



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS



(Version 2.08; Released April 2018)

WBS Element: 47532.3.2 TIP No.: I-5986A County(ies): Cumberland Page 1 of 5

General Project Information

WBS Element:	47532.3.2	TIP Number:	I-5986A	Project Type:	Roadway Widening	Date:	4/13/2020
NCDOT Contact:	Paul Atkinson, PE			Contractor / Designer:	Matthew Cook, PE		
Address:	1202 Birch Ridge Drive Raleigh, NC 27610			Address:	8601 Six Forks Road Forum 1, Suite 700 Raleigh, NC 27615		
	Phone: (919)707-6707				Phone: (919)653-7350		
	Email: patkinson@ncdot.gov				Email: mcook@rkk.com		
City/Town:	Raleigh			County(ies):	Cumberland		
River Basin(s):	Cape Fear			CAMA County?	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	15.42 MI.	Surrounding Land Use:	Farmland, Woods, Little Residential					
	Proposed Project			Existing Site				
Project Built-Upon Area (ac.)	488.5	ac.	309.5	ac.				
Typical Cross Section Description:	A typical cross-section is 174 foot-wide will be used; which will include ten 12-foot travel lanes, and two varying width traveling lanes from 0-foot to 12-foot. It also contains two 14-foot exterior shoulder sections where 12-feet is paved, and two 13-foot paved interior shoulder sections.			The existing typical section is 160-feet wide with four 12-foot lanes, exterior 10.5-foot paved shoulders, 3.5-foot paved interior shoulders, and 84-foot wide paved median.				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	73,800	Year:	2040	Existing:	56,700	Year:	2018
General Project Narrative: (Description of Minimization of Water Quality Impacts)	I-5986A is a roadway widening project of I-95 from the existing four lanes to the proposed ten lanes in Cumberland County. The expansion is 15.416 miles long and begins from Murphy Road (Exist 55) and ends south of Bud Hawkins Road- Exit (70). Wetlands, perennial streams, and intermittent streams are found within the limits of the project area. The jurisdictional streams within the study area have no impairments and do not provide habitat for any threatened or endangered aquatic species. Design Mitigations for wetlands and streams include: 1. Steepening of roadway fill slopes within jurisdictional areas 2. Stormwater was designed to avoid direct discharge into jurisdictional features to the maximum extent practicable. 3. Stormwater design velocities entering jurisdictional features have been mitigated to be non-erosive (less than 2 fps). 4. Open shoulder sections were maximized to promote sheet flow from the roadway 5. Diffuse flow provided at outlets that do not have a well defined outfall.							

Waterbody Information

Surface Water Body (1):	UT to Reese Creek		NCDWR Stream Index No.:	18-28-2				
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C					
	Supplemental Classification:		None					
Other Stream Classification:	None							
Impairments:	None							
Aquatic T&E Species?	No		Comments:					
NRTR Stream ID:	No NRTR Name		Buffer Rules in Effect:		N/A			
Project Includes Bridge Spanning Water Body?	No		Deck Drains Discharge Over Buffer?	N/A		Dissipator Pads Provided in Buffer?	N/A	
Deck Drains Discharge Over Water Body?	N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)								



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 47532.3.2 TIP No.: I-5986A County(ies): Cumberland Page 2 of 5

Additional Waterbody Information

Surface Water Body (2):	UT to Reese Creek	NCDWR Stream Index No.:	18-28-2
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	No NRTR Name	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?		Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			

Surface Water Body (3):	Reese Creek	NCDWR Stream Index No.:	18-28-2
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	Reese Creek	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			

Surface Water Body (4):	UT to Reese Creek	NCDWR Stream Index No.:	18-28-2
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	SA	Buffer Rules in Effect:	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			

Surface Water Body (5):	UT to Baker Swamp	NCDWR Stream Index No.:	18-28-2-2
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	SB	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 47532.3.2 TIP No.: I-5986A County(ies): Cumberland Page 3 of 5

Additional Waterbody Information

Surface Water Body (6):	Baker Swamp	NCDWR Stream Index No.:	18-28-2-2
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	Baker Swamp	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			

Surface Water Body (7):	UT to Cape Fear River	NCDWR Stream Index No.:	18-(1)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply V (WS-V)	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	SC	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			

Surface Water Body (8):	UT to Cape Fear River	NCDWR Stream Index No.:	18-(1)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply V (WS-V)	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	SD	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			

Surface Water Body (9):	UT to Cape Fear River	NCDWR Stream Index No.:	18-(1)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply V (WS-V)	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	SE	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)
(If yes, provide justification in the General Project Narrative)			



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 47532.3.2

TIP No.:

I-5986A

County(ies): Cumberland

Page 4

of

5

Additional Waterbody Information

Surface Water Body (10):	UT to Cape Fear River		NCDWR Stream Index No.:	18-(1)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply V (WS-V)		
	Supplemental Classification:		None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SF			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (11):	UT to Cape Fear River		NCDWR Stream Index No.:	18-(1)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply V (WS-V)		
	Supplemental Classification:		None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SG			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (12):	UT to Cape Fear River		NCDWR Stream Index No.:	18-(1)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply V (WS-V)		
	Supplemental Classification:		None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SH			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (13):	UT to Black River		NCDWR Stream Index No.:	18-68-12-1	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C		
	Supplemental Classification:		Swamp Waters (Sw)		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SI			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					



North Carolina Department of Transportation

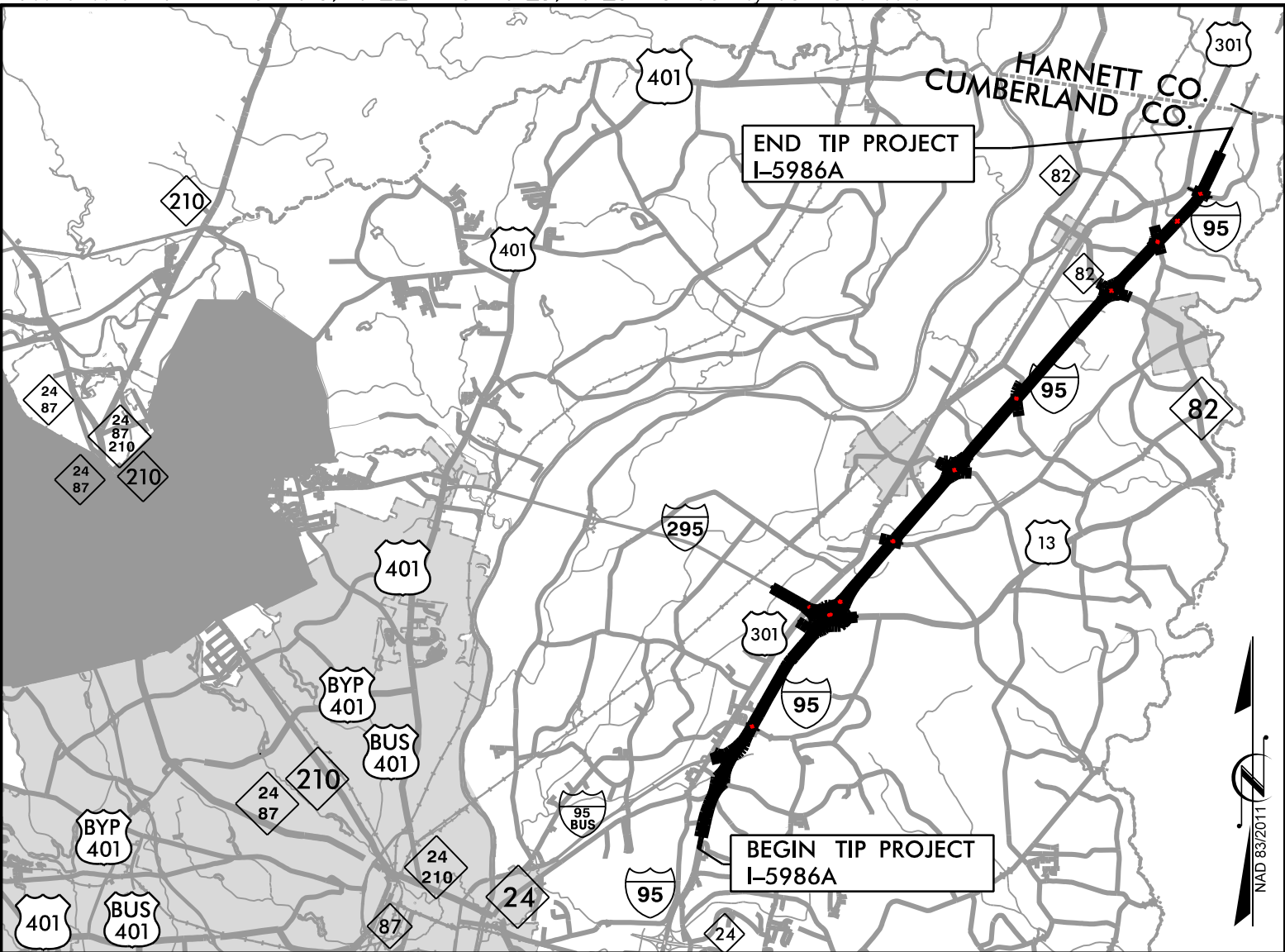
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element:	47532.3.2	TIP No.:	I-5986A	County(ies):	Cumberland	Page	5	of	5
Additional Waterbody Information									
Surface Water Body (14):	UT to Black River			NCDWR Stream Index No.:	18-68-12-1				
NCDWR Surface Water Classification for Water Body			Primary Classification:	Class C					
			Supplemental Classification:	Swamp Waters (Sw)					
Other Stream Classification:	None								
Impairments:	None								
Aquatic T&E Species?	No		Comments:						
NRTR Stream ID:	SJ			Buffer Rules in Effect:			N/A		
Project Includes Bridge Spanning Water Body?	No		Deck Drains Discharge Over Buffer?	N/A		Dissipator Pads Provided in Buffer?			N/A
Deck Drains Discharge Over Water Body?		N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)									
Surface Water Body (15):	Black River			NCDWR Stream Index No.:	18-68-12-1				
NCDWR Surface Water Classification for Water Body			Primary Classification:	Class C					
			Supplemental Classification:	Swamp Waters (Sw)					
Other Stream Classification:	None								
Impairments:	None								
Aquatic T&E Species?	No		Comments:						
NRTR Stream ID:	Black River			Buffer Rules in Effect:			N/A		
Project Includes Bridge Spanning Water Body?	Yes		Deck Drains Discharge Over Buffer?	N/A		Dissipator Pads Provided in Buffer?			N/A
Deck Drains Discharge Over Water Body?		No	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)									
Surface Water Body (16):	UT to Black River			NCDWR Stream Index No.:	18-68-12-1				
NCDWR Surface Water Classification for Water Body			Primary Classification:	Class C					
			Supplemental Classification:	Swamp Waters (Sw)					
Other Stream Classification:	None								
Impairments:	None								
Aquatic T&E Species?	No		Comments:						
NRTR Stream ID:	SK			Buffer Rules in Effect:			N/A		
Project Includes Bridge Spanning Water Body?	No		Deck Drains Discharge Over Buffer?	N/A		Dissipator Pads Provided in Buffer?			N/A
Deck Drains Discharge Over Water Body?		N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)									

09/08/19

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See Sheets 1C-1 Thru 1C-8, 1C-22 Thru 1C-25, 1C-28 For Survey Control Sheets



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

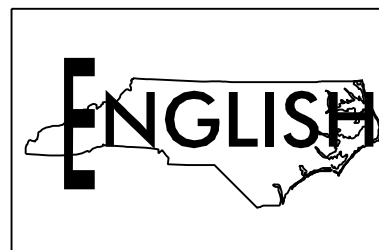
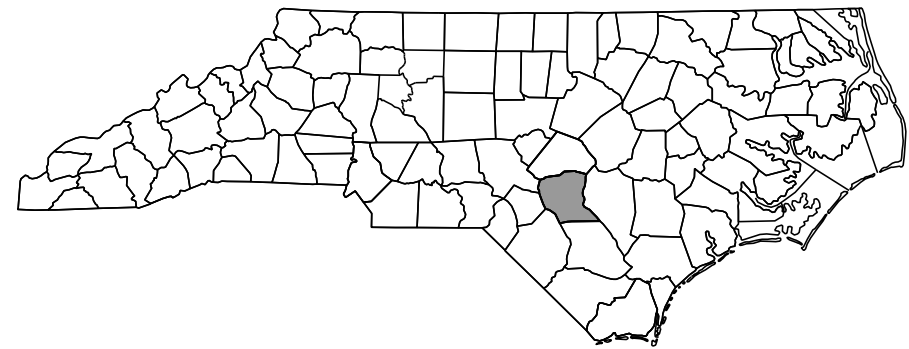
CUMBERLAND COUNTY

LOCATION: I-95 WIDENING FROM SOUTH OF SR 1832
(MURPHY ROAD- EXIT 55) TO SOUTH OF SR 1811
(BUD HAWKINS ROAD-EXIT 70)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, LIGHTING,
SIGNING, ITS, CULVERTS & STRUCTURES

WETLAND AND SURFACE WATER IMPACTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5986A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47532.3.2	NHP-0095(057)		



PERMIT DRAWING
SHEET 1 OF 163

BEGIN TIP PROJECT I-5986A

-LSB- POT STA. 12 + 00.00
-LNB- POT STA. 12 + 00.00

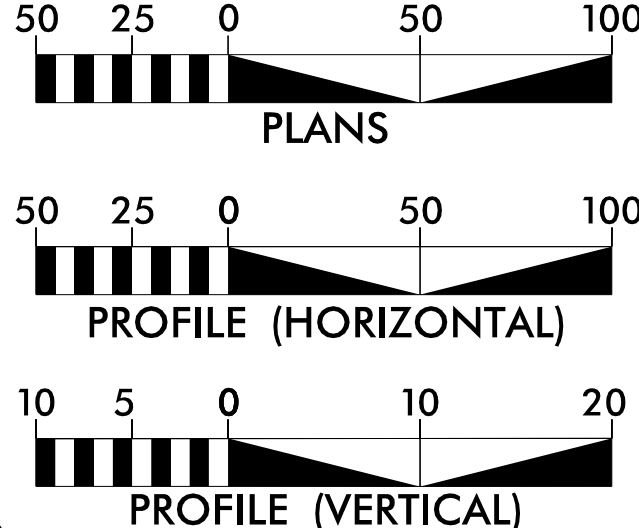
SITE 4
SITE 3
SITE 5
SITE 2
SITE 1
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
SITE 11
SITE 12
SITE 13
SITE 14
SITE 15
SITE 16
SITE 17
SITE 18
SITE 19
SITE 20
SITE 21
SITE 22
SITE 23
SITE 24
SITE 25
SITE 26
SITE 27
SITE 28
SITE 29
SITE 30
SITE 31
SITE 32
SITE 33
SITE 34
SITE 35
SITE 36
SITE 37
SITE 38
SITE 39
SITE 40
SITE 41
SITE 42
SITE 43
SITE 44
SITE 45
SITE 46
SITE 47
SITE 48
SITE 49
SITE 50
SITE 51
SITE 52
SITE 53
SITE 54
SITE 55
SITE 56

-L- POT Sta. 79 + 78.98 =
-LNB- POT Sta. 129 + 28.86 (13' RT)

-L- POT Sta. 80 + 40.84 =
-LSB- ST Sta. 130 + 34.61 (13' LT)

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

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 56,700
ADT 2040 = 73,800
K = 55%
D = 7%
T = 18% *
V = 75 MPH

FUNC CLASS: INTERSTATE
* (TTST 13% + DUALS 5%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5986A.....15.368 MILES
LENGTH STRUCTURE TIP PROJECT I-5986A.....0.048 MILES
TOTAL LENGTH TIP PROJECT I-5986A.....15.416 MILES

NCDOT CONTACT

Michael Penney, PE
PROJECT ENGINEER - DESIGN-BUILD UNIT

PLANS PREPARED BY:

RK&K RUMMEL, KLEPPER & KAMH, LLP
8601 SIX FORKS ROAD, SUITE 700
RALEIGH, NORTH CAROLINA 27615-3960
NC LICENSE NO. F-0112

FOR NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 20, 2019



Michael T. Merritt, PE
PROJECT ENGINEER

Anthony A. Houser, PE
PROJECT DESIGN ENGINEER

HYDRAULICS
ENGINEER

SIGNATURE: P.E.

ROADWAY
DESIGN
ENGINEER

SIGNATURE: P.E.

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

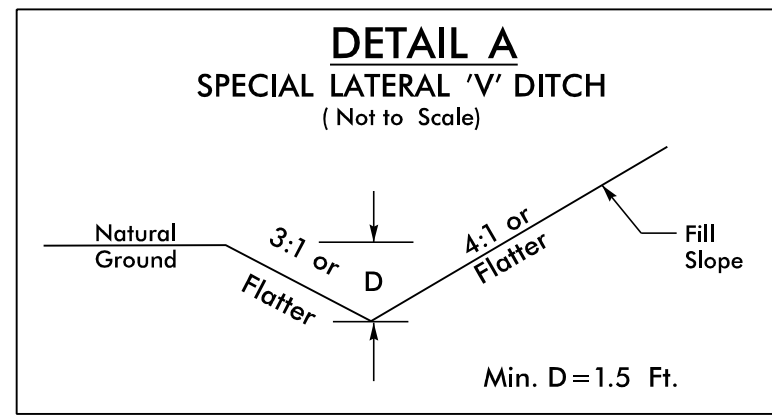


TIP PROJECT: I-5986A

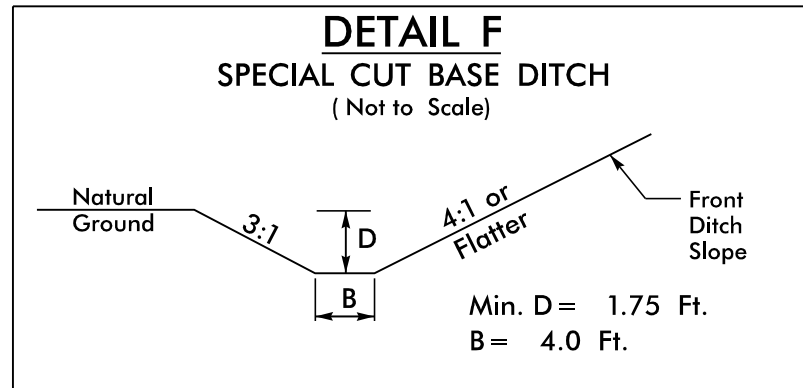
CONTRACT: C204283

5/1/2020 R:\Hydraulics\PERMITS_Environmental\Drawings\4B\I-5986A_Hyd_TSH.dgn Fkeys

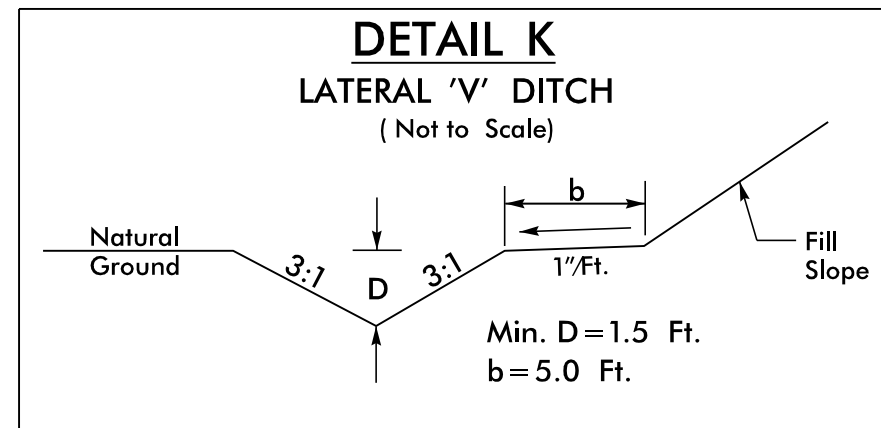
5/1/2020
P:\Hydraulics\PERMITS-Environmental\Drawings\4BXI-5986A_HYD-Ditch_Detail_Sec1.dgn
P:\Keys



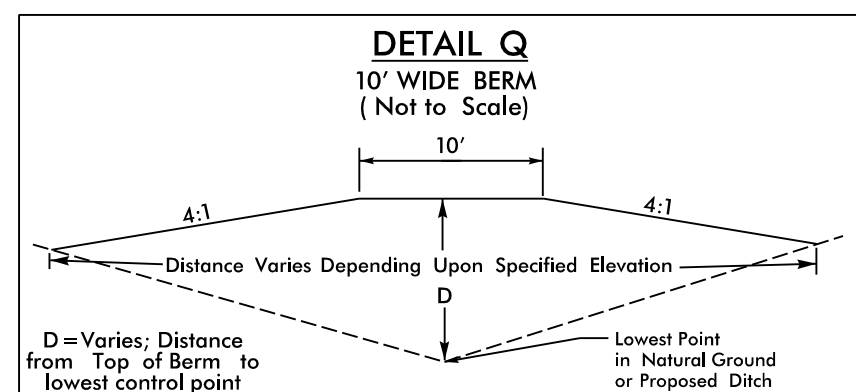
-YINB- STA. 44+50 TO STA. 47+00 RT
-L- STA. 210+50 TO STA. 212+25 RT
-Y5RPD- STA. 10+90 TO STA. 12+00 LT
-LSB- STA. 19+50 TO STA. 31+00 LT
-LSB- STA. 61+50 TO STA. 62+75 RT
-Y4- STA. 50+00 TO STA. 55+00 LT
-Y4A- STA. 61+00 TO STA. 65+49 LT
-Y5- STA. 107+78 TO STA. 109+61 RT
-Y5- STA. 46+00 TO STA. 47+50 LT
-Y5- STA. 65+00 TO STA. 68+00 RT
-Y5- STA. 85+50 TO STA. 86+50 LT
-Y5- STA. 85+00 TO STA. 89+00 RT
-Y5SPUR- STA. 19+49 TO STA. 22+03 LT



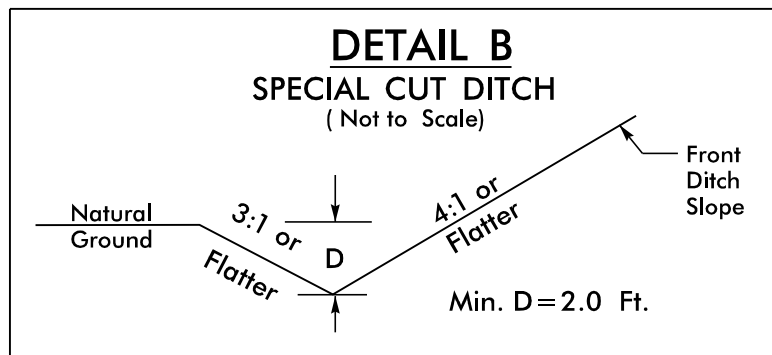
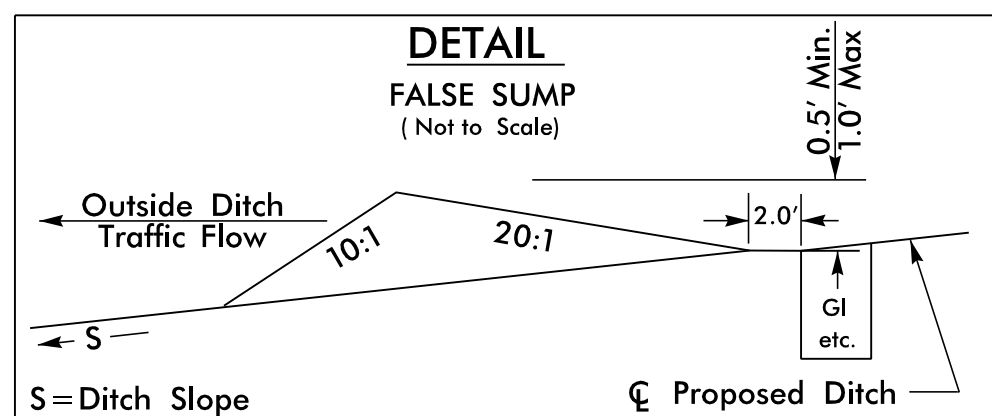
-L- STA. 132+50 TO STA. 137+00 LT
-L- STA. 159+00 TO STA. 162+00 LT
-L- STA. 165+50 TO STA. 167+00 LT
-L- STA. 223+11 TO STA. 226+23 RT
-L- STA. 239+00 TO STA. 247+00 LT
-L- STA. 255+00 TO STA. 269+00 RT
-Y5B- STA. 12+50 TO STA. 17+50 RT



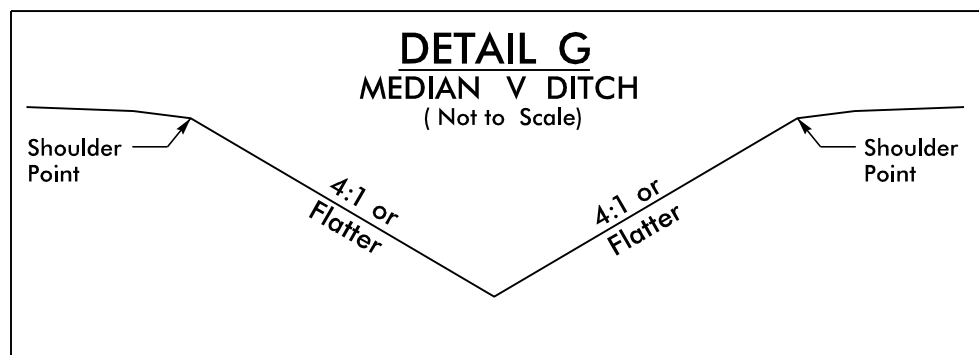
-L- STA. 89+00 TO STA. 90+50 RT
-L- STA. 112+50 TO STA. 113+81 RT
-L- STA. 129+00 TO STA. 131+50 RT
-L- STA. 138+00 TO STA. 138+50 LT
-L- STA. 154+50 TO STA. 158+87 LT
-L- STA. 249+00 TO STA. 253+00 RT
-Y5C- STA. 19+38 TO STA. 24+50 LT
-Y5- STA. 42+00 TO STA. 45+51 LT
-Y5- STA. 64+50 TO STA. 68+50 LT
-Y5- STA. 70+02 TO STA. 76+21 LT
-Y5- STA. 70+00 TO STA. 73+64 RT



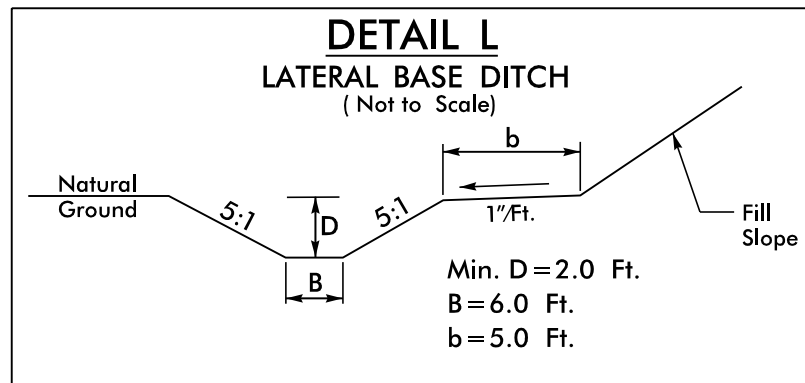
-L- STA. 126+25 LT; TOP ELEVATION=121.5'
-L- STA. 138+00 LT; TOP ELEVATION=128.5'
-L- STA. 154+50 LT; TOP ELEVATION=132.0'



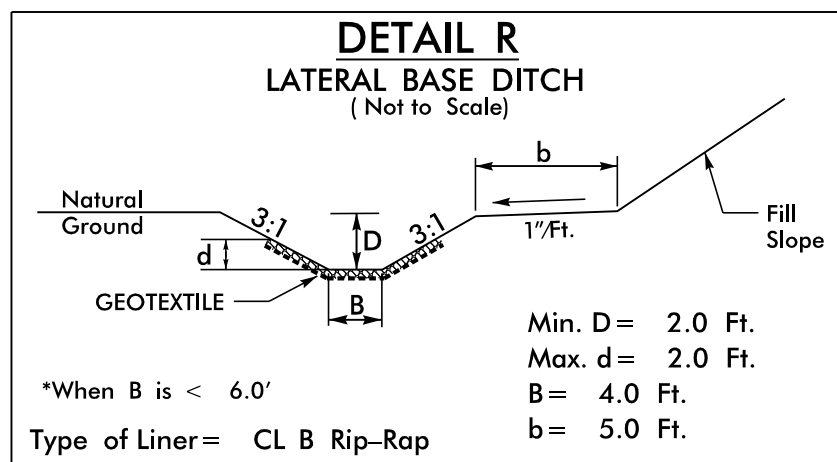
-YINB- STA. 47+00 TO STA. 59+00 RT
-L- STA. 103+00 TO STA. 107+72 LT
-L- STA. 138+50 TO STA. 186+00 RT
-L- STA. 232+00 TO STA. 239+00 LT
-L- STA. 256+00 TO STA. 269+00 LT
-L- STA. 232+50 TO STA. 241+50 RT
-L- STA. 245+00 TO STA. 249+00 RT
-Y5FLY- STA. 82+33 TO STA. 85+77 RT
-Y5SPUR- STA. 10+46 TO STA. 16+99 LT
-Y5RPA- STA. 36+85 TO STA. 37+50 LT
-Y5RPA- STA. 34+49 TO STA. 36+85 RT
-L- STA. 227+00 TO STA. 232+50 RT
-Y5LPD- STA. 12+79 TO STA. 14+50 LT
-Y5A- STA. 110+75 TO STA. 112+50 RT
-Y5C- STA. 25+00 TO STA. 26+65 RT
-Y5C- STA. 24+50 TO STA. 25+92 LT
-LSB- STA. 68+50 TO STA. 76+50 LT
-L- STA. 221+58 TO STA. 232+00 LT



-LSB- STA. 84+00 TO STA. 86+00 LT
-LSB- STA. 105+00 TO STA. 113+50 RT
-L- STA. 215+00 TO STA. 217+50 LT
-Y5- STA. 83+50 TO STA. 85+50 LT
-Y5RPA- STA. 45+00 TO STA. 49+00 LT



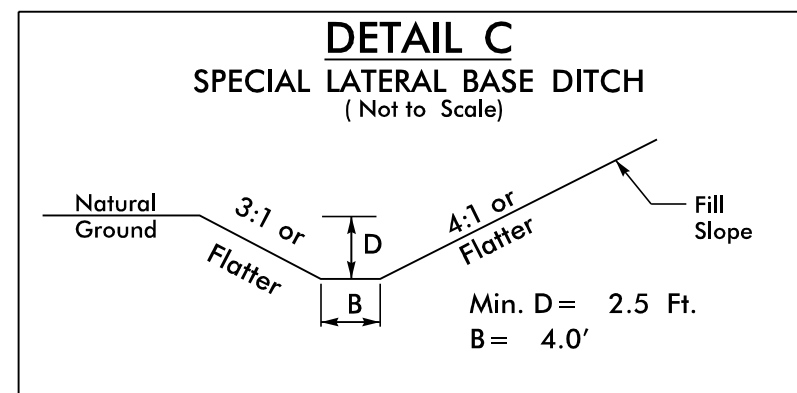
-L- STA. 128+00 TO STA. 130+00 LT



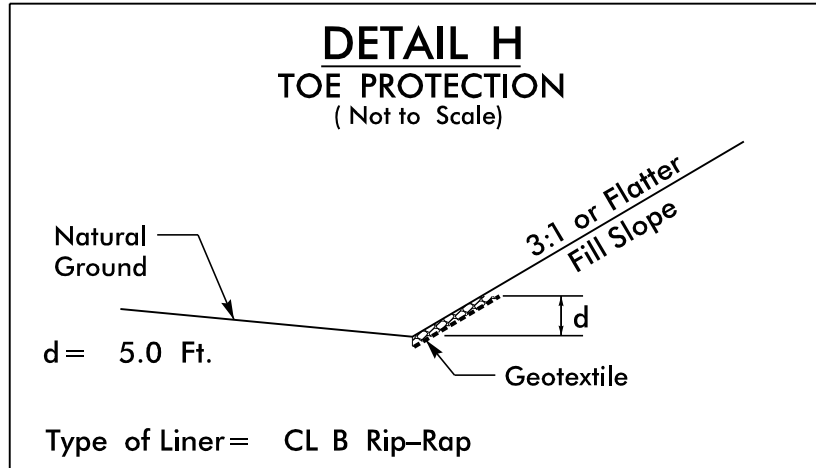
*When B is < 6.0'

Type of Liner = CL B Rip-Rap

-L- STA. 158+87 TO STA. 159+00 LT, D=1.5'

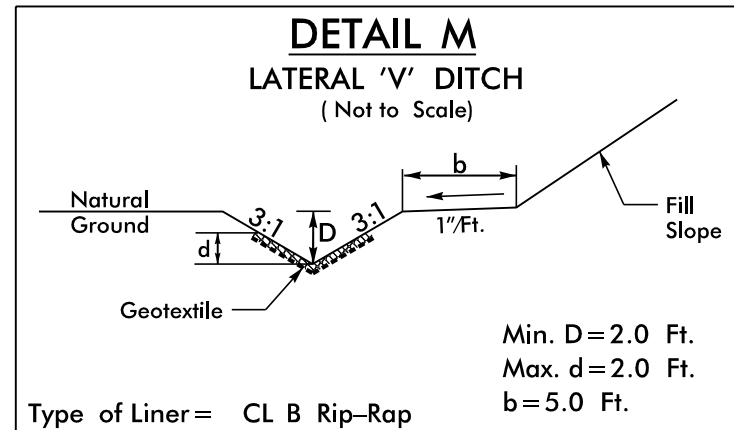


-LSB- STA. 112+50 TO STA. 129+00 LT
-L- STA. 212+25 TO STA. 220+00 RT
-L- STA. 208+50 TO STA. 215+00 LT
-Y5B- STA. 10+44 TO STA. 12+50 RT
-Y5FLY- STA. 66+80 TO STA. 70+00 LT
-Y5FLY- STA. 63+50 TO STA. 66+80 RT



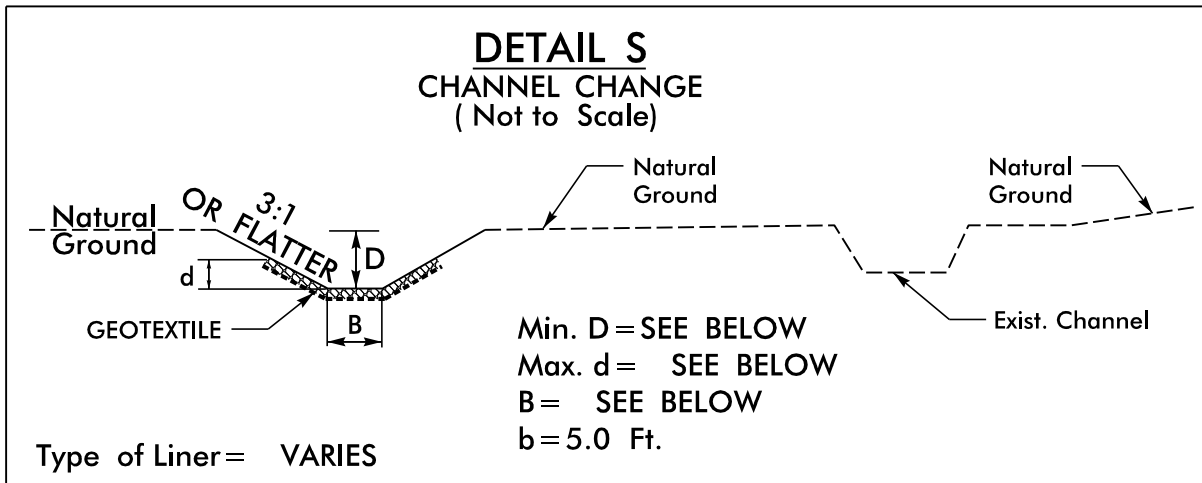
Type of Liner = CL B Rip-Rap

-L- STA. 121+50 TO STA. 127+90 RT
-L- STA. 186+71 TO STA. 187+92 LT
-L- STA. 198+60 TO STA. 203+00 RT
-L- STA. 199+36 TO STA. 202+57 LT
-Y4- STA. 40+82 TO STA. 43+12 LT
-Y4- STA. 40+38 TO STA. 41+90 RT
-Y5LPD- STA. 19+00 TO STA. 21+00 RT
-Y5LPD- STA. 20+21 TO STA. 24+50 LT
-Y5FLY- STA. 57+07 TO STA. 62+59 LT
-Y5RPD- STA. 15+00 TO STA. 24+34 RT
-Y5C- STA. 12+83 TO STA. 17+66 LT
-Y5C- STA. 12+64 TO STA. 17+88 RT
-Y5B- STA. 13+20 TO STA. 17+18 LT
-Y5RPC- STA. 13+37 TO STA. 21+33 RT
-Y5LPD- STA. 38+47 TO STA. 39+75 LT
-Y5LPD- STA. 37+76 TO STA. 39+18 RT
-Y5RPA- STA. 42+36 TO STA. 44+00 RT
-Y5- STA. 47+87 TO STA. 50+88 LT
-Y5- STA. 55+85 TO STA. 65+25 LT
-Y5- STA. 64+30 TO STA. 64+55 RT
-Y5LPD- STA. 44+31 TO STA. 48+12 RT
-YRPA- STA. 11+88 TO STA. 13+93 RT
-LSB- STA. 88+50 TO STA. 90+48 RT
-LSB- STA. 90+97 TO STA. 95+38 RT



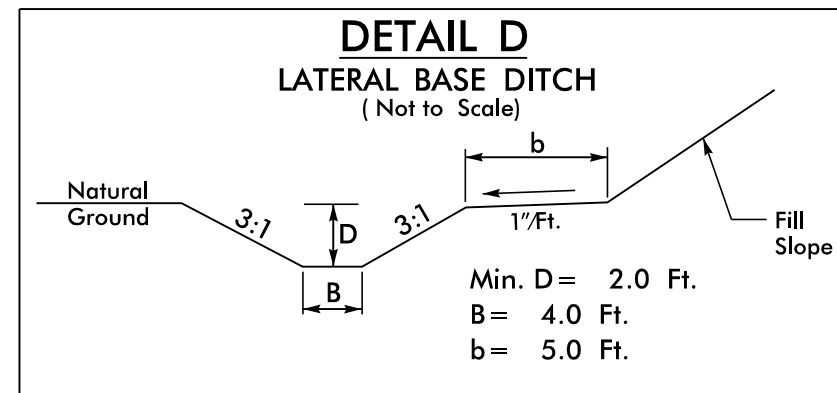
Type of Liner = CL B Rip-Rap

-Y5RPD- STA. 12+93 TO STA. 15+40 RT

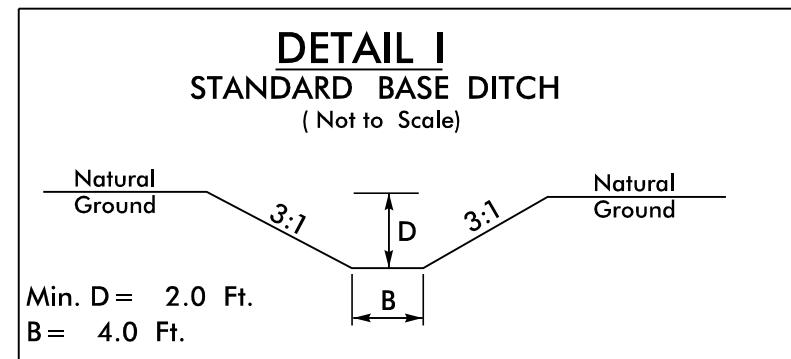


Type of Liner = VARIES

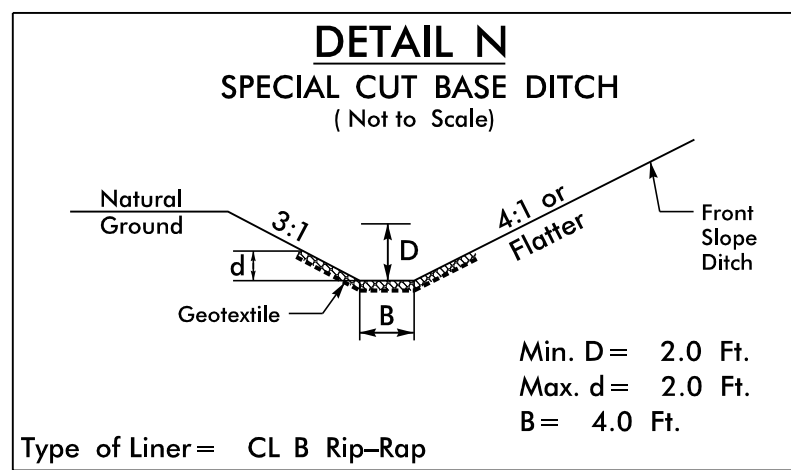
DETAIL NOT USED IN SECTION 1



-L- STA. 90+50 TO STA. 100+28 RT
-L- STA. 162+00 TO STA. 165+50 LT
-L- STA. 247+00 TO STA. 251+50 LT
-L- STA. 252+00 TO STA. 256+00 LT
-L- STA. 253+00 TO STA. 255+00 RT
-Y5LPD- STA. 26+50 TO STA. 30+65 RT

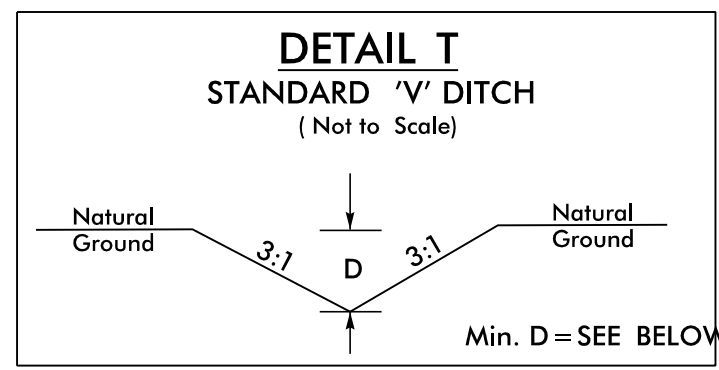


-Y5LPD- STA. 13+78 RT, L=285',
BEG. ELEV=131.67, END ELEV=130.90, S=0.3%
-LNB- STA. 60+18 TO STA. 61+15 RT, D=1.25',
BEG. ELEV=114.10, END ELEV=111.40, S=2.8%
-LNB- STA. 61+15 TO STA. 62+18 RT, D=1.25',
BEG. ELEV=111.40, END ELEV=113.10, S=1.7%

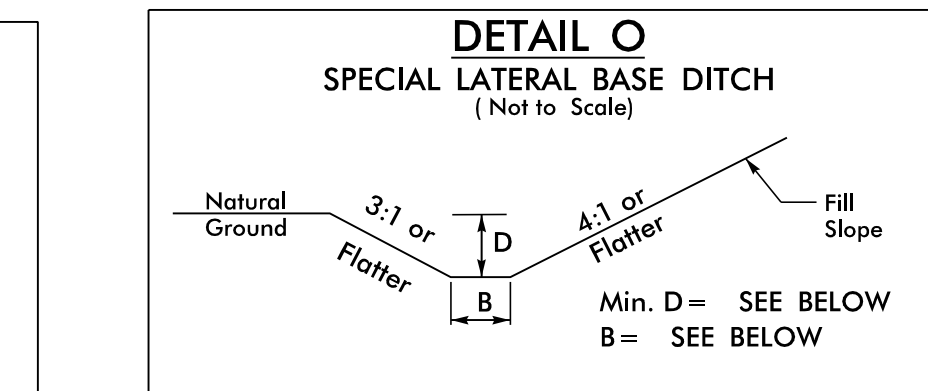


Type of Liner = CL B Rip-Rap

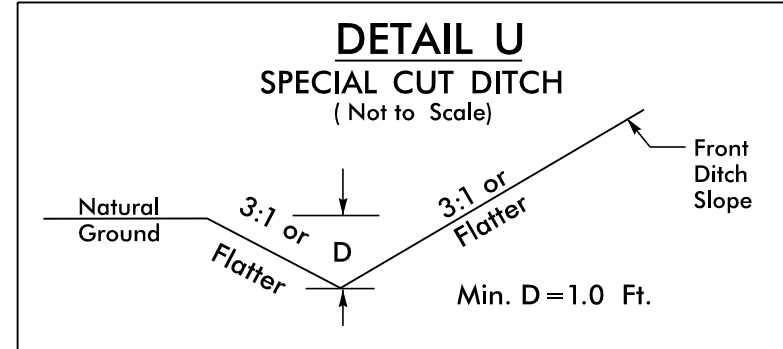
-L- STA. 107+72 TO STA. 109+00 LT, D=1.0'



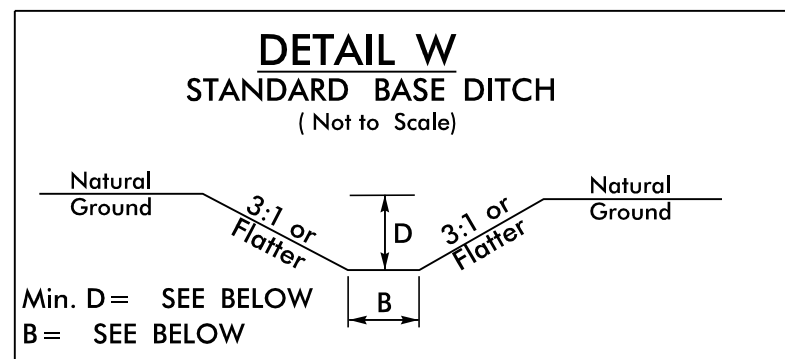
-YINB- STA. 44+50, L=53', S=0.8%, D=1.5',
BEG. ELEV=119.98, END ELEV=119.56, M=3.5
-Y5LPA- STA. 18+75, L=50', S=4.8%, D=1.0',
BEG. ELEV=144.45, END ELEV=142.05, M=3
-L- STA. 186+00 RT, L=200', S=0.3%, D=2.5',
BEG. ELEV=125.00, END ELEV=124.40'



