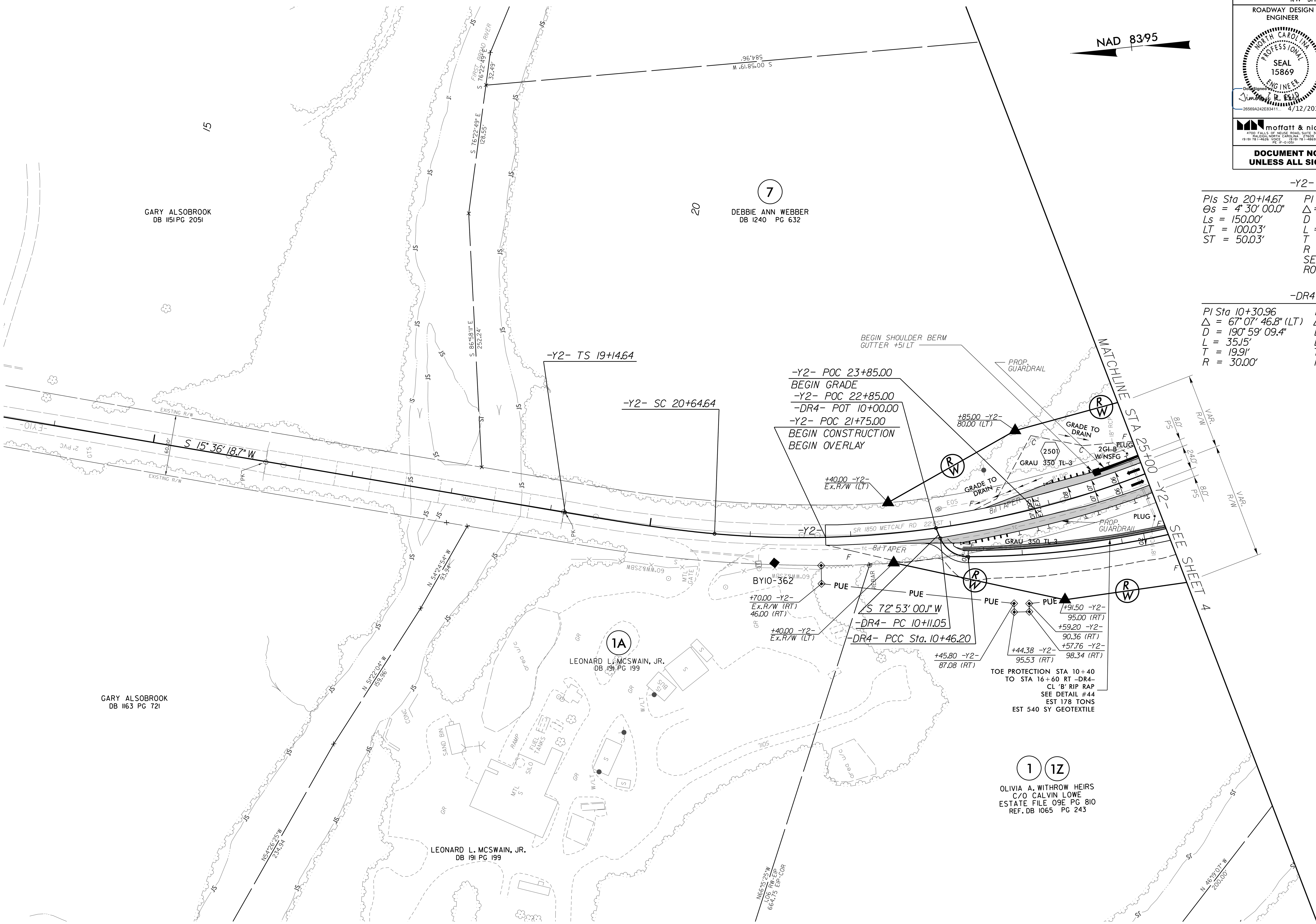


-Y2-

PIs Sta 20+14.67	PI Sta 31+27.15
Θs = 4° 30' 00.0"	Δ = 96° 06' 18.7" (LT)
Ls = 150.00'	D = 6° 00' 00.0"
LT = 100.03'	L = 1,601.75
ST = 50.03'	T = 1,062.52'
	R = 954.93'
	SE = .06
	RO = 150'

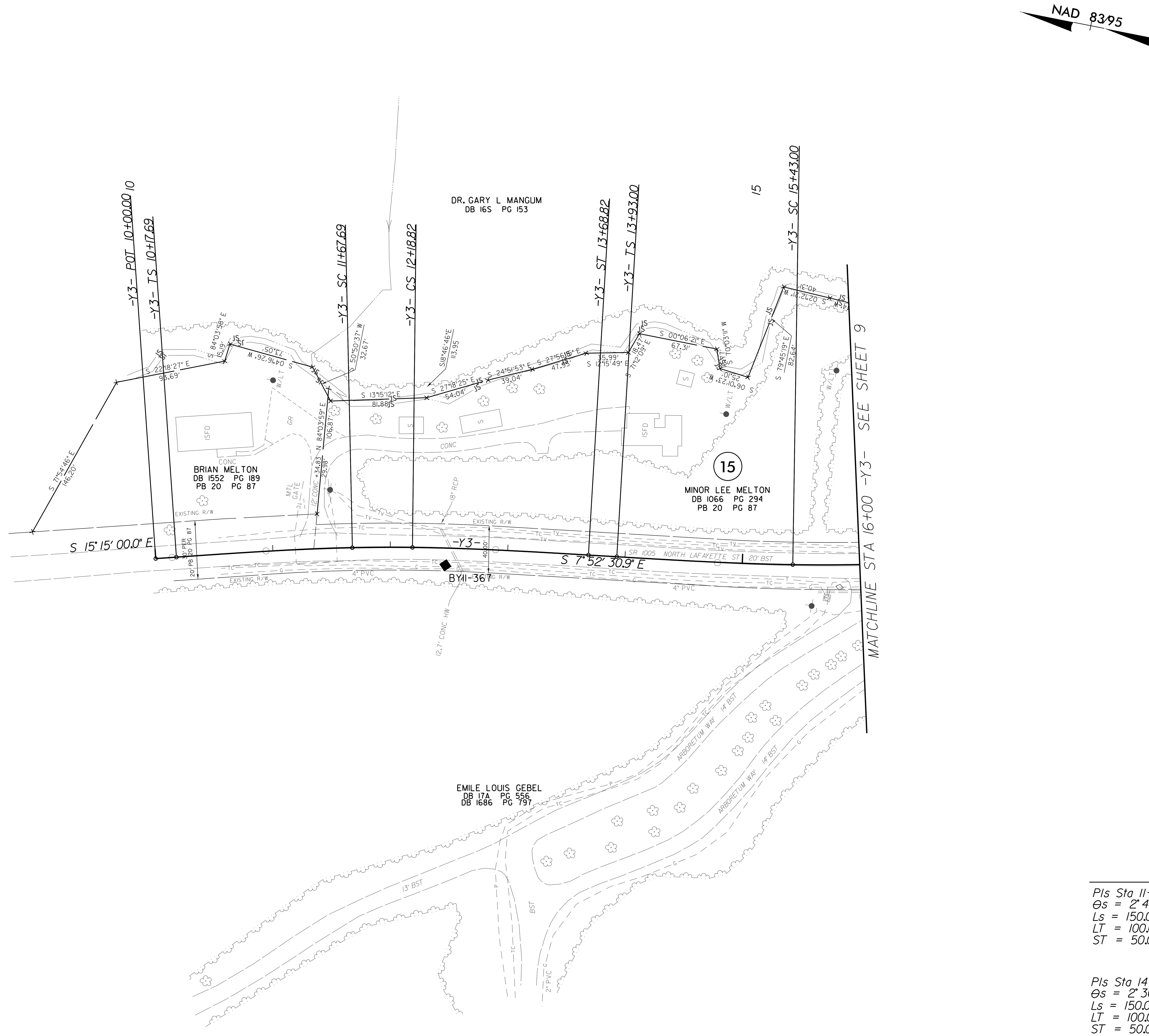
-DR4-

PI Sta 10+30.96	PI Sta 12+14.82
Δ = 67° 07' 46.8" (LT)	Δ = 20° 20' 22.3" (LT)
D = 190° 59' 09.4"	D = 6° 05' 43.1"
L = 35.15'	L = 333.69'
T = 19.91'	T = 168.62'
R = 30.00'	R = 940.00'

FOR -Y2- PROFILE SEE SHEET 56

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017
moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609	SDG Sungate Design Group, P.A., 915-A Jones Franklin Rd, Raleigh, N.C. 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y3-

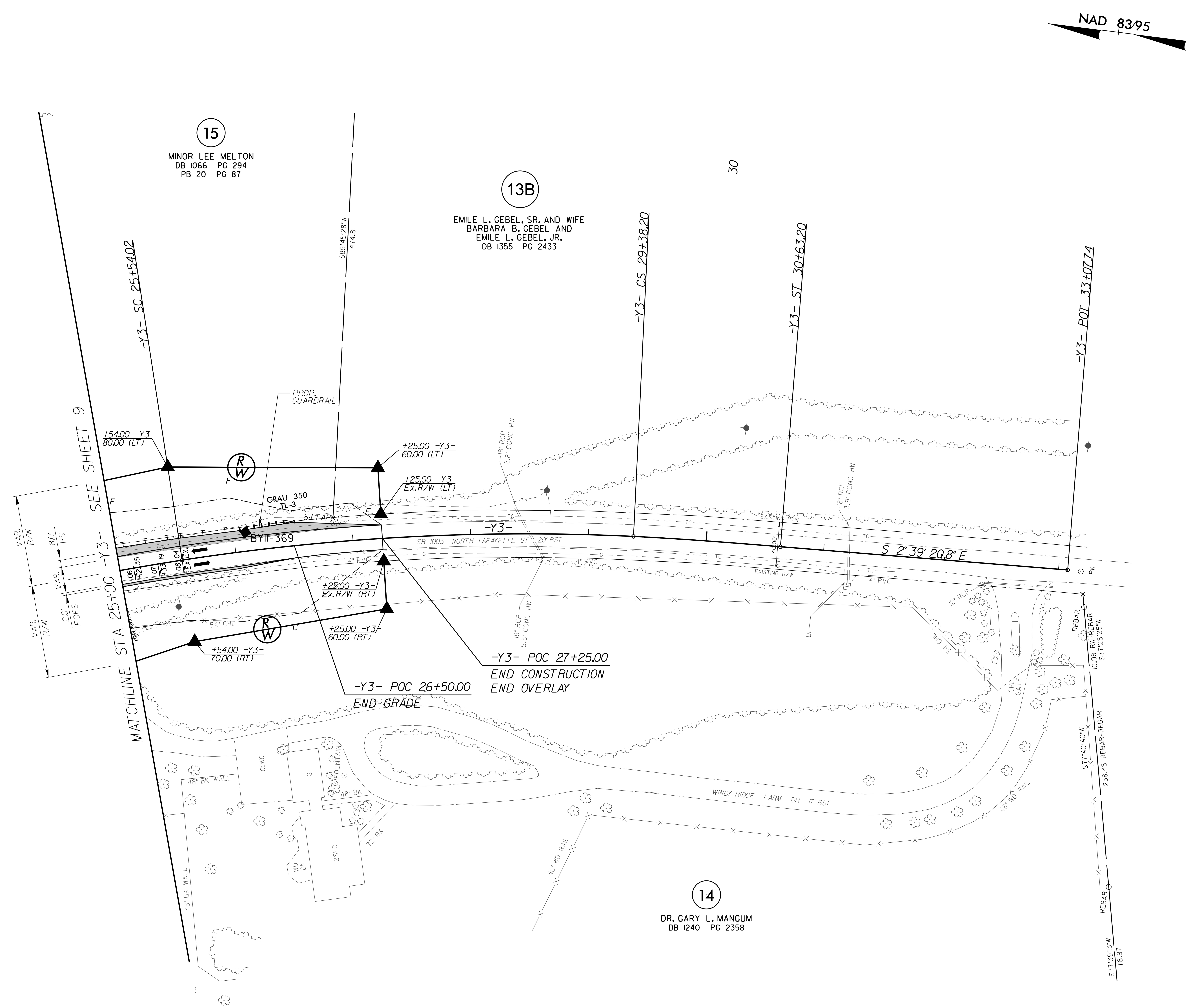
PIs Sta 11+17.70	PI Sta 11+93.26	PIs Sta 12+68.83
Θs = 2° 45' 00.0"	Δ = 1° 52' 29.1" (RT)	Θs = 2° 45' 00.0"
Ls = 150.00'	D = 3° 40' 00.0"	Ls = 150.00'
LT = 100.01'	L = 51.13	LT = 100.01'
ST = 50.01'	T = 25.57'	ST = 50.01'
	R = 1,562.61'	

PIs Sta 14+93.01	PI Sta 16+18.88
Θs = 2° 30' 00.0"	Δ = 5° 03' 21.5" (LT)
Ls = 150.00'	D = 3° 20' 00.0"
LT = 100.01'	L = 151.68
ST = 50.01'	T = 75.89'
	R = 1,718.87'

FOR -Y3- PROFILE SEE SHEET 56

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER 4/12/2017	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER 4/12/2017
moffatt & nichol	SDG Sungate Design Group, P.A.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y3-

PIs Sta 25+12.36	PI Sta 27+46.76	PIs Sta 29+79.88
Θs = 1° 52' 30.0"	Δ = 11° 31' 31.6" (RT)	Θs = 1° 52' 30.0"
Ls = 125.00'	D = 3° 00' 00.0"	Ls = 125.00'
LT = 83.34'	L = 384.18	LT = 83.34'
ST = 41.67'	T = 192.74'	ST = 41.67'
	R = 1,909.86'	
	SE = EXIST.	

FOR -Y3- PROFILE SEE SHEET 56

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	28
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON DocuSigned by: Joshua G. Dalton 1089AD8C14994C3... 4/12/2017
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX PE (F-0105)	SDG Sungate Design Group, P.A. Engineering - Landscape Architecture - Environmental 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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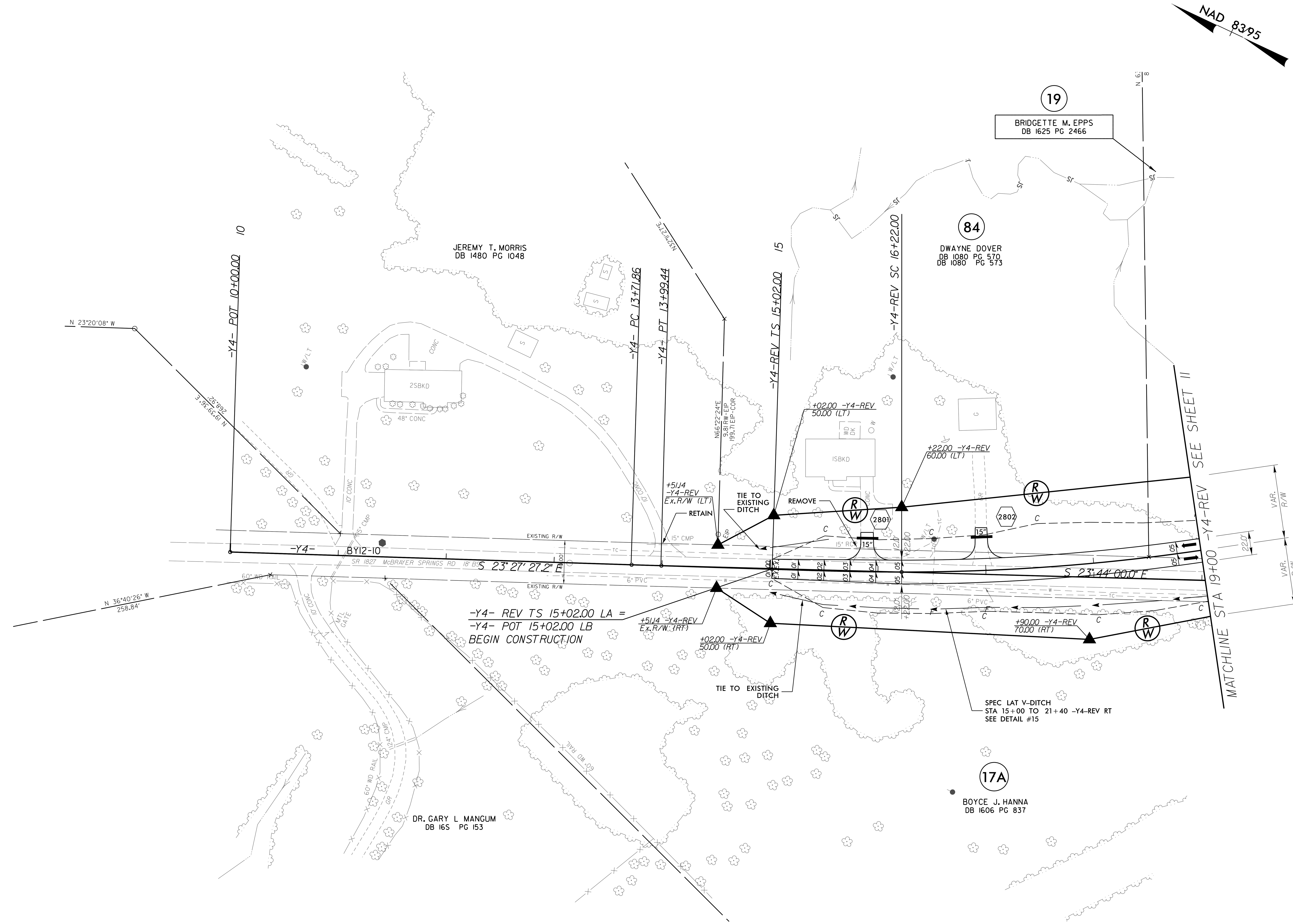

-Y4-

PI Sta 13+85.65
Δ = 0° 16' 32.7" (LT)
D = 1° 00' 00.0"
L = 27.58'
T = 13.79'
R = 5,729.58'

-Y4-REV

PIs Sta 15+82.00	PI Sta 18+44.49
Θs = 1° 48' 00.0"	Δ = 13° 17' 22.9" (LT)
Ls = 120.00'	D = 3° 00' 00.0"
LT = 80.00'	L = 442.99
ST = 40.00'	T = 222.49'
	R = 1,909.86'
	SE = .05
	RO = 120'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y4-REV PROFILE SEE SHEET 57

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	29
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER — DocuSigned by: Timothy R. Reid — 26569A242E83411... 4/12/2017	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — DocuSigned by: Joshua G. Dalton — 1089AD8C14994C3... 4/12/2017
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX PE (F-0105)	SDG Sungate Design Group, P.A. Engineering - Landscape Architecture - Environmental 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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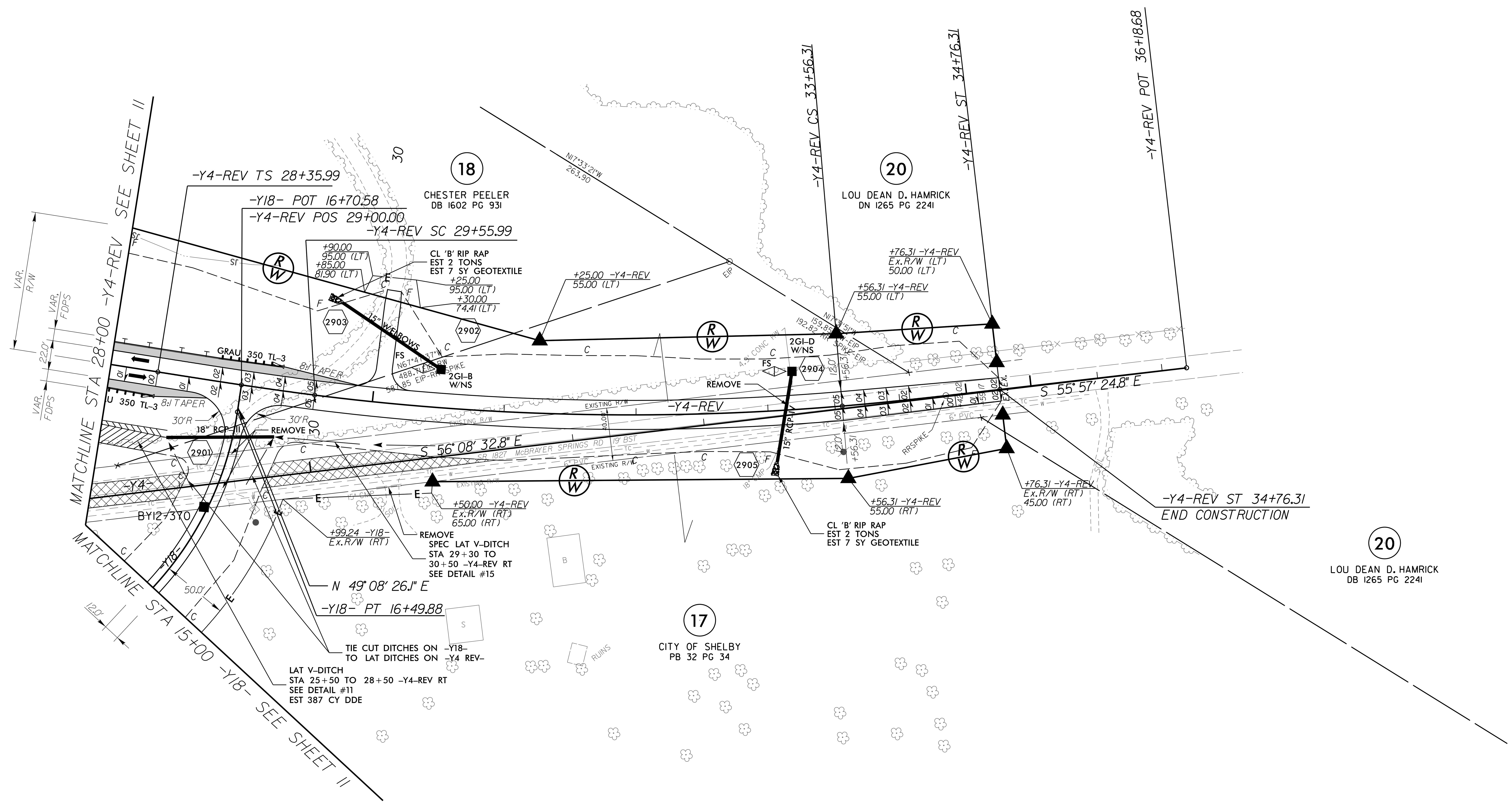
NAD 83/95



-Y4-REV			-Y18-
PIs Sta 29+15.99	PI Sta 31+56.89	PIs Sta 33+96.31	PI Sta 15+25.20
Θs = 1° 48' 00.0"	Δ = 12° 00' 34.7" (LT)	Θs = 1° 48' 00.0"	Δ = 65° 15' 10.8" (LT)
Ls = 120.00'	D = 3° 00' 00.0"	Ls = 120.00'	D = 22° 55' 05.9"
LT = 80.00'	L = 400.32	LT = 80.00'	L = 284.72'
ST = 40.00'	T = 200.90'	ST = 40.00'	T = 160.04'
	R = 1,909.86'		R = 250.00'
	SE = .05		
	RO = 120'		

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y4-REV PROFILE SEE SHEET 57
FOR -Y18- PROFILE SEE SHEET 76

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	30
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON — DocuSigned by: Joshua G. Dalton 1089AD8C14994C3... 4/12/2017
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX PE (F-0105)	SDG Sungate Design Group, P.A. Engineering - Landscape Architecture - Environmental 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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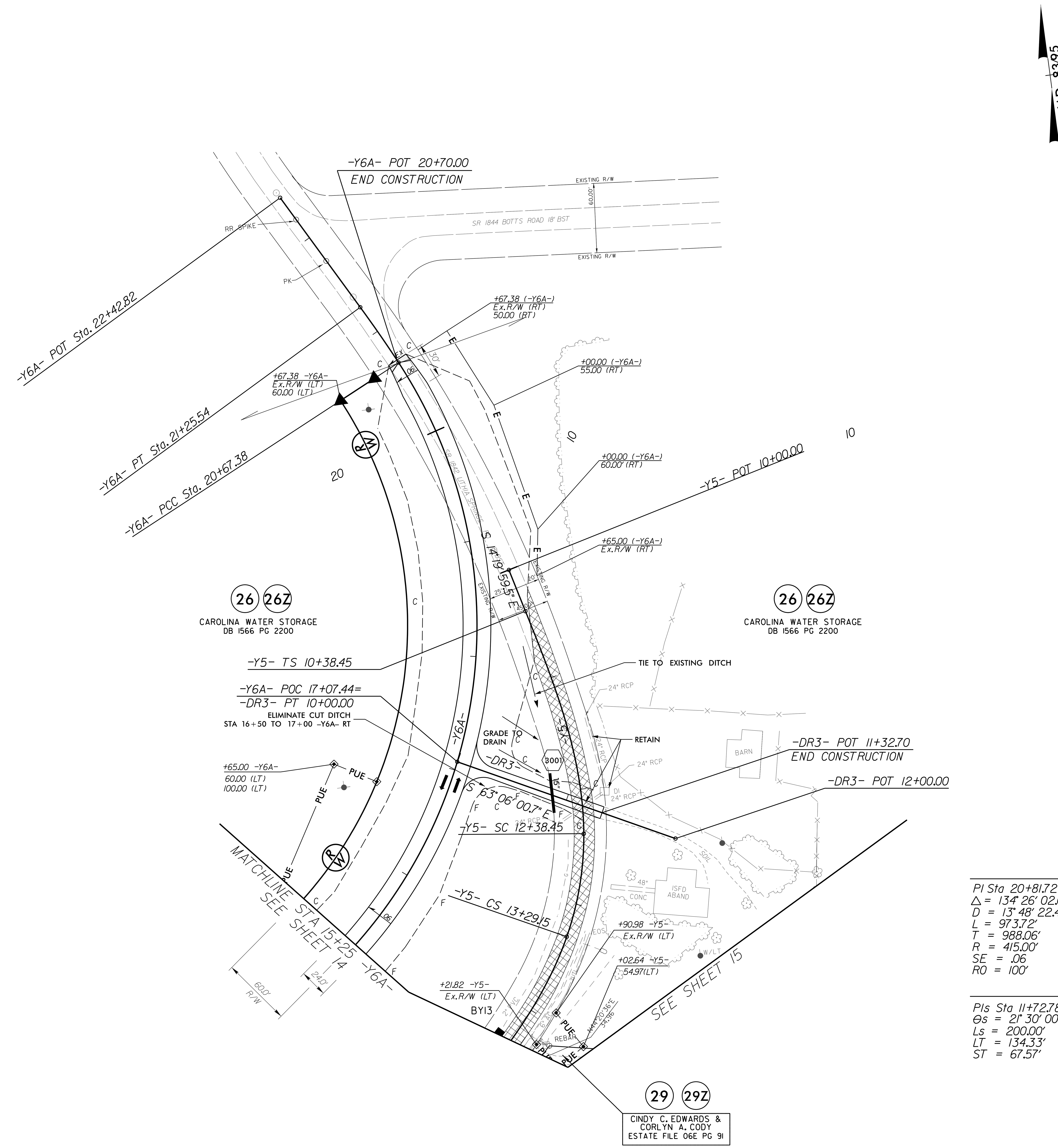

-Y6A-

PI Sta 20+81.72
Δ = 134° 26' 02.0" (LT)
D = 13° 48' 22.4"
L = 973.72'
T = 988.06'
R = 415.00'
SE = .06
RO = 100'

PI Sta 20+96.47
Δ = 3° 00' 07.2" (LT)
D = 5° 09' 42.4"
L = 58.16'
T = 29.09'
R = 1110.00'
SE = .05
RO = EXIST.

-Y5-

PIs Sta 11+72.78
θs = 21° 30' 00.0"
Ls = 200.00'
LT = 134.33'
ST = 67.57'

PI Sta 12+84.24
Δ = 19° 29' 59.5" (RT)
D = 21° 30' 00.0"
L = 90.70'
T = 45.79'
R = 266.49

PIs Sta 13+96.72
θs = 21° 30' 00.0"
Ls = 200.00'
LT = 134.33'
ST = 67.57'

FOR -Y6A- PROFILE SEE SHEET 58
FOR -DR3- PROFILE SEE SHEET 58

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017

moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609

SDG Sungate Design Group, P.A. — 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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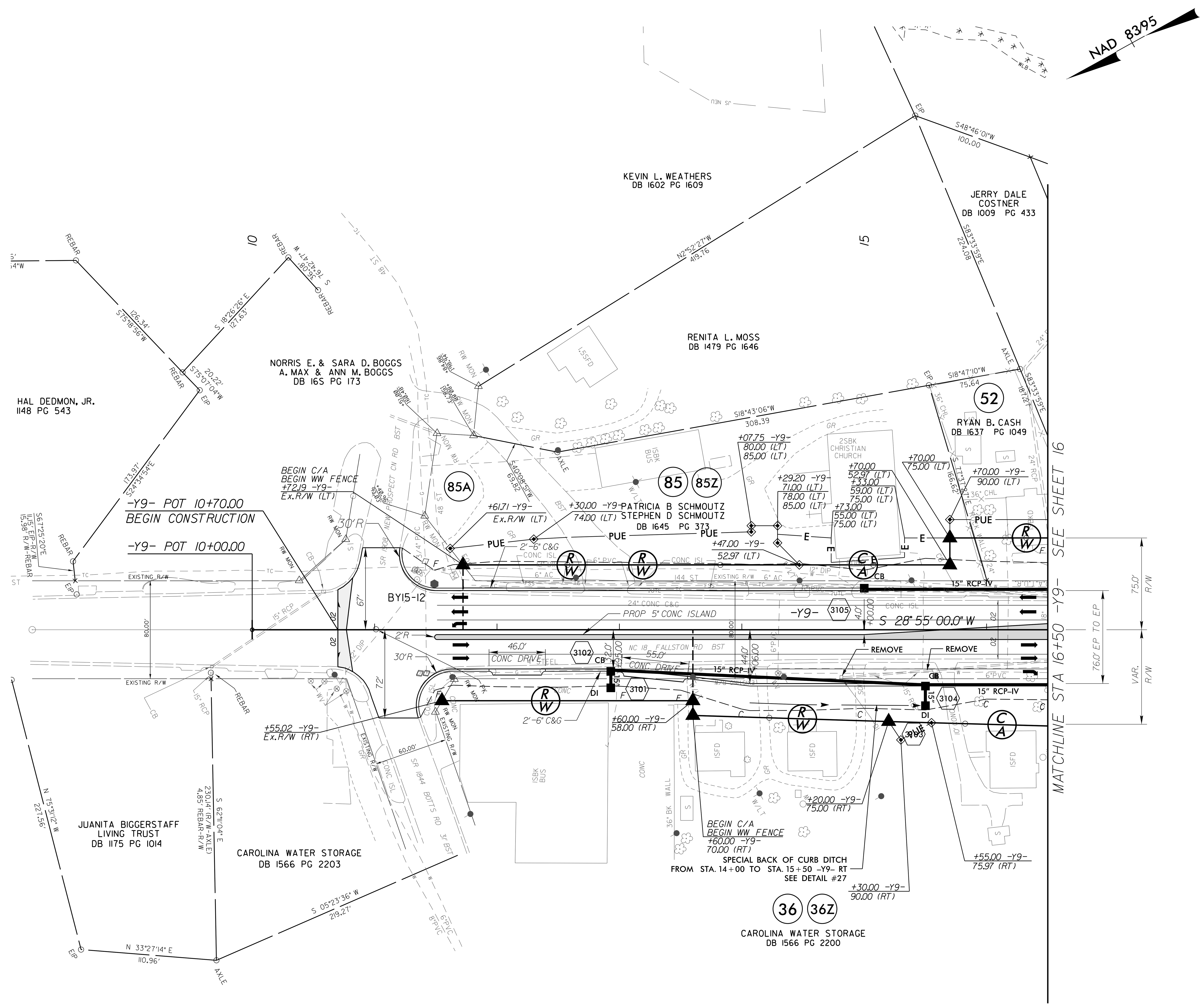
NAD 83/95
KEVIN L. WEATHERS
DB 1602 PG 1609
JERRY DALE COSTNER
DB 1009 PG 433
RENITA L. MOSS
DB 1479 PG 1646
NORRIS E. & SARA D. BOGGS
A. MAX & ANN M. BOGGS
DB 165 PG 173
HAL DEDMON, JR.
1148 PG 543
RYAN B. CASH
DB 1637 PG 1049
PATRICIA B SCHMOUTZ
STEPHEN D SCHMOUTZ
DB 1645 PG 373
-Y9- POT 10+70.00
BEGIN CONSTRUCTION
-Y9- POT 10+00.00
BEGIN C/A
BEGIN WW FENCE
S 28° 55' 00.0" W
PROP 5' CONC ISLAND
JUANITA BIGGERSTAFF
LIVING TRUST
DB 1175 PG 1014
CAROLINA WATER STORAGE
DB 1566 PG 2203
SPECIAL BACK OF CURB DITCH
FROM STA. 14+00 TO STA. 15+50 -Y9- RT
SEE DETAIL #27
CAROLINA WATER STORAGE
DB 1566 PG 2200
MATCHLINE STA 16+50 -Y9- SEE SHEET 16

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y9- PROFILE SEE SHEET 60

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 15869 NORTH CAROLINA PROFESSIONAL ENGINEER 4/12/2017	SEAL 26971 NORTH CAROLINA PROFESSIONAL ENGINEER 4/12/2017
moffatt & nichol	SDG Sungate Design Group, P.A.

