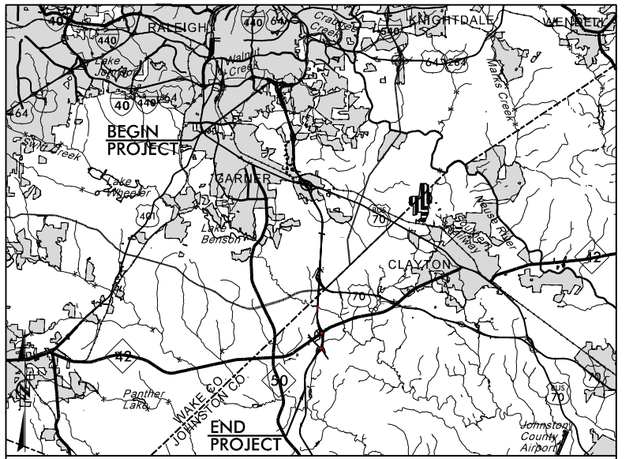
09/08/99

TIP PROJECT: I-5111 /I-4739

CONTRACT: C204134

See Sheet 1-B For Plan Sheet Symbols



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE & JOHNSTON COUNTIES

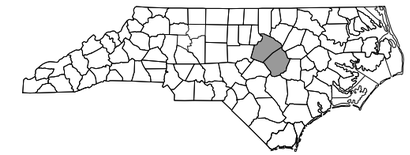
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5111 /I-4739	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
42346.3.1	IMNHF-040-4(139)301	PE

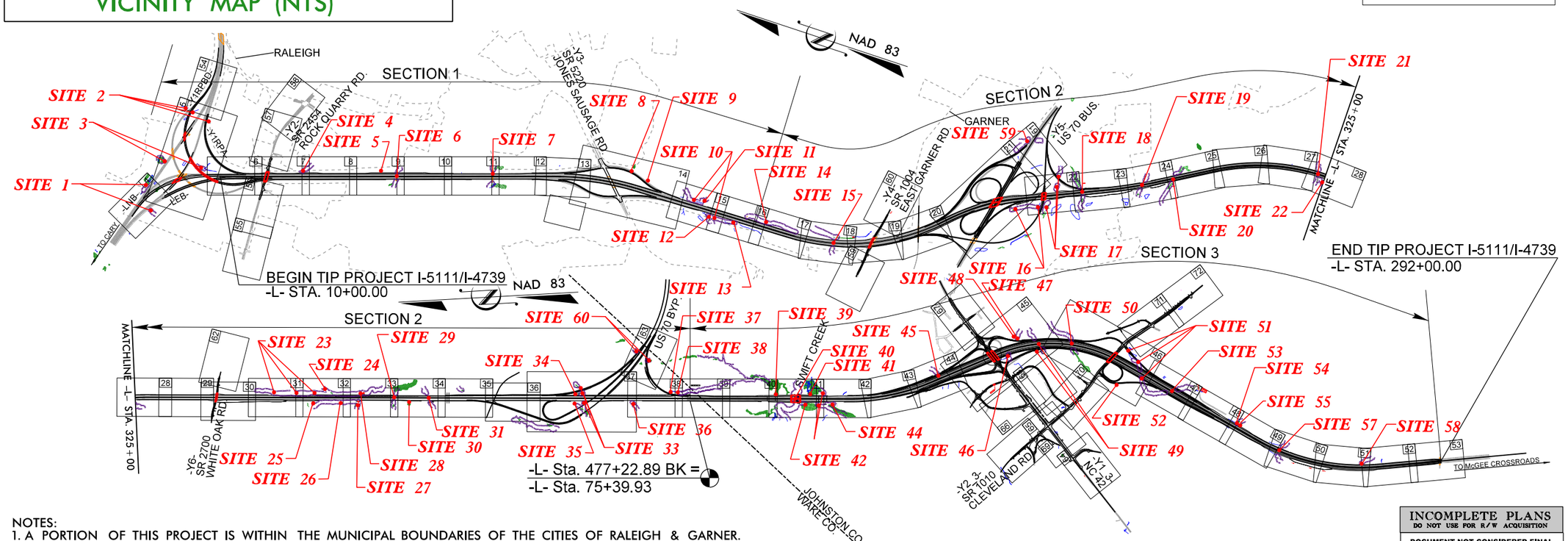
LOCATION: I-40 FROM I-440 /US 64 (EXIT 301) TO JUST NORTH OF SR 1525 (CORNWALLIS ROAD), INCLUDING IMPROVEMENTS TO NC 42 AND SR 1010 (CLEVELAND ROAD).

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, RESURFACING & STRUCTURES

BUFFER IMPACTS



PERMIT DRAWING
SHEET 1 OF 52



NOTES:
1. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITIES OF RALEIGH & GARNER.
2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III MODIFIED.
3. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 106,200
ADT 2040 = 137,200
DHV = 65%
D = 9%
T = 9% *
V = 70 MPH & 75 MPH **
FUNC CLASS: URBAN INTERSTATE
* (TTST 5% + DUAL 4%)
** DESIGN SPEED CHANGES AT US 70 BUS

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5111 /I-4739 ..... 12.950 miles
LENGTH STRUCTURE TIP PROJECT I-5111 /I-4739 ..... 0.094 miles
TOTAL LENGTH OF PROJECT I-5111 /I-4739 ..... 13.044 miles

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER - DESIGN-BUILD UNIT

PLANS PREPARED BY:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

S.T. WOOTEN

Brandon J. McInnis, P.E.
PROJECT ENGINEER

Mary E. Yahl, P.E.
PROJECT DESIGN ENGINEER

LETTING DATE:
JUNE 19, 2018

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2/6/2019
R:\Hydraulics\PERMITS_Environmental\Drawings\4C\I5111_I4739_Hyd_buf_tsh.dgn
aburke

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	2D-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING
SHEET 2 OF 52

BUFFER IMPACT TABLE - OUTFALL Y1RPWB 1700
IMPERV. AREA INCREASE = 0.28 AC
-Y1RPWB- STA. 14+50 TO STA. 18+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	28 FT.	350 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.30%
MAX. LONGITUDINAL SLOPE	4.00%	1.72%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	4 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.6 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.7 FPS

BUFFER IMPACT TABLE - OUTFALL Y1RPWB 1900
IMPERV. AREA INCREASE = 1.34 AC
-Y1RPEB- STA. 19+00 TO STA. 19+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	134 FT.	50 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.52%
MAX. LONGITUDINAL SLOPE	4.00%	0.52%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.3 FPS

BUFFER IMPACT TABLE - (JS SBB) OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-L- STA. 16+50 TO STA. 18+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	150 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.80%
MAX. LONGITUDINAL SLOPE	4.00%	2.94%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.8 FPS

BUFFER IMPACT TABLE - (JS SBB) OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-L- STA. 20+00 TO STA. 22+00 RT
-L- STA. 22+50 TO STA. 25+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	450 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.58%
MAX. LONGITUDINAL SLOPE	4.00%	1.52%
MAX. SIDE SLOPE	3:1	5:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - (JS SBB) OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-L- STA. 24+50 TO STA. 28+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	350 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.38%
MAX. LONGITUDINAL SLOPE	4.00%	0.64%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.6 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.7 FPS

BUFFER IMPACT TABLE - (JS SBB) OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-L- STA. 21+50 TO STA. 22+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	50 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.94%
MAX. LONGITUDINAL SLOPE	4.00%	1.94%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-Y1RPA- STA. 19+80 TO STA. 24+30 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	450 FT.
MIN. LONGITUDINAL SLOPE	0.30%	2.87%
MAX. LONGITUDINAL SLOPE	4.00%	3.68%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-Y1RPA- STA. 25+00 TO STA. 28+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	350 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.34%
MAX. LONGITUDINAL SLOPE	4.00%	2.28%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-Y1RPBD- STA. 40+00 TO STA. 41+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	4.00%
MAX. LONGITUDINAL SLOPE	4.00%	4.00%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	6 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.34 AC
-Y1RPWB- STA. 19+00 TO STA. 20+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	134 FT.	150 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.78%
MAX. LONGITUDINAL SLOPE	4.00%	3.02%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	4 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL Y1RPWB 1900
IMPERV. AREA INCREASE = 1.34 AC
-Y1RPWB- STA. 34+80 TO STA. 37+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	134 FT.	220 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.66%
MAX. LONGITUDINAL SLOPE	4.00%	1.66%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	4
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-L2RT- STA. 472+65 TO STA. 474+75 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	210 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.00%
MAX. LONGITUDINAL SLOPE	4.00%	1.00%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	6 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL MP2 #1
IMPERV. AREA INCREASE = 1.79 AC
-Y1RPA- STA. 29+00 TO STA. 32+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	179 FT.	350 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.32%
MAX. LONGITUDINAL SLOPE	4.00%	2.14%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00
IMPERV. AREA INCREASE = 7.57 AC
-L- STA. 107+60 TO STA. 110+85 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	325 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.60%
MAX. LONGITUDINAL SLOPE	4.00%	0.74%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.1 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.2 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00
IMPERV. AREA INCREASE = 7.57 AC
-Y3RPC- STA. 23+00 TO STA. 26+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	300 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.44%
MAX. LONGITUDINAL SLOPE	4.00%	1.44%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.6 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.7 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00
IMPERV. AREA INCREASE = 7.57 AC
-Y3RPC- STA. 17+50 TO STA. 18+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	2.02%
MAX. LONGITUDINAL SLOPE	4.00%	2.74%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL 1442
IMPERV. AREA INCREASE = 0.88 AC
-Y3RPD- STA. 14+73 TO STA. 16+25 LT
-Y3RPD- STA. 17+79 TO STA. 18+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	88 FT.	173 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.82%
MAX. LONGITUDINAL SLOPE	4.00%	2.10%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00
IMPERV. AREA INCREASE = 7.57 AC
-Y3RPB- STA. 13+29 TO STA. 15+84 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	255 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.76%
MAX. LONGITUDINAL SLOPE	4.00%	1.35%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 1442
IMPERV. AREA INCREASE = 0.88 AC
-Y3RPA- STA. 16+03 TO STA. 21+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	88 FT.	497 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.31%
MAX. LONGITUDINAL SLOPE	4.00%	1.74%
MAX. SIDE SLOPE	3:1	5:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.5 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.6 FPS

BUFFER IMPACT TABLE - OUTFALL 1442
IMPERV. AREA INCREASE = 0.88 AC
-Y3RPA- STA. 16+03 TO STA. 22+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	88 FT.	597 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.62%
MAX. LONGITUDINAL SLOPE	4.00%	1.85%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.8 FPS

BUFFER IMPACT TABLE - (JS SI) OUTFALL 142+50
IMPERV. AREA INCREASE = 7.95 AC
-L- STA. 148+50 TO STA. 150+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	795 FT.	200 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.40%
MAX. LONGITUDINAL SLOPE	4.00%	3.46%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	4 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00
IMPERV. AREA INCREASE = 7.57 AC
-L- STA. 111+00 TO STA. 112+50 RT
-L- STA. 113+50 TO STA. 122+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	1000 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.04%
MAX. LONGITUDINAL SLOPE	4.00%	1.78%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.8 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00
IMPERV. AREA INCREASE = 7.57 AC
-L- STA. 113+50 TO STA. 122+50 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	900 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.30%
MAX. LONGITUDINAL SLOPE	4.00%	1.70%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.5 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.6 FPS

BUFFER IMPACT TABLE - OUTFALL 1442
IMPERV. AREA INCREASE = 0.88 AC
-L- STA. 125+50 TO STA. 135+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	88 FT.	950 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.30%
MAX. LONGITUDINAL SLOPE	4.00%	0.88%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 142+50
IMPERV. AREA INCREASE = 7.95 AC
-L- STA. 137+50 TO STA. 144+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	795 FT.	350 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.48%
MAX. LONGITUDINAL SLOPE	4.00%	0.50%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL 142+50
IMPERV. AREA INCREASE = 7.95 AC
-L- STA. 148+00 TO STA. 148+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	795 FT.	50 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.32%
MAX. LONGITUDINAL SLOPE	4.00%	1.32%
MAX. SIDE SLOPE	3:1	5:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL 142+50
IMPERV. AREA INCREASE = 7.95 AC
-L- STA. 152+00 TO STA. 152+50 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	795 FT.	50 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.70%
MAX. LONGITUDINAL SLOPE	4.00%	1.70%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL 4000
IMPERV. AREA INCREASE = 3.20 AC
-L- STA. 31+00 TO STA. 33+00 LT
-L- STA. 33+50 TO STA. 34+50 LT
-L- STA. 37+00 TO STA. 37+50 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	320 FT.	350 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.40%
MAX. LONGITUDINAL SLOPE	4.00%	0.70%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL 4000
IMPERV. AREA INCREASE = 3.20 AC
-L- STA. 30+00 TO STA. 35+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	320 FT.	500 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.40%
MAX. LONGITUDINAL SLOPE	4.00%	0.50%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	4 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL 6500 (OUTLET 0910)
IMPERV. AREA INCREASE = 7.15 AC
-L- STA. 38+00 TO STA. 39+00 RT
-L- STA. 41+00 TO STA. 43+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	715 FT.	300 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.71%
MAX. LONGITUDINAL SLOPE	4.00%	0.93%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 6500 (OUTLET 0910)
IMPERV. AREA INCREASE = 7.15 AC
-L- STA. 48+00 TO STA. 49+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	715 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.36%
MAX. LONGITUDINAL SLOPE	4.00%	1.36%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	4 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL 6500 (OUTLET 0910)
IMPERV. AREA INCREASE = 7.15 AC
-L- STA. 48+00 TO STA. 49+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	715 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.01%
MAX. LONGITUDINAL SLOPE	4.00%	1.01%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 6500 (OUTLET 0910)
IMPERV. AREA INCREASE = 7.15 AC
-L- STA. 50+00 TO STA. 53+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	715 FT.	300 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.42%
MAX. LONGITUDINAL SLOPE	4.00%	1.68%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	6 FT.
MAX. Q2 VELOCITY	2.0 FPS	2.0 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.2 FPS

BUFFER IMPACT TABLE - OUTFALL 6500 (OUTLET 0910)
IMPERV. AREA INCREASE = 7.15 AC
-L- STA. 55+00 TO STA. 57+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	715 FT.	200 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.14%
MAX. LONGITUDINAL SLOPE	4.00%	1.56%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.6 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.7 FPS

BUFFER IMPACT TABLE - OUTFALL 6500
IMPERV. AREA INCREASE = 8.45 AC
-L- STA. 67+00 TO STA. 70+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	845 FT.	300 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.53%
MAX. LONGITUDINAL SLOPE	4.00%	0.60%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	6 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.1 FPS

BUFFER IMPACT TABLE - OUTFALL 6500
IMPERV. AREA INCREASE = 8.45 AC
-L- STA. 74+00 TO STA. 75+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	845 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.49%
MAX. LONGITUDINAL SLOPE	4.00%	0.49%
MAX. SIDE SLOPE	3:1	6:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL 91+00 (DUAL 10x9 RCBC)
IMPERV. AREA INCREASE = 7.57 AC
-L- STA. 82+00 TO STA. 83+00 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	757 FT.	200 FT.
MIN. LONGITUDINAL SLOPE	0.30%	1.52%
MAX. LONGITUDINAL SLOPE	4.00%	1.52%
MAX. SIDE SLOPE	3:1	8:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.9 FPS
MAX. Q10 VELOCITY	4.0 FPS	2.0 FPS

BUFFER IMPACT TABLE - OUTFALL 6500
IMPERV. AREA INCREASE = 8.45 AC
-L- STA. 78+00 TO STA. 80+50 RT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	845 FT.	250 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.56%
MAX. LONGITUDINAL SLOPE	4.00%	1.32%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.8 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.9 FPS

BUFFER IMPACT TABLE - OUTFALL 6500
IMPERV. AREA INCREASE = 8.45 AC
-L- STA. 70+00 TO STA. 71+00 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	845 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.60%
MAX. LONGITUDINAL SLOPE	4.00%	0.60%
MAX. SIDE SLOPE	3:1	4:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.8 FPS

BUFFER IMPACT TABLE - OUTFALL 6500
IMPERV. AREA INCREASE = 8.45 AC
-L- STA. 72+50 TO STA. 73+50 LT

PARAMETER	TOTAL REQUIRED	SEGMENT PROVIDES
TREATMENT LENGTH	845 FT.	100 FT.
MIN. LONGITUDINAL SLOPE	0.30%	0.50%
MAX. LONGITUDINAL SLOPE	4.00%	0.50%
MAX. SIDE SLOPE	3:1	3:1
MAX. BASE WIDTH	6 FT.	0 FT.
MAX. Q2 VELOCITY	2.0 FPS	1.7 FPS
MAX. Q10 VELOCITY	4.0 FPS	1.8 FPS

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R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 3 OF 52

BUFFER FILTRATION–SECTION 2

GRASS SWALE DATA	PROVIDING FILTRATION
DA= 0.44ac SLOPE= 1.68% Q2= 1.61cfs V2= 2.00ft/s D2= 0.45' Q10= 2.06cfs V10= 2.12ft/s D10= 0.49'	–L– STA. 170+00 TO 172+00 LT PSH 17 DETAIL E
DA= 1.68ac SLOPE= 0.94% Q2= 4.62cfs V2= 1.99ft/s D2= 0.68' Q10= 5.91cfs V10= 2.11ft/s D10= 0.75'	–L– STA. 177+50 TO 179+50 LT PSH 17–18 DETAIL G
DA= 1.47ac SLOPE= 0.53% Q2= 4.04cfs V2= 1.63ft/s D2= 0.79' Q10= 5.17cfs V10= 1.73ft/s D10= 0.86'	–L– STA. 181+50 TO 184+50 LT PSH 18 DETAIL G
DA= 1.75ac SLOPE= 0.42% Q2= 5.69cfs V2= 1.63ft/s D2= 0.93' Q10= 7.28cfs V10= 1.74ft/s D10= 1.02'	–L– STA. 200+00 TO 203+50 LT PSH 19 DETAIL G
DA= 1.21ac SLOPE= 0.42% Q2= 3.88cfs V2= 1.48ft/s D2= 0.81' Q10= 4.96cfs V10= 1.58ft/s D10= 0.89'	–L– STA. 203+50 TO 207+00 LT PSH 19–20 DETAIL G
DA= 1.24ac SLOPE= 0.90% Q2= 3.98cfs V2= 1.98ft/s D2= 0.71' Q10= 5.09cfs V10= 2.10ft/s D10= 0.78'	–L– STA. 216+00 TO 218+00 LT PSH 20 DETAIL G
DA= 0.14ac SLOPE= 0.48% Q2= 0.48cfs V2= 0.84ft/s D2= 0.31' Q10= 0.62cfs V10= 0.90ft/s D10= 0.34'	–L– 193+00 TO 193+50 LT PSH 19 RDY CUT DITCH
DA= 0.64ac SLOPE= 0.45% Q2= 1.91cfs V2= 1.27ft/s D2= 0.61' Q10= 2.59cfs V10= 1.37ft/s D10= 0.67'	–L– STA. 193+50 TO 195+50 LT PSH 19 RDY CUT DITCH
DA= 0.87ac SLOPE= 0.93% Q2= 2.59cfs V2= 1.8ft/s D2= 0.60' Q10= 3.31cfs V10= 1.91ft/s D10= 0.66'	–L– STA. 195+50 TO 197+50 LT PSH 19 DETAIL L
DA= 0.51ac SLOPE= 0.71% Q2= 1.40cfs V2= 1.40ft/s D2= 0.50' Q10= 1.79cfs V10= 1.49ft/s D10= 0.55'	–Y5RPB– STA. 45+00 TO 46+50 LT PSH 61 DETAIL B

GRASS SWALE DATA	PROVIDING FILTRATION
DA= 1.53ac SLOPE= 1.8% Q2= 3.90cfs V2= 1.99ft/s D2= 0.38' Q10= 4.90cfs V10= 2.14ft/s D10= 0.43'	–L– 256+00+00 TO 257+28 RT PSH 23 DETAIL U
DA= 0.72ac SLOPE= 0.45% Q2= 2.32cfs V2= 1.22ft/s D2= 0.56' Q10= 2.97cfs V10= 1.29ft/s D10= 0.62'	–L– 262+00 TO 264+85 LT PSH 23 RDY CUT DITCH
DA= 1.98ac SLOPE= 0.45% Q2= 6.33cfs V2= 1.57ft/s D2= 0.82' Q10= 8.10cfs V10= 1.67ft/s D10= 0.90'	–L– 264+85 TO 273+00 LT PSH 23–24 RDY CUT DITCH
DA= 1.57ac SLOPE= 0.45% Q2= 5.03cfs V2= 1.48ft/s D2= 0.75' Q10= 6.43cfs V10= 1.57ft/s D10= 0.83'	–L– 262+50 TO 271+50 RT PSH 23–24 RDY CUT DITCH
DA= 0.16ac SLOPE= 1.4% Q2= 0.47cfs V2= 1.25ft/s D2= 0.25' Q10= 0.60cfs V10= 1.33ft/s D10= 0.27'	–L– 312+50 TO 314+50 LT PSH 27 RDY CUT DITCH
DA= 1.16ac SLOPE= 1.3% Q2= 3.45cfs V2= 2.0ft/s D2= 0.54' Q10= 4.42cfs V10= 2.13ft/s D10= 0.59'	–L– 310+00 TO 311+50 RT PSH 27 RDY CUT DITCH
DA= 5.57ac SLOPE= 0.6% Q2= 17.0cfs V2= 1.99ft/s D2= 1.05' Q10= 21.0cfs V10= 2.10ft/s D10= 1.16'	–L– 322+00 TO 323+32 RT PSH 28 DETAIL U
DA= 10.08ac SLOPE= 0.4% Q2= 27.11cfs V2= 1.96ft/s D2= 1.58' Q10= 34.87cfs V10= 2.09ft/s D10= 1.78'	–L– 322+68 TO 323+75 LT PSH 28 DETAIL U
DA= 0.81ac SLOPE= 1.4% Q2= 2.60cfs V2= 1.90ft/s D2= 0.48' Q10= 3.32cfs V10= 2.02ft/s D10= 0.52'	–L– 338+00 TO 341+50 RT PSH 29 RDY CUT DITCH
DA= 1.36ac SLOPE= 0.9% Q2= 4.37cfs V2= 1.88ft/s D2= 0.62' Q10= 5.59cfs V10= 2.00ft/s D10= 0.68'	–L– 341+50 TO 346+46 RT PSH 29 RDY CUT DITCH
DA= 0.75ac SLOPE= 1.4% Q2= 2.39cfs V2= 1.86ft/s D2= 0.46' Q10= 3.06cfs V10= 1.98ft/s D10= 0.51'	–L– 338+00 TO 341+50 LT PSH 29 RDY CUT DITCH
DA= 1.12ac SLOPE= 0.9% Q2= 3.59cfs V2= 1.77ft/s D2= 0.58' Q10= 4.59cfs V10= 1.88ft/s D10= 0.64'	–L– 341+50 TO 346+46 LT PSH 29 RDY CUT DITCH
DA= 0.55ac SLOPE= 2.0% Q2= 1.75cfs V2= 2.00ft/s D2= 0.38' Q10= 2.24cfs V10= 2.12ft/s D10= 0.42'	–L– 360+37 TO 363+00 RT PSH 31 RDY CUT DITCH

GRASS SWALE DATA	PROVIDING FILTRATION
DA= 0.77ac SLOPE= 0.3% Q2= 2.47cfs V2= 1.31ft/s D2= 0.79' Q10= 3.16cfs V10= 1.39ft/s D10= 0.87'	–L– 387+50 TO 389+50 RT PSH 33 DETAIL E
DA= 0.81ac SLOPE= 0.7% Q2= 2.59cfs V2= 1.44ft/s D2= 0.55' Q10= 3.31cfs V10= 1.53ft/s D10= 0.60'	–L– 390+93 TO 395+00 RT PSH 33 RDY CUT DITCH
DA= 0.81ac SLOPE= 0.4% Q2= 2.20cfs V2= 1.11ft/s D2= 0.81' Q10= 2.90cfs V10= 1.19ft/s D10= 0.90'	–L– 396+50 TO 399+00 RT PSH 34 DETAIL AN
DA= 2.5ac SLOPE= 0.8% Q2= 8.00cfs V2= 1.99ft/s D2= 1.16' Q10= 10.00cfs V10= 2.10ft/s D10= 1.26'	–L– 403+00 TO 405+93 RT PSH 34 DETAIL AN
DA= 1.08ac SLOPE= 0.3% Q2= 3.71cfs V2= 1.30ft/s D2= 0.85' Q10= 4.75cfs V10= 1.38ft/s D10= 0.93'	–L– 411+00 TO 415+50 LT PSH 35 DETAIL E
DA= 2.52ac SLOPE= 0.5% Q2= 8.10cfs V2= 1.98ft/s D2= 1.08' Q10= 10.0cfs V10= 2.09ft/s D10= 1.17'	–L– 417+50 TO 420+50 LT PSH 35 DETAIL E
DA= 0.66ac SLOPE= 0.4% Q2= 2.11cfs V2= 1.21ft/s D2= 0.66' Q10= 2.70cfs V10= 1.29ft/s D10= 0.72'	–L– 418+00 TO 419+35 RT PSH 35 DETAIL E
DA= 1.12ac SLOPE= 0.3% Q2= 3.60cfs V2= 1.28ft/s D2= 0.84' Q10= 4.60cfs V10= 1.36ft/s D10= 0.92'	–L– 419+35 TO 422+50 RT PSH 35–36 DETAIL E
DA= 1.44ac SLOPE= 0.7% Q2= 4.60cfs V2= 1.62ft/s D2= 0.97' Q10= 5.90cfs V10= 1.73ft/s D10= 1.07'	–L– 410+00 TO 414+16 RT PSH 35 DETAIL AE
DA= 1.51ac SLOPE= 0.7% Q2= 4.90cfs V2= 1.65ft/s D2= 1.00' Q10= 6.20cfs V10= 1.75ft/s D10= 1.09'	–L– 414+16 TO 417+50 RT PSH 35 DETAIL AE
DA= 1.34ac SLOPE= 0.3% Q2= 4.30cfs V2= 1.34ft/s D2= 0.80' Q10= 5.5cfs V10= 1.43ft/s D10= 0.88'	–L– 424+50 TO 429+00 LT PSH 36 DETAIL E
DA= 0.47ac SLOPE= 0.4% Q2= 1.50cfs V2= 1.15ft/s D2= 0.57' Q10= 1.90cfs V10= 1.21ft/s D10= 0.63'	–L– 450+00 TO 452+00 LT PSH 37 DETAIL E
DA= 0.37ac SLOPE= 2.0% Q2= 1.30cfs V2= 1.44ft/s D2= 0.20' Q10= 1.70cfs V10= 1.57ft/s D10= 0.23'	–L– 446+00 TO 447+40 RT PSH 37 DETAIL AM