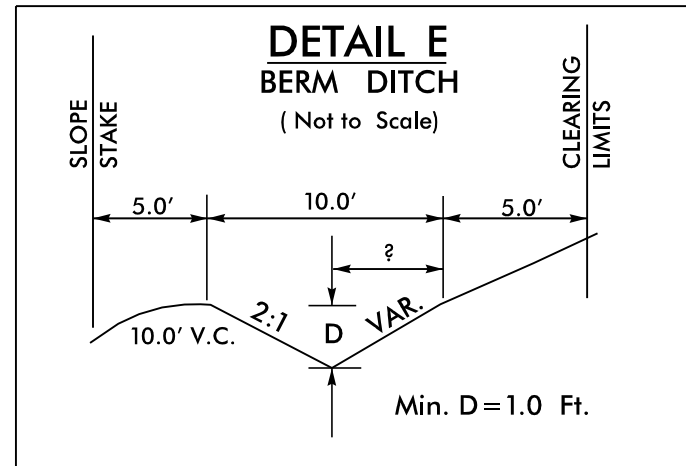
-LSB- STA. 31+00 TO STA. 37+00 LT, B=8', D=2.0'
-LSB- STA. 51+50 TO STA. 53+50 LT, B=11', D=1.5'
-LNB- STA. 115+00 TO STA. 118+50 RT, B=4', D=0.75'
-L- STA. 192+74 TO STA. 195+45 LT, B=7', D=2.0'
-Y4- STA. 42+00 TO STA. 61+50 RT, B=4', D=3.5'
-Y4- STA. 61+50 TO STA. 64+64 RT, B=4', D=2.75'



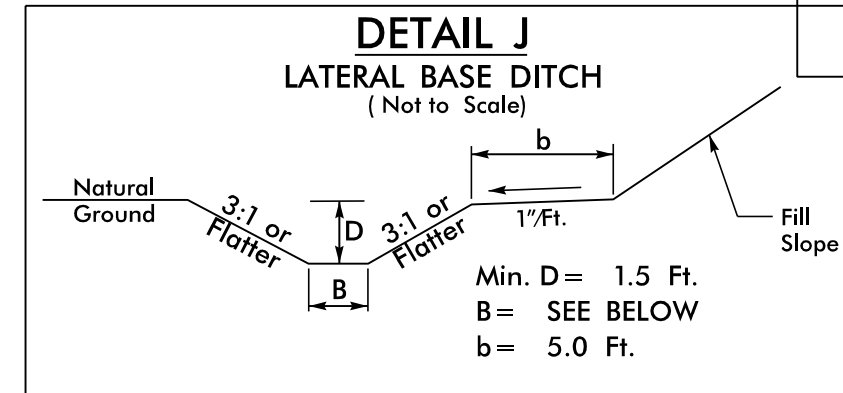
-LSB- STA. 81+00 TO STA. 84+00 LT
-LSB- STA. 128+50 TO STA. 129+00 LT
-LNB- STA. 45+20 TO STA. 48+00 LT
-LNB- STA. 118+50 TO STA. 120+52 RT
-L- STA. 102+12 TO STA. 103+00 LT
-L- STA. 111+00 TO STA. 112+50 RT
-L- STA. 113+81 TO STA. 118+50 LT
-L- STA. 131+50 TO STA. 132+50 RT
-L- STA. 169+00 TO STA. 173+00 LT
-L- STA. 232+50 TO STA. 241+50 RT



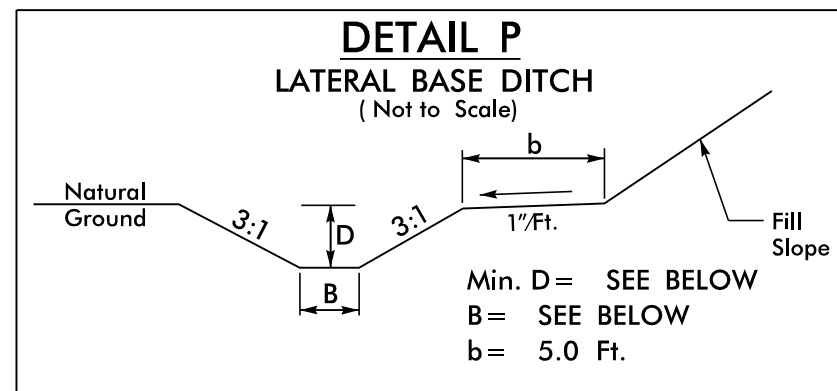
-L- STA. 128+00 RT, L=94, B=8', D=2.5',
BEG. ELEV=117.39, END ELEV=117.15, S=0.26%, M=6.0
-L- STA. 138+50 RT, L=41, B=6', D=2.0',
BEG. ELEV=122.78, END ELEV=122.45, S=0.80%, M=6.0
-L- STA. 113+81 RT, L=35, B=3', D=2.0',
BEG. ELEV=122.50, END ELEV=122.36, S=0.40%, M=3.0
-L- STA. 100+28 RT, L=22, B=6', D=2.5',
BEG. ELEV=121.50, END ELEV=121.43, S=0.33%, M=6.0
-L- STA. 107+72 RT, L=70, B=3', D=2.0',
BEG. ELEV=120.09, END ELEV=120.30, S=0.30%, M=6.0
-L- STA. 121+12 RT, L=54', B=3', D=3.0',
BEG. ELEV=115.95, END ELEV=115.80, S=0.28%, M=5.5
-L- STA. 160+29 RT, L=69, B=12', D=3.0',
BEG. ELEV=124.74, END ELEV=124.63, S=0.16%, M=3.0
-Y5- STA. 104+47 TO STA. 106+50 LT, B=10', D=2.25',
BEG. ELEV=126.60, END ELEV=127.08, S=0.24%, M=3.0
-L- STA. 215+50 LT, L=76', B=4', D=1.25',
BEG. ELEV=127.55, END ELEV=127.30, S=0.33%, M=3.0
-LNB- STA. 106+25 TO STA. 107+70 RT, B=4', D=1.0',
BEG. ELEV=113.08, END ELEV=112.80, S=0.19%, M=3.0
-LNB- STA. 107+70 TO STA. 108+54 RT, B=4', D=1.0',
BEG. ELEV=112.80, END ELEV=115.21, S=2.9%, M=3.0
-LNB- STA. 115+00 RT, L=107', B=4', D=1.0',
BEG. ELEV=120.50, END ELEV=119.6, S=0.8%, M=3.0



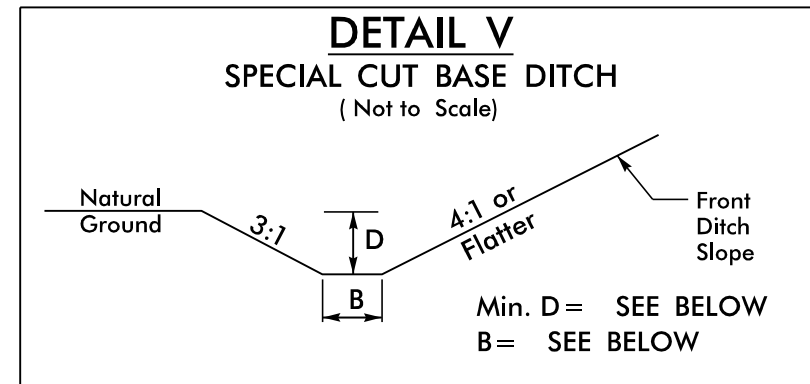
DETAIL NOT USED IN SECTION 1



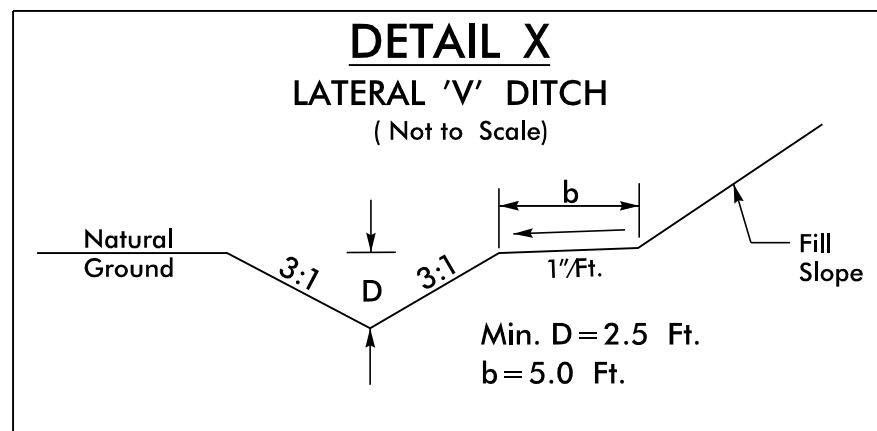
-L- STA. 90+50 TO STA. 94+00 LT, B=4',
-L- STA. 118+50 TO STA. 121+12 LT, B=4',
-L- STA. 130+00 TO STA. 132+50 LT, B=4',
-L- STA. 137+00 TO STA. 138+00 LT, B=4',
-L- STA. 139+50 TO STA. 147+00 LT, B=4',
-L- STA. 147+00 TO STA. 154+50 LT, B=4'



-Y3- STA. 18+50 TO STA. 19+15 LT, B=4', D=1.00'
-Y3- STA. 22+50 TO STA. 24+12 LT, B=4', D=2.00'
-L- STA. 128+00 TO STA. 129+00 RT, B=4', D=1.00'
-Y5- STA. 65+00 TO STA. 68+50 LT, B=4', D=1.00'



-LSB- STA. 57+50 TO STA. 61+50 RT, B=4', D=0.75'
-LSB- STA. 75+50 TO STA. 84+48 RT, B=4', D=0.75'
-LSB- STA. 94+00 TO STA. 96+00 RT, B=4', D=1.0'
-L- STA. 86+50 TO STA. 90+50 LT, B=4', D=1.5'
-L- STA. 94+00 TO STA. 100+28 LT, B=4', D=2.0'
-L- STA. 100+28 TO STA. 102+12 LT, B=4', D=1.0'
-L- STA. 109+00 TO STA. 113+81 LT, B=4', D=1.5'
-L- STA. 195+45 TO STA. 199+55 LT, B=7', D=1.0'
-Y4A- STA. 14+50 TO STA. 16+34 RT, B=4', D=1.0'

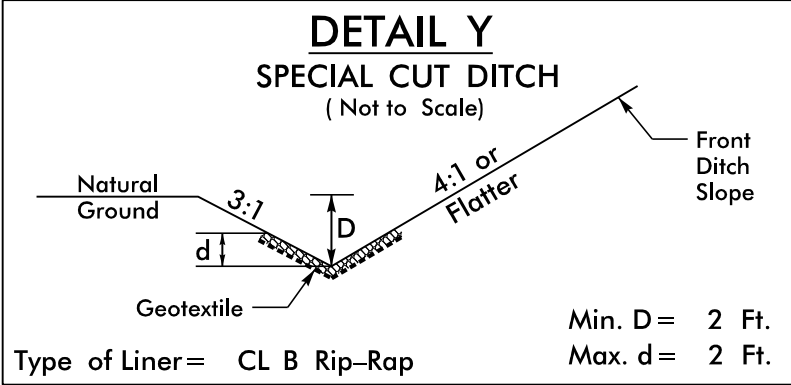


DETAIL NOT USED IN SECTION 1

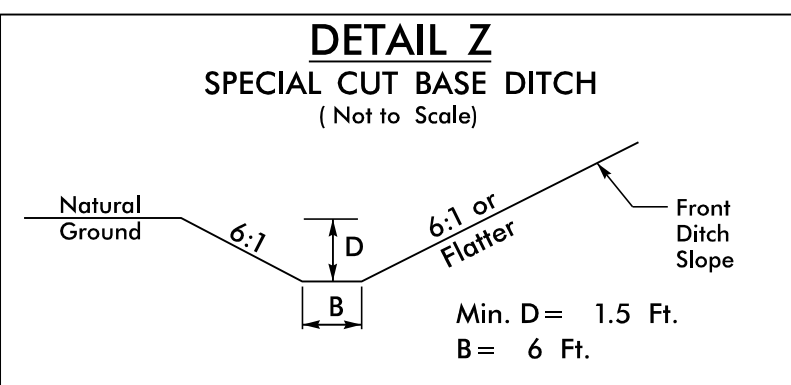
PROJECT REFERENCE NO.	SHEET NO.
1-5986A	2D-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

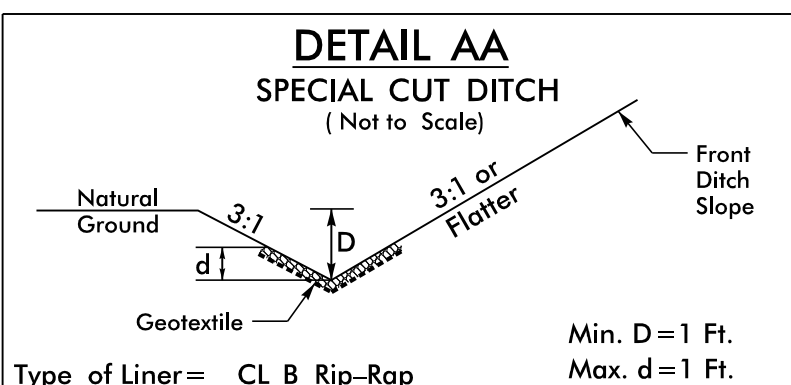
PERMIT DRAWING
SHEET 3 OF 163



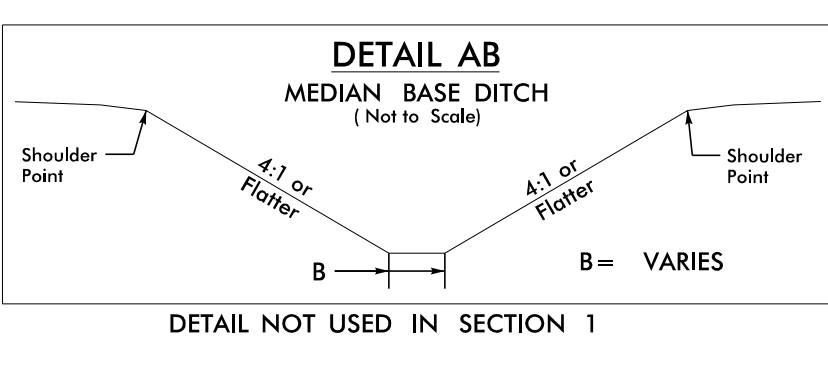
DETAIL NOT USED IN SECTION 1



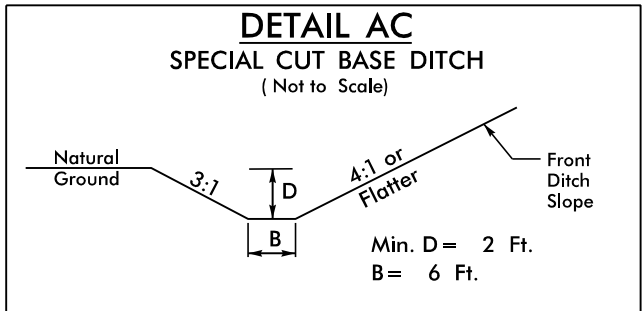
DETAIL NOT USED IN SECTION 1



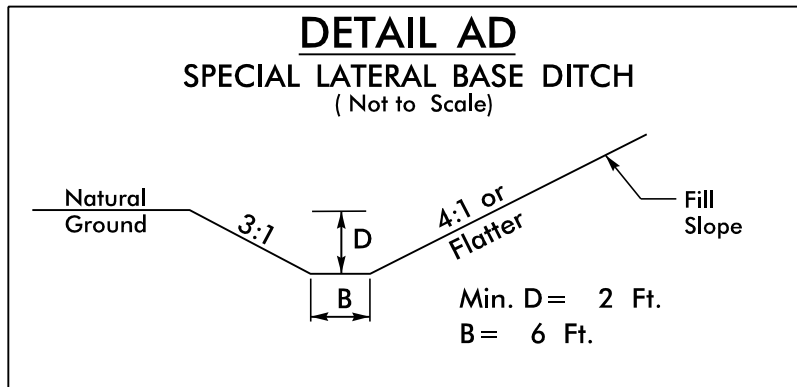
-Y5FLY- STA. 80+14.68 TO STA. 82+33.14



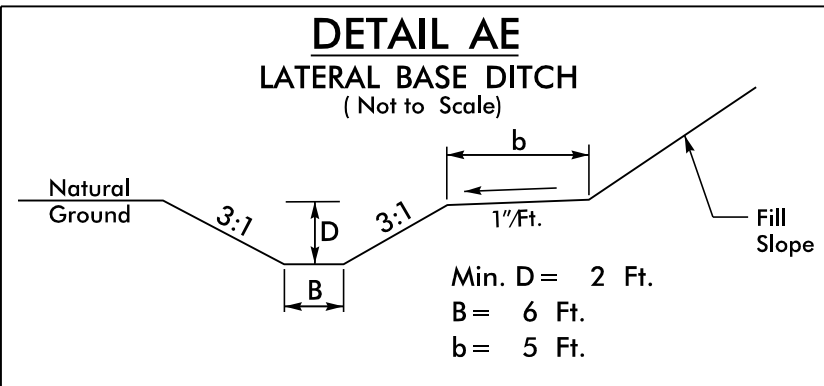
DETAIL NOT USED IN SECTION 1



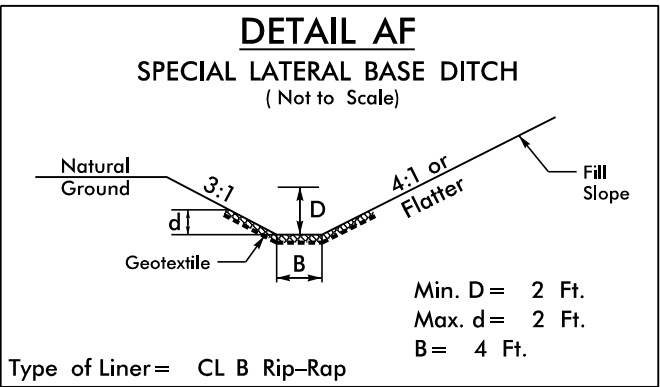
DETAIL NOT USED IN SECTION 1



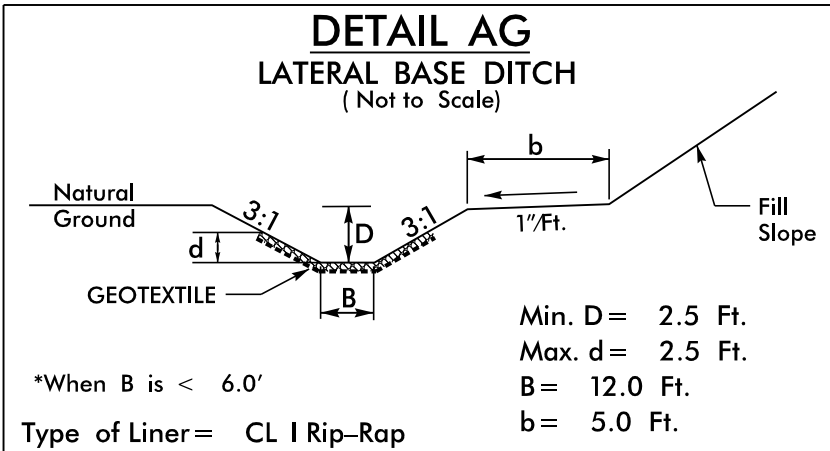
DETAIL NOT USED IN SECTION 1



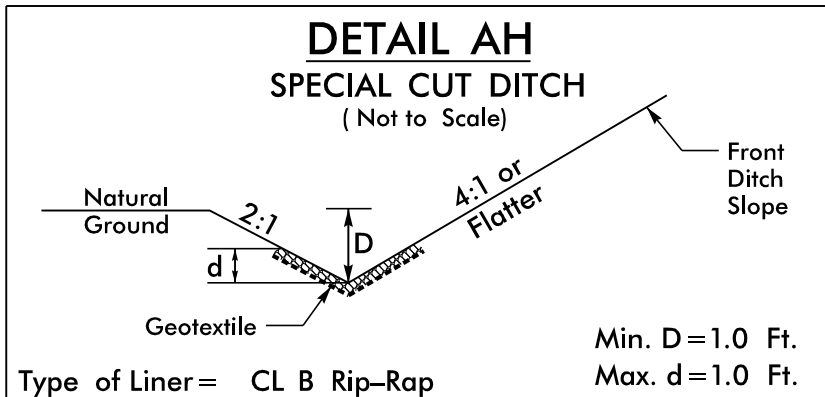
DETAIL NOT USED IN SECTION 1



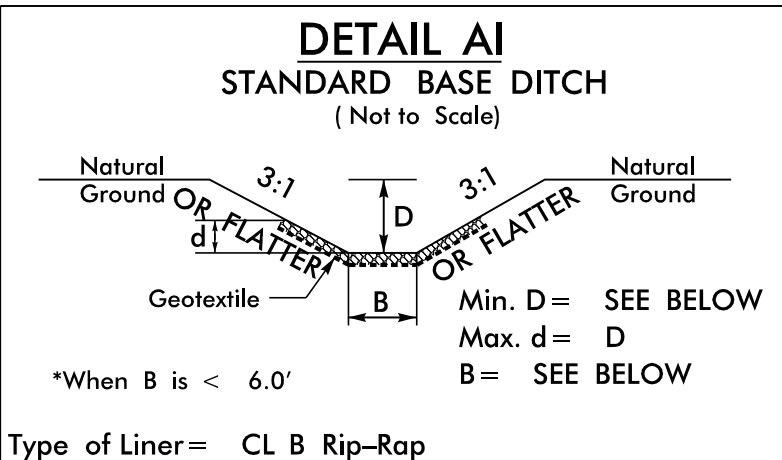
-Y5- STA. 64+50 TO STA. 65+00 RT
-Y5FLY- STA. 62+54 TO STA. 63+50 RT



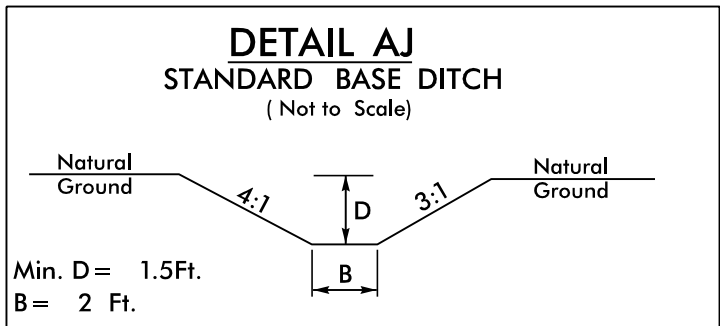
DETAIL NOT USED IN SECTION 1



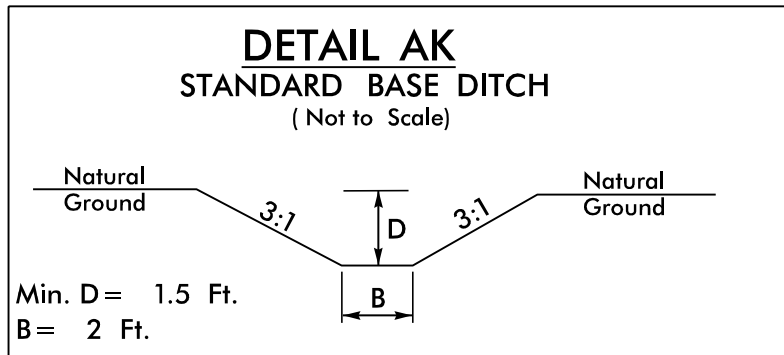
DETAIL NOT USED IN SECTION 1



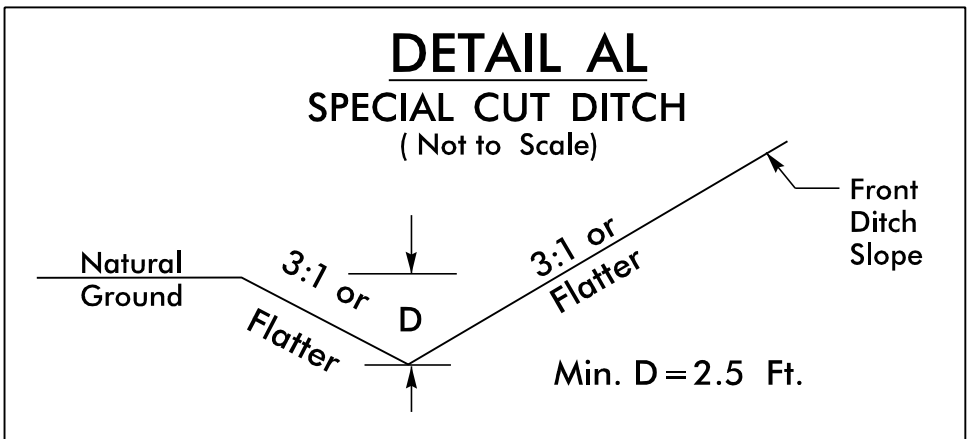
-L- STA. 121+12 RT, L=54', B=3', D=3.0'
BEG. ELEV.=115.95 END ELEV.=115.80, S=0.28%, M=5.5
-Y1SB- STA. 18+58 TO 21+90 RT, B=4', D=2.5'
BEG. ELEV.=119.34 END ELEV.=115.4, S=1.7% M=3.0



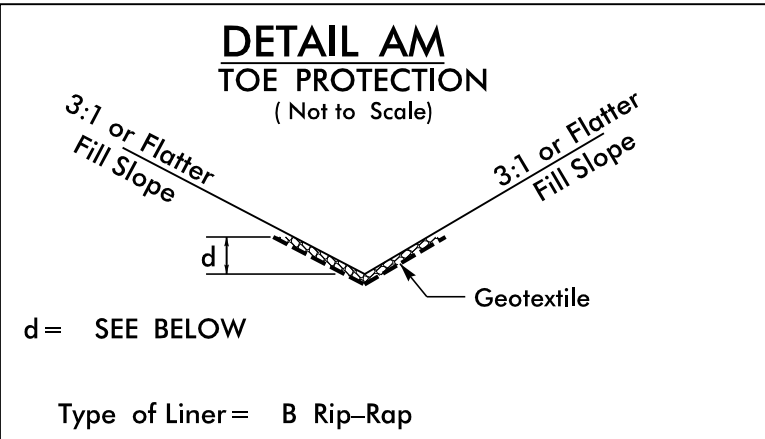
DETAIL NOT USED IN SECTION 1



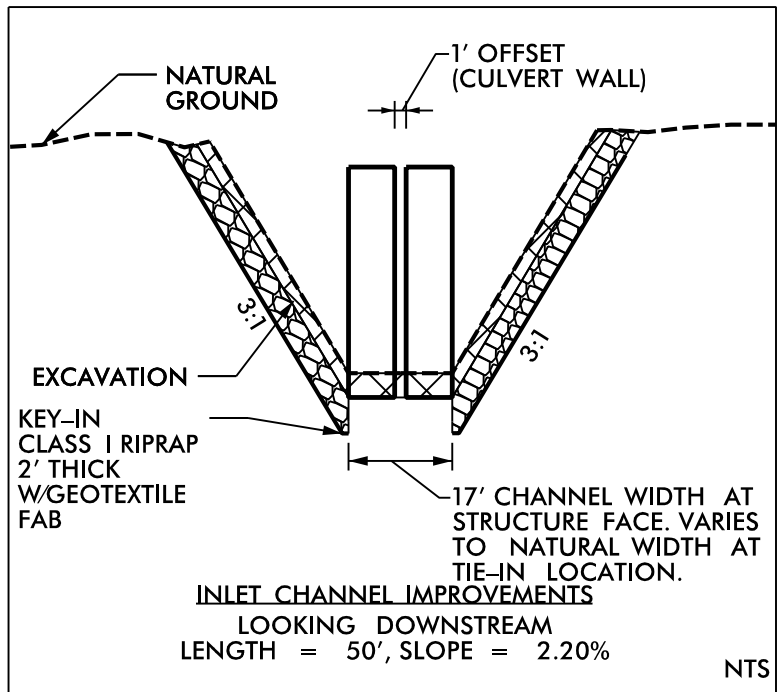
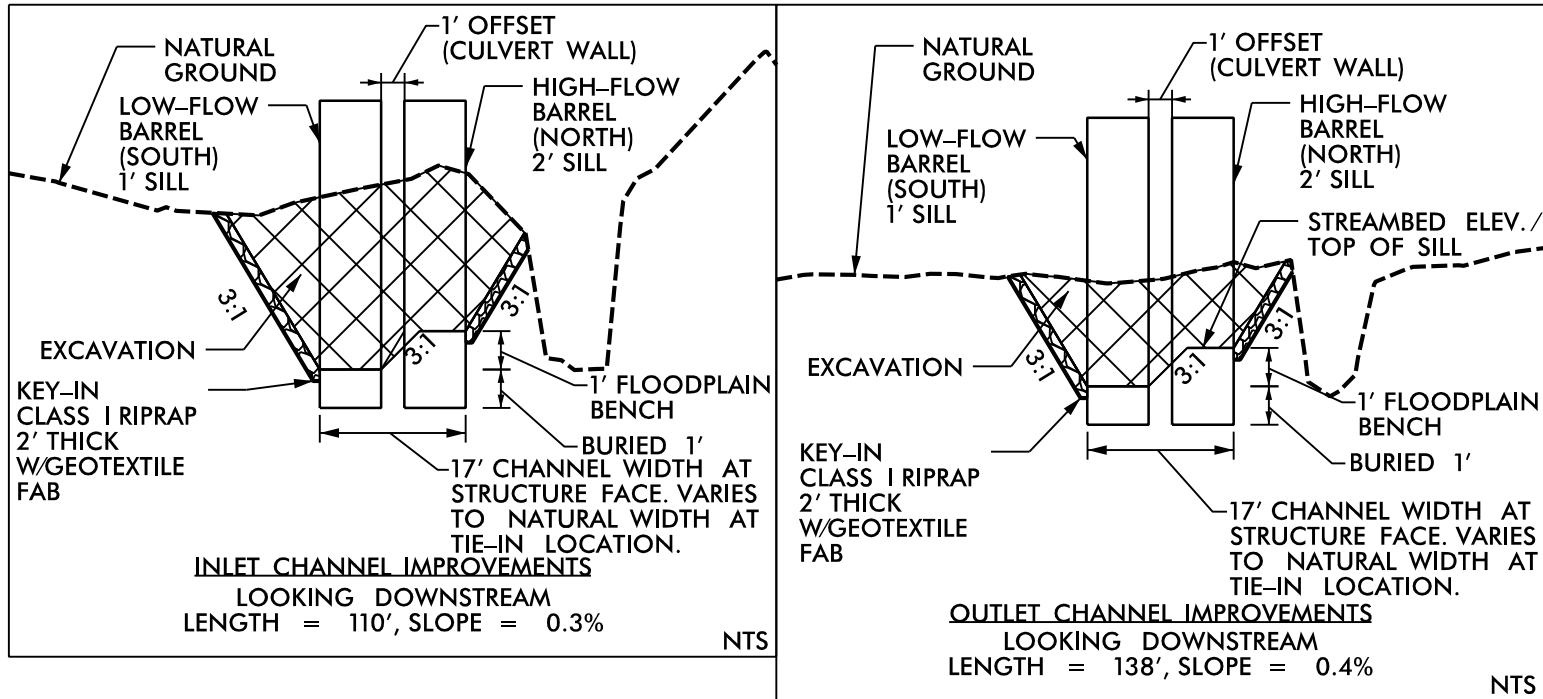
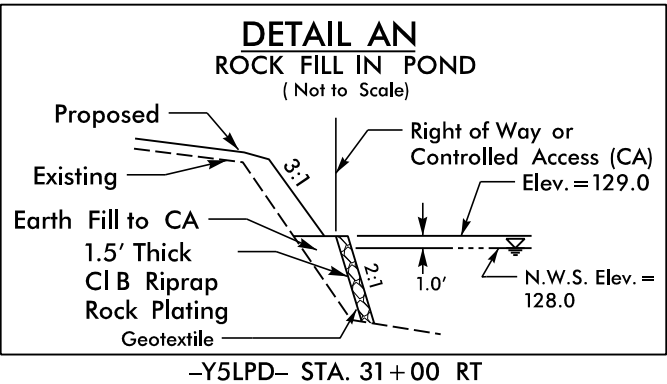
DETAIL NOT USED IN SECTION 1



DETAIL NOT USED IN SECTION 1



DETAIL NOT USED IN SECTION 1

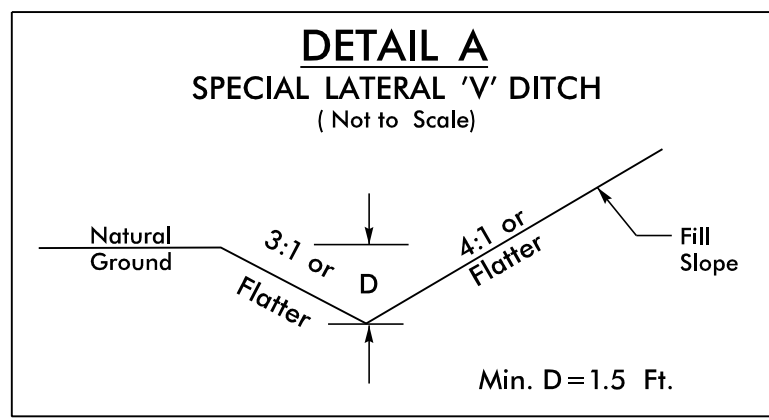


RK&K

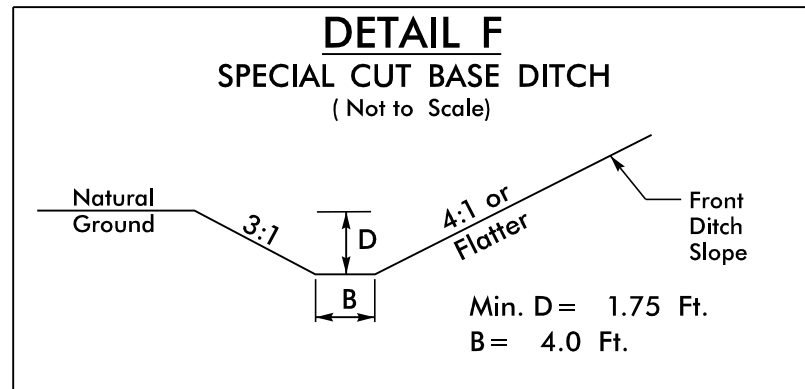
P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

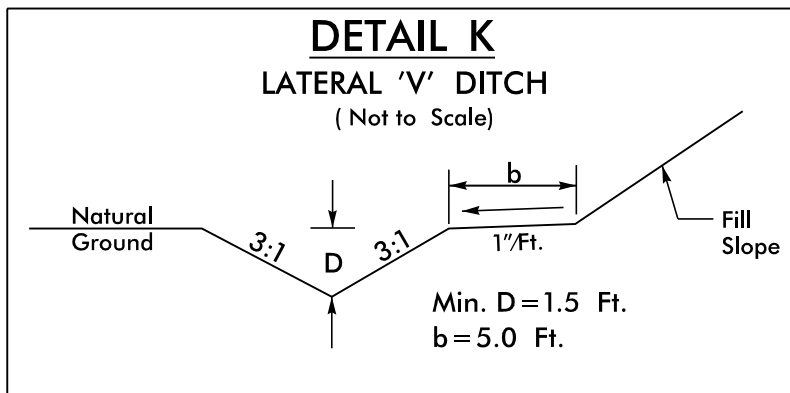
Responsive People | Creative Solutions



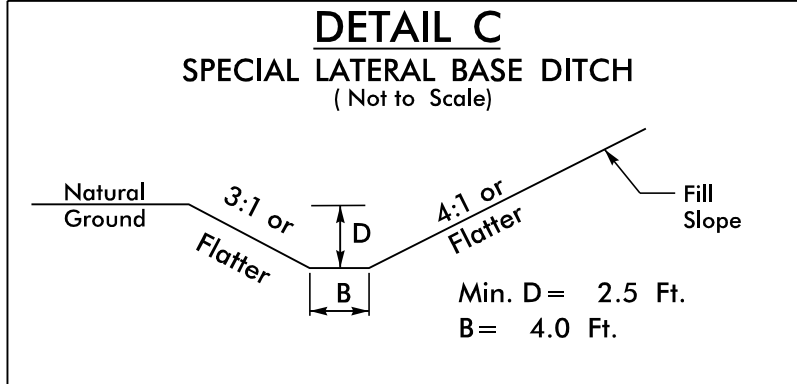
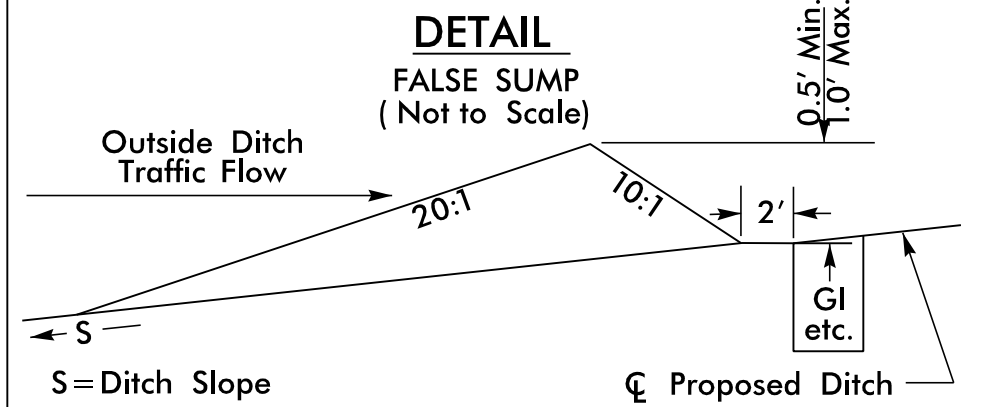
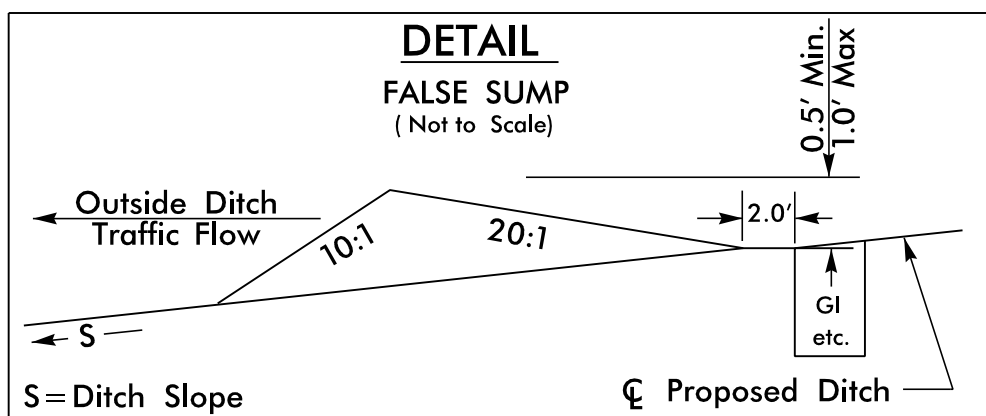
-L- STA. 333+00 TO STA. 340+50 RT
-L- STA. 341+00 TO STA. 345+00 LT
-L- STA. 499+65 TO STA. 500+00 LT
-SR5A- STA. 10+50 TO STA. 11+77 LT
-Y6- STA. 28+00 TO STA. 28+50 LT
-Y7A- STA. 15+00 TO STA. 16+00 LT
-Y8- STA. 16+00 TO STA. 16+50 RT
-Y8- STA. 29+50 TO STA. 34+50 RT



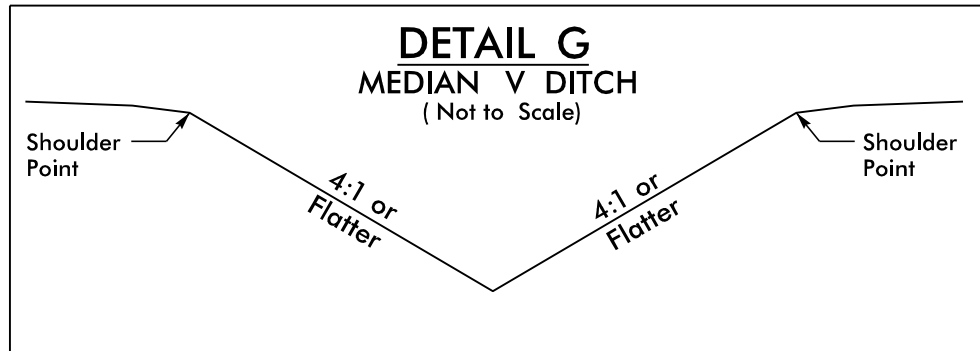
-L- STA. 282+50 TO STA. 288+50 LT
-L- STA. 307+00 TO STA. 316+50 LT
-L- STA. 296+50 TO STA. 300+50 RT
-L- STA. 307+50 TO STA. 308+50 RT
-L- STA. 336+00 TO STA. 339+00 LT
-L- STA. 361+00 TO STA. 362+00 LT
-L- STA. 364+00 TO STA. 364+50 RT
-L- STA. 370+50 TO STA. 372+00 LT
-L- STA. 371+50 TO STA. 372+50 RT
-L- STA. 453+50 TO STA. 461+50 LT
-L- STA. 465+00 TO STA. 470+50 LT
-L- STA. 438+00 TO STA. 460+00 RT
-L- STA. 435+00 TO STA. 440+50 LT
-L- STA. 493+00 TO STA. 496+50 LT
-Y7D- STA. 14+80 TO STA. 16+25 LT
-Y7RPB- STA. 10+18.97 TO STA. 18+29.27 LT
-Y7RPC- STA. 10+05.01 TO STA. 16+61.51 RT



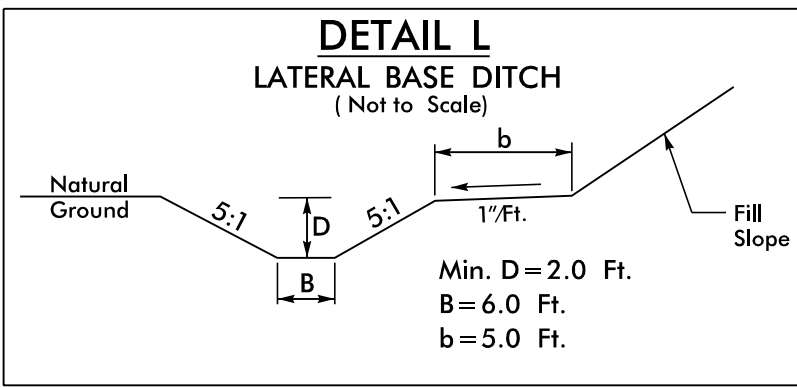
-L- STA. 280+00 TO STA. 289+00 RT
-L- STA. 320+00 TO STA. 322+00 RT
-L- STA. 324+00 TO STA. 333+00 RT
-L- STA. 345+00 TO STA. 351+00 LT
-L- STA. 353+00 TO STA. 355+00 LT
-L- STA. 402+50 TO STA. 403+00 RT
-L- STA. 403+00 TO STA. 406+50 LT
-SR3- STA. 24+50 TO STA. 28+00 LT
-Y20- STA. 19+00 TO STA. 21+93.18 LT
-Y20- STA. 22+44.57 TO STA. 22+95.34 RT
-Y6- STA. 13+50 TO STA. 15+50 LT
-Y6- STA. 23+00 TO STA. 28+50 RT
-Y6- STA. 28+50 TO STA. 29+50 LT
-Y7C- STA. 16+50 TO STA. 19+00 LT
-Y7D- STA. 11+00 TO STA. 14+50 RT
-Y7RPB- STA. 21+00 TO STA. 23+74 RT
-Y7RPC- STA. 17+13.38 TO STA. 19+00 LT
-Y7RPC- STA. 20+50 TO STA. 23+90 LT
-Y7RPD- STA. 22+00 TO STA. 24+00 RT
-Y8- STA. 26+19 TO STA. 29+50 RT



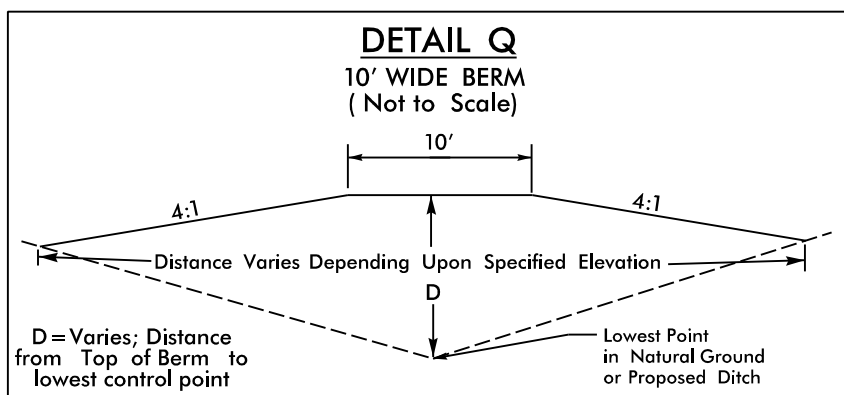
-L- STA. 306+75 TO STA. 307+00 LT
-L- STA. 339+00 TO STA. 341+00 LT
-L- STA. 422+20 TO STA. 427+50 RT
-L- STA. 496+50 TO STA. 499+65 LT
-L- STA. 504+50 TO STA. 508+50 LT
-L- STA. 529+50 TO STA. 538+77 LT
-L- STA. 541+75 TO STA. 538+77 LT
-L- STA. 425+58 TO STA. 435+00 LT
-L- STA. 440+50 TO STA. 448+50 LT
-L- STA. 510+00 TO STA. 513+00 LT
-L- STA. 539+70 TO STA. 504+58 LT
-SR3- STA. 32+78.79 TO STA. 34+17 LT
-Y8- STA. 33+50 TO STA. 37+50 LT



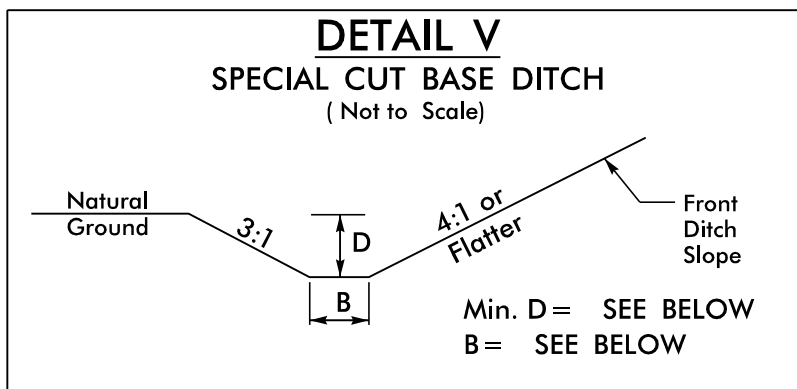
-L- STA. 390+50 TO STA. 392+50 LT
-Y20- STA. 21+93.18 TO STA. 22+44.57 LT
-Y7RPA- STA. 10+40.05 TO STA. 11+40.19 RT
-Y7RPD- STA. 10+84.95 TO STA. 11+84.98 LT