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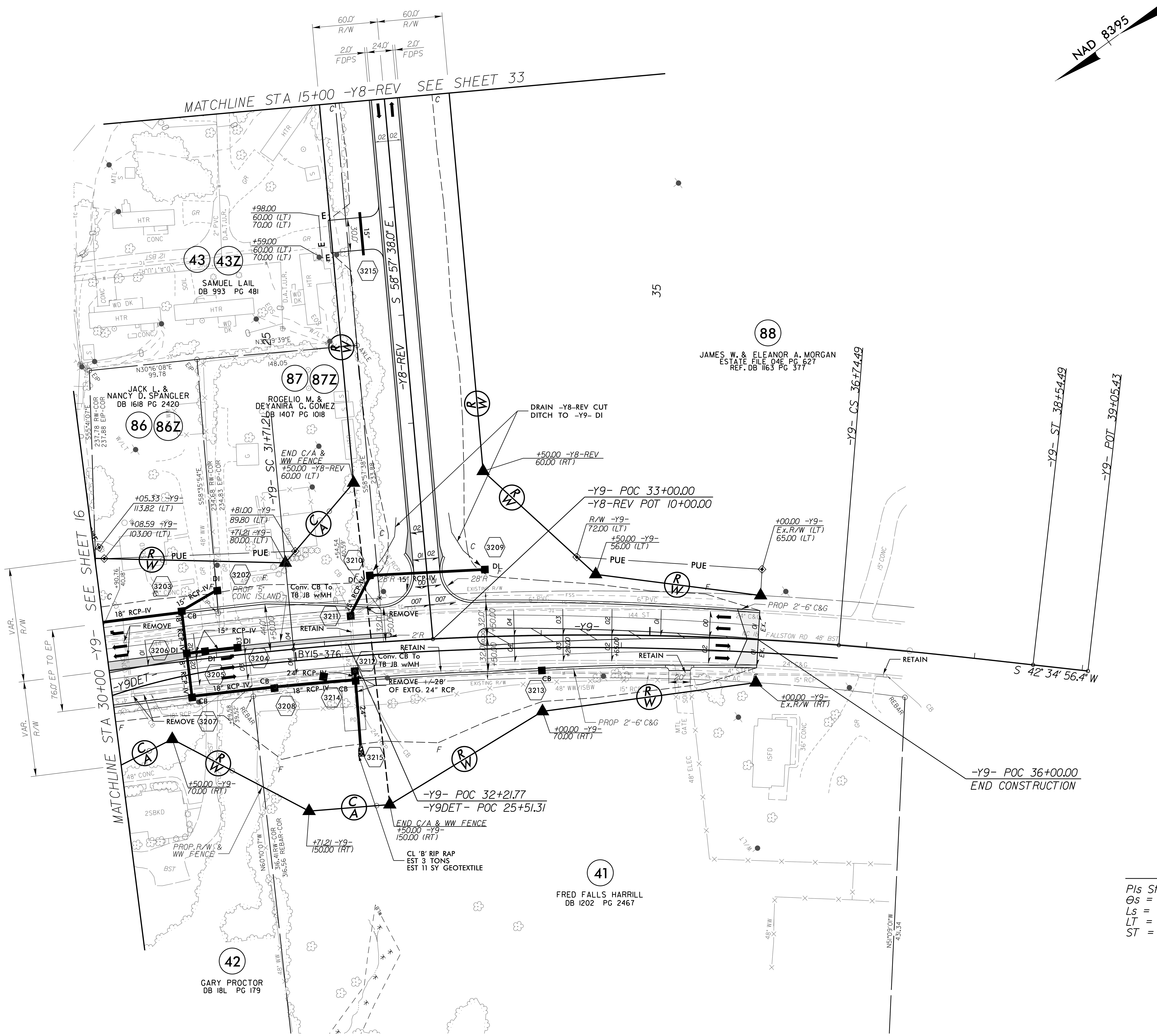

-Y9- DETOUR

PI Sta 23+74.52
△ = 25° 07' 00.2" (RT)
D = 6° 59' 14.2"
L = 359.46'
T = 182.67'
R = 820.00'

-Y9-

PIs Sta 31+11.21	PI Sta 34+23.50	PIs Sta 37+34.50
Θs = 1° 48' 00.0"	△ = 10° 03' 56.4" (RT)	Θs = 1° 48' 00.0"
Ls = 180.00'	D = 2° 00' 00.0"	Ls = 180.00'
LT = 120.01'	L = 503.28	LT = 120.01'
ST = 60.01'	T = 252.29'	ST = 60.01'
	R = 2,864.79'	
	SE = .04	
	RO = 180'	

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y9- DETOUR DETAILS SEE SHEET 2B-2
FOR -Y8-REV PROFILE SEE SHEET 59
FOR -Y9- PROFILE SEE SHEET 60

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017
moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609	SDG Sungate Design Group, P.A., Raleigh, N.C. 27606

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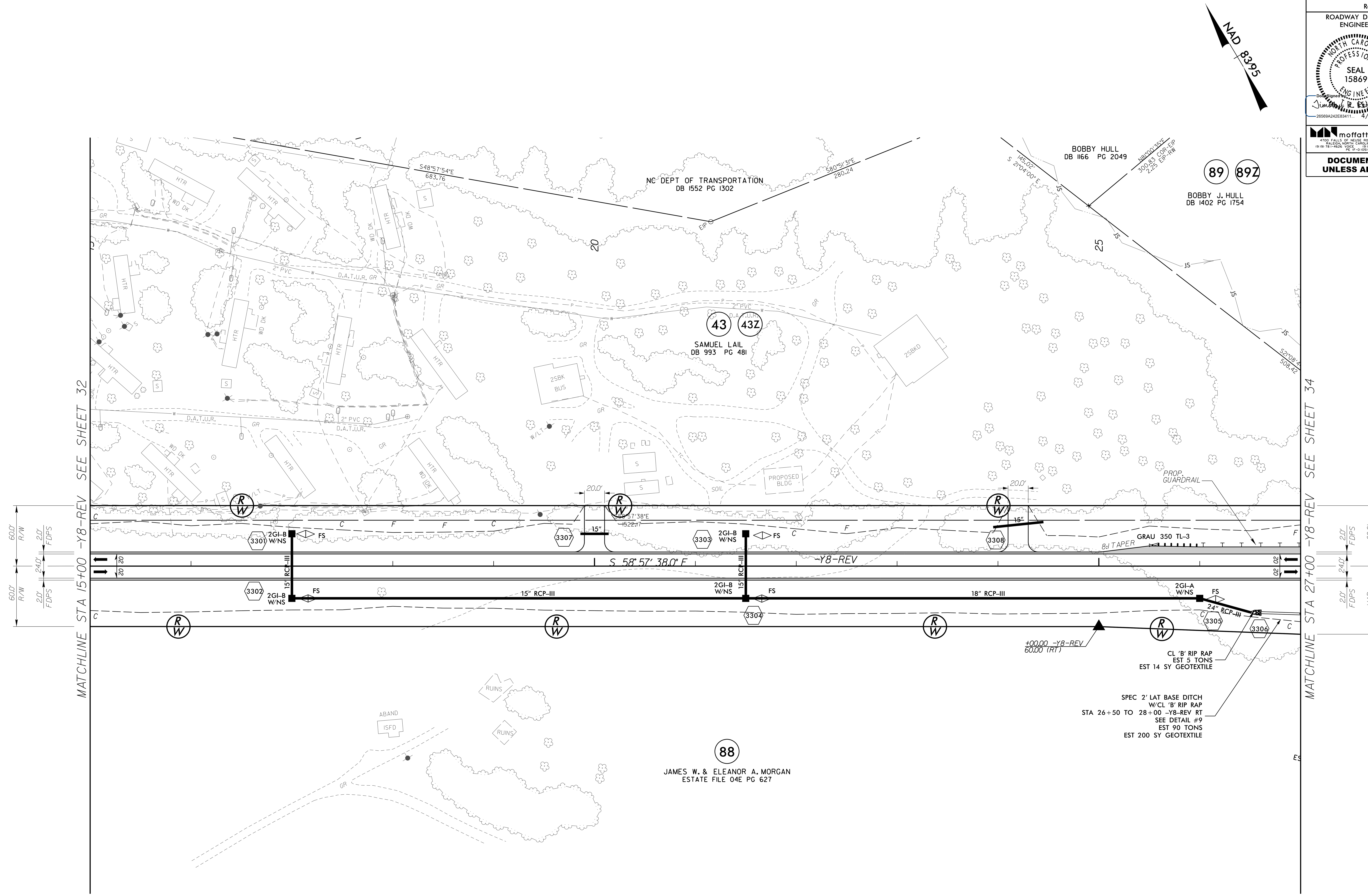

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y8-REV PROFILE SEE SHEET 59

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	34
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017

moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609

SDG Sungate Design Group, P.A. — 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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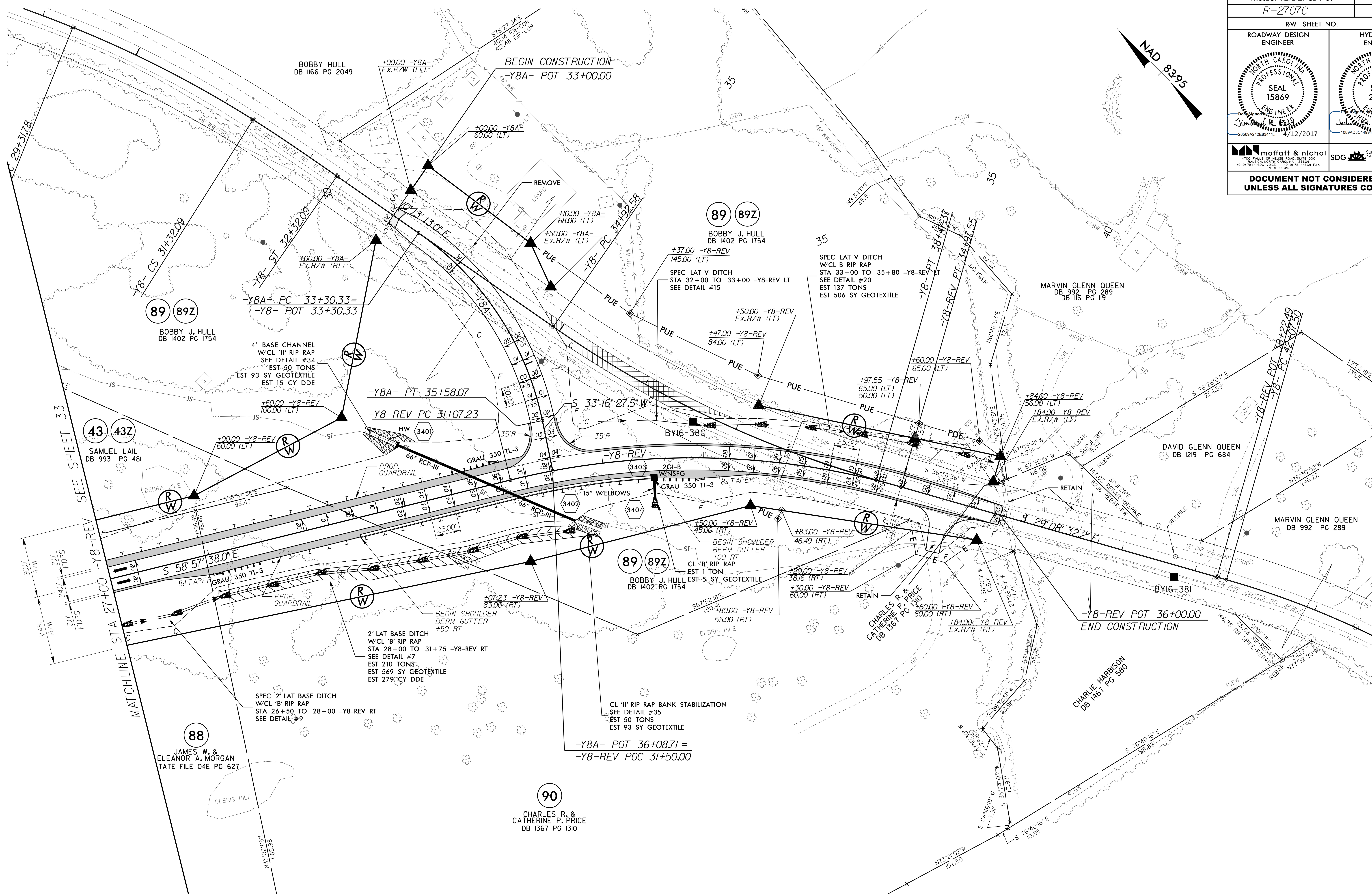

NAD 83/95
BEGIN CONSTRUCTION
-Y8A- POT 33+00.00
BOBBY HULL
DB 1166 PG 2049
-Y8- CS 31+32.09
-Y8- ST 32+32.09
-Y8A- PC 33+30.33=
-Y8- POT 33+30.33
BOBBY J. HULL
DB 1402 PG 1754
4' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #34
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 15 CY DDE
-Y8A- PT 35+58.07
-Y8-REV PC 31+07.23
S 33° 16' 27.5" W
SAMUEL LAIL
DB 993 PG 481
SEE SHEET 33
MATCHLINE STA 27+00 -Y8-REV
S 58° 57' 38.0" E
2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 28+00 TO 31+75 -Y8-REV RT
SEE DETAIL #7
EST 210 TONS
EST 569 SY GEOTEXTILE
EST 279 CY DDE
SPEC 2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 26+50 TO 28+00 -Y8-REV RT
SEE DETAIL #9
CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 50 TONS
EST 93 SY GEOTEXTILE
-Y8A- POT 36+08.71 =
-Y8-REV POC 31+50.00
JAMES W. &
ELEANOR A. MORGAN
ESTATE FILE 04E PG 627
CHARLES R. &
CATHERINE P. PRICE
DB 1367 PG 1310
SPEC LAT V DITCH
STA 32+00 TO 33+00 -Y8-REV LT
SEE DETAIL #15
SPEC LAT V DITCH
W/CL B RIP RAP
STA 33+00 TO 35+80 -Y8-REV LT
SEE DETAIL #20
EST 137 TONS
EST 506 SY GEOTEXTILE
-Y8- PT 38+44.37
-Y8-REV PT 34+97.55
-Y8-REV POT 38+22.49
-Y8- PC 40+10.50
MARVIN GLENN QUEEN
DB 992 PG 289
DB 115 PG 119
DAVID GLENN QUEEN
DB 1219 PG 684
CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE
BYI6-380
BYI6-381
S 29° 08' 32.2" E
-Y8-REV POT 36+00.00
END CONSTRUCTION
CHARLIE HARBISON
DB 1467 PG 580

-Y8-			-Y8-	-Y8-
PIs Sta 28+98.45	PI Sta 30+32.20	PIs Sta 31+65.43	PI Sta 36+71.61	PI Sta 43+89.21
Θs = 2° 34' 01.3"	Δ = 10° 17' 03.1" (RT)	Θs = 2° 34' 01.3"	Δ = 18° 55' 19.2" (LT)	Δ = 23° 17' 46.6" (RT)
Ls = 100.00'	D = 5° 08' 02.5"	Ls = 100.00'	D = 5° 20' 00.0"	D = 6° 30' 00.0"
LT = 66.67'	L = 200.31'	LT = 66.67'	L = 354.79'	L = 358.40'
ST = 33.34'	T = 100.43'	ST = 33.34'	T = 179.02'	T = 181.71'
	R = 1,116.00'		R = 1,074.30'	R = 881.47'

-Y8A-	-Y8-REV
PI Sta 34+50.00	PI Sta 33+06.92
Δ = 43° 29' 40.5" (RT)	Δ = 29° 49' 05.8" (RT)
D = 19° 05' 54.9"	D = 7° 38' 22.0"
L = 227.74'	L = 390.32'
T = 119.67'	T = 199.69'
R = 300.00'	R = 750.00'
	SE = .08
	RO = 200'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y8A- PROFILE SEE SHEET 58
FOR -Y8-REV PROFILE SEE SHEET 59

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017
moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609	SDG Sungate Design Group, P.A., 915-A Jones Franklin Rd., Raleigh, N.C. 27606

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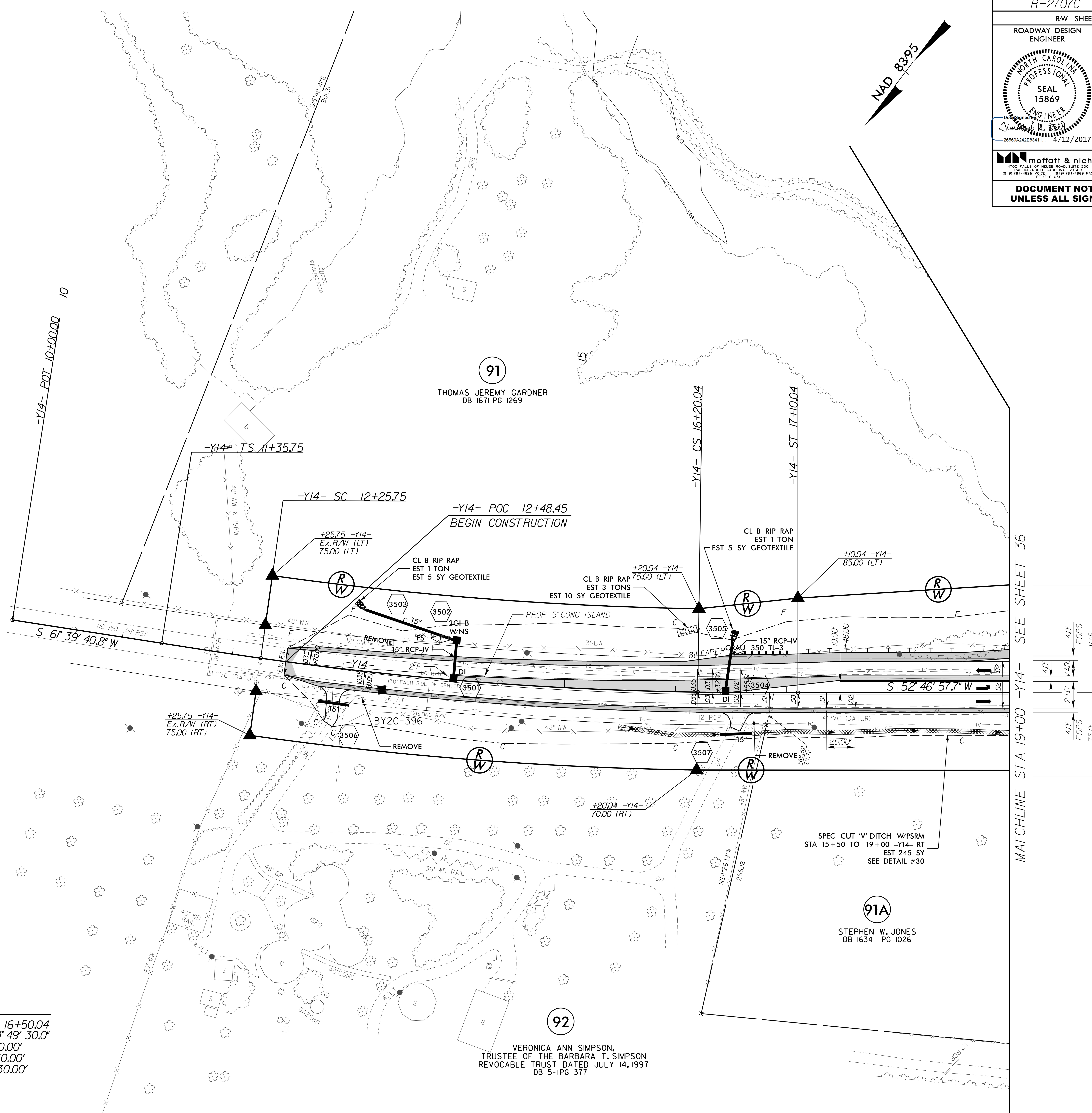

-Y14-

PIs Sta 11+95.75	PI Sta 14+23.15	PIs Sta 16+50.04
θs = 0° 49' 30.0"	Δ = 7° 13' 43.1" (LT)	θs = 0° 49' 30.0"
Ls = 90.00'	D = 1° 50' 00.0"	Ls = 90.00'
LT = 60.00'	L = 394.29	LT = 60.00'
ST = 30.00'	T = 197.41'	ST = 30.00'
	R = 3,125.22'	
	SE = .035	
	RO = 90'	

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y14- PROFILE SEE SHEET 69

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	36
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017

moffatt & nichol

Sungate Design Group, P.A.

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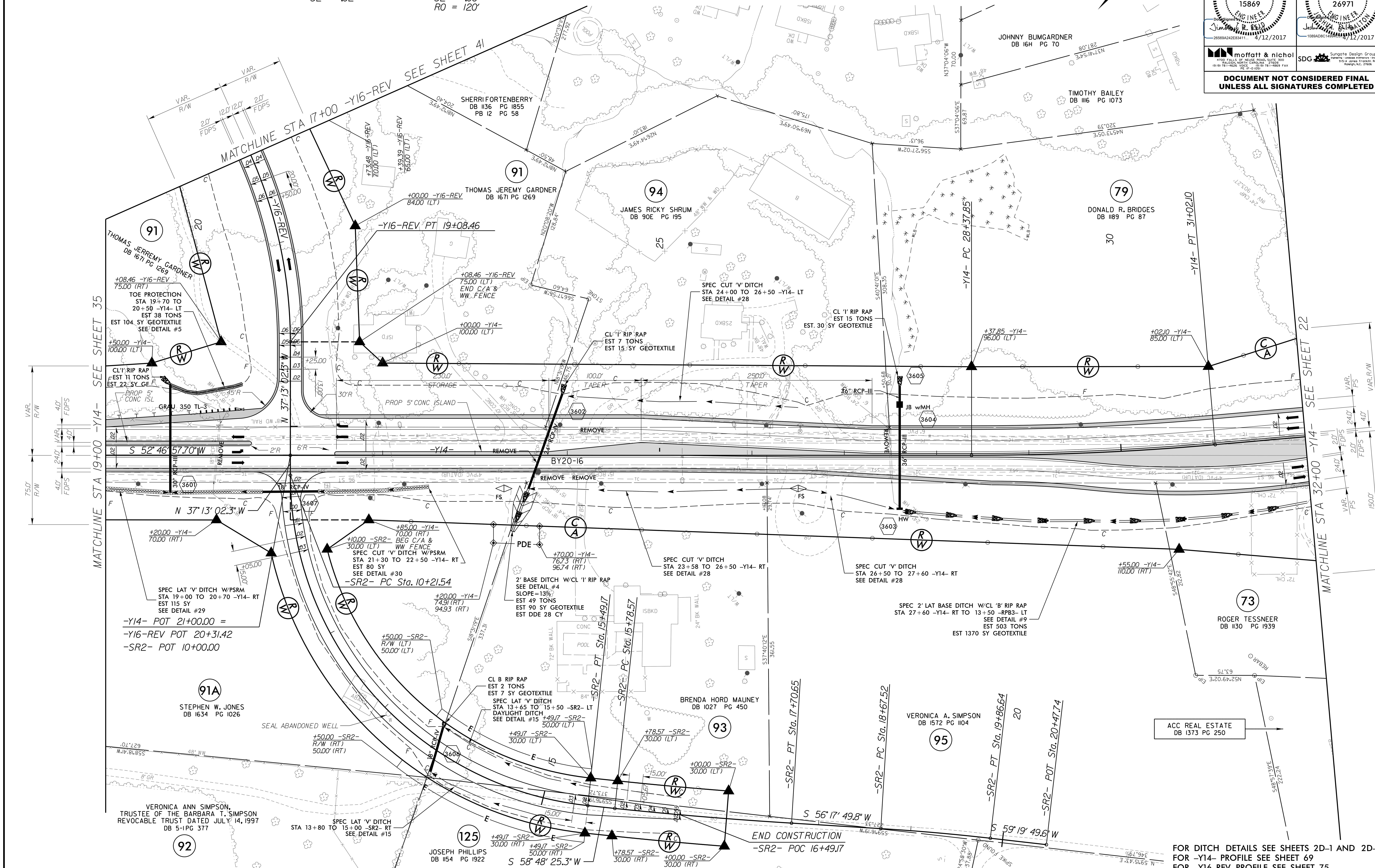
-Y14-	-Y16-REV	-SR2-	-SR2-	-SR2-
PI Sta 29+70.06	PI Sta 17+93.18	PI Sta 13+45.54	PI Sta 16+74.63	PI Sta 19+27.09
Δ = 5° 00' 00.0" (LT)	Δ = 26° 55' 35.7" (RT)	Δ = 83° 58' 32.4" (LT)	Δ = 2° 30' 35.6" (LT)	Δ = 3° 01' 59.9" (RT)
D = 1° 53' 31.9"	D = 11° 27' 33.0"	D = 15° 54' 55.8"	D = 1° 18' 23.9"	D = 2° 32' 47.3"
L = 264.24'	L = 234.98'	L = 527.63'	L = 192.09'	L = 119.12'
T = 132.21'	T = 119.70'	T = 324.01'	T = 96.06'	T = 59.57'
R = 3,028.00'	R = 500.00'	R = 360.00'	R = 4,385.00'	R = 2,250.00'
SE = .02	SE = .06			
	RO = 120'			



NAD 83/95
MATCHLINE STA 17+00 -Y16-REV SEE SHEET 41
MATCHLINE STA 19+00 -Y14- SEE SHEET 35
MATCHLINE STA 32+00 -Y14- SEE SHEET 22
SHERRI FORTENBERRY DB 1136 PG 1855 PB 12 PG 58
THOMAS JEREMY GARDNER DB 1671 PG 1269
JAMES RICKY SHRUM DB 90E PG 195
JOHNNY BUMGARDNER DB 16H PG 70
TIMOTHY BAILEY DB 1116 PG 1073
DONALD R. BRIDGES DB 1189 PG 87
ROGER TESSNEER DB 1130 PG 1939
STEPHEN W. JONES DB 1634 PG 1026
BRENDA HORD MAUNEY DB 1027 PG 450
VERONICA A. SIMPSON DB 1572 PG 1104
ACC REAL ESTATE DB 1373 PG 250
VERONICA ANN SIMPSON, TRUSTEE OF THE BARBARA T. SIMPSON REVOCABLE TRUST DATED JULY 14, 1997 DB 5-I PG 377
JOSEPH PHILLIPS DB 1154 PG 1922
-Y16-REV PT 19+08.46
-Y14- POT 21+00.00 = -Y16-REV POT 20+31.42 -SR2- POT 10+00.00
-SR2- PC Sta. 10+21.54
END CONSTRUCTION -SR2- POC 16+49.17
S 52° 46' 57.70" W
N 37° 13' 02.3" W
S 56° 17' 49.8" W
S 59° 19' 49.6" W
S 58° 48' 25.3" W
TOE PROTECTION STA 19+70 TO 20+50 -Y14- LT EST 38 TONS EST 104 SY GEOTEXTILE SEE DETAIL #5
SPEC CUT 'V' DITCH STA 24+00 TO 26+50 -Y14- LT SEE DETAIL #28
CL 'I' RIP RAP EST 15 TONS EST. 30 SY GEOTEXTILE
CL 'I' RIP RAP EST 7 TONS EST 15 SY GEOTEXTILE
CL 'I' RIP RAP EST 11 TONS EST 22 SY GE
SPEC CUT 'V' DITCH W/PSRM STA 21+30 TO 22+50 -Y14- RT EST 80 SY SEE DETAIL #30
SPEC LAT 'V' DITCH W/PSRM STA 19+00 TO 20+70 -Y14- RT EST 115 SY SEE DETAIL #29
2' BASE DITCH W/CL 'I' RIP RAP SEE DETAIL #4 SLOPE=13% EST 49 TONS EST 90 SY GEOTEXTILE EST DDE 28 CY
SPEC CUT 'V' DITCH STA 23+58 TO 26+50 -Y14- RT SEE DETAIL #28
SPEC CUT 'V' DITCH STA 26+50 TO 27+60 -Y14- RT SEE DETAIL #28
SPEC 2' LAT BASE DITCH W/CL 'B' RIP RAP STA 27+60 -Y14- RT TO 13+50 -RPB3- LT SEE DETAIL #9 EST 503 TONS EST 1370 SY GEOTEXTILE
CL B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE
SPEC LAT 'V' DITCH STA 13+65 TO 15+50 -SR2- LT DAYLIGHT DITCH SEE DETAIL #15
SPEC LAT 'V' DITCH STA 13+80 TO 15+00 -SR2- RT SEE DETAIL #15
SEAL ABANDONED WELL
PROP 5' CONC ISLAND
GRAU 350 TL-3
BY20-16

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y14- PROFILE SEE SHEET 69
FOR -Y16-REV PROFILE SEE SHEET 75

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	37

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 15869 — 4/12/2017	SEAL 26971 — 4/12/2017

moffatt & nichol — SDG Sungate Design Group, P.A.