GRASS SWALE DATA	PROVIDING FILTRATION
DA= 0.72ac SLOPE= 0.3% Q2= 2.60cfs V2= 1.04ft/s D2= 0.91' Q10= 3.40cfs V10= 1.11ft/s D10= 1.01'	–L– 462+50 TO 464+00 RT PSH 38 DETAIL AN
DA= 2.60ac SLOPE= 1.1% Q2= 6.00cfs V2= 2.00ft/s D2= 0.92' Q10= 7.60cfs V10= 2.13ft/s D10= 1.01'	–L– 467+50 TO 473+50 RT PSH 38 DETAIL AE
DA= 1.13ac SLOPE= 0.3% Q2= 3.60cfs V2= 1.09ft/s D2= 1.05' Q10= 4.60cfs V10= 1.16ft/s D10= 1.15'	–Y5LPB– 17+50 TO 20+98 RT PSH 21 DETAIL AN
DA= 0.39ac SLOPE= 2.5% Q2= 1.10cfs V2= 2.00ft/s D2= 0.33' Q10= 1.40cfs V10= 2.13ft/s D10= 0.36'	–Y5LPB– 12+25 TO 13+82 RT PSH 21 DETAIL E
DA= 0.75ac SLOPE= 1.4% Q2= 3.40cfs V2= 2.00ft/s D2= 0.75' Q10= 4.30cfs V10= 2.16ft/s D10= 0.84'	–Y5LPB– 25+00 TO 26+85 RT PSH 21 DETAIL AN
DA= 3.79ac SLOPE= 0.6% Q2= 12.0cfs V2= 1.99ft/s D2= 1.42' Q10= 16.0cfs V10= 2.14ft/s D10= 1.58'	–Y5LPB– 26+85 TO 29+45 RT PSH 21 DETAIL AN
DA= 2.73ac SLOPE= 0.7% Q2= 7.50cfs V2= 1.99ft/s D2= 0.87' Q10= 9.60cfs V10= 2.12ft/s D10= 0.95'	–Y5RPB– 30+50 TO 34+00 RT PSH 21 DETAIL E
DA= 4.18ac SLOPE= 0.9% Q2= 11.48cfs V2= 2.00ft/s D2= 0.74' Q10= 14.69cfs V10= 2.14ft/s D10= 0.84'	–Y5RPBSPUR– 13+73 TO 17+20 RT PSH 21 DETAIL AU
DA= 1.81ac SLOPE= 0.8% Q2= 4.97cfs V2= 1.96ft/s D2= 0.80' Q10= 6.36cfs V10= 2.09ft/s D10= 0.87'	–Y5RPB– 40+50 TO 43+50 LT PSH 21/61 DETAIL E
DA= 0.53ac SLOPE= 2.0% Q2= 1.50cfs V2= 1.99ft/s D2= 0.39' Q10= 1.90cfs V10= 2.12ft/s D10= 0.42'	–Y5RPA– 17+50 TO 20+50 RT PSH 22 DETAIL G
DA= 0.38ac SLOPE= 0.9% Q2= 1.10cfs V2= 1.18ft/s D2= 0.48' Q10= 1.40cfs V10= 1.26ft/s D10= 0.53'	–Y5RPA– 27+00 TO 29+00 RT PSH 61 DETAIL AE
DA= 1.56ac SLOPE= 1.2% Q2= 4.60cfs V2= 1.99ft/s D2= 0.88' Q10= 5.90cfs V10= 2.12ft/s D10= 0.96'	–L– 249+50 TO 250+53 LT PSH 22 DETAIL AN
DA= 0.24ac SLOPE= 2.3% Q2= 0.88cfs V2= 1.94ft/s D2= 0.34' Q10= 1.10cfs V10= 2.05ft/s D10= 0.37'	–Y5RPC– 52+00 TO 53+28 LT PSH 22 DETAIL E

GRASS SWALE DATA	PROVIDING FILTRATION
DA= 0.23ac SLOPE= 0.3% Q2= 0.84cfs V2= 0.89ft/s D2= 0.48' Q10= 1.10cfs V10= 0.96ft/s D10= 0.54'	–Y5RPC– 53+28 TO 54+50 LT PSH 22 DETAIL E
DA= 2.78ac SLOPE= 0.9% Q2= 8.30cfs V2= 2.00ft/s D2= 0.68' Q10= 11.00cfs V10= 2.17ft/s D10= 0.79'	–L– 249+00 TO 251+00 RT PSH 22 DETAIL U
DA= 1.00ac SLOPE= 2.1% Q2= 2.50cfs V2= 1.99ft/s D2= 0.56' Q10= 3.20cfs V10= 2.12ft/s D10= 0.61'	–L– 251+50 TO 253+00 RT PSH 22 DETAIL E
DA= 1.33ac SLOPE= 1.3% Q2= 3.70cfs V2= 1.96ft/s D2= 0.79' Q10= 4.70cfs V10= 2.08ft/s D10= 0.87'	–L– 253+00 TO 256+00 RT PSH 22 DETAIL G
DA= 0.98ac SLOPE= 0.5% Q2= 3.10cfs V2= 1.27ft/s D2= 0.90' Q10= 4.00cfs V10= 1.35ft/s D10= 0.99'	–L– 252+00 TO 254+50 LT PSH 22 DETAIL E
DA= 0.18ac SLOPE= 0.3% Q2= 0.36cfs V2= 0.64ft/s D2= 0.43' Q10= 0.46cfs V10= 0.68ft/s D10= 0.48'	–Y8RPA– 24+50 TO 26+00 LT PSH 63 DETAIL E
DA= 0.36ac SLOPE= 3.5% Q2= 0.74cfs V2= 1.90ft/s D2= 0.36' Q10= 0.95cfs V10= 2.02ft/s D10= 0.40'	–Y8RPA– 26+00 TO 28+50 LT PSH 63 DETAIL E
DA= 0.68ac SLOPE= 1.1% Q2= 2.20cfs V2= 1.56ft/s D2= 0.63' Q10= 2.80cfs V10= 1.66ft/s D10= 0.69'	–L– 474+00 TO 476+00 RT PSH 38 DETAIL AE
DA= 9.26ac SLOPE= 0.4% Q2= 25.0cfs V2= 1.93ft/s D2= 1.51' Q10= 33.0cfs V10= 2.08ft/s D10= 1.73'	–L– 437+00 TO 444+00 LT PSH 37 DETAIL U
DA= 10.0ac SLOPE= 0.3% Q2= 28.0cfs V2= 1.89ft/s D2= 1.65' Q10= 35.0cfs V10= 2.00ft/s D10= 1.83'	–L– 444+00 TO 446+90 LT PSH 37 DETAIL U
DA= 1.03ac SLOPE= 1.4% Q2= 3.50cfs V2= 1.97ft/s D2= 0.77' Q10= 4.50cfs V10= 2.10ft/s D10= 0.85'	–Y8RPA– 26+00 TO 27+01 RT PSH 63 DETAIL AN
DA= 3.31ac SLOPE= 0.6% Q2= 11.0cfs V2= 1.99ft/s D2= 1.36' Q10= 15.0cfs V10= 2.15ft/s D10= 1.53'	–Y8RPA– 27+48 TO 29+60 RT PSH 63 DETAIL AN
DA= 3.96ac SLOPE= 0.5% Q2= 10.0cfs V2= 1.71ft/s D2= 0.88' Q10= 13.0cfs V10= 1.84ft/s D10= 1.01'	–L2– 282+11 TO 282+50 RT PSH 25 DETAIL U

GRASS SWALE DATA	PROVIDING FILTRATION
DA= 1.89ac SLOPE= 0.8% Q2= 5.60cfs V2= 1.91ft/s D2= 0.70' Q10= 7.20cfs V10= 2.03ft/s D10= 0.77'	–L– 284+00 TO 290+00 RT PSH 25 RDY CUT DITCH

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SHEET 4 OF 52

BUFFER FILTRATION–SECTION 3

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 4.51ac	DA= 1.89ac	DA= 1.20ac	DA= 8.50ac	DA= 3.09ac	DA= 4.00ac	DA= 4.00ac	DA= 2.47ac	DA= 0.78ac	DA= 0.95ac
SLOPE= 0.3%	SLOPE= 0.9%	SLOPE= 0.4%	SLOPE= 0.3%	SLOPE= 0.7%	SLOPE= 0.5%	SLOPE= 0.6%	SLOPE= 0.7%	SLOPE= 1.3%	SLOPE= 2.2%
Q2= 11.0cfs	Q2= 6.90cfs	Q2= 3.80cfs	Q2= 27.0cfs	Q2= 9.9cfs	Q2= 13.0cfs	Q2= 13.0cfs	Q2= 8.50cfs	Q2= 2.50cfs	Q2= 3.10cfs
V2= 1.45ft/s	V2= 1.84ft/s	V2= 1.23ft/s	V2= 1.85ft/s	V2= 1.99ft/s	V2= 1.78ft/s	V2= 1.99ft/s	V2= 1.79ft/s	V2= 1.96ft/s	V2= 1.96ft/s
D2= 1.47'	D2= 0.63'	D2= 1.00'	D2= 1.64'	D2= 1.29'	D2= 1.03'	D2= 0.95'	D2= 0.76'	D2= 0.53'	D2= 0.51'
Q10= 15.0cfs	Q10= 8.90cfs	Q10= 4.90cfs	Q10= 35.0cfs	Q10= 13.0cfs	Q10= 16.0cfs	Q10= 16.0cfs	Q10= 11.0cfs	Q10= 3.20cfs	Q10= 3.90cfs
V10= 1.57ft/s	V10= 1.99ft/s	V10= 1.34ft/s	V10= 1.98ft/s	V10= 2.13ft/s	V10= 1.88ft/s	V10= 2.10ft/s	V10= 1.93ft/s	V10= 2.09ft/s	V10= 2.07ft/s
D10= 1.65'	D10= 0.73'	D10= 1.10'	D10= 1.85'	D10= 1.43'	D10= 1.15'	D10= 1.06'	D10= 0.87'	D10= 0.58'	D10= 0.56'
PROVIDING FILTRATION –L– STA. 117+00 TO 118+17 RT PSH 40 DETAIL AE	PROVIDING FILTRATION –L– STA. 111+09 LT L=70' PSH 42 DETAIL AM	PROVIDING FILTRATION –L– STA. 163+70 TO 166+64 LT PSH 45 DETAIL AN	PROVIDING FILTRATION –L– STA. 146+15 TO 147+00 RT PSH 45 DETAIL U	PROVIDING FILTRATION –Y1RPA– STA. 18+05 TO 22+50 LT PSH 45 DETAIL AN	PROVIDING FILTRATION –Y1RPD– STA. 14+21 TO 15+75 LT PSH 45 DETAIL AM	PROVIDING FILTRATION –Y1RPD– STA. 15+75 TO 16+53 LT PSH 45 DETAIL AM	PROVIDING FILTRATION –L3– STA. 173+25 TO 175+50 LT PSH 45 DETAIL U	PROVIDING FILTRATION –Y1RPD– STA. 20+28 TO 21+50 LT PSH 45 DETAIL G	PROVIDING FILTRATION –Y1RPA– STA. 19+50 TO 22+00 RT PSH 45 ROADWAY CUT DITCH

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 1.65ac	DA= 0.80ac	DA= 0.87ac	DA= 2.41ac	DA= 0.89ac	DA= 14.1ac	DA= 3.09ac	DA= 4.35ac	DA= 8.48ac	DA= 13.0ac	DA= 2.85ac	DA= 3.28ac	DA= 1.99ac
SLOPE= 0.5%	SLOPE= 3.2%	SLOPE= 0.3%	SLOPE= 0.7%	SLOPE= 0.3%	SLOPE= 0.3%	SLOPE= 0.3%	SLOPE= 0.8%	SLOPE= 0.3%	SLOPE= 0.3%	SLOPE= 0.7%	SLOPE= 0.6%	SLOPE= 0.3%
Q2= 4.60cfs	Q2= 1.00cfs	Q2= 2.80cfs	Q2= 8.30cfs	Q2= 2.00cfs	Q2= 45.0cfs	Q2= 8.50cfs	Q2= 12.0cfs	Q2= 27.0cfs	Q2= 42.0cfs	Q2= 9.10cfs	Q2= 11.0cfs	Q2= 5.90cfs
V2= 1.22ft/s	V2= 1.99ft/s	V2= 1.25ft/s	V2= 1.91ft/s	V2= 1.10ft/s	V2= 1.90ft/s	V2= 1.42ft/s	V2= 2.00ft/s	V2= 1.84ft/s	V2= 2.00ft/s	V2= 1.95ft/s	V2= 1.99ft/s	V2= 1.42ft/s
D2= 0.79'	D2= 0.41'	D2= 0.80'	D2= 1.20'	D2= 0.67'	D2= 1.98'	D2= 1.41'	D2= 0.79'	D2= 1.64'	D2= 1.94'	D2= 1.25'	D2= 1.36'	D2= 0.96'
Q10= 5.90cfs	Q10= 1.30cfs	Q10= 3.60cfs	Q10= 9.90cfs	Q10= 2.60cfs	Q10= 58.0cfs	Q10= 11.0cfs	Q10= 15.0cfs	Q10= 35.0cfs	Q10= 53.0cfs	Q10= 12.0cfs	Q10= 13.0cfs	Q10= 7.60cfs
V10= 1.30ft/s	V10= 2.12ft/s	V10= 1.33ft/s	V10= 2.00ft/s	V10= 1.18ft/s	V10= 2.03ft/s	V10= 1.52ft/s	V10= 2.12ft/s	V10= 1.97ft/s	V10= 2.13ft/s	V10= 2.09ft/s	V10= 2.08ft/s	V10= 1.51ft/s
D10= 0.87'	D10= 0.45'	D10= 0.88'	D10= 1.28'	D10= 0.74'	D10= 2.22'	D10= 1.55'	D10= 0.89'	D10= 1.86'	D10= 2.16'	D10= 1.38'	D10= 1.45'	D10= 1.06'
PROVIDING FILTRATION –LCDEB– STA. 54+64.54 TO 59+01.14 RT PSH 45–46 ROADWAY CUT DITCH	PROVIDING FILTRATION –Y1RPA– STA. 15+74.66 TO 16+33.93 RT PSH 45 DETAIL AN	PROVIDING FILTRATION –L– STA. 186+00 TO 189+50 RT PSH 46 DETAIL E	PROVIDING FILTRATION –L– STA. 184+00 TO 185+50 RT PSH 46 DETAIL AN	PROVIDING FILTRATION –L– STA. 191+00 TO 193+50 LT PSH 46 DETAIL E	PROVIDING FILTRATION –L– STA. 209+00 TO 209+78 RT PSH 46 DETAIL M	PROVIDING FILTRATION –Y2– STA. 59+26 TO 61+00 LT PSH 46 DETAIL AN	PROVIDING FILTRATION –Y2RPB– STA. 24+00 TO 26+60 LT PSH 46 DETAIL M	PROVIDING FILTRATION –Y2– STA. 57+50 TO 58+00 LT PSH 46 DETAIL U	PROVIDING FILTRATION –Y2RPA– STA. 19+63 TO 22+75 LT PSH 46 DETAIL U	PROVIDING FILTRATION –Y2RPA– STA. 19+50 TO 20+50 RT PSH 46 DETAIL U	PROVIDING FILTRATION –Y2RPA– STA. 20+50 TO 23+50 RT PSH 46 DETAIL U	PROVIDING FILTRATION –Y2RPA– STA. 13+62 TO 17+40 RT PSH 46 DETAIL E

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 1.17ac	DA= 1.01ac	DA= 0.82ac	DA= 1.12ac	DA= 0.55ac	DA= 0.83ac	DA= 1.69ac	DA= 1.14ac	DA= 0.58ac	DA= 1.61ac	DA= 3.91ac	DA= 0.53ac	DA= 3.58ac
SLOPE= 0.9%	SLOPE= 0.5%	SLOPE= 0.5%	SLOPE= 1.2%	SLOPE= 1.4%	SLOPE= 2.5%	SLOPE= 1.7%	SLOPE= 1.9%	SLOPE= 0.4%	SLOPE= 1.3%	SLOPE= 0.7%	SLOPE= 2.4%	SLOPE= 0.5%
Q2= 3.50cfs	Q2= 3.00cfs	Q2= 2.40cfs	Q2= 3.30cfs	Q2= 1.60cfs	Q2= 4.30cfs	Q2= 4.30cfs	Q2= 3.40cfs	Q2= 1.90cfs	Q2= 5.50cfs	Q2= 11.0cfs	Q2= 0.97cfs	Q2= 11.0cfs
V2= 1.42ft/s	V2= 1.13ft/s	V2= 1.08ft/s	V2= 1.68ft/s	V2= 1.42ft/s	V2= 1.95ft/s	V2= 1.96ft/s	V2= 1.91ft/s	V2= 0.93ft/s	V2= 1.98ft/s	V2= 1.99ft/s	V2= 2.00ft/s	V2= 1.74ft/s
D2= 0.64'	D2= 0.67'	D2= 0.67'	D2= 0.63'	D2= 0.43'	D2= 0.46'	D2= 0.61'	D2= 0.54'	D2= 0.64'	D2= 0.50'	D2= 0.85'	D2= 0.35'	D2= 0.93'
Q10= 4.50cfs	Q10= 3.80cfs	Q10= 3.10cfs	Q10= 4.30cfs	Q10= 2.10cfs	Q10= 3.20cfs	Q10= 5.40cfs	Q10= 4.30cfs	Q10= 2.40cfs	Q10= 7.10cfs	Q10= 14.0cfs	Q10= 1.20cfs	Q10= 15.0cfs
V10= 1.52ft/s	V10= 1.20ft/s	V10= 1.15ft/s	V10= 1.79ft/s	V10= 1.52ft/s	V10= 2.07ft/s	V10= 2.07ft/s	V10= 2.03ft/s	V10= 0.99ft/s	V10= 2.14ft/s	V10= 2.12ft/s	V10= 2.11ft/s	V10= 1.90ft/s
D10= 0.70'	D10= 0.73'	D10= 0.73'	D10= 0.69'	D10= 0.48'	D10= 0.51'	D10= 0.66'	D10= 0.59'	D10= 0.70'	D10= 0.58'	D10= 0.96'	D10= 0.38'	D10= 1.09'
PROVIDING FILTRATION –Y2RPB– STA. 15+64.89 TO 18+50 LT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –LCDEB– STA. 68+22.85 TO 70+94.51 LT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 200+00 TO 203+50 RT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 198+50 TO 202+75 LT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 202+75 TO 204+50 LT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 204+00 TO 205+00 RT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –Y2RPD3– STA. 17+50 TO 24+00 RT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –Y2RPD3– STA. 16+70 TO 23+00 LT PSH 46 ROADWAY CUT DITCH	PROVIDING FILTRATION –Y2RPD3– STA. 12+21.20 TO 15+51.99 LT PSH 47 ROADWAY CUT DITCH	PROVIDING FILTRATION –LCDWB– STA. 102+08 TO 103+27 LT PSH 47 DETAIL AM	PROVIDING FILTRATION –LCDEB– STA. 88+99 TO 91+52 RT PSH 47 DETAIL AM	PROVIDING FILTRATION –L– STA. 227+50 TO 229+50 LT PSH 48 DETAIL E	PROVIDING FILTRATION –L– STA. 231+50 TO 232+65 LT PSH 48–49 DETAIL AM

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 0.71ac	DA= 1.19ac	DA= 3.79ac
SLOPE= 3.2%	SLOPE= 1.1%	SLOPE= 0.7%
Q2= 2.00cfs	Q2= 4.10cfs	Q2= 12.0cfs
V2= 1.96ft/s	V2= 1.99ft/s	V2= 1.97ft/s
D2= 0.22'	D2= 0.37'	D2= 0.91'
Q10= 2.50cfs	Q10= 5.20cfs	Q10= 16.0cfs
V10= 2.11ft/s	V10= 2.14ft/s	V10= 2.14ft/s
D10= 0.25'	D10= 0.43'	D10= 1.05'
PROVIDING FILTRATION –L– STA. 243+00 TO 243+50 RT PSH 49 DETAIL AM	PROVIDING FILTRATION –L– STA. 237+00 TO 241+50 LT PSH 49 DETAIL AU	PROVIDING FILTRATION –L– STA. 234+28 TO 235+50 LT PSH 49 DETAIL AM

GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA	GRASS SWALE DATA
DA= 4.31ac	DA= 0.83ac	DA= 4.37ac	DA= 1.75ac	DA= 1.70ac	DA= 3.45ac	DA= 0.94ac
SLOPE= 0.7%	SLOPE= 0.4%	SLOPE= 0.5%	SLOPE= 0.3%	SLOPE= 0.3%	SLOPE= 0.7%	SLOPE= 0.3%
Q2= 12.0cfs	Q2= 2.70cfs	Q2= 15.0cfs	Q2= 4.00cfs	Q2= 5.50cfs	Q2= 11.0cfs	Q2= 2.40cfs
V2= 1.99ft/s	V2= 1.04ft/s	V2= 1.89ft/s	V2= 1.03ft/s	V2= 1.09ft/s	V2= 1.99ft/s	V2= 1.24ft/s
D2= 0.90'	D2= 0.66'	D2= 1.09'	D2= 0.80'	D2= 0.92'	D2= 0.84'	D2= 0.74'
Q10= 15.0cfs	Q10= 3.40cfs	Q10= 19.0cfs	Q10= 5.10cfs	Q10= 7.00cfs	Q10= 14.0cfs	Q10= 3.00cfs
V10= 2.12ft/s	V10= 1.10ft/s	V10= 2.02ft/s	V10= 1.09ft/s	V10= 1.16ft/s	V10= 2.13ft/s	V10= 1.31ft/s
D10= 1.01'	D10= 0.72'	D10= 1.23'	D10= 0.88'	D10= 1.00'	D10= 0.96'	D10= 0.81'
PROVIDING FILTRATION –L– STA. 245+50 TO 247+66 LT PSH 50 DETAIL AM	PROVIDING FILTRATION –L– STA. 250+18 TO 253+50 LT PSH 50 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 249+00 TO 250+00 LT PSH 50 DETAIL U	PROVIDING FILTRATION –L– STA. 250+50 TO 260+19 RT PSH 50–51 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 253+50 TO 260+13 LT PSH 50–51 ROADWAY CUT DITCH	PROVIDING FILTRATION –L– STA. 269+00 TO 270+71 LT PSH 51 DETAIL AM	PROVIDING FILTRATION –Y2– STA. 61+50 TO 63+50 LT PSH 71 DETAIL E

2/6/2019
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abburke

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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NC LICENSE NO. F–0112 • (919) 878–9560

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

BUFFER DRAWING SHEET 5 OF 52

NAD 83

SITE 1B

SITE 1A

MATCHLINE SEE INSERT ABOVE

MATCHLINE SEE INSERT BELOW

MATCHLINE -LWB- STA. 20+50 SEE SHEET 5

MATCHLINE -LEB- STA. 16+50 SEE SHEET 5

-LWB- 15+00 20+00

-LEB- 15+00

BEG.WW FENCE

PROP.SOUND BARRIER

BEG.-NW1-

BEG.-NW3-

BERM DITCH SEE DETAIL BD

SP. LAT. BASE DITCH SEE DETAIL M

SP. LAT. V DITCH SEE DETAIL K

SP. LAT. BASE DITCH SEE DETAIL BF

SP. CUT SWALE W/HINGE SEE DETAIL G

Conv. DI TO JB w/MH

REPLACED W/42" RCP IV AS PART OF TIP #I-5338

POSSIBLE JUNCTION

PLUG AND FILL W/FLOWABLE FILL

TRENCHLESS INSTALLATION 36" WELDED STEEL

15 TONS CL B RIP RAP 38 SY GEOTEXTILE

SWAMP AREA

SZ

WI

WH

SY

SCALE 50 25 0 50 100

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2/6/2019
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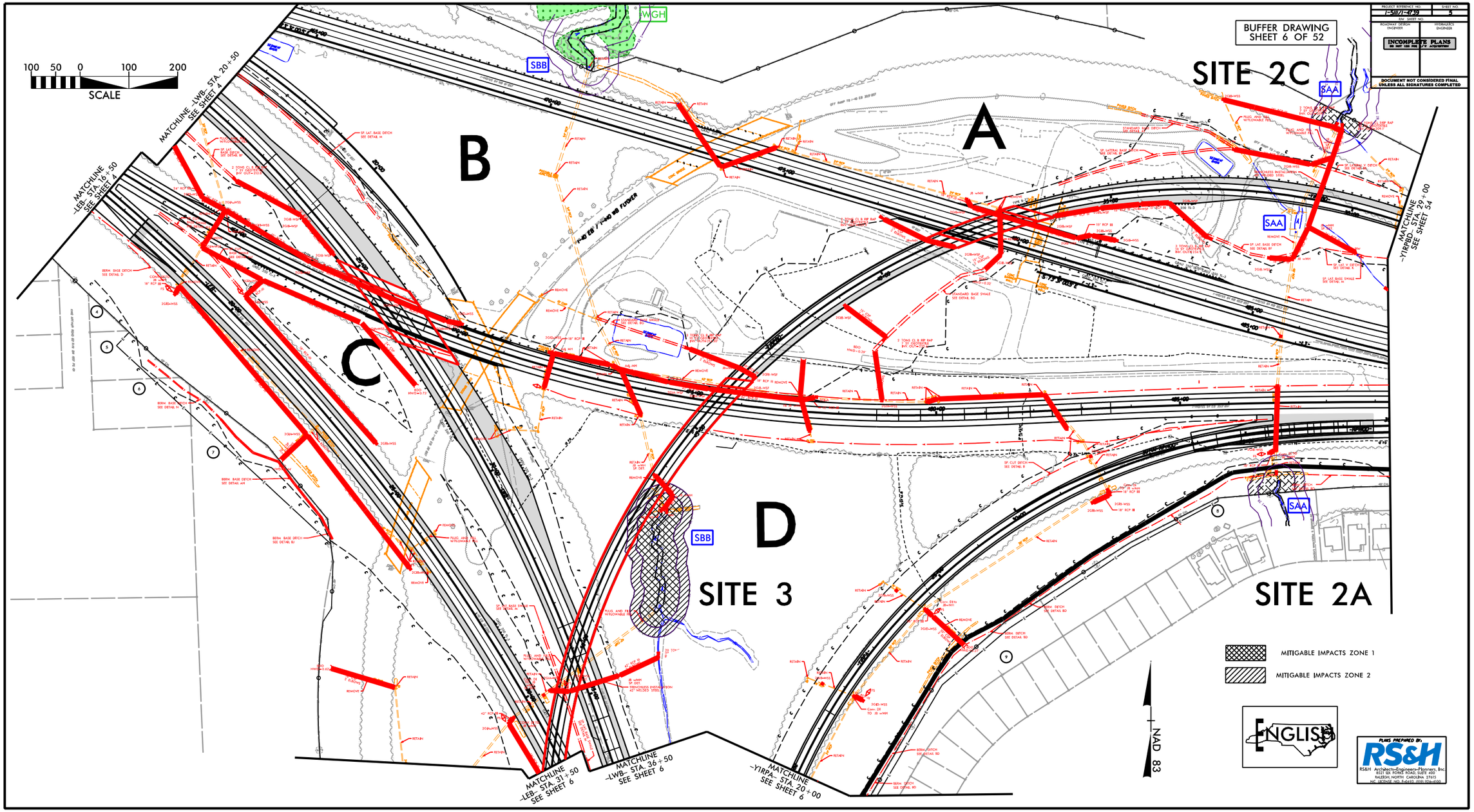
100 50 0 100 200
SCALE
MATCHLINE -LWB- STA. 20+50 SEE SHEET 4
MATCHLINE -LEB- STA. 16+50 SEE SHEET 4
B
A
C
D
SITE 2C
SITE 3
SITE 2A
SBB
SAA
WGH
BUFFER DRAWING SHEET 6 OF 52
MATCHLINE -LEB- STA. 31+50 SEE SHEET 6
MATCHLINE -LWB- STA. 36+50 SEE SHEET 6
MATCHLINE -YIRPA- STA. 20+00 SEE SHEET 6
MATCHLINE -YIRPBD- STA. 29+00 SEE SHEET 54
NAD 83
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ENGLISH
PLANS PREPARED BY
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PROJECT REFERENCE NO.
SHEET NO.
R-5417/-C-1-09
5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
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PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83

BUFFER DRAWING SHEET 7 OF 52

50 25 0 50 100
SCALE

SITE 4A

SB

MATCHLINE -Y2- STA. 37+50 SEE SHEET 57

MATCHLINE -Y2- STA. 30+50 SEE SHEET 56

MATCHLINE -L- STA. 26+50 SEE SHEET 6

MATCHLINE -L- STA. 40+00 SEE SHEET 8

MATCHLINE -YIRPBD- STA. 65+00 SEE SHEET 6

ROCK QUARRY HOLDINGS LLC

HAROLD T. WALL

BALL RENTALS LLC

EARNEST PAUL ADAMS

I-40 WB

I-40 EB

ROCK QUARRY RD

PROVIDENCE OF RALEIGH HOMEOWNERS ASSOC.INC.