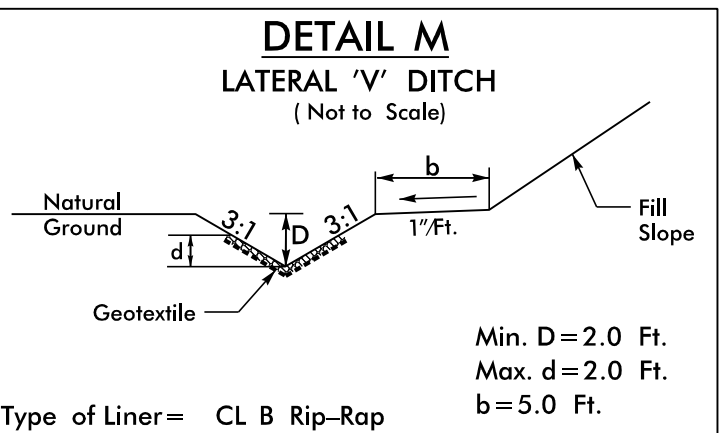
DETAIL NOT USED IN SECTION 2



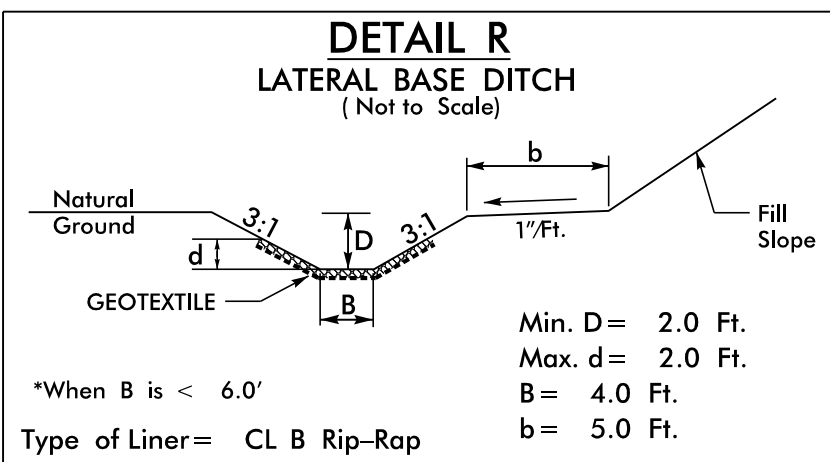
-L- STA. 500+00 LT, TOP ELEV.=173.9'
-L- STA. 500+00 RT, TOP ELEV.=172.3'
-SR3- STA. 20+50 RT, TOP ELEV.=151.0'
-SR3- STA. 24+50 RT, TOP ELEV.=150.0'



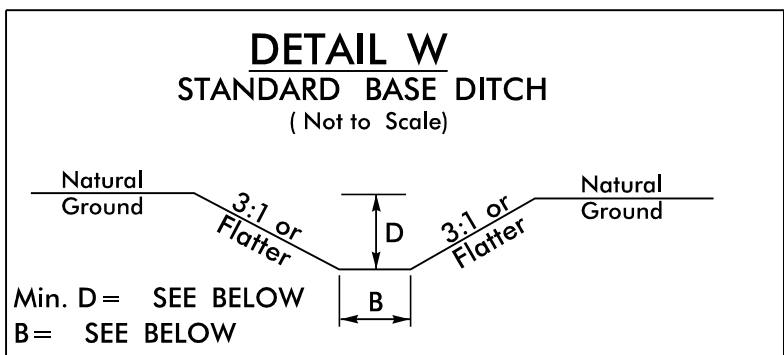
-Y20- STA. 24+45.78 TO STA. 32+51.25 RT, B=4', D=3.5'



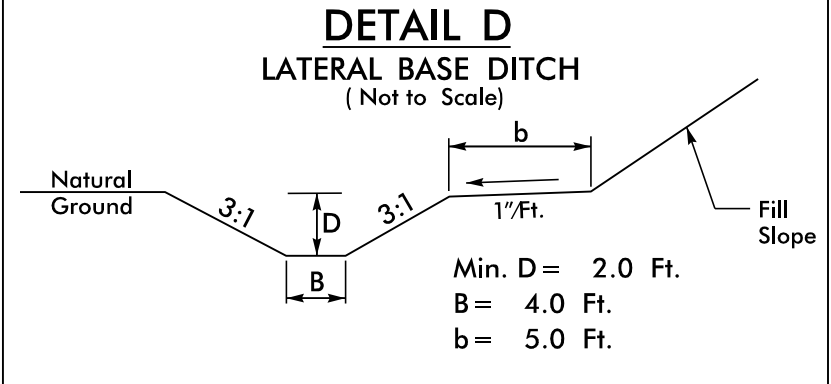
-Y7RPD- STA. 24+00 TO STA. 24+42 RT
-Y7C- STA. 11+00 TO STA. 12+53 LT



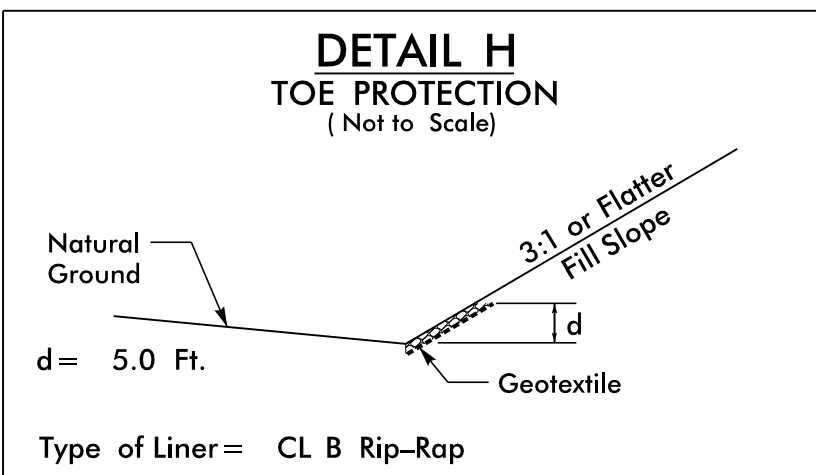
-L- STA. 517+50 TO STA. 521+00 LT



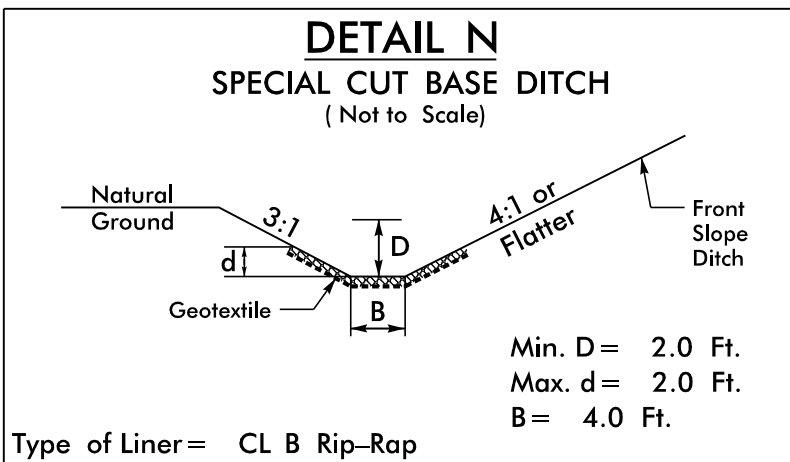
-SR5B- STA. 15+70 RT, B=8', D=3', M=3.0
BEG. ELEV.=168.57', END. ELEV.=168.33', S=0.30%, L=78'
-Y20- STA. 32+51 LT, B=4', D=4.0'
BEG. ELEV.=141.11 END. ELEV.=141.06, S=0.1%, M=4.0
-L- STA. 405+64 LT, B=4', D=3.0'
BEG. ELEV.=140.22 END. ELEV.=139.80, S=0.3%, M=4.0



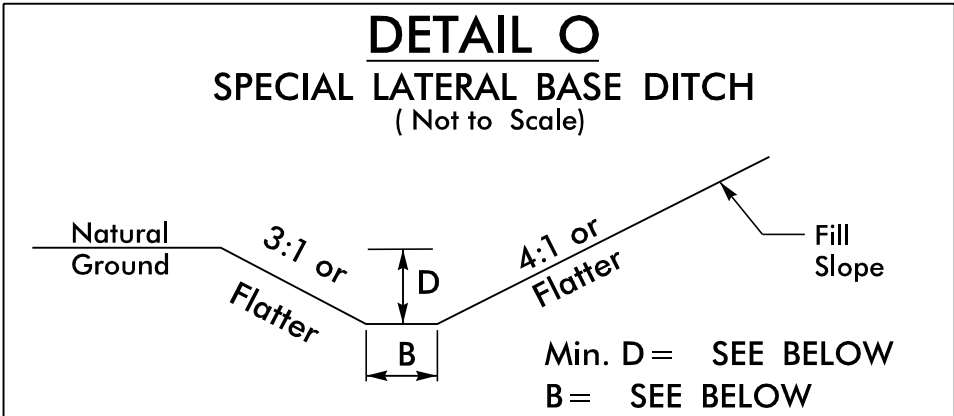
-L- STA. 280+50 TO STA. 282+50 LT
-L- STA. 296+50 TO STA. 301+00 LT
-L- STA. 316+50 TO STA. 324+00 LT
-L- STA. 327+50 TO STA. 336+00 LT
-L- STA. 300+50 TO STA. 302+30 RT
-L- STA. 357+79 TO STA. 364+00 RT
-L- STA. 370+00 TO STA. 370+50 LT
-L- STA. 372+00 TO STA. 375+50 LT
-L- STA. 405+46 TO STA. 407+50 RT
-L- STA. 470+50 TO STA. 474+50 LT
-L- STA. 500+00 TO STA. 504+50 LT
-Y7RPB- STA. 18+29 TO STA. 24+32 LT
-Y7B- STA. 14+72 TO STA. 15+72 LT
-Y7D- STA. 11+50 TO STA. 14+13 LT



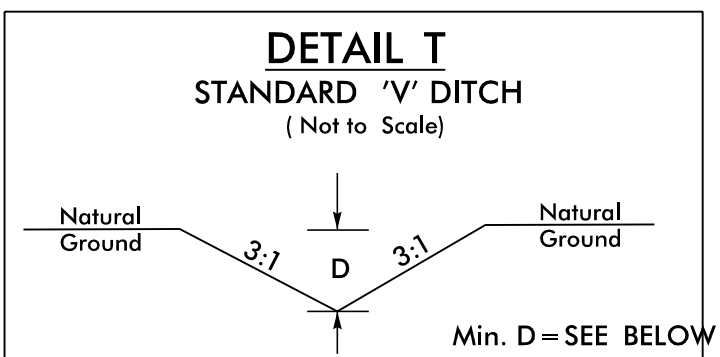
-L- STA. 300+50 TO STA. 304+95 LT
-L- STA. 422+95 TO STA. 425+20 LT
-L- STA. 508+50 TO STA. 509+52 LT
-L- STA. 522+75 TO STA. 525+40 LT
-L- STA. 435+00 TO STA. 437+00 RT
-SR3- STA. 34+16 TO STA. 35+78 LT
-Y7RPC- STA. 17+50 TO STA. 24+10 RT



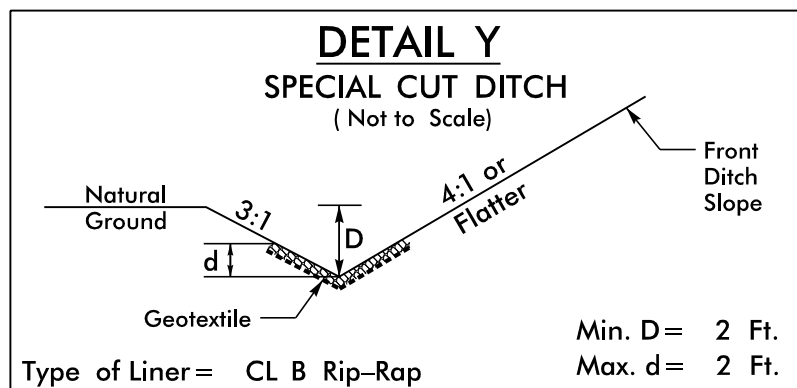
-L- STA. 513+00 TO STA. 517+50 LT
-Y20- STA. 32+51.25 TO STA. 33+42 RT



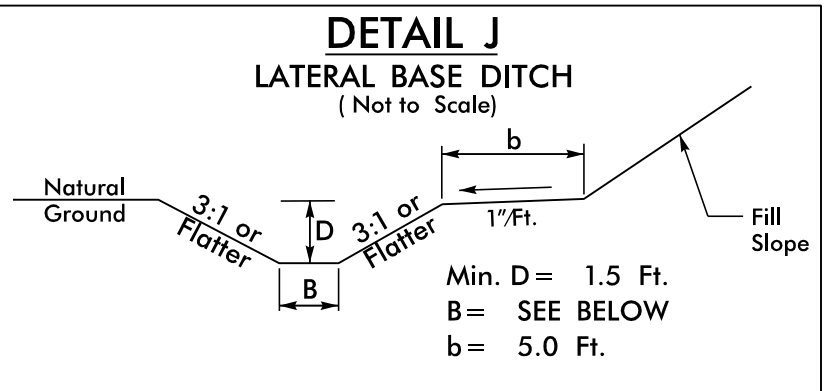
DETAIL NOT USED IN SECTION 2



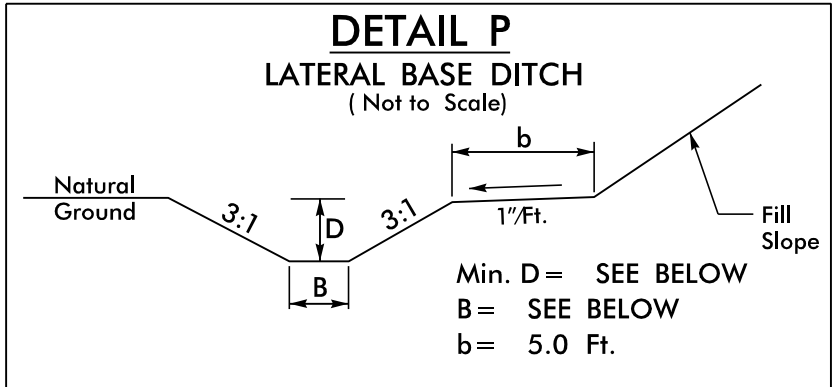
DETAIL NOT USED IN SECTION 2



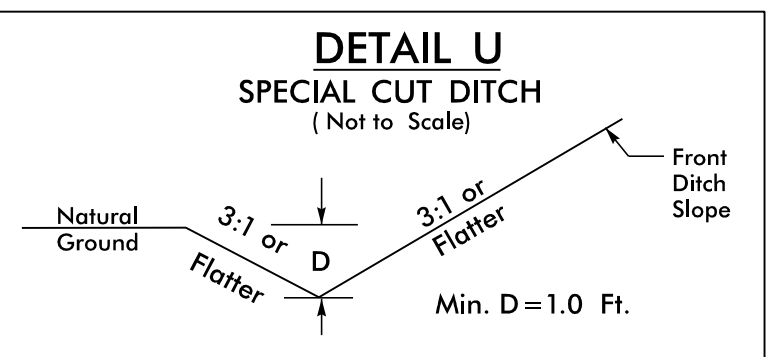
DETAIL NOT USED IN SECTION 2



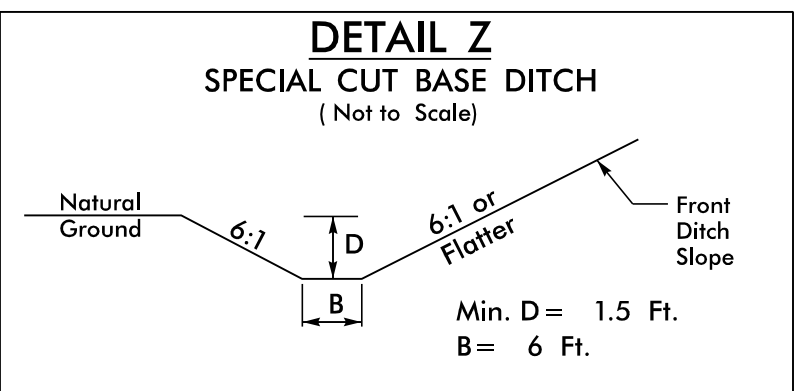
-L- STA. 340+50 TO STA. 355+00 RT, B=2'
-L- STA. 360+50 TO STA. 361+00 LT, B=4'
-L- STA. 372+50 TO STA. 376+50 RT, B=4'
-SR3- STA. 11+00 TO STA. 24+50 RT, B=4'
-Y7B- STA. 11+00 TO STA. 15+50 LT, B=4'
-Y7C- STA. 12+53 TO STA. 13+84 LT, B=4'
-Y7D- STA. 11+03 TO STA. 11+50 LT, B=4'
-Y7RPB- STA. 20+00 TO STA. 21+00 RT, B=4'
-Y7RPD- STA. 24+30 TO STA. 25+06 LT, B=4'



-L- STA. 355+00 TO STA. 360+50 LT, B=4', D=3'
-L- STA. 403+00 TO STA. 405+46 RT, B=4', D=4.5'
-Y20- STA. 22+95.34 TO STA. 24+46 RT, B=4', D=3'



-L- STA. 518+00 TO STA. 522+50 RT
-SR5A- STA. 11+77 TO STA. 12+27 LT
-SR5A- STA. 11+77 TO STA. 12+27 LT
-SR5A- STA. 13+79 TO STA. 19+00 LT
-SR5A- STA. 13+79 TO STA. 19+00 LT
-Y8- STA. 11+00 TO STA. 12+00 LT
-Y8- STA. 11+00 TO STA. 16+00 RT
-Y8- STA. 34+50 TO STA. 38+60 RT
-Y8- STA. 37+50 TO STA. 39+40 LT



-L- STA. 437+00 TO STA. 438+00 RT

RK&K

P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112

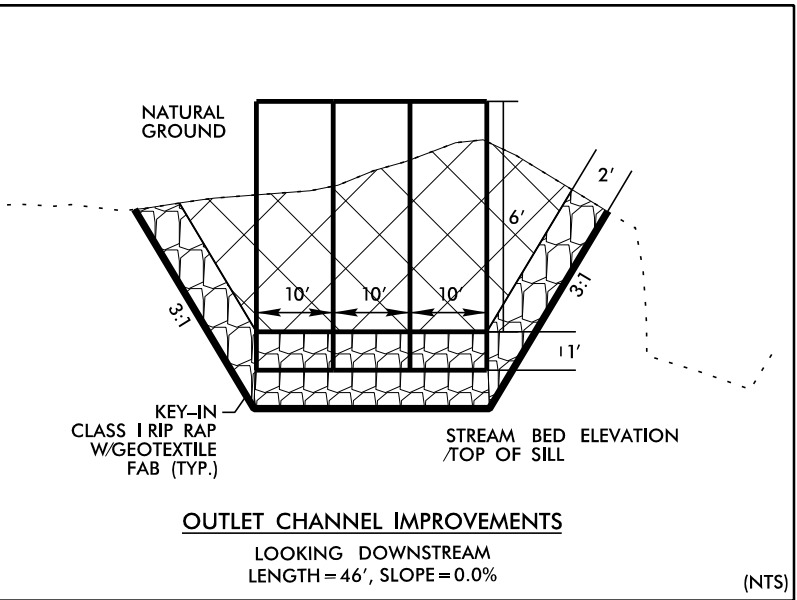
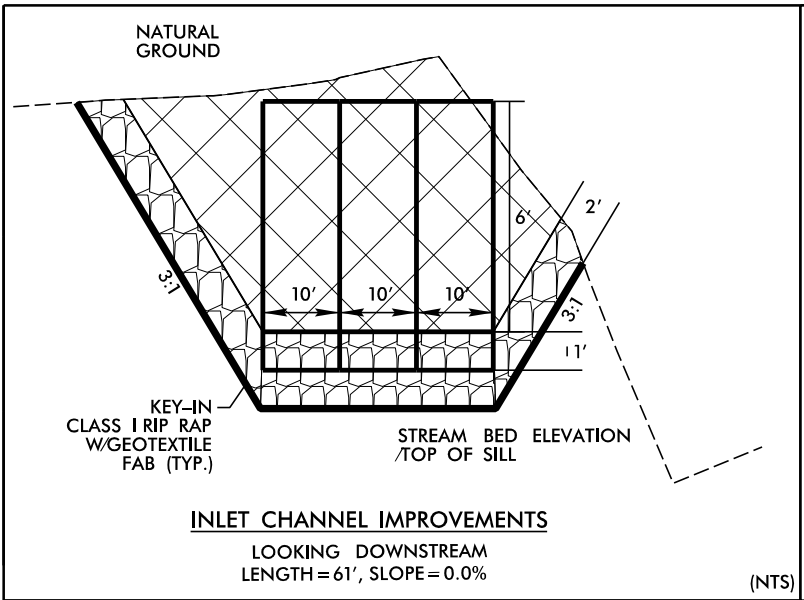
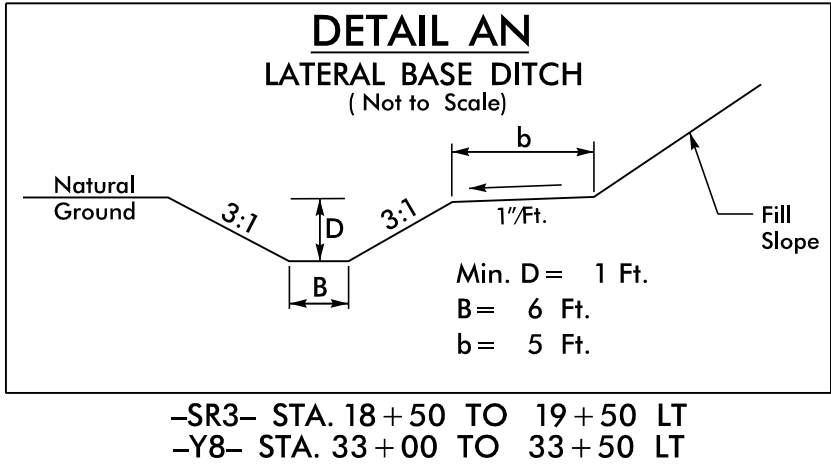
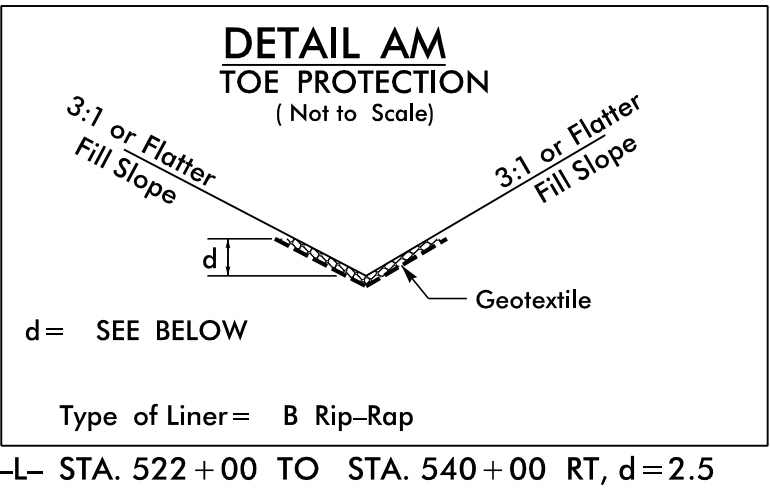
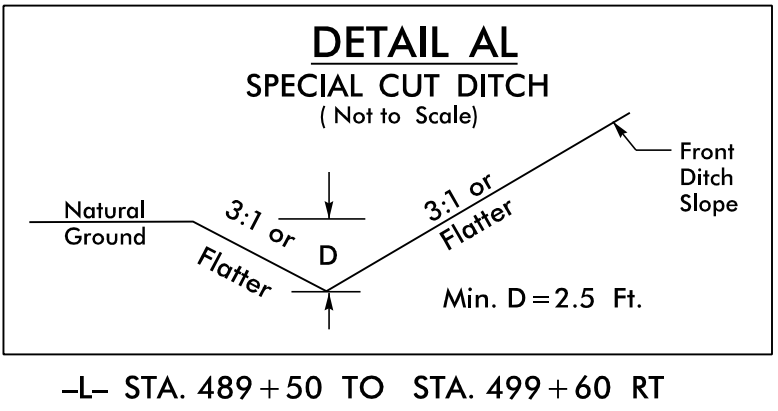
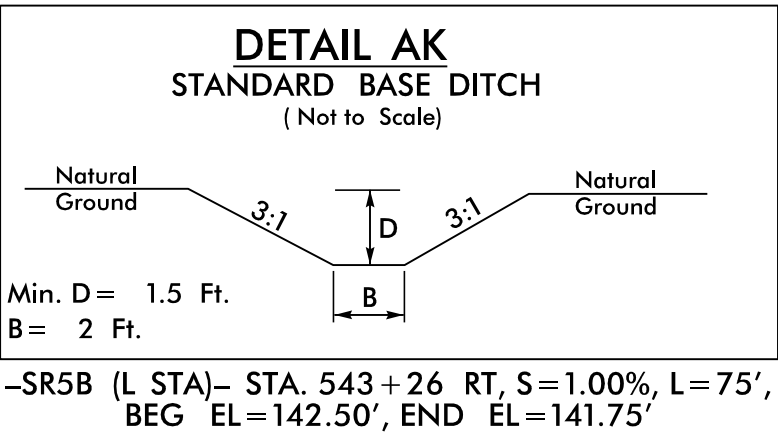
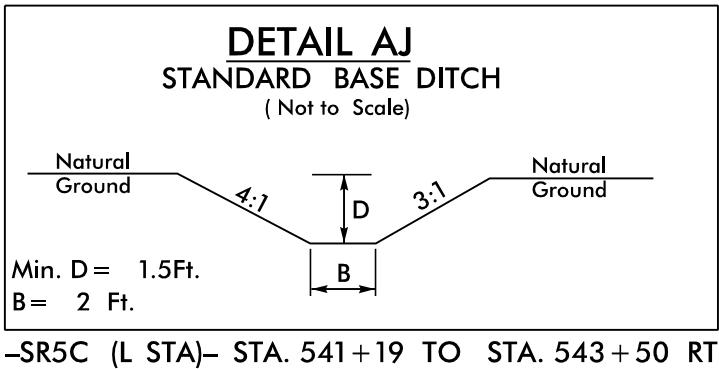
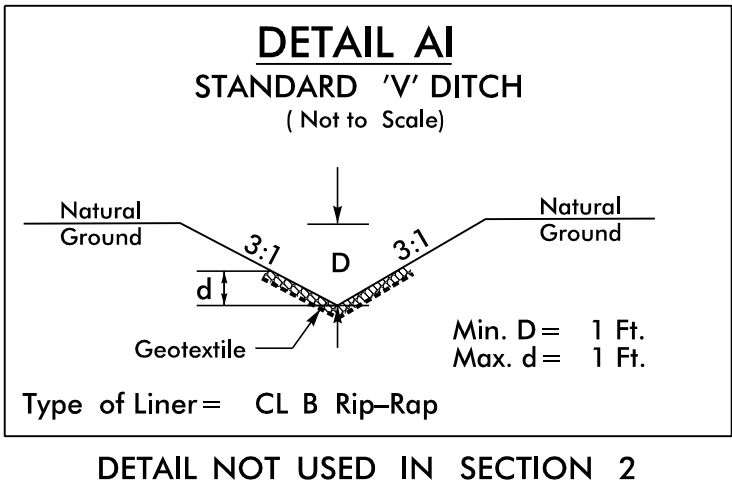
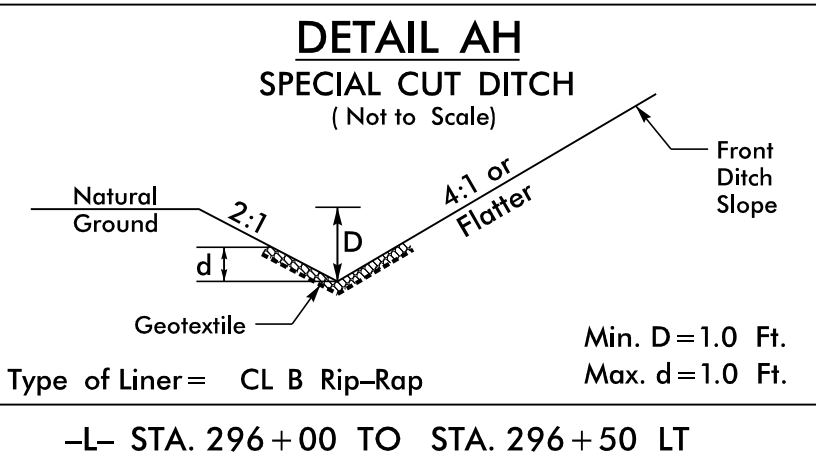
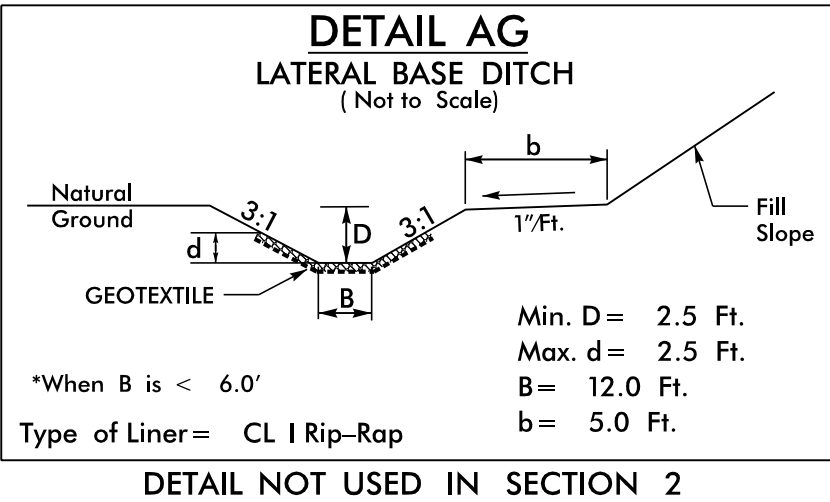
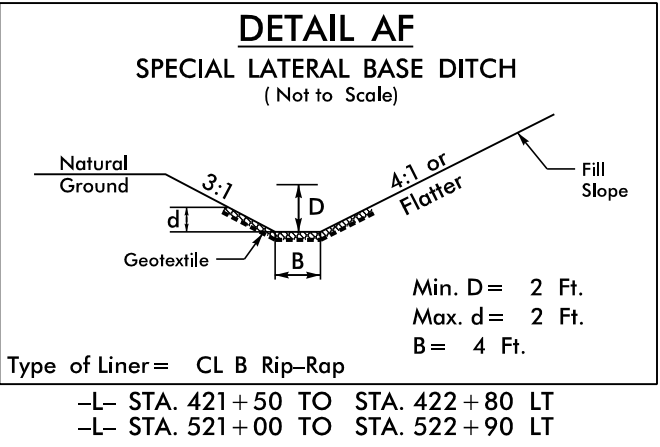
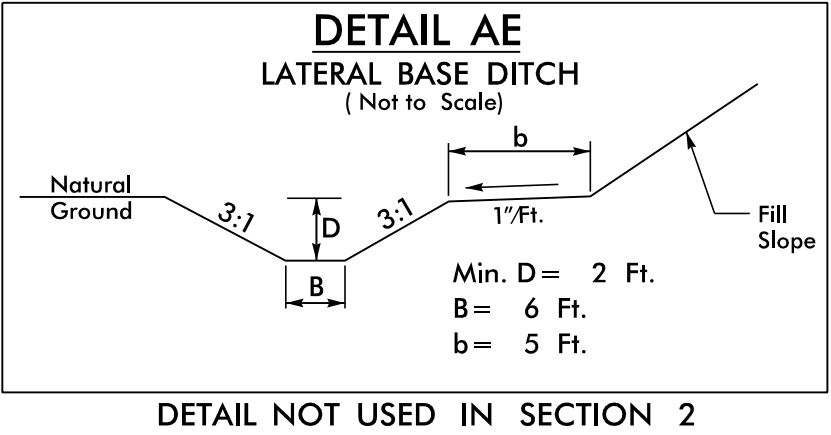
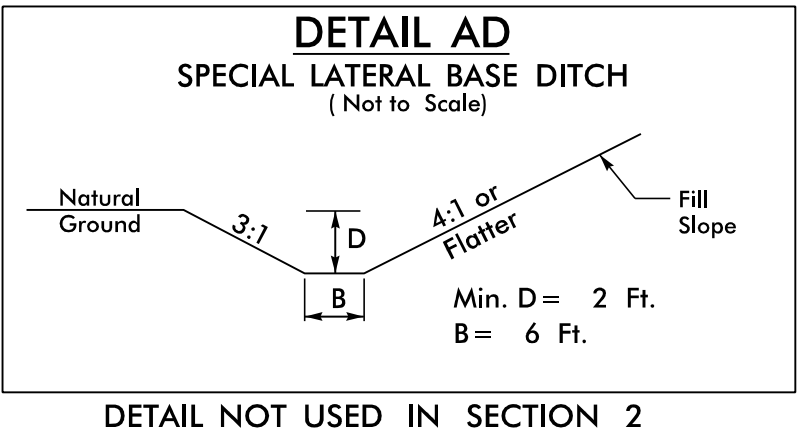
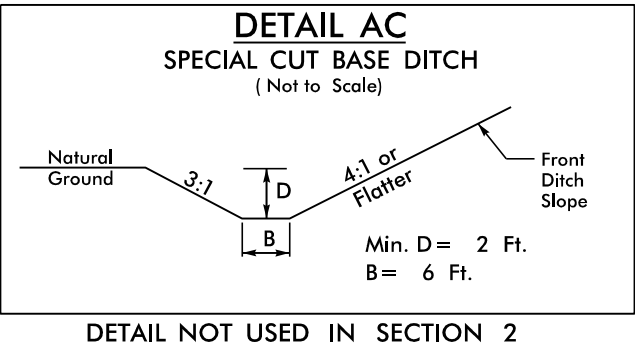
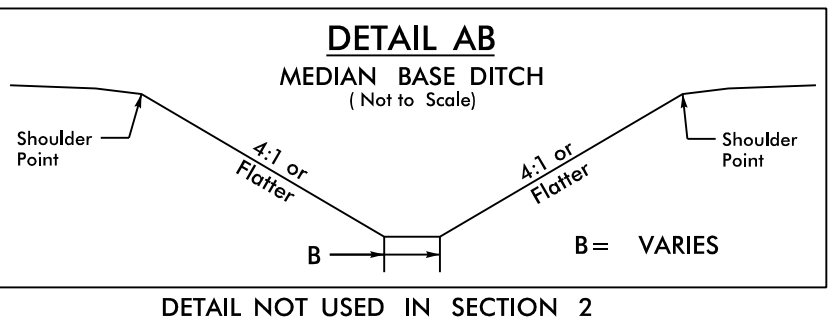
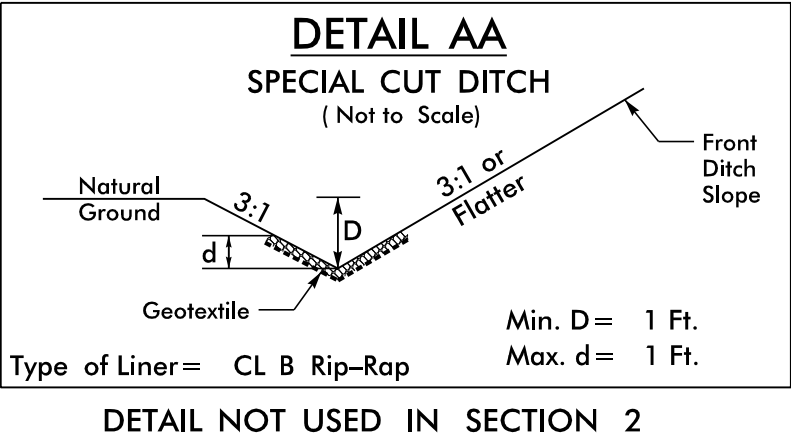
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

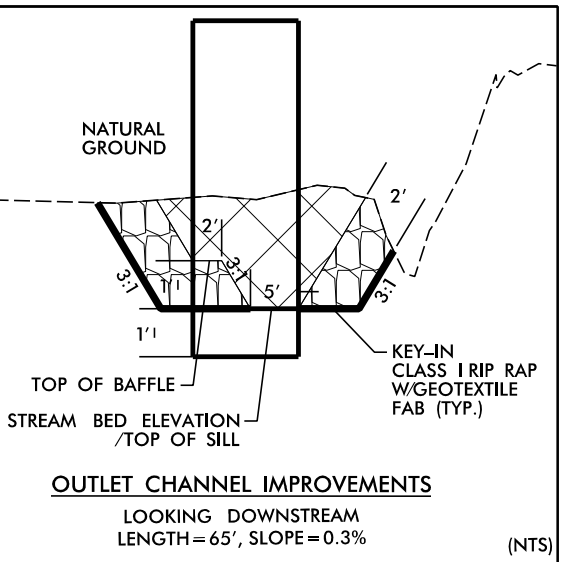
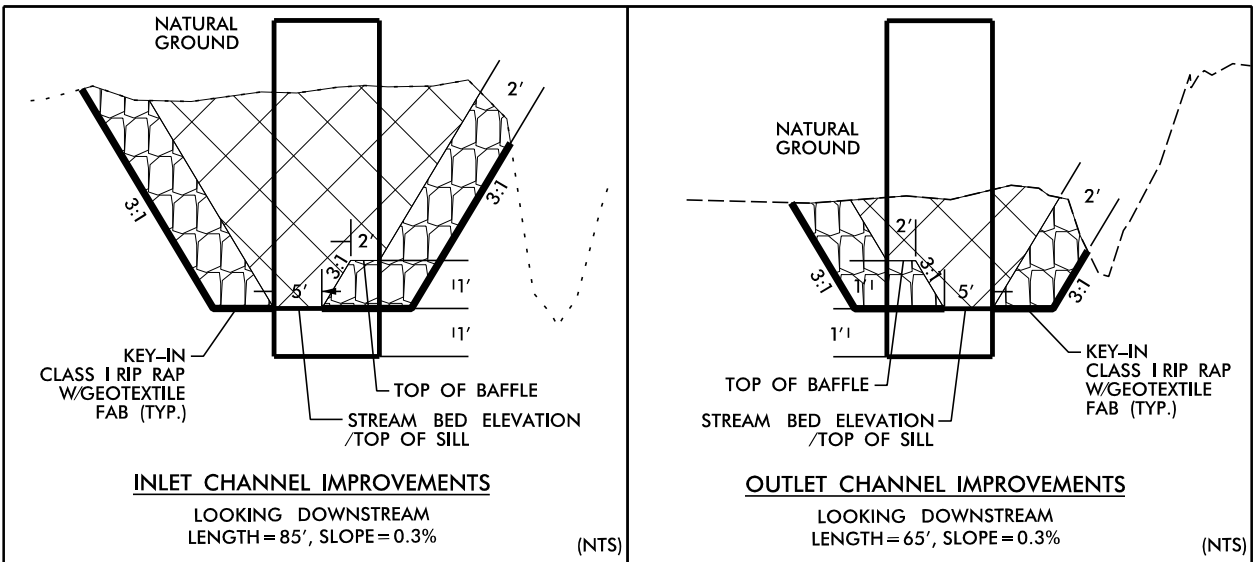
PROJECT REFERENCE NO.	SHEET NO.
1-5986A	2D-4
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

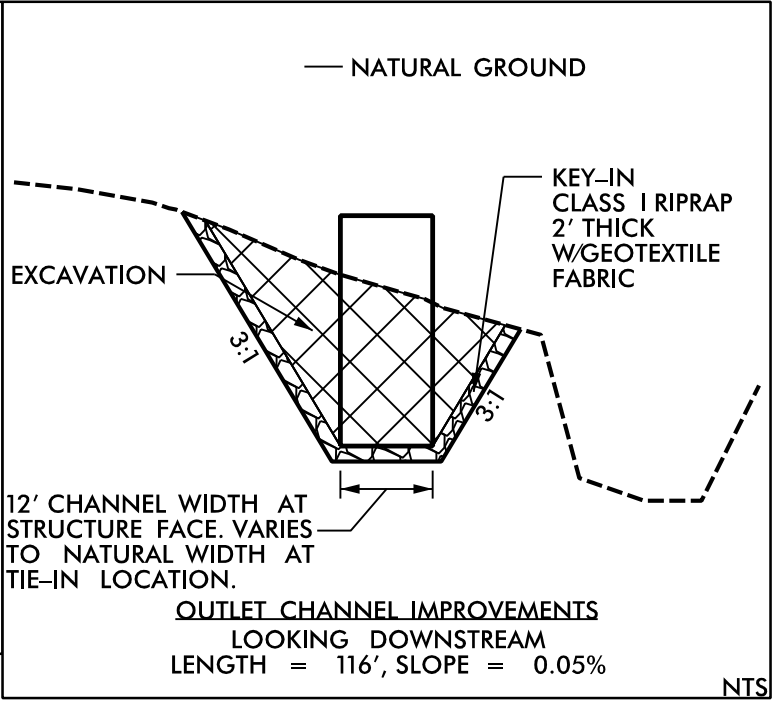
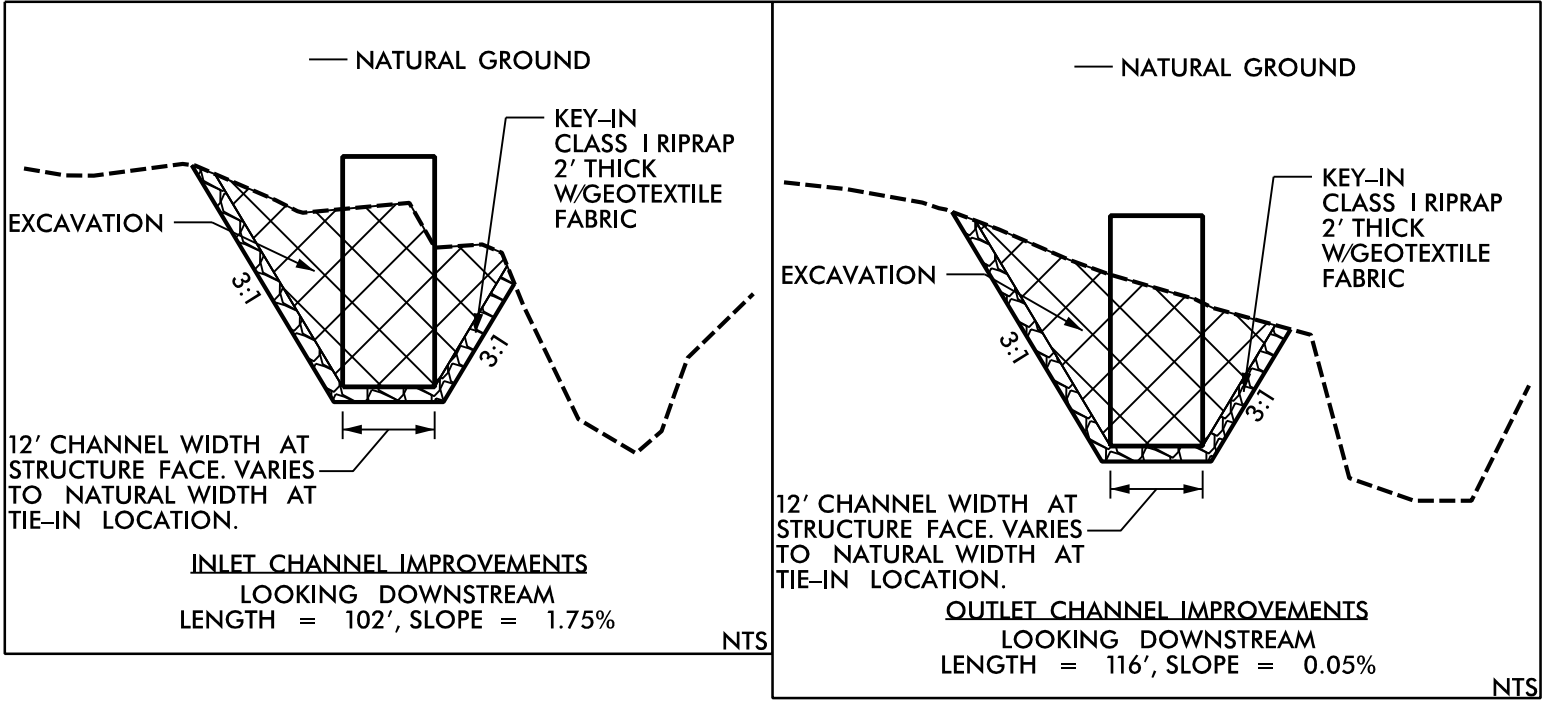
PERMIT DRAWING
SHEET 5 OF 163



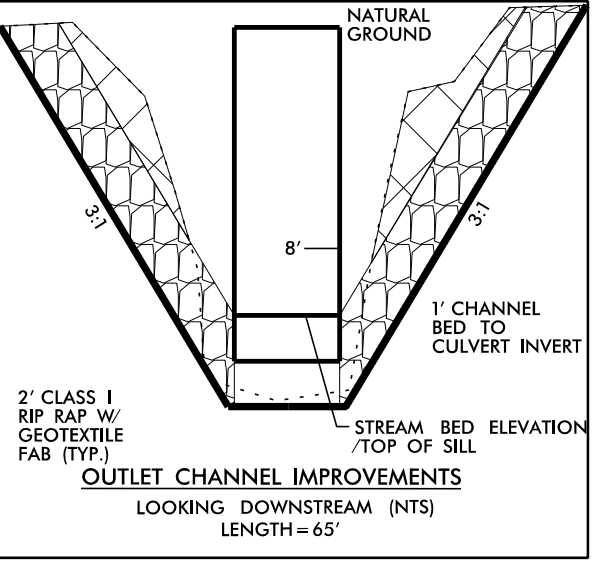
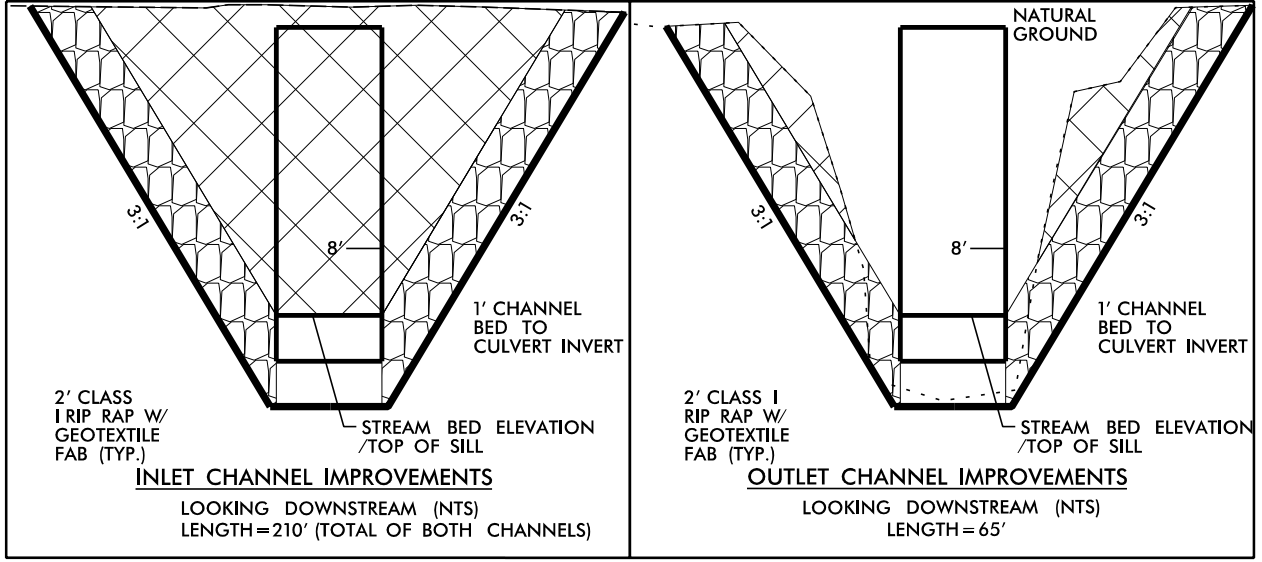
CULVERT INLET AND OUTLET DETAILS
-L- STA. 304+15