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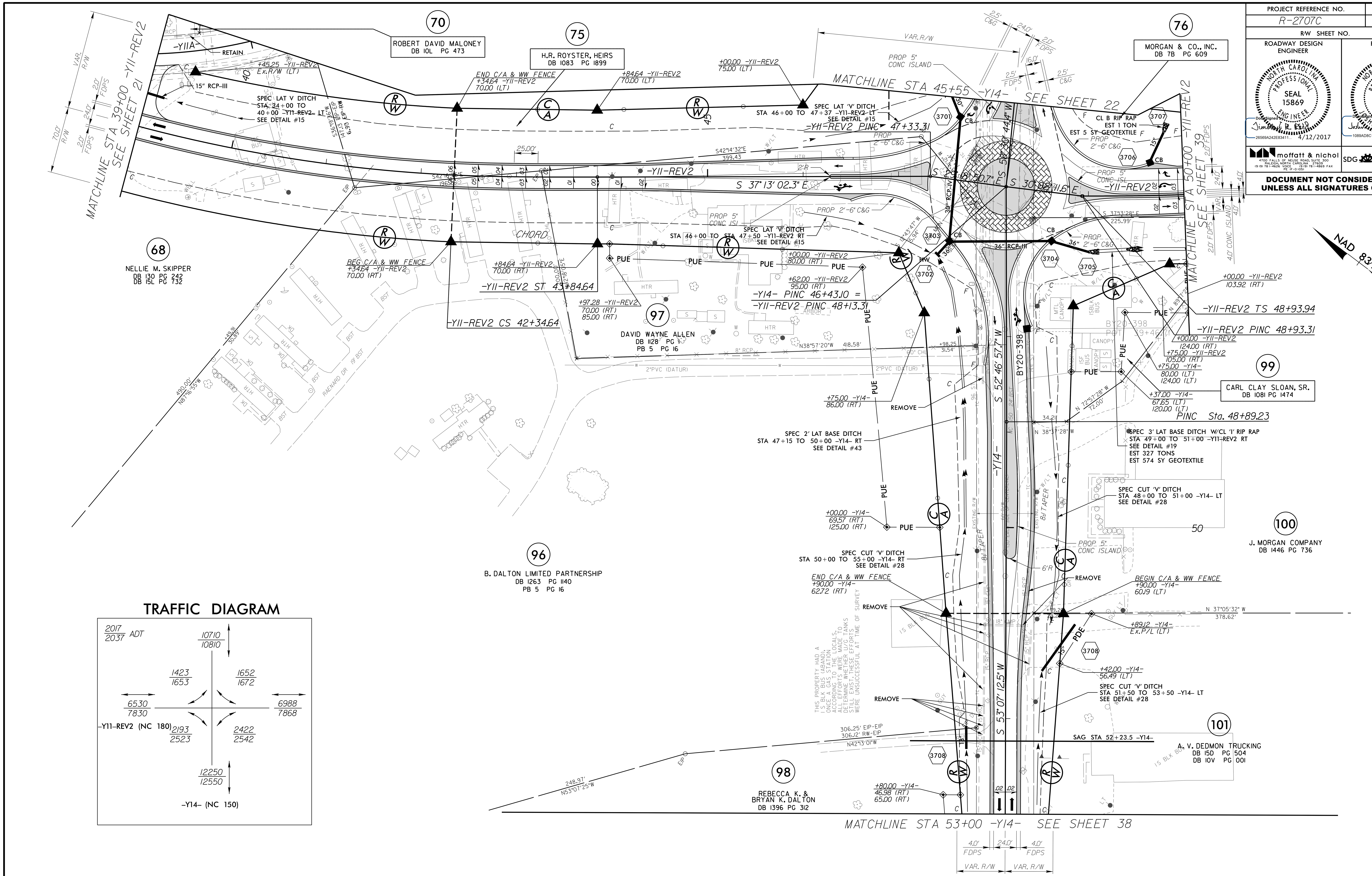

MATCHLINE STA 39+00 -YII-REV2 SEE SHEET 21
MATCHLINE STA 45+55 -Y14- SEE SHEET 22
MATCHLINE STA 50+00 -YII-REV2 SEE SHEET 39
MATCHLINE STA 53+00 -Y14- SEE SHEET 38
70 ROBERT DAVID MALONEY DB 10L PG 473
75 H.R. ROYSTER, HEIRS DB 1083 PG 1899
76 MORGAN & CO., INC. DB 7B PG 609
68 NELLIE M. SKIPPER DB 130 PG 242 DB 15L PG 732
97 DAVID WAYNE ALLEN DB 1128 PG 1 PB 5 PG 16
99 CARL CLAY SLOAN, SR. DB 1081 PG 1474
96 B. DALTON LIMITED PARTNERSHIP DB 1263 PG 1140 PB 5 PG 16
100 J. MORGAN COMPANY DB 1446 PG 736
98 REBECCA K. & BRYAN K. DALTON DB 1396 PG 312
101 A. V. DEDMON TRUCKING DB 15D PG 504 DB 10V PG 001
-YII-REV2 ST 43+84.64
-YII-REV2 CS 42+34.64
-YII-REV2 PINC 47+33.31
-Y14- PINC 46+43.10 = -YII-REV2 PINC 48+13.31
-YII-REV2 TS 48+93.94
-YII-REV2 PINC 48+93.31
PINC Sta. 48+89.23
SPEC LAT V DITCH STA 34+00 TO 40+00 -YII-REV2 LT SEE DETAIL #15
SPEC LAT 'V' DITCH STA 46+00 TO 47+37 -YII-REV2 LT SEE DETAIL #15
SPEC LAT 'V' DITCH STA 46+00 TO STA 47+50 -YII-REV2 RT SEE DETAIL #15
SPEC 2' LAT BASE DITCH STA 47+15 TO 50+00 -Y14- RT SEE DETAIL #43
SPEC 3' LAT BASE DITCH W/CL 'I' RIP RAP STA 49+00 TO 51+00 -YII-REV2 RT SEE DETAIL #19 EST 327 TONS EST 574 SY GEOTEXTILE
SPEC CUT 'V' DITCH STA 48+00 TO 51+00 -Y14- LT SEE DETAIL #28
SPEC CUT 'V' DITCH STA 50+00 TO 55+00 -Y14- RT SEE DETAIL #28
SPEC CUT 'V' DITCH STA 51+50 TO 53+50 -Y14- LT SEE DETAIL #28
CL B RIP RAP EST 1 TON EST 5 SY GEOTEXTILE
SAG STA 52+23.5 -Y14-
NAD 83/95
TRAFFIC DIAGRAM
2017/2037 ADT
-YII-REV2 (NC 180)
-Y14- (NC 150)

-YII-REV2			
PI Sta 40+02.53	PIs Sta 42+84.65	PIs Sta 50+27.39	PI Sta 51+86.72
Δ = 17° 10' 47.2" (LT)	θs = 2° 45' 16.6"	θs = 7° 32' 20.1"	Δ = 13° 55' 13.1" (LT)
D = 3° 40' 22.1"	Ls = 150.00'	Ls = 200.00'	D = 7° 32' 20.1"
L = 467.76'	LT = 100.01'	LT = 133.45'	L = 184.65'
T = 235.65'	ST = 50.01'	ST = 66.78'	T = 92.78'
R = 1,560.00'			R = 760.00'
SE = .06			SE = .08

-YIIA-
PI Sta 38+50.38
Δ = 36° 14' 03.9" (LT)
D = 11° 30' 00.0"
L = 315.08'
T = 163.01'
R = 498.22'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR ROUNDABOUT DETAIL SEE SHEET 2B-7
FOR -YII-REV2 PROFILE SEE SHEET 66 & 67
FOR -Y14- PROFILE SEE SHEET 70

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	38
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA DALTON
DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017	DocuSigned by: Joshua A. Dalton 1089AD8C14994C5... 4/12/2017
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX PE (F-0105)	SDG Sungate Design Group, P.A. Engineering - Landscape Architecture - Environmental 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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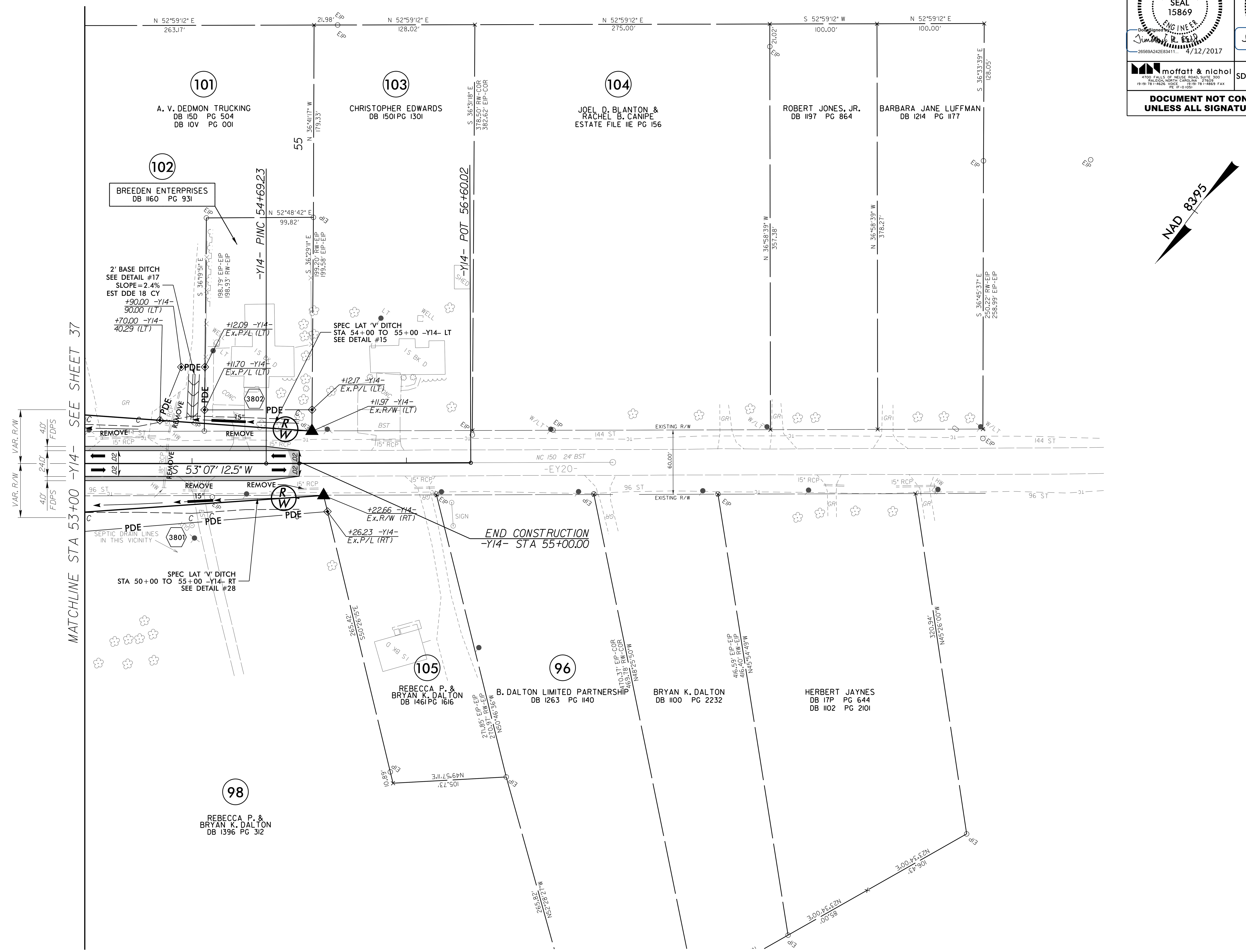

N 52°59'12" E 263.17'
21.98'
N 52°59'12" E 128.02'
N 52°59'12" E 275.00'
S 52°59'12" W 100.00'
N 52°59'12" E 100.00'
101
A. V. DEDMON TRUCKING
DB 15D PG 504
DB 10V PG 001
103
CHRISTOPHER EDWARDS
DB 1501 PG 1301
104
JOEL D. BLANTON &
RACHEL B. CANIPE
ESTATE FILE 11E PG 156
ROBERT JONES, JR.
DB 1197 PG 864
BARBARA JANE LUFFMAN
DB 1214 PG 1177
102
BREEDEN ENTERPRISES
DB 1160 PG 931
N 52°48'42" E 99.82'
-Y14- PINC 54+69.23
-Y14- POT 56+60.02
N 36°41'17" W 179.33'
S 36°31'18" E 378.50' RW-COR 382.62' EIP-COR
S 36°29'11" E 199.20' RW-EIP 199.58' EIP-EIP
S 36°19'51" E 198.79' EIP-EIP 198.93' RW-EIP
N 36°58'39" W 357.38'
N 36°58'39" W 378.27'
S 36°33'39" E 128.05'
S 36°45'37" E 250.22' RW-EIP 258.99' EIP-EIP
21.02'
NAD 83/95
2' BASE DITCH
SEE DETAIL #17
SLOPE=2.4%
EST DDE 18 CY
+90.00 -Y14-
90.00 (LT)
+70.00 -Y14-
40.29 (LT)
+12.09 -Y14-
Ex.P/L (LT)
+11.70 -Y14-
Ex.P/L (LT)
SPEC LAT 'V' DITCH
STA 54+00 TO 55+00 -Y14- LT
SEE DETAIL #15
+12.17 -Y14-
Ex.P/L (LT)
+11.97 -Y14-
Ex.R/W (LT)
PDE
REMOVE
3802
3801
EXISTING R/W
144 ST
96 ST
15" RCP
NC 150 24' BST
-EY20-
60.00'
S 53° 07' 12.5" W
VAR. R/W
4.0' FDPS
24.0'
MATCHLINE STA 53+00 -Y14- SEE SHEET 37
SEPTIC DRAIN LINES IN THIS VICINITY
SPEC LAT 'V' DITCH
STA 50+00 TO 55+00 -Y14- RT
SEE DETAIL #28
+22.66 -Y14-
Ex.R/W (RT)
+26.23 -Y14-
Ex.P/L (RT)
END CONSTRUCTION
-Y14- STA 55+00.00
SIGN
265.42' S50°26'15"E
105
REBECCA P. &
BRYAN K. DALTON
DB 1461 PG 1616
96
B. DALTON LIMITED PARTNERSHIP
DB 1263 PG 1140
BRYAN K. DALTON
DB 1100 PG 2232
HERBERT JAYNES
DB 17P PG 644
DB 1102 PG 2101
271.85' EIP-EIP 270.97' RW-EIP N50°46'36"W
470.37' EIP-COR 469.78' RW-COR N48°25'50"W
416.59' EIP-EIP 416.40' RW-EIP N45°54'49"W
320.94' N45°26'00"W
10.89'
N49°57'11"E 105.73'
98
REBECCA P. &
BRYAN K. DALTON
DB 1396 PG 312
265.82' N52°28'27"W
N23°34'00"E 106.43'
N23°34'00"E 85.00'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y14- PROFILE SEE SHEET 70

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER — DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — DocuSigned by: Joshua G. Dalton 1089AD8C14994C3... 4/12/2017
moffatt & nichol 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX PE (F-0105)	SDG Sungate Design Group, P.A. Engineering - Landscape Architecture - Environmental 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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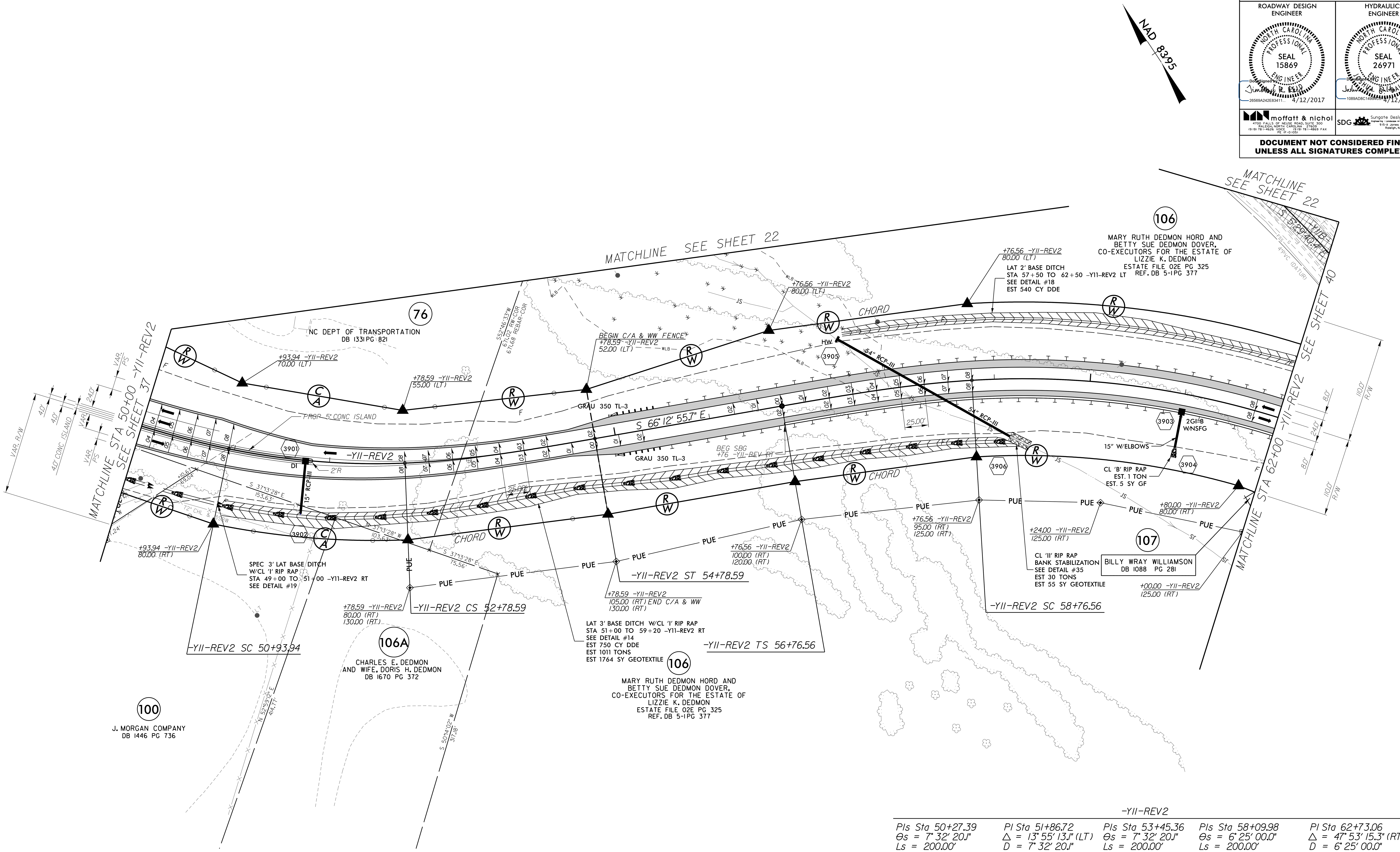
NAD 83/95
MATCHLINE SEE SHEET 22
MATCHLINE SEE SHEET 22
MATCHLINE STA 50+00 -YII-REV2 SEE SHEET 37
MATCHLINE STA 62+00 -YII-REV2 SEE SHEET 40
76
NC DEPT OF TRANSPORTATION
DB 1331 PG 821
106
MARY RUTH DEDMON HORD AND
BETTY SUE DEDMON DOVER,
CO-EXECUTORS FOR THE ESTATE OF
LIZZIE K. DEDMON
ESTATE FILE 02E PG 325
REF. DB 5-1PG 377
106A
CHARLES E. DEDMON
AND WIFE, DORIS H. DEDMON
DB 1670 PG 372
100
J. MORGAN COMPANY
DB 1446 PG 736
107
BILLY WRAY WILLIAMSON
DB 1088 PG 281
-YII-REV2
S 66° 12' 55.7" E
CHORD
PROP. 5' CONC ISLAND
4.0' CONC ISLAND
GRAU 350 TL-3
BEG SBG +76 -YII-BEV RT
+93.94 -YII-REV2 70.00 (LT)
+78.59 -YII-REV2 55.00 (LT)
BEGIN C/A & WW FENCE +78.59 -YII-REV2 52.00 (LT)
+76.56 -YII-REV2 80.00 (LT)
+76.56 -YII-REV2 80.00 (LT)
LAT 2' BASE DITCH
STA 57+50 TO 62+50 -YII-REV2 LT
SEE DETAIL #18
EST 540 CY DDE
54" RCP-III
15" RCP-III
15" W/ELBOWS
2GI-B W/NSFG
CL 'B' RIP RAP
EST. 1 TON
EST. 5 SY GF
+80.00 -YII-REV2 80.00 (RT)
+24.00 -YII-REV2 125.00 (RT)
+76.56 -YII-REV2 95.00 (RT) 125.00 (RT)
CL 'II' RIP RAP
BANK STABILIZATION
SEE DETAIL #35
EST 30 TONS
EST 55 SY GEOTEXTILE
+00.00 -YII-REV2 125.00 (RT)
-YII-REV2 SC 58+76.56
+76.56 -YII-REV2 100.00 (RT) 120.00 (RT)
-YII-REV2 ST 54+78.59
+78.59 -YII-REV2 105.00 (RT) END C/A & WW 130.00 (RT)
-YII-REV2 TS 56+76.56
LAT 3' BASE DITCH W/CL 'I' RIP RAP
STA 51+00 TO 59+20 -YII-REV2 RT
SEE DETAIL #14
EST 750 CY DDE
EST 1011 TONS
EST 1764 SY GEOTEXTILE
+78.59 -YII-REV2 80.00 (RT) 130.00 (RT)
-YII-REV2 CS 52+78.59
+93.94 -YII-REV2 80.00 (RT)
SPEC 3' LAT BASE DITCH
W/CL 'I' RIP RAP
STA 49+00 TO 51+00 -YII-REV2 RT
SEE DETAIL #19
-YII-REV2 SC 50+93.94
S 37°13'28" E 153.63'
S 37°13'28" E 75.56'
N 52°59'12" E 414.77'
S 50°14'02" W 311.18'
3901
3902
3903
3904
3905
3906
PUE
25.00'
VAR. R/W
110.0' R/W

-YII-REV2				
PIs Sta 50+27.39	PI Sta 51+86.72	PIs Sta 53+45.36	PIs Sta 58+09.98	PI Sta 62+73.06
Θs = 7° 32' 20.1"	△ = 13° 55' 13.1" (LT)	Θs = 7° 32' 20.1"	Θs = 6° 25' 00.0"	△ = 47° 53' 15.3" (RT)
Ls = 200.00'	D = 7° 32' 20.1"	Ls = 200.00'	Ls = 200.00'	D = 6° 25' 00.0"
LT = 133.45'	L = 184.65'	LT = 133.45'	LT = 133.42'	L = 746.30'
ST = 66.78'	T = 92.78'	ST = 66.78'	ST = 66.75'	T = 396.50'
	R = 760.00'			R = 892.92'
	SE = .08			SE = .08
	RO = 200'			RO = 200'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y11-REV2 PROFILE SEE SHEETS 67

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	40
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — DocuSigned by: Timothy R. Reid, 26569A242E83411... 4/12/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON — DocuSigned by: Joshua G. Dalton, 1089AD8C14994C3... 4/12/2017
moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE (919) 781-4869 FAX, PE (F-0105)	SDG Sungate Design Group, P.A., Engineering - Landscape Architecture - Environmental, 915-A Jones Franklin Rd., Raleigh, N.C. 27606

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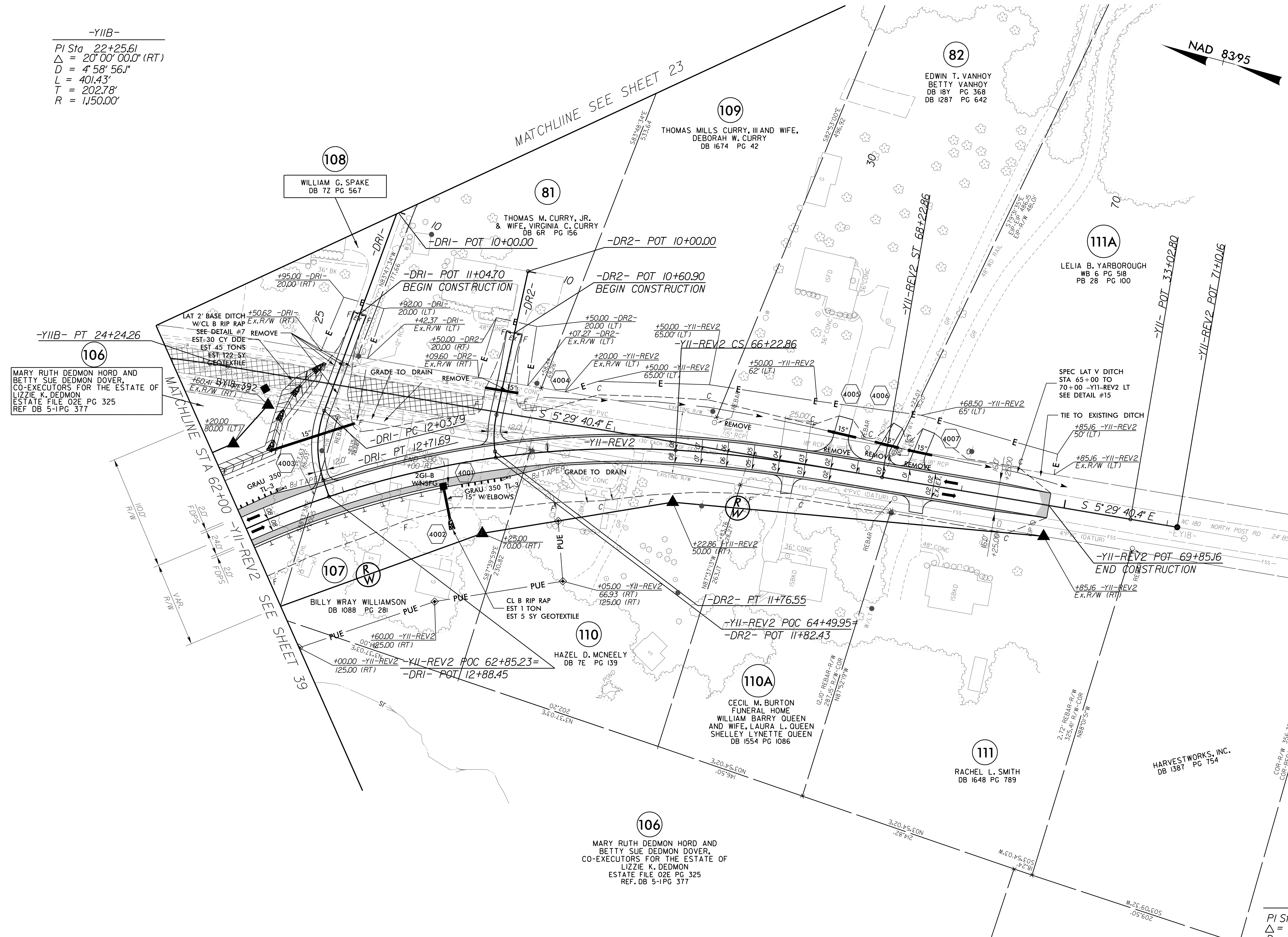

-YIIB-
PI Sta 22+25.61
△ = 20° 00' 00.0" (RT)
D = 4° 58' 56.1"
L = 401.43'
T = 202.78'
R = 1,150.00'
NAD 83/95
MATCHLINE SEE SHEET 23
MATCHLINE STA 62+00 -YII-REV2 SEE SHEET 39
-YIIB- PT 24+24.26
106
MARY RUTH DEDMON HORD AND BETTY SUE DEDMON DOVER, CO-EXECUTORS FOR THE ESTATE OF LIZZIE K. DEDMON ESTATE FILE 02E PG 325 REF DB 5-1PG 377
108
WILLIAM G. SPAKE DB 7Z PG 567
81
THOMAS M. CURRY, JR. & WIFE, VIRGINIA C. CURRY DB 6R PG 156
109
THOMAS MILLS CURRY, III AND WIFE, DEBORAH W. CURRY DB 1674 PG 42
82
EDWIN T. VANHOY BETTY VANHOY DB 18Y PG 368 DB 1287 PG 642
111A
LELIA B. YARBOROUGH WB 6 PG 518 PB 28 PG 100
-DR1- POT 10+00.00
-DR1- POT 11+04.70 BEGIN CONSTRUCTION
-DR2- POT 10+00.00
-DR2- POT 10+60.90 BEGIN CONSTRUCTION
-YII-REV2 CS 66+22.86
-YII-REV2 ST 68+22.86
-YII- POT 33+02.80
-YII-REV2 POT 71+10.16
LAT 2' BASE DITCH W/CL B RIP RAP SEE DETAIL #7 EST 30 CY DDE EST 45 TONS EST 122 SY GEOTEXTILE
REMOVE
GRADE TO DRAIN
SPEC LAT V DITCH STA 65+00 TO 70+00 -YII-REV2 LT SEE DETAIL #15
TIE TO EXISTING DITCH
S 5° 29' 40.4" E
-YII-REV2
-DR1- PC 12+03.79
-DR1- PT 12+71.69
GRAU 350 TL-3
2GI-B W/NSFG
GRAU 350 TL-3
15" W/ELBOWS
-YII-REV2 POT 69+85.16 END CONSTRUCTION
107
BILLY WRAY WILLIAMSON DB 1088 PG 281
110
HAZEL D. MCNEELY DB 7E PG 139
CL B RIP RAP EST 1 TON EST 5 SY GEOTEXTILE
-DR2- PT 11+76.55
-YII-REV2 POC 64+49.95= -DR2- POT 11+82.43
-YII-REV2 POC 62+85.23= -DR1- POT 12+88.45
110A
CECIL M. BURTON FUNERAL HOME WILLIAM BARRY QUEEN AND WIFE, LAURA L. QUEEN SHELLEY LYNETTE QUEEN DB 1554 PG 1086
111
RACHEL L. SMITH DB 1648 PG 789
HARVESTWORKS, INC. DB 1387 PG 754
106
MARY RUTH DEDMON HORD AND BETTY SUE DEDMON DOVER, CO-EXECUTORS FOR THE ESTATE OF LIZZIE K. DEDMON ESTATE FILE 02E PG 325 REF. DB 5-1PG 377