PROVIDENCE OF RALEIGH TOWNHOUSE OWNERS ASSOC.INC

PROPOSED ENCLOSED DRAINAGE SYSTEM UNDERNEATH BRIDGE (60) 4" DECK DRAINS EVERY 6' CONNECTED W/16" UVL-PROOF PVC

SP. CUT SWALE W/HINGE SEE DETAIL G

SPECIAL CUT DITCH SEE DETAIL B

SPECIAL LATERAL "V" DITCH SEE DETAIL K

SP. CUT BASE SWALE SEE DETAIL AU

CONC. BERM DITCH SEE DETAIL BL

PLUG AND FILL W/FLOWABLE FILL

REMOVE

18" CSP 2 ELBOWS

24" CSP 2 ELBOWS

42" CSP 2 ELBOWS

24" RCP III

18" RCP III

15" RCP III

TB 2GIB-ST

TB 2GIA-ST

2GI-B

2GIA-WSS

JB w/MH

RETAIN. CB

CONVERT DI TO JB w/MH

SPECIAL DESIGN DITCH

HIGH PT. STA. 27+32.69 -L- (RIGHT)

HIGH PT. STA. 27+85.00 -L- (RIGHT)

LOW PT. STA. 65+80.46 -YIRPBD-

HIGH PT. STA. 68+14.28 -YIRPBD-

BL-104

-YIRPBD-

PI Sta 66+31.65
Δ = 6° 07' 43.4" (RT.)
D = 4° 18' 28.6"
L = 142.27'
T = 71.20'
R = 1,330.00'
e = 0.06
V = 60 MPH

PIs Sta 67+69.42
Θs = 4° 18' 28.6"
Ls = 200.00'
LT = 133.37'
ST = 66.70'

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PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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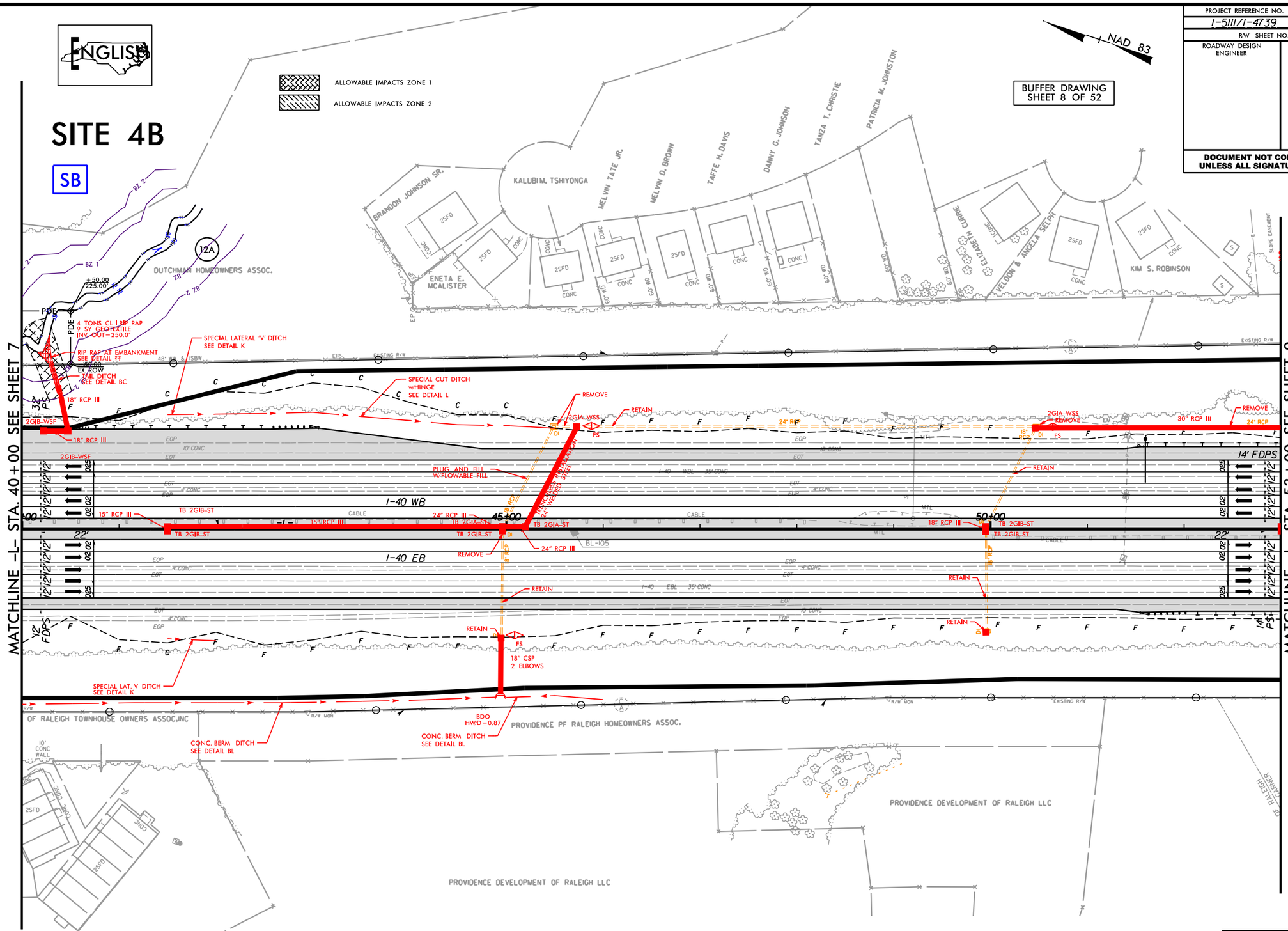

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PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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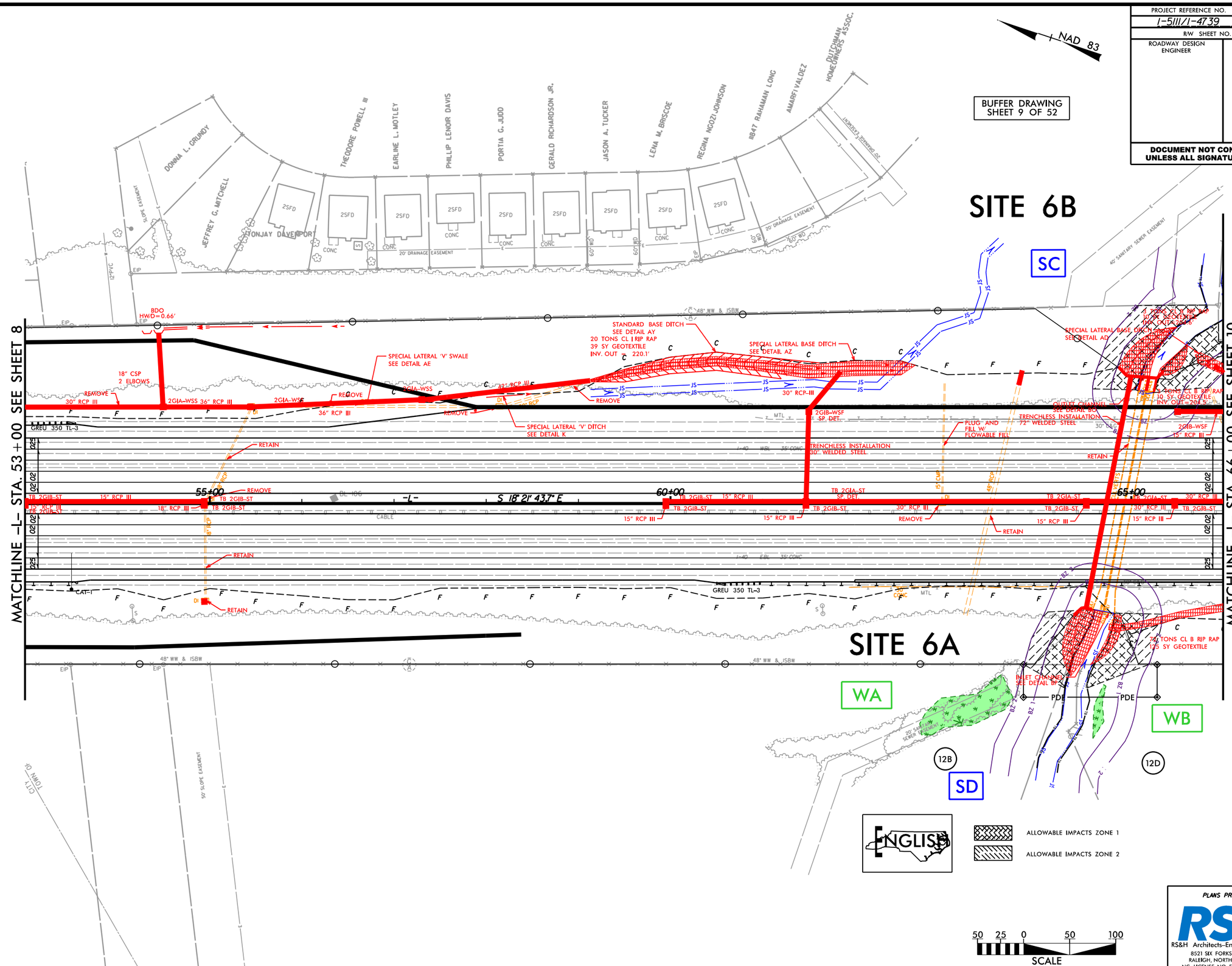

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PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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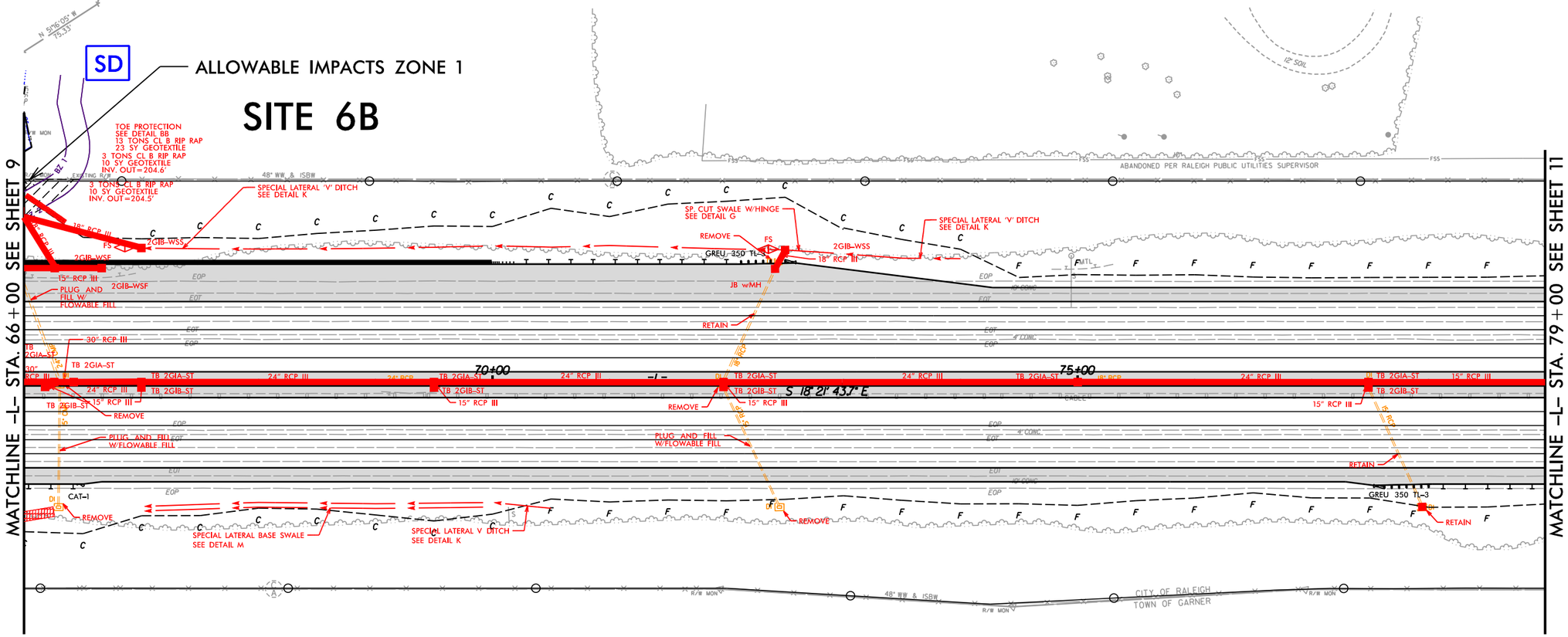
NAD 83

BUFFER DRAWING
SHEET 10 OF 52

SD

ALLOWABLE IMPACTS ZONE 1

SITE 6B



ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

50 25 0 50 100
SCALE

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PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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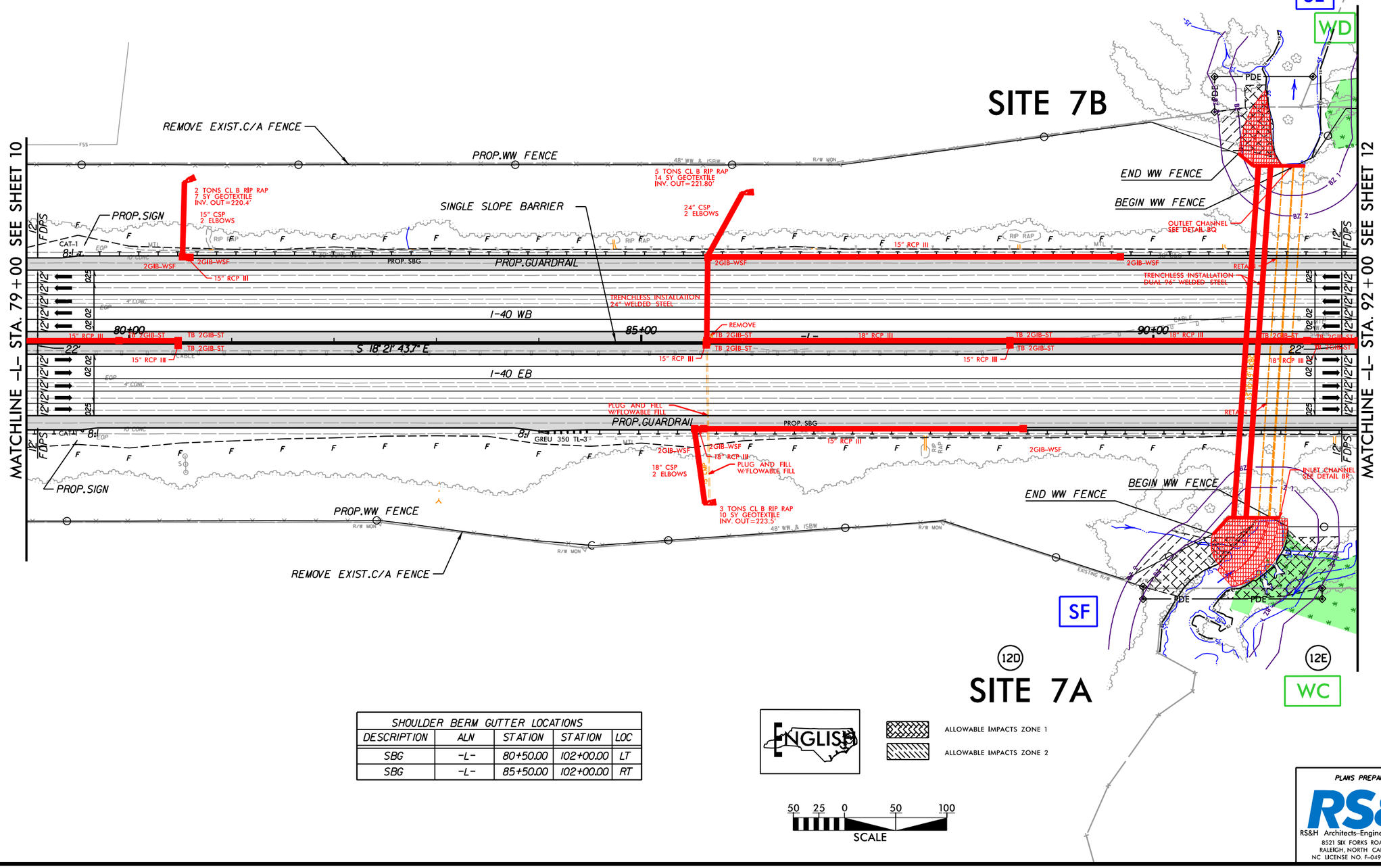
NAD 83

BUFFER DRAWING SHEET 11 OF 52



SHOULDER BERM GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	80+50.00	102+00.00	LT
SBG	-L-	85+50.00	102+00.00	RT

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

50 25 0 50 100
SCALE

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2/5/2019
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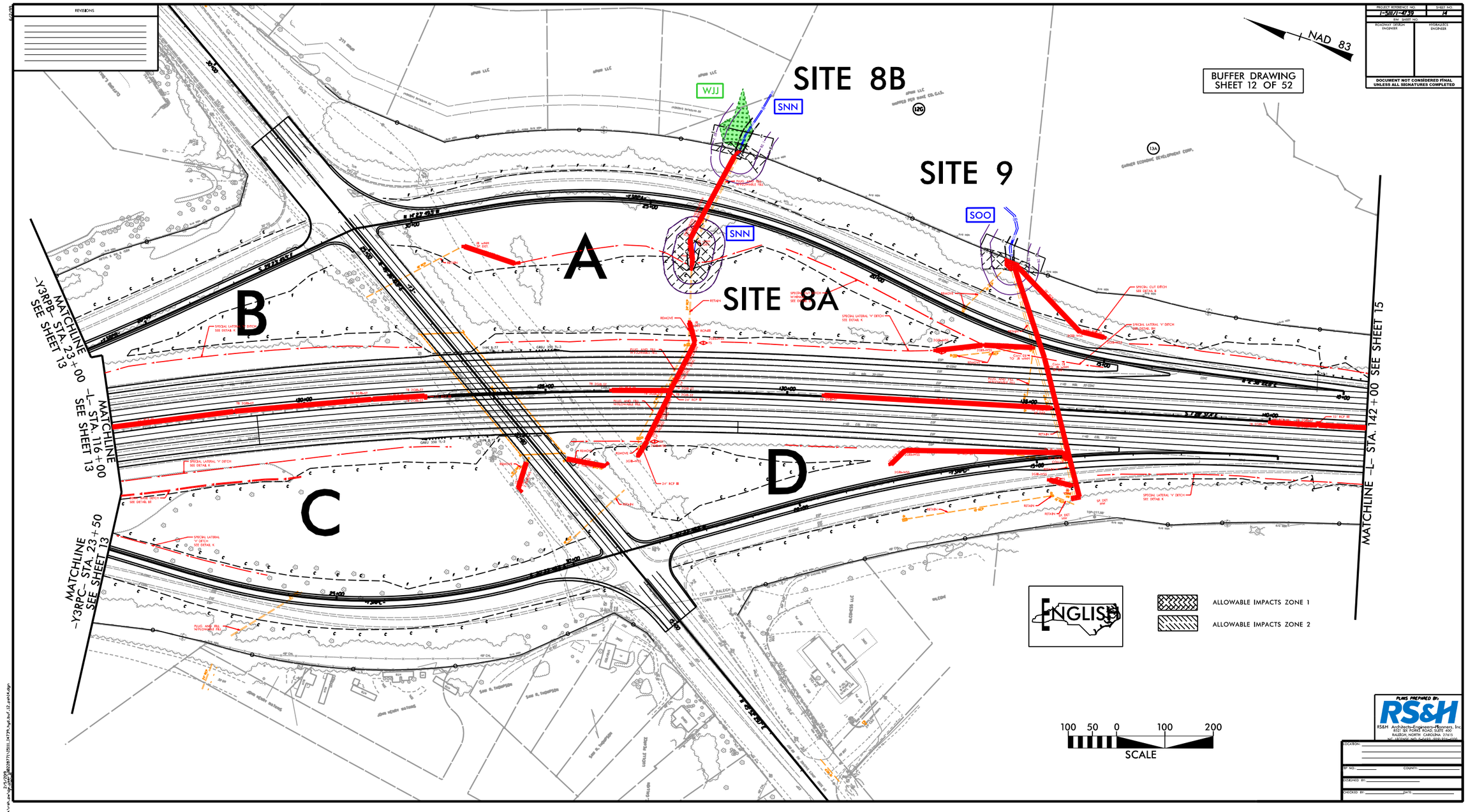
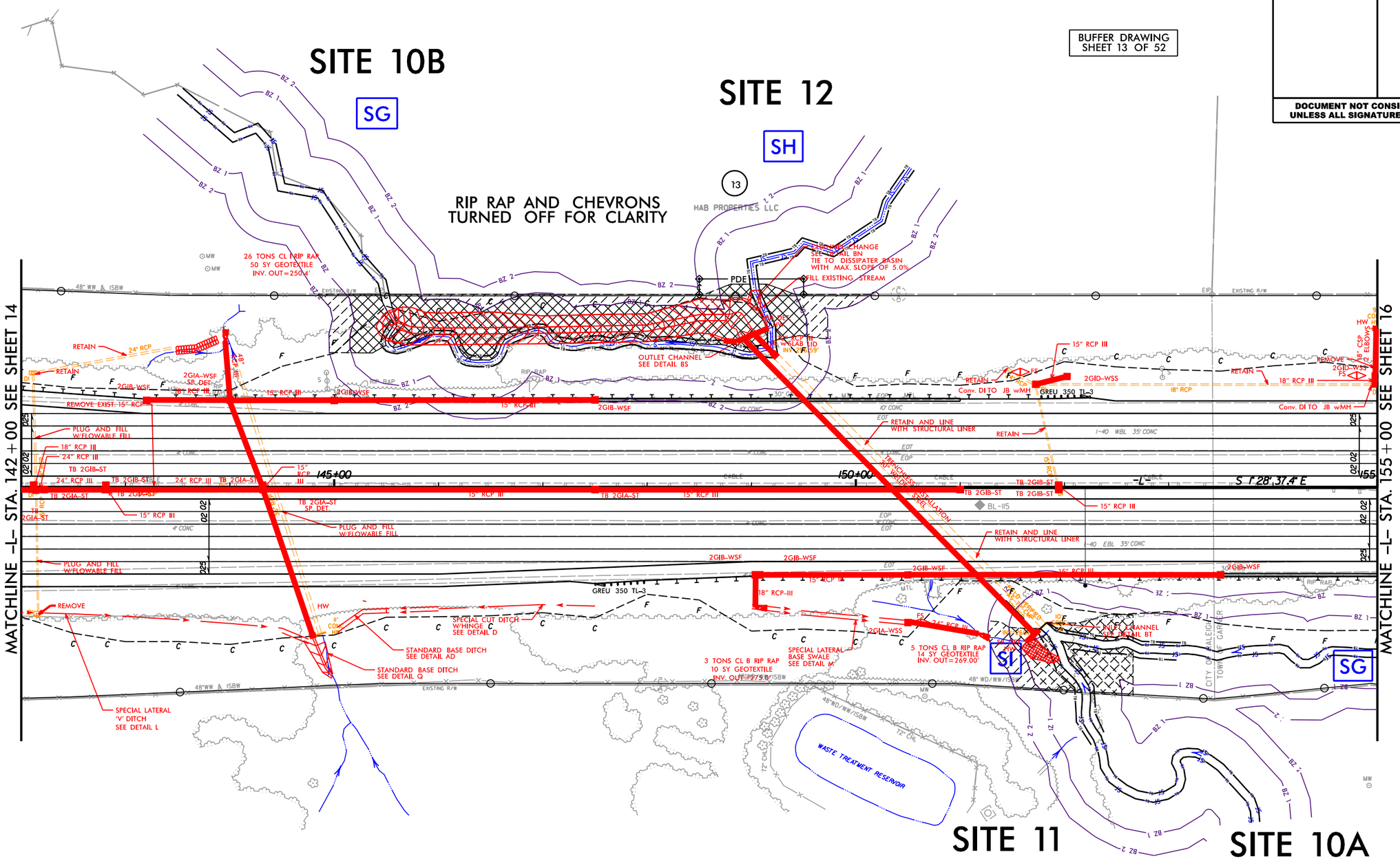