CULVERT INLET AND OUTLET DETAILS
-L- STA. 355+00



CULVERT INLET AND OUTLET DETAILS
-L- STA. 422+50.5



CULVERT INLET AND OUTLET DETAILS
-L- STA. 540+46

RK&K

P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112

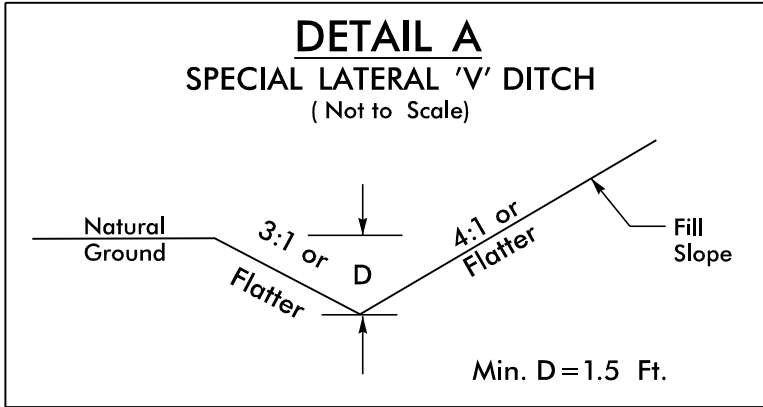
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

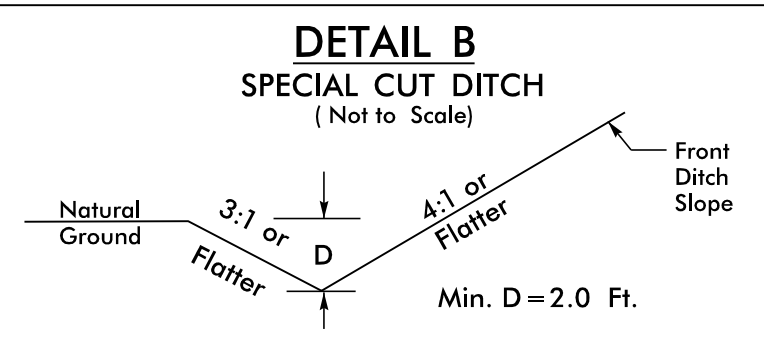
5/1/2020
F:\Hydraulics\PERMITS\Environmental\Drawings\4B\1-5986A_HYD.Ditch_Detail_Sec2.dgn
FKeys

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

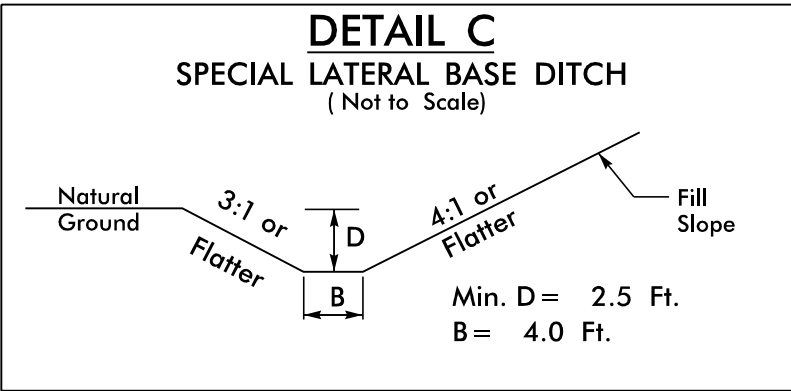
PERMIT DRAWING
SHEET 6 OF 163



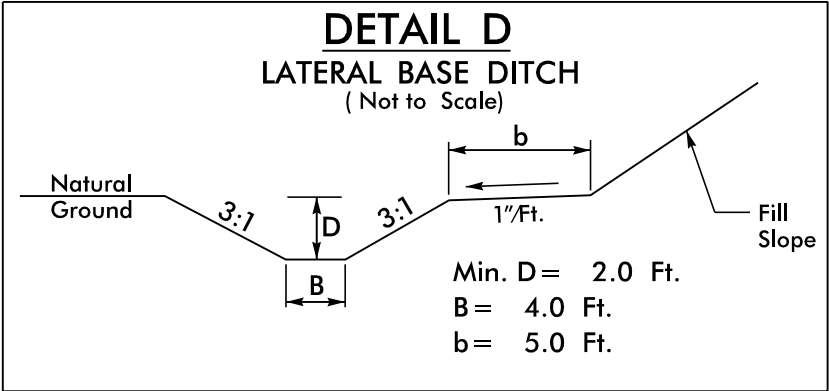
-L- STA. 626+93 TO STA. 629+50 LT
-L- STA. 627+50 TO STA. 629+00 RT
-L- STA. 735+00 TO STA. 735+85 LT
-L- STA. 740+00 TO STA. 742+50 LT
-L- STA. 761+00 TO STA. 761+35 LT



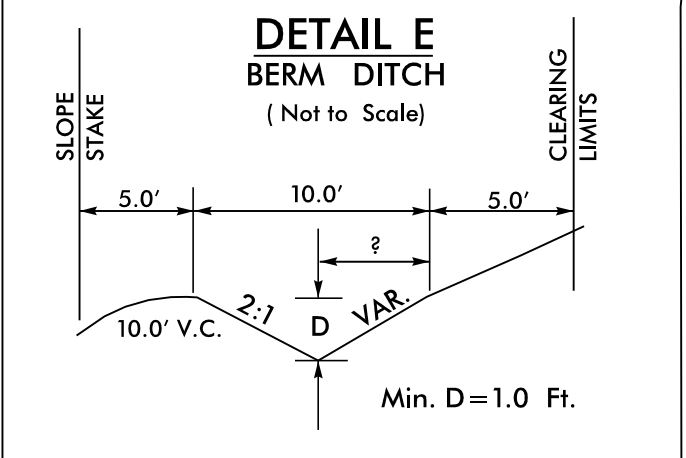
-L- STA. 582+00 TO STA. 585+00 LT
-L- STA. 595+00 TO STA. 599+50 LT
-L- STA. 599+00 TO STA. 600+00 RT
-L- STA. 609+50 TO STA. 610+50 LT
-L- STA. 620+00 TO STA. 620+50 LT
-L- STA. 629+50 TO STA. 635+00 LT
-L- STA. 629+00 TO STA. 637+00 RT
-L- STA. 647+00 TO STA. 649+00 LT
-L- STA. 646+00 TO STA. 650+50 RT
-L- STA. 653+00 TO STA. 659+00 RT
-L- STA. 696+00 TO STA. 709+00 LT
-L- STA. 711+50 TO STA. 715+00 RT
-L- STA. 711+50 TO STA. 735+00 LT
-L- STA. 725+50 TO STA. 726+50 RT
-L- STA. 731+50 TO STA. 732+50 RT
-L- STA. 742+50 TO STA. 753+00 LT
-L- STA. 758+50 TO STA. 759+00 LT
-L- STA. 760+00 TO STA. 761+00 LT
-SR5- STA. 14+00 TO STA. 17+96 RT
-SR5- STA. 20+92 TO STA. 22+92 RT
-SR5- STA. 33+47 TO STA. 37+00 RT
-SR5- STA. 37+50 TO STA. 41+50 LT
-Y9A- STA. 10+00 TO STA. 16+50 RT
-Y9A- STA. 10+00 TO STA. 16+00 LT
-Y9C- STA. 13+50 TO STA. 15+50 LT
-Y9C- STA. 13+00 TO STA. 15+50 RT
-Y9RPA- STA. 15+70 TO STA. 19+00 LT
-Y9RPA- STA. 14+73 TO STA. 18+50 RT
-Y9RPD- STA. 16+86 TO STA. 20+00 LT
-Y10- STA. 12+50 TO STA. 13+00 RT
-Y10- STA. 31+00 TO STA. 34+00 RT
-Y10- STA. 32+00 TO STA. 34+00 RT
-Y11- STA. 12+00 TO STA. 13+30 LT
-Y11- STA. 12+00 TO STA. 13+90 RT
-Y11- STA. 13+60 TO STA. 15+00 LT
-Y11- STA. 32+50 TO STA. 36+00 LT
-Y11DW- STA. 12+50 TO STA. 15+50 LT
-Y11DW- STA. 11+50 TO STA. 15+50 RT
-Y21- STA. 14+00 TO STA. 19+78 LT
Y21- STA. 14+50 TO STA. 16+82 RT



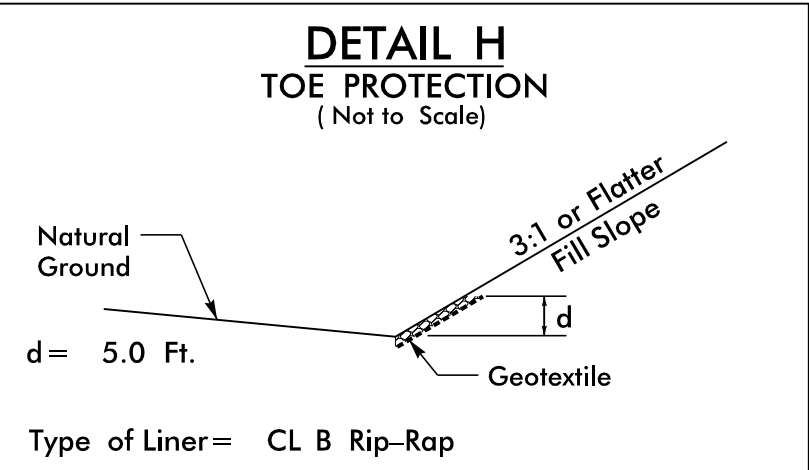
-L- STA. 541+75 TO STA. 550+50 LT
-L- STA. 620+50 TO STA. 622+47 RT
-L- STA. 756+50 TO STA. 758+50 LT
-Y9A- STA. 16+50 TO STA. 18+90 LT (3:1 FILL SLOPE)
-Y9C- STA. 13+50 TO STA. 15+50 LT
-Y10- STA. 15+00 TO STA. 16+00 RT



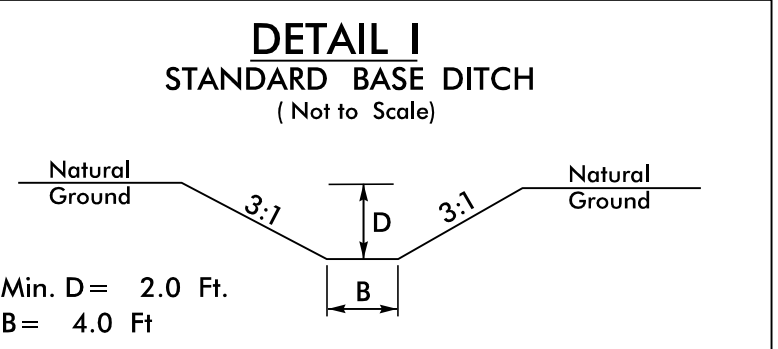
-L- STA. 573+00 TO STA. 573+60 LT
-L- STA. 639+50 TO STA. 640+35 RT
-L- STA. 642+70 TO STA. 646+00 RT
-L- STA. 656+00 TO STA. 660+10 LT
-L- STA. 666+00 TO STA. 667+00 LT
-L- STA. 694+80 TO STA. 696+50 RT
-L- STA. 699+50 TO STA. 704+40 RT
-L- STA. 732+50 TO STA. 742+00 RT
-L- STA. 745+50 TO STA. 756+40 RT
-L- STA. 753+00 TO STA. 756+40 LT
-L- STA. 754+00 TO STA. 776+50 LT
-SR5- STA. 17+96 TO STA. 19+55 RT
-SR5- STA. 19+65 TO STA. 20+92 RT
-Y9A- STA. 16+50 TO STA. 18+90 RT
-Y9C- STA. 11+40 TO STA. 13+00 RT
-Y9RPB- STA. 20+50 TO STA. 23+50 LT
-Y10- STA. 24+00 TO STA. 28+75 RT
-Y11- STA. 14+20 TO STA. 19+00 RT
-Y11- STA. 15+00 TO STA. 21+50 LT
-Y21- STA. 19+78 TO STA. 24+50 LT
-Y21- STA. 25+00 TO STA. 34+00 LT



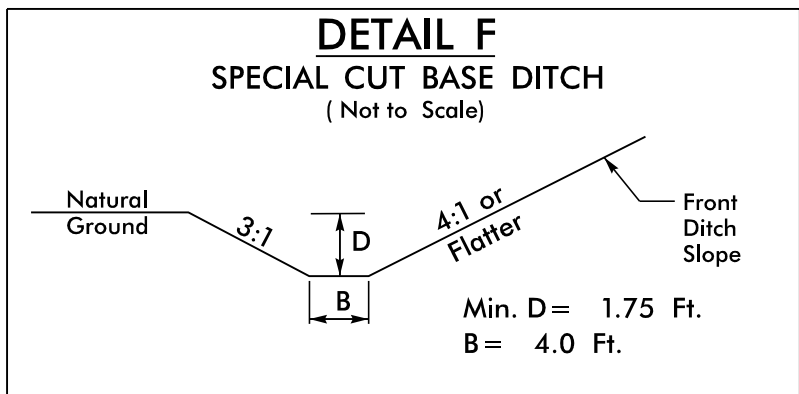
DETAIL NOT USED IN SECTION 3



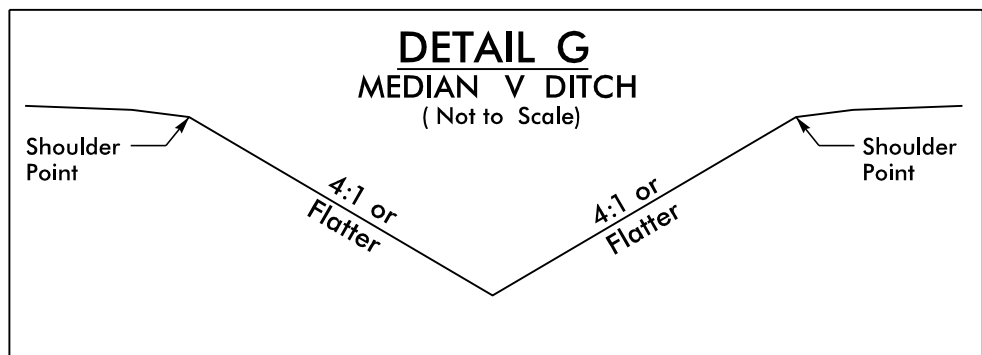
-L- STA. 605+75 TO STA. 606+83 LT
-L- STA. 622+50 TO STA. 627+00 LT
-L- STA. 625+75 TO STA. 627+50 RT
-L- STA. 674+70 TO STA. 677+10 RT
-L- STA. 678+75 TO STA. 684+10 RT
-L- STA. 692+30 TO STA. 694+76 RT
-L- STA. 735+85 TO STA. 736+10 LT
-Y9RPA- STA. 10+00 TO STA. 13+30 RT
-Y10- STA. 16+00 TO STA. 18+00 RT



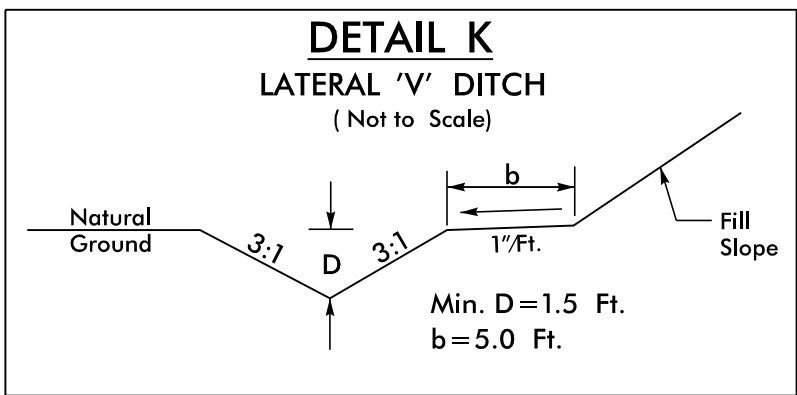
-L- STA. 695+15 TO STA. 696+00 LT,
BEG. EL=128.85', END EL=129.15', L=95', S=0.3%
-L- STA. 761+30 LT,
BEG. EL=145.03', END EL=144.20', L=28', S=3.0%
-Y9B- STA. 13+00 TO 14+05 LT,
BEG. EL=151.25', END EL=152.05', L=105', S=0.8%
-Y9B- STA. 16+47 TO 17+00 LT,
BEG. EL=152.60', END EL=151.20', L=53', S=2.6%
-Y9C- STA. 11+40 RT,
BEG. EL=153.80', END EL=151.00', L=300', S=0.9%
-Y9RPA- STA. 16+20 RT,
BEG. EL=150.32', END EL=150.15', L=54', S=0.3%



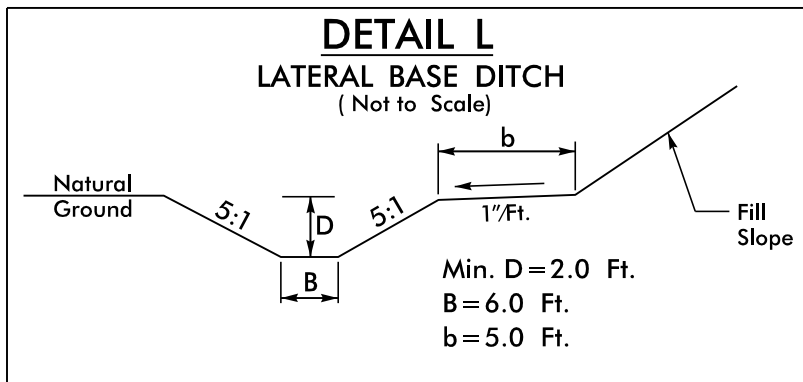
-L- STA. 550+50 TO STA. 573+00 LT
-L- STA. 585+00 TO STA. 590+15 LT
-L- STA. 585+00 TO STA. 590+50 RT
-L- STA. 594+50 TO STA. 599+00 RT
-L- STA. 637+50 TO STA. 639+50 RT
-L- STA. 654+50 TO STA. 656+00 LT
-L- STA. 659+00 TO STA. 660+10 RT
-L- STA. 660+10 TO STA. 666+00 LT
-L- STA. 696+50 TO STA. 699+50 RT
-L- STA. 742+00 TO STA. 745+50 RT
-Y9RPD- STA. 10+23 TO STA. 16+86 LT
-SR5- STA. 36+28 TO STA. 37+50 LT
-Y10- STA. 13+00 TO STA. 15+00 RT



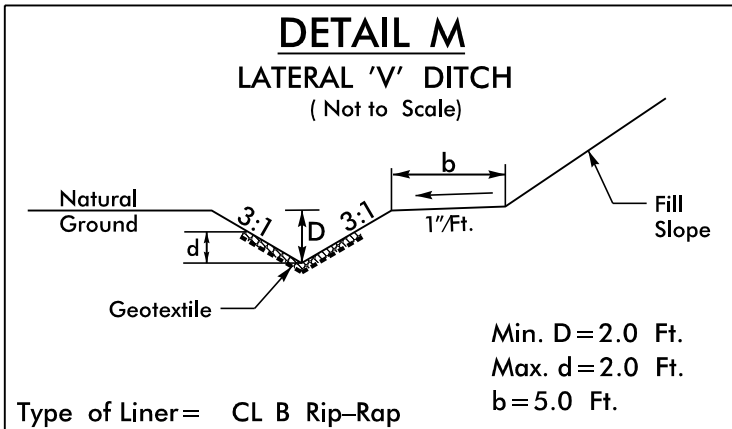
-L- STA. 557+50 TO STA. 574+00 RT
-L- STA. 599+50 TO STA. 600+50 LT
-L- STA. 643+00 TO STA. 647+00 LT



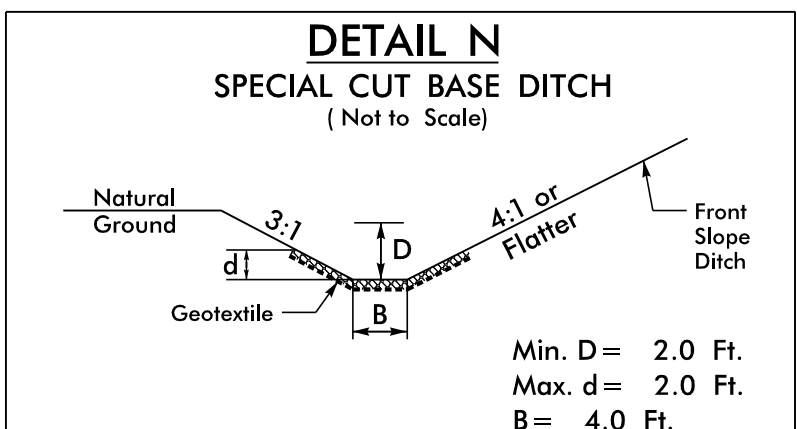
-Y9RPD- STA. 18+29 TO STA. 24+50 RT
-Y10- STA. 20+00 TO STA. 21+30 RT
-Y10- STA. 27+86 TO STA. 31+00 LT
-Y10- STA. 28+75 TO STA. 32+00 RT
-Y11- STA. 26+00 TO STA. 27+00 RT
-Y21- STA. 31+00 TO STA. 36+00 RT



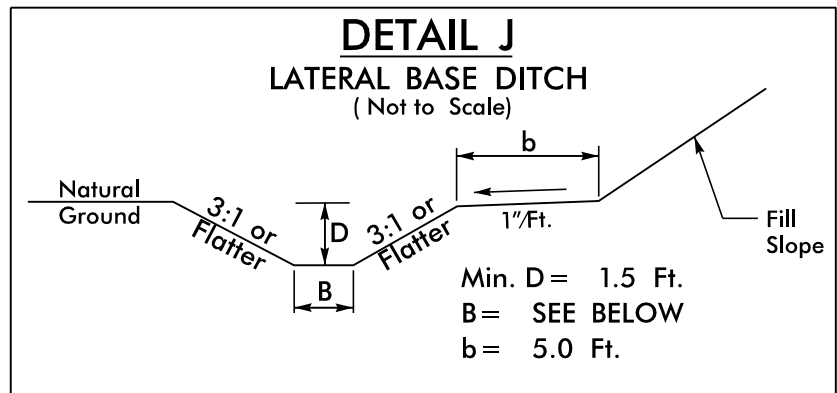
DETAIL NOT USED IN SECTION 3



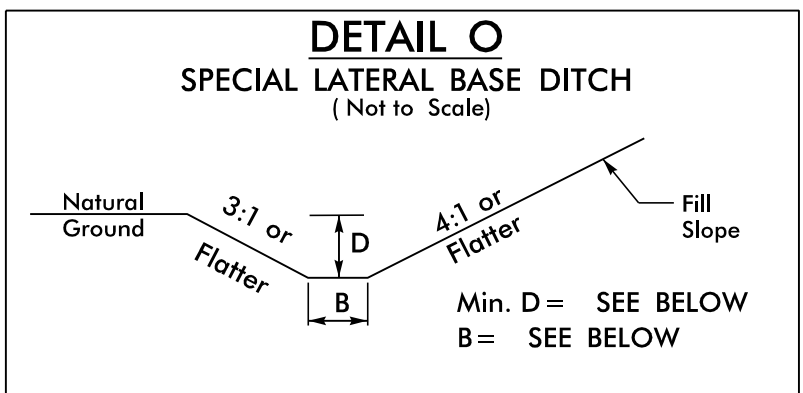
DETAIL NOT USED IN SECTION 3



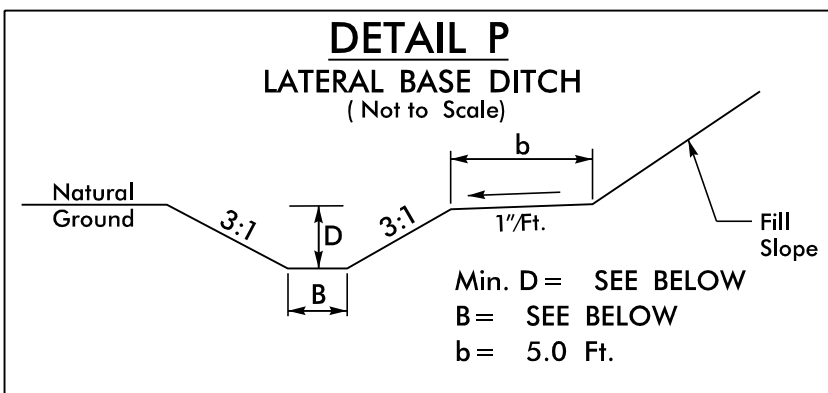
DETAIL NOT USED IN SECTION 3



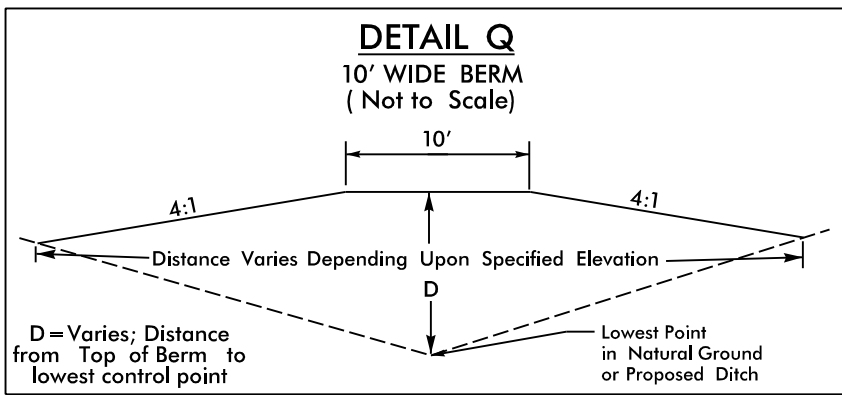
DETAIL NOT USED IN SECTION 3



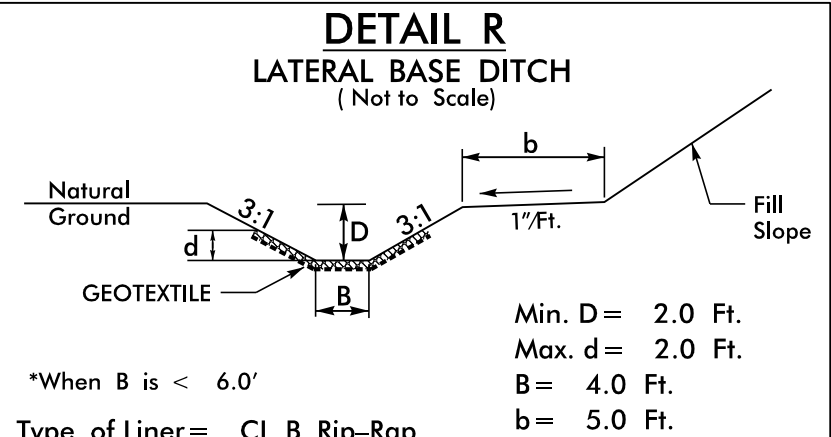
DETAIL NOT USED IN SECTION 3



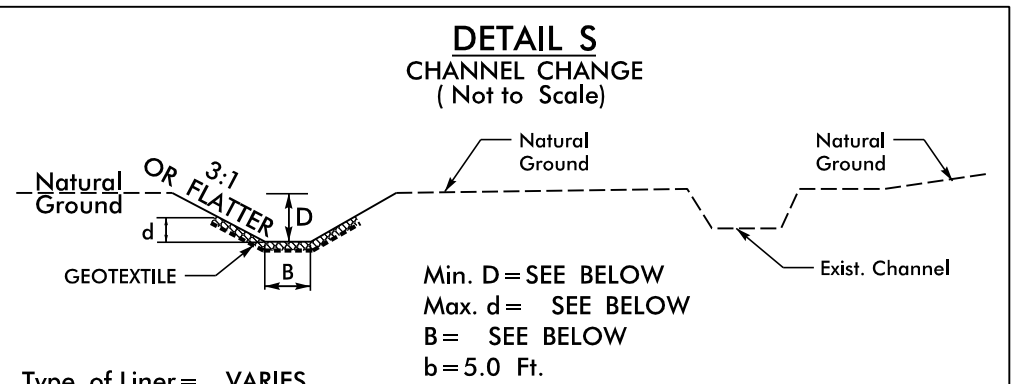
-L- STA. 704+55 TO STA. 709+40 RT, B=10', D=2.0'
-L- STA. 756+40 TO STA. 758+00 RT, B=12', D=2.5'



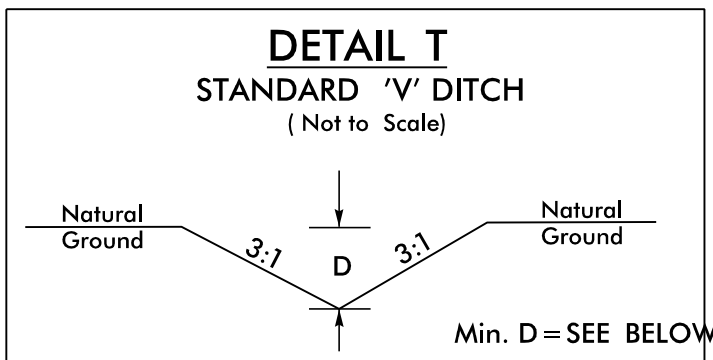
-L- STA. 642+70 LT, TOP ELEV=148.1'
-L- STA. 759+00 LT, TOP ELEV=148.5'
-L- STA. 762+00 LT, TOP ELEV=146.8'



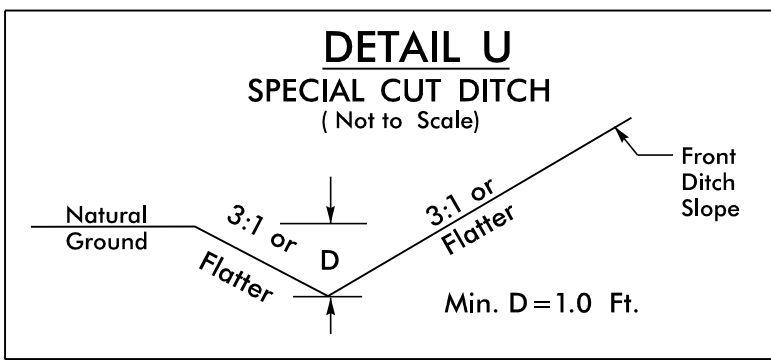
DETAIL NOT USED IN SECTION 3



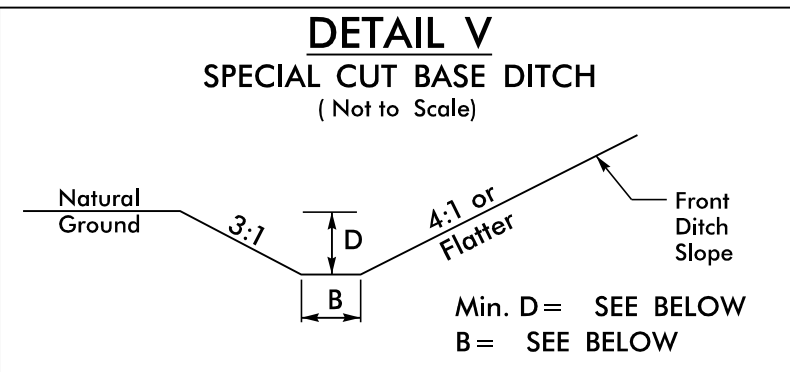
-L- STA. 766+40 LT, B=6', CL I RIPRAP, MIN D=3.0'
BEG. EL=138.55', END EL=137.85', L=55', S=1.3%
-L- STA. 766+40 RT, B=6', CL II RIPRAP, MIN D=3.0'
BEG. EL=134.80', END EL=134.35', L=48', S=0.9%



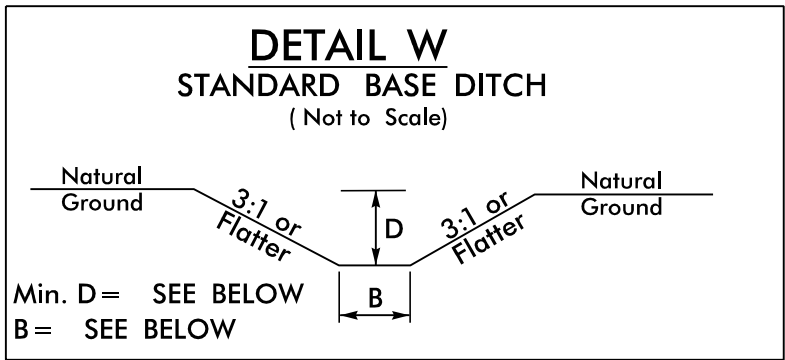
-L- STA. 735+85 LT,
BEG. EL=144.50', END EL=144.53', L=20', S=0.2%



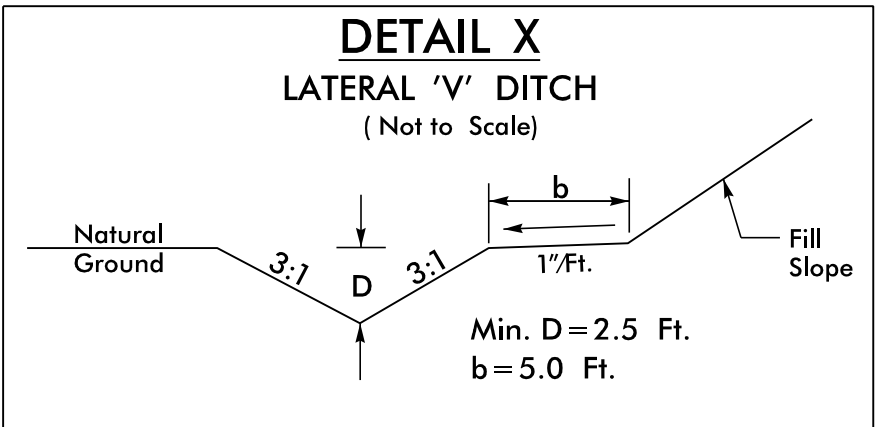
DETAIL NOT USED IN SECTION 3



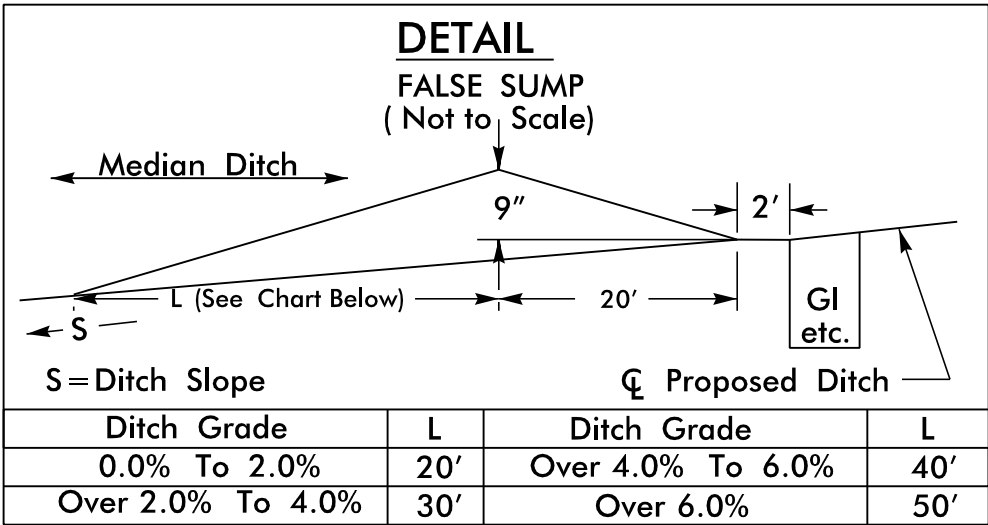
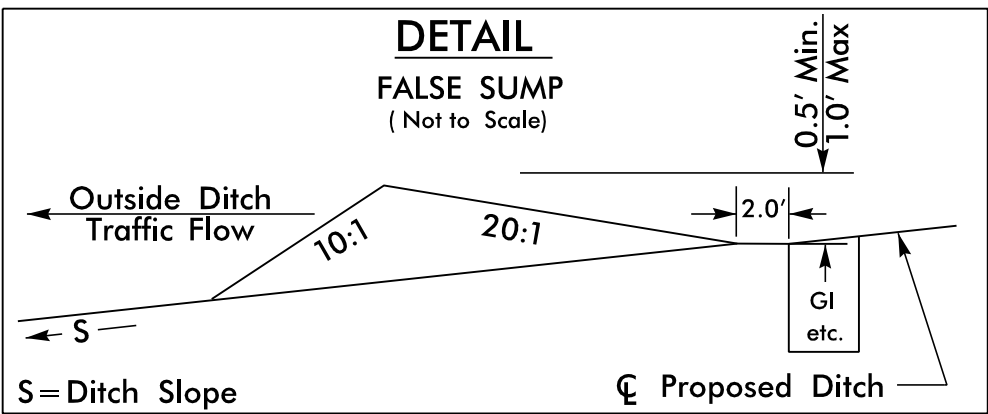
-Y9C- STA. 16+50 TO STA. 19+00 RT, MIN D=1.0', B=2'



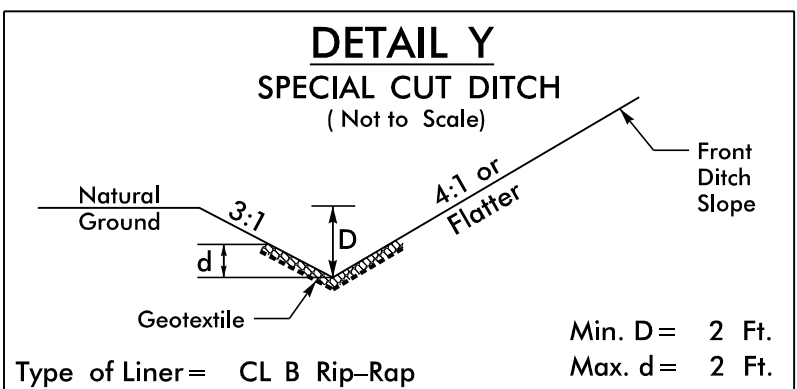
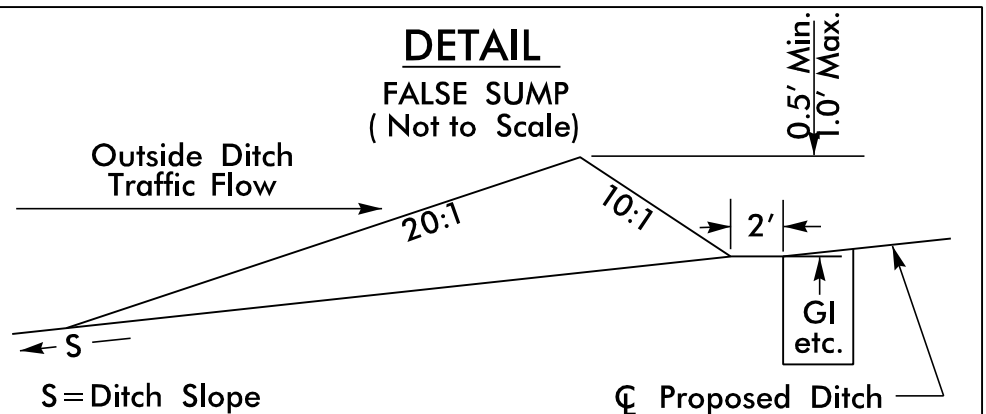
DETAIL NOT USED IN SECTION 3



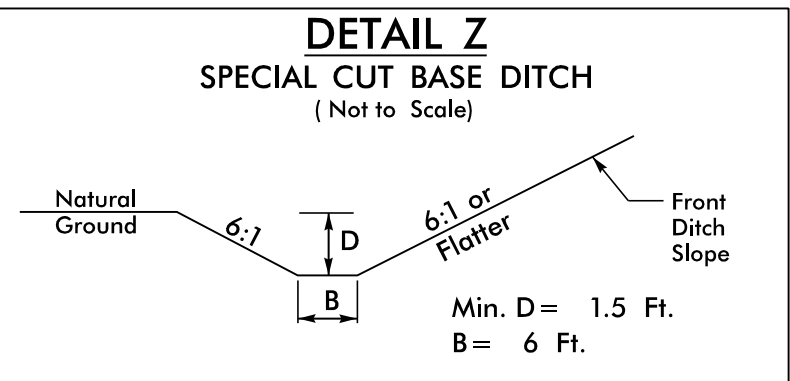
DETAIL NOT USED IN SECTION 3



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'