-DR1-

PI Sta 12+39.11
△ = 38° 54' 21.0" (LT)
D = 57° 17' 44.8"
L = 67.90'
T = 35.32'
R = 100.00'
SE = .02

-DR2-

PI Sta 11+59.02
△ = 20° 17' 57.7" (LT)
D = 57° 17' 44.8"
L = 35.43'
T = 17.90'
R = 100.00'
SE = .02

-YII-REV2

PI Sta 62+73.06	PIs Sta 66+89.61
△ = 47° 53' 15.26" (RT)	Θs = 6° 25' 00.0"
D = 6° 25' 00.0"	Ls = 200.00'
L = 746.30'	LT = 133.42'
T = 396.50'	ST = 66.75'
R = 892.92'	
SE = .08	
RO = 200'	

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y11-REV2 PROFILE SEE SHEET 67 & 68
FOR -DR1- PROFILE SEE SHEET 68
FOR -DR2- PROFILE SEE SHEET 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	41
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — 4/12/2017

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — 4/12/2017

moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609

SDG Sungate Design Group, P.A. — 915-A Jones Franklin Rd. Raleigh, N.C. 27606

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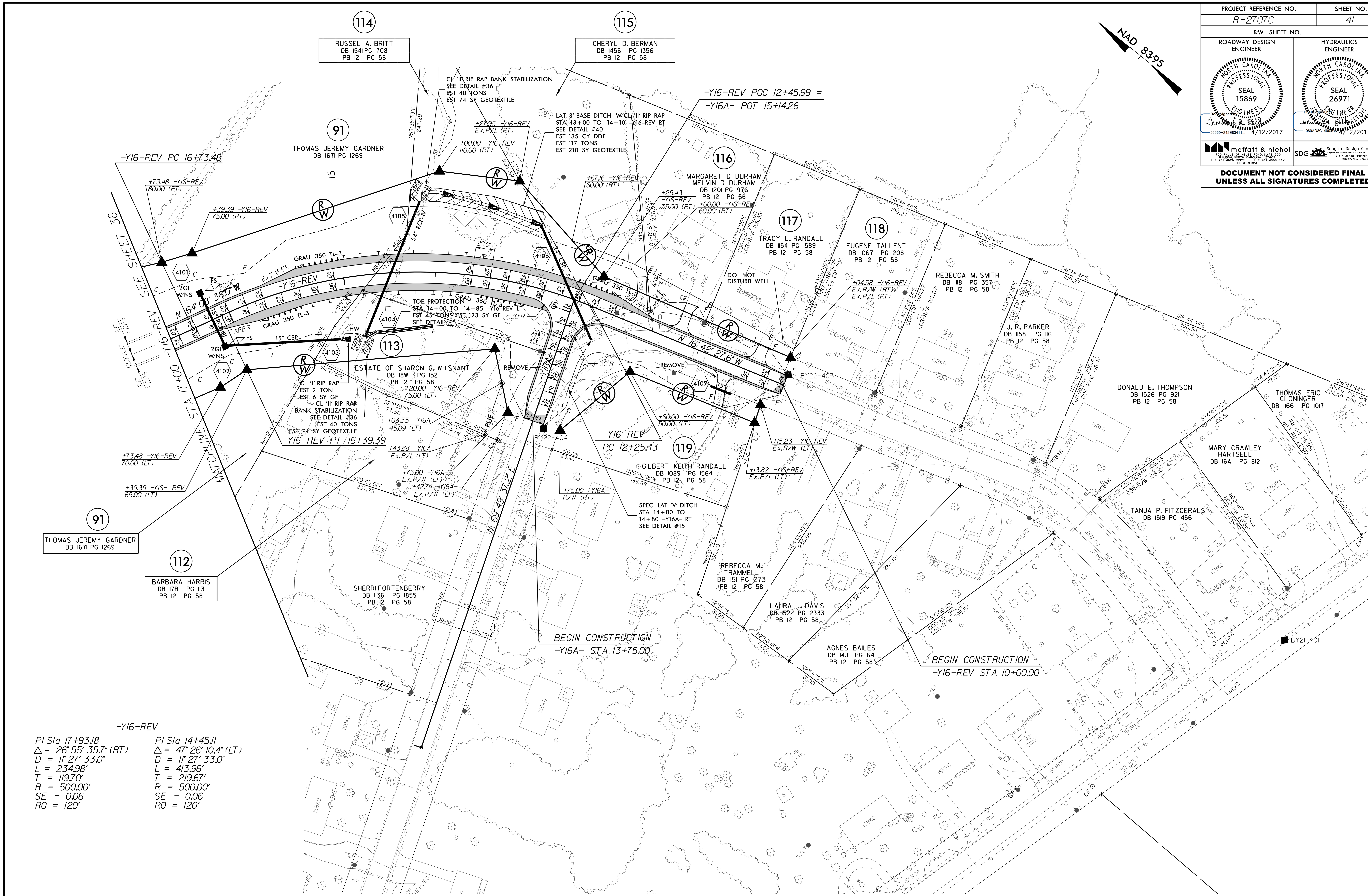

NAD 83/95
SEE SHEET 36
MATCHLINE STA 17+00 -Y16-REV
-Y16-REV PC 16+73.48
-Y16-REV PT 16+39.39
-Y16-REV POC 12+45.99 = -Y16A- POT 15+14.26
-Y16-REV PC 12+25.43
BEGIN CONSTRUCTION -Y16A- STA 13+75.00
BEGIN CONSTRUCTION -Y16-REV STA 10+00.00
RUSSEL A. BRITT DB 1541 PG 708 PB 12 PG 58
CHERYL D. BERMAN DB 1456 PG 1356 PB 12 PG 58
THOMAS JEREMY GARDNER DB 1671 PG 1269
MARGARET D DURHAM MELVIN D DURHAM DB 1201 PG 976 PB 12 PG 58
TRACY L. RANDALL DB 1154 PG 1589 PB 12 PG 58
EUGENE TALLENT DB 1067 PG 208 PB 12 PG 58
REBECCA M. SMITH DB 1118 PG 357 PB 12 PG 58
J. R. PARKER DB 1158 PG 116 PB 12 PG 58
DONALD E. THOMPSON DB 1526 PG 921 PB 12 PG 58
THOMAS ERIC CLONINGER DB 1166 PG 1017
MARY CRAWLEY HARTSELL DB 16A PG 812
TANJA P. FITZGERALS DB 1519 PG 456
ESTATE OF SHARON G. WHISNANT DB 18W PG 152 PB 12 PG 58
GILBERT KEITH RANDALL DB 1089 PG 1564 PB 12 PG 58
REBECCA M. TRAMMELL DB 151 PG 273 PB 12 PG 58
LAURA L. DAVIS DB 1522 PG 2333 PB 12 PG 58
AGNES BAILES DB 14J PG 64 PB 12 PG 58
SHERRI FORTENBERRY DB 1136 PG 1855 PB 12 PG 58
BARBARA HARRIS DB 17B PG 113 PB 12 PG 58
CL 'II' RIP RAP BANK STABILIZATION SEE DETAIL #36 EST 40 TONS EST 74 SY GEOTEXTILE
LAT 3' BASE DITCH W/CL 'II' RIP RAP STA 13+00 TO 14+10 -Y16-REV RT SEE DETAIL #40 EST 135 CY DDE EST 117 TONS EST 210 SY GEOTEXTILE
TOE PROTECTION STA 14+00 TO 14+85 -Y16-REV LT EST 45 TONS EST 123 SY GF SEE DETAIL #5
CL 'I' RIP RAP EST 2 TON EST 6 SY GF
CL 'II' RIP RAP BANK STABILIZATION SEE DETAIL #36 EST 40 TONS EST 74 SY GEOTEXTILE
SPEC LAT 'V' DITCH STA 14+00 TO 14+80 -Y16A- RT SEE DETAIL #15
DO NOT DISTURB WELL

-Y16-REV	
PI Sta 17+93.18	PI Sta 14+45.11
△ = 26° 55' 35.7" (RT)	△ = 47° 26' 10.4" (LT)
D = 11° 27' 33.0"	D = 11° 27' 33.0"
L = 234.98'	L = 413.96'
T = 119.70'	T = 219.67'
R = 500.00'	R = 500.00'
SE = 0.06	SE = 0.06
RO = 120'	RO = 120'

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y16-REV PROFILE SEE SHEET 75
FOR -Y16A- PROFILE SEE SHEET 75

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	42
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971
4/12/2017	4/12/2017
moffatt & nichol	SDG Sungate Design Group, P.A.

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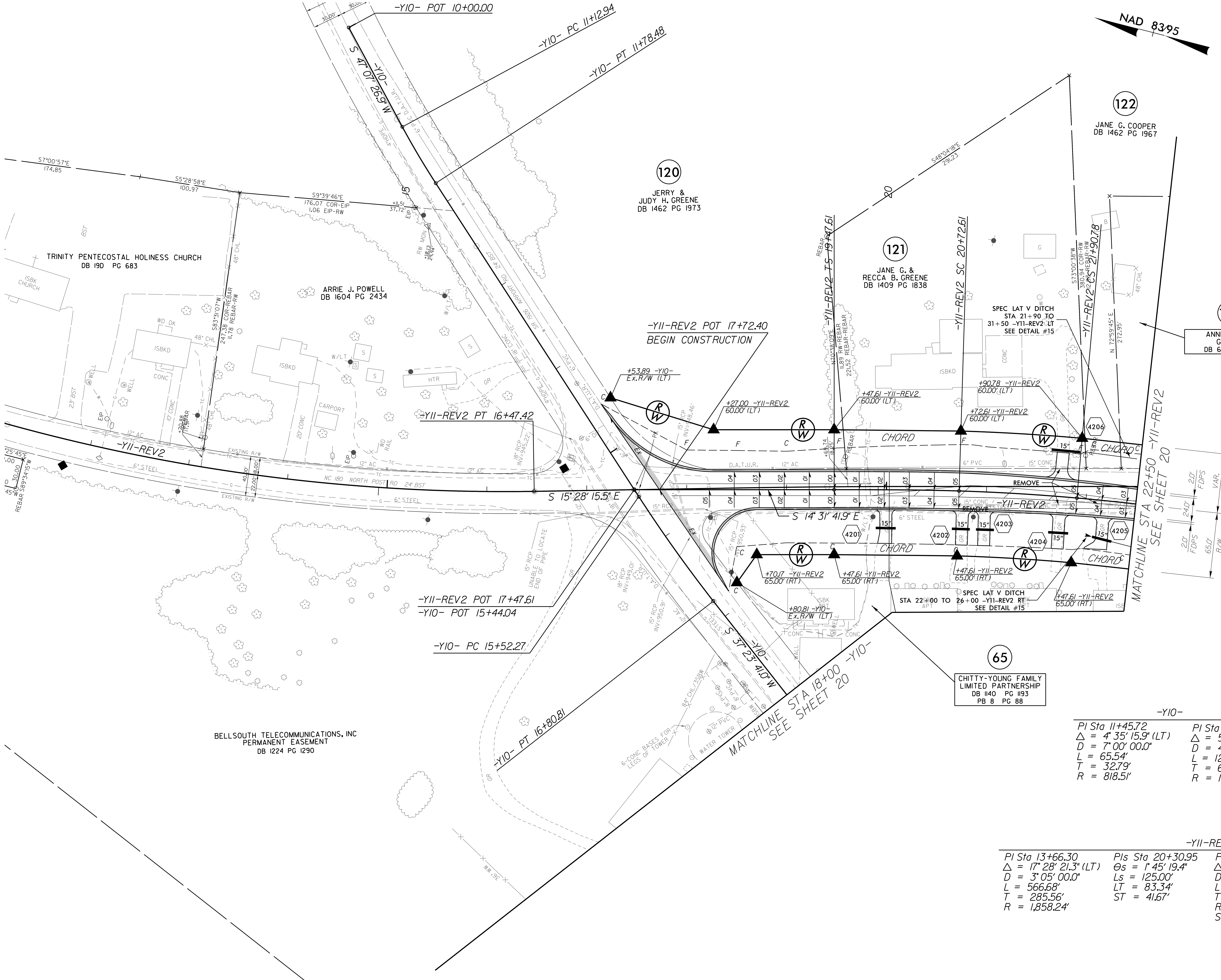

NAD 83/95
-Y10- POT 10+00.00
-Y10- PC 11+12.94
-Y10- PT 11+78.48
S 47° 07' 26.9" W
120
JERRY & JUDY H. GREENE DB 1462 PG 1973
121
JANE G. & RECCA B. GREENE DB 1409 PG 1838
122
JANE G. COOPER DB 1462 PG 1967
123
ANNIE LAURA GREENE DB 6K PG 100
TRINITY PENTECOSTAL HOLINESS CHURCH DB 19D PG 683
ARRIE J. POWELL DB 1604 PG 2434
-Y11-REV2 POT 17+72.40
BEGIN CONSTRUCTION
-Y11-REV2 TS 19+47.61
-Y11-REV2 SC 20+72.61
-Y11-REV2 CS 21+90.78
SPEC LAT V DITCH STA 21+90 TO 31+50 -Y11-REV2 LT SEE DETAIL #15
-Y11-REV2 PT 16+47.42
-Y11-REV2
S 15° 28' 15.5" E
S 14° 31' 41.9" E
CHORD
REMOVE
MATCHLINE STA 22+50 -Y11-REV2 SEE SHEET 20
-Y11-REV2 POT 17+47.61
-Y10- POT 15+44.04
-Y10- PC 15+52.27
-Y10- PT 16+80.81
S 37° 23' 41.0" W
MATCHLINE STA 18+00 -Y10- SEE SHEET 20
SPEC LAT V DITCH STA 22+00 TO 26+00 -Y11-REV2 RT SEE DETAIL #15
65
CHITTY-YOUNG FAMILY LIMITED PARTNERSHIP DB 1140 PG 1193 PB 8 PG 88
BELLSOUTH TELECOMMUNICATIONS, INC PERMANENT EASEMENT DB 1224 PG 1290

-Y10-

PI Sta 11+45.72	PI Sta 16+16.58
Δ = 4° 35' 15.9" (LT)	Δ = 5° 08' 30.1" (LT)
D = 7° 00' 00.0"	D = 4° 00' 00.0"
L = 65.54'	L = 128.54'
T = 32.79'	T = 64.31'
R = 818.51'	R = 1432.39'

-Y11-REV2

PI Sta 13+66.30	PIs Sta 20+30.95	PI Sta 21+31.71	PIs Sta 22+32.45
Δ = 17° 28' 21.3" (LT)	Θs = 1° 45' 19.4"	Δ = 3° 19' 08.1" (RT)	Θs = 1° 45' 19.4"
D = 3° 05' 00.0"	Ls = 125.00'	D = 2° 48' 31.0"	Ls = 125.00'
L = 566.68'	LT = 83.34'	L = 118.17'	LT = 83.34'
T = 285.56'	ST = 41.67'	T = 59.10'	ST = 41.67'
R = 1,858.24'		R = 2,040.00'	
		SE = .05	

FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2
FOR -Y11-REV2 PROFILE SEE SHEET 66

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	43

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

DocuSigned by: Timothy R. Reid

4/12/2017

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 (919) 781-4865 FAX
PE SF-0105

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DocuSigned by: Joshua G. Dalton

4/12/2017

SDG Sungate Design Group, P.A.
Engineering · Landscape Architecture · Surveying
919-A Jones Franklin Rd.
Raleigh, N.C. 27606

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-L- US 74 (SHELBY BYPASS)

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	20,200 CFS
DESIGN FREQUENCY	=	50 YRS
DESIGN HW ELEVATION	=	716.2 FT
BASE DISCHARGE	=	23,400 CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	717.69 FT
OVERTOPPING DISCHARGE	=	+31,700 CFS
OVERTOPPING FREQUENCY	=	+500 YRS
OVERTOPPING ELEVATION	=	733.80 FT

BM # 17
EL = 707.47'
N = 581328.8 E = 1236485.0
8 INCH NAIL IN BASE OF 20 INCH SYCAMORE
-L- STA. 385+52.11 93.83' (LT.)

BEGIN GRADE TIP PROJECT R-2707C
STA 382+00.00, EL = 739.13' A.H.
END GRADE TIP PROJECT R-2707B
STA 382+00.17, EL = 739.13' B.K.

BEGIN BRIDGE +/-

PROPOSED GRADE

PI = 387+05.00
EL = 728.87'
VC = 1,010'
K = 258
DS = 80 MPH

END BRIDGE +/-

(-)2.032%

(+)1.878%

1.5 : 1

1.5 : 1

EXISTING GROUND

-Y2- OVER -L-

-L- STA. 387+54.08 = -Y2- STA 29+07.16
EL = 733.81'

PI = 387+05.00
EL = 728.87'
VC = 1,010'
K = 258
DS = 80 MPH

PROPOSED GRADE

EXISTING GROUND

(+)

FOR -L- PLAN SEE SHEET 4

810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650

380 381 382 383 384 385 386 387 388 389 390 391 392 393 394

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	44

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R REID

DocuSigned by: Timothy R. Reid

4/12/2017

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
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(919) 781-4626 FAX (919) 781-4865
PE-F-0105

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G DALTON

DocuSigned by: Joshua G. Dalton

4/12/2017

Sungate Design Group, P.A.
Engineering · Landscape Architecture · Environmental
919-A Jones Franklin Rd.
Raleigh, N.C. 27606

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-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.0606

DRAINAGE AREA	= 67 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 175 CFS
DESIGN HW ELEVATION	= 736.0 FT
100 YEAR DISCHARGE	= 205 CFS
100 YEAR HW ELEVATION	= 737.0 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +205 CFS
OVERTOPPING ELEVATION	= 759.0 FT

EXISTING GROUND

PROPOSED GRADE

(+)1.878 3%

66"

FOR -L- PLAN SEE SHEET 5

800 790 780 770 760 750 740 730 720 710

394 395 396 397 398 399 400 401 402 403 404 405 406

-L- US 74 (SHELBY BYPASS)

BM # 19
EL.= 743.84
N = 581644.2 E = 1238547.5
8 INCH NAIL IN BASE OF 15 INCH WHITE OAK
-L- STA. 406+30.34 85.93' (LT.)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.0612

DRAINAGE AREA	= 16 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 48 CFS
DESIGN HW ELEVATION	= 769.6 FT
100 YEAR DISCHARGE	= 56 CFS
100 YEAR HW ELEVATION	= 770.05 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +56 CFS
OVERTOPPING ELEVATION	= 777.8 FT

PI = 418+00.00
EL = 787.00'
VC = 600'
K = 719
DS = 80 MPH

EXISTING GROUND

PROPOSED GRADE

(+)1.878 3%

(+)1.878 3%

36"

FOR -L- PLAN SEE SHEET 6

810 800 790 780 770 760 750 740 730 720

406 407 408 409 410 411 412 413 414 415 416 417 418

-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.0711

DRAINAGE AREA	= 75 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 194 CFS
DESIGN HW ELEVATION	= 773.35 FT
100 YEAR DISCHARGE	= 226 CFS
100 YEAR HW ELEVATION	= 774.18 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +226 CFS
OVERTOPPING ELEVATION	= 792.4 FT

BM # 20
EL.= 786.98
N = 581893.2 E = 1240600.5
8 INCH NAIL IN BASE OF 24 INCH WHITE OAK
-L- STA. 427+00.17 7.60' (RT.)

PI = 418+00.00
EL = 787.00'
VC = 600'
K = 719
DS = 80 MPH

EXISTING GROUND

PROPOSED GRADE

(+)1.0435%

(+)1.0435%

72"

FOR -L- PLAN SEE SHEET 7

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	45

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R REID
DocuSigned by: Timothy R. Reid
4/12/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G DALTON
DocuSigned by: Joshua G. Dalton
4/12/2017

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Raleigh, N.C. 27606

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-L- US 74 (SHELBY BYPASS)

BM # 21
EL.= 798.79
N = 582415.4 E = 1241740.0
8 INCH NAIL IN BASE OF 24 INCH RED OAK
-L- STA. 439+53.86 15.35' (LT.)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.0807

DRAINAGE AREA	= 58 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 157 CFS
DESIGN HW ELEVATION	= 794.50 FT
100 YEAR DISCHARGE	= 183 CFS
100 YEAR HW ELEVATION	= 795.25 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +183 CFS
OVERTOPPING ELEVATION	= 804.50 FT

EXISTING GROUND

PROPOSED GRADE

(+)1.0435%

(+)1.0435%

66"

FOR -L- PLAN SEE SHEET 8

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	46

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 T. R. REID — DocuSigned by: Timothy R. Reid 26569A242E83411... 4/12/2017

moffatt & nichol, 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE (919) 781-4869 FAX, PE (F-0105)

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON — DocuSigned by: Joshua G. Dalton 1089AD8C14994C3... 4/12/2017

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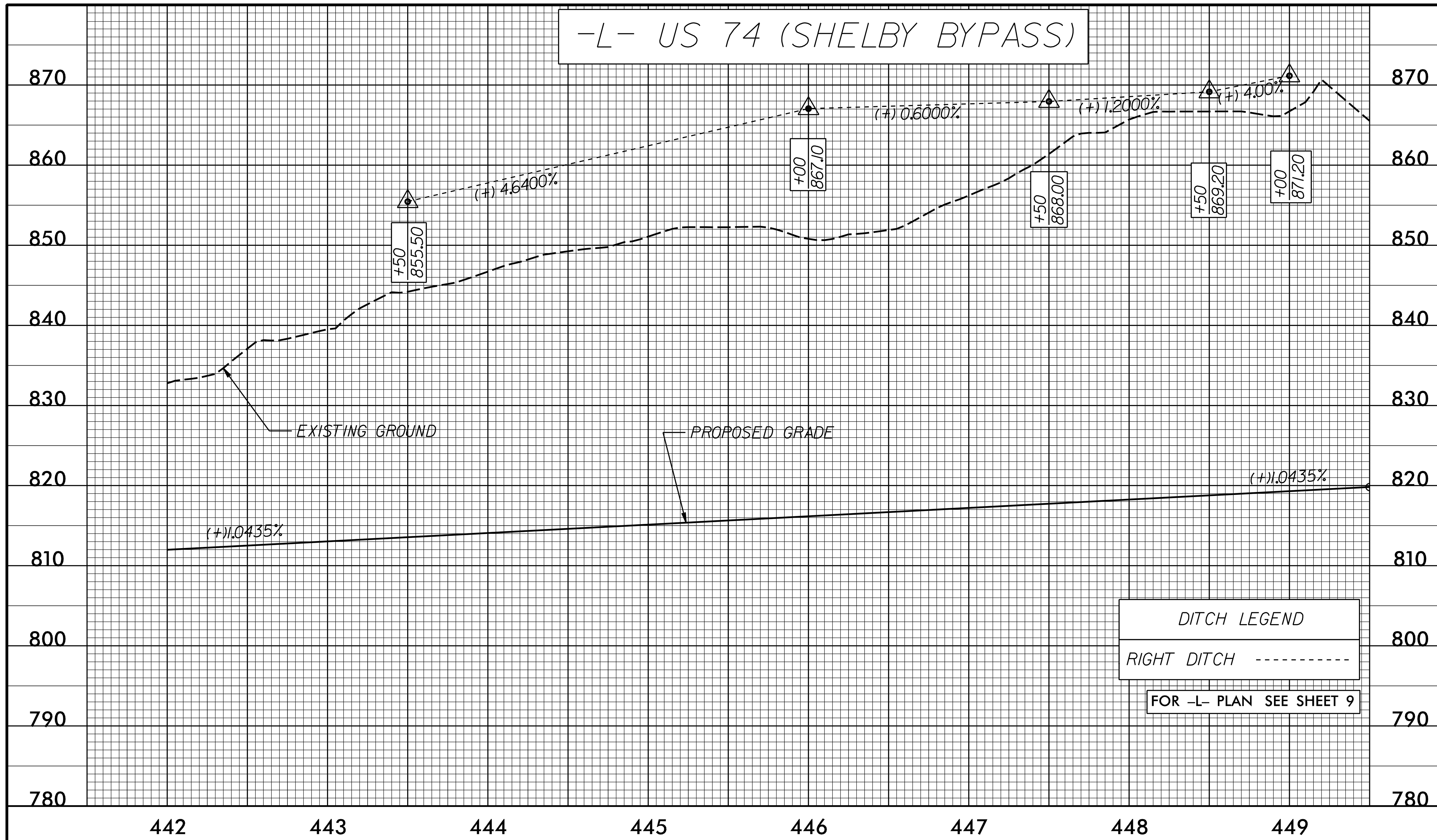
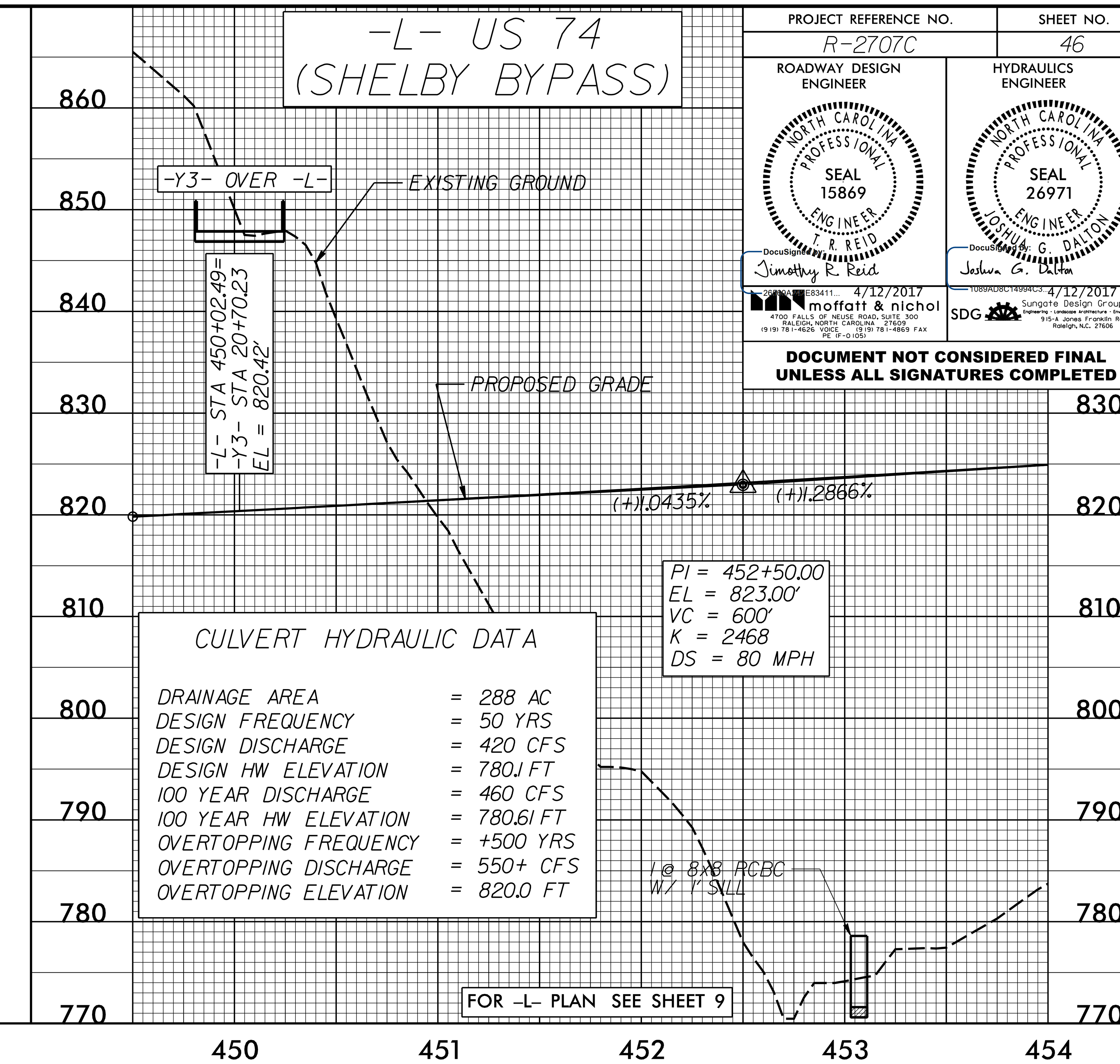
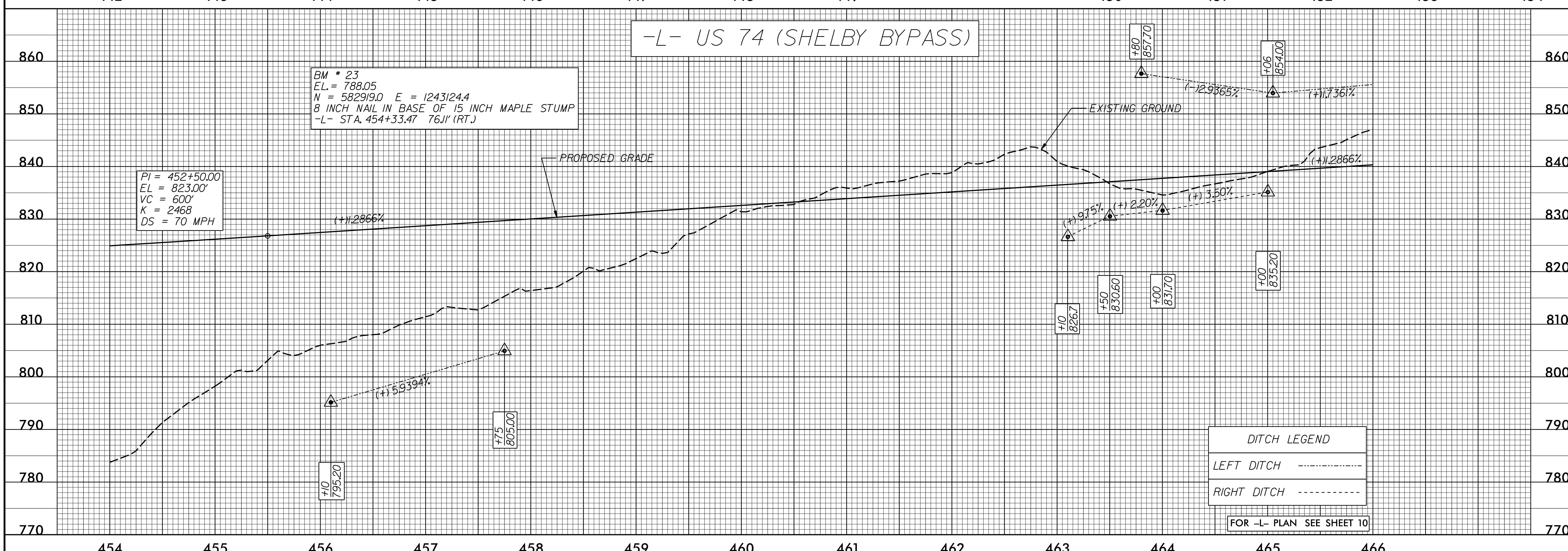