REVISIONS
PROJECT REFERENCE NO.
B-5117/B-4709
SHEET NO.
14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83
BUFFER DRAWING SHEET 12 OF 52
SITE 8B
SITE 9
SITE 8A
A
B
C
D
WJJ
SNN
SNN
SOO
MATCHLINE -Y3RPB- STA. 23+00 SEE SHEET 13
MATCHLINE -L- STA. 116+00 SEE SHEET 13
MATCHLINE -Y3RPC- STA. 23+50 SEE SHEET 13
MATCHLINE -L- STA. 142+00 SEE SHEET 15
ENGLISH
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
100 50 0 100 200
SCALE
PLANS PREPARED BY:
RS&H
RS&H Architects-Engineers-Planners, Inc.
8521 SEY PORKE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27615
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

BUFFER DRAWING SHEET 13 OF 52



MITIGABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

50 25 0 50 100
SCALE

PLANS PREPARED BY:

RS&H Architects-Engineers-Planners, Inc.
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27615
NC LICENSE NO. F-0493 (919) 926-4100

8/17/99

2/5/2019
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PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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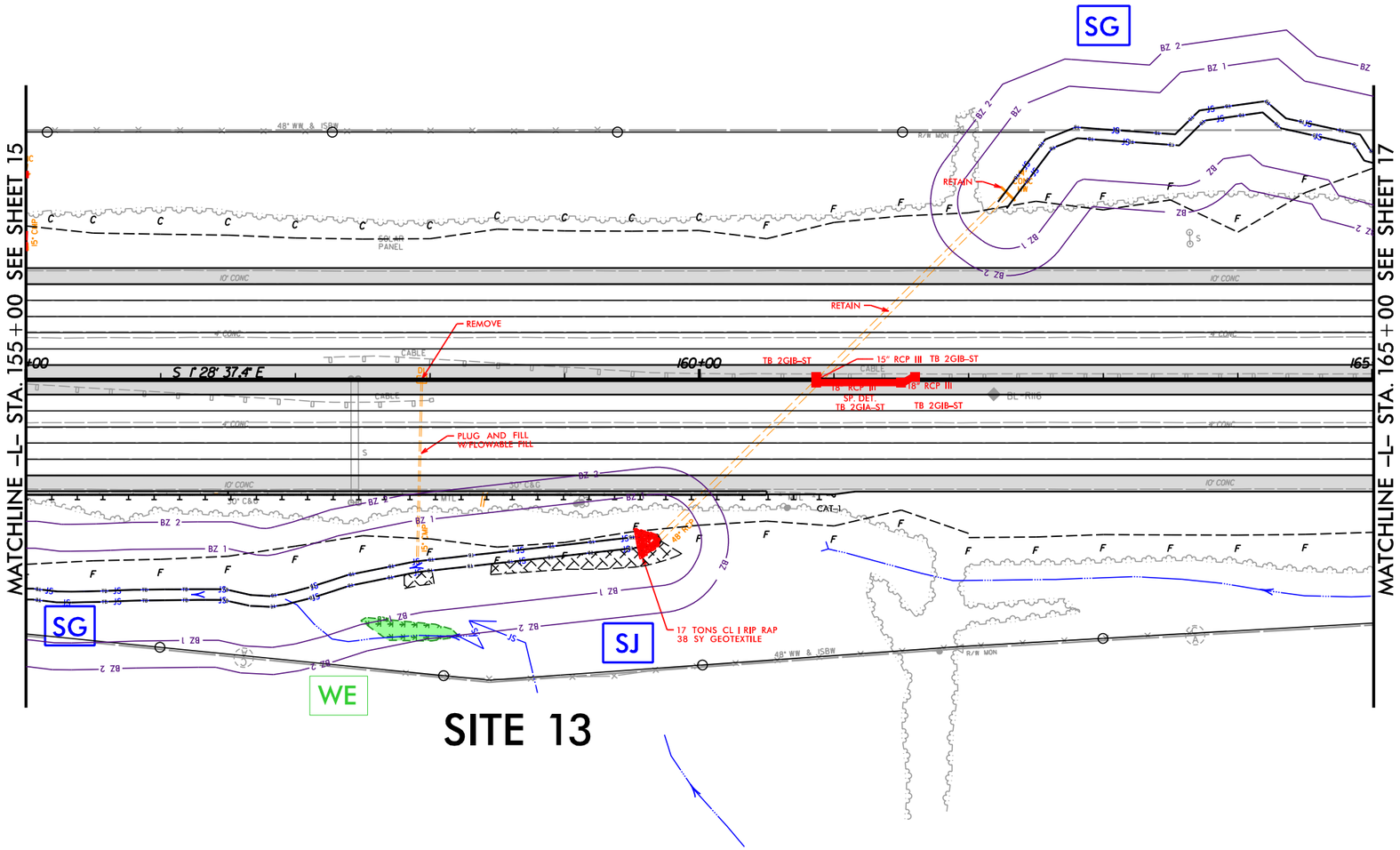
NAD 83

BUFFER DRAWING
SHEET 14 OF 52



SITE 13

ENGLISH

ALLOWABLE IMPACTS ZONE 1

50 25 0 50 100
SCALE

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ENGLISH

8/17/99

PERMIT DRAWING
SHEET 15 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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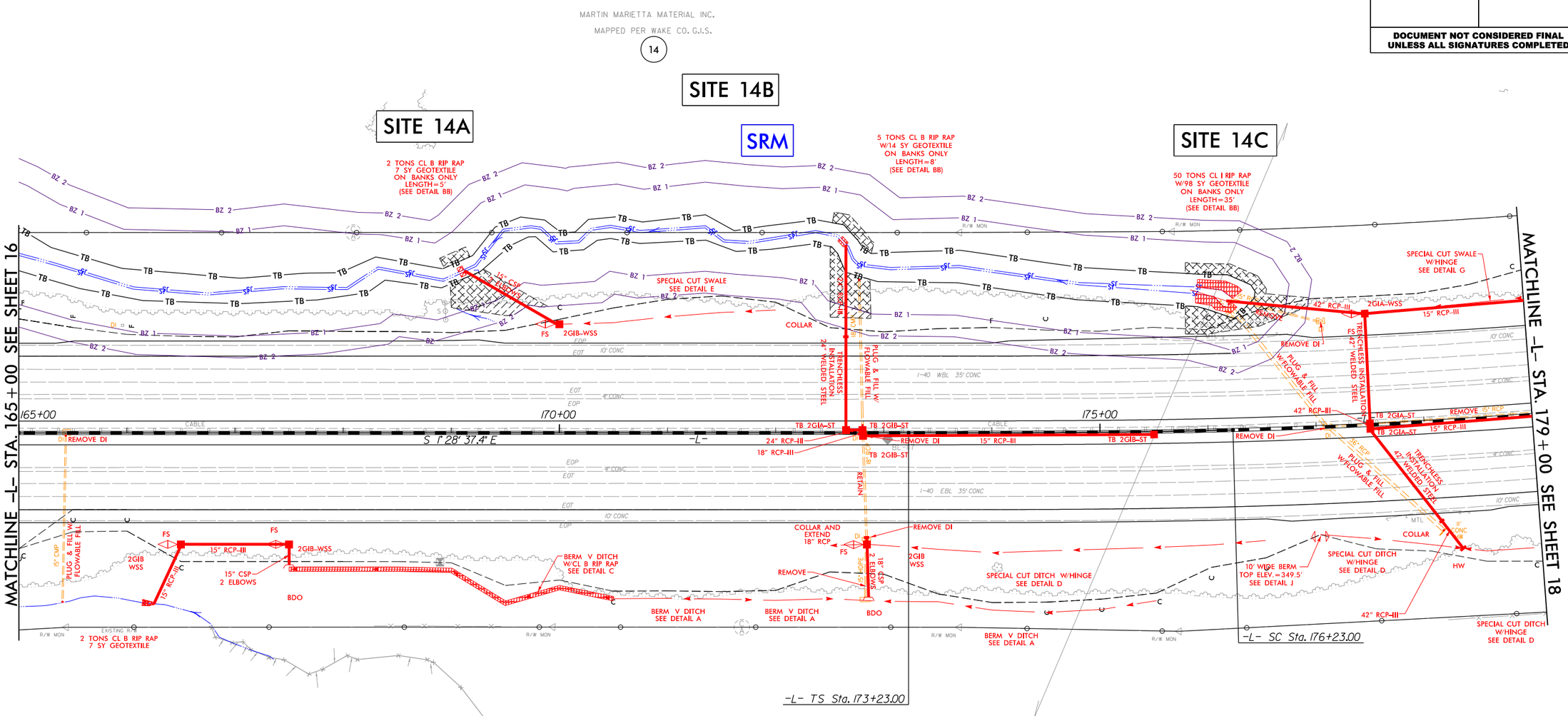
NAD 83



PLANS PREPARED BY :

RK&K

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RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

2/5/2019
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dburke

8/17/99

PERMIT DRAWING
SHEET 16 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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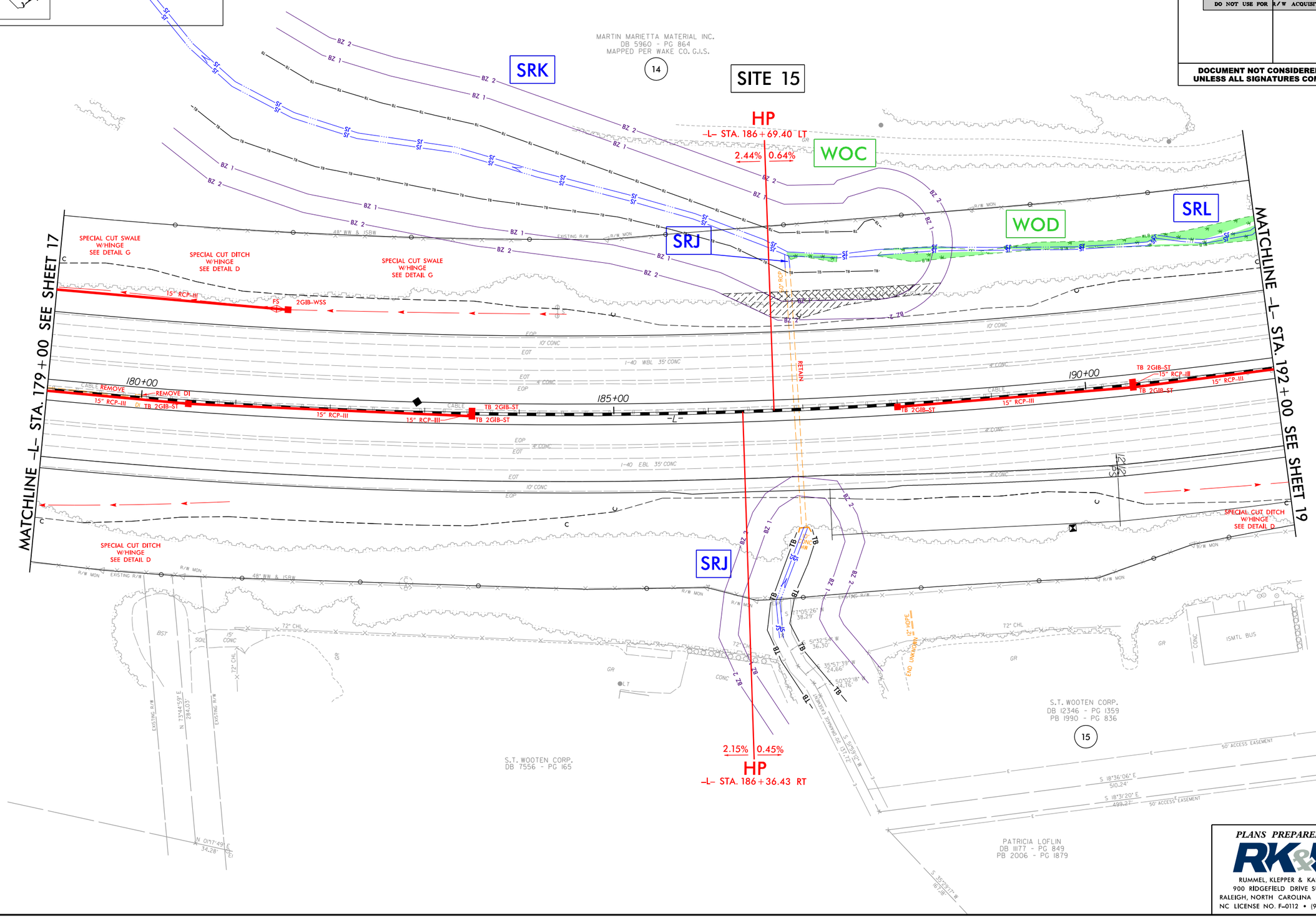
NAD 83



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REVISIONS

ROW REVISION – 11-30-2018 – ADDED PARCEL NO. 18A AND REVISED ROWPUE FOR PARCEL 18.

PERMIT DRAWING
SHEET 17 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

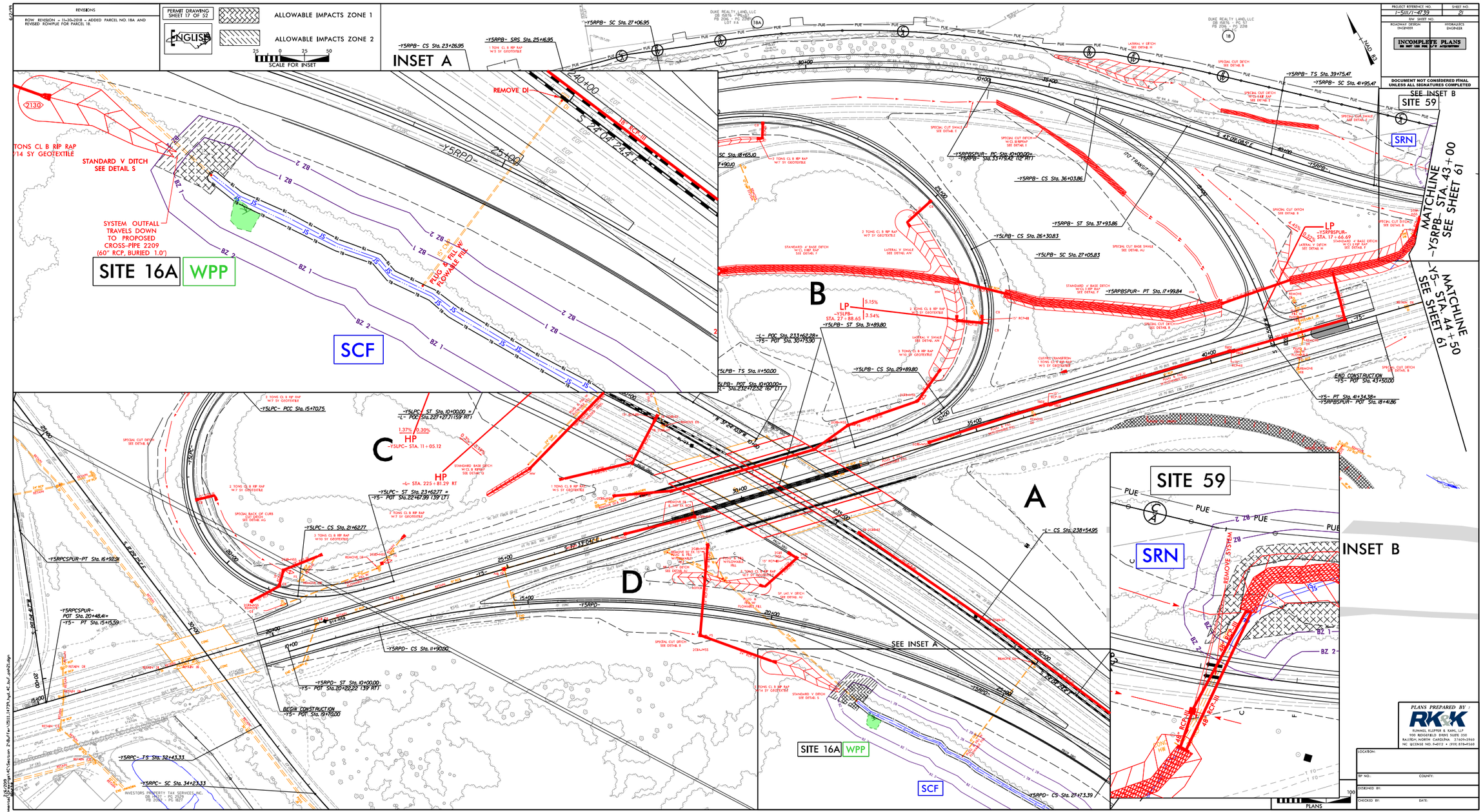
SCALE FOR INSET

25 0 25 50

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4759	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

R:\Highway\Proj\VERMITS_Environmental\I-5209_R-2248\Roadway\Plans\Sheets\Section 2\Sheet 17\5111_17_PR_Hydr_4C_Incl_pnt2D.dgn

8/17/99

PERMIT DRAWING
SHEET 18 OF 52

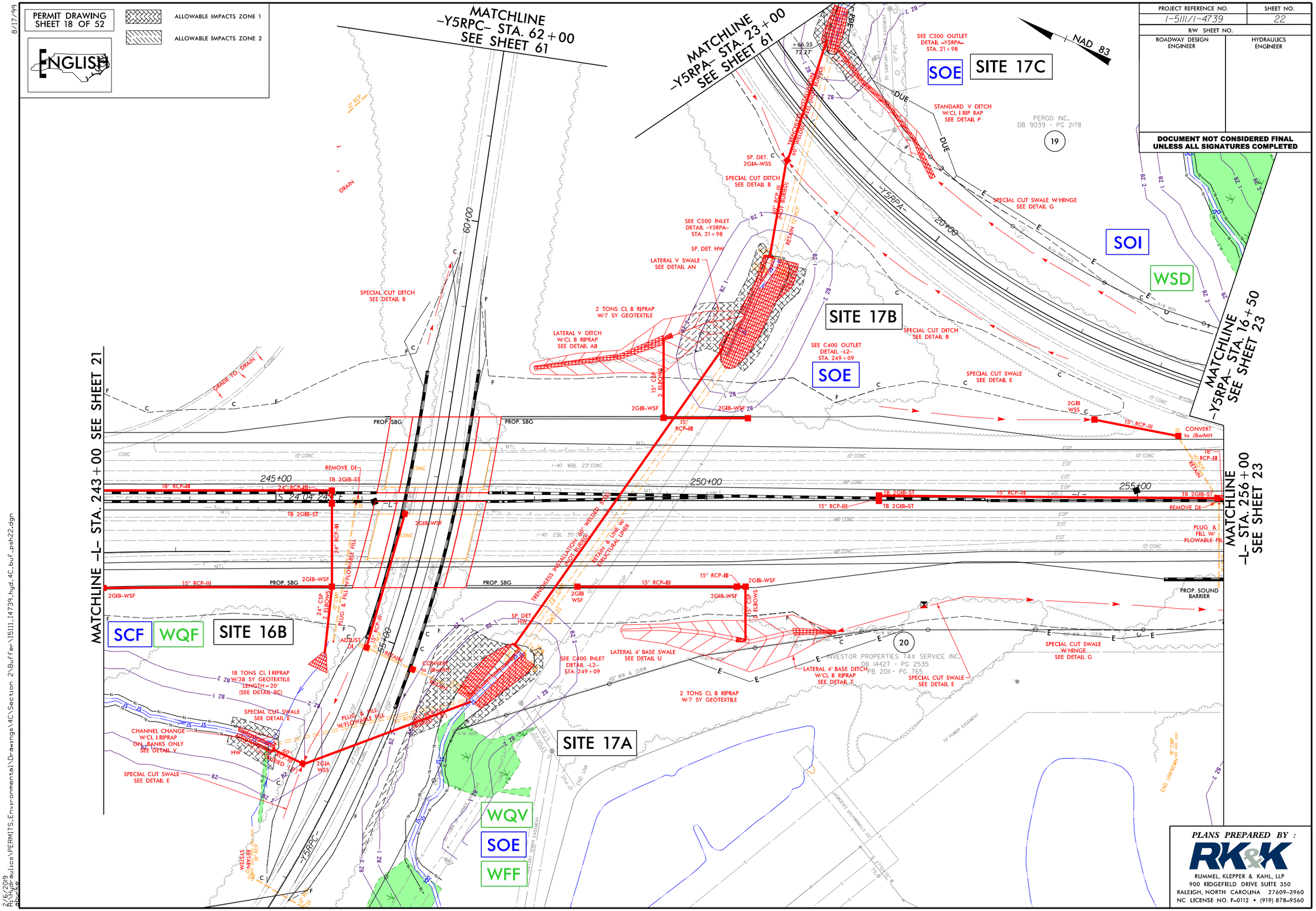
ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PERMIT DRAWING
SHEET 19 OF 52

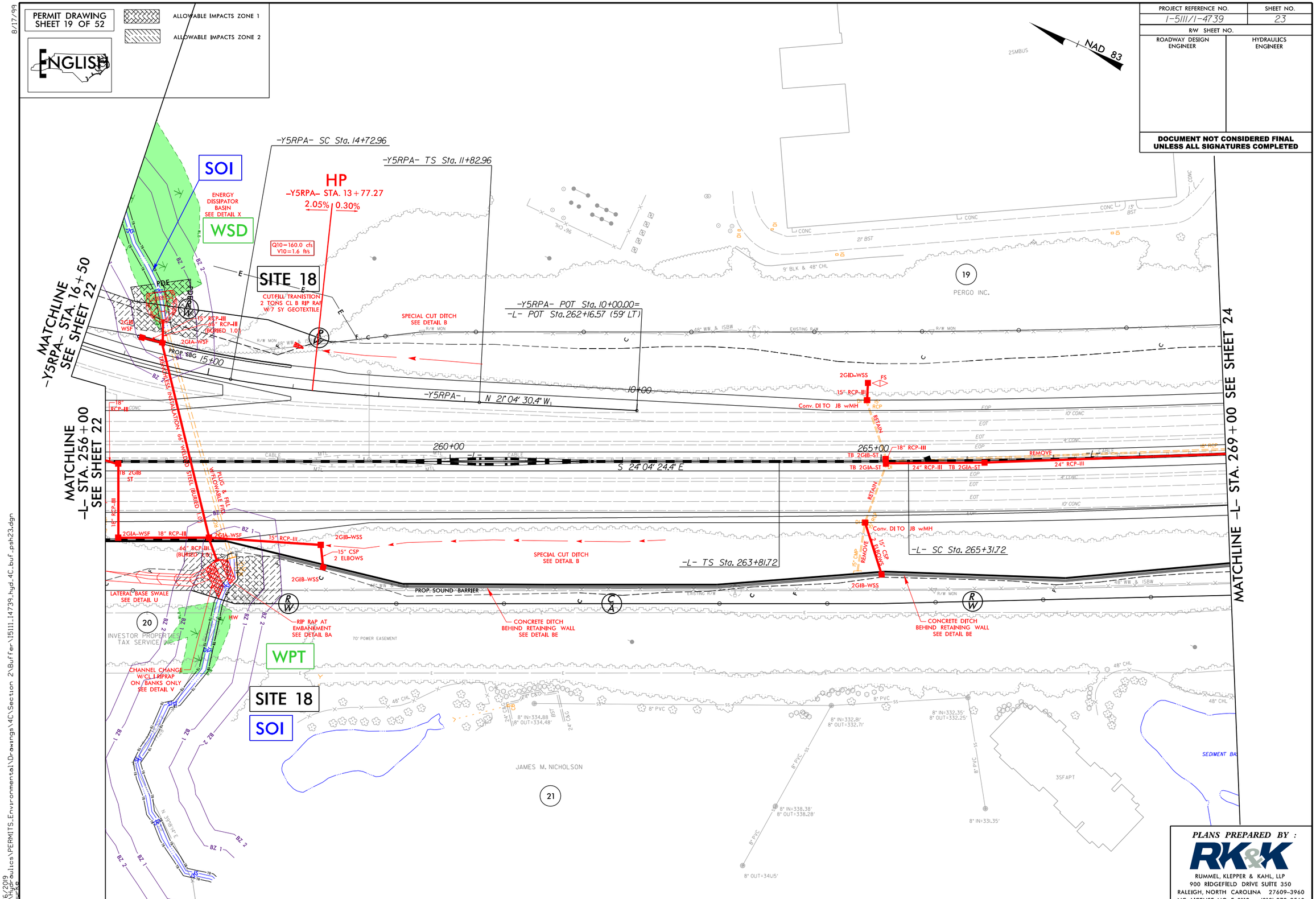
ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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abur56