-L- STA. 654+00 TO STA. 654+50 LT



DETAIL NOT USED IN SECTION 3

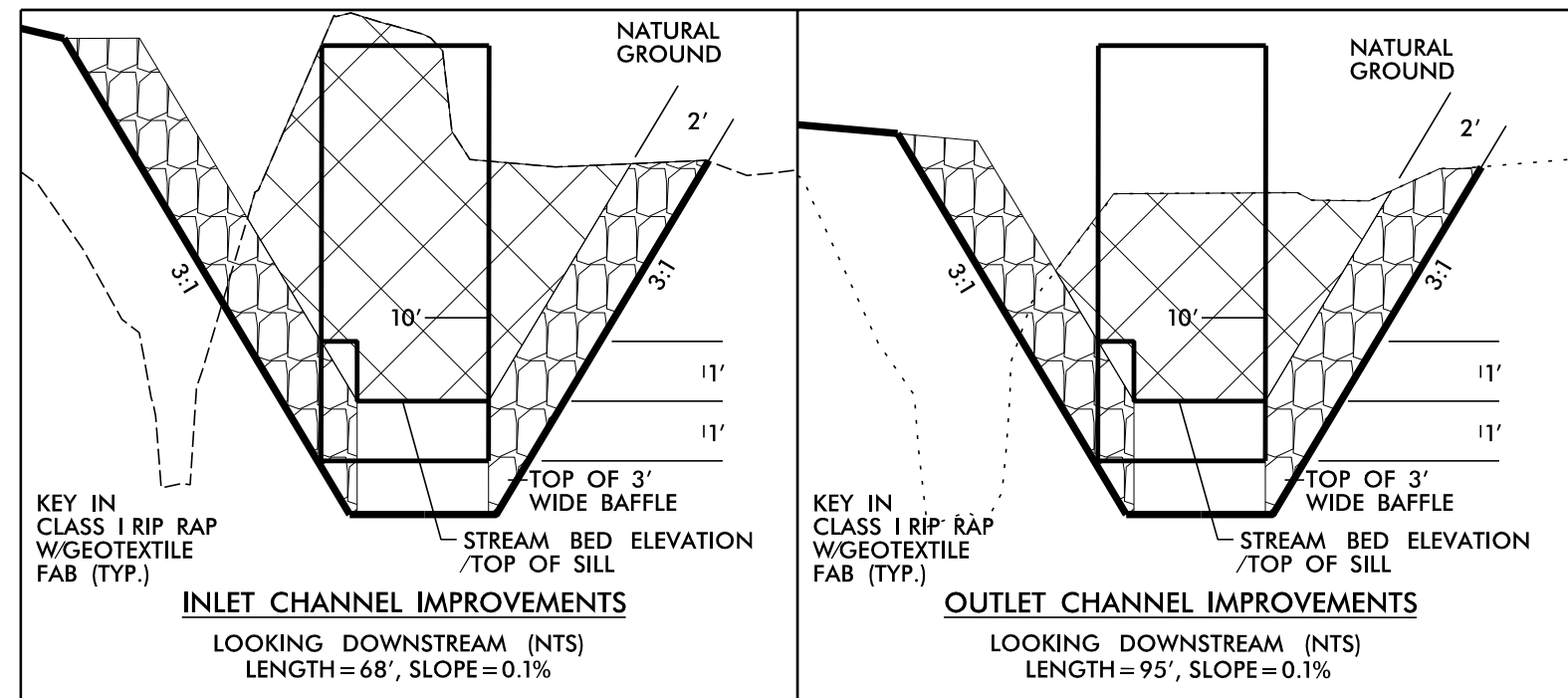
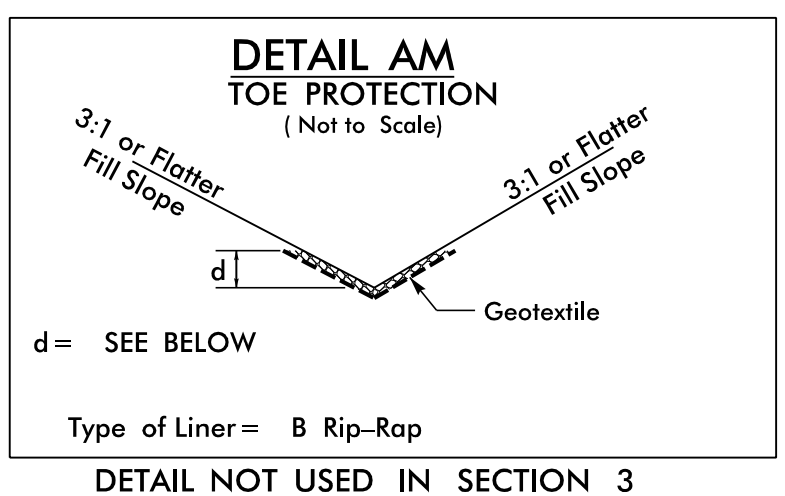
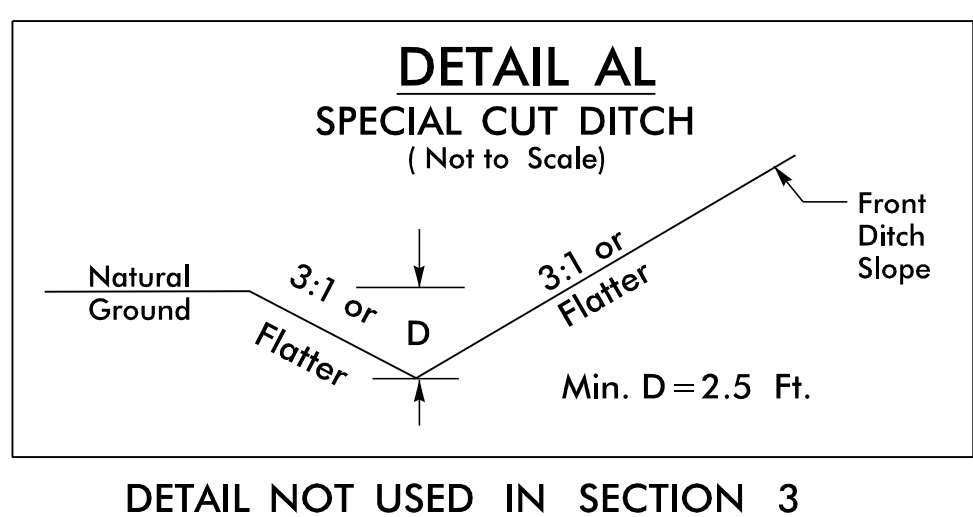
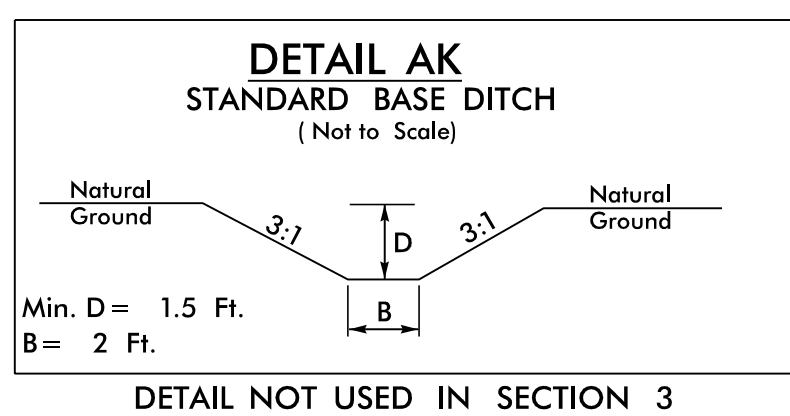
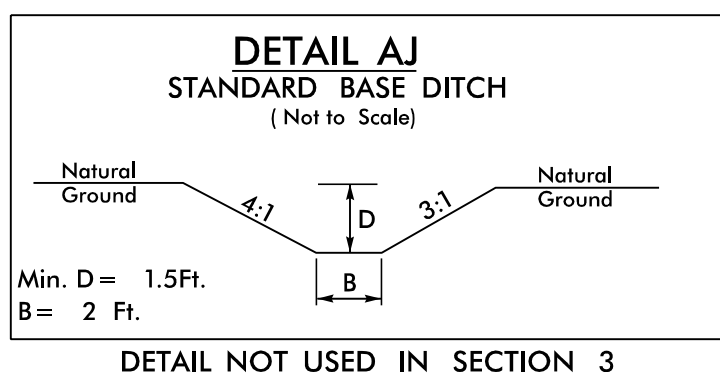
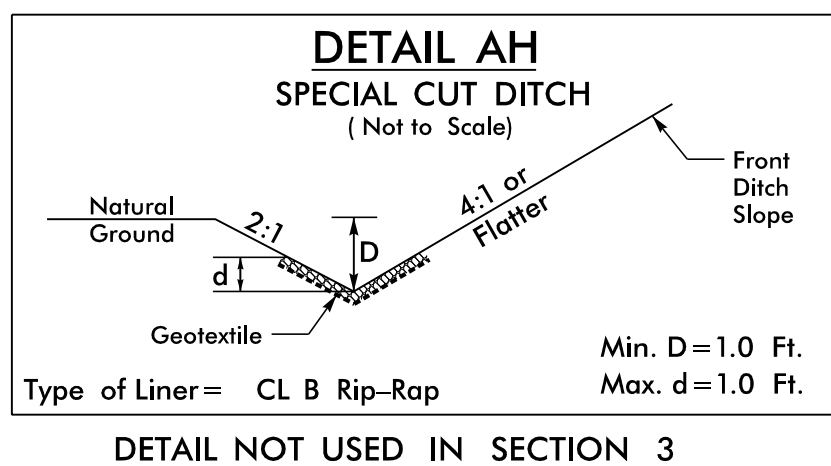
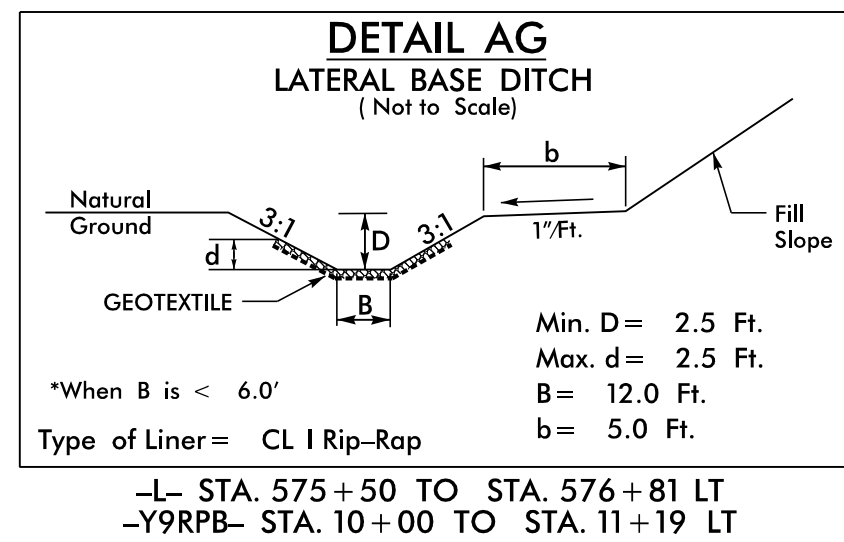
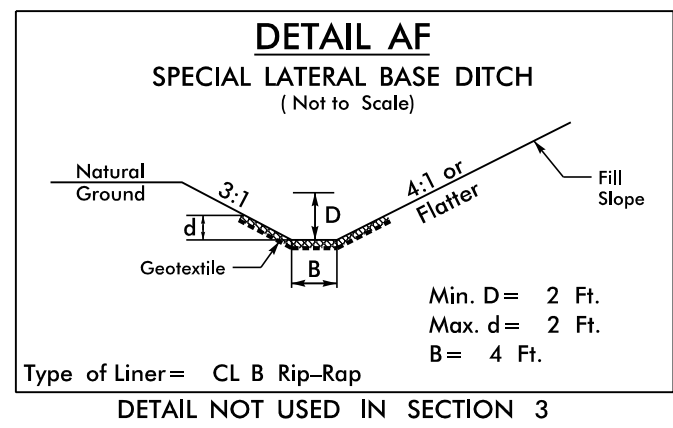
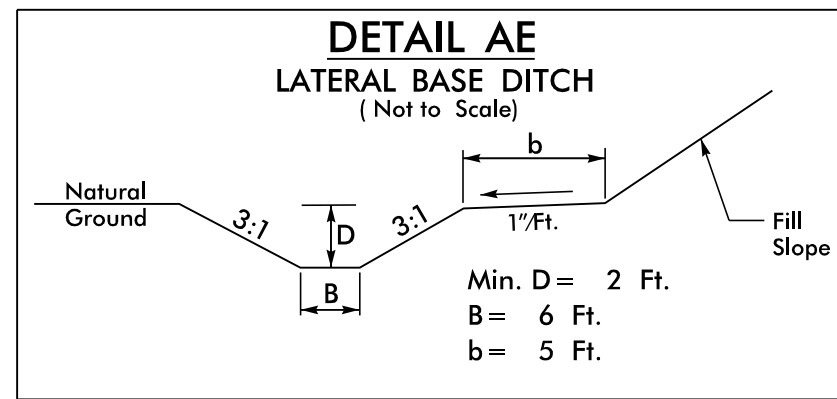
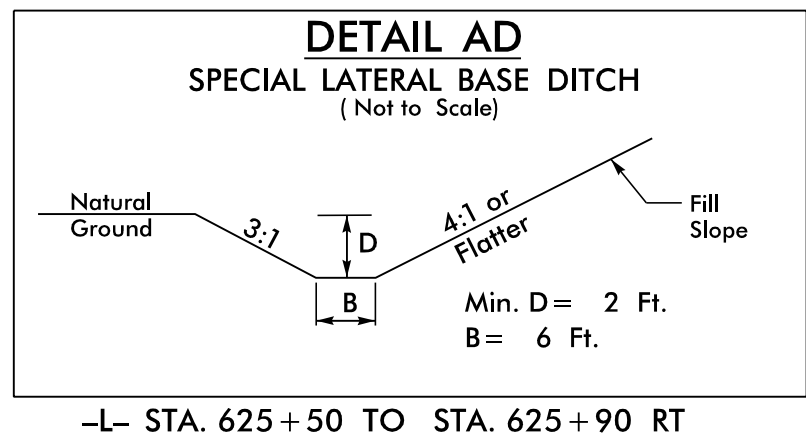
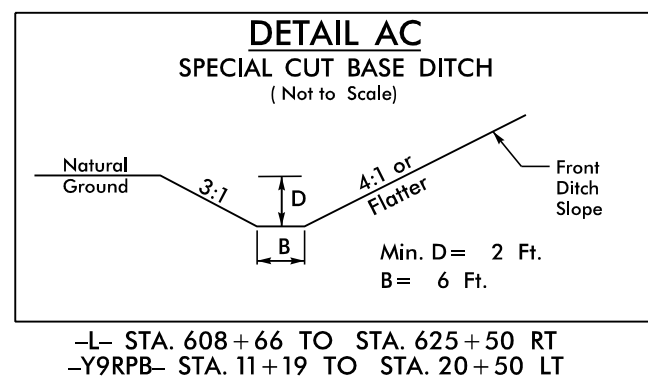
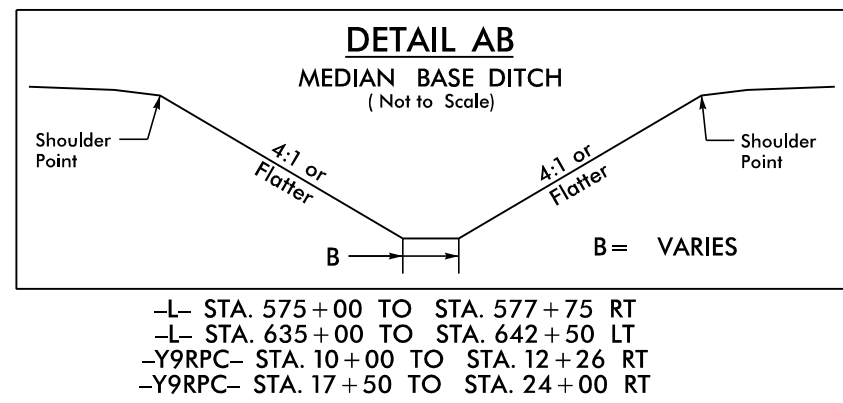
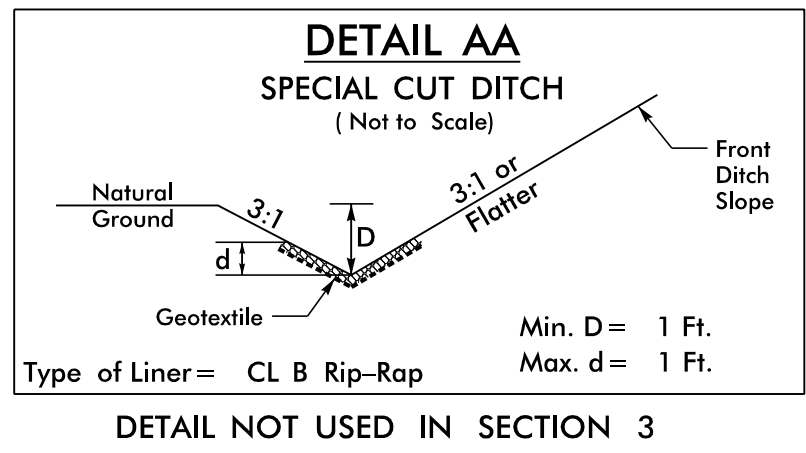


P: (919) 878-9560
900 Ridgefield Drive Suite 350 | Raleigh, North Carolina 27609-3960
NC License No. F-0112

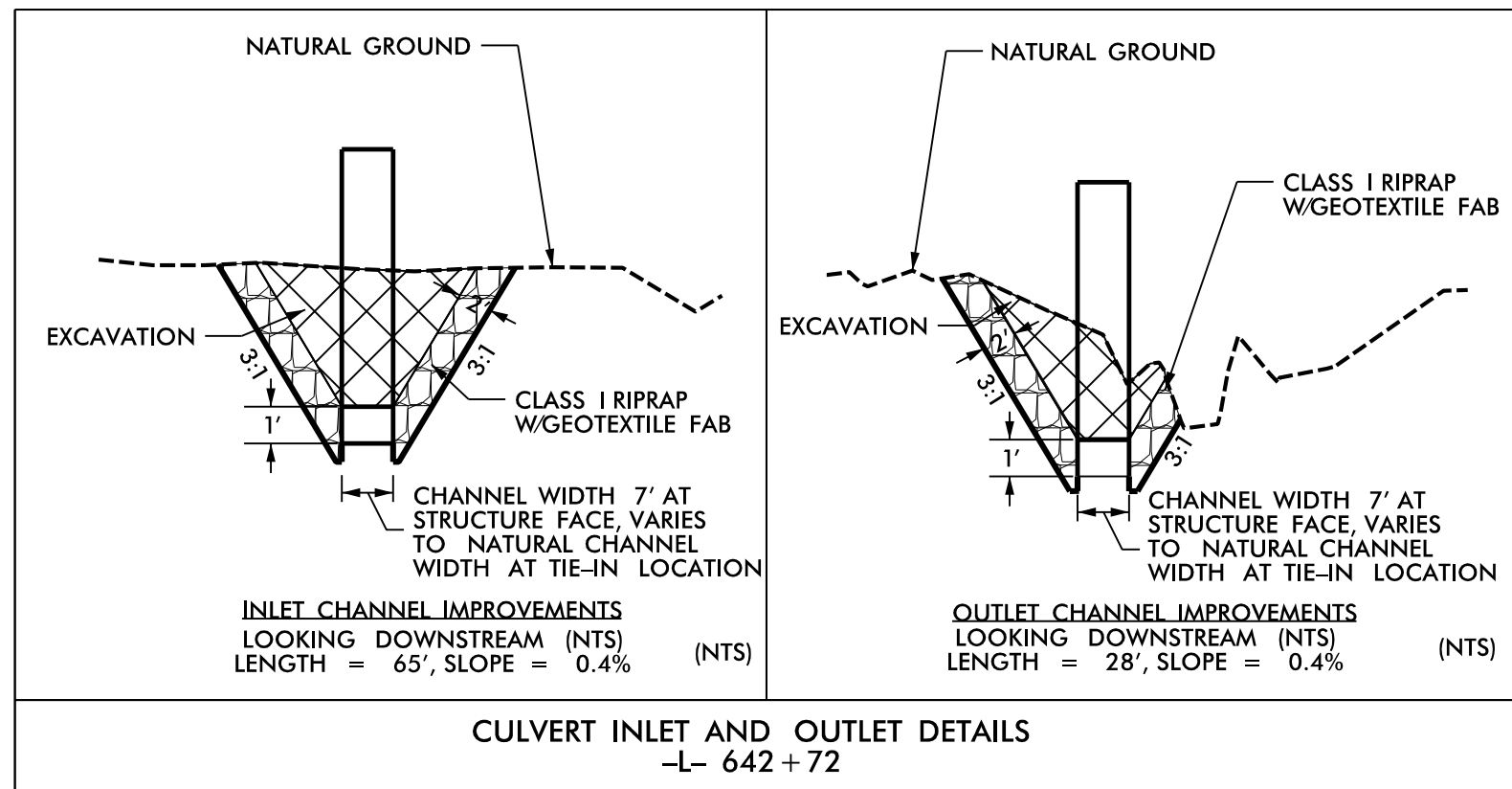
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

5/1/2020
F:\Hydraulics\PERMITS\Environmental\Drawings\4B\I-5986A_HYD.Ditch_Detail_Sec3.dgn
FKeys



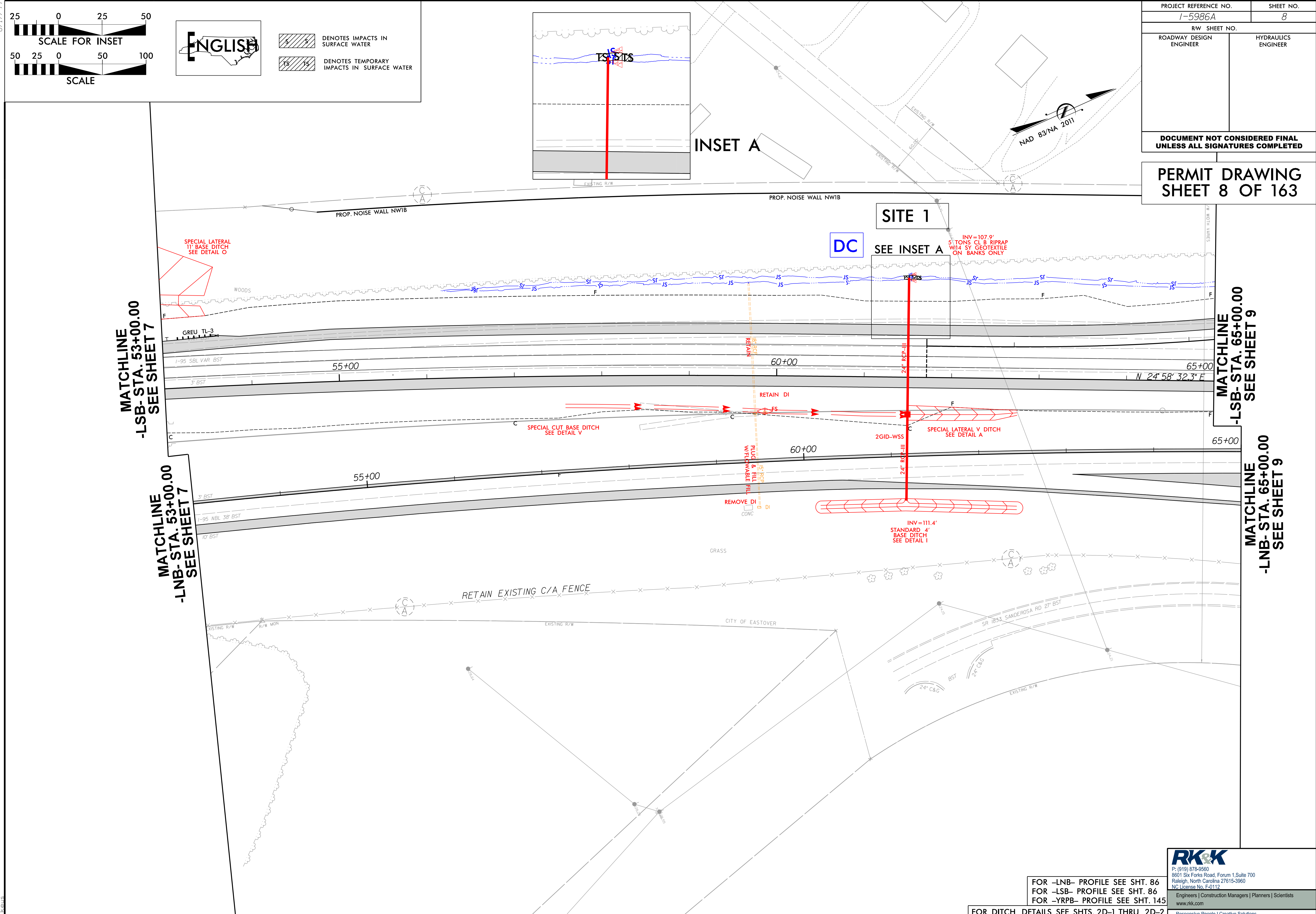
CULVERT INLET AND OUTLET DETAILS
—L— 574+71



CULVERT INLET AND OUTLET DETAILS
—L— 642+72

PROJECT REFERENCE NO.	SHEET NO.
I-5986A	2D-6
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 7 OF 163	

8/17/99
S:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh08.dgn
RKK



PROJECT REFERENCE NO. I-5986A		SHEET NO. 8	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

PERMIT DRAWING
SHEET 8 OF 163

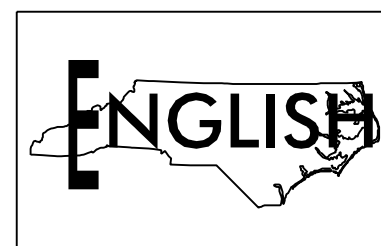
FOR -LNB- PROFILE SEE SHT. 86
FOR -LSB- PROFILE SEE SHT. 86
FOR -YRPB- PROFILE SEE SHT. 145

FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RKK

P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



The diagram shows a 2D lattice with a vertical red line (defect) and a blue line (surface) intersecting at a red triangle. The labels 'TS' and 'NTS' are placed on either side of the intersection. A dashed line is labeled '110' and a solid line is labeled '100'.

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

MATCHLINE
-LSB- STA. 53+00.00
SEE SHEET 7

MATCHLINE
-LNB- STA. 53+00.00
SEE SHEET 7

MATCHLINE
-LSB- STA. 65+00.00
SEE SHEET 9

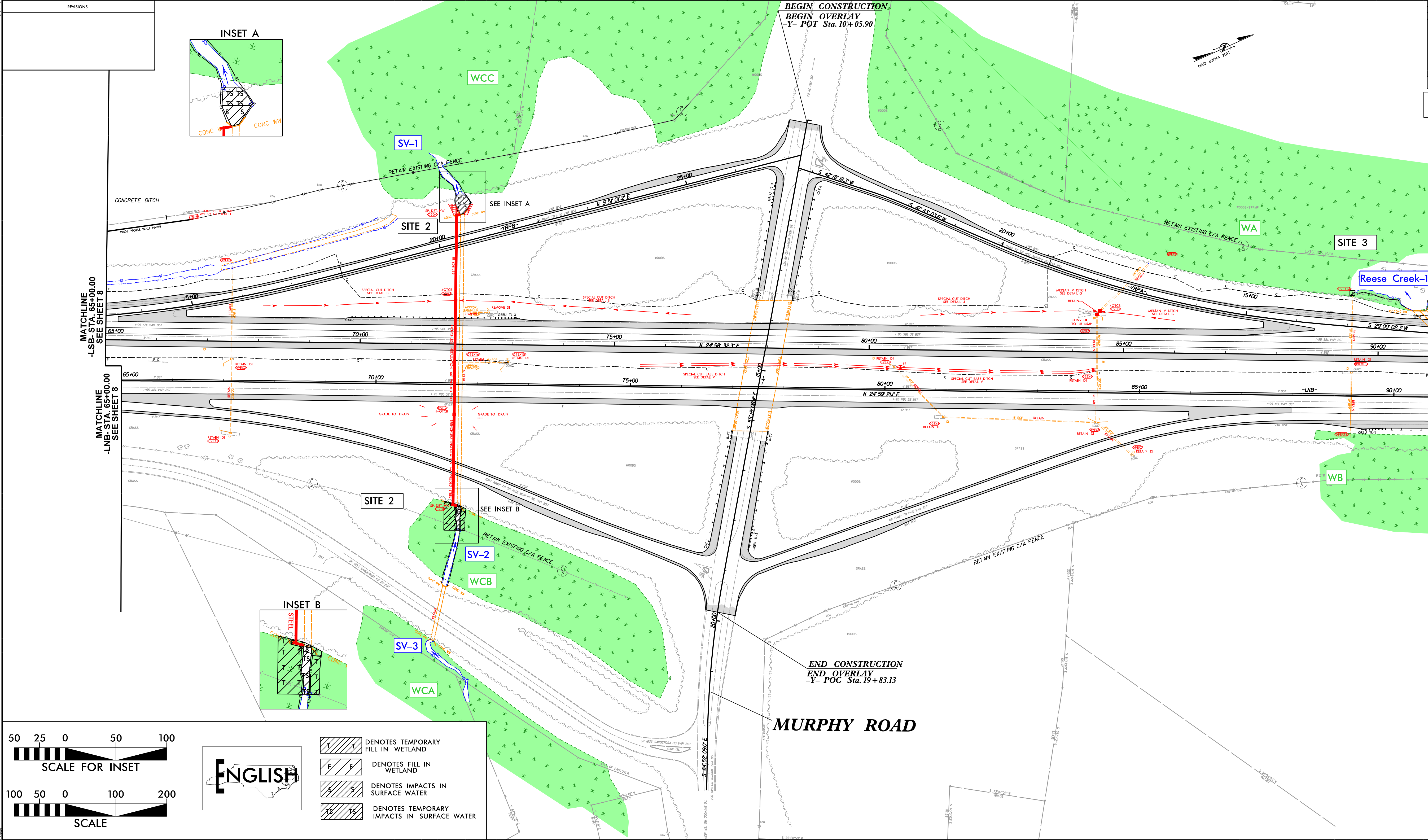
MATCHLINE
-LNB- STA. 65+00.00
SEE SHEET 9

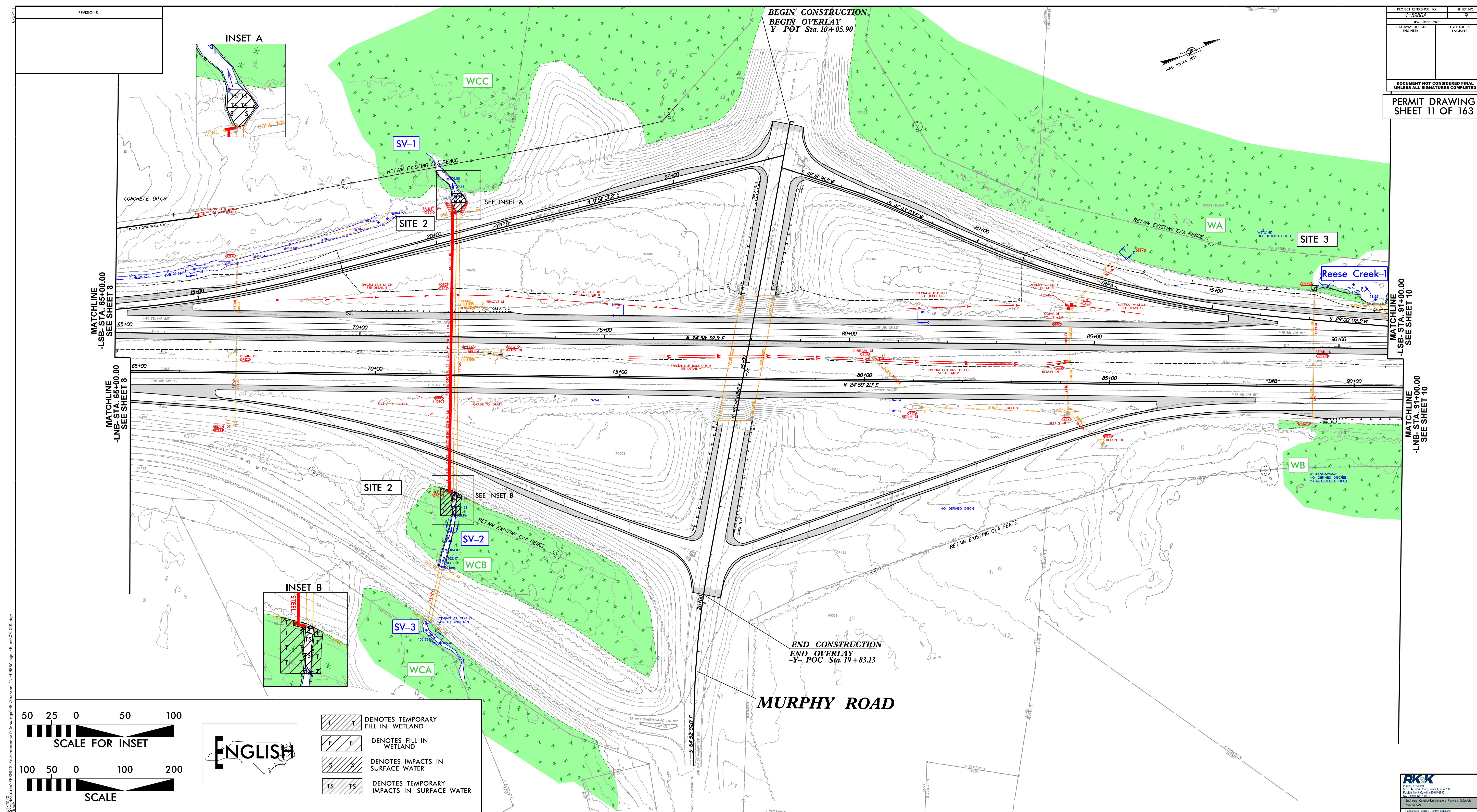
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

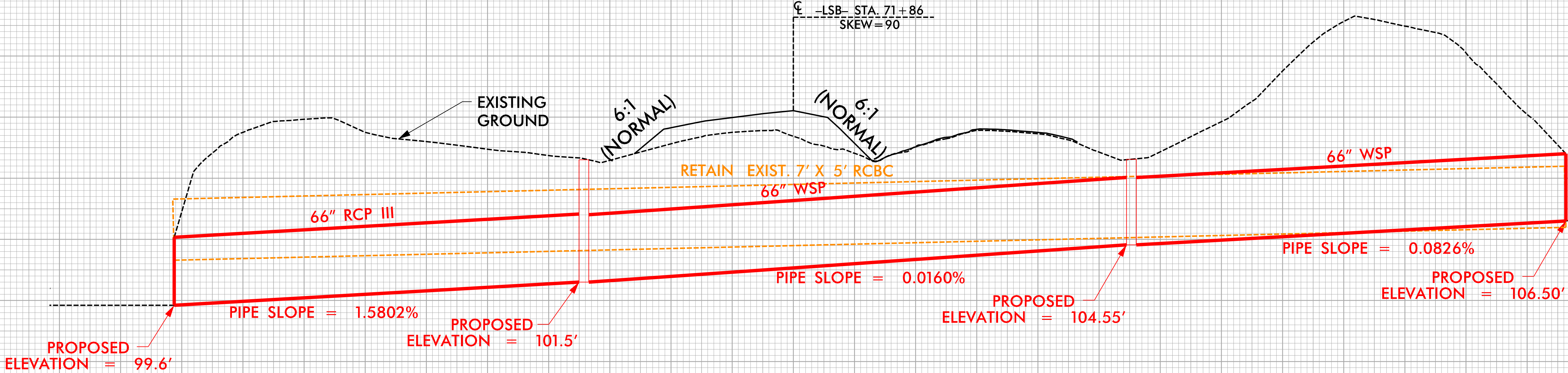
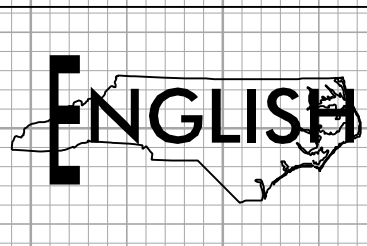




PROJECT REFERENCE NO.	SHEET NO.
I-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 2
-LSB- STA. 71+86

PERMIT DRAWING
SHEET 12 OF 163

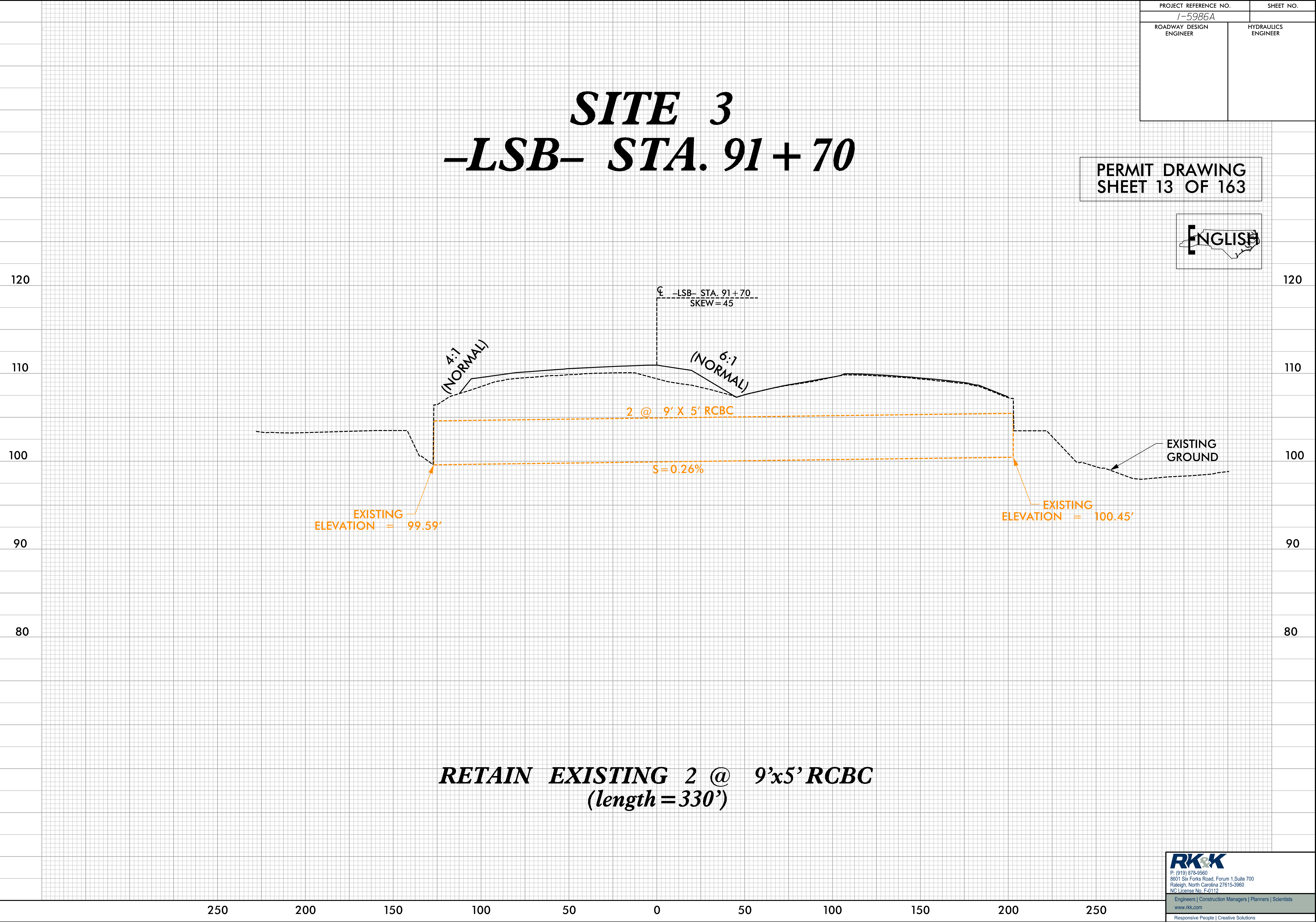
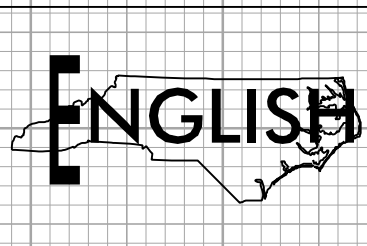


TRENCHLESS INSTALLATION 66" WELDED STEEL AND 66" RCP-III
(not buried)
(length = 394')

PROJECT REFERENCE NO.		SHEET NO.
I-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 3
-LSB- STA. 91+70

PERMIT DRAWING
SHEET 13 OF 163

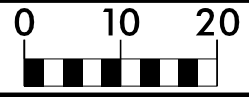


RETAIN EXISTING 2 @ 9'x5' RCBC
(length = 330')

6/23/16

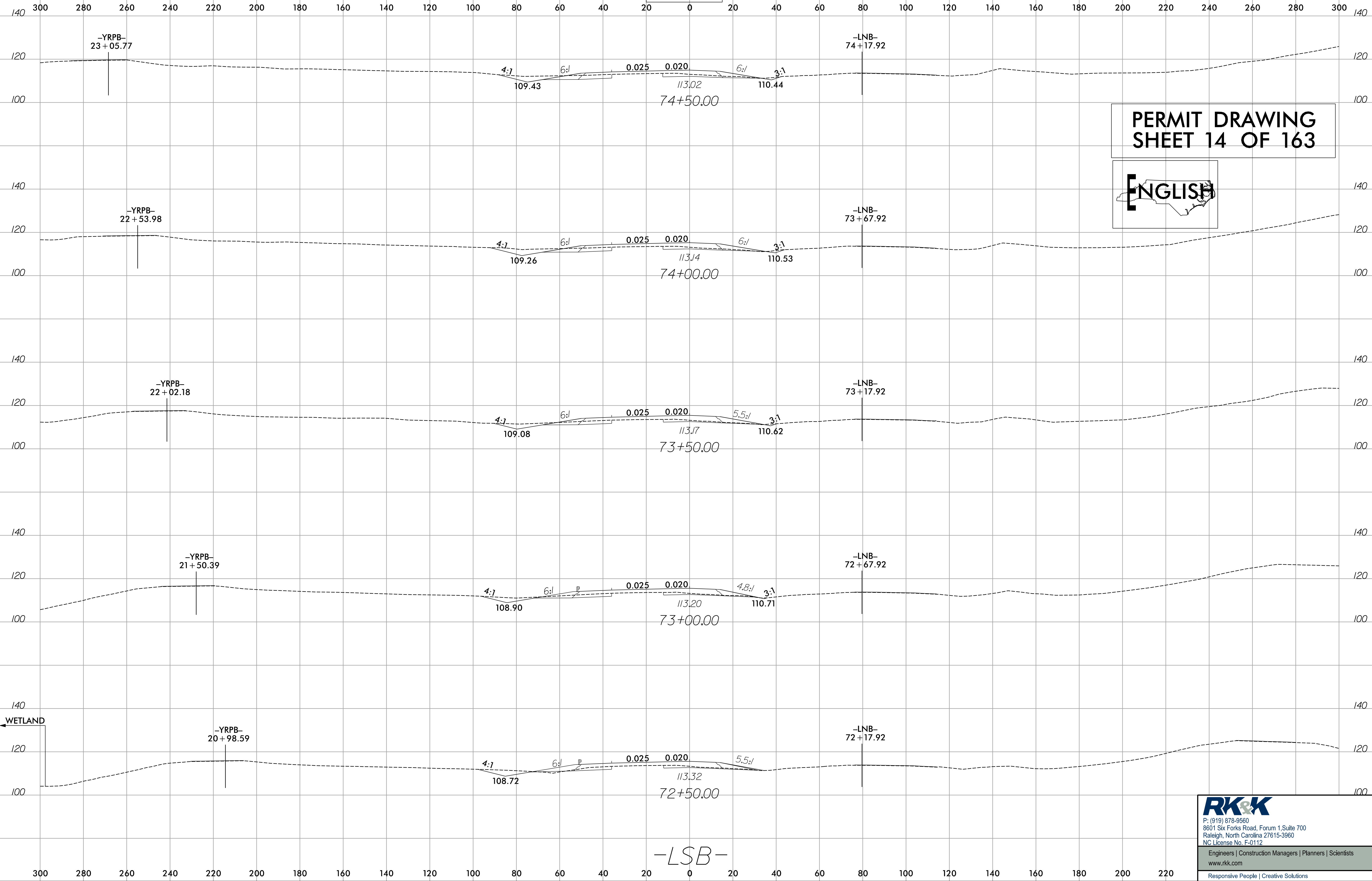
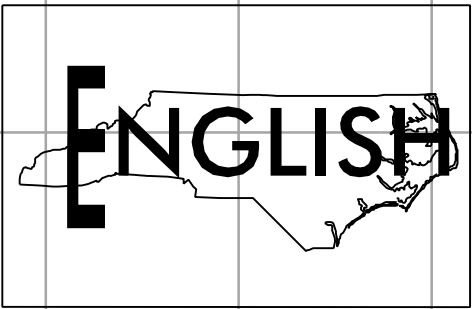
5/1/2020
R:\Hydraulic\PERMITS\Environmental\Drawings\4\I-5986A_hyd-prm_wet_XPL_USB_SITE02.dgn
kajls

SITE 2



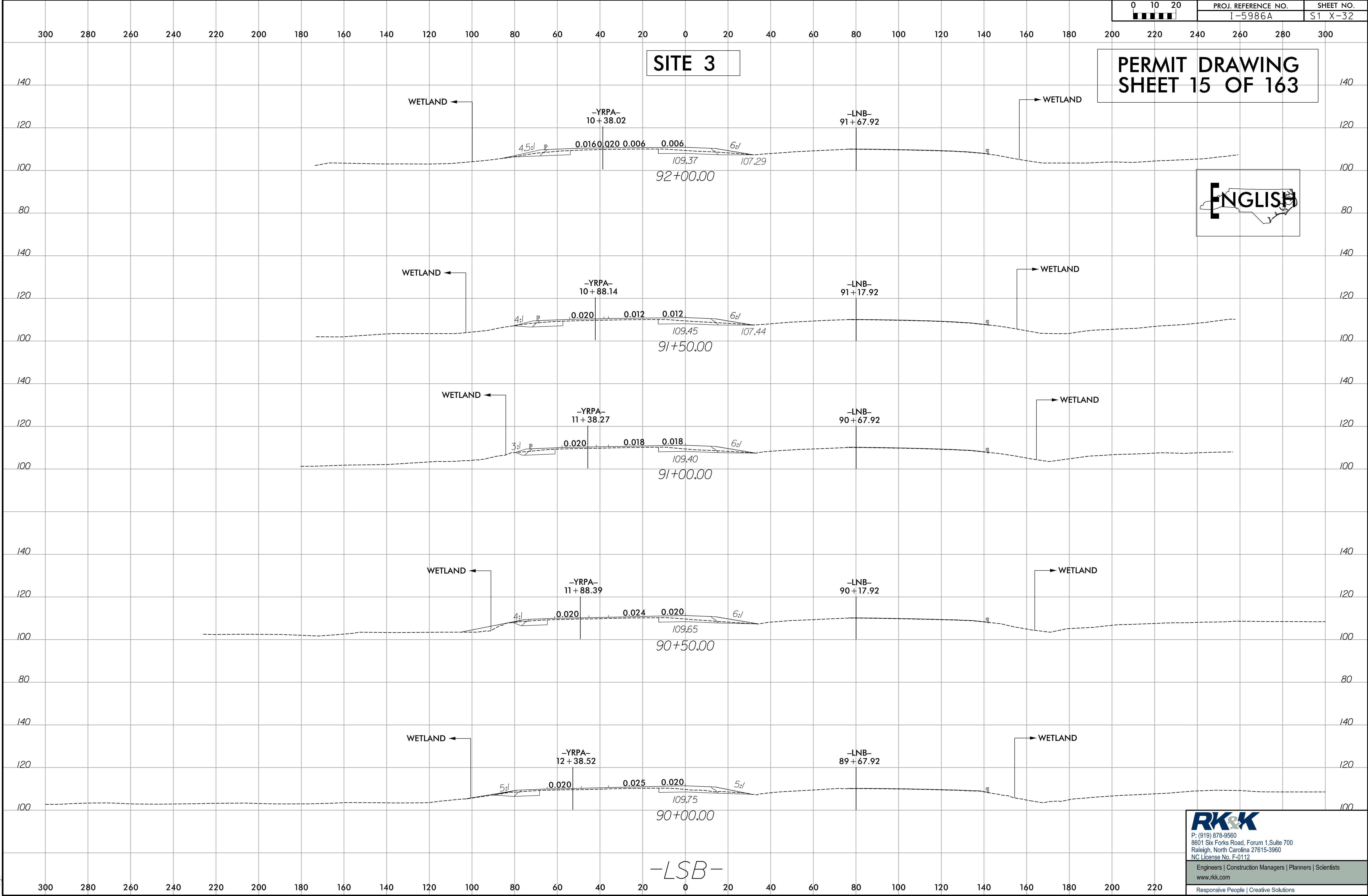
PROJ. REFERENCE NO.	SHEET NO.
I-5986A	S1 X-25

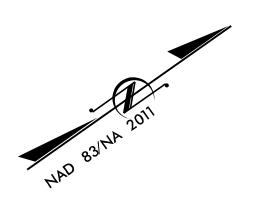
PERMIT DRAWING
SHEET 14 OF 163



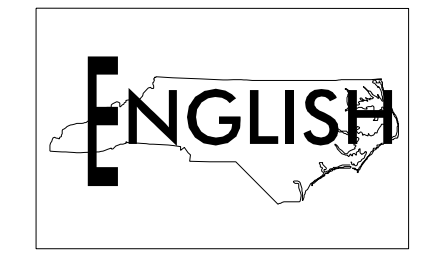
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

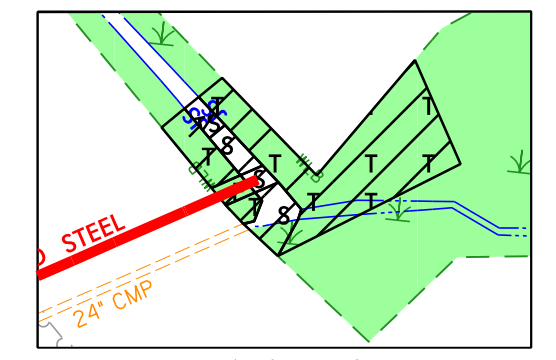




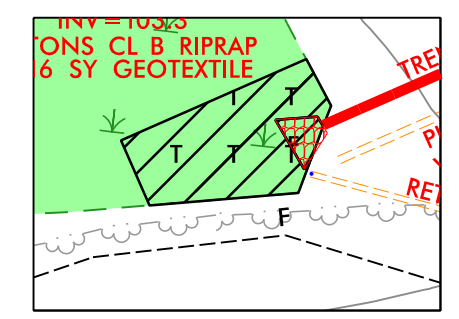
- DENOTES MECHANIZED CLEARING
- F F DENOTES FILL IN WETLAND
- Y Y DENOTES TEMPORARY FILL IN WETLAND
- S S DENOTES IMPACTS IN SURFACE WATER