CULVERT HYDRAULIC DATA

DRAINAGE AREA	=	288 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	420 CFS
DESIGN HW ELEVATION	=	780.1 FT
100 YEAR DISCHARGE	=	460 CFS
100 YEAR HW ELEVATION	=	780.61 FT
OVERTOPPING FREQUENCY	=	+500 YRS
OVERTOPPING DISCHARGE	=	550+ CFS
OVERTOPPING ELEVATION	=	820.0 FT



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	47

ROADWAY DESIGN ENGINEER — SEAL 15869, T. R. REID — Timothy R. Reid — 4/12/2017 — moffatt & nichol

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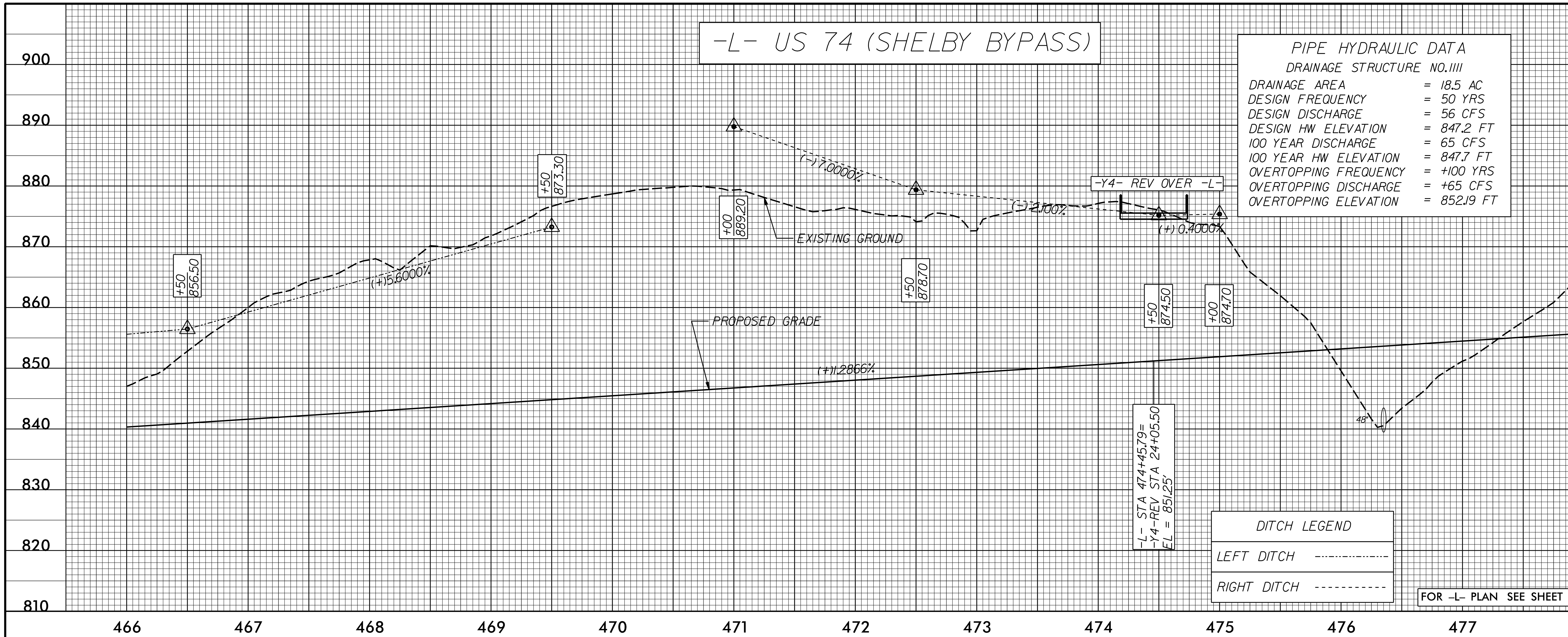
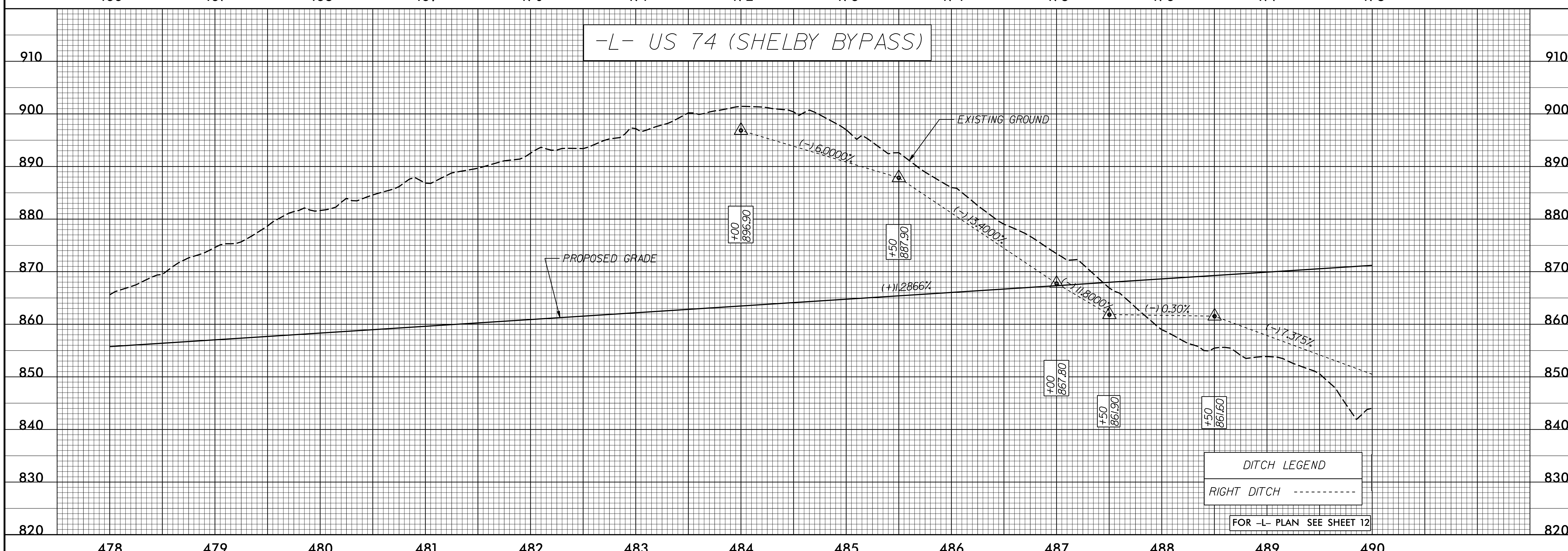
PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1111

DRAINAGE AREA	=	18.5 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	56 CFS
DESIGN HW ELEVATION	=	847.2 FT
100 YEAR DISCHARGE	=	65 CFS
100 YEAR HW ELEVATION	=	847.7 FT
OVERTOPPING FREQUENCY	=	+100 YRS
OVERTOPPING DISCHARGE	=	+65 CFS
OVERTOPPING ELEVATION	=	852.19 FT





PROJECT REFERENCE NO.	SHEET NO.
R-2707C	48

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NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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HYDRAULICS ENGINEER

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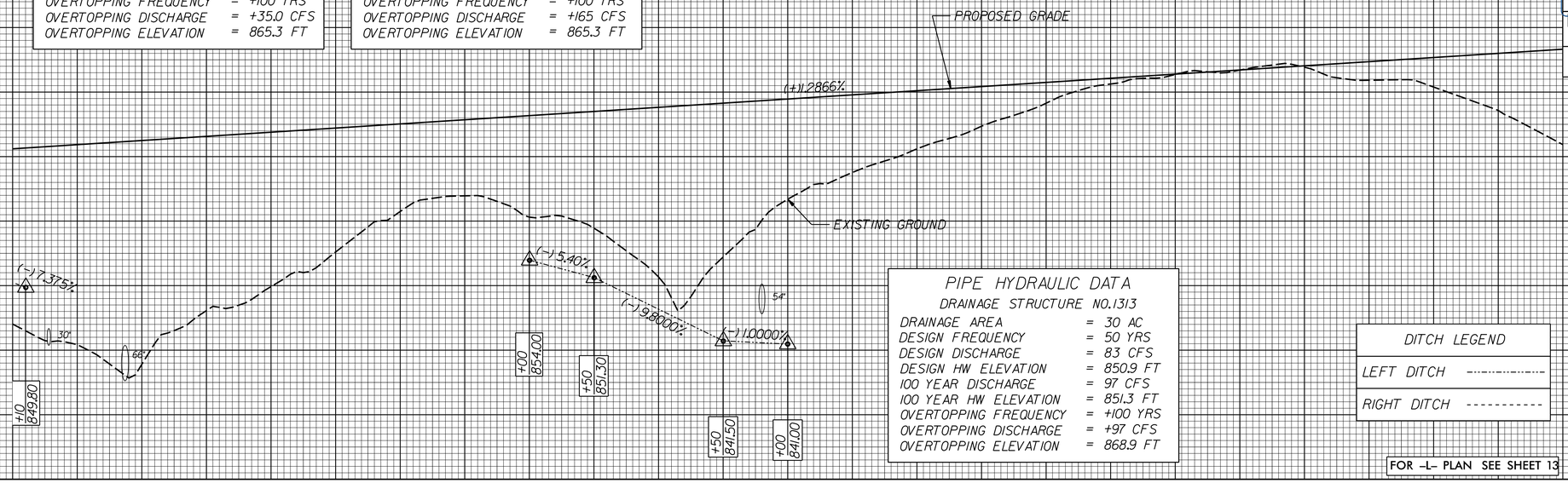
-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1301

DRAINAGE AREA	= 6.2 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 19.6 CFS
DESIGN HW ELEVATION	= 851.3 FT
100 YEAR DISCHARGE	= 21.3 CFS
100 YEAR HW ELEVATION	= 851.65 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +35.0 CFS
OVERTOPPING ELEVATION	= 865.3 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1302

DRAINAGE AREA	= 53 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 140 CFS
DESIGN HW ELEVATION	= 842.3 FT
100 YEAR DISCHARGE	= 165 CFS
100 YEAR HW ELEVATION	= 843.1 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +165 CFS
OVERTOPPING ELEVATION	= 865.3 FT



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1313

DRAINAGE AREA	= 30 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 83 CFS
DESIGN HW ELEVATION	= 850.9 FT
100 YEAR DISCHARGE	= 97 CFS
100 YEAR HW ELEVATION	= 851.3 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +97 CFS
OVERTOPPING ELEVATION	= 868.9 FT

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

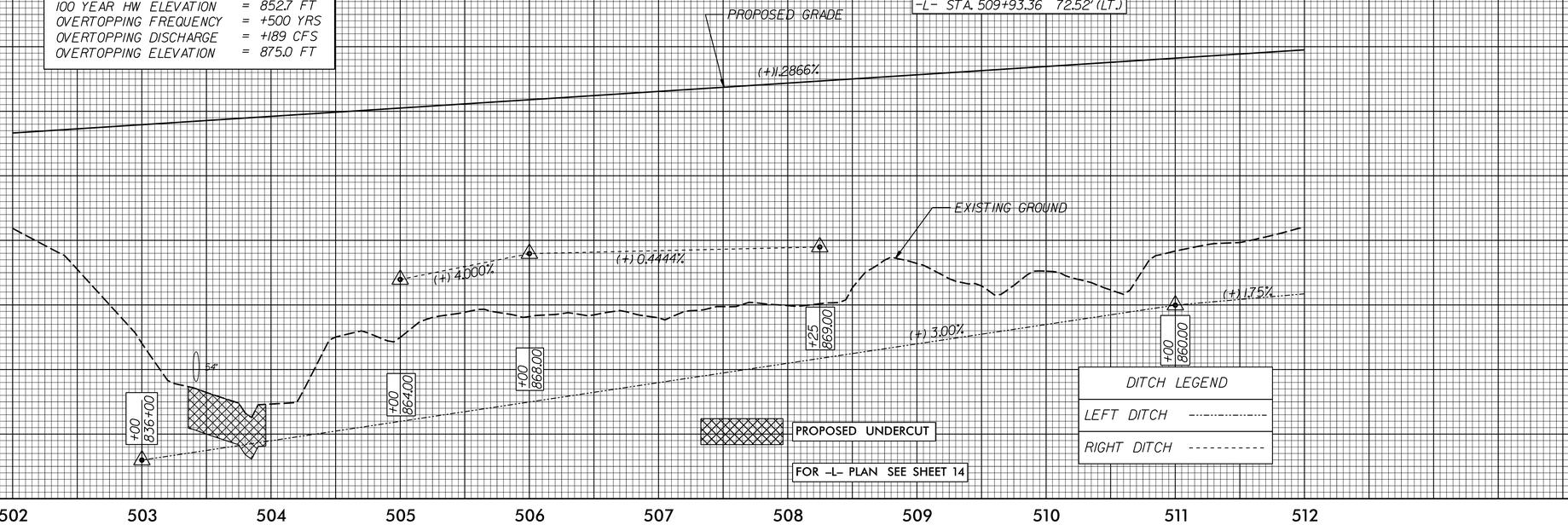
FOR -L- PLAN SEE SHEET 13

-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1406

DRAINAGE AREA	= 39 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 105 CFS
DESIGN HW ELEVATION	= 851.8 FT
100 YEAR DISCHARGE	= 123 CFS
100 YEAR HW ELEVATION	= 852.7 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= +189 CFS
OVERTOPPING ELEVATION	= 875.0 FT

BM # 24
EL.= 863.23'
N = 583410.1 E = 1248643.0
CHISLED "X" ON HEADWALL
-L- STA. 509+93.36 72.52' (LT.)



PROPOSED UNDERCUT

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

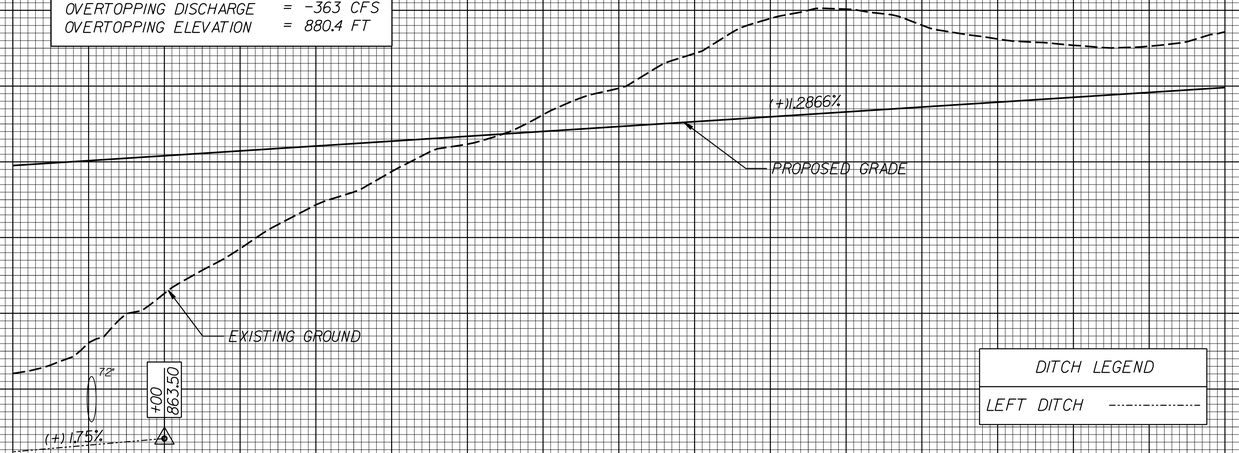
FOR -L- PLAN SEE SHEET 14

-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.15OI

DRAINAGE AREA	= 78 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 196 CFS
DESIGN HW ELEVATION	= 875.5 FT
100 YEAR DISCHARGE	= 228 CFS
100 YEAR HW ELEVATION	= 876.3 FT
OVERTOPPING FREQUENCY	= -500 YRS
OVERTOPPING DISCHARGE	= -363 CFS
OVERTOPPING ELEVATION	= 880.4 FT



DITCH LEGEND

LEFT DITCH

FOR -L- PLAN SEE SHEET 15

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	49

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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4/12/2017

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PROJECT REFERENCE NO.	SHEET NO.
R-2707C	50

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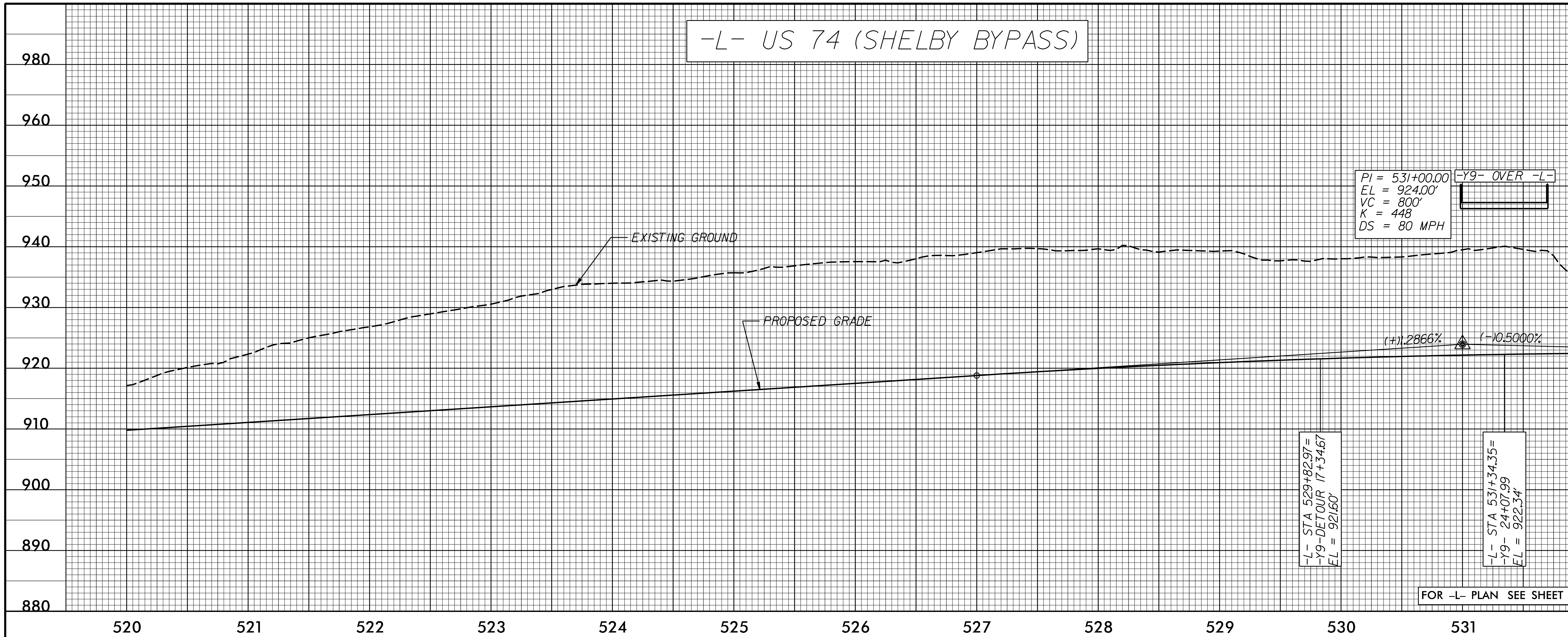
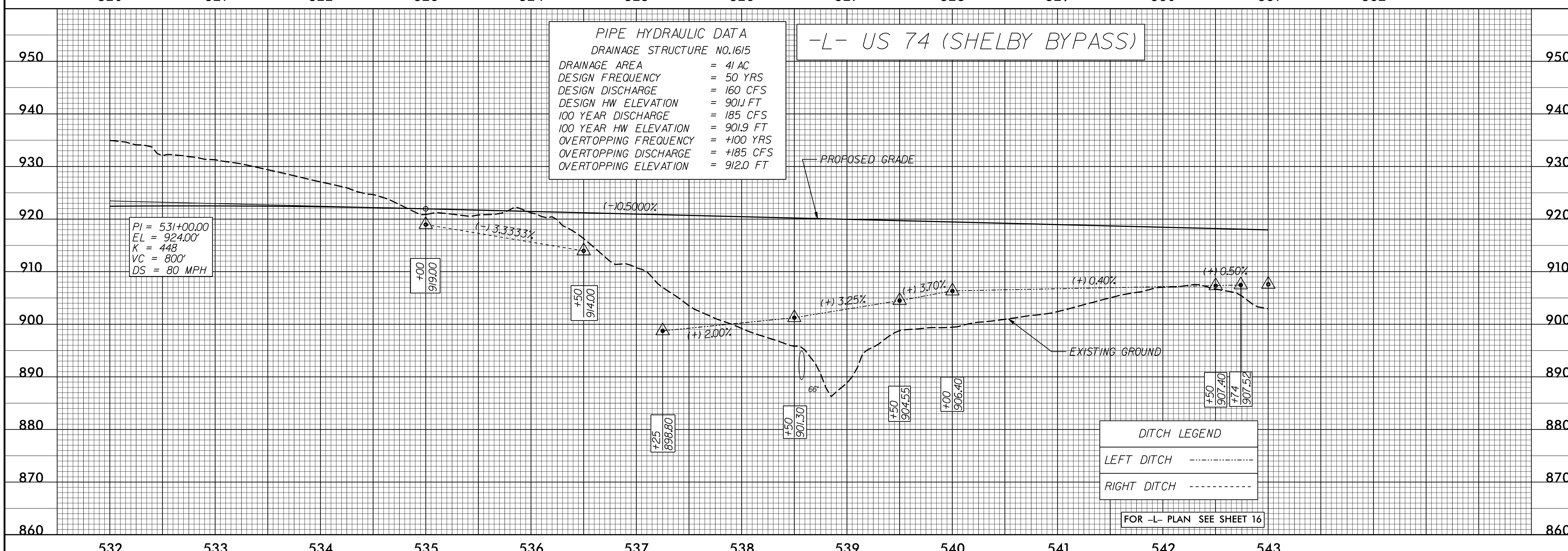
-L- US 74 (SHELBY BYPASS)



-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.1615		
DRAINAGE AREA	=	41 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	160 CFS
DESIGN HW ELEVATION	=	901.1 FT
100 YEAR DISCHARGE	=	185 CFS
100 YEAR HW ELEVATION	=	901.9 FT
OVERTOPPING FREQUENCY	=	+100 YRS
OVERTOPPING DISCHARGE	=	+185 CFS
OVERTOPPING ELEVATION	=	912.0 FT



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	51

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

DocuSigned by: Timothy R. Reid

4/12/2017

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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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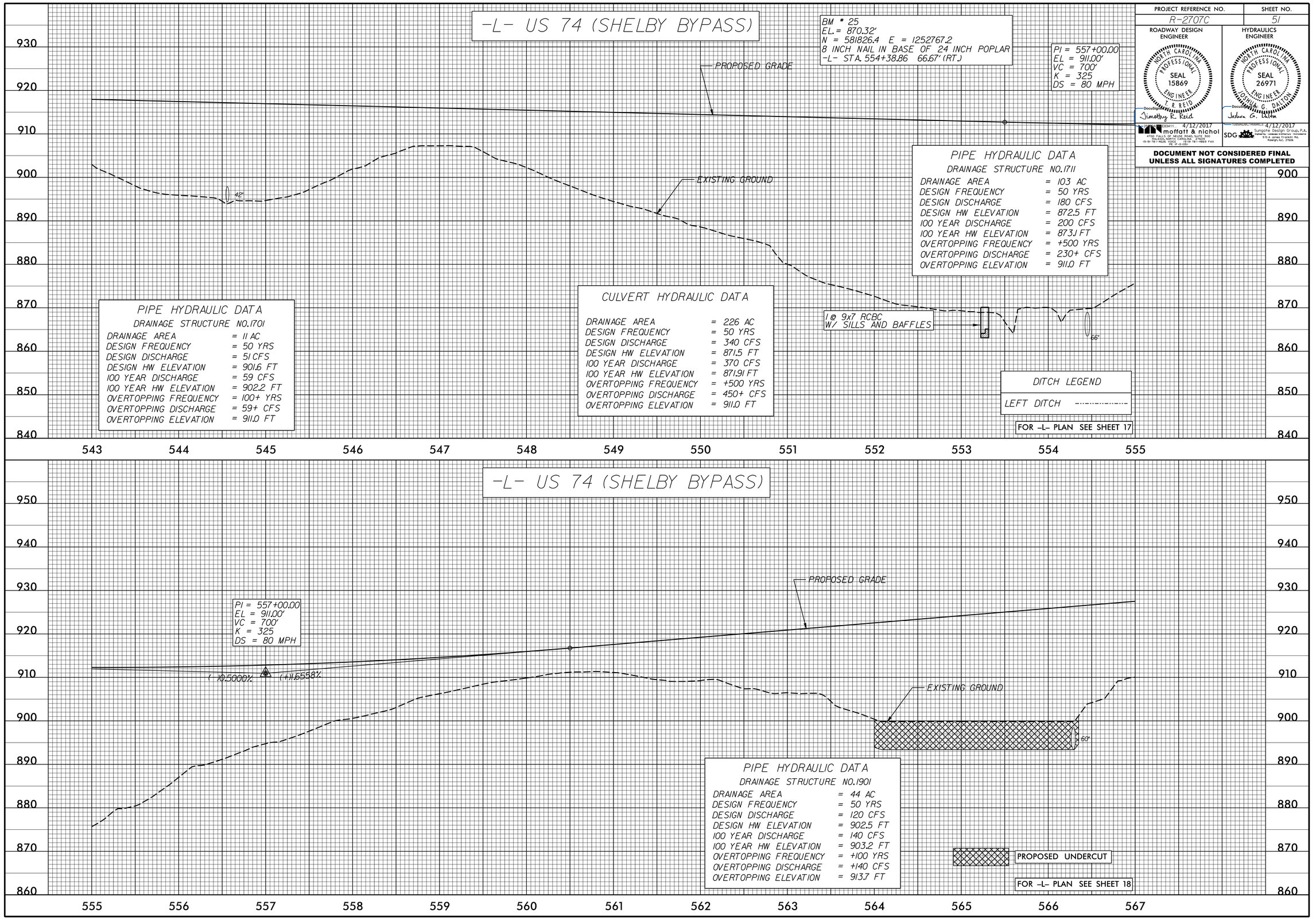

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1711

DRAINAGE AREA	= 103 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 180 CFS
DESIGN HW ELEVATION	= 872.5 FT
100 YEAR DISCHARGE	= 200 CFS
100 YEAR HW ELEVATION	= 873.1 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 230+ CFS
OVERTOPPING ELEVATION	= 911.0 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1701

DRAINAGE AREA	= 11 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 51 CFS
DESIGN HW ELEVATION	= 901.6 FT
100 YEAR DISCHARGE	= 59 CFS
100 YEAR HW ELEVATION	= 902.2 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 59+ CFS
OVERTOPPING ELEVATION	= 911.0 FT

CULVERT HYDRAULIC DATA

DRAINAGE AREA	= 226 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 340 CFS
DESIGN HW ELEVATION	= 871.5 FT
100 YEAR DISCHARGE	= 370 CFS
100 YEAR HW ELEVATION	= 871.91 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 450+ CFS
OVERTOPPING ELEVATION	= 911.0 FT

DITCH LEGEND

LEFT DITCH

FOR -L- PLAN SEE SHEET 17

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1901

DRAINAGE AREA	= 44 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 120 CFS
DESIGN HW ELEVATION	= 902.5 FT
100 YEAR DISCHARGE	= 140 CFS
100 YEAR HW ELEVATION	= 903.2 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +140 CFS
OVERTOPPING ELEVATION	= 913.7 FT

PROPOSED UNDERCUT

FOR -L- PLAN SEE SHEET 18

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	52

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 — T. R. REID — Timothy R. Reid — 4/12/2017 — moffatt & nichol

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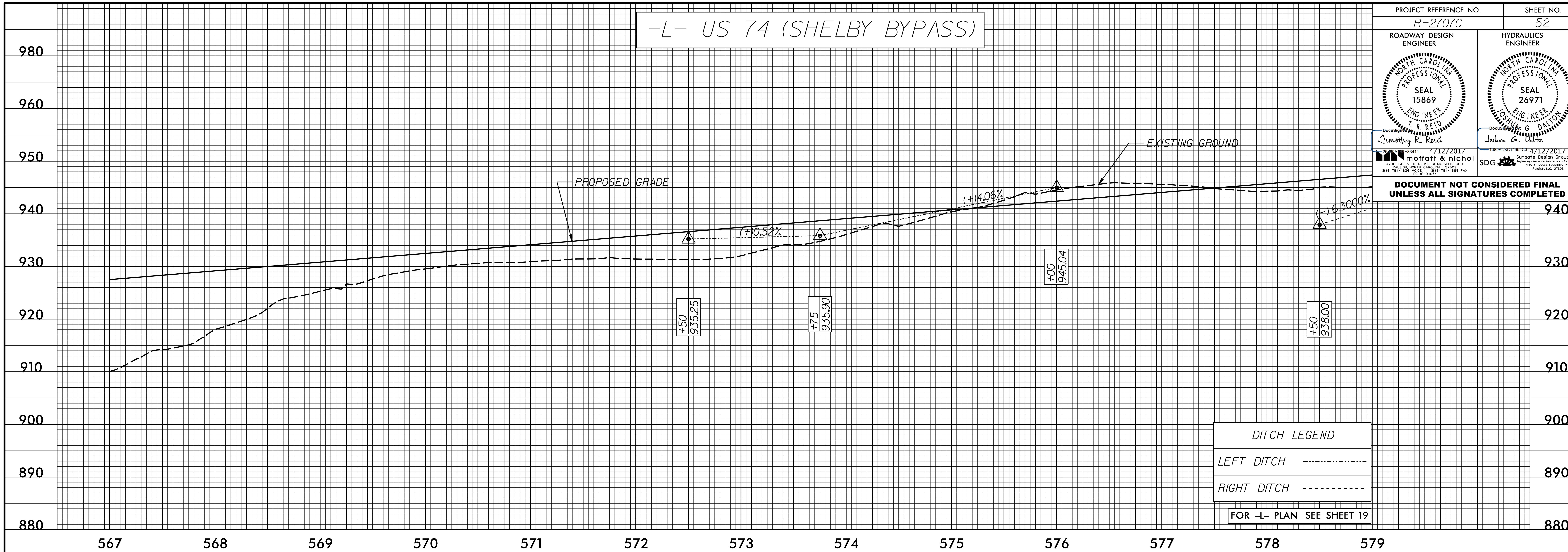