8/17/99

PERMIT DRAWING
SHEET 20 OF 52

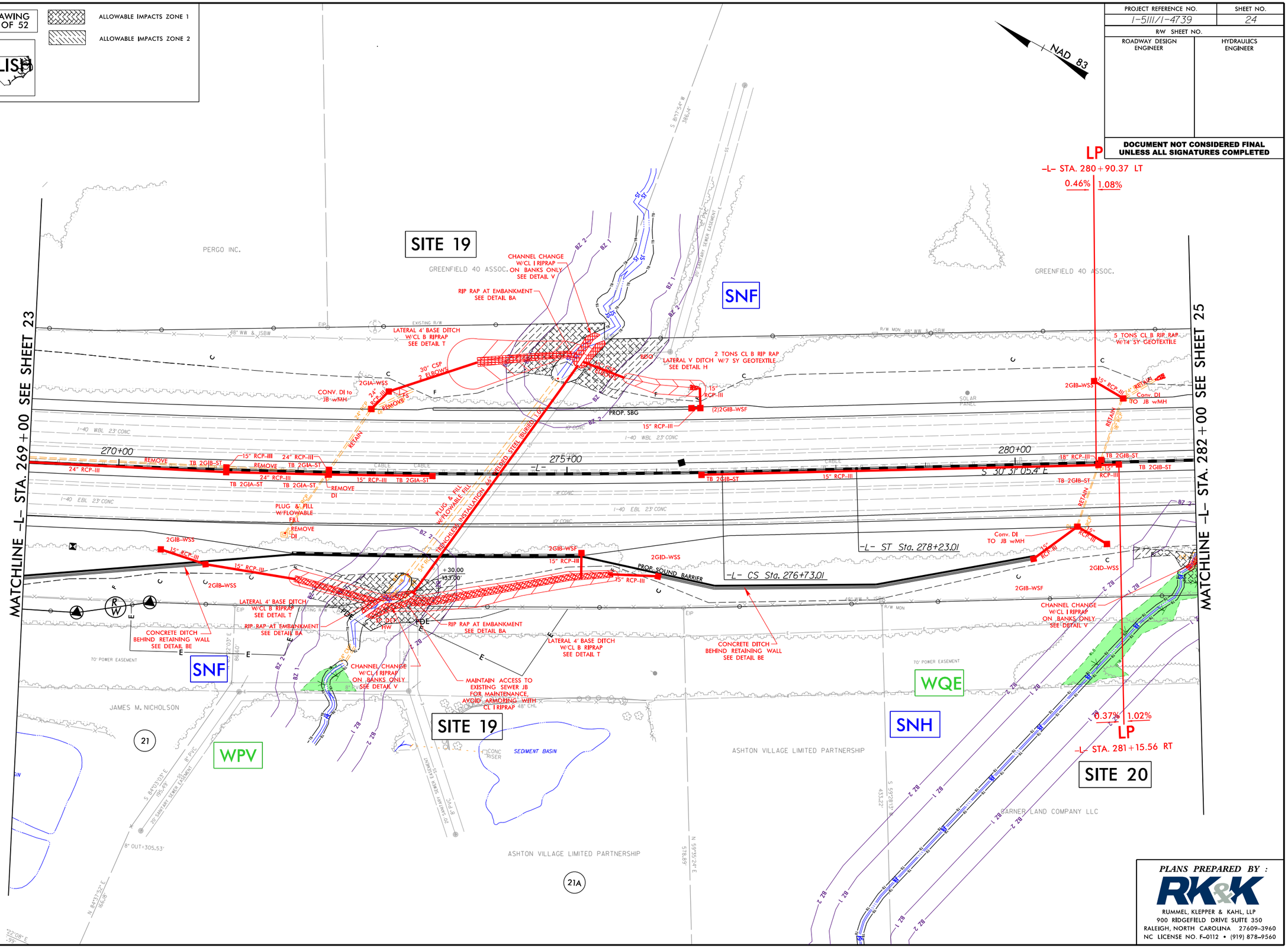
ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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abburke

8/17/99

PERMIT DRAWING
SHEET 21 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

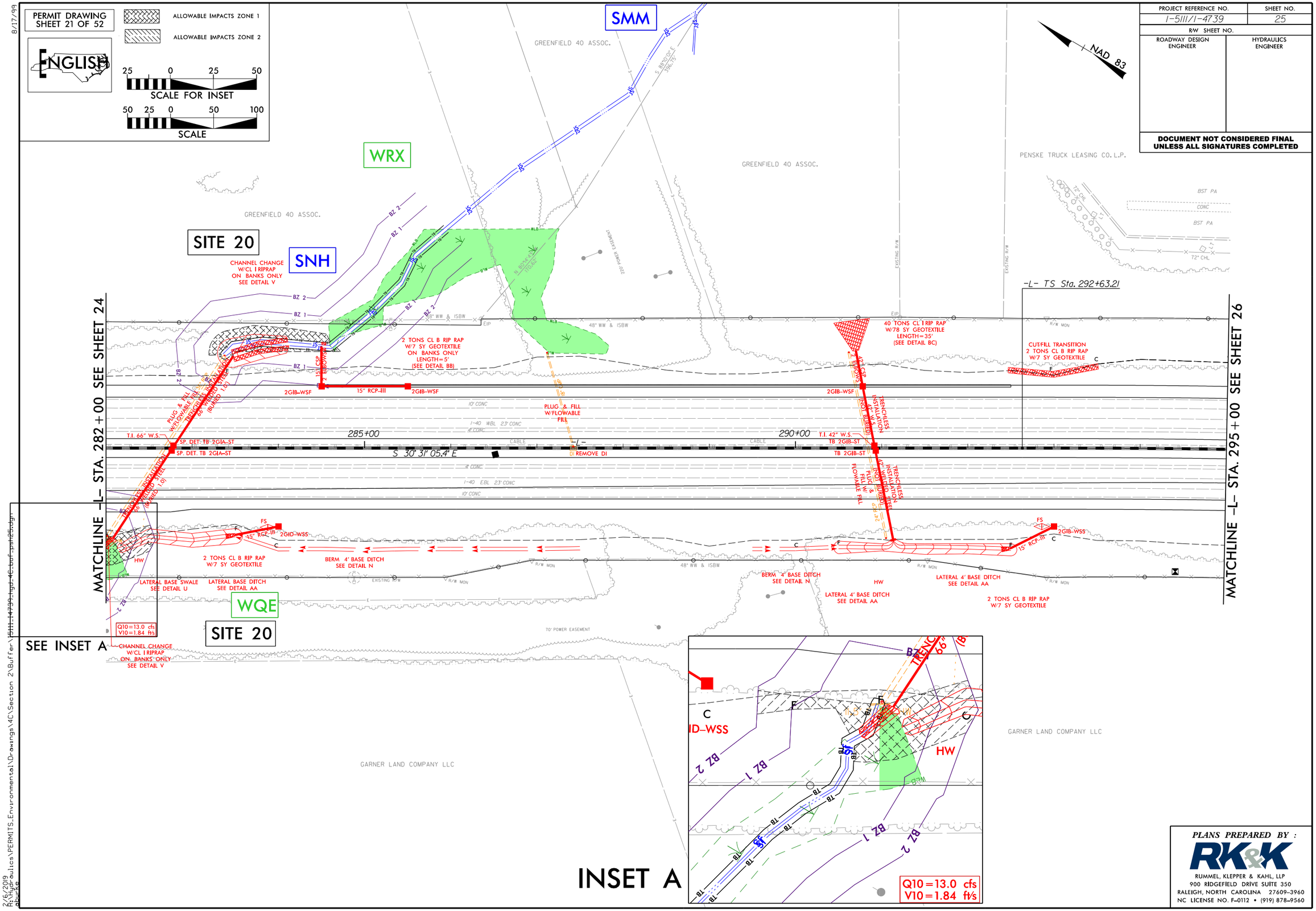
ALLOWABLE IMPACTS ZONE 2

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PERMIT DRAWING
SHEET 22 OF 52

ENGLISH

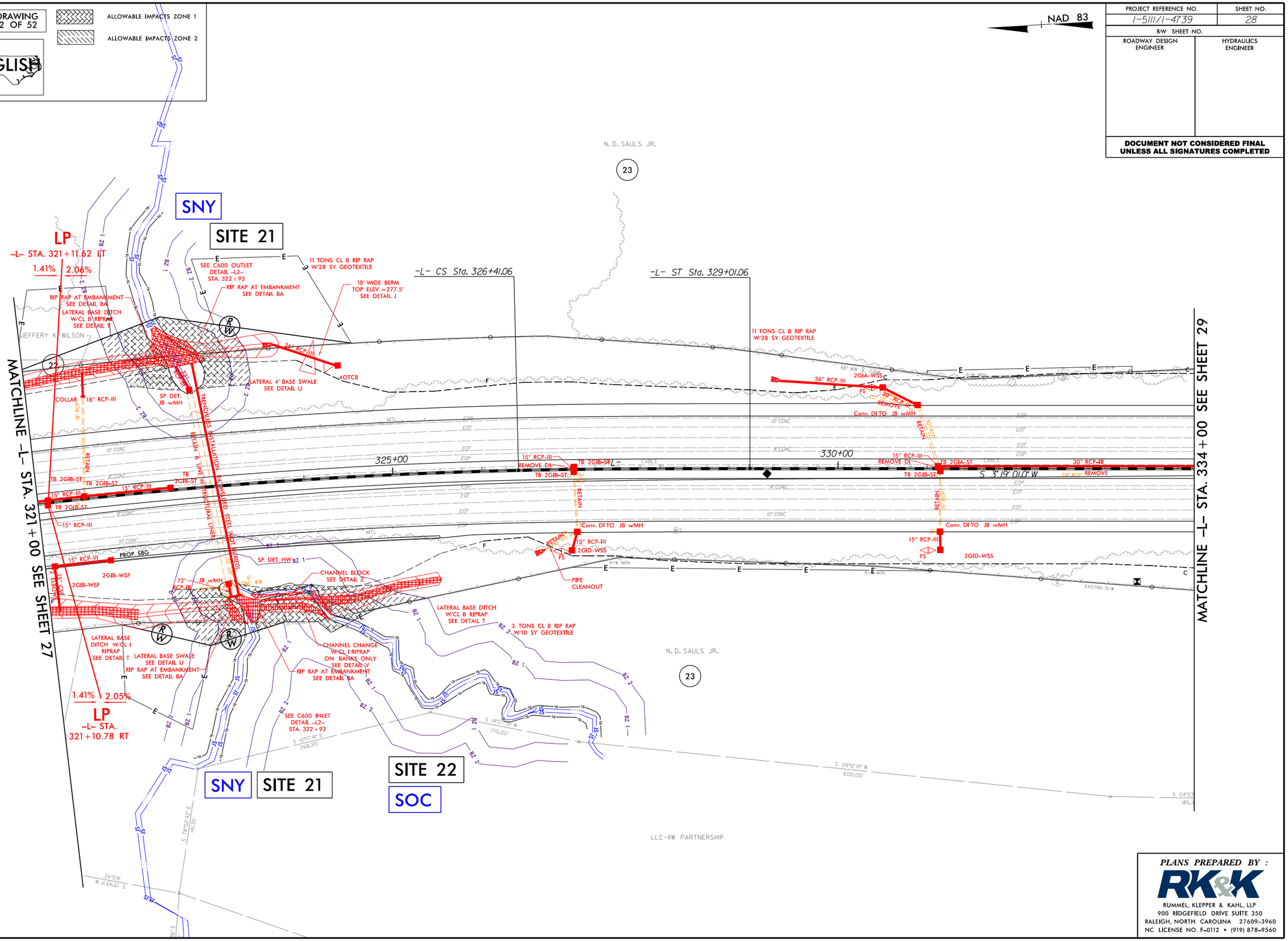
ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PERMIT DRAWING
SHEET 23 OF 52

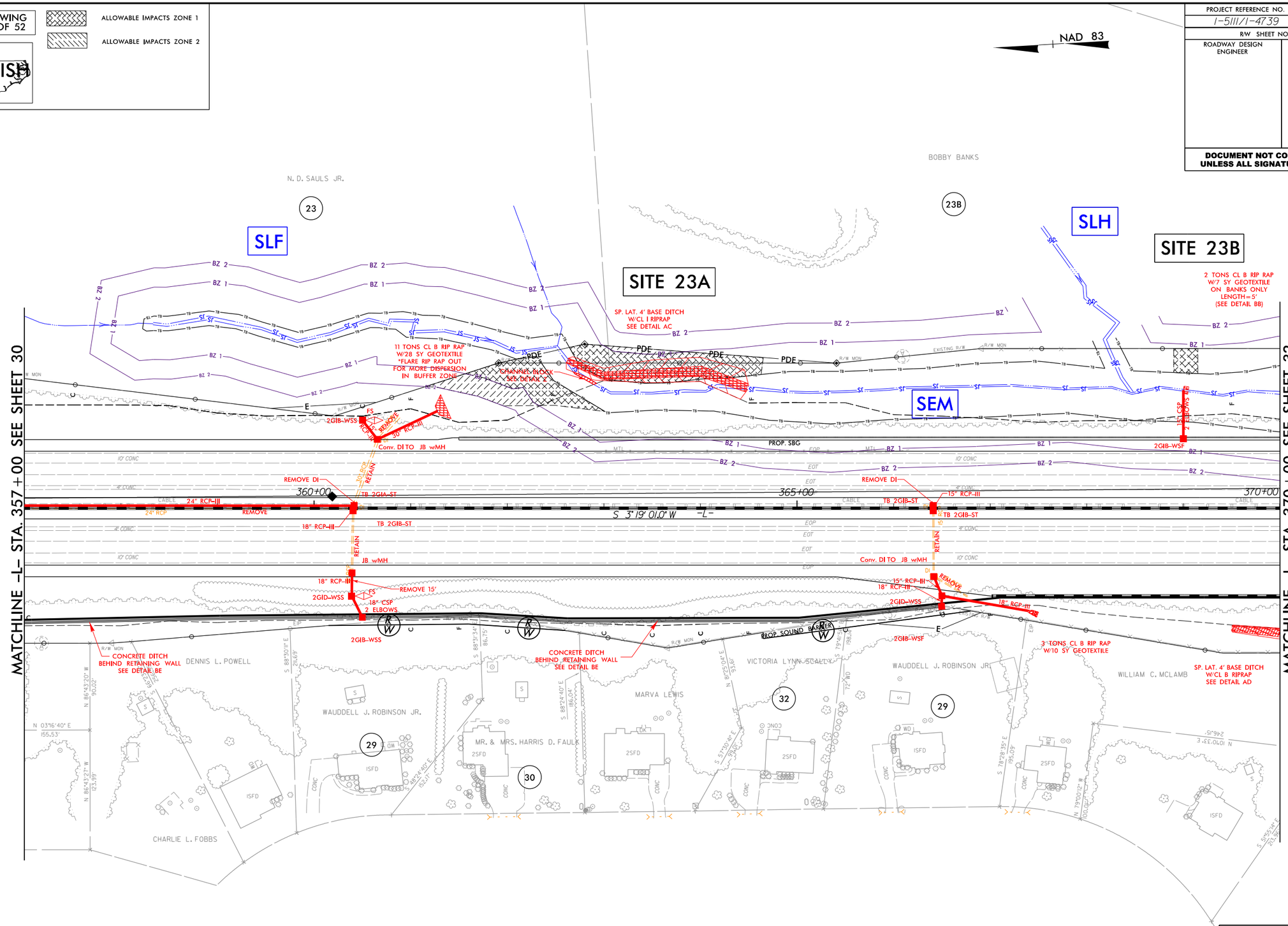
ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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2/6/2019
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aburke

PERMIT DRAWING
SHEET 24 OF 52

ENGLISH

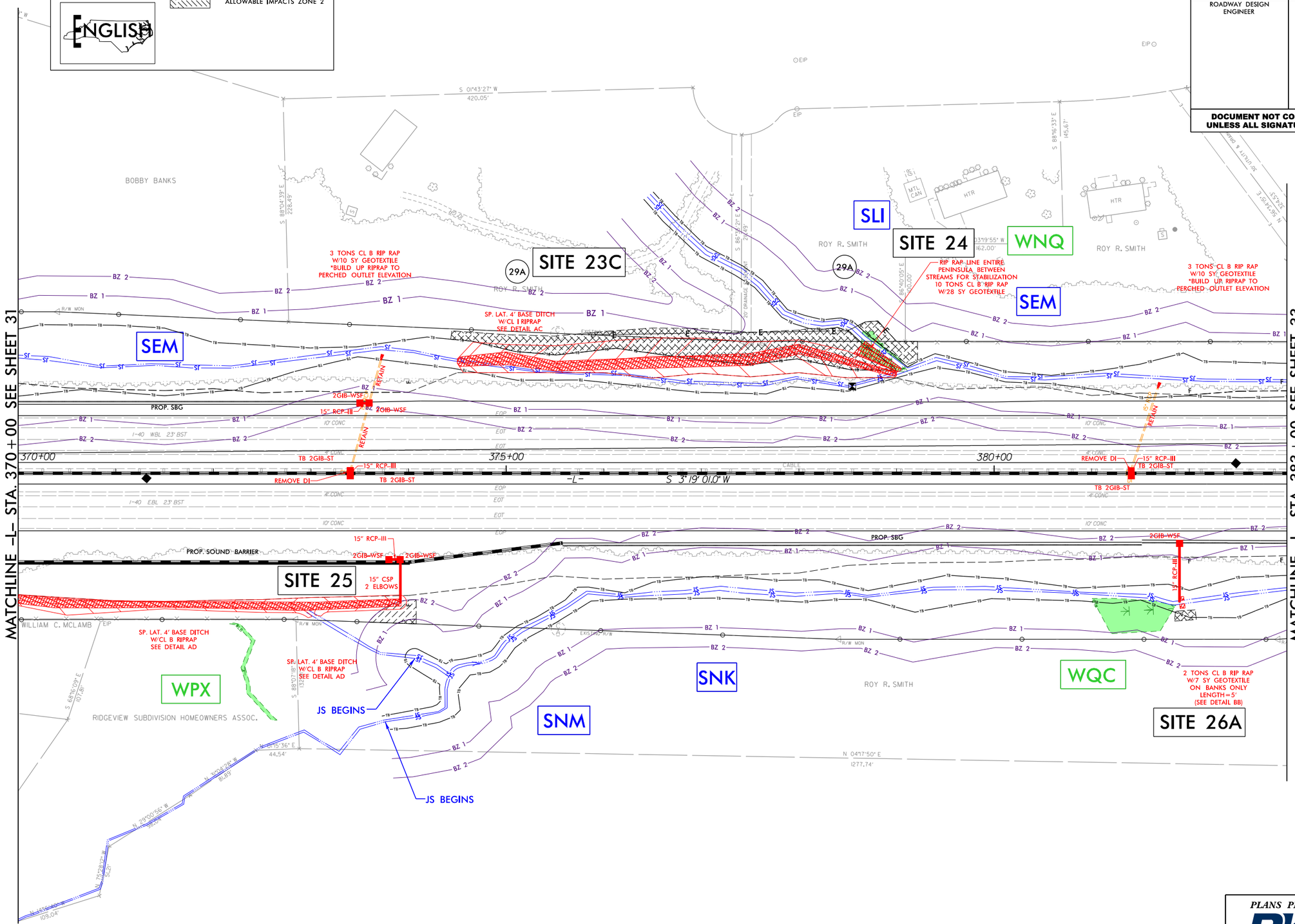
ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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RALEIGH, NORTH CAROLINA 27609-3960
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2/5/2019
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8/17/99

PERMIT DRAWING
SHEET 25 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

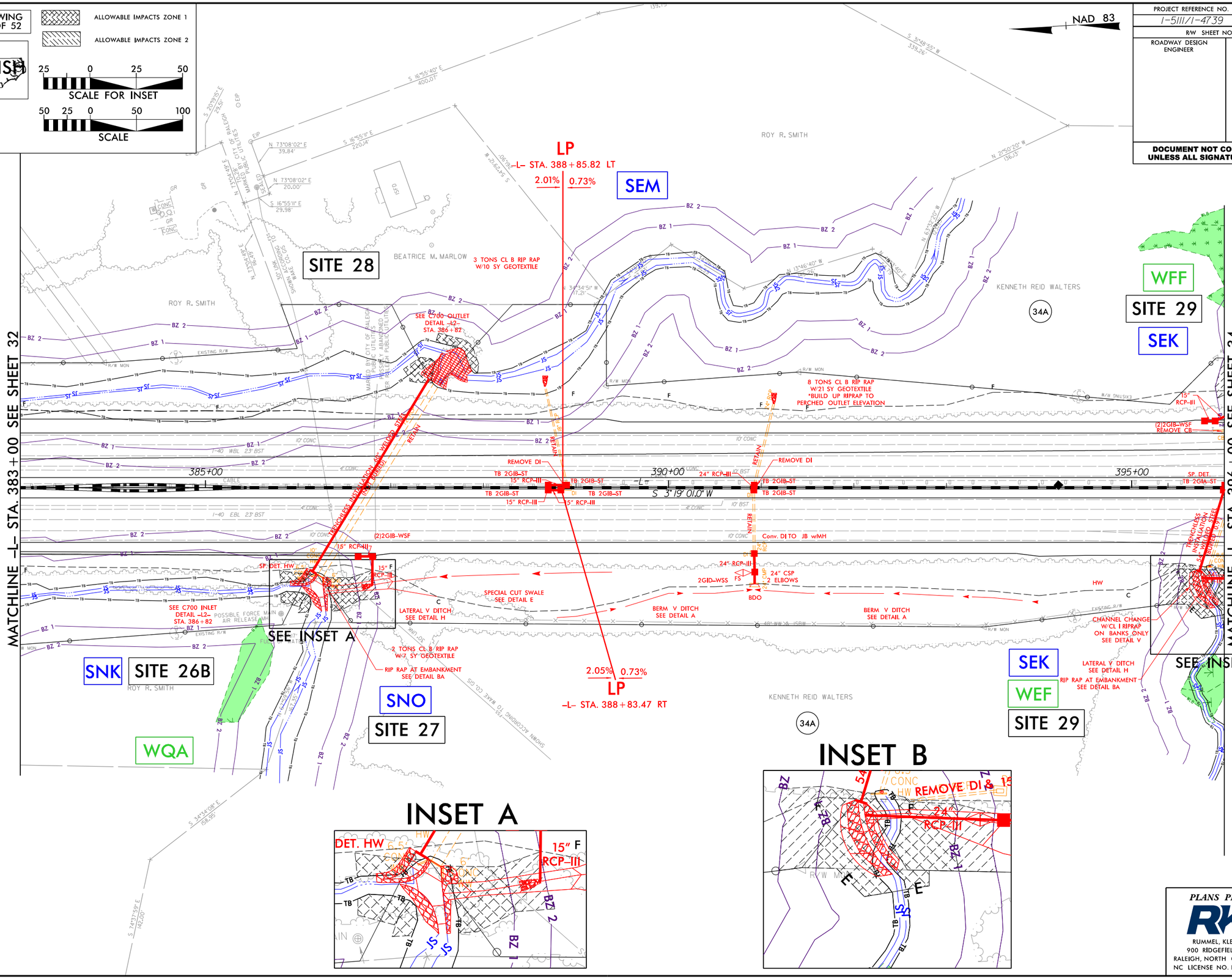
25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PERMIT DRAWING
SHEET 26 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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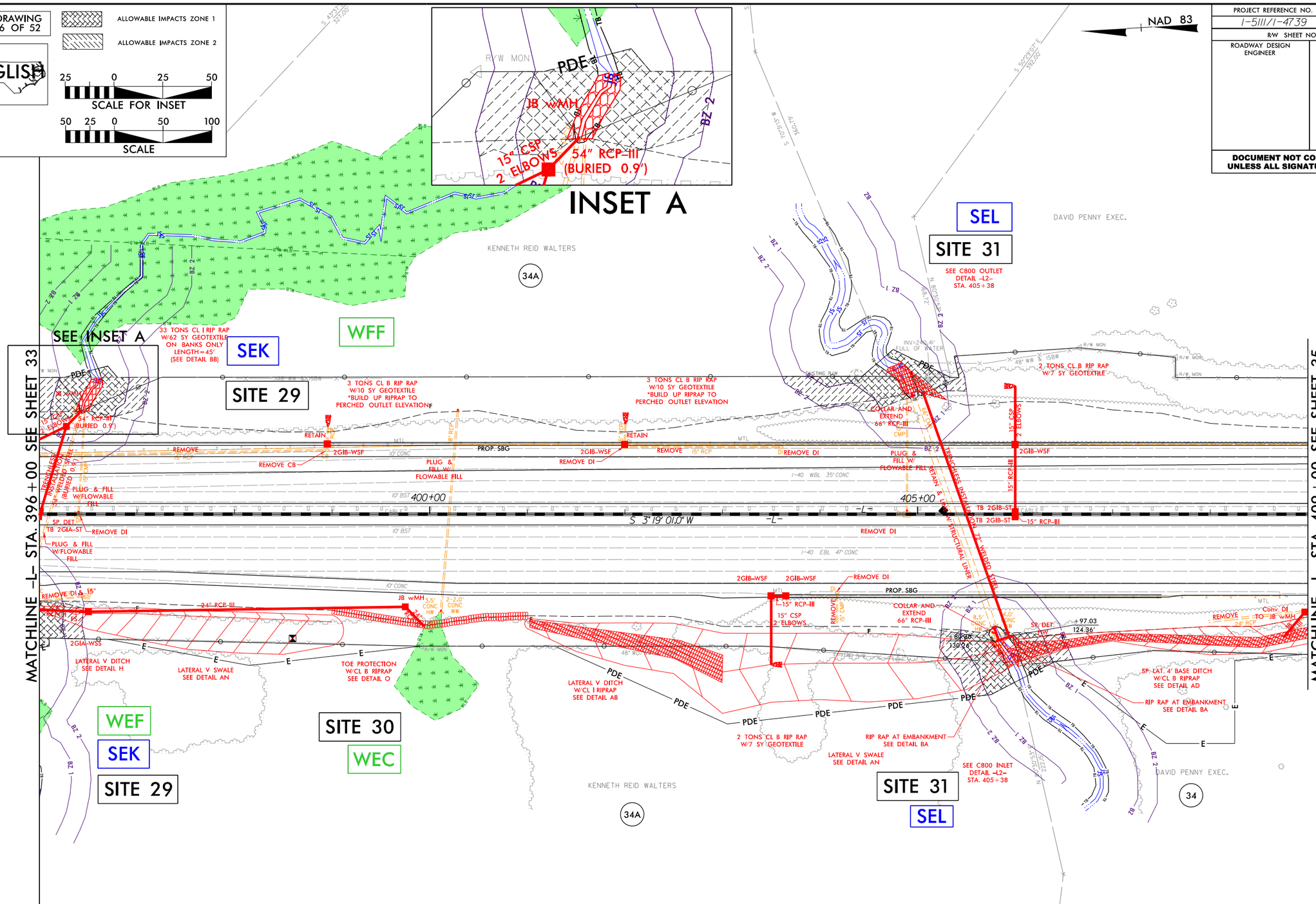