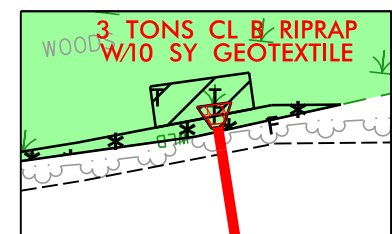
- 50 25 0 50 100
SCALE FOR INSET
- 100 50 0 100 200
SCALE



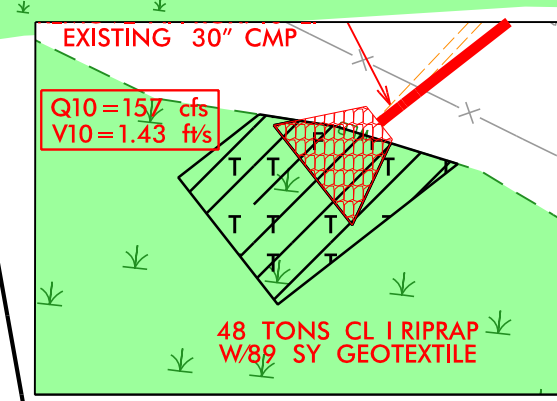
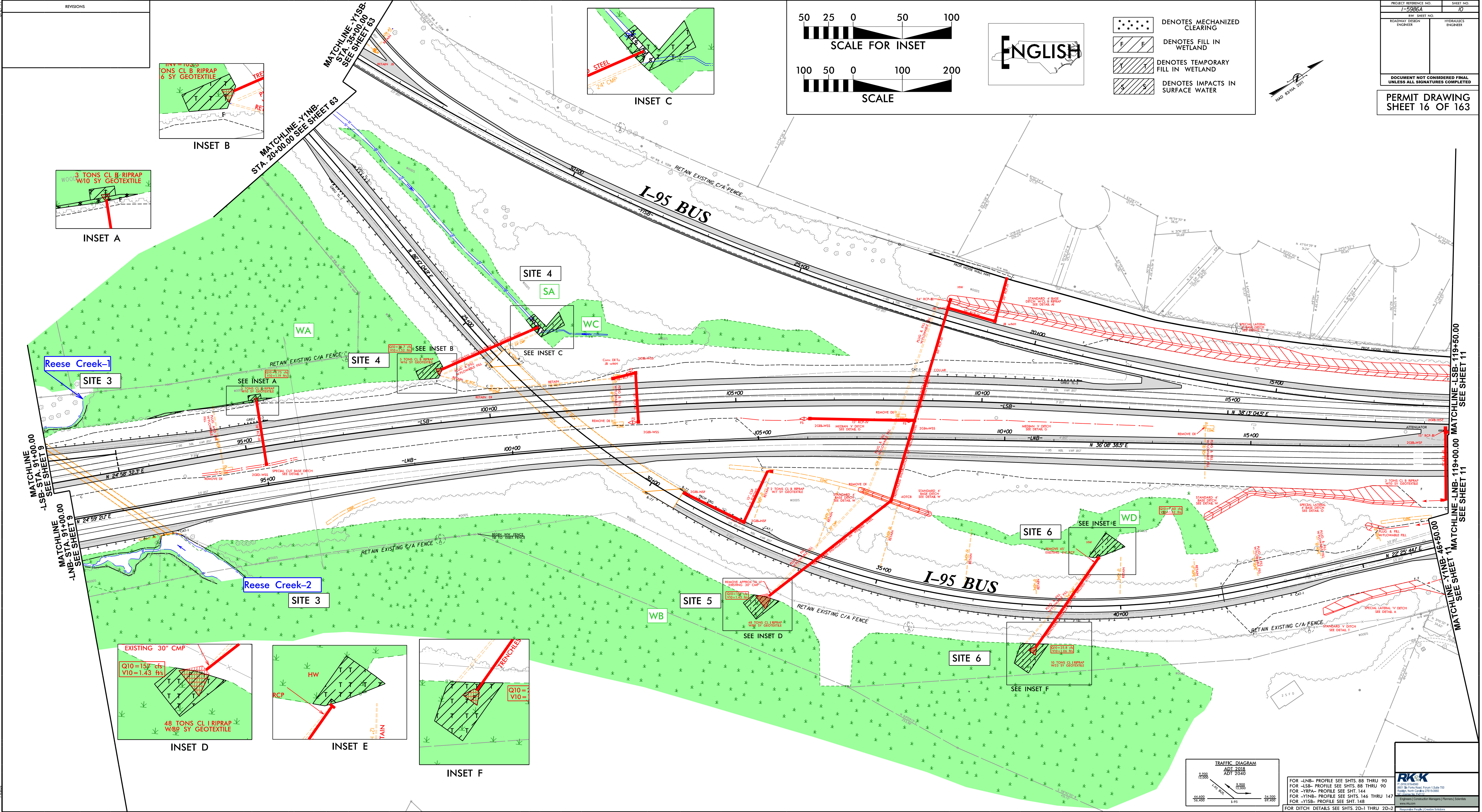
INSET C



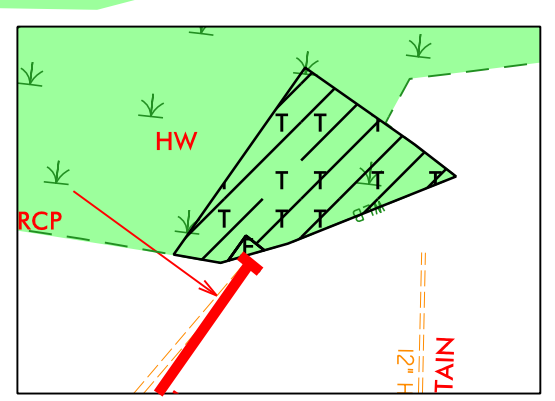
INSET B



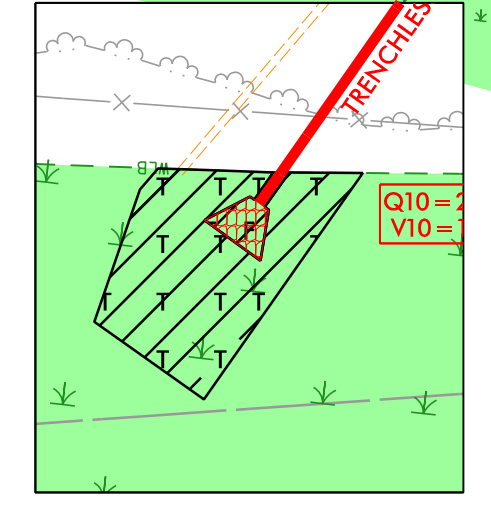
INSET A



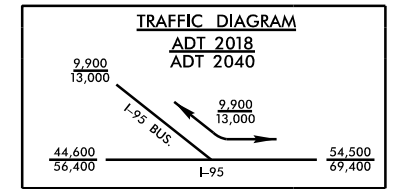
INSET D



INSET E



INSET F



FOR -LNB- PROFILE SEE SHTS. 88 THRU 90
FOR -LSB- PROFILE SEE SHTS. 88 THRU 90
FOR -YPA- PROFILE SEE SHT. 144
FOR -YINB- PROFILE SEE SHTS. 146 THRU 147
FOR -YISB- PROFILE SEE SHT. 148
FOR DITCH DETAILS SEE SHTS. 20-1 THRU 20-2



PROJECT REFERENCE NO.
7-5986-4

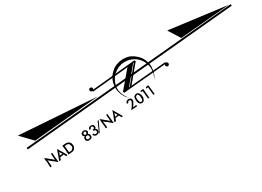
SHEET NO.
17

ROADWAY DESIGN
ENGINEER

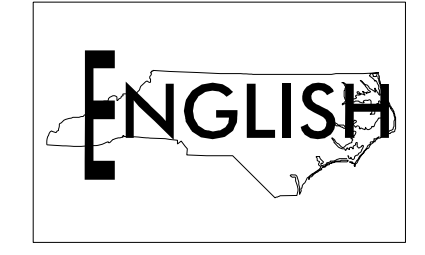
HYDRAULICS
ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

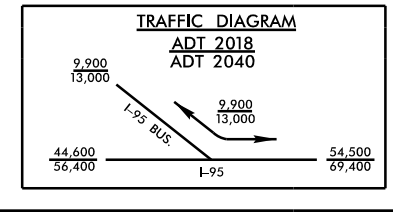
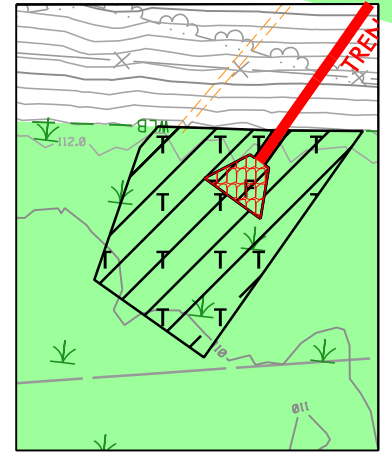
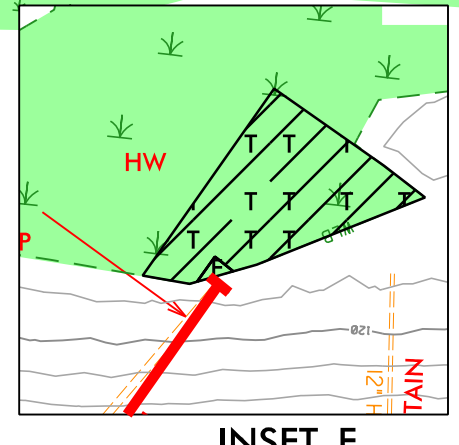
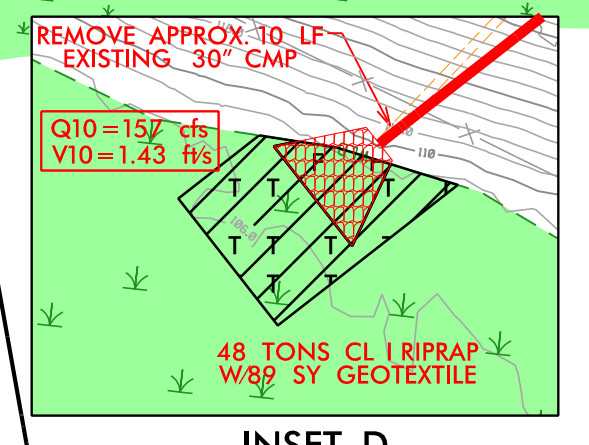
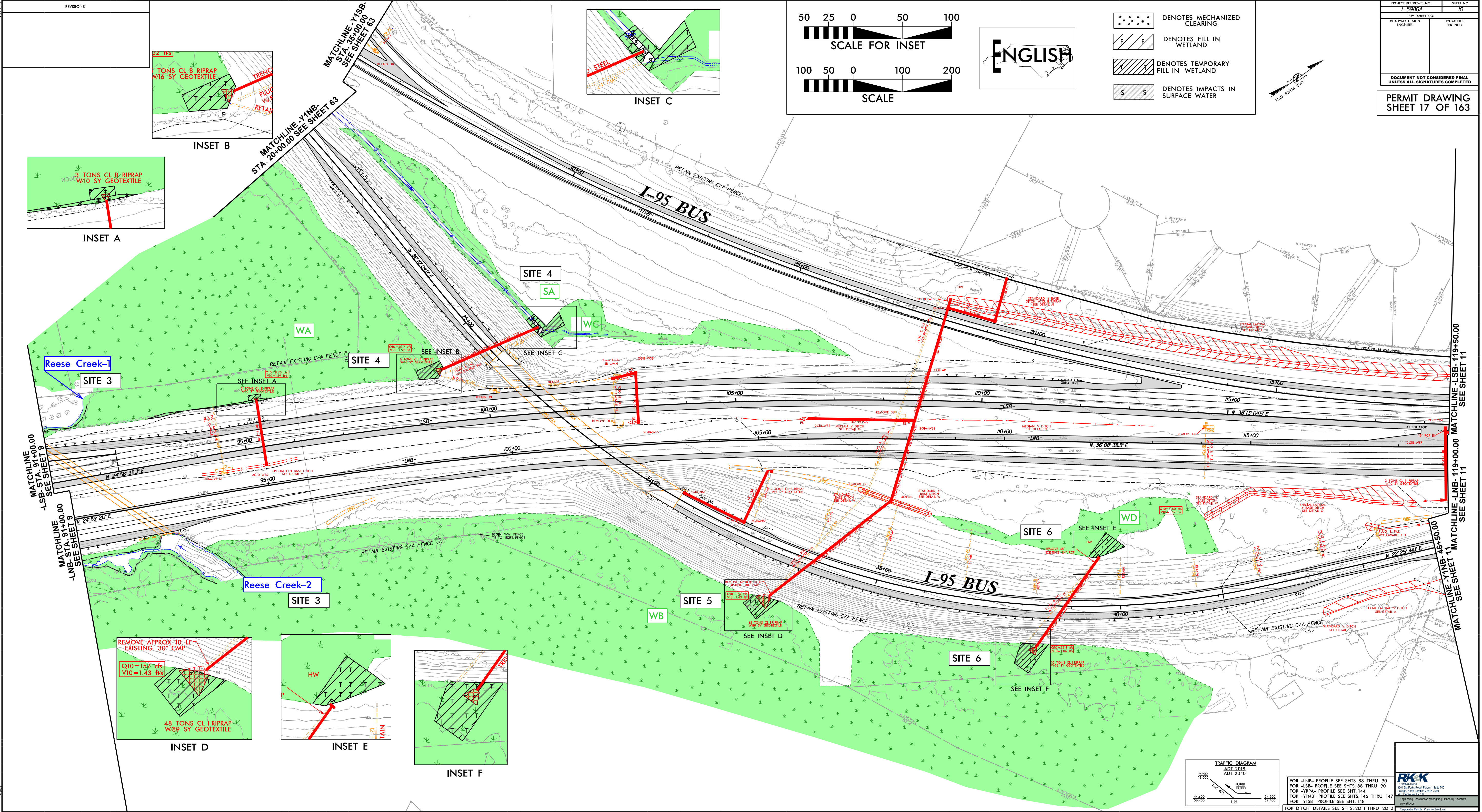
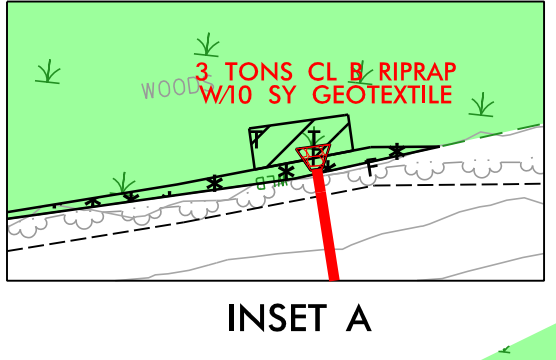
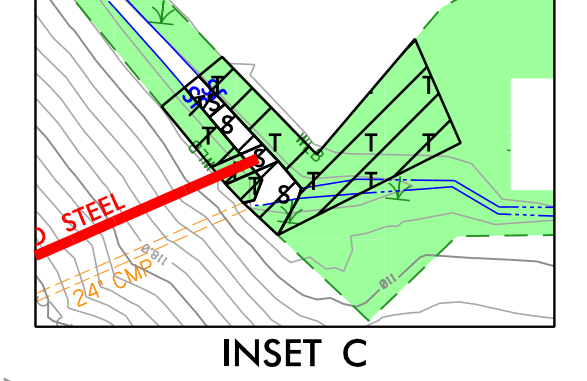
PERMIT DRAWING
SHEET 17 OF 163



- Denotes Mechanized Clearing
- Denotes Fill in Wetland
- Denotes Temporary Fill in Wetland
- Denotes Impacts in Surface Water



- Scale for Inset
- Scale



FOR -LNB- PROFILE SEE SHTS. 88 THRU 90
FOR -LSB- PROFILE SEE SHTS. 88 THRU 90
FOR -YPA- PROFILE SEE SHT. 144
FOR -YINB- PROFILE SEE SHTS. 146 THRU 147
FOR -YISB- PROFILE SEE SHT. 148
FOR DITCH DETAILS SEE SHTS. 20-1 THRU 20-2



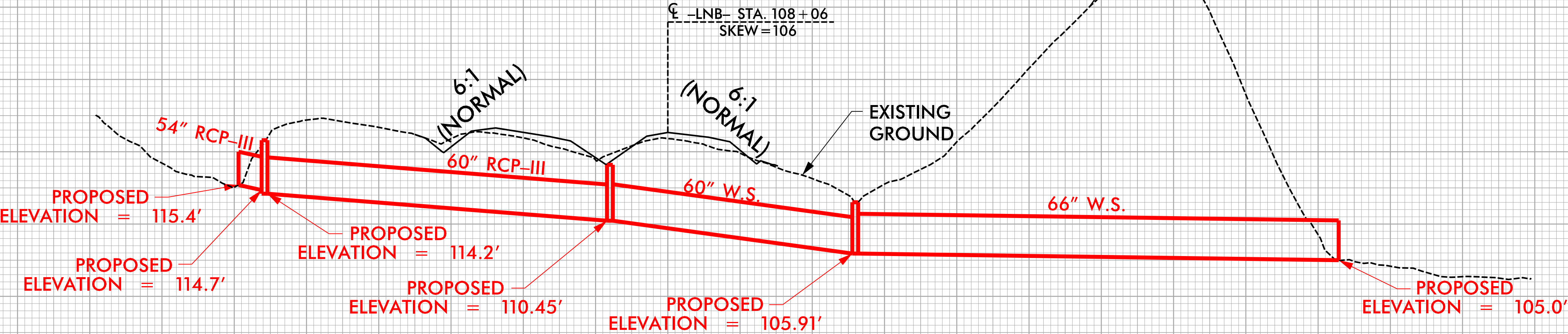
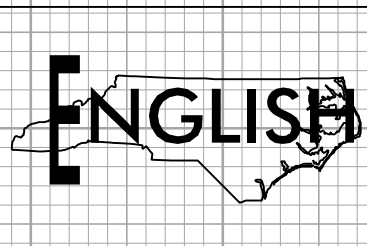
5/14/99

5/14/2020 11:05:11 AM C:\Users\pfl\OneDrive\Documents\Drawings\4C\1-5986A-hyd-prm-wet-PFL-SITE05.dgn

PROJECT REFERENCE NO.		SHEET NO.
1-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 5
-LNB- STA. 108+06

PERMIT DRAWING
SHEET 18 OF 163

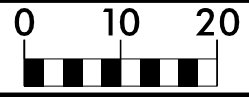


**54" RCP-III, 60" RCP-III, TRENCHLESS INSTALLATION 60" WELDED STEEL,
& TRENCHLESS INSTALLATION 66" WELDED STEEL
(length = 741')**

6/23/16

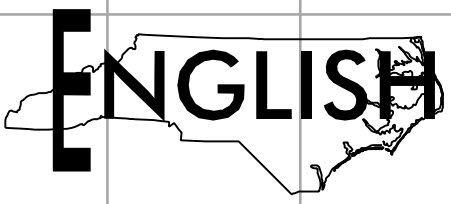
5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL_YINB-SITE04.dgn
kajls

SITE 4



PROJ. REFERENCE NO.	SHEET NO.
I-5986A	S1 X-35

PERMIT DRAWING
SHEET 19 OF 163



-LSB-

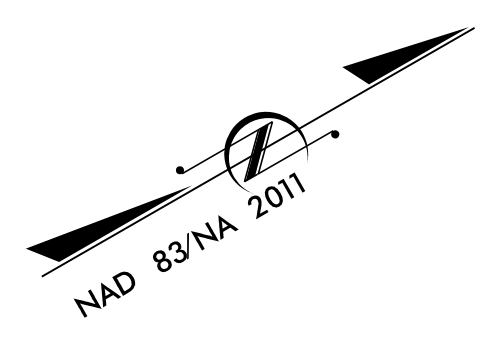


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

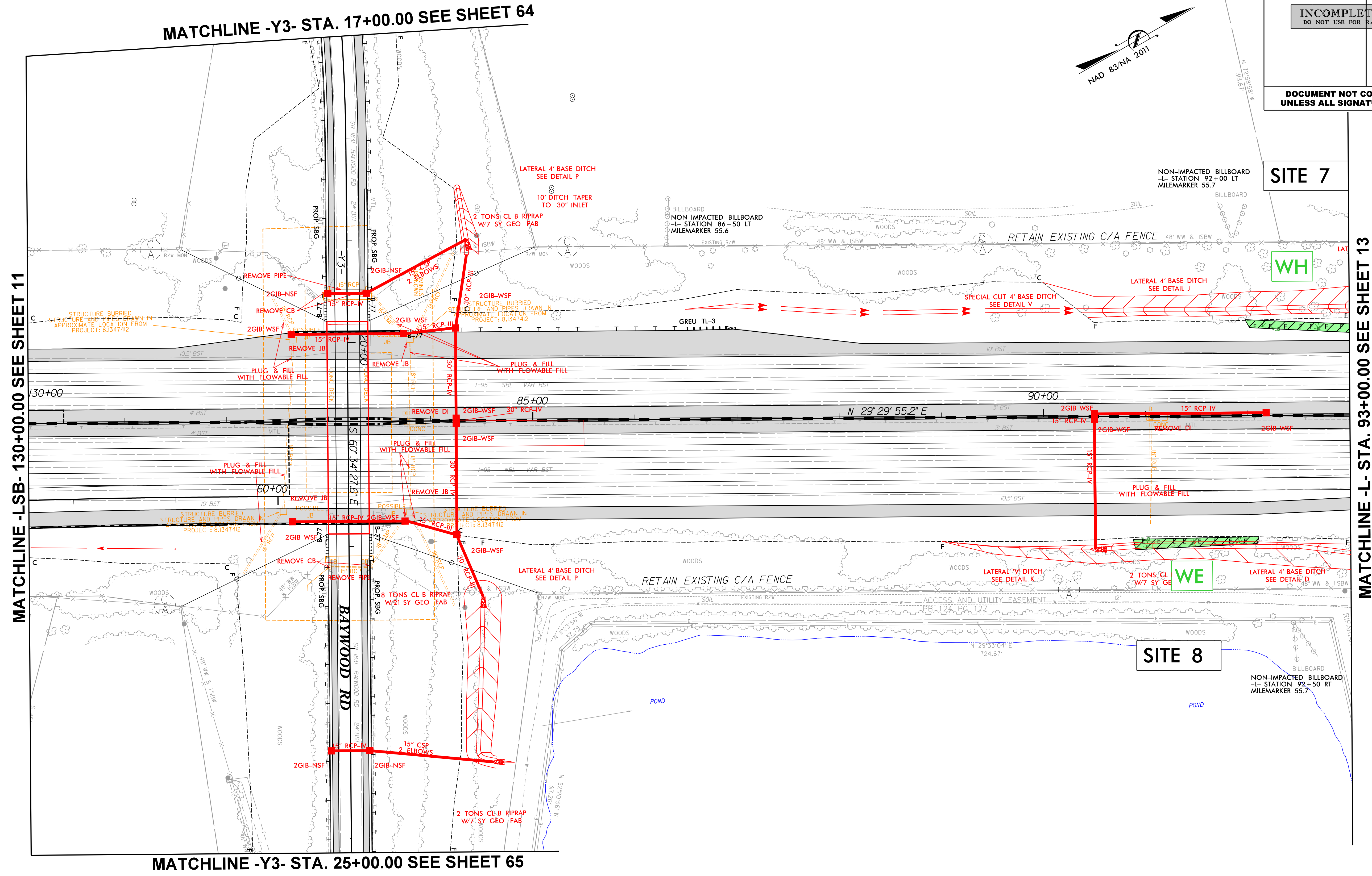
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
8/17/2020
C:\Users\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh12.dgn
E:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh12.dgn

PERMIT DRAWING
SHEET 20 OF 163



PROJECT REFERENCE NO.	SHEET NO.
I-5986A	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

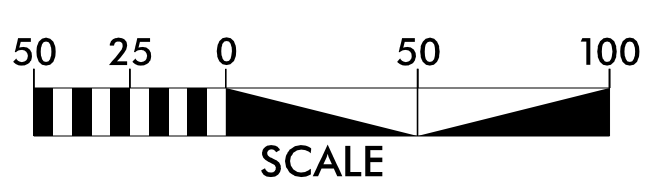


SITE 7

SITE 8

MATCHLINE -L- STA. 93+00.00 SEE SHEET 13

MATCHLINE -LSB- 130+00.00 SEE SHEET 11



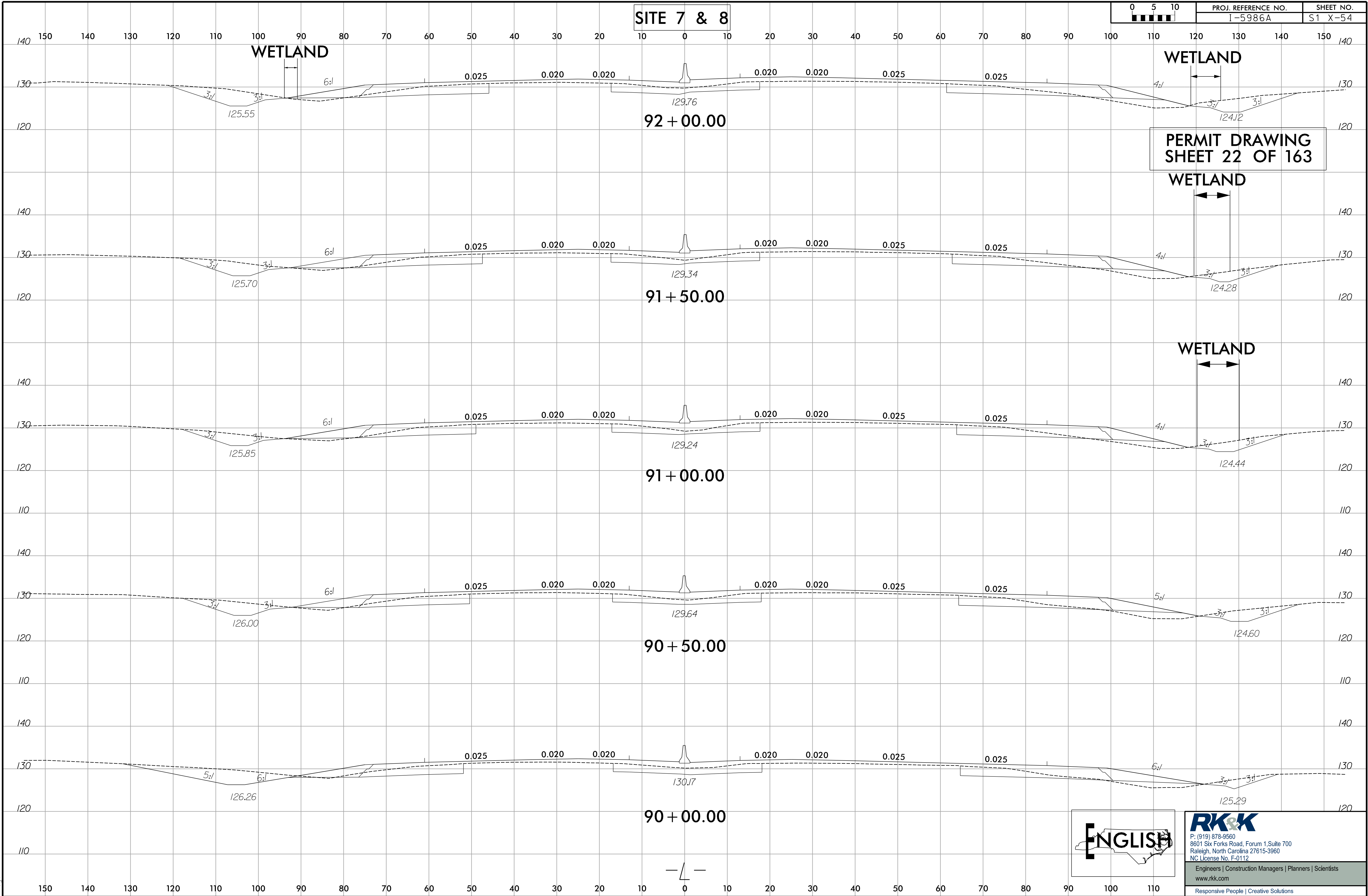
ENGLISH

DENOTES FILL IN
WETLAND
DENOTES EXCAVATION
IN WETLAND

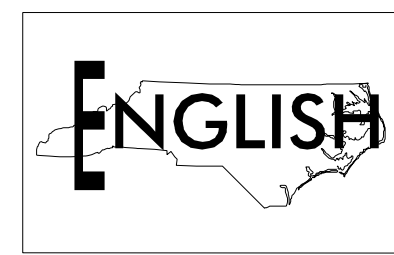
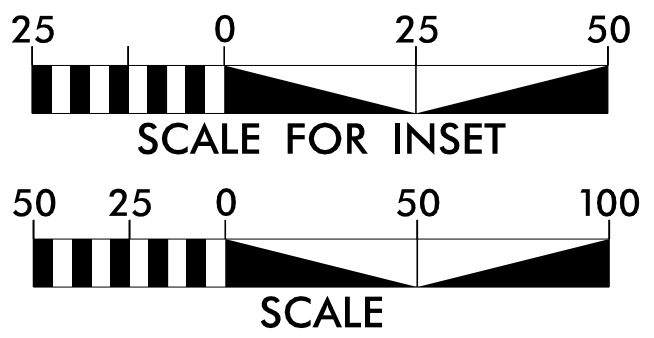
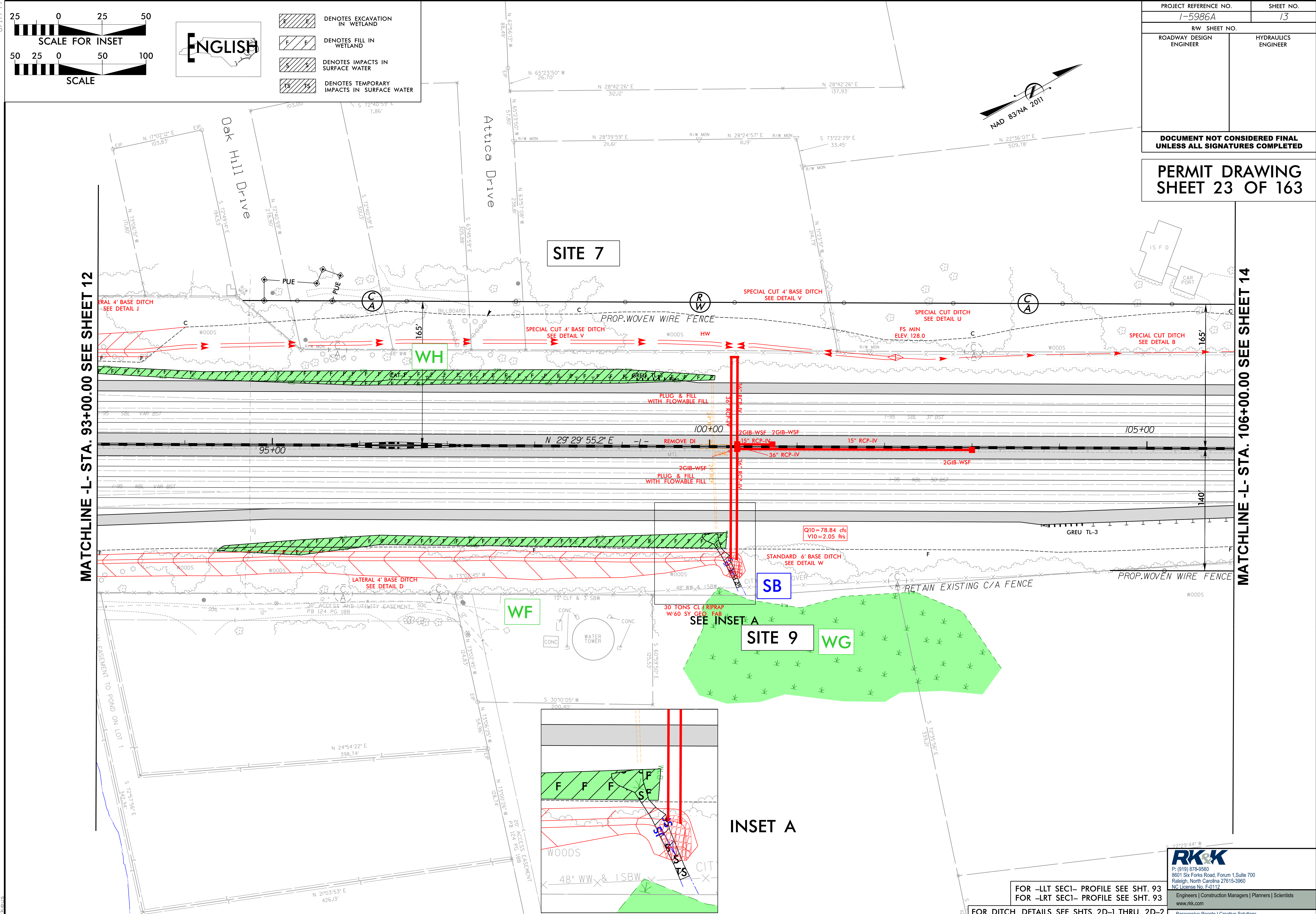
FOR -LSB- PROFILE SEE SHT. 91
FOR -LLT SEC1- PROFILE SEE SHT. 92
FOR -LRT SEC1- PROFILE SEE SHT. 92
FOR -YINB- PROFILE SEE SHT. 147
FOR -Y3- PROFILE SEE SHT. 149

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

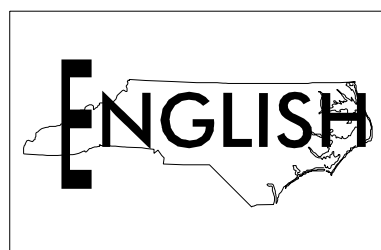


8/17/99
8/17/2020
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\1-5986A_hyd_4B_psh13.dgn
RKK



- E E DENOTES EXCAVATION IN WETLAND
- F F DENOTES FILL IN WETLAND
- S S DENOTES IMPACTS IN SURFACE WATER
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

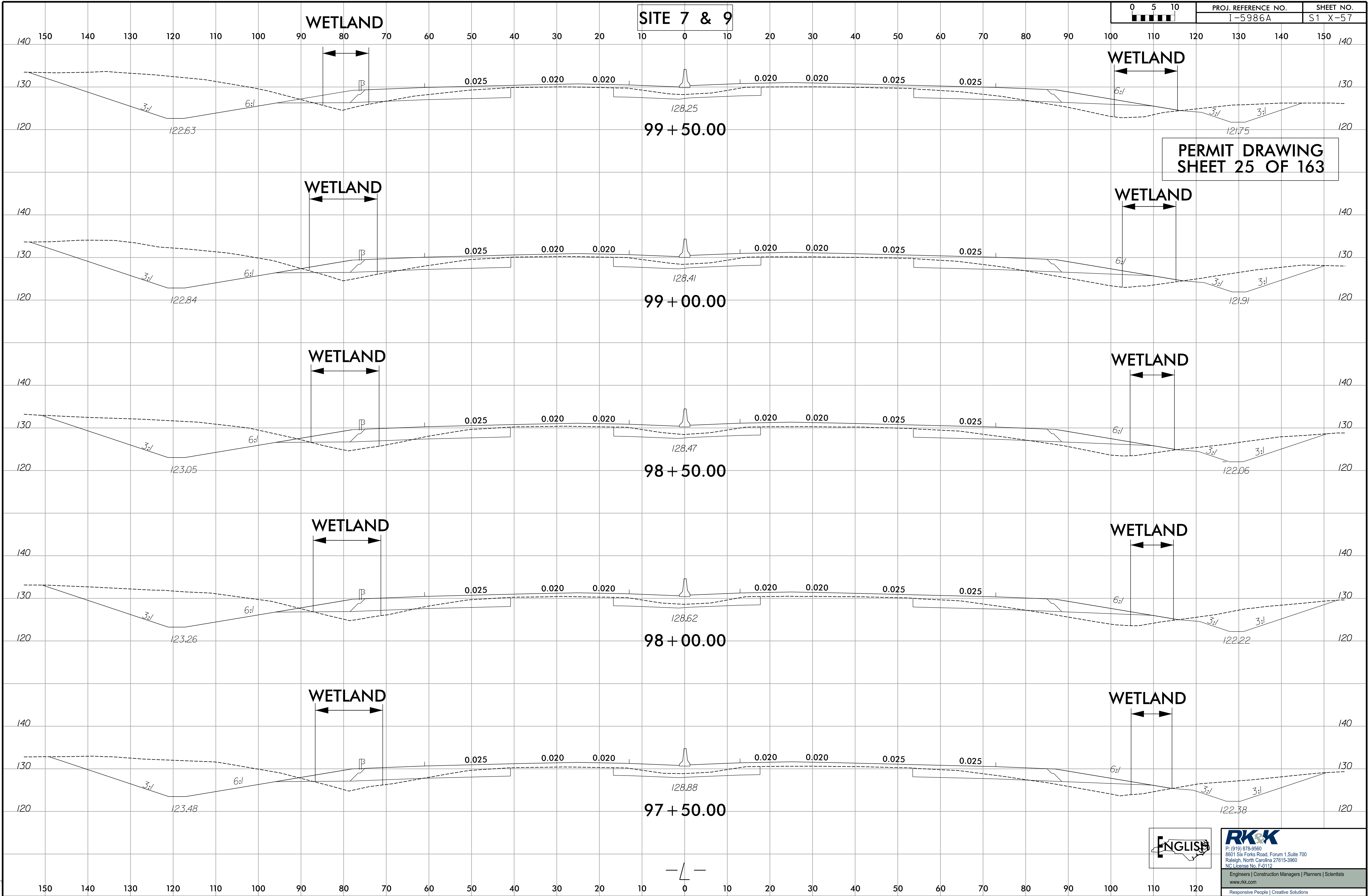
PROJECT REFERENCE NO.		SHEET NO.
1-5986A		13
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 23 OF 163		



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

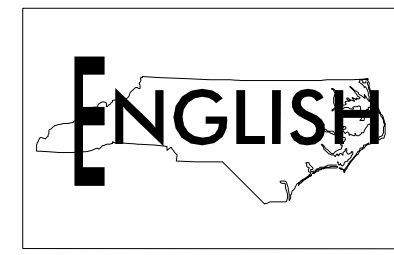
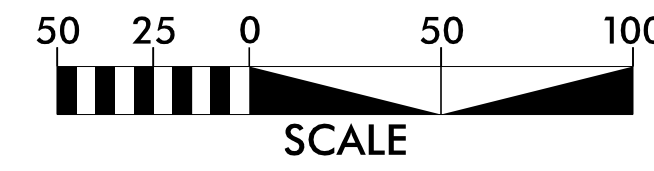
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

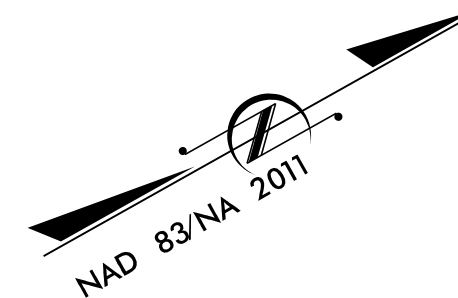


8/17/99

S:\2020\Hydraulics PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh14.dgn
E:\2020\Hydraulics PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh14.dgn



DENOTES FILL IN WETLAND

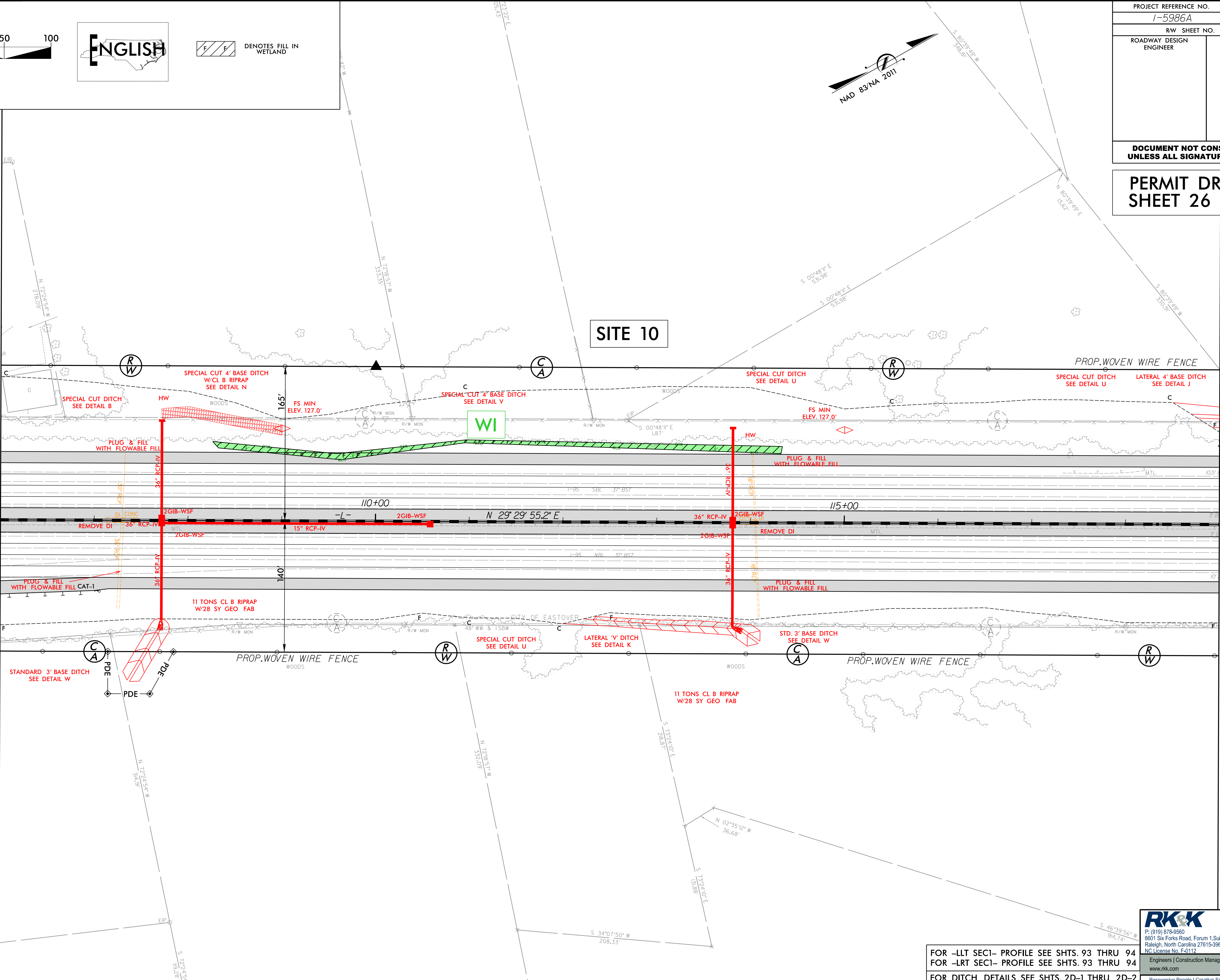


PROJECT REFERENCE NO.		SHEET NO.
I-5986A		14
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PERMIT DRAWING
SHEET 26 OF 163

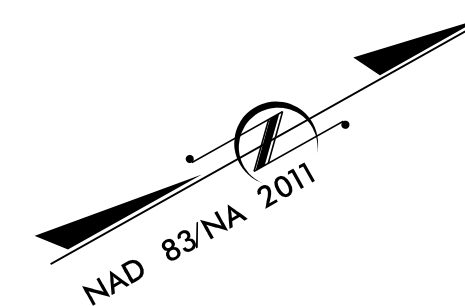
MATCHLINE -L- STA. 106+00.00 SEE SHEET 13

MATCHLINE -L- STA. 119+00.00 SEE SHEET 15



FOR -LLT SEC1- PROFILE SEE SHTS. 93 THRU 94
FOR -LRT SEC1- PROFILE SEE SHTS. 93 THRU 94
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



SITE 10

MATCHLINE -L- STA. 119+00.00 SEE SHEET 15

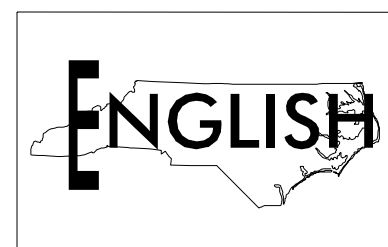
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112





Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions



5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 1\1-5986A_hyd-4B_psh15.dgn
keels

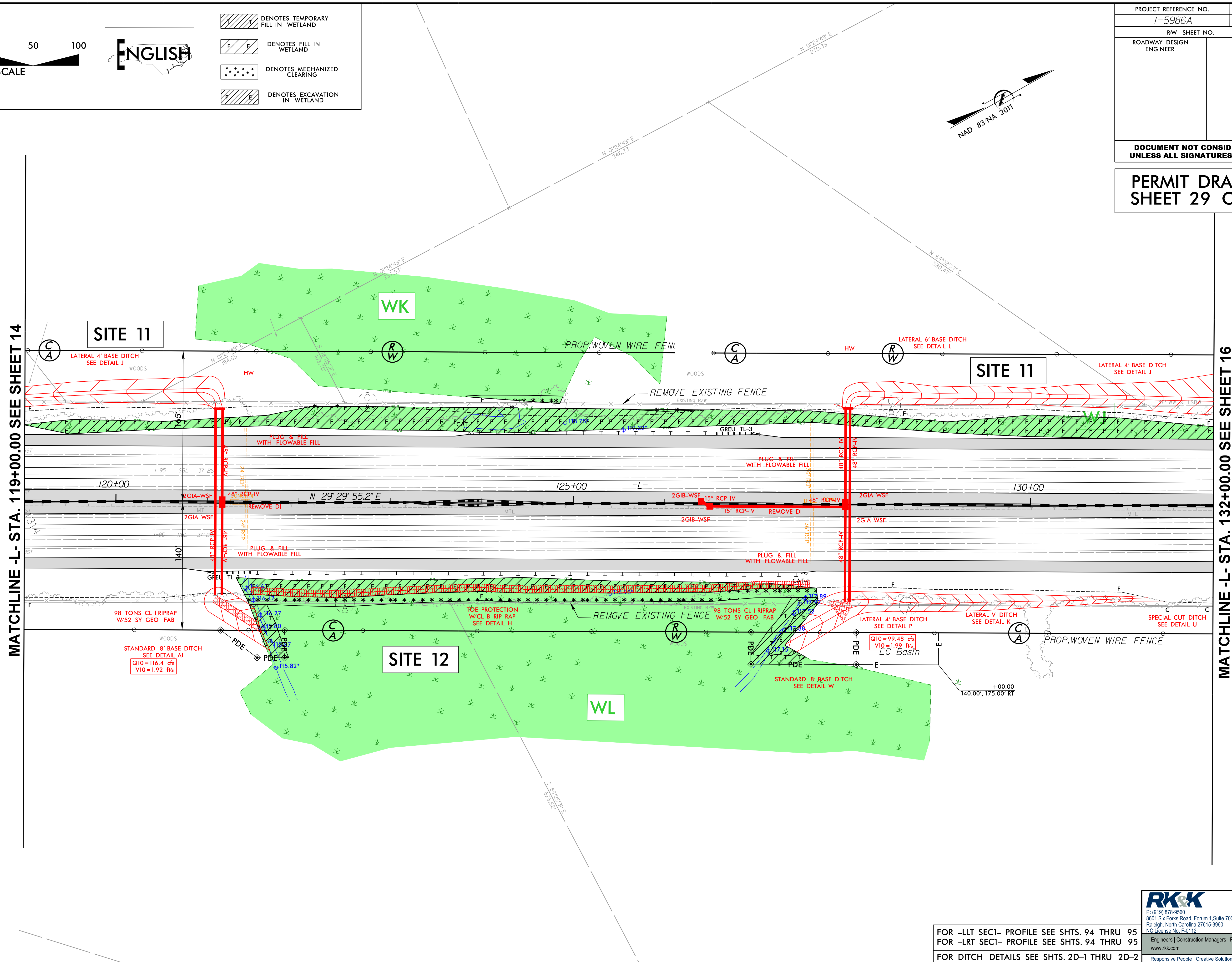
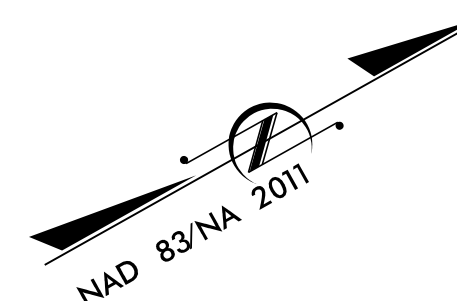