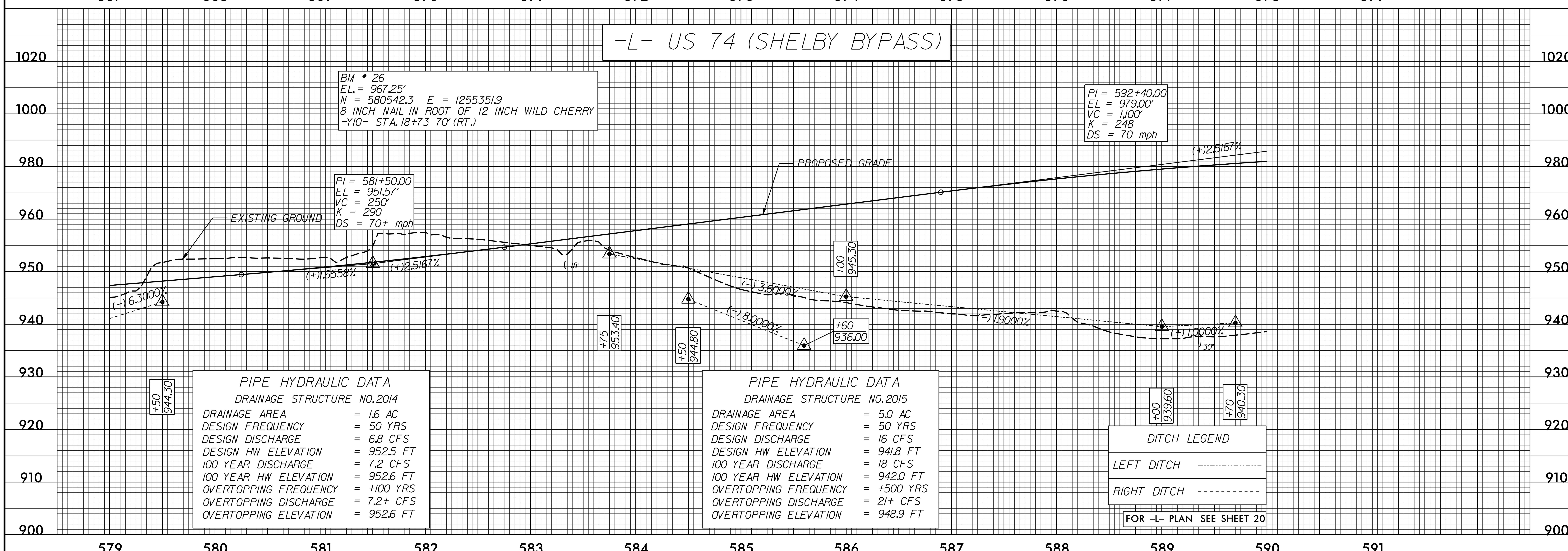

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 2014

DRAINAGE AREA	= 1.6 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 6.8 CFS
DESIGN HW ELEVATION	= 952.5 FT
100 YEAR DISCHARGE	= 7.2 CFS
100 YEAR HW ELEVATION	= 952.6 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= 7.2+ CFS
OVERTOPPING ELEVATION	= 952.6 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 2015

DRAINAGE AREA	= 5.0 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 16 CFS
DESIGN HW ELEVATION	= 941.8 FT
100 YEAR DISCHARGE	= 18 CFS
100 YEAR HW ELEVATION	= 942.0 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 21+ CFS
OVERTOPPING ELEVATION	= 948.9 FT

PROJECT REFERENCE NO. R-2707C | SHEET NO. 53

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15869 T. R. REID — Timothy R. Reid — 4/12/2017 — moffatt & nichol

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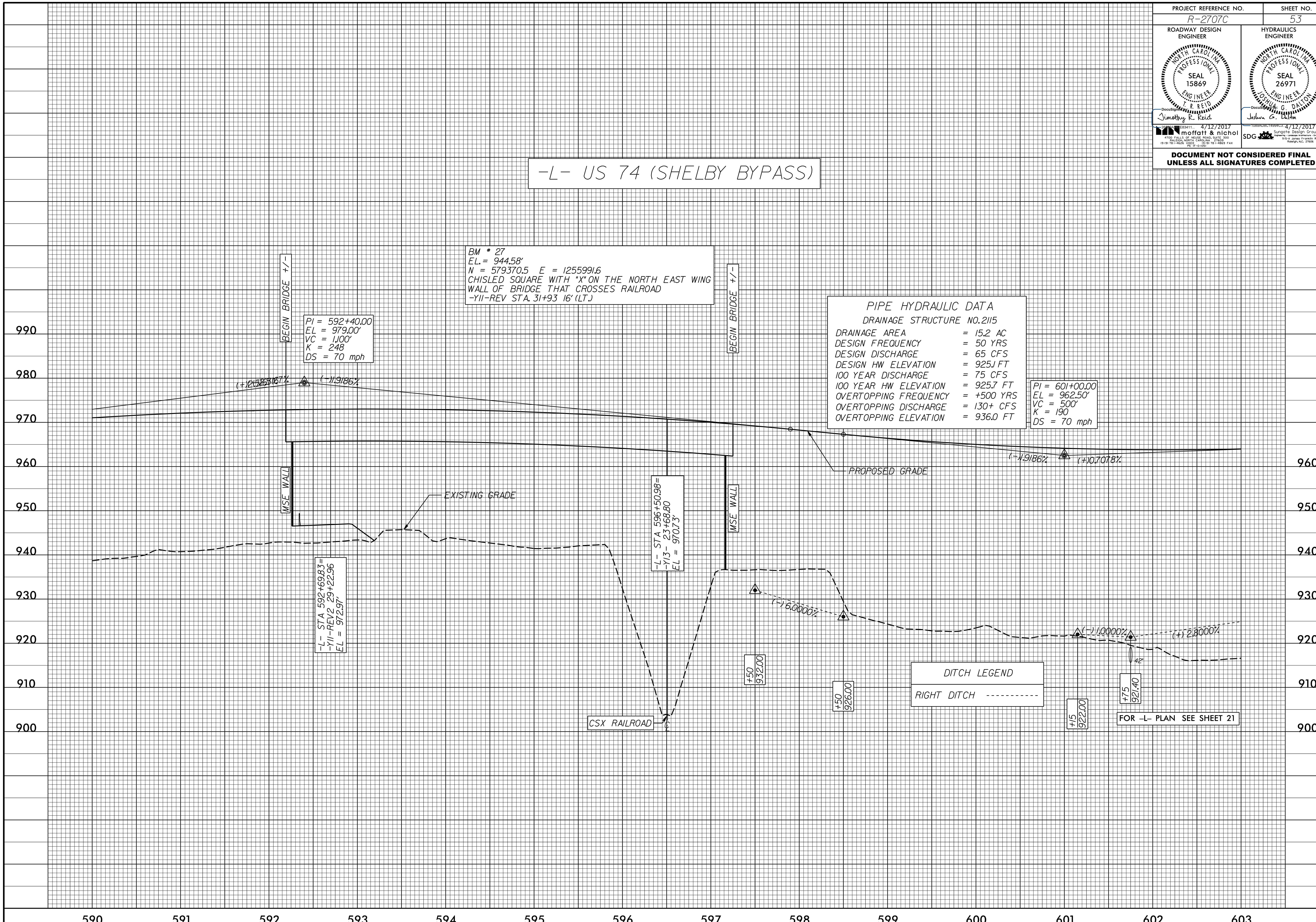
-L- US 74 (SHELBY BYPASS)

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.2115

DRAINAGE AREA	=	15.2 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	65 CFS
DESIGN HW ELEVATION	=	925.1 FT
100 YEAR DISCHARGE	=	75 CFS
100 YEAR HW ELEVATION	=	925.7 FT
OVERTOPPING FREQUENCY	=	+500 YRS
OVERTOPPING DISCHARGE	=	130+ CFS
OVERTOPPING ELEVATION	=	936.0 FT


BM # 27
EL.= 944.58'
N = 579370.5 E = 1255991.6
CHISLED SQUARE WITH "X" ON THE NORTH EAST WING WALL OF BRIDGE THAT CROSSES RAILROAD
-Y11-REV STA. 31+93 16' (LT.)
BEGIN BRIDGE +/-
PI = 592+40.00
EL = 979.00'
VC = 1100'
K = 248
DS = 70 mph
(-)1.9186%
MSE WALL
EXISTING GRADE
-L- STA 592+69.83=
-Y11-REV2 29+22.96
EL = 972.97'
-L- STA 596+50.98=
-Y13- 23+68.80
EL = 970.73'
CSX RAILROAD
PROPOSED GRADE
PI = 601+00.00
EL = 962.50'
VC = 500'
K = 190
DS = 70 mph
(-)1.9186%
(+)0.7078%
(-)6.0000%
(-)1.0000%
(+) 2.8000%
+50 932.00
+50 926.00
+15 922.00
+75 921.40
DITCH LEGEND
RIGHT DITCH
FOR -L- PLAN SEE SHEET 21
990
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PROJECT REFERENCE NO.	SHEET NO.
R-2707C	54

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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4/12/2017

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Raleigh, N.C. 27606

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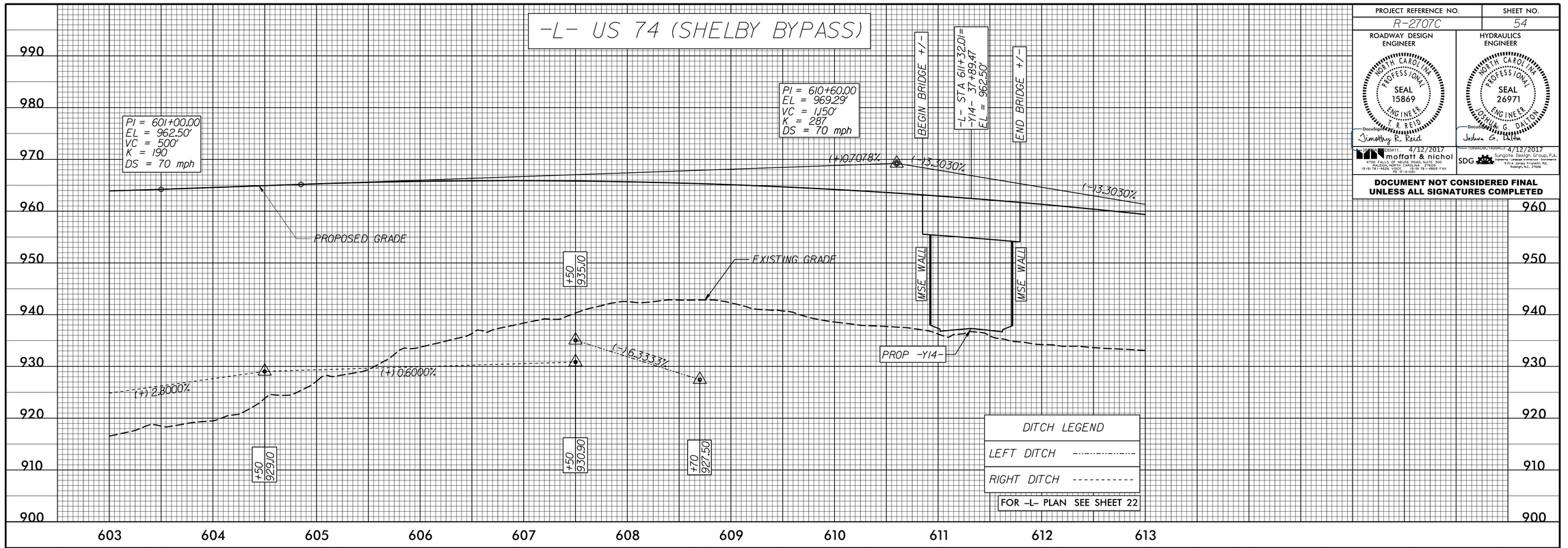

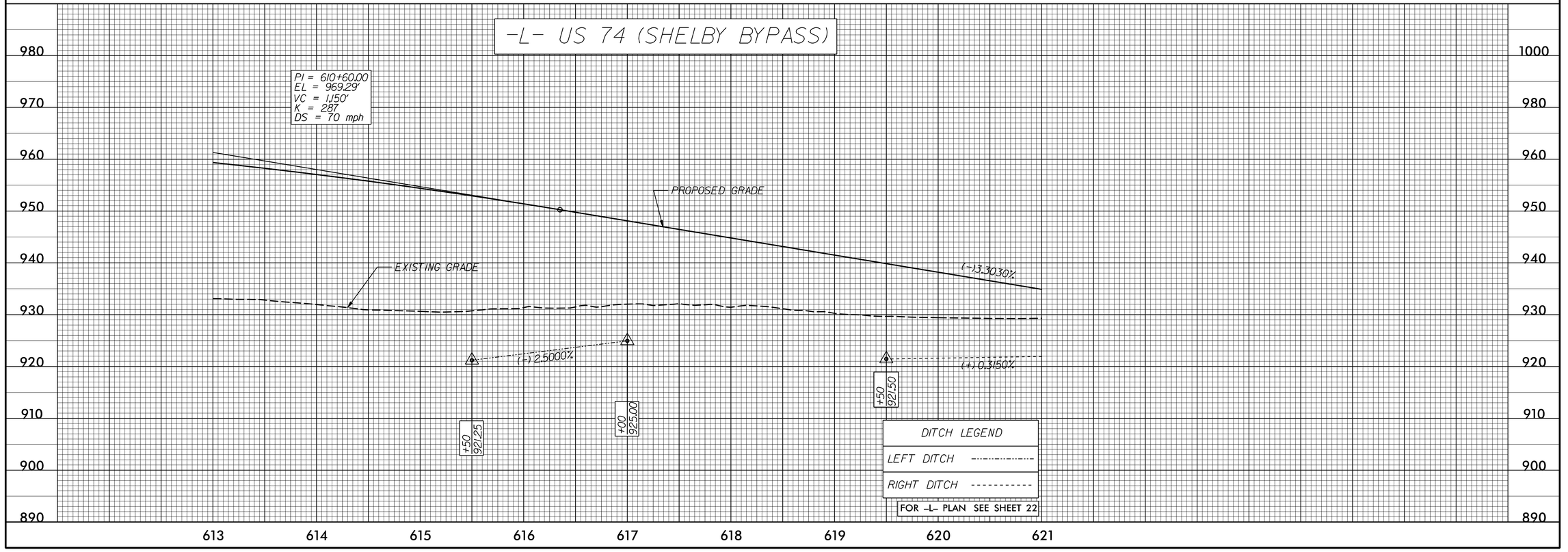

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	55

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Timothy R. Reid 4/12/2017

Joshua G. Dalton 4/12/2017

moffatt & nichol

SDG Sungate Design Group, P.A.

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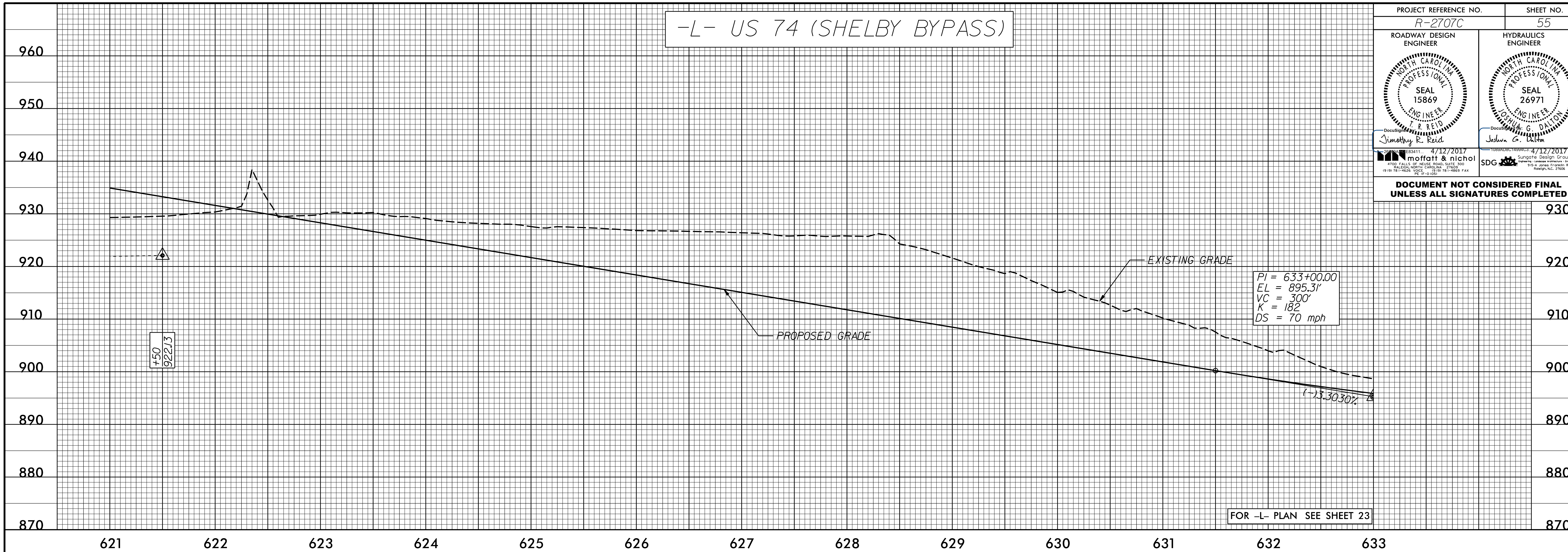

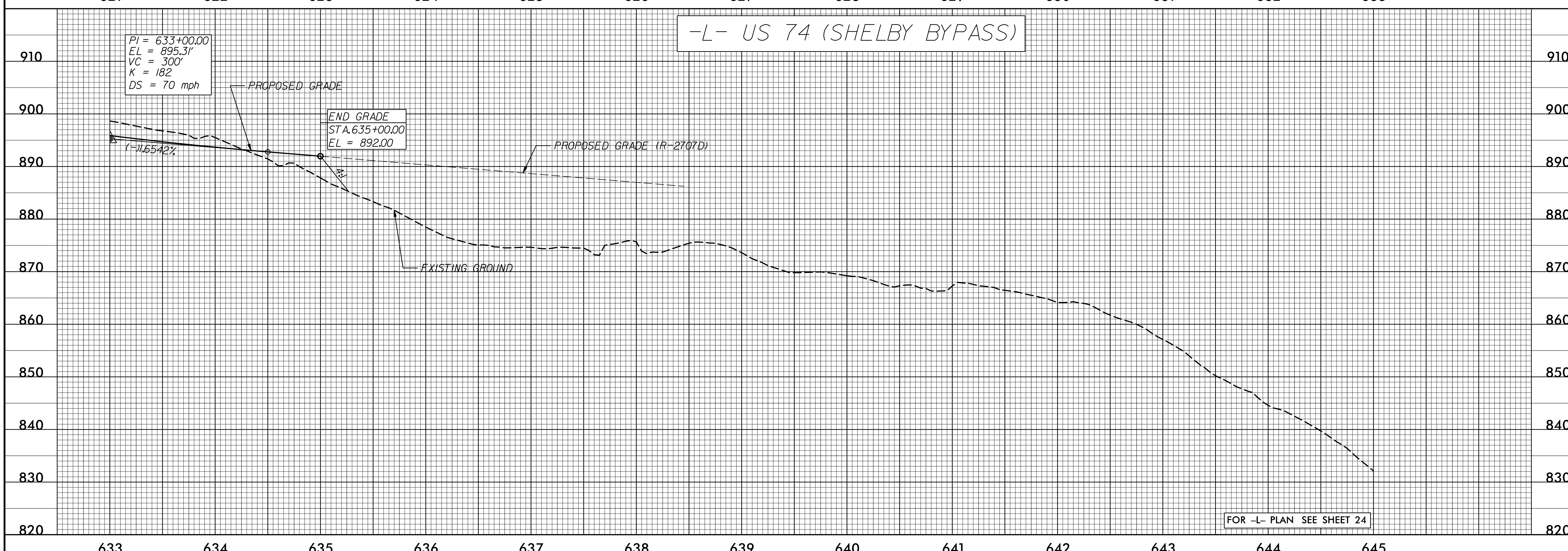
-L- US 74 (SHELBY BYPASS)
910
900
890
880
870
860
850
840
830
820
PI = 633+00.00
EL = 895.31'
VC = 300'
K = 182
DS = 70 mph
PROPOSED GRADE
END GRADE
STA.635+00.00
EL = 892.00
PROPOSED GRADE (R-2707D)
(-)1.6542%
EXISTING GROUND
FOR -L- PLAN SEE SHEET 24
633
634
635
636
637
638
639
640
641
642
643
644
645

-Y2- SR 1850 (METCALF RD)

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.0420

DRAINAGE AREA	=	5.1 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	16 CFS
DESIGN HW ELEVATION	=	720.0 FT
100 YEAR DISCHARGE	=	18 CFS
100 YEAR HW ELEVATION	=	720.3 FT
OVERTOPPING FREQUENCY	=	+100 YRS
OVERTOPPING DISCHARGE	=	+18 CFS
OVERTOPPING ELEVATION	=	740.2 FT

BM # 18
EL. = 778.74'
N = 581169.5 E = 1236857.1
8 INCH NAIL IN BASE OF 20 INCH WHITE OAK
-Y2- STA. 30+98.41 28.12' (LT.)

END GRADE STA. 33+25.00
BEGIN OVERLAY AND
SHOULDER WIDENING
EL. = 780.81

BEGIN BRIDGE +/-

END BRIDGE +/-

END OVERLAY AND
SHOULDER WIDENING
STA. 33+75.00
EL. = 782.73

BEGIN GRADE STA. 23+85.00
END OVERLAY AND
SHOULDER WIDENING
EL. = 742.27

PROPOSED GRADE

(+) 4.1000%

EXISTING GROUND

-Y2- STA 29+07.16=
-L- STA 387+54.08

BEGIN OVERLAY AND
SHOULDER WIDENING
STA. 21+75.00
EL. = 732.86

PROPOSED -L-

EXIST. 24"

FOR -Y2- PLAN SEE SHEETS 4 & 25

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	56

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-Y3- SR 1005 (NORTH LAFAYETTE ST)

BM # 22
EL. = 830.34'
N = 583077.3 E = 1242588.9
8 INCH NAIL IN ROOT OF 10 INCH POPLAR
-Y3- STA. 18+12.62 31.46' (RT.)

PI = 21+88.00
EL = 860.60'
VC = 550'
K = 86
DS = 50 mph

BEGIN BRIDGE +/-

END BRIDGE +/-

-Y3- STA 20+70.23=
-L- STA 450+02.49

PI = 25+12.00
EL = 865.50'
VC = 80'
K = 109
DS = 60 mph

END GRADE STA. 26+50.00
EL. = 868.60

(+)7.9404%

(+)11.5123%

(+)11.5123%

(+)2.2486%

PROPOSED GRADE

EXISTING GROUND

BEGIN GRADE STA. 17+90.00
EL. = 829.00

BEGIN OVERLAY AND
SHOULDER WIDENING
3" RESURF. DEPTH
STA. 16+15.00
EL. = 817.17'

END OVERLAY AND
SHOULDER WIDENING
3" RESURF. DEPTH
STA. 27+25.00
EL. = 870.53'

PROPOSED -L-

FOR -Y3- PLAN SEE SHEETS 9, 26, & 27

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	57

ROADWAY DESIGN ENGINEER — SEAL 15869 — T. R. REID — Timothy R. Reid — 4/12/2017 — moffatt & nichol

HYDRAULICS ENGINEER — SEAL 26971 — JOSHUA G. DALTON — Joshua G. Dalton — 4/12/2017 — SDG Sungate Design Group, P.A.

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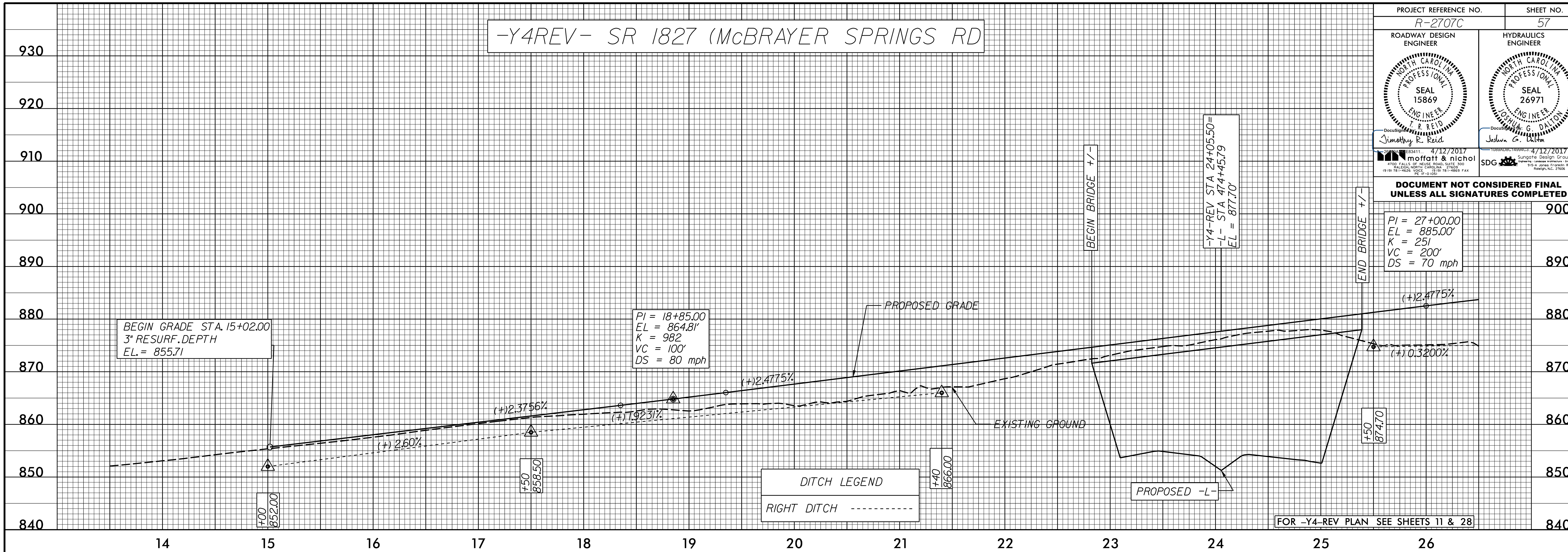
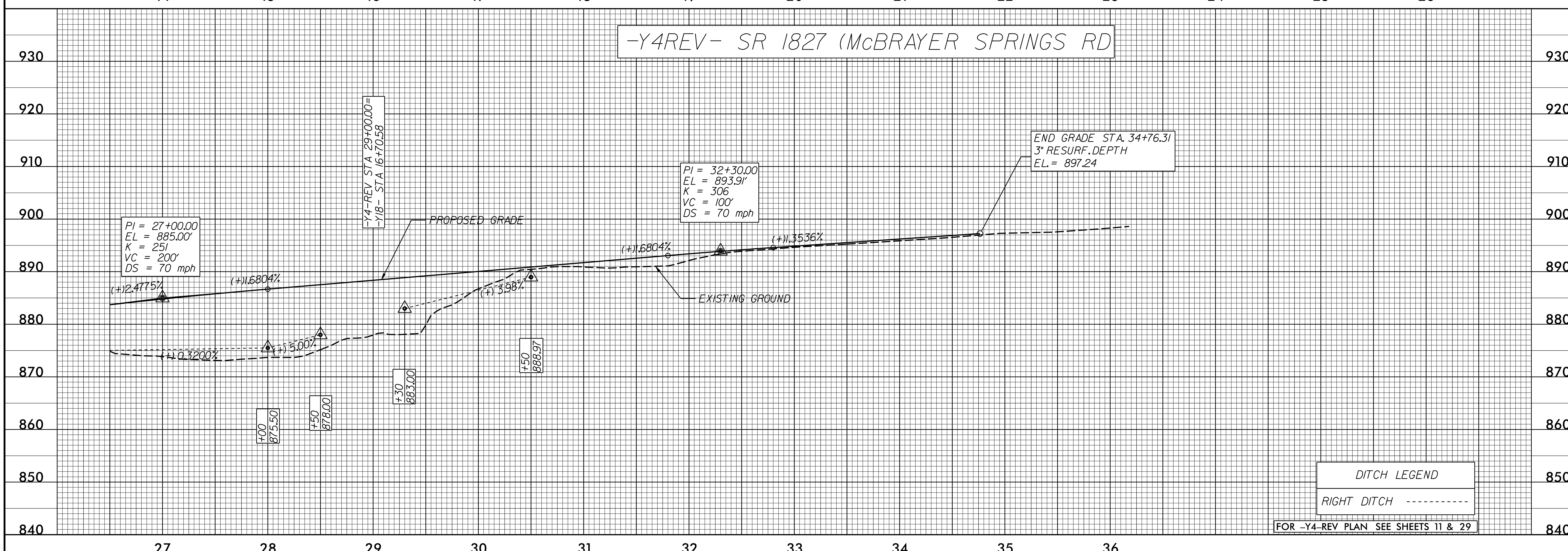


-Y4REV- SR 1827 (McBRAYER SPRINGS RD
930
920
910
900
890
880
870
860
850
840
BEGIN GRADE STA. 15+02.00
3" RESURF. DEPTH
EL.= 855.71
PI = 18+85.00
EL = 864.81'
K = 982
VC = 100'
DS = 80 mph
PI = 27+00.00
EL = 885.00'
K = 251
VC = 200'
DS = 70 mph
PROPOSED GRADE
EXISTING GROUND
BEGIN BRIDGE +/-
END BRIDGE +/-
-Y4-REV STA 24+05.50=
-L- STA 47+45.79
EL = 877.70'
PROPOSED -L-
(+)2.60%
(+)2.3756%
(+)1.9231%
(+)2.4775%
(+)2.4775%
(+) 0.3200%
+00 852.00
+50 858.50
+40 866.00
+50 874.70
DITCH LEGEND
RIGHT DITCH
FOR -Y4-REV PLAN SEE SHEETS 11 & 28
14 15 16 17 18 19 20 21 22 23 24 25 26



-Y4REV- SR 1827 (McBRAYER SPRINGS RD
930
920
910
900
890
880
870
860
850
840
PI = 27+00.00
EL = 885.00'
K = 251
VC = 200'
DS = 70 mph
-Y4-REV STA 29+00.00=
-Y18- STA 16+70.58
PROPOSED GRADE
PI = 32+30.00
EL = 893.91'
K = 306
VC = 100'
DS = 70 mph
END GRADE STA. 34+76.31
3" RESURF. DEPTH
EL.= 897.24
EXISTING GROUND
(+)2.4775%
(+)1.6804%
(+)1.6804%
(+)1.3536%
(+) 3.98%
(+) 5.00%
(+) 0.3200%
+00 875.50
+50 878.00
+30 883.00
+50 888.97
DITCH LEGEND
RIGHT DITCH
FOR -Y4-REV PLAN SEE SHEETS 11 & 29
27 28 29 30 31 32 33 34 35 36

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	58

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NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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-Y6A- SR 1843 (SPRING BROOK DR)

BEGIN GRADE STA. 10+00.00 = STA. 10+00.00 (-Y6-)
EL. = 857.83

-Y6A- STA 11+85.69 = -Y6- STA 11+85.28
EL = 861.24'