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REVISIONS

PERMIT DRAWING
SHEET 27 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

25 0 25 50
SCALE FOR INSET

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS

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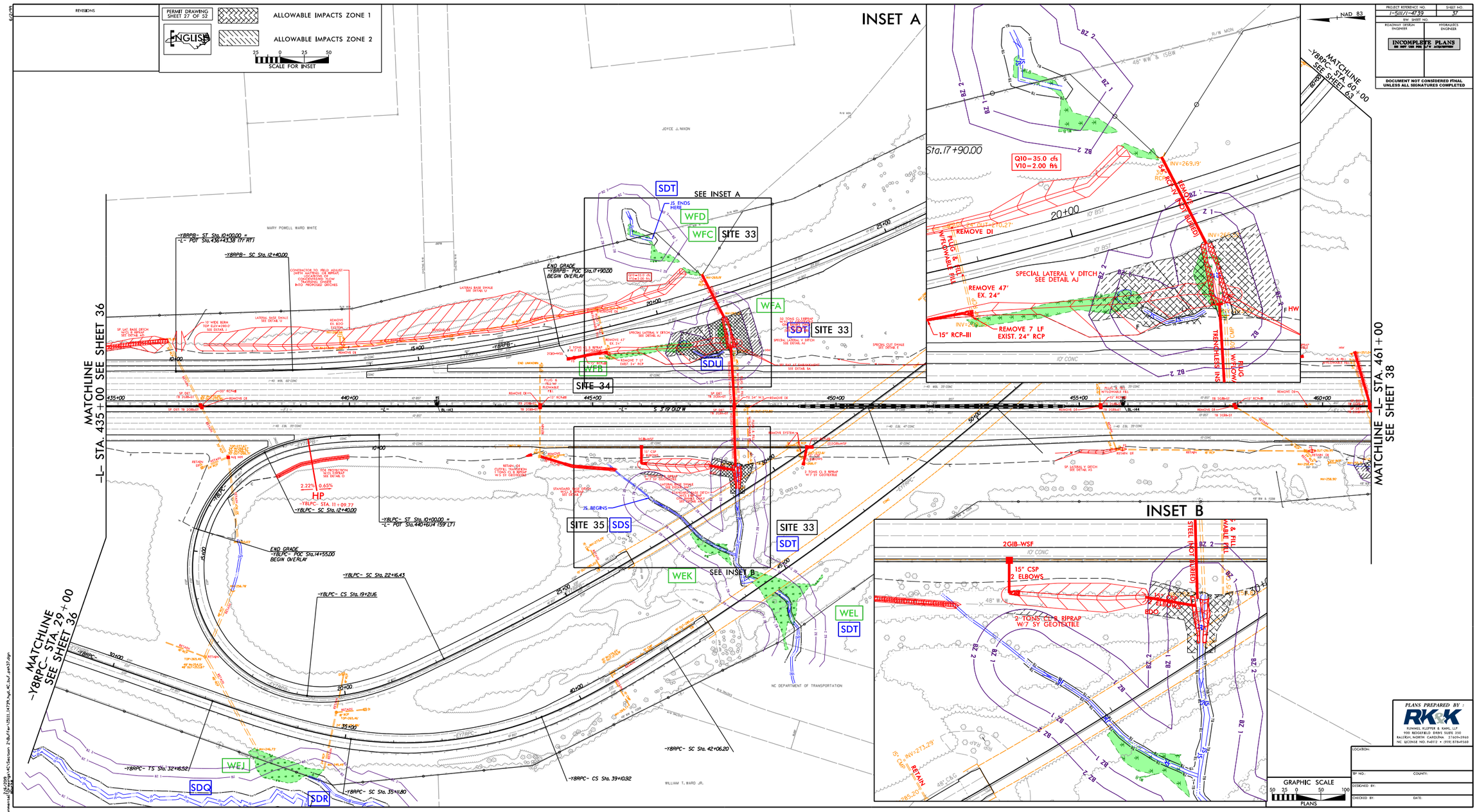

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RALEIGH, NORTH CAROLINA 27609-2960
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GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:
TIP NO.: COUNTY:
DESIGNED BY:
CHECKED BY: DATE:

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PERMIT DRAWING
SHEET 28 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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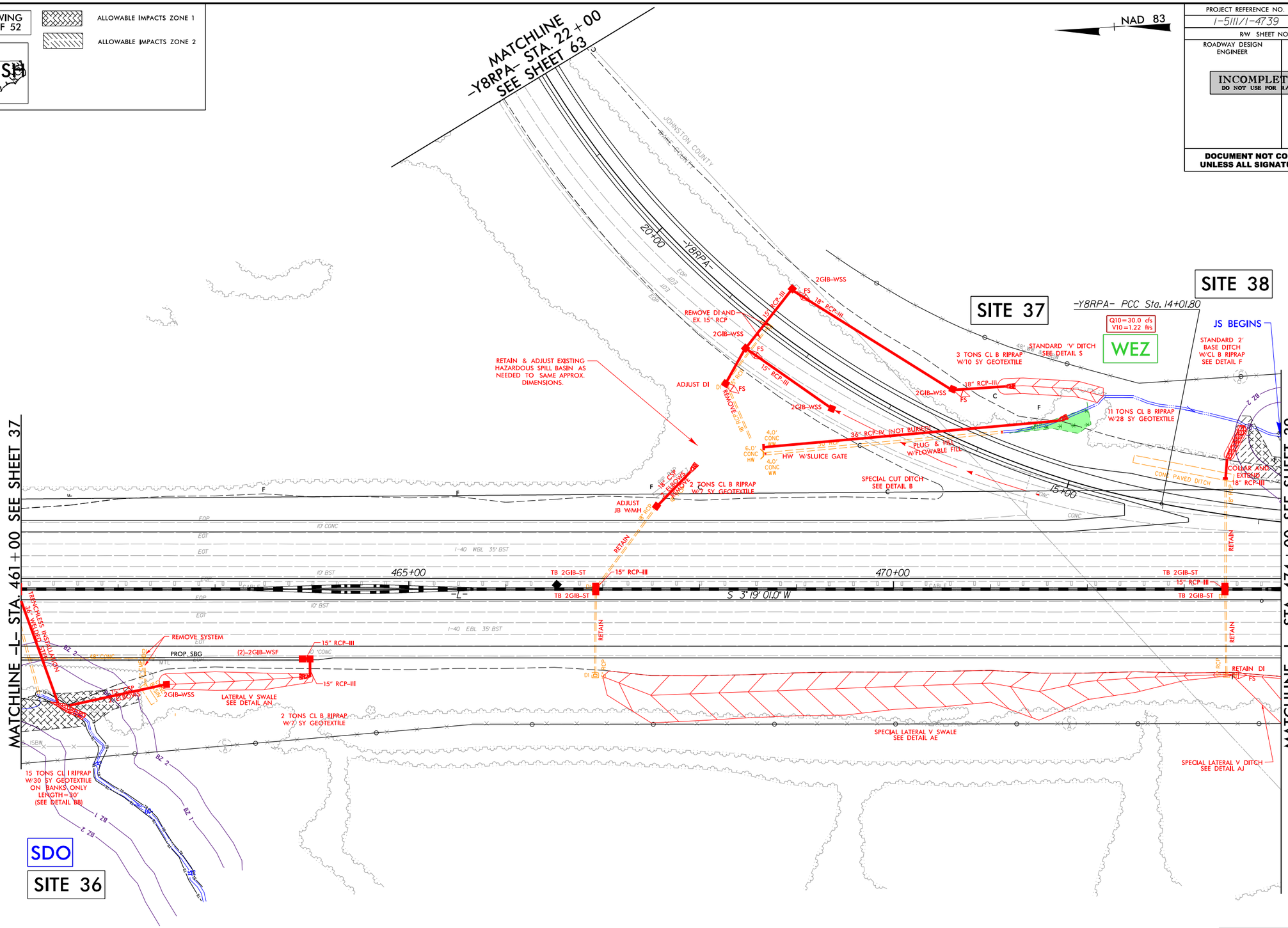

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PERMIT DRAWING
SHEET 29 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	61
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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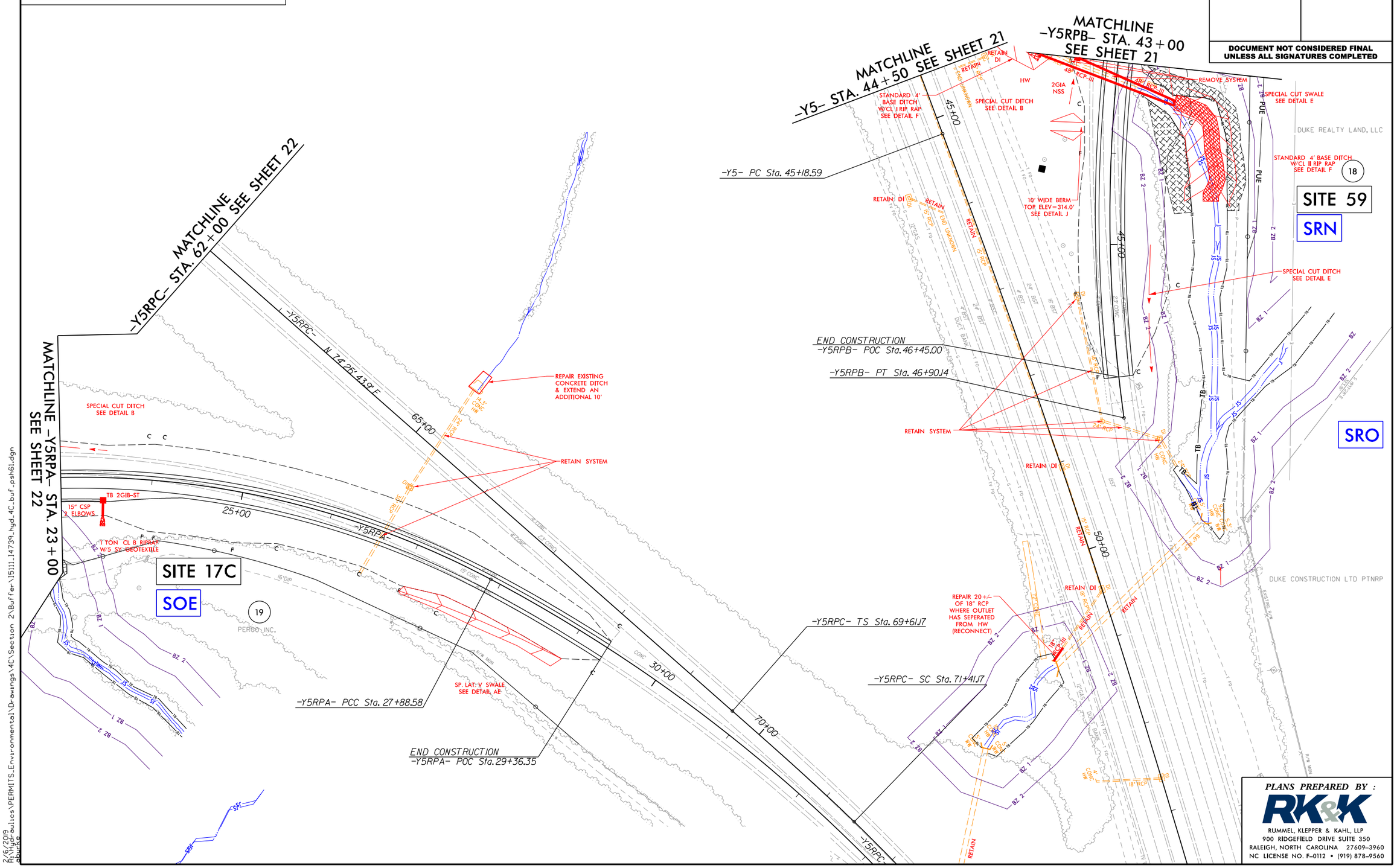
NAD 83



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dburke

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	63
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 30 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83

SET

SITE 60

WFI

WEY

WEX

SET

HP
-Y8RPA- STA. 28+45.64

SITE 60

MATCHLINE -Y8RPB- STA. 32+50 SEE SHEET 37

MATCHLINE -Y8LPC- STA. 43+00 SEE SHEET 37

MATCHLINE -Y8RPC- STA. 60+00 SEE SHEET 37

MATCHLINE -Y8RPA- STA. 22+00 SEE SHEET 38

END CONSTRUCTION
-Y8RPB- POC Sta. 42+63.72

-Y8LPC- PT Sta. 55+76.08

-Y8RPC- SC Sta. 72+95.36

-Y8RPC- CS Sta. 70+00.09

Y8RPA- PC Sta. 34+78.95

END CONSTRUCTION
-Y8RPA- POC Sta. 34+88.95

-Y8RPA- ST Sta. 32+96.33

-Y8RPA- CS Sta. 30+86.33

S 58° 46' 31.41" E

REMOVE 15" METAL SILL (NO SILL DOWNSTREAM AND NOT SERVING ITS INTENDED PURPOSE)

RETAIN CB

RETAIN SYSTEM

CONC PAVED DITCH

RETAIN DI

SPECIAL CUT SWALE SEE DETAIL E

GRADE TO DRAIN

REMOVE CB

2GID-WSS

2GIB-WSS

2GIB-WSF

PLUG & FILL W/FLOWABLE FILL

COLLAR AND EXTEND 15" RCP-III

2 TONS CL B RIPRAP W/7 SY GEOTEXTILE

5 TONS CL B RIPRAP W/14 SY GEOTEXTILE

LATERAL V SWALE SEE DETAIL AN

Q10=14.0 cfs
V10=1.86 ft/s

Q10=4.2 cfs
V10=1.86 ft/s

0.35%

1.77%

48 TONS CL I RIPRAP W/89 SY GEOTEXTILE ON BANKS ONLY LENGTH=22' (SEE DETAIL BB)

LINE CUT DITCH TRANSITION 2 TONS CL B RIPRAP W/7 SY GEOTEXTILE

HW

PLUG & FILL W/FLOWABLE FILL

GRADE PAVEMENT REMOVAL AREA TO DRAIN TO HW 6300

20 TONS CL I RIPRAP W/39 SY GEOTEXTILE

HAZARDOUS SPILL BASIN SEE 2D-7

SLUICE GATE

WAKE COUNTY
JOHNSTON COUNTY

-Y8RPB- -Y8RPC- -Y8LPC- -Y8RPA-

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aburke

PERMIT DRAWING
SHEET 31 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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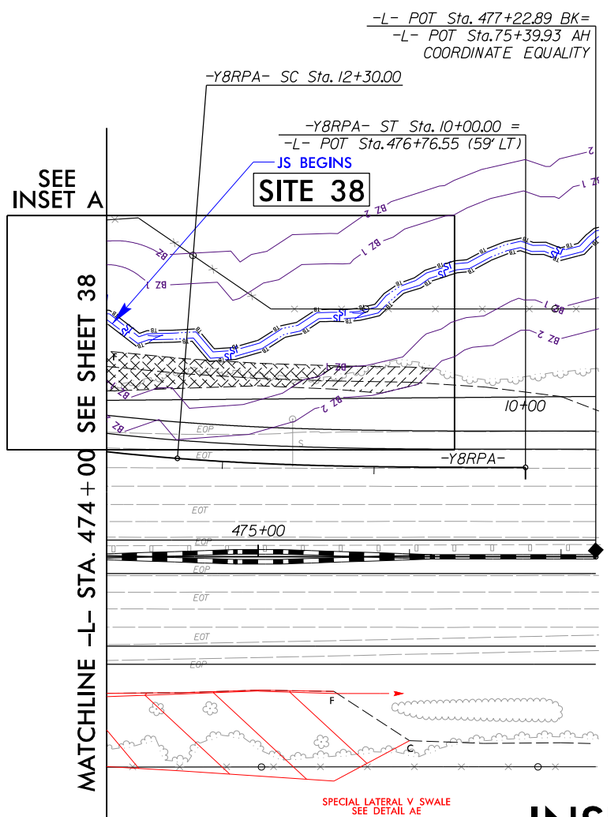
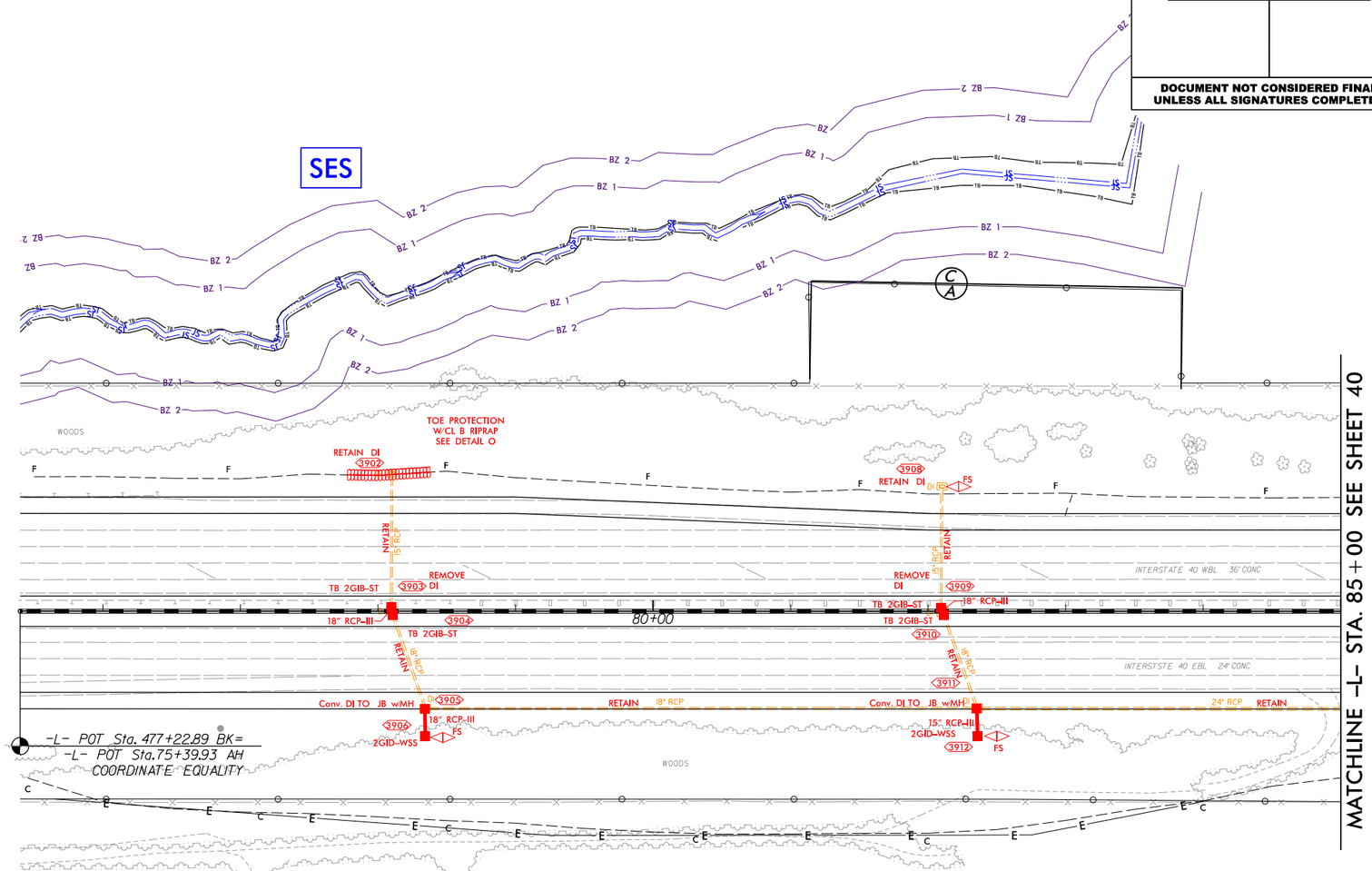
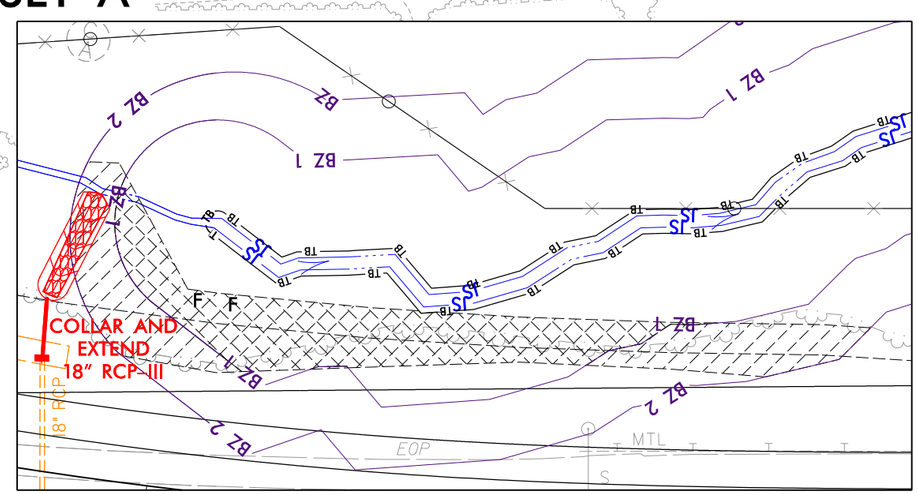




INSET A



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PERMIT DRAWING
SHEET 32 OF 52

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SES

WEM

NAD 83

THE BROWN-GOWER COMPANY, LLC
DB 5037 PG 696 (JOHNSTON)
DB 16848 PG 552 (WAKE)
BM 1972 PG 283 (WAKE)

39

SHEET FOR INFORMATION
ONLY– NO IMPACTS

LP
–L3– STA. 94+97.14 LT
1.98% 0.87%

MATCHLINE –L– STA. 85+00 SEE SHEET 39

MATCHLINE –L– STA. 98+00 SEE SHEET 41

BIORETENTION BASIN

15 TONS CL I RIPRAP
W/30 SY GEOTEXTILE

5 TONS CL B RIPRAP
W/14 SY GEOTEXTILE

LATERAL 4' BASE DITCH
SEE DETAIL R

36" RCP-III

HW F

60"
RCP-III

SP. DET.
JB w/MH

RISER
STRUCTURE

15" RCP-III

2GIB-WSF

2GIB-WSF

15" RCP-III

PROP. SBG

JB w/MH

24" RCP-III

REMOVE DI
& 20' EX. 15"

2GID-WSS

FS

15" RCP-III

JB w/MH

15" RCP

RETAIN

18" RCP-III
REMOVE
DI

TB 2GIB-ST

15" RCP-III

90+00

TB 2GIB-ST

REMOVE 7' & EX. DI

TB 2GIB-ST

18" RCP-III

24" RCP-III

5" RCP
PLUG & FILL
W/FLOWABLE FILL

18" RCP-III

TB 2GIB-ST

TB 2GIB-ST

18" RCP-III

TB 2GIB-ST

S 5°19'01.0" W

PLUG & FILL
W/FLOWABLE FILL

18" CMP

RETAIN AND CLEAN OUT 60" EQUILIZER PIPE

REMOVE
DI

TB 2GIB-ST

18" RCP

RETAIN

Conv. DI TO JB w/MH

DI

30" RCP-III

10" RCP

REMOVE

2GIA-WSS

FS

30" CSP
2 ELBOWS

2GIA-WSF

24" RCP-III

PROP. SBG

COLLAR
AND EXTEND
60" RCP-III

LATERAL 4' BASE SWALE
SEE DETAIL U

8 TONS CL B RIP RAP
W/21 SY GEOTEXTILE

LATERAL 4' BASE SWALE
SEE DETAIL U

ARMOR SLOPE W/
CL II RIPRAP UP TO
100-YR ELEV=201.7'

BIORETENTION
BASIN

RISER
STRUCTURE

42" RCP-III

HW

RW MON

EXISTING R/W

20 TONS CL I RIPRAP
W/39 SY GEOTEXTILE

2.00% 0.89%

LP
–L3– STA. 95+03.19 RT

THE BROWN-GOWER COMPANY, LLC
DB 5037 PG 696 (JOHNSTON)
DB 16848 PG 552 (WAKE)
BM 1972 PG 283 (WAKE)

39

WEQ

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PERMIT DRAWING
SHEET 33 OF 52