- | | |
|---|--------------------------------------|
|  | DENOTES TEMPORARY
FILL IN WETLAND |
|  | DENOTES FILL IN
WETLAND |
|  | DENOTES MECHANIZED
CLEARING |
|  | DENOTES EXCAVATION
IN WETLAND |

PROJECT REFERENCE NO.	SHEET NO.
1-5986A	15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PERMIT DRAWING
SHEET 29 OF 163



FOR -LLT SEC1- PROFILE SEE SHTS. 94 THRU 95
FOR -LRT SEC1- PROFILE SEE SHTS. 94 THRU 95
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

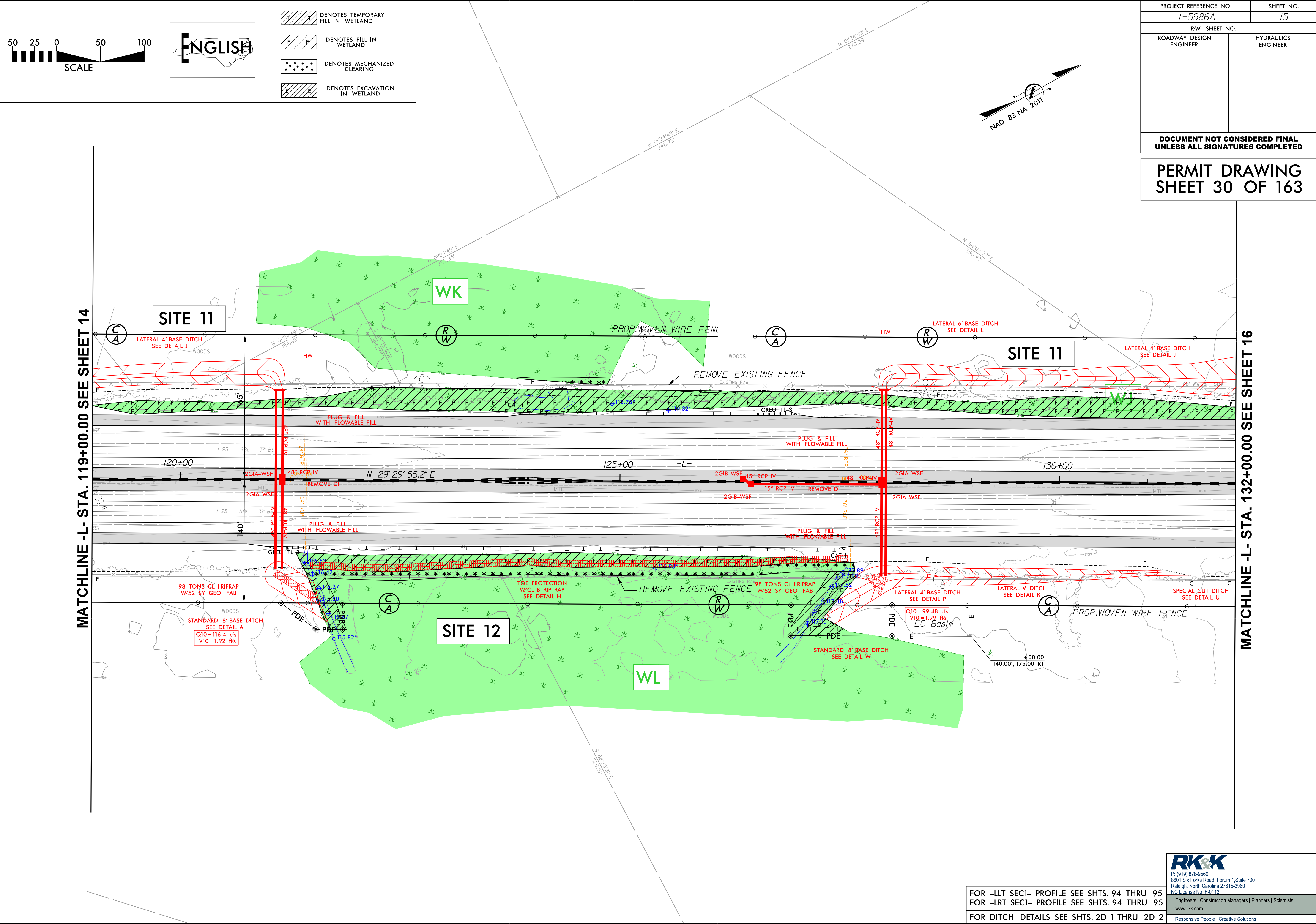


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

8/17/99
5/1/2020
E:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh15.CON.dgn
RKK



PROJECT REFERENCE NO.		SHEET NO.	
I-5986A		15	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 30 OF 163			

FOR -LLT SEC1- PROFILE SEE SHTS. 94 THRU 95
FOR -LRT SEC1- PROFILE SEE SHTS. 94 THRU 95
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

5/14/99

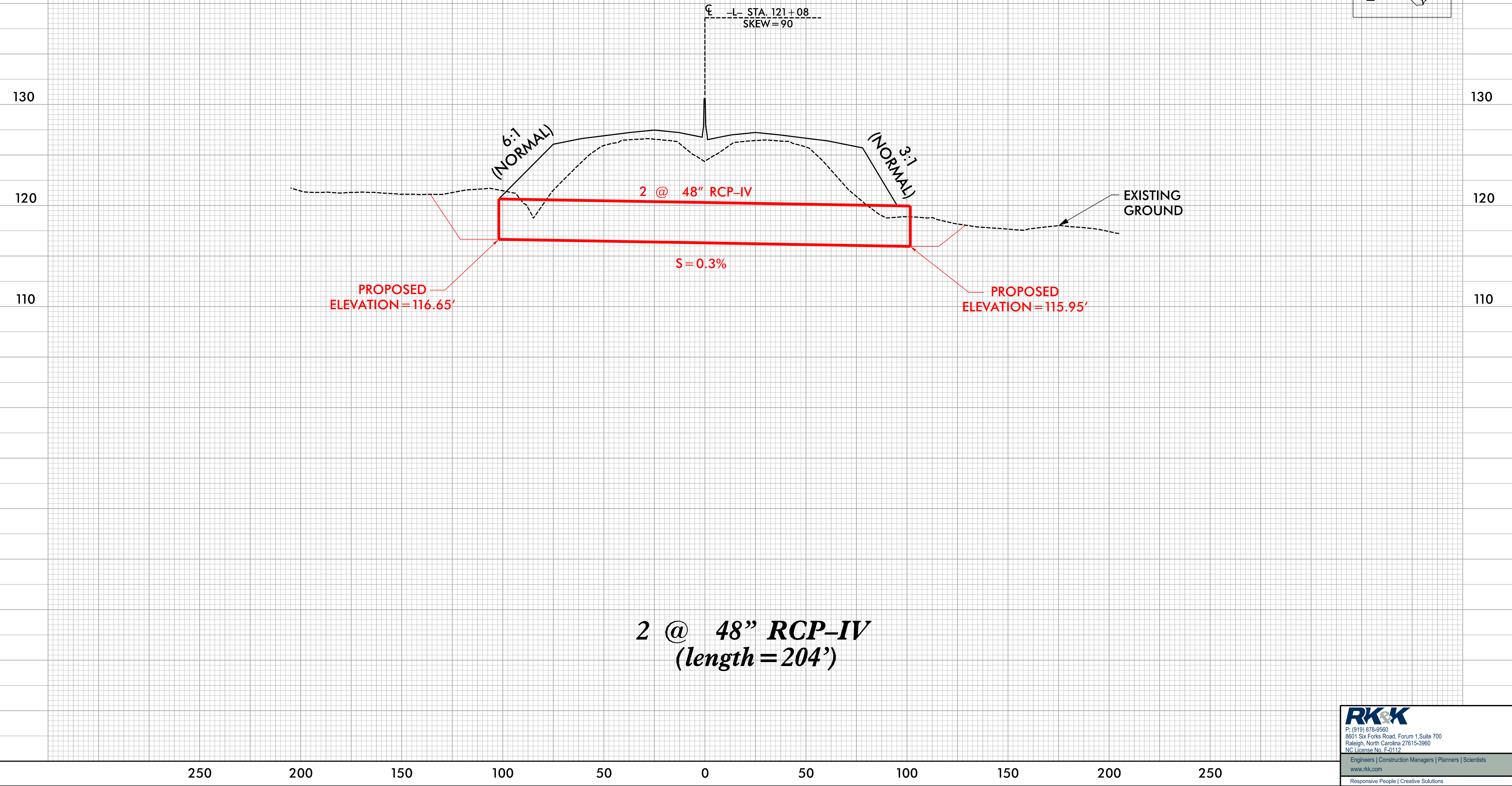
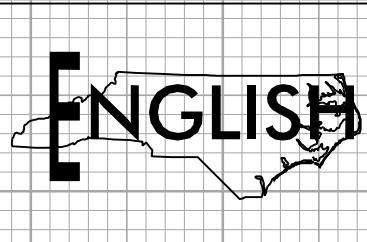
5/1/2020
R:\Projects\PERMITS\Environmental\Drawings\4C\1-5986A-hyd.prm.wet.pfl_SITE12.dgn
Fields

PROJECT REFERENCE NO.		SHEET NO.
1-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 11 & 12

-L- STA. 121+08

PERMIT DRAWING
SHEET 31 OF 163



P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

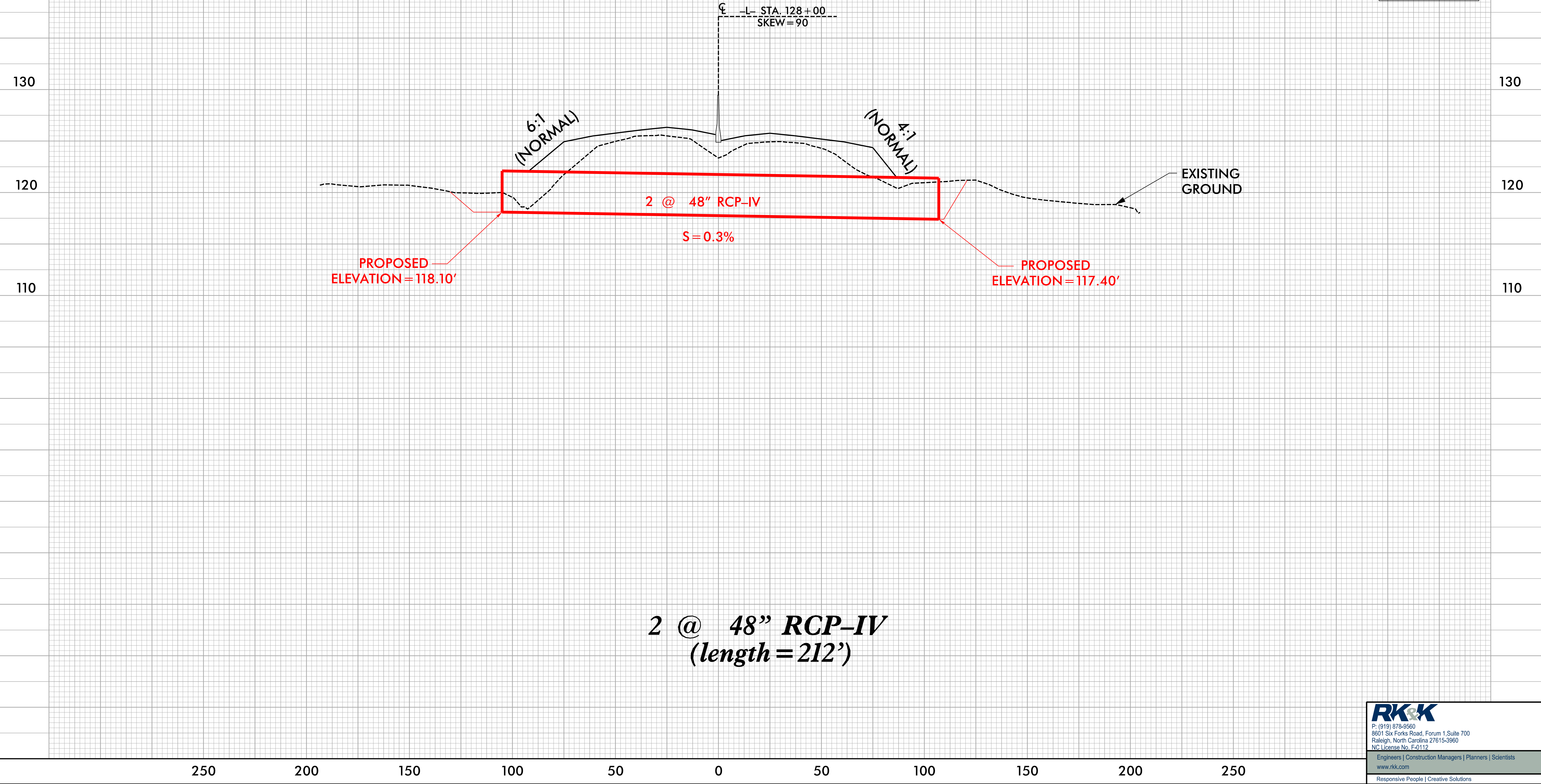
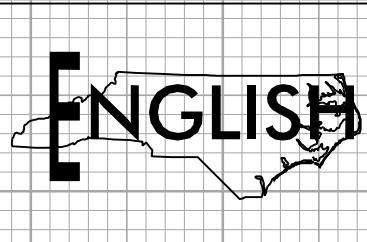
5/14/99

5/1/2020
R:\Projects\PERMITS\Environmental\Drawings\4C\1-5986A-hyd.prm.wet.PFL_SITE1.dgn
Fields

PROJECT REFERENCE NO.		SHEET NO.
1-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

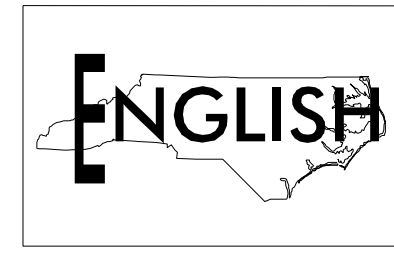
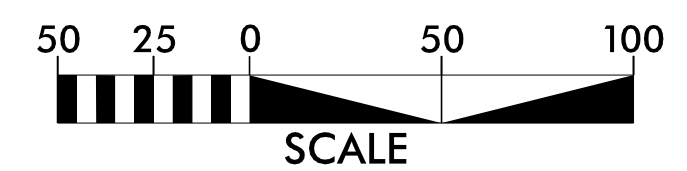
SITE 11 & 12
-L- STA. 128+00

PERMIT DRAWING
SHEET 32 OF 163





8/17/99
5/1/2020
P:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh16.dgn
E:\k

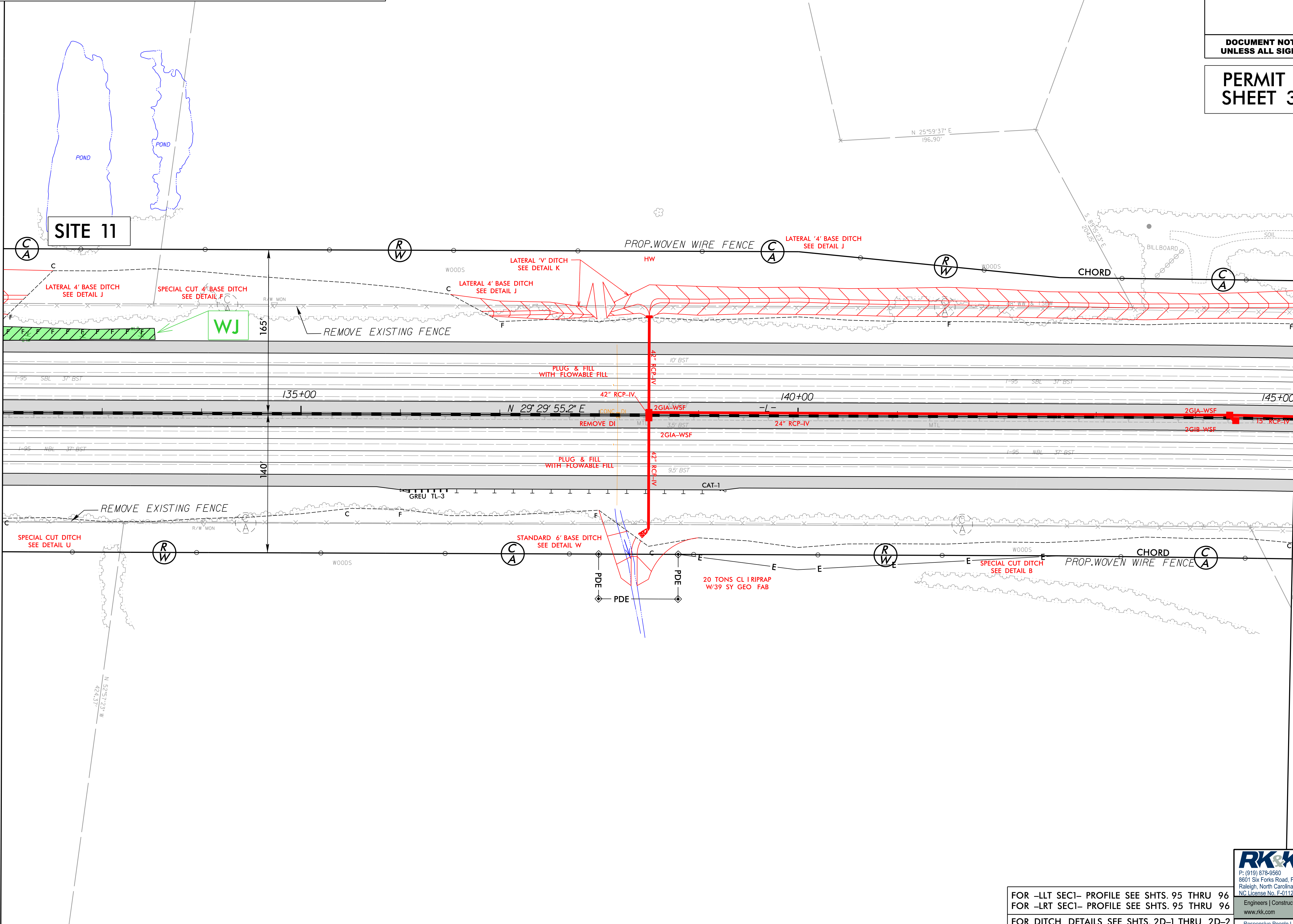


DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.		SHEET NO.
I-5986A		16
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 34 OF 163		

MATCHLINE -L- STA. 132+00.00 SEE SHEET 15

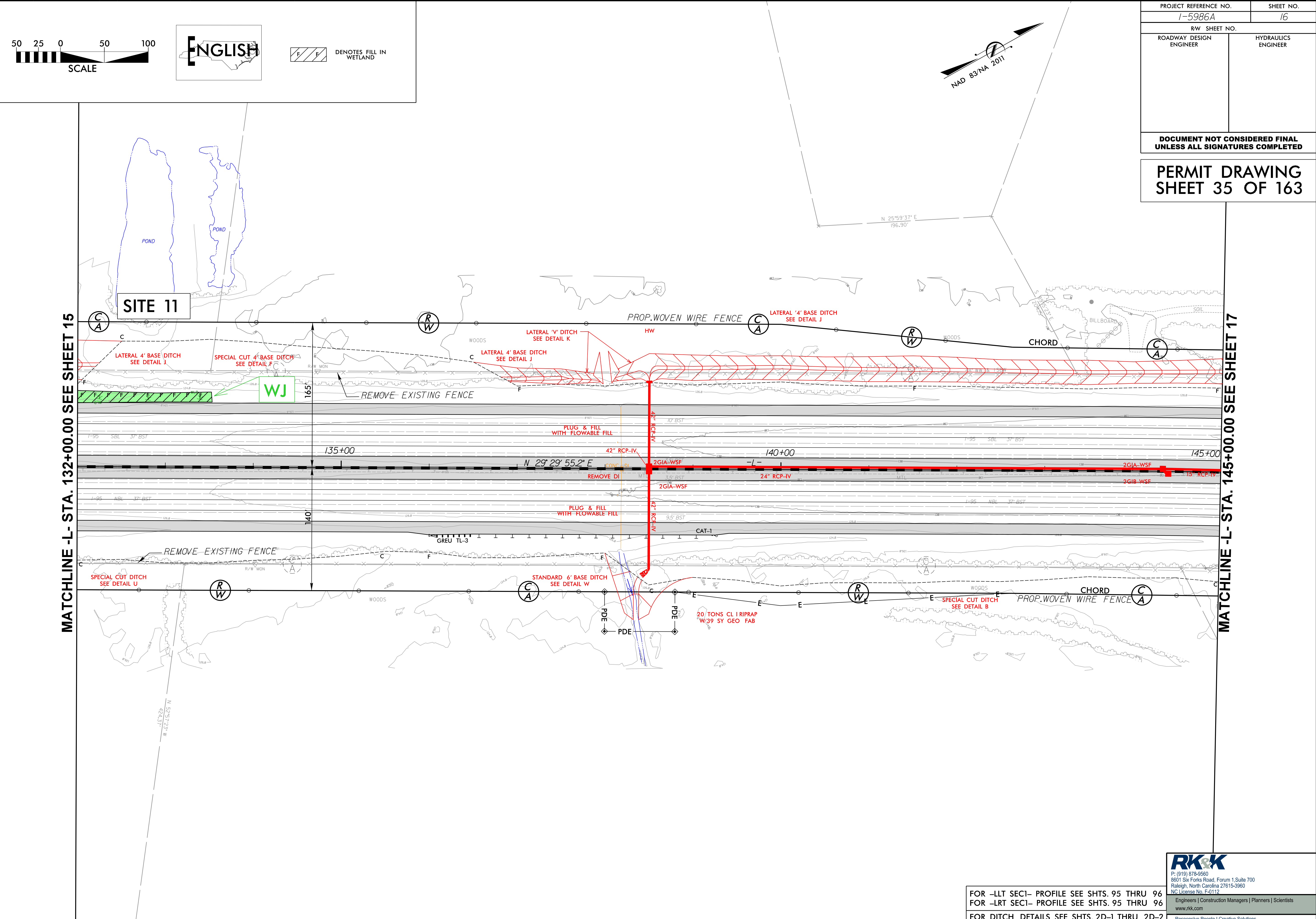
MATCHLINE -L- STA. 145+00.00 SEE SHEET 17



FOR -LLT SEC1- PROFILE SEE SHTS. 95 THRU 96
FOR -LRT SEC1- PROFILE SEE SHTS. 95 THRU 96
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
S:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh16_C0N.dgn
E:\2020
RKK

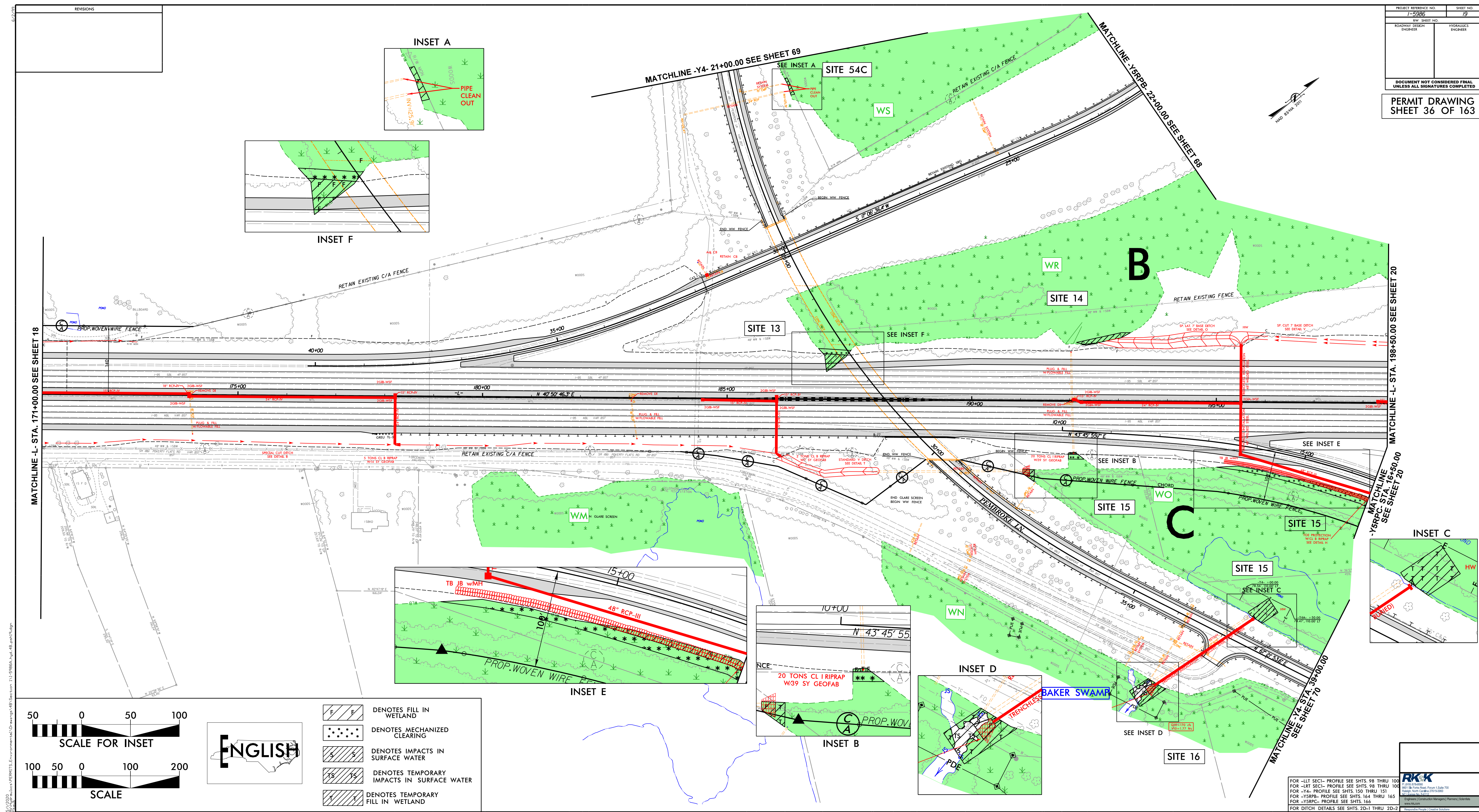


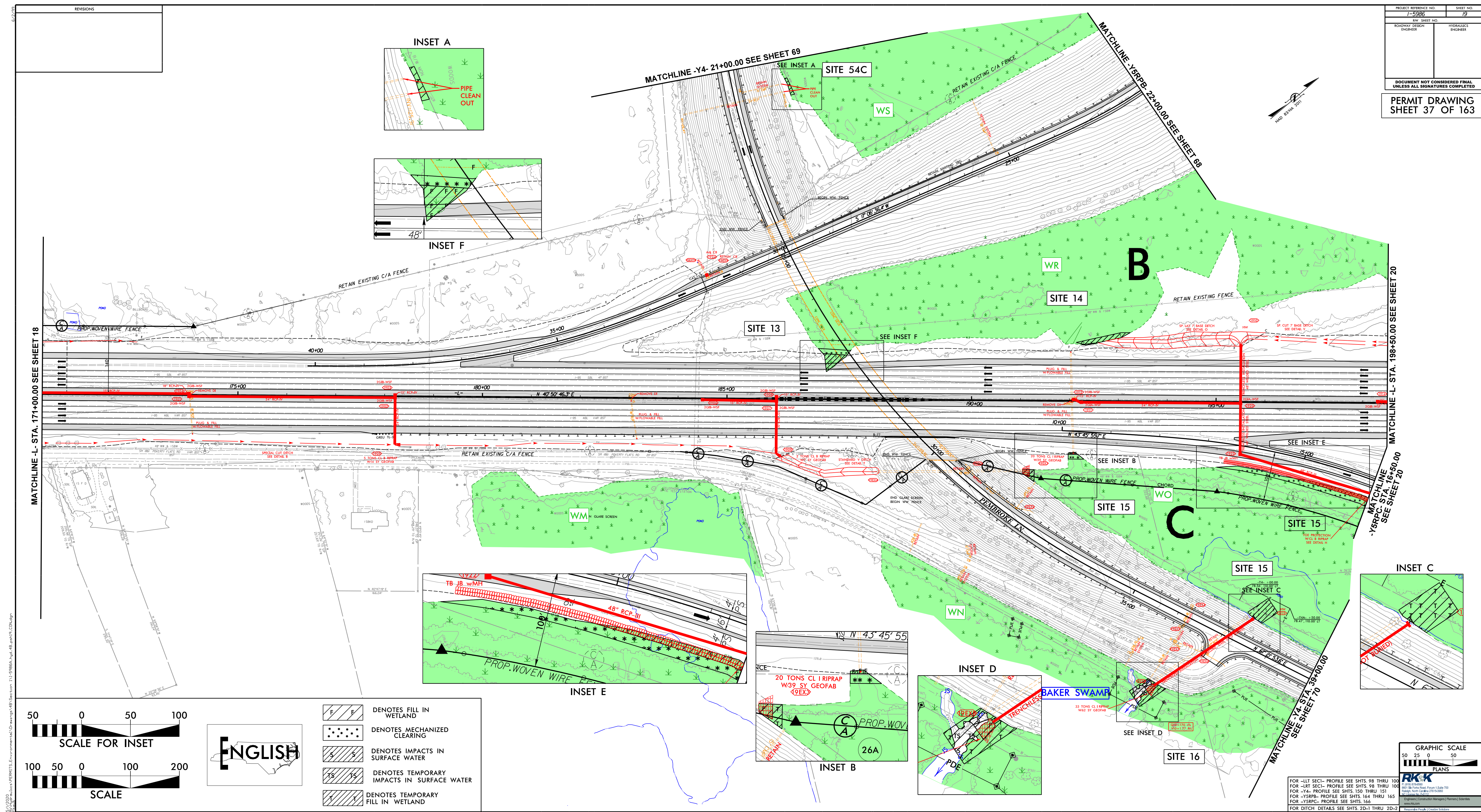
PROJECT REFERENCE NO. I-5986A		SHEET NO. 16
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PERMIT DRAWING
SHEET 35 OF 163

FOR -LLT SEC1- PROFILE SEE SHTS. 95 THRU 96
FOR -LRT SEC1- PROFILE SEE SHTS. 95 THRU 96
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions





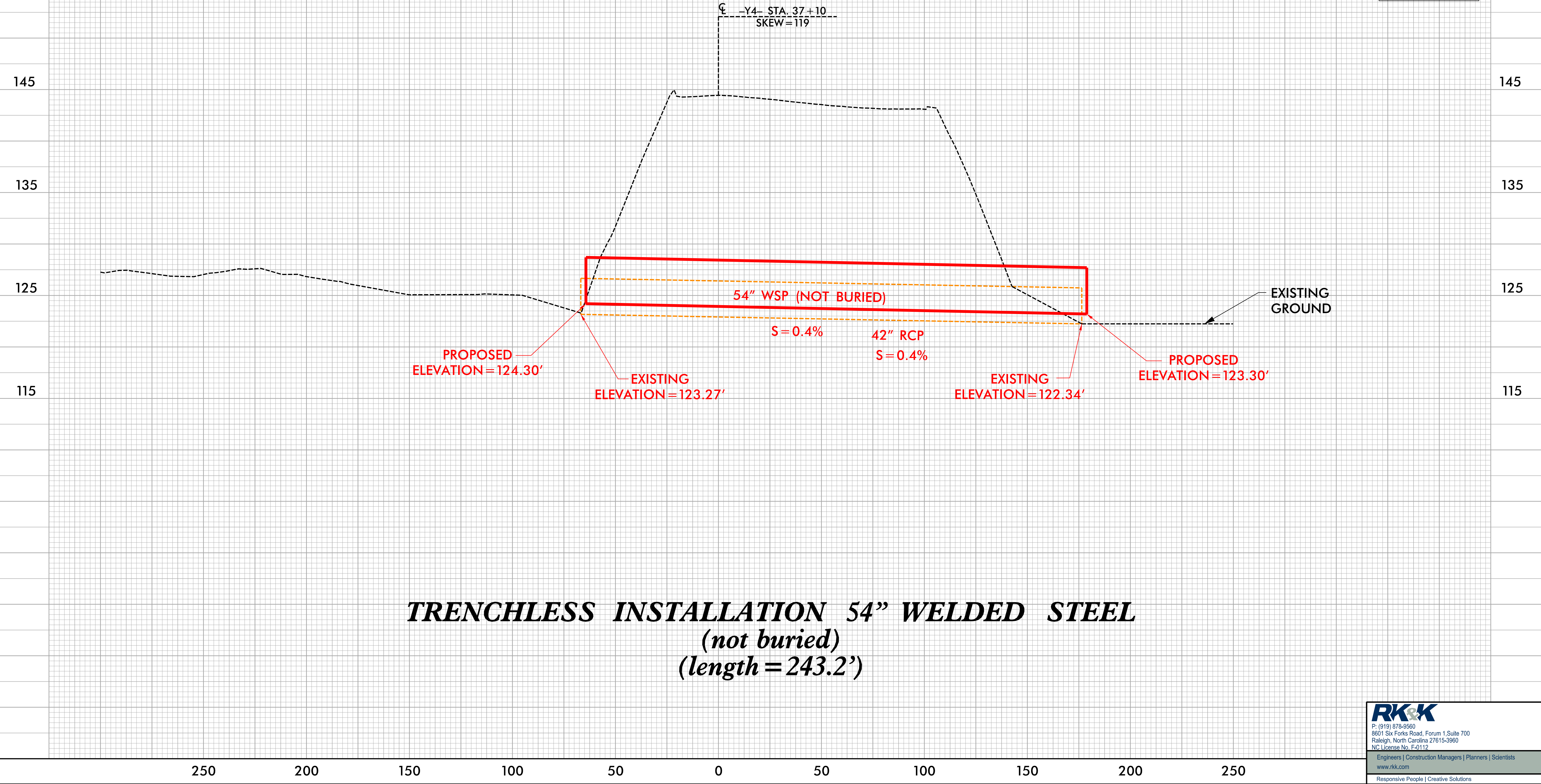
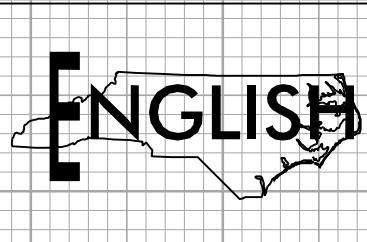
5/14/99

5/14/2020
C:\Users\Public\Documents\PERMITS\Environmental\Drawings\4C\1-5986A_hyd.prm.wet.pfl_SITE16.dgn
Fields

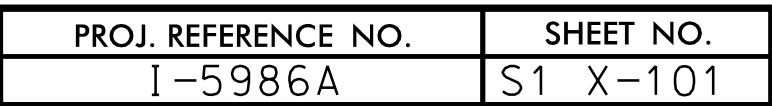
PROJECT REFERENCE NO.		SHEET NO.
1-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 15 & 16 -Y4- STA. 37+10

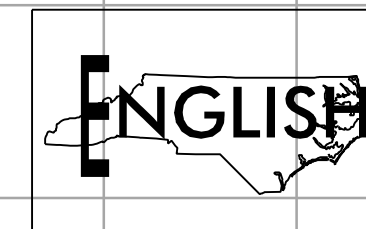
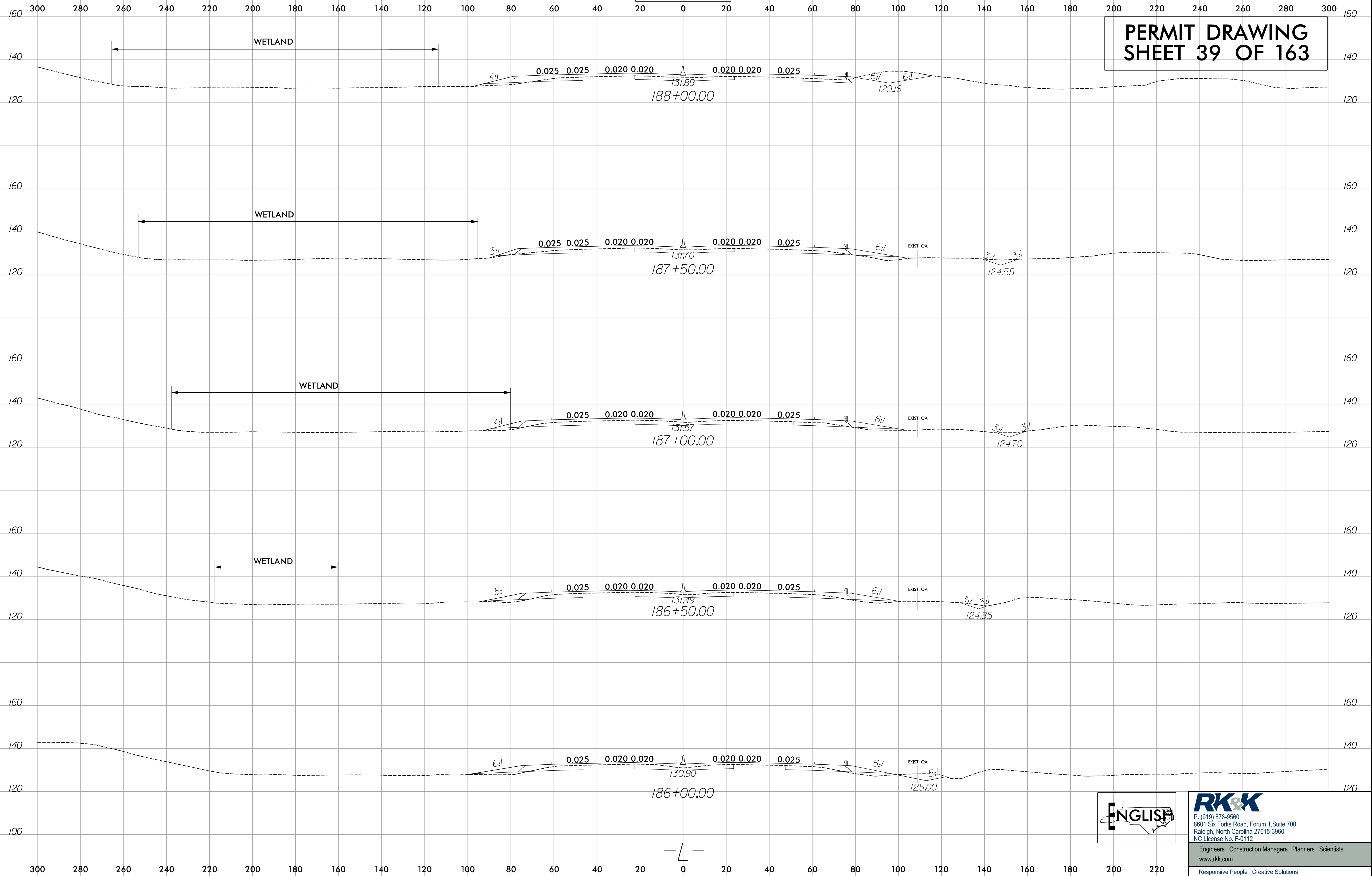
PERMIT DRAWING
SHEET 38 OF 163



TRENCHLESS INSTALLATION 54" WELDED STEEL
(not buried)
(length = 243.2')

$$-\angle-$$


PERMIT DRAWING
SHEET 39 OF 163



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

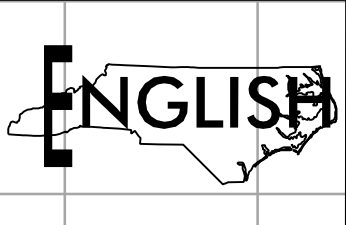
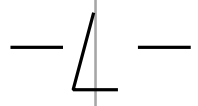
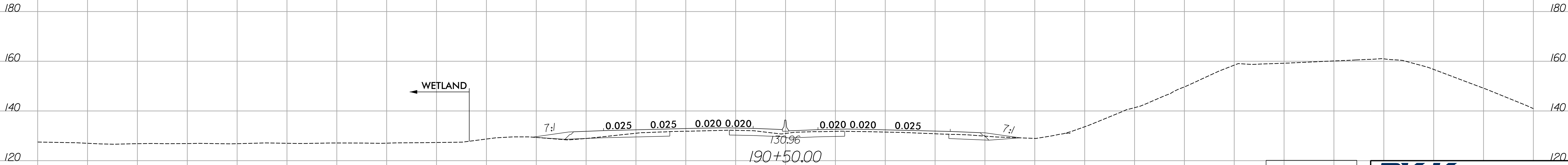
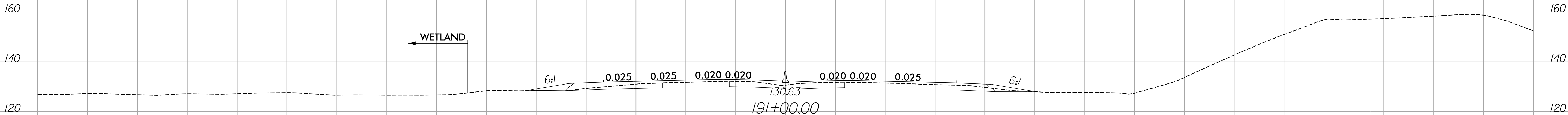
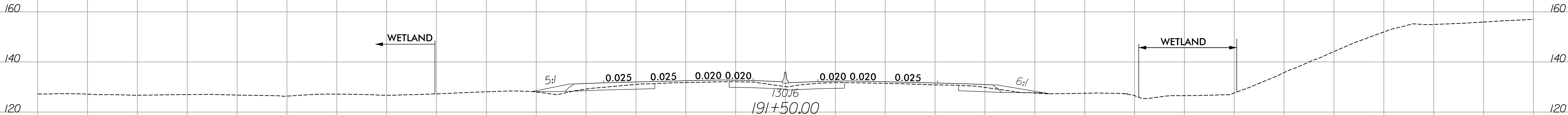
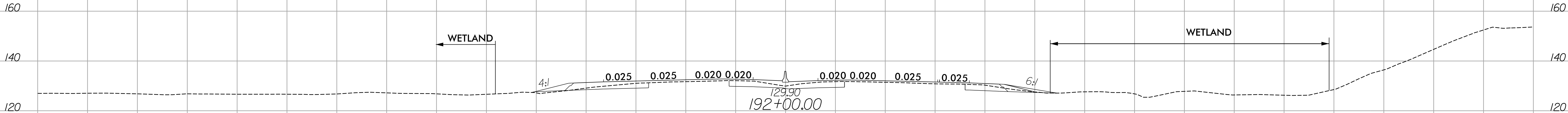
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