PI = 12+40.00
EL = 862.17'
K = 115
VC = 150'
DS = 30

PROPOSED GRADE

EXISTING GROUND

(+)11.8096%

(+)5.2031%

-Y6A- STA 17+07.44 = -DR3- STA 10+00.00
EL = 886.49'

PI = 17+70.00
EL = 889.75'
K = 115
VC = 100'
DS = 30

(+)5.2031%

(+)4.3333%

END GRADE STA. 20+70.00 = EL. = 902.75

FOR -Y6A- PLAN SEE SHEETS 14 & 30

-DR3-

BEGIN GRADE
STA. 10+12.00 -DR3- =
STA. 17+07.44 -Y6A- (12.0' LT)
EL. = 887.21

END GRADE
STA. 11+24.83 -DR3-
EL = 888.92

℄ -Y6A-

PI = 10+32.00
EL = 887.31'
K = 11
VC = 40'
DS = 20 mph

PI = 10+82.00
EL = 885.81'
K = 6
VC = 60'
DS = 15 mph

PROPOSED GRADE

EXISTING GROUND

(+)16.0000%

(+)10.5000%

(-)13.0000%

(+)1.2581%

FOR -DR3- PLAN SEE SHEET 30

-Y8A- SR 1927 (CARTER RD CONNECTOR)

BEGIN GRADE STA. 33+00.00 = STA. 33+00.00 (-Y8-)
EL. = 886.00

END GRADE STA. 35+96.71 = STA. 31+50.00 -Y8-REV (12.0' LT)
EL. = 877.31

-Y8A- STA 36+08.71 = -Y8-REV STA 31+50.00
EL = 876.35'

PROPOSED GRADE

EXISTING GROUND

(-)12.9298%

(-)18.00%

-Y8A- STA 33+30.52 = -Y8-
EL = 885.11'

FOR -Y8A- PLAN SEE SHEET 34

-Y8-REV SR 1927 (CARTER RD)

PI = 12+20.00
EL = 954.01'
K = 44
VC = 350'
DS = 30 mph

-Y8-REV STA 10+32.02=
-Y9- STA 33+00.00
EL = 945.22'

(+)4.0000%

(-)4.0240%

PROPOSED GRADE

EXISTING GROUND

BEGIN GRADE
STA 10+32.02 -Y8-REV =
STA 33+00.00 -Y9- (32.02' RT)
EL = 946.49'

FOR -Y8-REV PLAN SEE SHEETS 32 & 33

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	59

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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4/12/2017

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-Y8-REV SR 1927 (CARTER RD)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 34011

DRAINAGE AREA	=	92 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	175 CFS
DESIGN HW ELEVATION	=	865.86 FT
100 YEAR DISCHARGE	=	280 CFS
100 YEAR HW ELEVATION	=	869.85 FT
OVERTOPPING FREQUENCY	=	+50 YRS
OVERTOPPING DISCHARGE	=	868.25 CFS
OVERTOPPING ELEVATION	=	870.60 FT

-Y8-REV STA 31+50.00=
-Y8A- STA 36+08.71
EL = 876.35'

END GRADE STA. 36+00.00
EL.= 860.56

PI = 35+50.00
EL = 860.25'
K = 22
VC = 100'
DS = 30 mph

EXISTING GROUND

PROPOSED GRADE

(-)1.8400%

(-)1.1.00%

(-)1.9000%

(-)2.8000%

(-)2.4500%

(-)6.2629%

(-)4.0240%

(+)0.6200%

+50 889.50

+00 877.40

+50 871.90

+50 864.00

+00 871.00

+75 860.50

+00 868.55

+80 85.00

DITCH LEGEND

LEFT DITCH	·-·-·-·-·
RIGHT DITCH	----------

FOR -Y8-REV PLAN SEE SHEETS 33 & 34

-Y9- NC 18 (FALLSTON RD)

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	60

ROADWAY DESIGN ENGINEER

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Raleigh, N.C. 27606

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BEGIN GRADE STA. 10+70.00
3" RESURF. DEPTH
EL. = 948.04

PI = 12+90.00
EL = 946.70'
VC = 80'
K = 407
DS = 70 mph

(-)0.6109%

(-)0.8077%

(-)1.100%

-Y9- STA 17+12.36=
-Y9-DET STA 10+00.00
EL = 943.29'

+00
944.50

+50
943.00

PROPOSED GRADE

PI = 19+20.00
EL = 941.61'
VC = 300'
K = 117
DS = 55 mph

(-)0.8077%

(+)1.7476%

EXISTING GROUND

PI = 24+00.00
EL = 950.00'
VC = 250'
K = 85
DS = 50 mph

BEGIN BRIDGE +/-

(+)1.7476%

FOR -Y9- PLAN SEE SHEETS 16 & 31

-Y9- NC 18 (FALLSTON RD)

PI = 24+00.00
EL = 950.00'
VC = 250'
K = 85
DS = 50 mph

-Y4- STA 24+07.99=
-L- STA 531+34.35

END BRIDGE +/-

(+)1.7476%

(-)1.1806%

PROPOSED GRADE

PI = 30+80.00
EL = 941.97'
VC = 240'
K = 96
DS = 50 mph

-Y9- STA 32+21.77=
-Y9-DET STA 25+48.92
EL = 943.86'

-Y9- STA 33+00.00=
-Y8-REV STA 10+00.00
EL = 944.90'

END GRADE STA. 36+00.00
3" RESURF. DEPTH
EL. = 948.89

(-)1.1806%

(+)1.3299%

EXISTING GROUND

PROPOSED -L-

FOR -Y9- PLAN SEE SHEETS 16 & 32

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	61

ROADWAY DESIGN ENGINEER — SEAL 15869
HYDRAULICS ENGINEER — SEAL 26971

moffatt & nichol — SDG Sungate Design Group, P.A.

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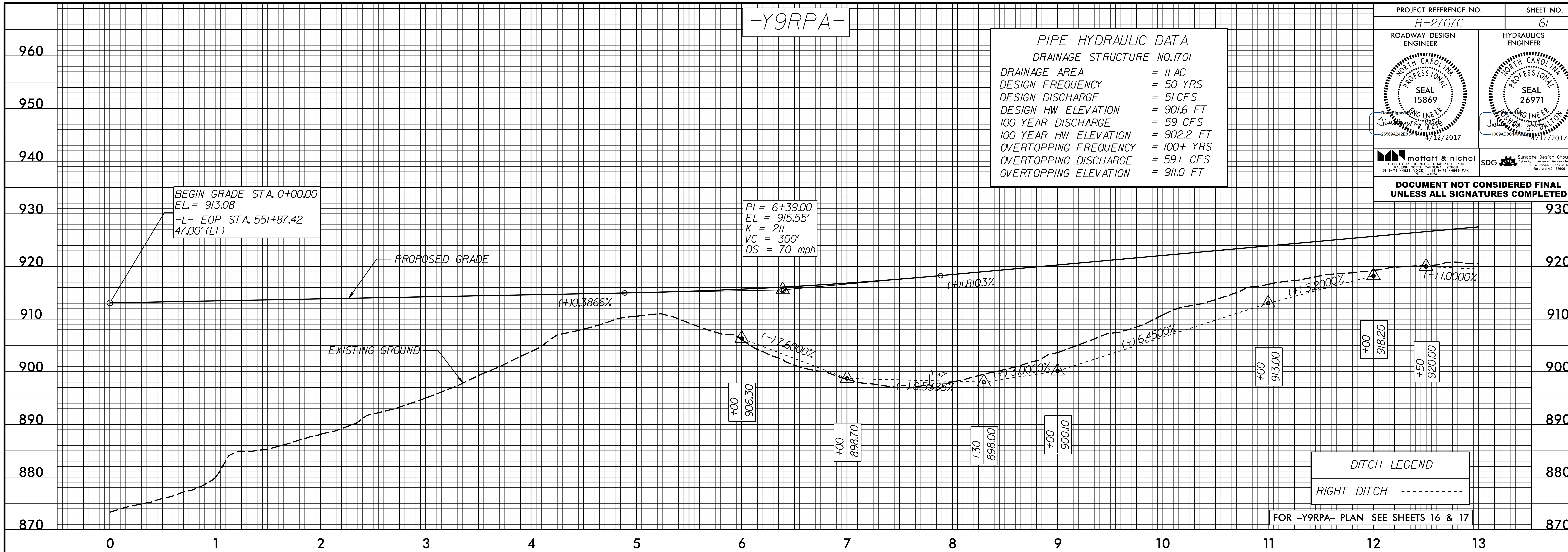
-Y9RPA-

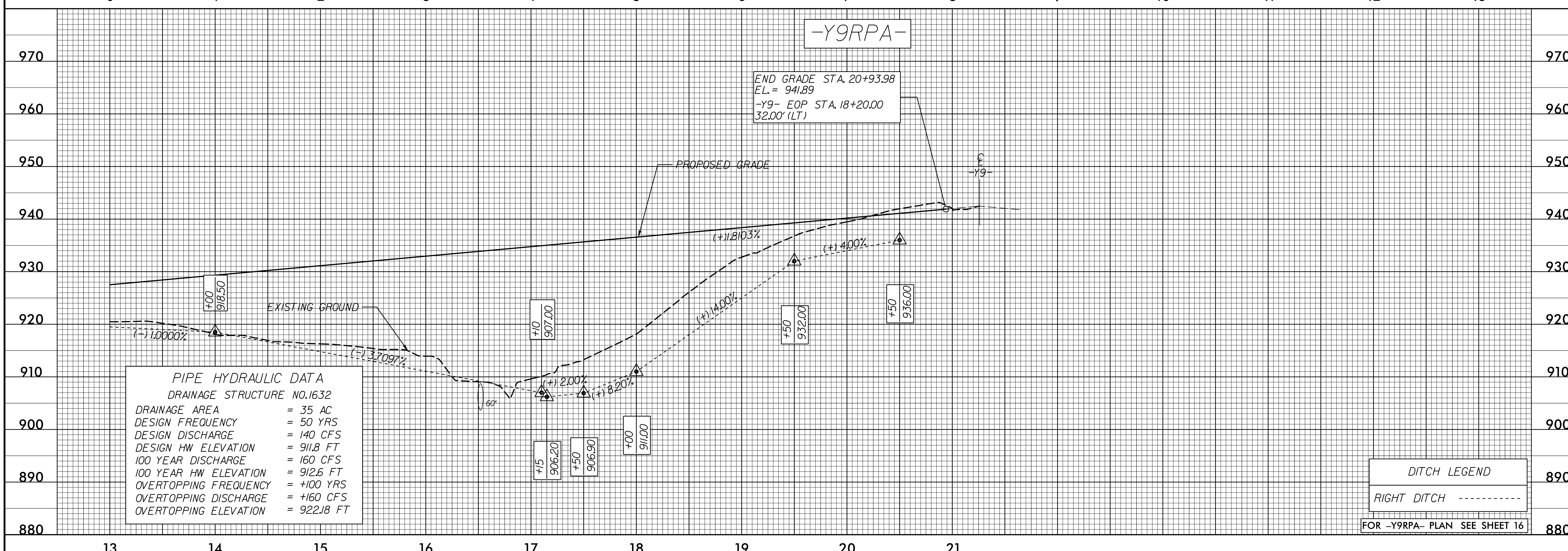


PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1701

DRAINAGE AREA	= 11 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 51 CFS
DESIGN HW ELEVATION	= 901.6 FT
100 YEAR DISCHARGE	= 59 CFS
100 YEAR HW ELEVATION	= 902.2 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 59+ CFS
OVERTOPPING ELEVATION	= 911.0 FT

-Y9RPA-



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1632

DRAINAGE AREA	= 35 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 140 CFS
DESIGN HW ELEVATION	= 911.8 FT
100 YEAR DISCHARGE	= 160 CFS
100 YEAR HW ELEVATION	= 912.6 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +160 CFS
OVERTOPPING ELEVATION	= 922.18 FT

-Y9RPB-

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	62

ROADWAY DESIGN ENGINEER

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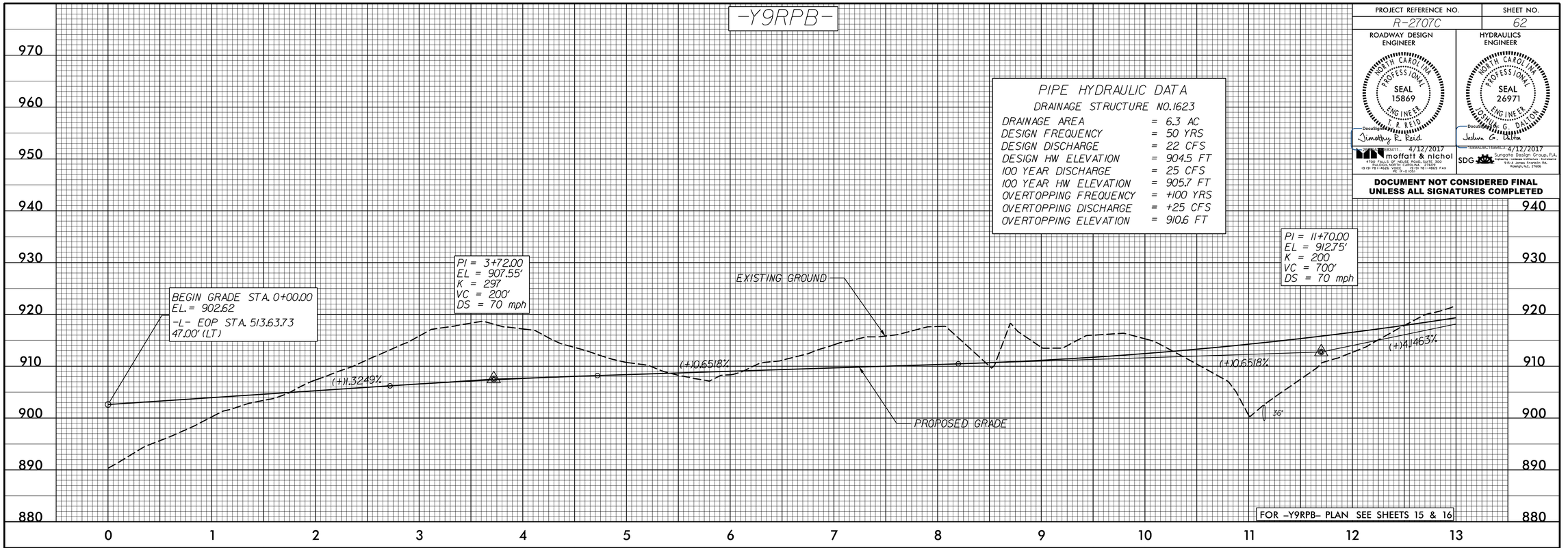
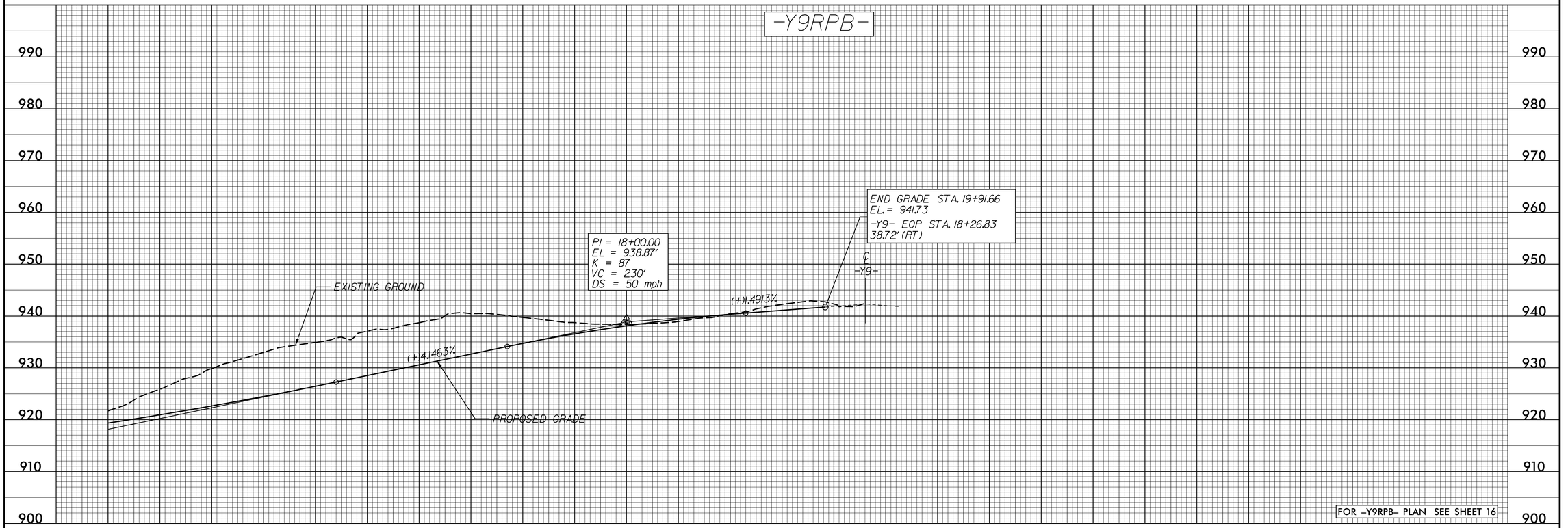
PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1623

DRAINAGE AREA	=	6.3 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	22 CFS
DESIGN HW ELEVATION	=	904.5 FT
100 YEAR DISCHARGE	=	25 CFS
100 YEAR HW ELEVATION	=	905.7 FT
OVERTOPPING FREQUENCY	=	+100 YRS
OVERTOPPING DISCHARGE	=	+25 CFS
OVERTOPPING ELEVATION	=	910.6 FT





-Y9RPC-

BEGIN GRADE STA. 0+00.00
EL. = 901.52
-L- EOP STA. 514+27.12
47.00' (RT)

EXISTING GROUND

PROPOSED GRADE

PI = 6+40.00
EL = 908.02'
K = 182
VC = 550'
DS = 70 mph

(+)11.0159%

(+)4.0365%

FOR -Y9RPC- PLAN SEE SHEETS 15 & 16

-Y9RPC-

PI = 14+45.00
EL = 940.52'
K = 97
VC = 200'
DS = 50 mph

END GRADE STA. 16+26.54
EL. = 944.11
-Y9- EOP STA. 28+45.00
32.00' (RT)

℄ -Y9-

(+)4.0365%

(+)1.9800%

EXISTING GROUND

PROPOSED GRADE

FOR -Y9RPC- PLAN SEE SHEET 16

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	63

ROADWAY DESIGN ENGINEER

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-Y9RPD-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1701

DRAINAGE AREA	= 11 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 51 CFS
DESIGN HW ELEVATION	= 901.6 FT
100 YEAR DISCHARGE	= 59 CFS
100 YEAR HW ELEVATION	= 902.2 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 59+ CFS
OVERTOPPING ELEVATION	= 911.0 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1615

DRAINAGE AREA	= 6.3 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 22 CFS
DESIGN HW ELEVATION	= 906.8 FT
100 YEAR DISCHARGE	= 25 CFS
100 YEAR HW ELEVATION	= 907.0 FT
OVERTOPPING FREQUENCY	= +100 YRS
OVERTOPPING DISCHARGE	= +25 CFS
OVERTOPPING ELEVATION	= 909.6 FT

BEGIN GRADE STA. 0+00.00
EL.= 915.49
-L- EOP STA. 547+05.16
47.00' (RT)

PI = 2+25.00
EL = 916.62'
K = 374
VC = 300'
DS = 70 mph

PI = 6+50.00
EL = 915.35'
K = 113
VC = 400'
DS = 50 mph

PROPOSED GRADE

EXISTING GROUND

(+)0.5025%
(-)0.3000%
(-)0.3000%
(+)3.2464%
(+) 1.72%
(+) 1.08%
(+) 2.82%
(+) 4.82%

42"
66"
36"

+50 904.93
+00 908.79
+50 909.33
+00 910.74
+50 913.15

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

FOR -Y9RPC- PLAN SEE SHEETS 16 & 17

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	64

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID
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NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
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-Y9RPD-

PI = 14+20.00
EL = 940.34'
K = 142
VC = 200'
DS = 50 mph

END GRADE STA. 16+27.24
EL.= 944.15
-Y9- EOP STA. 28+39.11
33.43' (RT)

PROPOSED GRADE

℄ -Y9-

(+)3.2464%
(+)1.8371%

EXISTING GROUND

FOR -Y9RPC- PLAN SEE SHEET 17

-Y9LPB-

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	65

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BEGIN GRADE STA. 0+00.00
EL. = 922.50
-L- EOP STA. 529+74.35
47.00' (LT)

PI = 1+55.00
EL = 921.42'
K = 99
VC = 200'
DS = 25 mph

PI = 3+80.00
EL = 915.30'
K = 38
VC = 250'
DS = 25 mph

PI = 11+63.00
EL = 946.05'
K = 41
VC = 150'
DS = 25 mph

EXISTING GRADE

PROPOSED GRADE

(-)0.695%

(-)2.7212%

(-)2.7212%

(+)3.9269%

(+)3.9269%

(+)10.2481%

END GRADE STA. 12+88.76
EL. = 946.36
-Y9- EOP STA. 22+28.31
32.00' (RT)

FOR -Y9LPB- PLAN SEE SHEET 16

990 980 970 960 950 940 930 920 910 900

0 1 2 3 4 5 6 7 8 9 10 11 12 13

-Y11-REV2 NC 180 (NORTH POST RD)

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	66

ROADWAY DESIGN ENGINEER

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BEGIN GRADE
STA. 17+72.40
3" RESURF. DEPTH
EL.= 952.80

PI = 19+43.00
EL = 956.38'
VC = 265'
K = 85
DS = 50 mph

(+)2.0992%

(-)1.0120%

PROPOSED GRADE

EXISTING GROUND

-Y11-REV2 STA 17+47.61=
-Y10- STA 15+44.04

(-)1.7500%

(-)3.0100%

(-)1.9500%

(-)0.6622%

+50 946.40

+90 949.20

+00 950.22

+00 944.20

+00 940.30

DITCH LEGEND

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

FOR -Y11-REV2 PLAN SEE SHEETS 20, 21, & 42

-Y11-REV2 NC 180 (NORTH POST RD)

-L-
(US 74)

PI = 28+70.00
EL = 947.00'
VC = 120'
K = 183
DS = 70 mph

-Y11-REV2 STA 29+22.96
-L- STA 592+69.83
EL = 946.81'

BEGIN BRIDGE +/-

-Y11-REV2 STA 32+31.41=
-Y13- STA 25+91.28
EL = 945.71'

END BRIDGE +/-

BM # 27
EL.= 944.58
N = 579371 E = 1255992
CHISLED SQUARE WITH X ON THE NORTHEAST WINGWALL OF BRIDGE THAT CROSSES RAILROAD
-Y11REV2- STA.31+86.28 63.41' (LT.)

PROPOSED GRADE

(-)1.0120%

(-)0.3561%

(-)0.6622%

(+)2.0000%

EXISTING GROUND

(-)1.0000%

(+)1.0075%

(+)0.3100%

+00 938.50

+00 942.53

+90 941.50

+50 942.70

+20 939.30

+00 937.80

CSX RAILROAD

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.2117

DRAINAGE AREA	= 0.70 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 3.2 CFS
DESIGN HW ELEVATION	= 939.4 FT
100 YEAR DISCHARGE	= 3.4 CFS
100 YEAR HW ELEVATION	= 939.5 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 4+ CFS
OVERTOPPING ELEVATION	= 941.0 FT

DITCH LEGEND

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

FOR -Y11-REV2 PLAN SEE SHEETS 21 & 37

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	67

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER T. R. REID

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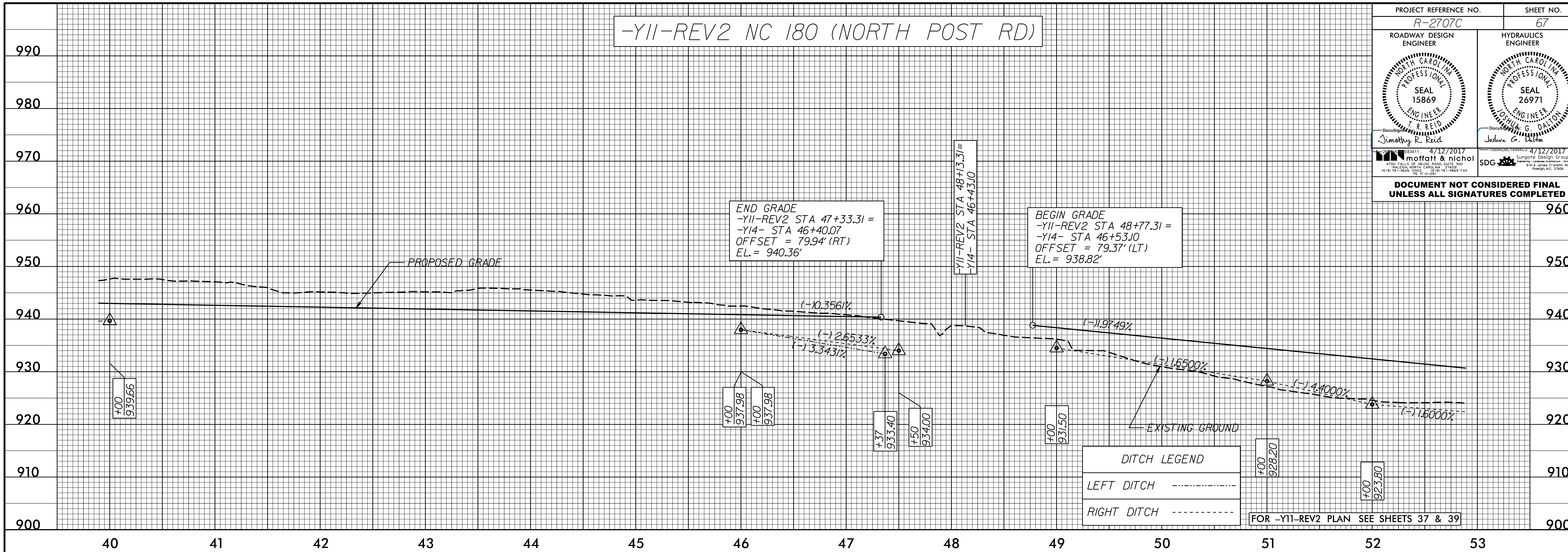
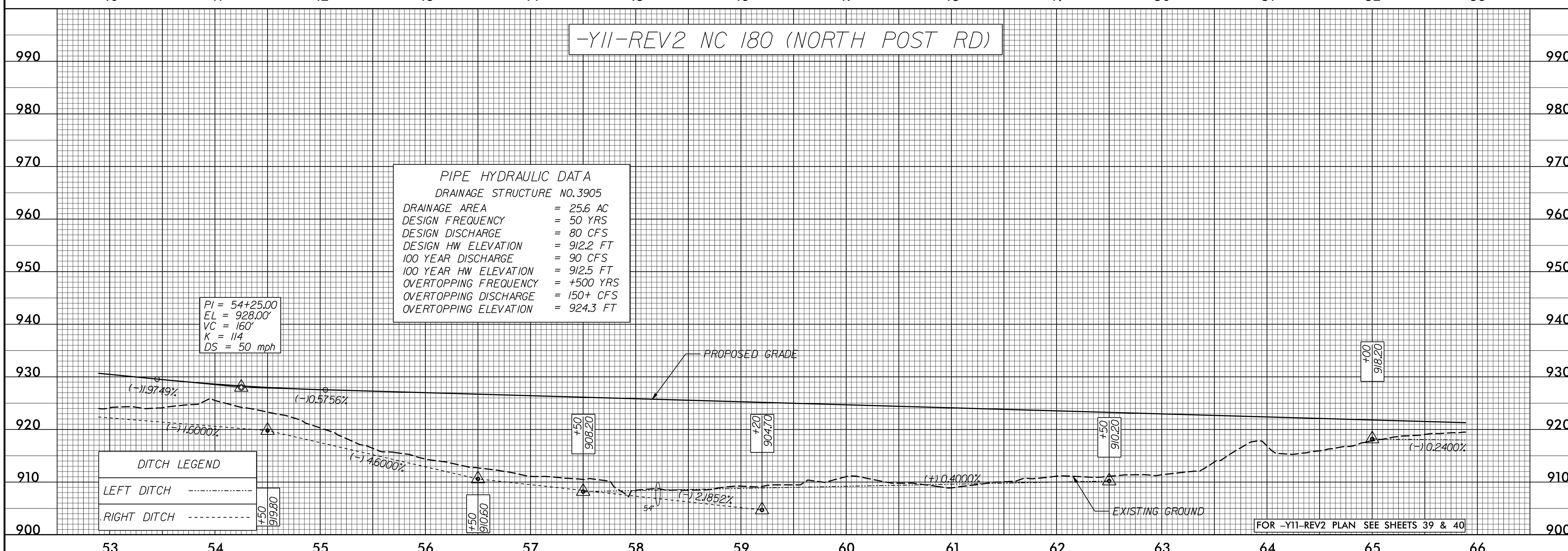
-Y11-REV2 NC 180 (NORTH POST RD)



-Y11-REV2 NC 180 (NORTH POST RD)



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.3905

DRAINAGE AREA	= 25.6 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 80 CFS
DESIGN HW ELEVATION	= 912.2 FT
100 YEAR DISCHARGE	= 90 CFS
100 YEAR HW ELEVATION	= 912.5 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 150+ CFS
OVERTOPPING ELEVATION	= 924.3 FT

-Y11-REV2 NC 180 (NORTH POST RD)

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	68

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R REID

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970 960 950 940 930 920 910 900 890 880

66 67 68 69 70 71

END GRADE STA.69+85.16
3" RESURF.DEPTH
EL.= 919.02'