ENGLISH

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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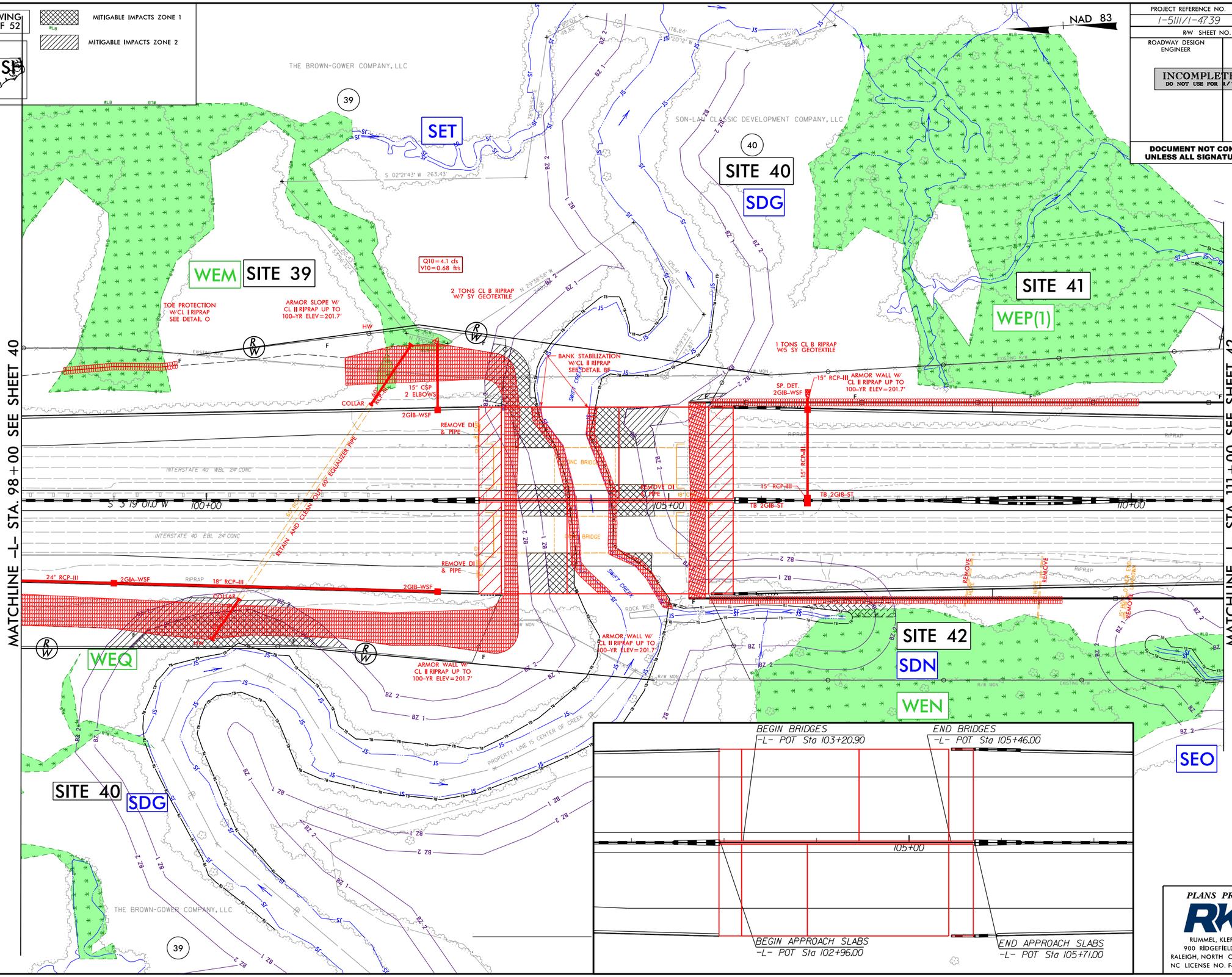

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SHEET 34 OF 52

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

ENGLISH

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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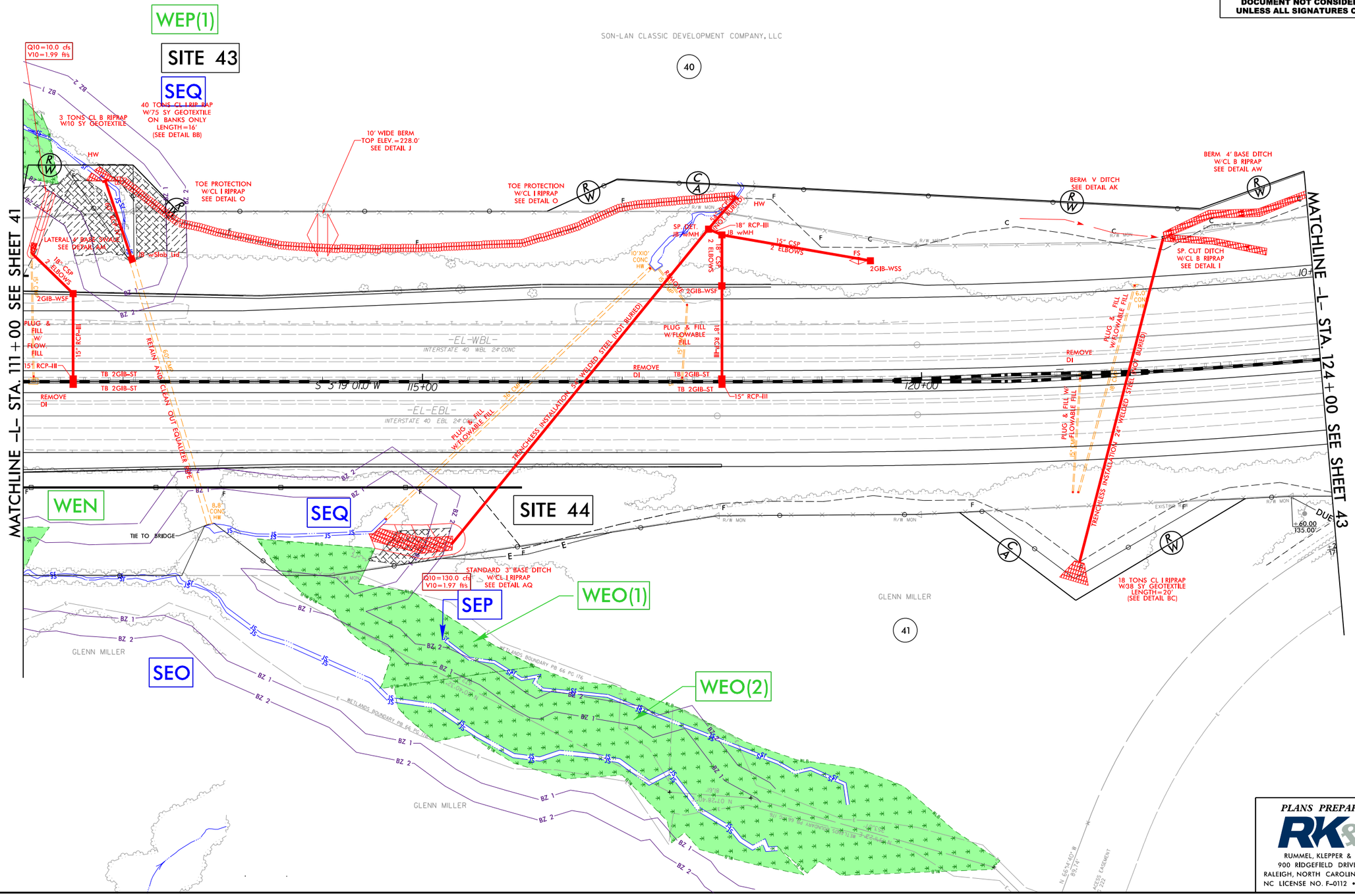

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SHEET 35 OF 52

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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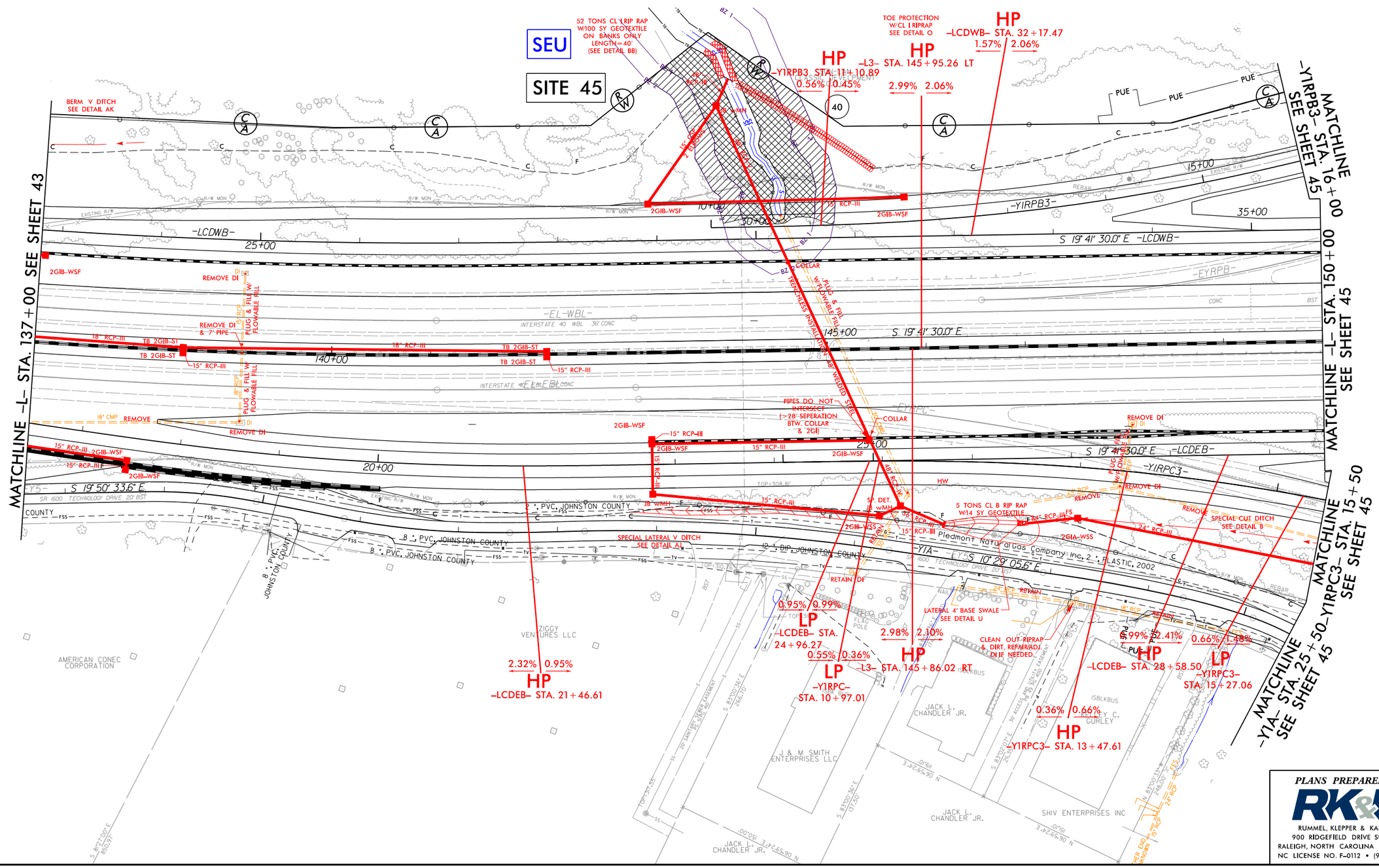

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abuckle

REVISIONS

MATCHLINE -Y1_3- STA. 67+00 SEE SHEET 67

PERMIT DRAWING SHEET 36 OF 52

ENGLISH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4759	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS

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NAD 83

INSET A

SEE INSET A

SITE 48

SLW

SLV

SITE 47

120 TONS CL I RIP RAP W/223 SY GEOTEXTILE ON BANKS ONLY LENGTH=55' (SEE DETAIL BB)

TOE PROTECTION W/CL I RIPRAP SEE DETAIL O

30" CSP 2 ELBOWS

Q10=16.0 cfs
V10=1.88 ft/s
LATERAL BASE SWALE SEE DETAIL AM

2 TONS CL B RIP RAP W/7 SY GEOTEXTILE

RIP RAP AT EMBANKMENT SEE DETAIL BA

2 TONS CL B RIP RAP W/7 SY GEOTEXTILE

INSET B

INSET C

INSET D

SEE INSET B

SLU

SITE 49

WOE

SITE 46

SEA

SEE INSET D

WC

WOB

SITE 49

SLU

WD

SEE INSET C

MATCHLINE -Y1C- STA. 16+50 SEE SHEET 68

MATCHLINE -L- STA. 177+00 SEE SHEET 46

MATCHLINE

MATCHLINE -Y1_3- STA. 51+50 SEE SHEET 66

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GRAPHIC SCALE

50 25 0 50 100

PLANS

LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

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SHEET 37 OF 52

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	46

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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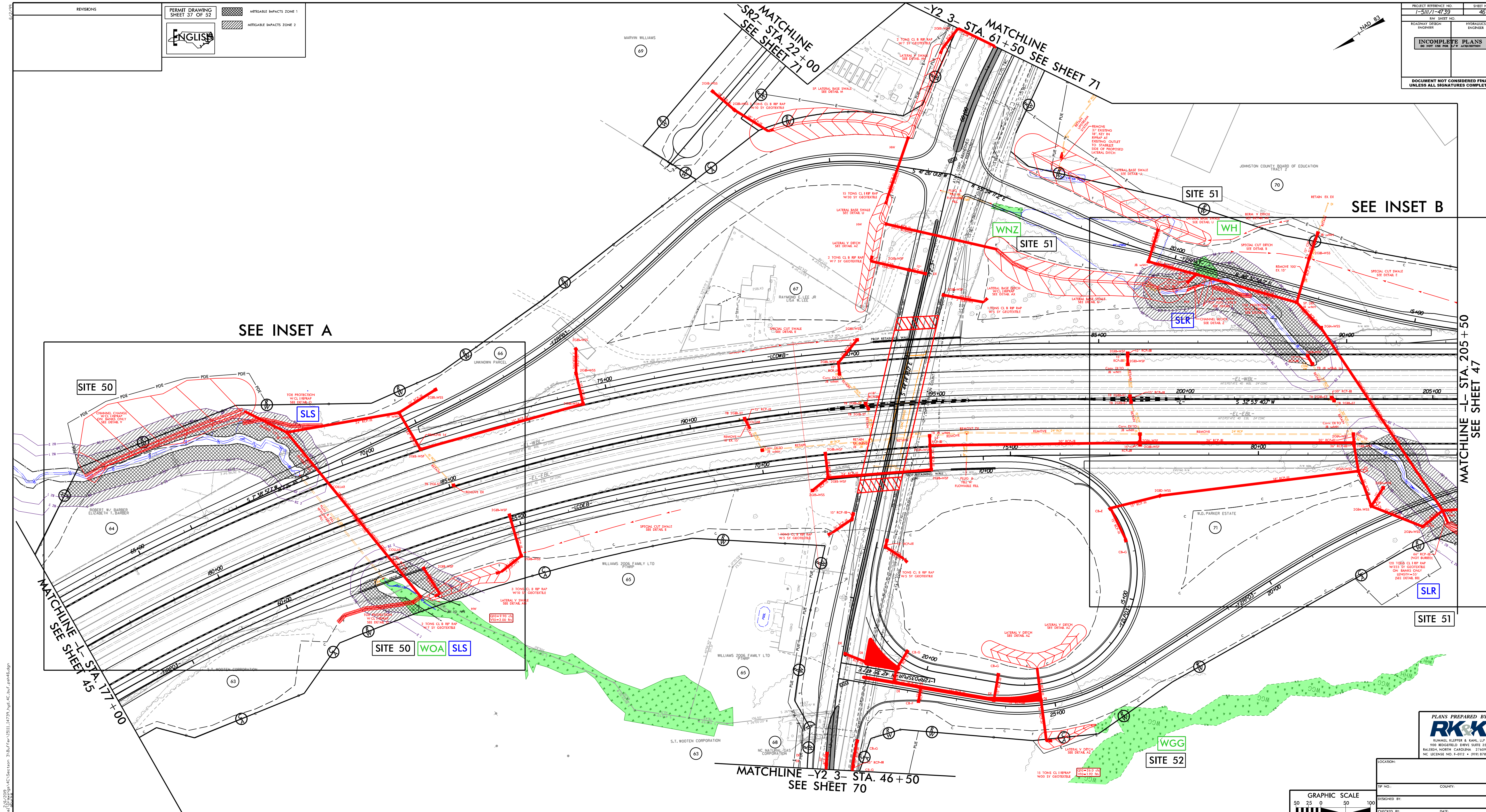

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PLANS

LOCATION:
TIP NO.: COUNTY:
DESIGNED BY:
CHECKED BY: DATE:

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SHEET 38 OF 52

ENGLISH

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

INSET A

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	46A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
NO SHEET TOTAL PLANS
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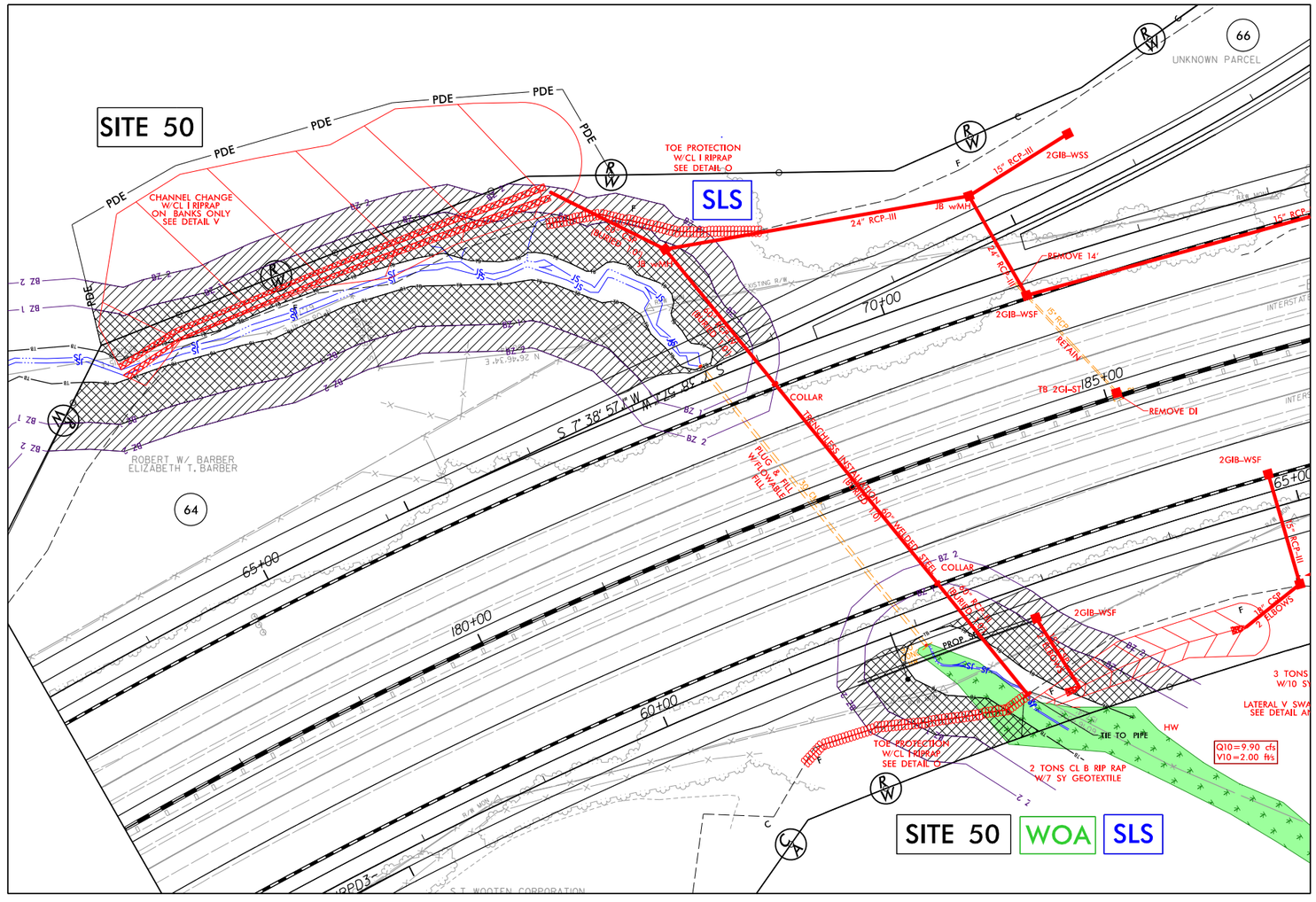

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LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

GRAPHIC SCALE
50 25 0 50 100
PLANS

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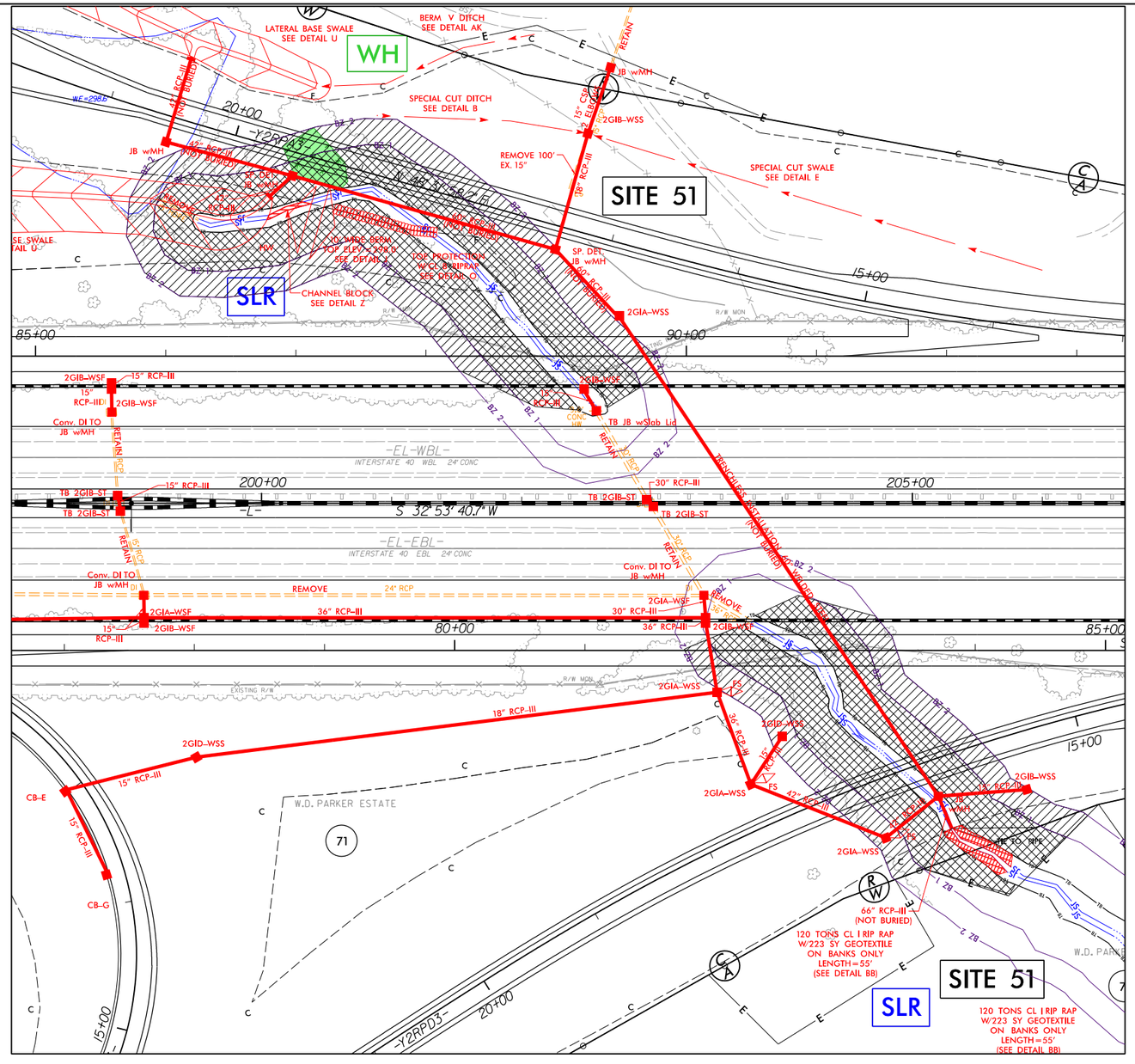
SHEET 39 OF 52

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

INSET B



PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	46B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS

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GRAPHIC SCALE
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PLANS

LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

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SHEET 40 OF 52

ENGLISH

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	47
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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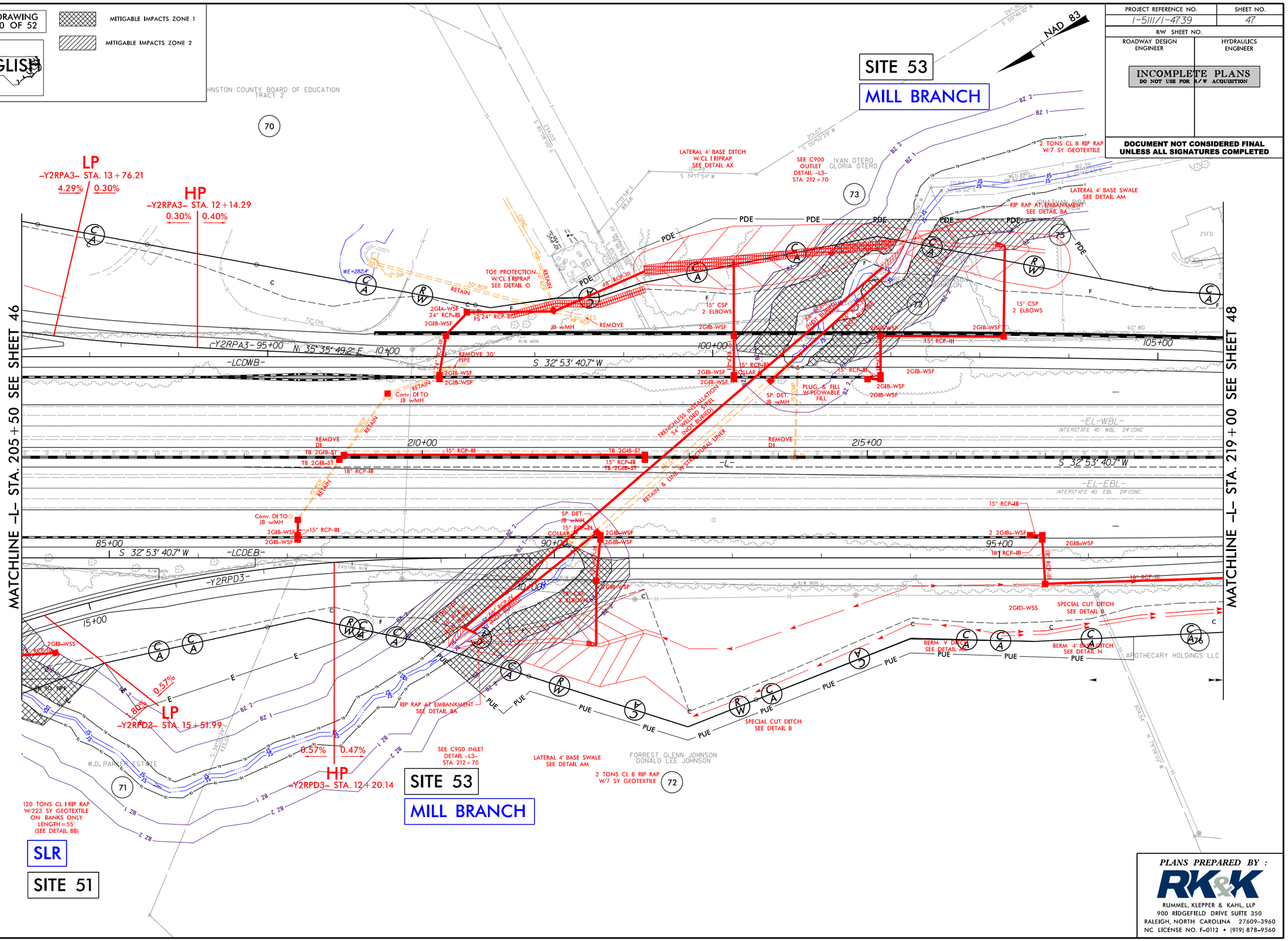