PROPOSED GRADE

(-) 0.2400%

EXISTING GROUND

+00
917.00

DITCH LEGEND

LEFT DITCH ----------

FOR -Y11-REV2 PLAN SEE SHEET 40

-DR1-

BEGIN GRADE
STA.11+04.70 -DR1-
EL = 922.17

END GRADE
STA. 12+72.45 -DR1- =
STA.62+85.23 -Y11-REV2 (14.0' LT)
EL. = 927.13

℄ -Y11-REV2

PI = 11+40.00
EL = 920.91'
K = 6
VC = 70'
DS = 10 mph

PI = 12+30.00
EL = 928.20'
K = 8
VC = 80'
DS = 20 mph

(-)12.5116%

(-)18.0000%

(+)8.0986%

(-)13.5805%

(+)18.0986%

PROPOSED GRADE

EXISTING GROUND

(-)10.3750%

+60
918.50

+40
910.20

FOR -DR1- PLAN SEE SHEET 40

-DR2-

END GRADE
STA. 11+68.42 -DR2- =
STA.64+50.28 -Y11-REV2 (14.0' LT)
EL. = 923.95

BEGIN GRADE
STA.10+60.90 -DR2-
EL = 921.55

℄ -Y11-REV2

PI = 10+80.00
EL = 921.17'
K = 5
VC = 38'
DS = 10 mph

PI = 11+30.00
EL = 924.51'
K = 7
VC = 60'
DS = 20 mph

(-)11.4516%

(-)18.0000%

(-)12.0000%

(+)16.6731%

PROPOSED GRADE

EXISTING GROUND

FOR -DR2- PLAN SEE SHEET 40

10 11 12 13 10 11 12

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	69

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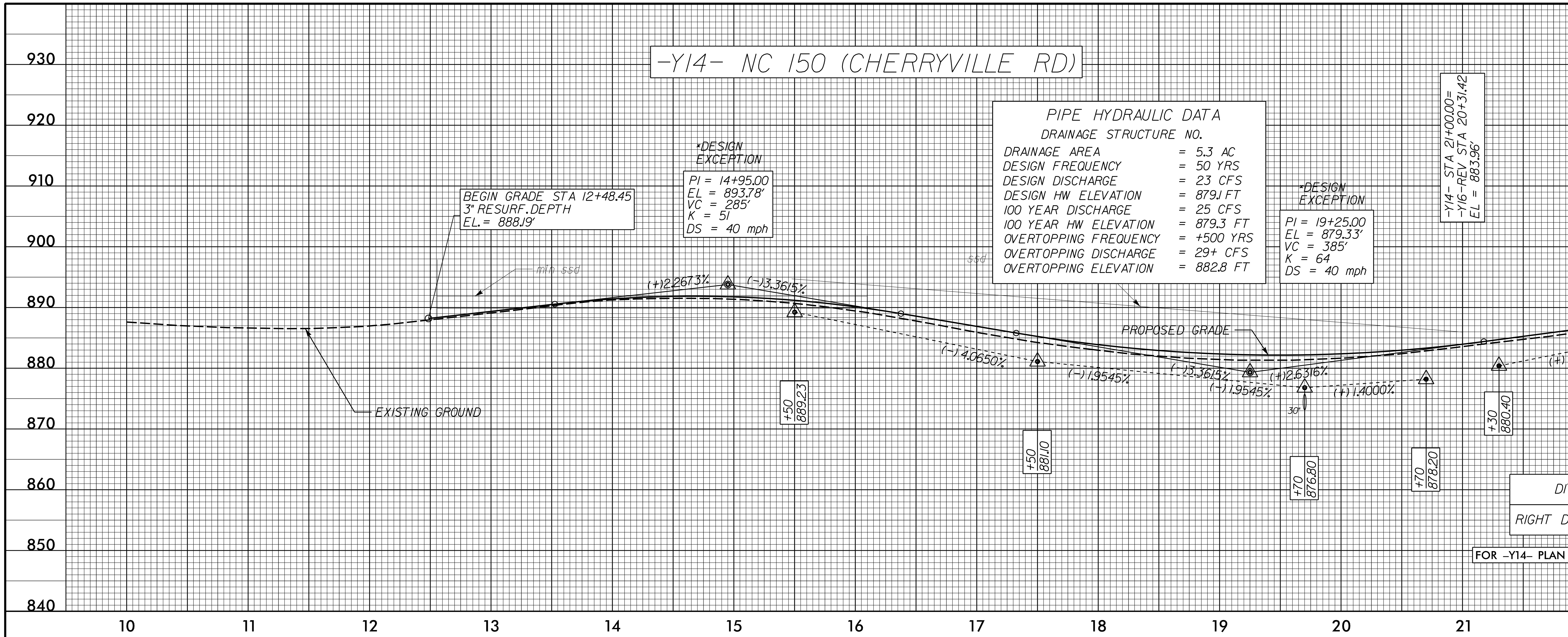
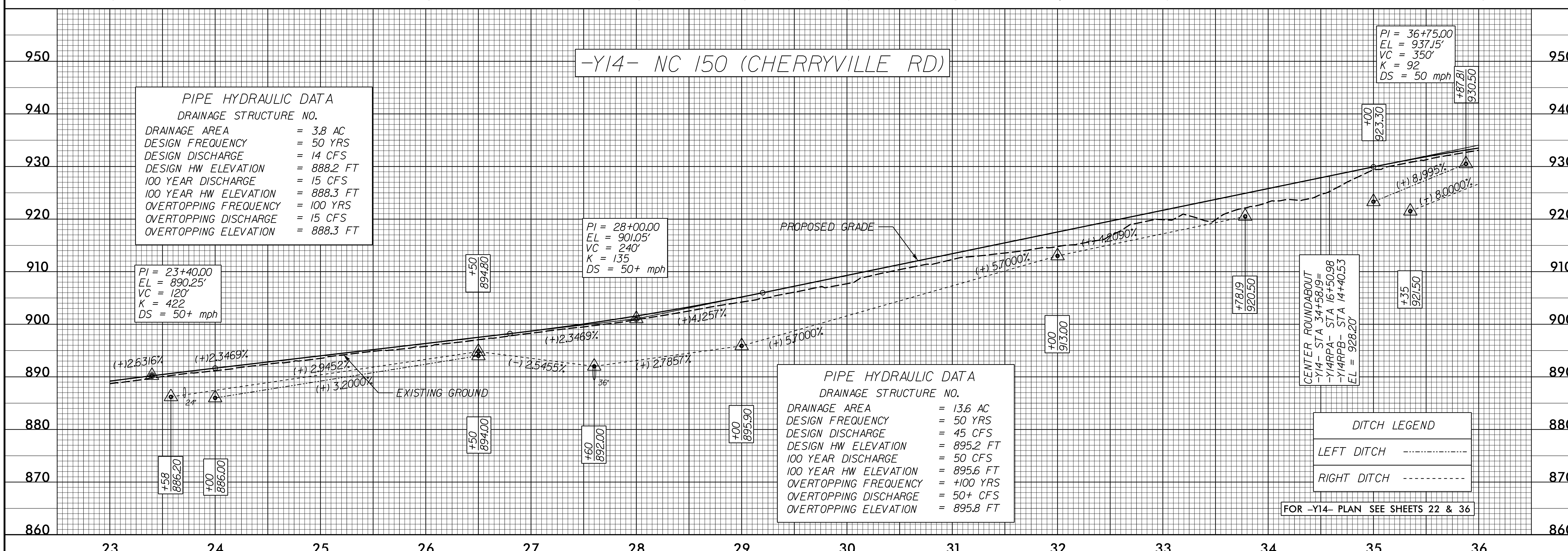

-Y14- NC 150 (CHERRYVILLE RD)
*DESIGN EXCEPTION
PI = 14+95.00
EL = 893.78'
VC = 285'
K = 51
DS = 40 mph
BEGIN GRADE STA 12+48.45
3" RESURF.DEPTH
EL.= 888.19'
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 5.3 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 23 CFS
DESIGN HW ELEVATION = 879.1 FT
100 YEAR DISCHARGE = 25 CFS
100 YEAR HW ELEVATION = 879.3 FT
OVERTOPPING FREQUENCY = +500 YRS
OVERTOPPING DISCHARGE = 29+ CFS
OVERTOPPING ELEVATION = 882.8 FT
*DESIGN EXCEPTION
PI = 19+25.00
EL = 879.33'
VC = 385'
K = 64
DS = 40 mph
-Y14- STA 21+00.00=
-Y16-REV STA 20+31.42
EL = 883.96'
PI = 23+40.00
EL = 890.25'
VC = 120'
K = 422
DS = 50+ mph
min ssd
ssd
(+)2.2673%
(-)3.3615%
(-)4.0650%
(-)1.9545%
(-)3.3615%
(-)1.9545%
(+)2.6316%
(+)1.4000%
(+)4.0000%
PROPOSED GRADE
EXISTING GROUND
+50 889.23
+50 881.10
30"
+70 876.80
+70 878.20
+30 880.40
+50 885.20
DITCH LEGEND
RIGHT DITCH
FOR -Y14- PLAN SEE SHEETS 35 & 36


-Y14- NC 150 (CHERRYVILLE RD)
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 3.8 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 14 CFS
DESIGN HW ELEVATION = 888.2 FT
100 YEAR DISCHARGE = 15 CFS
100 YEAR HW ELEVATION = 888.3 FT
OVERTOPPING FREQUENCY = 100 YRS
OVERTOPPING DISCHARGE = 15 CFS
OVERTOPPING ELEVATION = 888.3 FT
PI = 23+40.00
EL = 890.25'
VC = 120'
K = 422
DS = 50+ mph
PI = 28+00.00
EL = 901.05'
VC = 240'
K = 135
DS = 50+ mph
PI = 36+75.00
EL = 937.15'
VC = 350'
K = 92
DS = 50 mph
PROPOSED GRADE
EXISTING GROUND
(+)2.6316%
(+)2.3469%
(+)2.9452%
(+)3.2000%
(+)2.3469%
(-)2.5455%
(+)2.7857%
(+)4.1257%
(+)5.7000%
(+)5.7000%
(+)4.2090%
(+)8.1995%
(+)8.0000%
24"
36"
+58 886.20
+00 886.00
+50 894.80
+50 894.00
+60 892.00
+00 895.90
+00 913.00
+78.19 920.50
+00 923.30
+35 921.50
+87.81 930.50
CENTER ROUNDABOUT
-Y14- STA 34+58.19=
-Y14RPA- STA 16+50.98
-Y14RPB- STA 14+40.53
EL = 928.20'
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 13.6 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 45 CFS
DESIGN HW ELEVATION = 895.2 FT
100 YEAR DISCHARGE = 50 CFS
100 YEAR HW ELEVATION = 895.6 FT
OVERTOPPING FREQUENCY = +100 YRS
OVERTOPPING DISCHARGE = 50+ CFS
OVERTOPPING ELEVATION = 895.8 FT
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR -Y14- PLAN SEE SHEETS 22 & 36

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	70

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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–Y14– NC 150 (CHERRYVILLE RD)

–L– (US 74)

PROPOSED GRADE

EXISTING GROUND

PI = 36+75.00
EL = 937.15'
VC = 350'
K = 92
DS = 50 mph

(+)4.1251%

(+)0.3207%

–Y14– STA 37+89.48
–L– STA 611+32.01
EL = 937.31'

+50
930.70

(+) 2.1664%

+13.84
933.00

+60
932.00

CENTER ROUNDABOUT
–Y14– STA 40+93.80
–Y14RPC– STA 13+17.38
–Y14RPD– STA 18+25.03
EL = 938.49'

PI = 43+00.00
EL = 939.15'
VC = 100'
K = 161
DS = 50+ mph

(+)0.3207%

(–)0.3000%

(–) 0.6114%

+73.80
935.70

PI = 45+10.00
EL = 938.52'
VC = 100'
K = 142
DS = 50+ mph

(–)0.3000%

(+)0.4029%

+50
933.40

CENTER ROUNDABOUT
–Y14– STA 46+43.10=
–Y11–REV2 STA 48+13.31
EL = 939.06'

(+)0.4029%

+15
934.00

PI = 49+90.00
EL = 940.45'
VC = 350'
K = 465
DS = 50+ mph

+00
936.70

(–) 0.4000%

(+) 0.3178%

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR –Y14– PLAN SEE SHEETS 22 & 37

–Y14– NC 150 (CHERRYVILLE RD)

PI = 49+90.00
EL = 940.45'
VC = 350'
K = 465
DS = 50+ mph

PROPOSED GRADE

(+)0.4029%

(–) 0.4000%

(+) 0.3178%

EXISTING GROUND

PI = 52+20.00
EL = 939.65'
VC = 110'
K = 167
DS = 50+ mph

(–)0.3495%

(+) 0.6650%

PI = 53+50.00
EL = 940.05'
VC = 100'
K = 165
DS = 50+ mph

(+)0.3077%

PI = 54+50.00
EL = 939.75'
VC = 100'
K = 125
DS = 50+ mph

(–)0.3000%

(+) 0.6440%

(+) 1.0000%

(+)0.5000%

END GRADE STA 55+00.00
3" RESURF. DEPTH
EL.= 940.00'

+00
935.50

+50
935.00

+50
935.70

+50
936.33

+00
934.00

+00
935.00

+00
937.36

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

FOR –Y14– PLAN SEE SHEETS 37 & 38

-Y14RPA-

PI = 7+25.00
EL = 936.00'
VC = 400'
K = 85
DS = 50 mph

BEGIN GRADE -Y14RPA- STA 0+00.00
-L- STA 628+24.07, 47.00' LT
EL = 912.23'

EXISTING GROUND

PROPOSED GRADE

(+)3.2781%

(-)11.4477%

FOR -Y14RPA- PLAN SEE SHEETS 22 & 23

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	7I

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0 1 2 3 4 5 6 7 8 9 10 11 12 13

960 950 940 930 920 910 900 890 880

-Y14RPA-

CENTRAL ISLAND -Y14RPA- STA.16+50.98=
-Y14- STA 34+58.19
EL = 928.49'

END GRADE -Y14RPA- STA 15+70.98
EL = 926.89'

PI = 14+80.00
EL = 925.07'
VC = 140'
K = 41
DS = 30 mph

PROPOSED GRADE

(-)11.4477%

(+)12.0000%

(-) 2.5000%

(+) 6.1990%

(-) 0.3704%

EXISTING GROUND

+00 921.25

+50 920.00

+85 919.50

+47 923.30

DITCH LEGEND

LEFT DITCH

FOR -Y14RPA- PLAN SEE SHEET 22

13 14 15 16 17

960 950 940 930 920 910 900 890 880

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	72

ROADWAY DESIGN ENGINEER

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-Y14RPB-

BEGIN GRADE -Y14RPB- STA 0+00.00
-L- STA 598+35.00, 47.00' LT
EL = 967.10'

PI = 1+55.00
EL = 964.35'
VC = 140'
K = 129
DS = 55 mph

PI = 4+70.00
EL = 962.18'
VC = 360'
K = 84
DS = 50 mph

PI = 12+30.00
EL = 924.28'
VC = 260'
K = 37
DS = 30 mph

(-)1.7742% (-)0.6875% (-)0.6875% (-)4.9875% (-)3.0000% (-)4.9875% (+)2.0000% (-)1.5000% (-)1.4911%

PROPOSED GRADE

EXISTING GROUND

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

+50 927.50

+00 923.00

+50 922.27

+00 921.50

FOR -Y14RPB- PLAN SEE SHEETS 21 & 22

0 1 2 3 4 5 6 7 8 9 10 11 12 13

990 980 970 960 950 940 930 920 910 900

-Y14RPB-

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 2246

DRAINAGE AREA	= 3.7 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 13.5 CFS
DESIGN HW ELEVATION	= 923.5 FT
100 YEAR DISCHARGE	= 14.4 CFS
100 YEAR HW ELEVATION	= 923.6 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 17+ CFS
OVERTOPPING ELEVATION	= 926.1 FT

END GRADE -Y14RPB- STA 13+60.53
EL = 926.89'

PROPOSED GRADE

CENTRAL ISLAND -Y14RPB- STA. 14+40.53
-Y14- STA 34+58.19
EL = 928.49'

24" RCP

(-)1.4911%

EXISTING GROUND

+62 920.50

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

FOR -Y14RPB- PLAN SEE SHEET 22

13 14 15

990 980 970 960 950 940 930 920 910 900

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	73

ROADWAY DESIGN ENGINEER

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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DocuSigned by: Joshua G. Dalton

4/12/2017

SDG Sungate Design Group, P.A.
Engineering · Landscape Architecture · Surveying
915-A Jones Franklin Rd.
Raleigh, N.C. 27606

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-Y14RPC-

BEGIN GRADE -Y14RPC- STA 0+00.00
-L- STA 597+55.00, 47.00' RT
EL = 968.61'

PI = 1+50.00
EL = 965.67'
VC = 100'
K = 179
DS = 65 mph

PI = 3+25.00
EL = 963.21'
VC = 200'
K = 92
DS = 50 mph

(-)1.9622%
(-)1.4035%
(-)1.4035%
(-)13.5810%

PROPOSED GRADE

CENTRAL ISLAND -Y14RPC- STA.13+17.38
-Y14- STA 40+93.80
EL = 938.41'

END GRADE -Y14RPC- STA 12+37.38
EL = 936.81'

PI = 11+25.00
EL = 934.56'
VC = 210'
K = 38
DS = 30 mph

(-)13.5810%
(+)2.0000%
(+)0.7010%
(+)0.4371%

EXISTING GROUND

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

+22.4
930.90

+45.09
931.76

+45.09
932.24

+00
932.00

FOR -Y14RPC- PLAN SEE SHEETS 21 & 22

-Y14RPD-

BEGIN GRADE -Y14RPD- STA 0+00.00=
-L- STA 628+59.80, 47.00' RT
EL = 908.67'

PI = 4+40.00
EL = 923.10'
VC = 220'
K = 92
DS = 50 mph

(+)3.2795%
(+)0.8837%

EXISTING GROUND

PROPOSED GRADE

+00
923.21

+00
921.50

(-)0.3020%
(-)0.3000%

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

FOR -Y14RPD- PLAN SEE SHEETS 22 & 23

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	74

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15869 ENGINEER TIMOTHY R. REID

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PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 2247

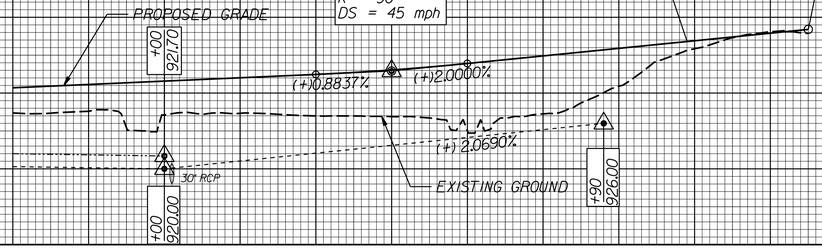
DRAINAGE AREA	= 6.9 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 23 CFS
DESIGN HW ELEVATION	= 922.4 FT
100 YEAR DISCHARGE	= 25 CFS
100 YEAR HW ELEVATION	= 922.6 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 29+ CFS
OVERTOPPING ELEVATION	= 923.8 FT

-Y14RPD-

CENTRAL ISLAND -Y14RPB- STA. 18+25.03
-Y14- STA 40+93.80
EL = 938.41'

END GRADE -Y14R4PC- STA 17+45.03
EL = 936.81'

PI = 15+50.00
EL = 932.91'
VC = 100'
K = 90
DS = 45 mph



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

FOR -Y14RPD- PLAN SEE SHEET 22

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	75

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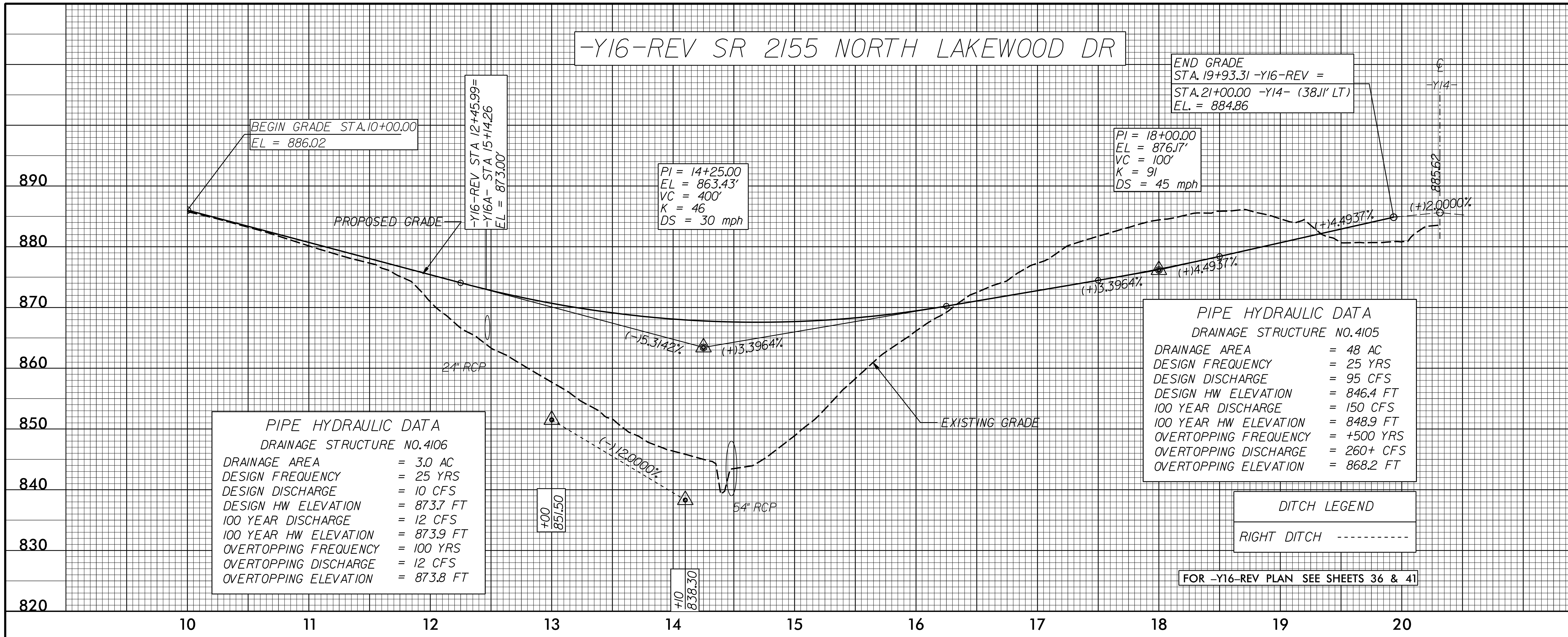
-Y16-REV SR 2155 NORTH LAKEWOOD DR



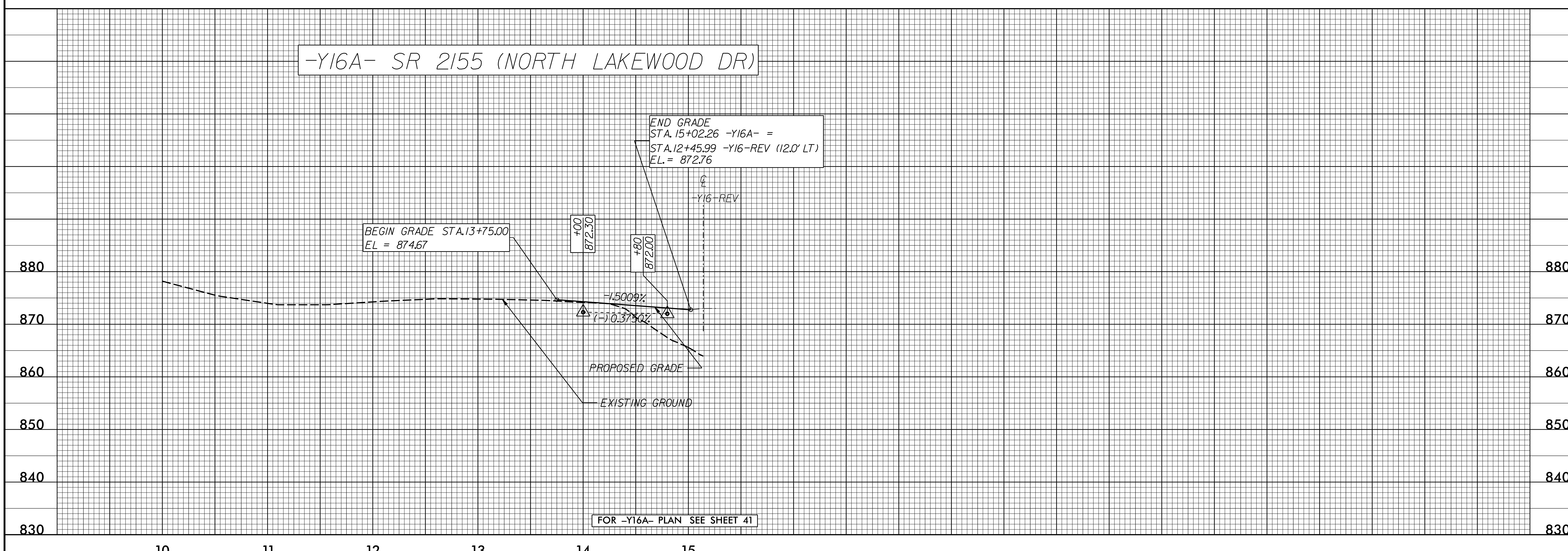
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 4106

DRAINAGE AREA	= 3.0 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 10 CFS
DESIGN HW ELEVATION	= 873.7 FT
100 YEAR DISCHARGE	= 12 CFS
100 YEAR HW ELEVATION	= 873.9 FT
OVERTOPPING FREQUENCY	= 100 YRS
OVERTOPPING DISCHARGE	= 12 CFS
OVERTOPPING ELEVATION	= 873.8 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 4105

DRAINAGE AREA	= 48 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 95 CFS
DESIGN HW ELEVATION	= 846.4 FT
100 YEAR DISCHARGE	= 150 CFS
100 YEAR HW ELEVATION	= 848.9 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= 260+ CFS
OVERTOPPING ELEVATION	= 868.2 FT

-Y16A- SR 2155 (NORTH LAKEWOOD DR)



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	76

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-Y18- SERVICE ROAD 1

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	0.96 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	3.5 CFS
DESIGN HW ELEVATION	=	886.02 FT
100 YEAR DISCHARGE	=	4.1 CFS
100 YEAR HW ELEVATION	=	886.10 FT
OVERTOPPING FREQUENCY	=	+100 YRS
OVERTOPPING DISCHARGE	=	+4.1 CFS
OVERTOPPING ELEVATION	=	887.30 FT

BEGIN GRADE STA.12+00.00
EL.= 891.72

PI = 13+00.00
EL = 890.60'
K = 168
VC = 100'
DS = 65 mph

PROPOSED GRADE

(-)11.2800%

(-)0.5243%

EXISTING GROUND

18"

℄ -Y14-

END GRADE
STA. 16+58.58 -Y18- =
STA. 29+00.00 -Y4-REV (12.0' RT)
EL. = 888.72

FOR -Y18- PLAN SEE SHEETS 11 & 29

-DR4-

BEGIN GRADE STA.10+10.32
EL.= 738.63

PI = 10+30.00
EL = 739.50'
VC = 30'
K = 3

(+)4.4263%

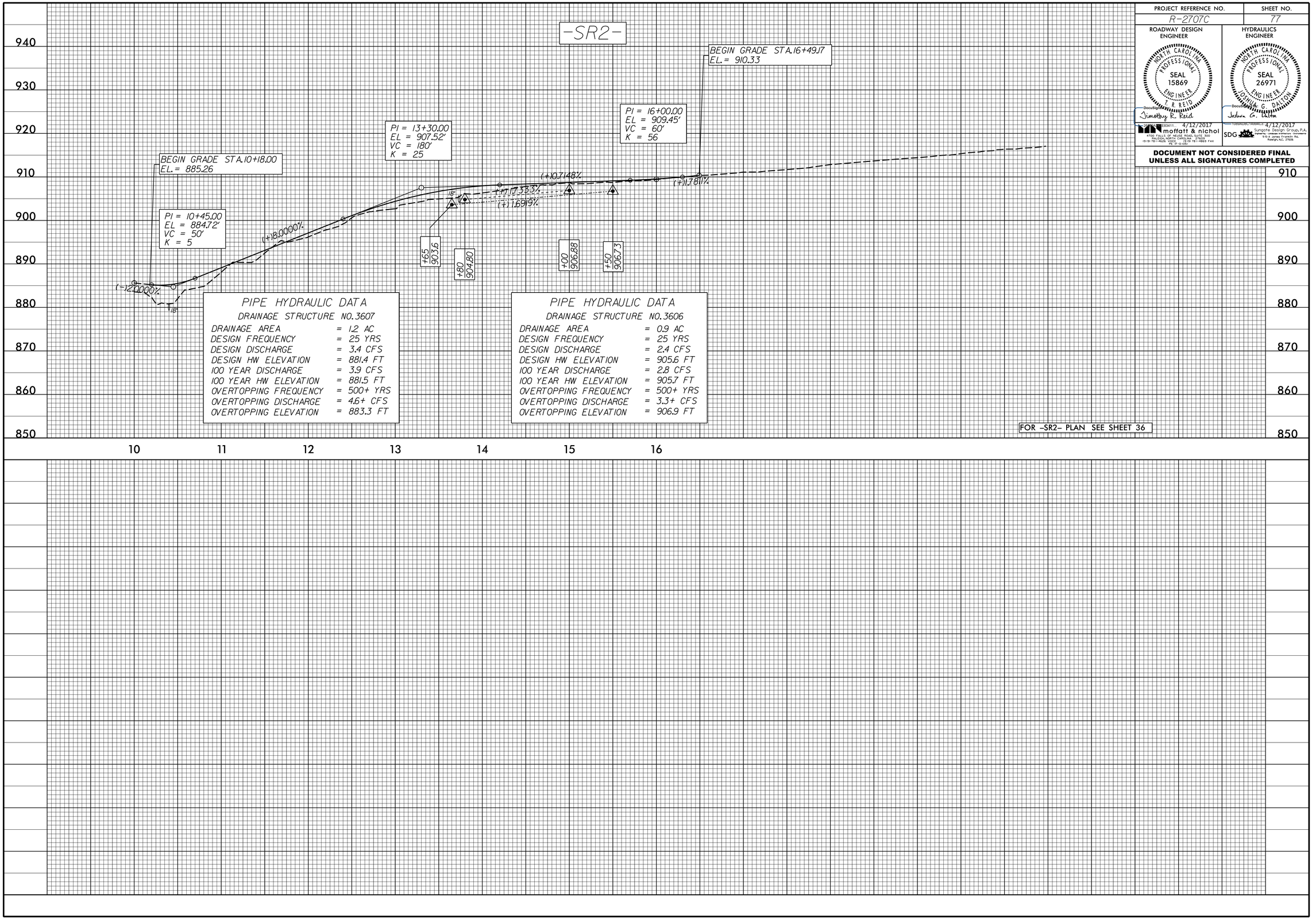
(-)6.0000%

PI = 15+50.00
EL = 708.30'
VC = 80'
K = 10

(+)1.7171%

END GRADE STA.17+26.25
EL.= 711.00

FOR -DR4- PLAN SEE SHEETS 4 & 25



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.3607

DRAINAGE AREA	= 1.2 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 3.4 CFS
DESIGN HW ELEVATION	= 881.4 FT
100 YEAR DISCHARGE	= 3.9 CFS
100 YEAR HW ELEVATION	= 881.5 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 4.6+ CFS
OVERTOPPING ELEVATION	= 883.3 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.3606

DRAINAGE AREA	= 0.9 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 2.4 CFS
DESIGN HW ELEVATION	= 905.6 FT
100 YEAR DISCHARGE	= 2.8 CFS
100 YEAR HW ELEVATION	= 905.7 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 3.3+ CFS
OVERTOPPING ELEVATION	= 906.9 FT

FOR -SR2- PLAN SEE SHEET 36

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	77

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