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SHEET 41 OF 52

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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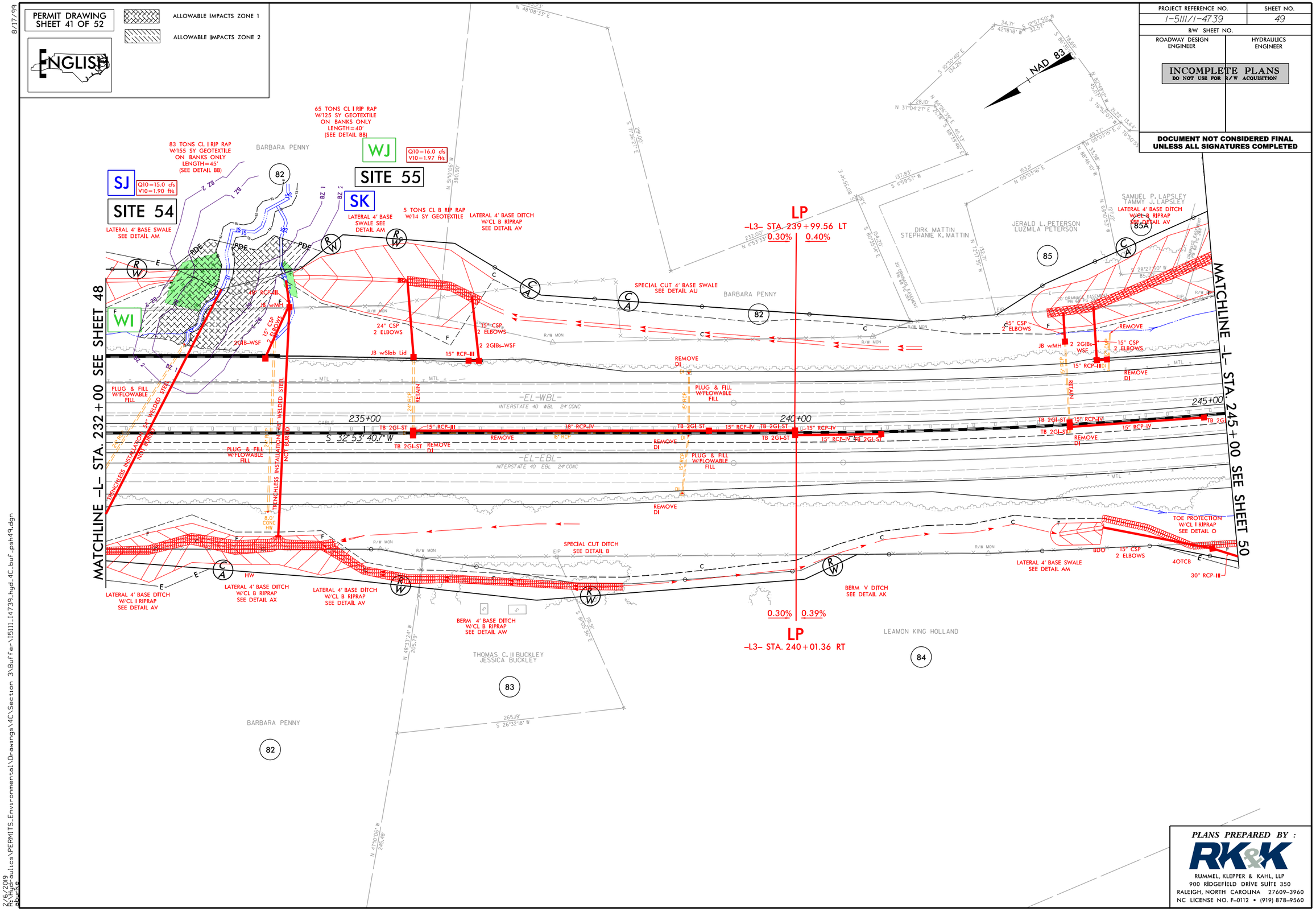

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SHEET 42 OF 52

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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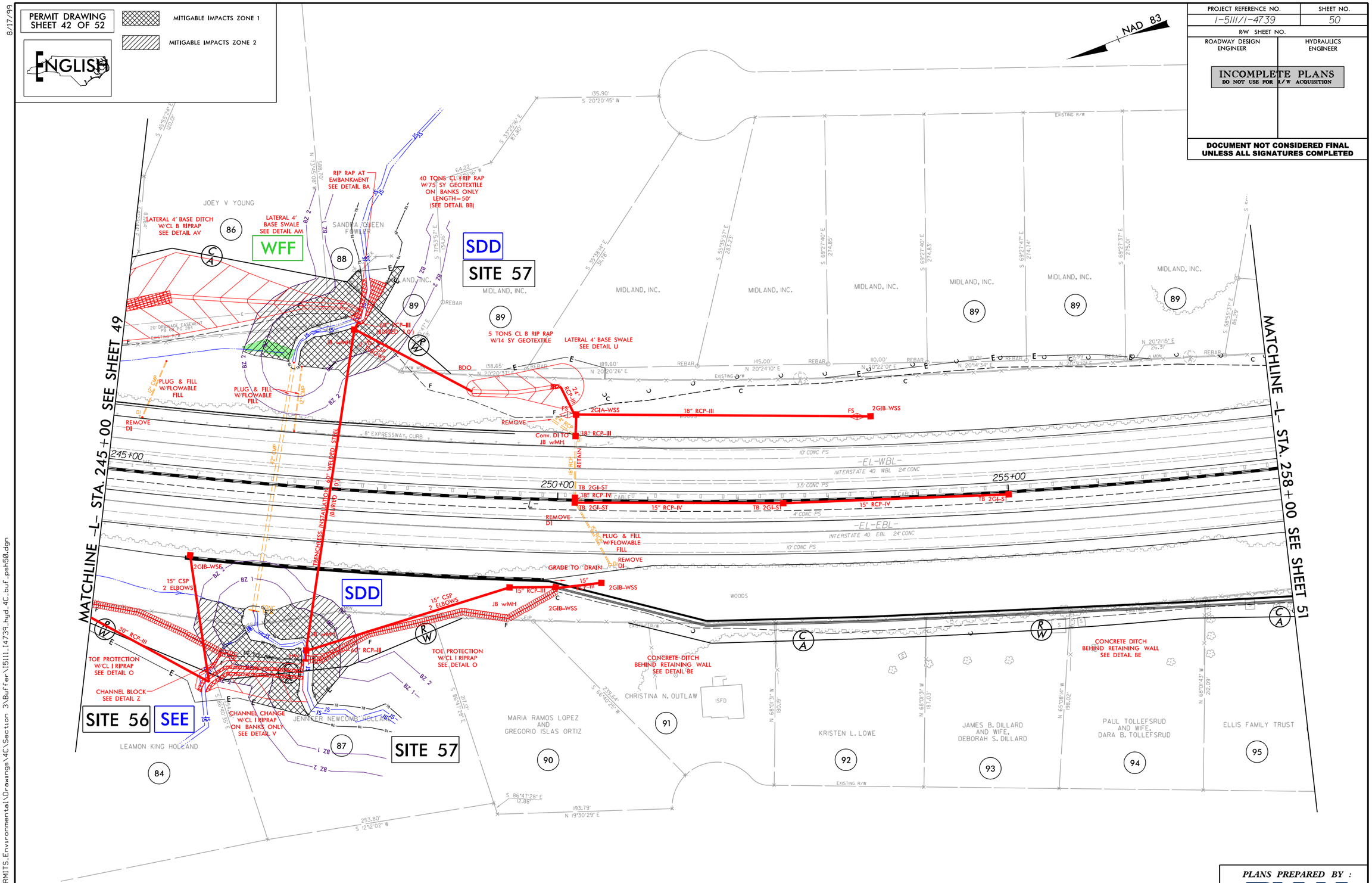

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SHEET 43 OF 52

ENGLISH

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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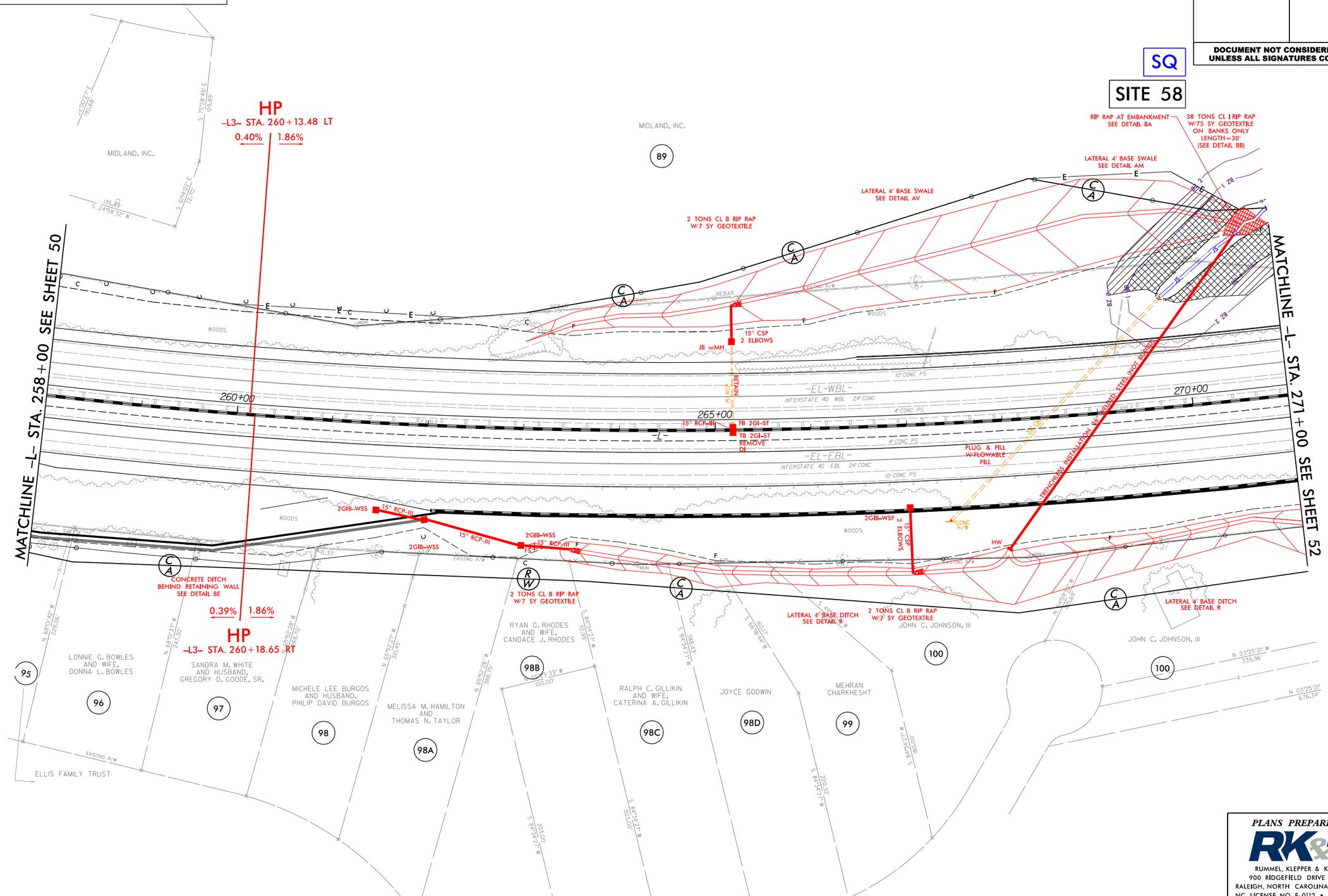
SQ

SITE 58



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SHEET 44 OF 52

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
I-5111/I-4739	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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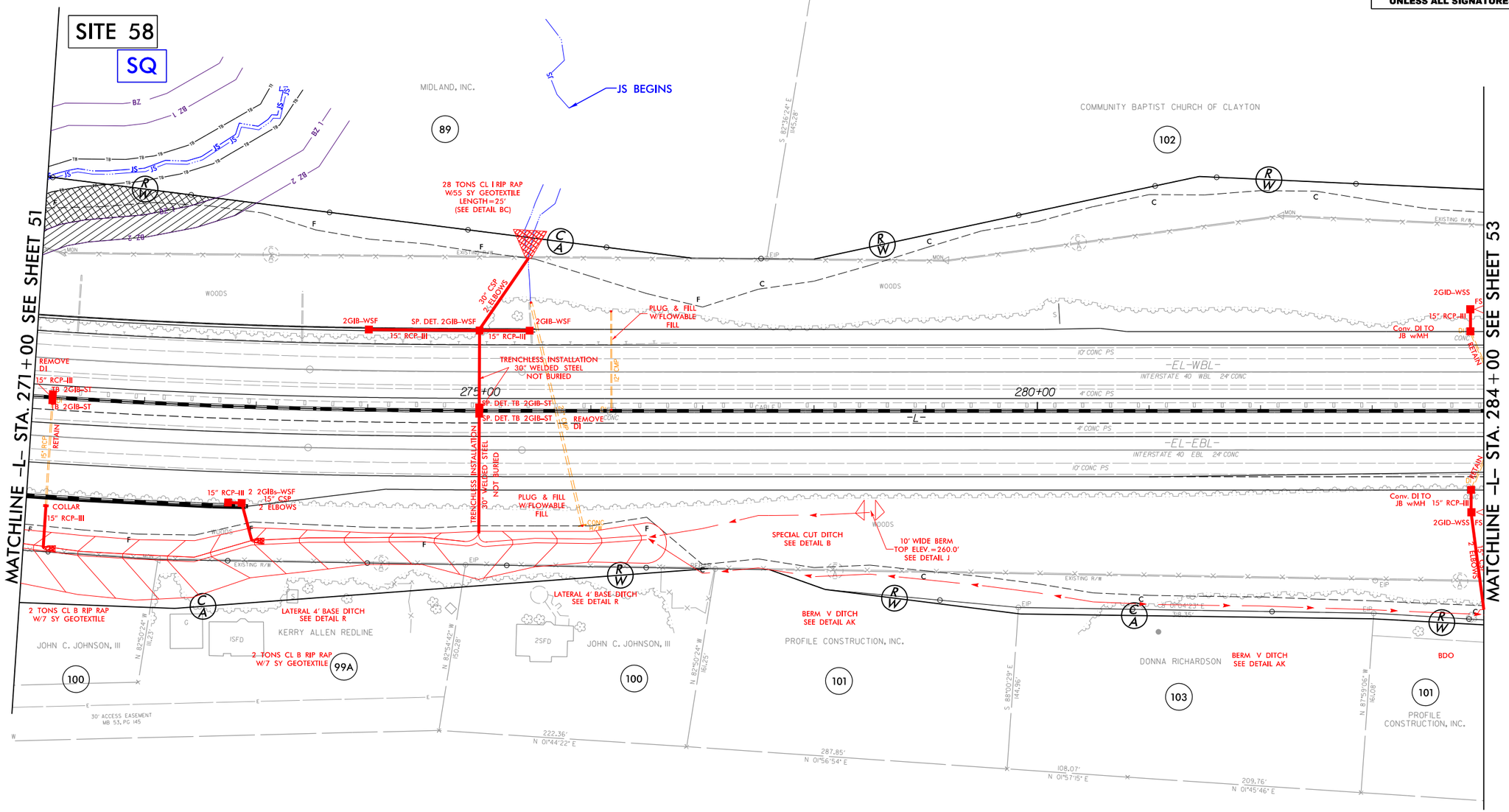

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RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1A	-LEB- 12+10 RT	HW Replacement & Dual 42" CSP	X			2689	1805	4494					
1B	-LWB- 18+74 LT	Prop 36" Welded Steel Pipe Outfall			X	335		335					
2A	-Y1RPA- 32+57 RT	HW Replacement & Prop Berm Ditch	X			2710	1734	4444					
2C	-Y1RPBD- 30+60 RT	Prop 48" & 15" RCP Pipe Outfall	X			2307	1296	3603					
3	_-LWB- 31+71 to 34+63 LT	Proposed 42" CSP Pipe Outfall & Prop HW			X				19748	14511	34259		
4A	-L- 39+10 LT	Prop Pipe Outfall & Widened Roadway Facility	X			1507	329	1836					
4B	-L- 40+19 LT	Pipe Outfall	X			1328	524	1852					
6A	-L- 64+70 RT	Prop 72" W.S. Suppl. Pipe, HW & Rip Rap	X			5030	2631	7661					
6B	-L- 65+16 LT	Prop 72" W.S. Suppl. Pipe, HW & Rip Rap	X			6091	3704	9795					
7A	-L- 91+13 RT	Prop Dual 96" Suppl. Pipes Plus HW & Channel Impovements	X			4638	2586	7224					
7B	-L- 91+37 LT	Prop Dual 96" Suppl. Pipes Plus HW & Channel Impovements	X			1923	796	2719					
8A	-Y3RPA- 23+91 LT	Prop Pipe & Widened Roadway Facility	X			8298	7943	16241					
8B	-Y3RPA- 23+46 RT	Prop Pipe & Widened Roadway Facility	X			1874	1001	2874					
9	-Y3RPA- 17+52 RT	Prop Pipe & Widened Roadway Facility	X			1944	1133	3077					
10A/11	-L- 151+12 to 152+66 RT	Prop 30" W.S. Pipe, HW & Widened Roadway Facility			X	5861	1580	7441					
10B/12	-L- 144+95 to 150+15 LT	Prop 30" W.S. Pipe, HW & Channel Realignment			X		4926	4926	17769		17769		
13	-L- 157+81 to 159+87 RT	Widened Roadway Facility			X	1748		1748					
TOTALS*:						**48283**	**31988**	**80270**	**37517**	**14511**	**52028**	**0**	**0**

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
02/05/2019
Wake County
I-5111
42346.3.1

Revised 2018 Feb

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS	
			ZONE 1 (ft^2)	ZONE 2 (ft^2)
7A	-L- 91+13 RT		2284	1189
TOTAL:			**2284**	**1189**

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RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
14A	-L- 168+89-169+89 LT	BANK STABILIZATION - SRM			X	1658	801	2459					
14B	-L- 172+50-172+88 LT	BANK STABILIZATION - SRM			X	1824	359	2183					
14C	-L- 175+81-176+98 LT	BANK STABILIZATION - SRM			X	2795	277	3071					
15	-L- 186+18-188+55 LT	ROADWAY FILL - SRJ			X	1605	2273	3878					
16A	-Y5RPD- 22+19-22+50 RT	EXIST. 24" CMP PLUG			X	2032	2231	4263					
16B	-Y5RPC- 53+20 LT	60" RCP - SCF, WQF	X			1489	0	1489					
17A	-Y5RPC- 54+38-55+47 RT	60" RCP - SOE, WQV	X			5392	2406	7798					
17B	-L- 250+27 LT	BANK STABILIZATION - SOE	X			4429	1309	5738					
17C	-Y5RPA- 21+91-23+05 RT	BANK STABILIZATION - SOE	X			2009	481	2490					
18	-L- 256+39-257+51 LT & RT	DITCH, 66" WSP- SOI, WSD	X			6677	3472	10149					
19	-L- 272+67-275+51 LT & RT	DITCH, 66" WSP - SNF	X			8722	5049	13771					
20	-L- 281+93-284+50 LT & RT	CHANNEL CHANGE - SNH, WQE,WRX	X			3908	956	4864					
21	-L- 322+40-323+33 LT & RT	CHANNEL CHANGE, 72" RCP, SNY	X			8579	4452	13031					
22	-L- 323+52-325+32 RT	CHANNEL CHANGE - SOC			X	3438	1054	4493					
23A	-L- 361+15-364+65 LT	CHANNEL CHANGE - SLF / SEM			X	8260	2082	10342					
23B	-L- 368+90-369+15 LT	BANK STABILIZATION - SEM			X	635	0	635					
23C	-L- 374+40-378+99 LT	CHANNEL CHANGE - SEM			X	10872	118	10990					
24	-L- 378+63-379+21 LT	BANK STABILIZATION - SLI			X	1055	0	1055					
25	-L- 373+59-374+08 RT	ROADWAY FILL/ DITCH - SNM			X	61	775	836					
26A	-L- 381+90 RT	BANK STABILIZATION - SNK			X	214	0	214					
26B	-L- 385+80-386+06 RT	BANK STABILIZATION - SNK			X	631	0	631					
27	-L- 386+06-386+88 RT	BANK STABILIZATION - SNO	X			1143	583	1726					
28A	-L- 387+14-387+47 LT	BANK STABILIZATION - SEM	X			1287	0	1287					
TOTALS*:						**78714**	**28678**	**107392**	**0**	**0**	**0**	**0**	**0**

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WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
16B	-Y5RPC- 53+20 LT		89	
17A	-Y5RPC- 54+38 RT		37	
18	-L- 256+39-257+51 LT & RT		1058	11
20	-L- 281+93-284+50 LT & RT		621	
24	-L- 378+63-379+21 LT		345	
TOTAL:			**2150**	**11**

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RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
29	-L- 395+85 RT	CHANNEL CHANGE - SEK	X			2985	1591	4575					
	-L- 396+45 LT	BANK STABILIZATION - SEK	X			2662	1647	4309					
30	ONLY IN PERMIT SET												
31	-L- 403+60-406+60 LT & RT	66" RCP - SEL	X			6020	4355	10375					
32	ONLY IN PERMIT SET												
33	-L- 447+90 LT & RT	54" RCP & 54" WSP - SDT, WFA, WFC	X			6439	3075	9514					
34	-L- 446+49-447+66 LT	ROADWAY FILL - SDU, WFB			X	3140	1550	4690					
35	-L- 444+65-446+47 RT	DITCH - SDS			X		212	212					
36	-L- 460+63-462+20 RT	36" WSP - SDO	X			2876	1229	4105					
37	ONLY IN PERMIT SET												
38	-L- 473+51-476+16 LT	EXTEND 18" RCP			X	3264	2467	5731					
59	-Y5RPB- 43+00-44+66 LT	2 @ 48" RCP, CHANNEL CHANGE - SRN	X		X	6380	87	6467					
60	-Y8RPB- 39+80 LT	CHANNEL WORK - SET, WEX	X			219	0	219					
	-Y8RPA- 26+57-28+05 RT	BANK STABILIZATION - SET, WEX	X			3934	2284	6218					
TOTALS*:						**37919**	**18496**	**56415**	**0**	**0**	**0**	**0**	**0**

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WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
33	-L- 447+90 LT & RT		564	
34	-L- 446+49-447+66 LT		547	425
60	-Y8RPA- 26+57-28+05 RT		2231	156
TOTAL:			**3342**	**581**

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RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
39	ONLY IN PERMIT SET												
40	-L- 99+00-107+44 LT & RT	BRIDGE		X					14370	9489	23859		
41	ONLY IN PERMIT SET												
42	-L- 106+42-107+44 RT	ROADWAY FILL - SDN, WEN			X	872	354	1225					
43	-L- 110+99-112+64 LT	60" RCP - SEQ	X			5506	2714	8220					
44	-L- 114+45-115+28 RT	DITCH - SEQ, WEO(1)			X	1229	728	1957					
45	-L- 143+25-145+12 LT	48" CSP - SEU	X						11384	6539	17923		
46	-L- 164+25-164+78 RT	30" CSP / 36" RCP - SEA, WOE	X						10987	7345	18332		
47	-Y1RPA- 16+15-17+72 RT	54" CSP - SLV	X			4847	1834	6680					
48	ONLY IN PERMIT SET												
49	-L- 170+95-175+40 LT & RT	66" WSP / 66" RCP - SLU, WC, WOB	X						19622	9908	29530		
50	-L- 178+00-184+97 LT&RT	60" CSP, CHANNEL CHANGE - SLS,WOA	X		X				38684	25634	64318		
51	-L- 199+51-205+31	ROADWAY FILL, 66" RCP - SLR, WH,WNZ	X		X				41544	26817	68361		
52	ONLY IN PERMIT SET												
53	-L- 209+51-217+29 LT & RT	54" RCP / 66" RCP - MILL BRANCH	X						26914	17627	44541		
54	-L- 232+37-234+37 LT	54" WSP - SJ, WI, WJ	X			8694	5213	13907					
55	ONLY IN PERMIT SET												
56	ONLY IN PERMIT SET												
57	-L- 246+11-248+25 LT & RT	60" WSP - SDD, WFF	X						16844	9397	26241		
58	-L- 269+75-270+63 LT	36" WSP - SQ	X						10399	7551	17950		
TOTALS*:						**21147**	**10842**	**31989**	**190748**	**120308**	**311055**	**0**	**0**

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WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
44	-L- 114+46 RT		2	
49	-L- 174+33 RT		1439	
50	-L- 183+49 RT		680	
51	-Y2RPA3- 19+34		862	535
54	-L- 232+68-234+16 LT		1926	902
57	-L- 246+36-246+93 LT		379	204
TOTAL:			**5288**	**1641**

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