6/23/16

SITE 14 & 15

PERMIT DRAWING
SHEET 40 OF 163



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists

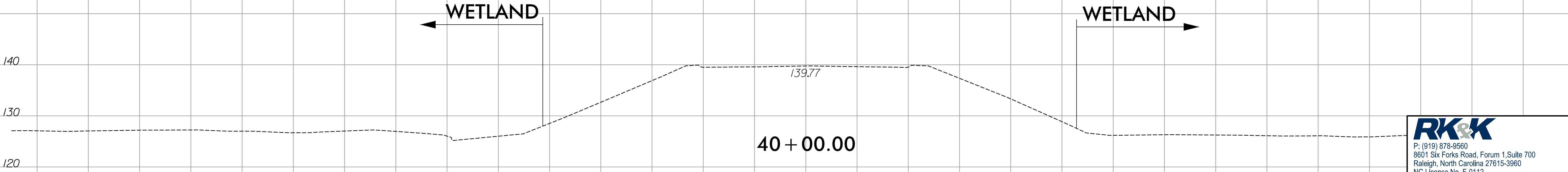
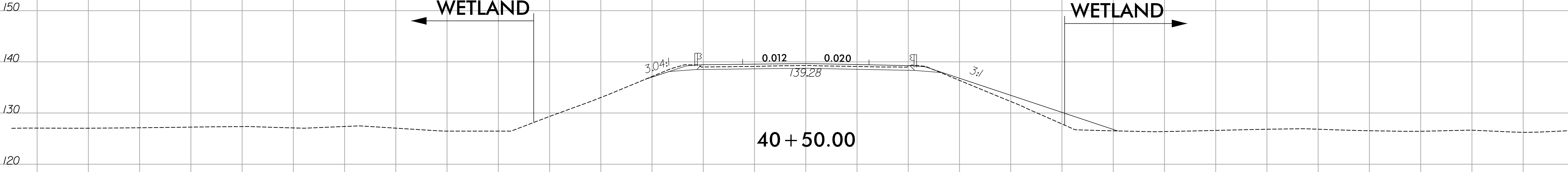
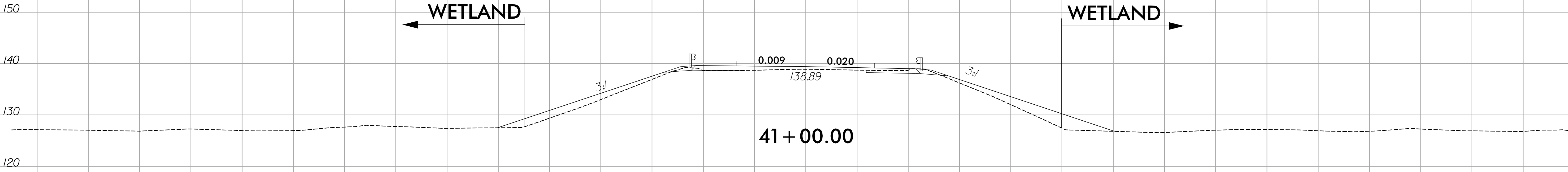
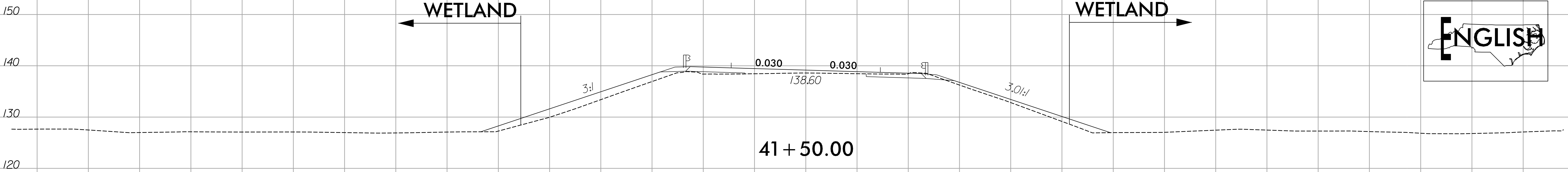
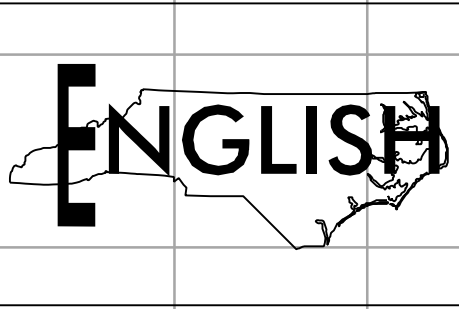
www.rkk.com

Responsive People | Creative Solutions

6/23/16

SITE 15 & 16

PERMIT DRAWING
SHEET 41 OF 163



-Y4-



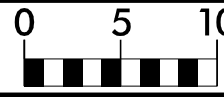
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16

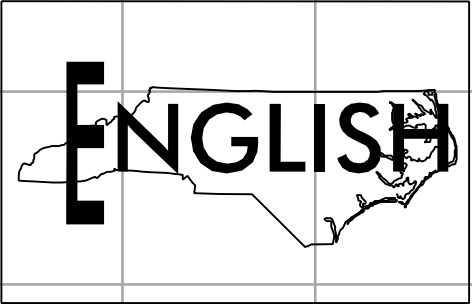
5/1/2020
R:\Hydraulic\PERMITS-Environmental\Drawings\4C\1-5986A_hyd-prm_wet_XPL_Y4_SITE54C.dgn
kajls

SITE 54C



PROJ. REFERENCE NO.	SHEET NO.
X-XXXX	X-2

PERMIT DRAWING
SHEET 42 OF 163



22 + 50.00

167.19

22 + 00.00

166.23

21 + 50.00

165.00

-A-

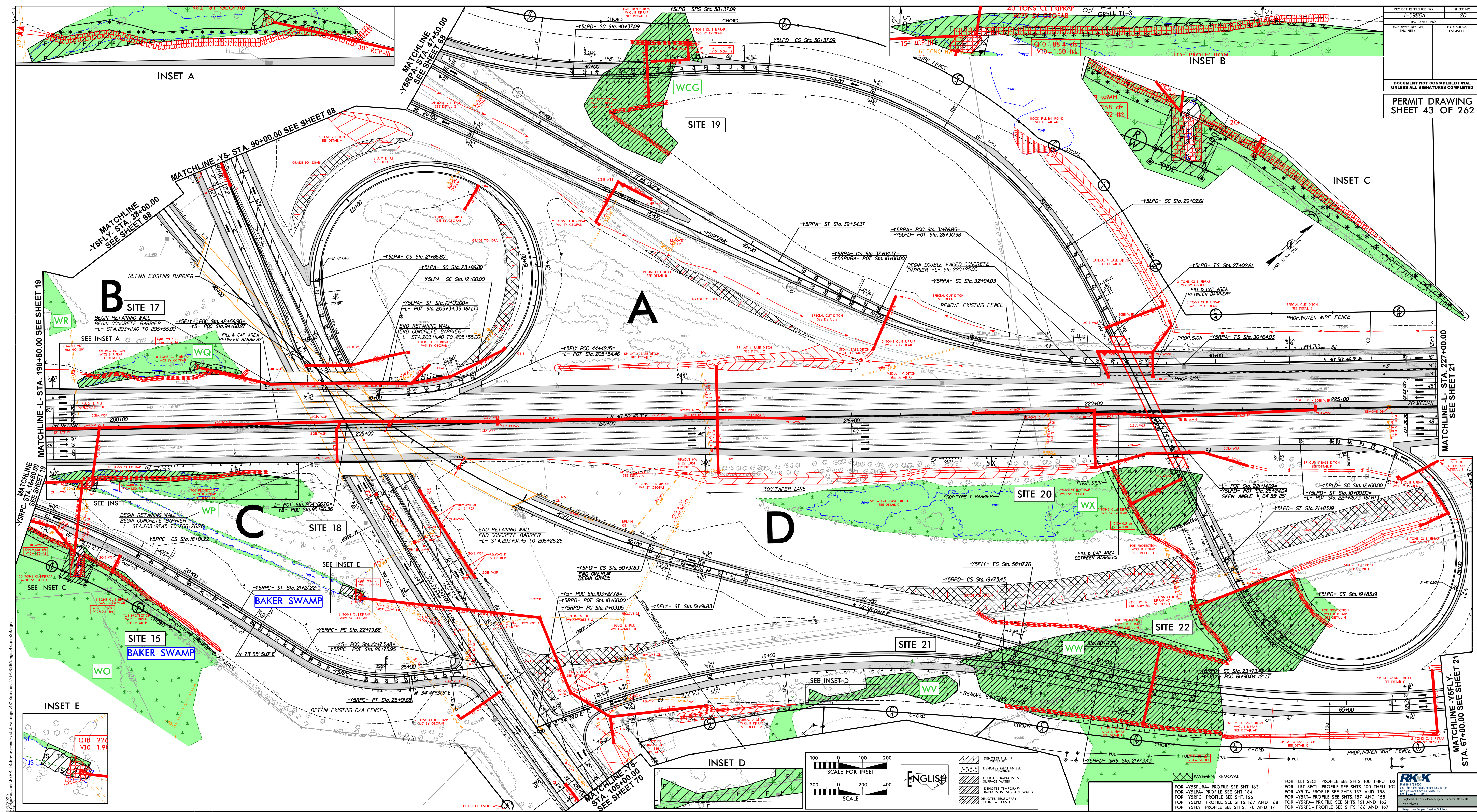
WETLAND

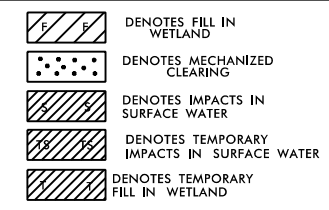
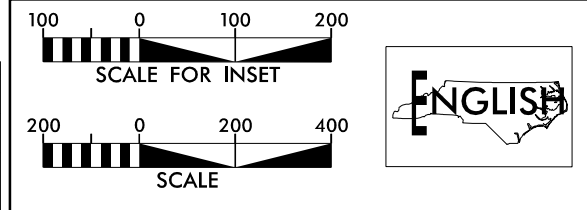
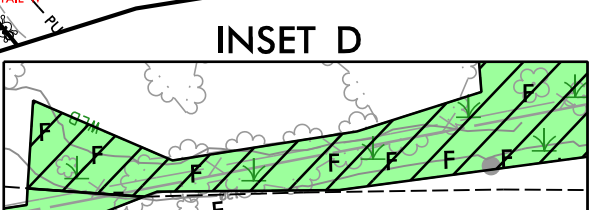
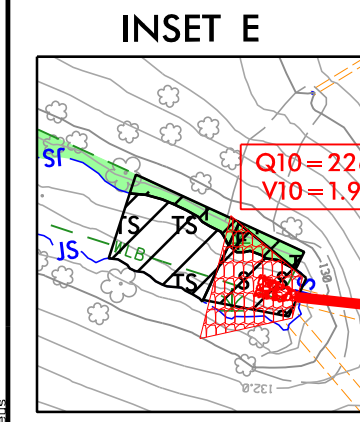
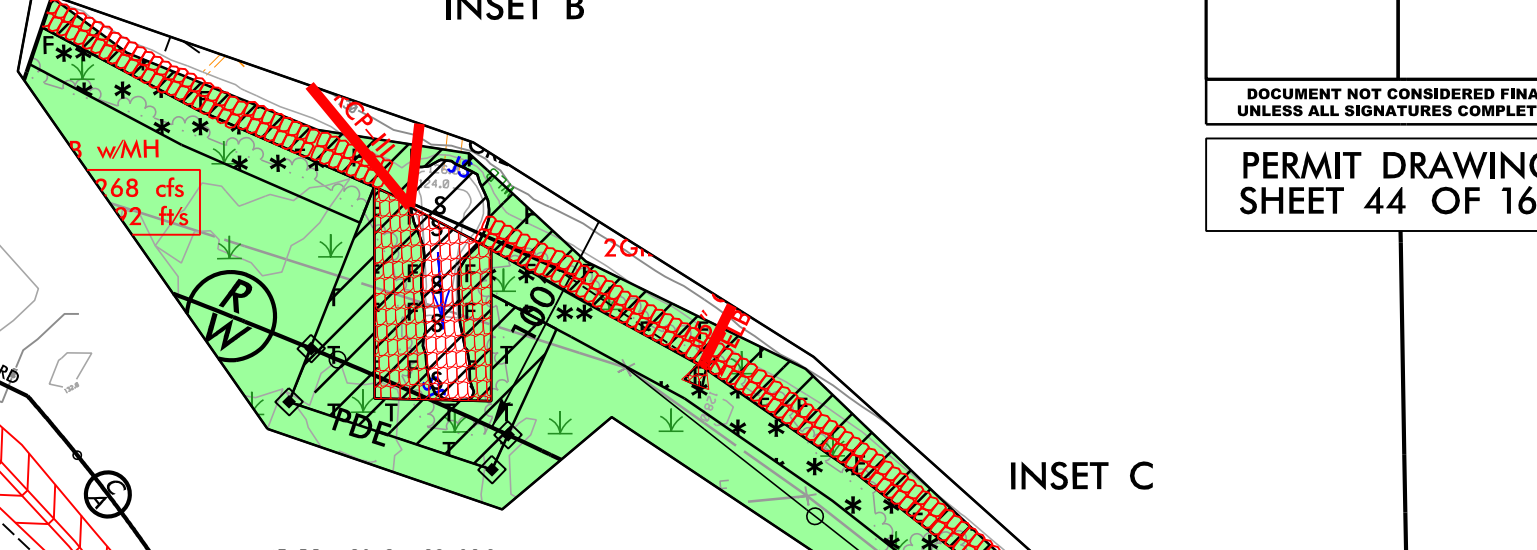
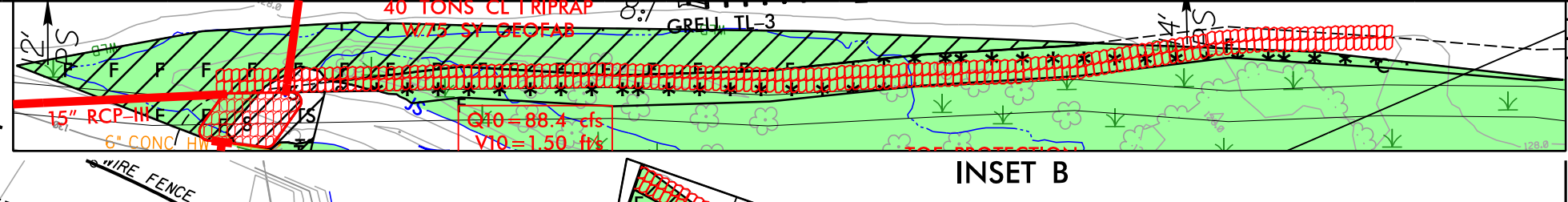
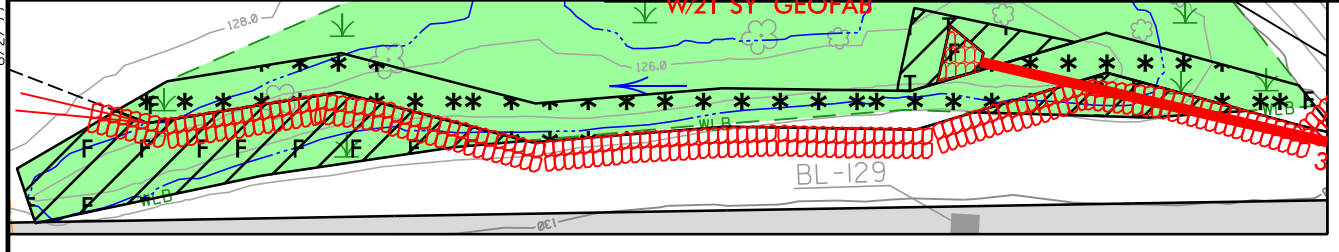
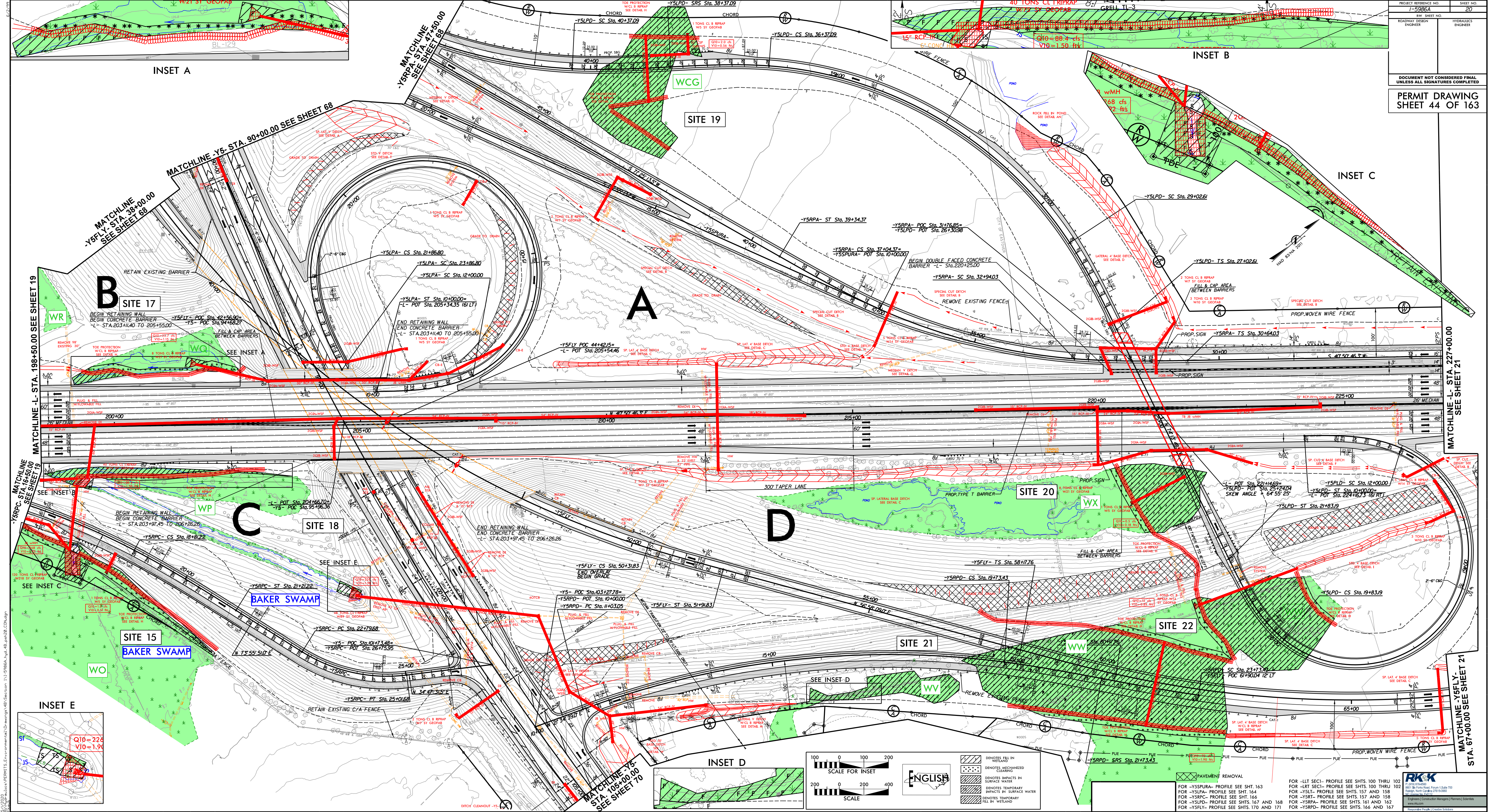
WETLAND



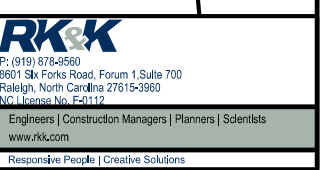
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions





FOR -YSSPURA- PROFILE SEE SHIT 163
FOR -YSSPURA- PROFILE SEE SHIT 164
FOR -YSSPURA- PROFILE SEE SHIT 165
FOR -YSSPURA- PROFILE SEE SHIT 166
FOR -YSSPURA- PROFILE SEE SHIT 167
FOR -YSSPURA- PROFILE SEE SHIT 168
FOR -YSSPURA- PROFILE SEE SHIT 169
FOR -YSSPURA- PROFILE SEE SHIT 170
FOR -YSSPURA- PROFILE SEE SHIT 171
FOR -YSSPURA- PROFILE SEE SHIT 172
FOR -YSSPURA- PROFILE SEE SHIT 173
FOR -YSSPURA- PROFILE SEE SHIT 174
FOR -YSSPURA- PROFILE SEE SHIT 175
FOR -YSSPURA- PROFILE SEE SHIT 176
FOR -YSSPURA- PROFILE SEE SHIT 177
FOR -YSSPURA- PROFILE SEE SHIT 178
FOR -YSSPURA- PROFILE SEE SHIT 179
FOR -YSSPURA- PROFILE SEE SHIT 180
FOR -YSSPURA- PROFILE SEE SHIT 181
FOR -YSSPURA- PROFILE SEE SHIT 182
FOR -YSSPURA- PROFILE SEE SHIT 183
FOR -YSSPURA- PROFILE SEE SHIT 184
FOR -YSSPURA- PROFILE SEE SHIT 185
FOR -YSSPURA- PROFILE SEE SHIT 186
FOR -YSSPURA- PROFILE SEE SHIT 187
FOR -YSSPURA- PROFILE SEE SHIT 188
FOR -YSSPURA- PROFILE SEE SHIT 189
FOR -YSSPURA- PROFILE SEE SHIT 190
FOR -YSSPURA- PROFILE SEE SHIT 191
FOR -YSSPURA- PROFILE SEE SHIT 192
FOR -YSSPURA- PROFILE SEE SHIT 193
FOR -YSSPURA- PROFILE SEE SHIT 194
FOR -YSSPURA- PROFILE SEE SHIT 195
FOR -YSSPURA- PROFILE SEE SHIT 196
FOR -YSSPURA- PROFILE SEE SHIT 197
FOR -YSSPURA- PROFILE SEE SHIT 198
FOR -YSSPURA- PROFILE SEE SHIT 199
FOR -YSSPURA- PROFILE SEE SHIT 200



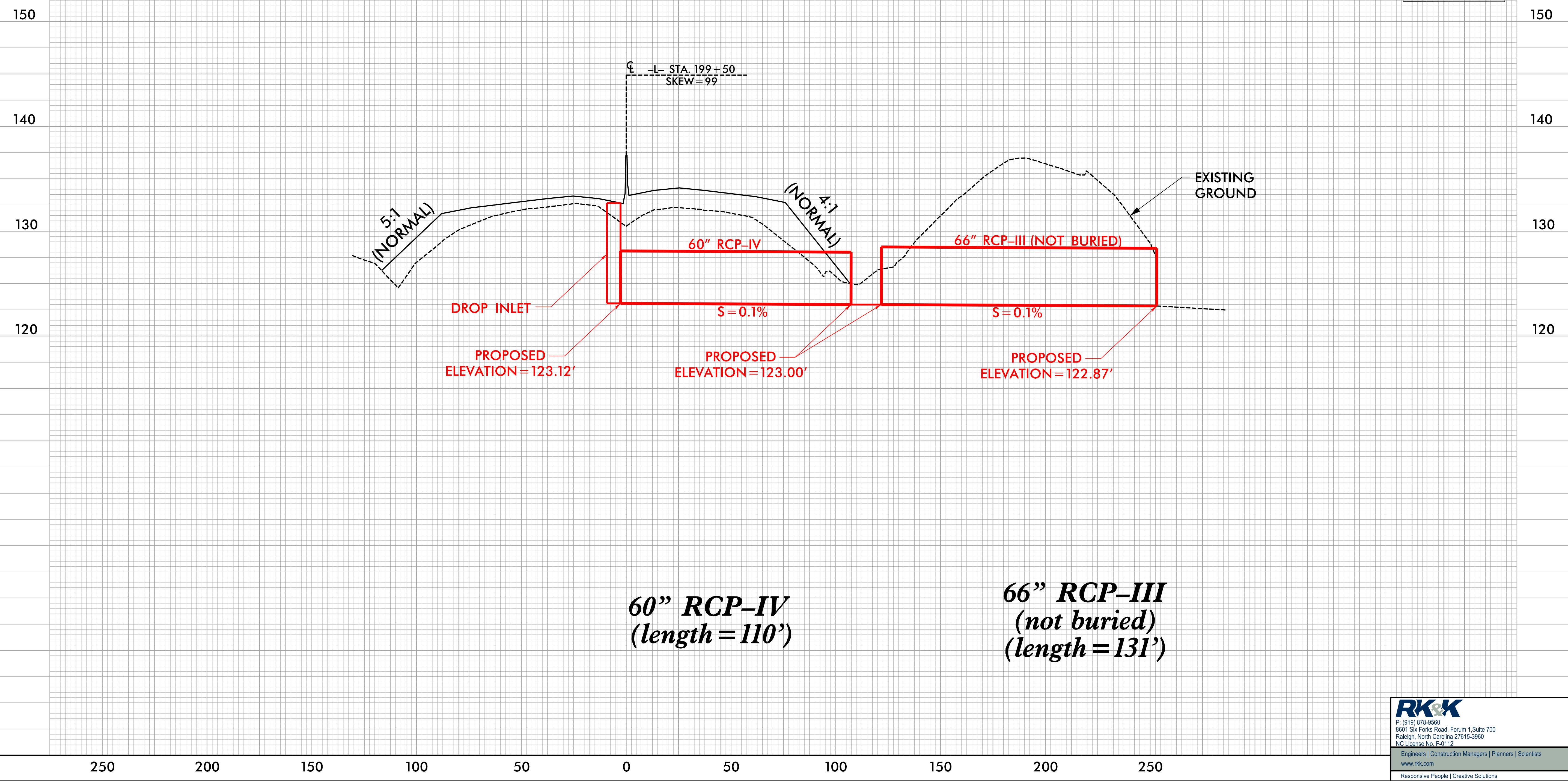
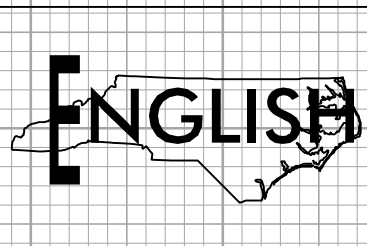
5/14/99

5/14/2020 11:01:00 AM C:\Users\pfl\OneDrive\Documents\Drawings\4C\1-5986A_hyd.prm.wet.pfl_SITE15.dgn

PROJECT REFERENCE NO.		SHEET NO.
1-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 15/18
-L- STA. 199+50

PERMIT DRAWING
SHEET 45 OF 163

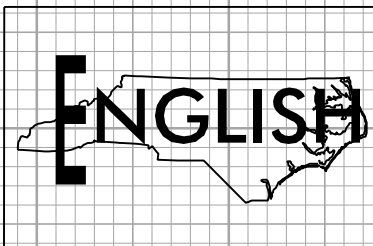


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

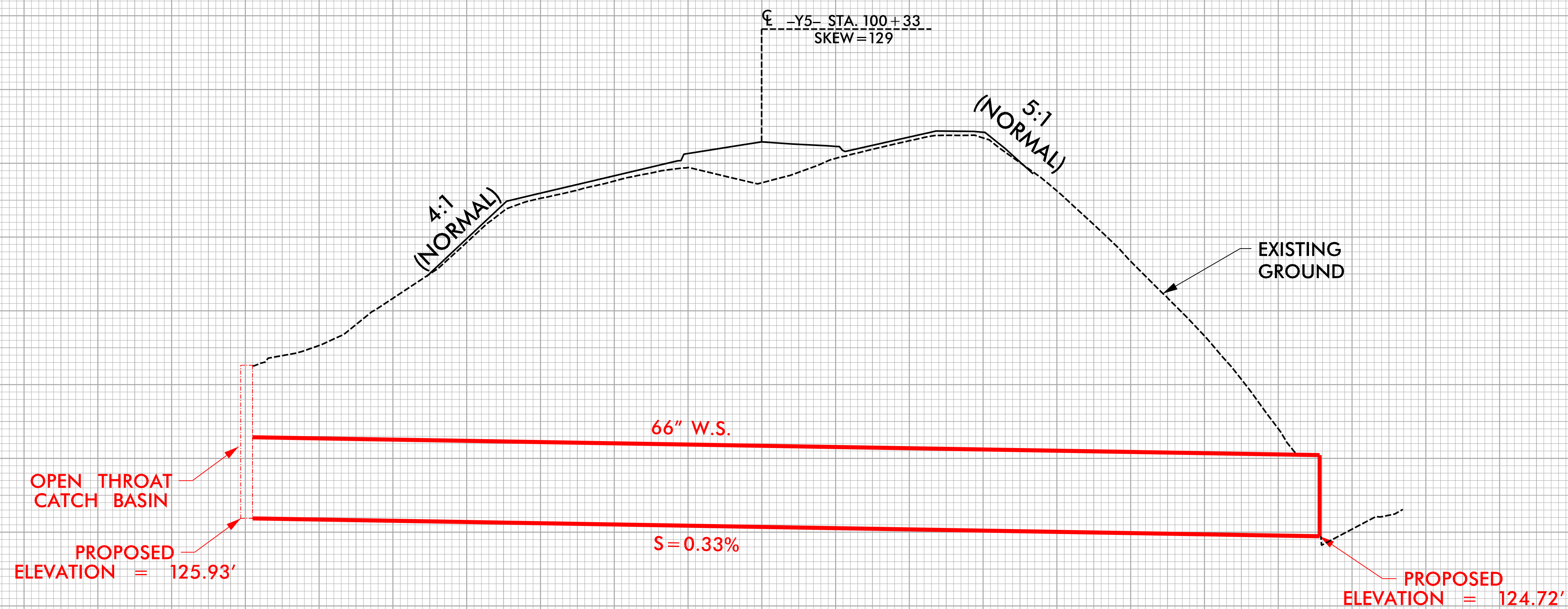
PROJECT REFERENCE NO.	SHEET NO.
I-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 46 OF 163



SITE 18

-Y5- STA. 100+33



TRENCHLESS INSTALLATION 66" WELDED STEEL
(length = 262')



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

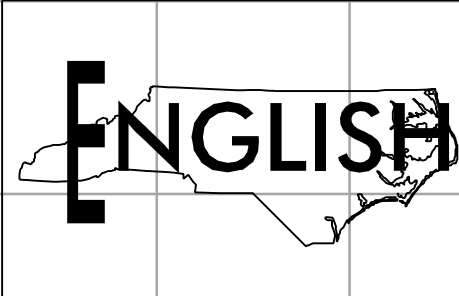
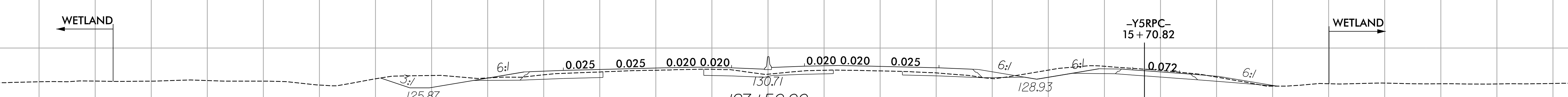
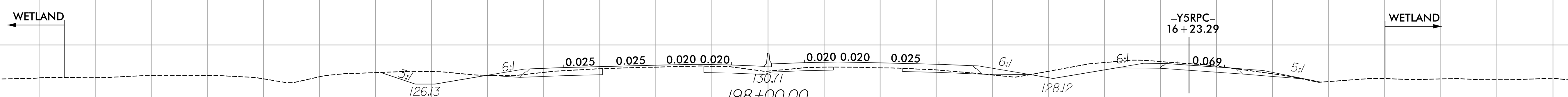
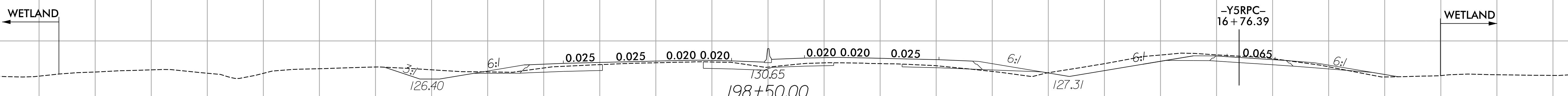
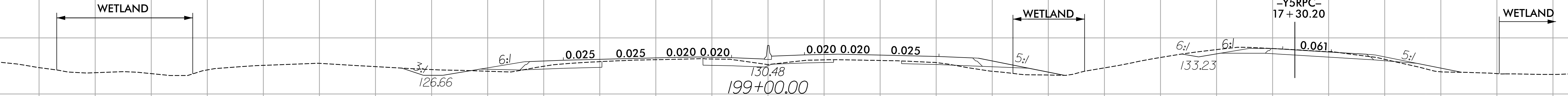
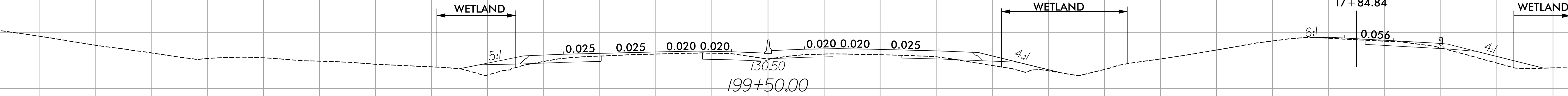
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16

SITE 15, 17, & 18

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S1 X-106

PERMIT DRAWING
SHEET 47 OF 163



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL\LL SITE\15&17&18.dgn
kaj

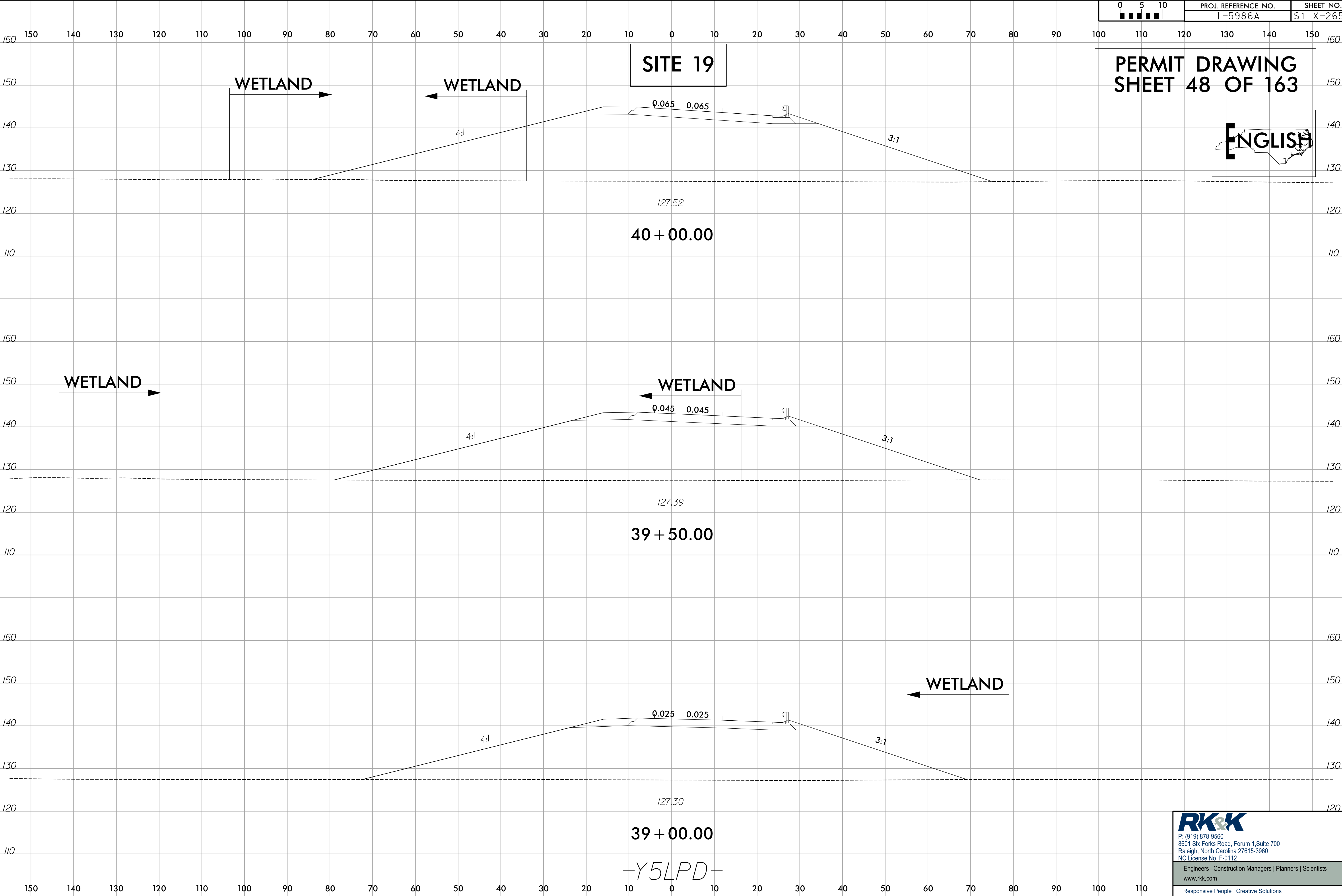
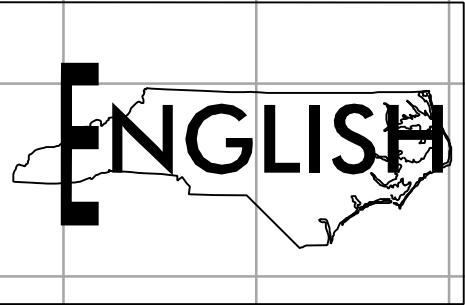
6/23/16

5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4C\1-5986A_hyd-prm_wet.XPL\Y5LPD_SITE19.dgn
kell

0 5 10 [Scale Bar]	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S1 X-265

SITE 19

PERMIT DRAWING
SHEET 48 OF 163

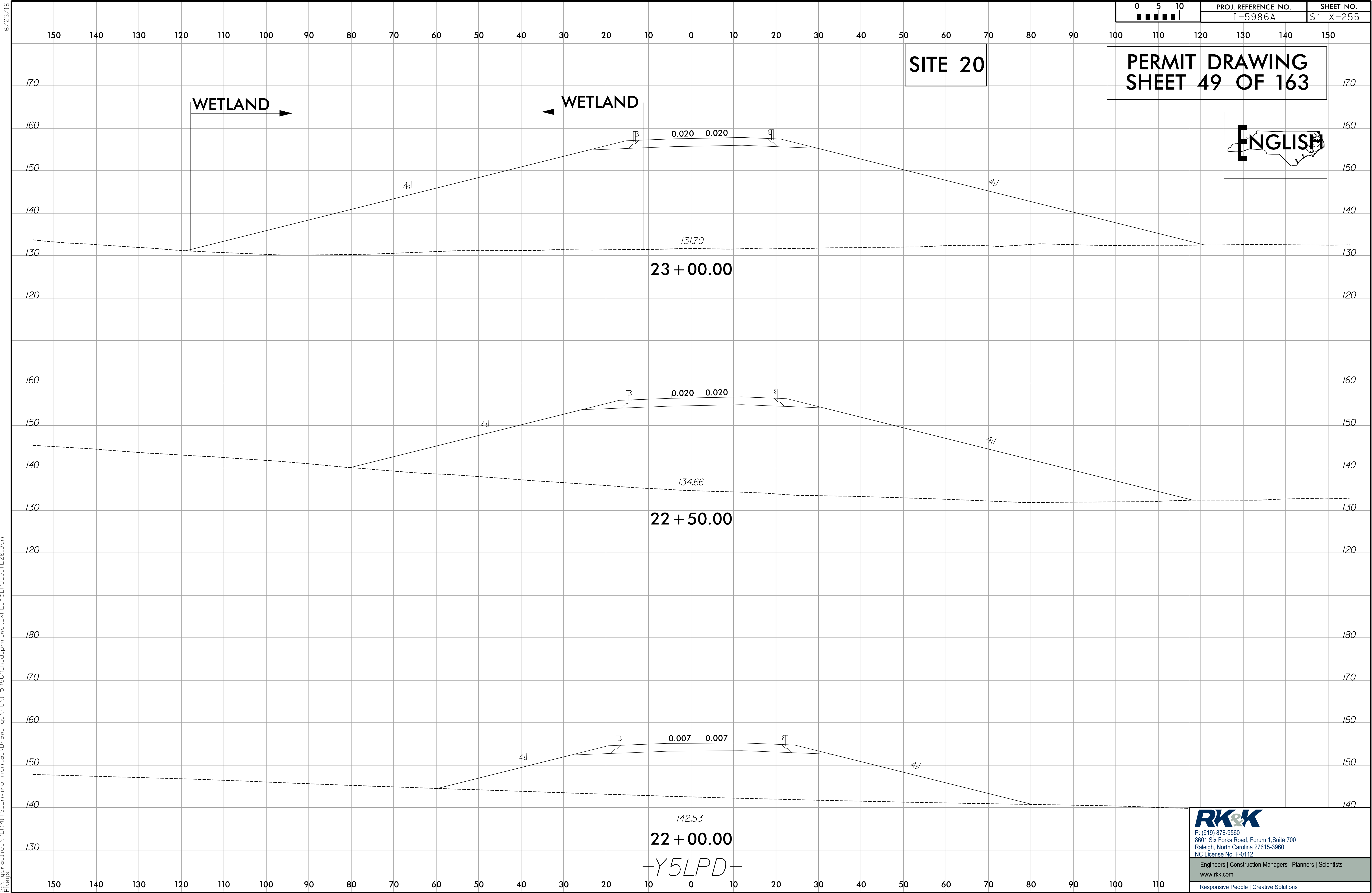


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

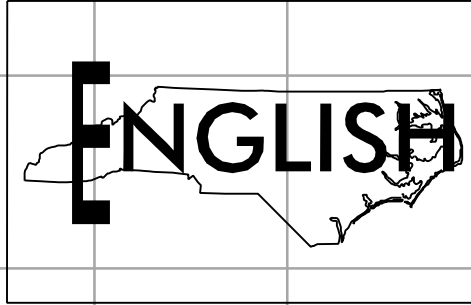
6/23/16

5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4\I-5986A_hyd-prm_wet.XPL_Y5LPD_SITE20.dgn
kell



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
<div></div>	I-5986A	S1 X-255

PERMIT DRAWING
SHEET 49 OF 163



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

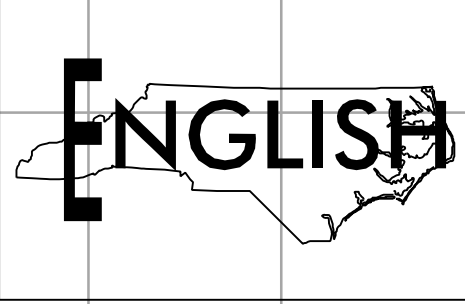
6/23/16

5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4[C:\I-5986A_hyd-prm_wet.XPL_Y5RPD_SITE2].dgn
kell

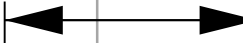
0 5 10 	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S1 X-249

SITE 21

PERMIT DRAWING
SHEET 50 OF 163



WETLAND



16 + 00.00

WETLAND



15 + 50.00

WETLAND



15 + 00.00

-Y5RPD-



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

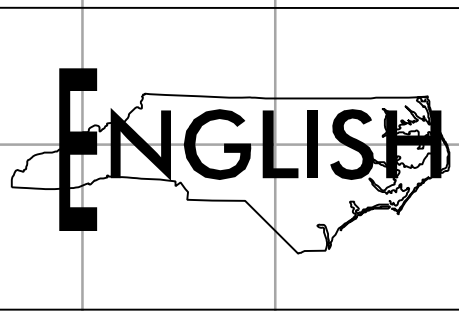
6/23/16

5/1/2020
R:\Hydraulic\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet.XPL_Y5LPD_SITE22.dgn
kyle

0 5 10 	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S1 X-254

SITE 22

PERMIT DRAWING
SHEET 51 OF 163



WETLAND

0.013 0.013

4:1

138.30

21 + 50.00

WETLAND

0.033 0.033

WETLAND

4:1

131.30

21 + 00.00

WETLAND

0.053 0.053

WETLAND

4:1

131.20

20 + 50.00

-Y5LPD-



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
S:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh22.dgn
RKK

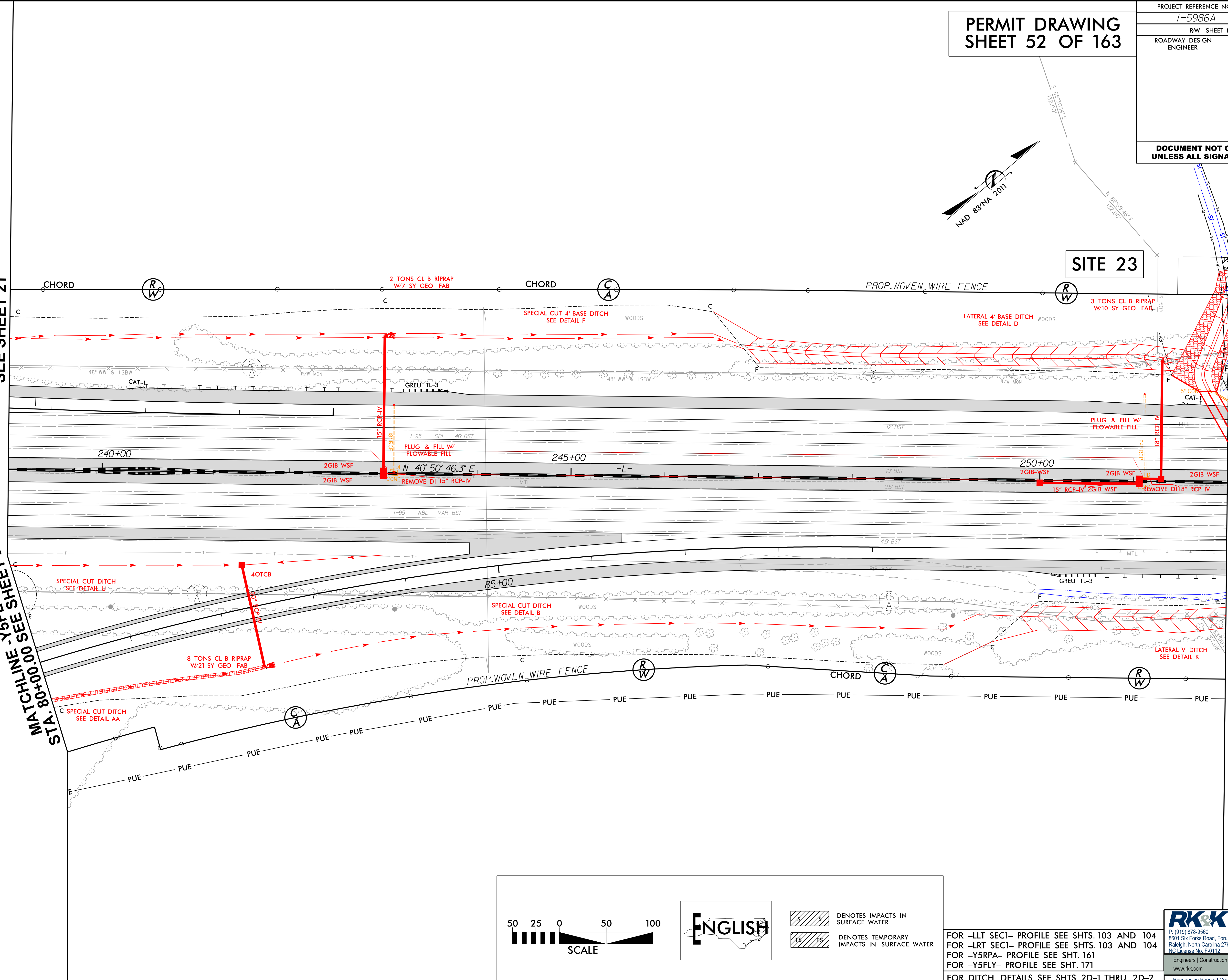
PERMIT DRAWING
SHEET 52 OF 163

PROJECT REFERENCE NO. I-5986A		SHEET NO. 22	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
</			

MATCHLINE -L- STA. 239+00.00
SEE SHEET 21

MATCHLINE -Y5FLYREV-
STA. 80+00.00 SEE SHEET 21

MATCHLINE -L- STA. 252+00.00 SEE SHEET 23



50 25 0 50 100
SCALE

ENGLISH

DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -LLT SEC1- PROFILE SEE SHTS. 103 AND 104
FOR -LRT SEC1- PROFILE SEE SHTS. 103 AND 104
FOR -Y5RPA- PROFILE SEE SHT. 161
FOR -Y5FLY- PROFILE SEE SHT. 171
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RKK
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
S:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A-hyd-4B_psh22.CON.dgn
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A-hyd-4B_psh22.CON.dgn

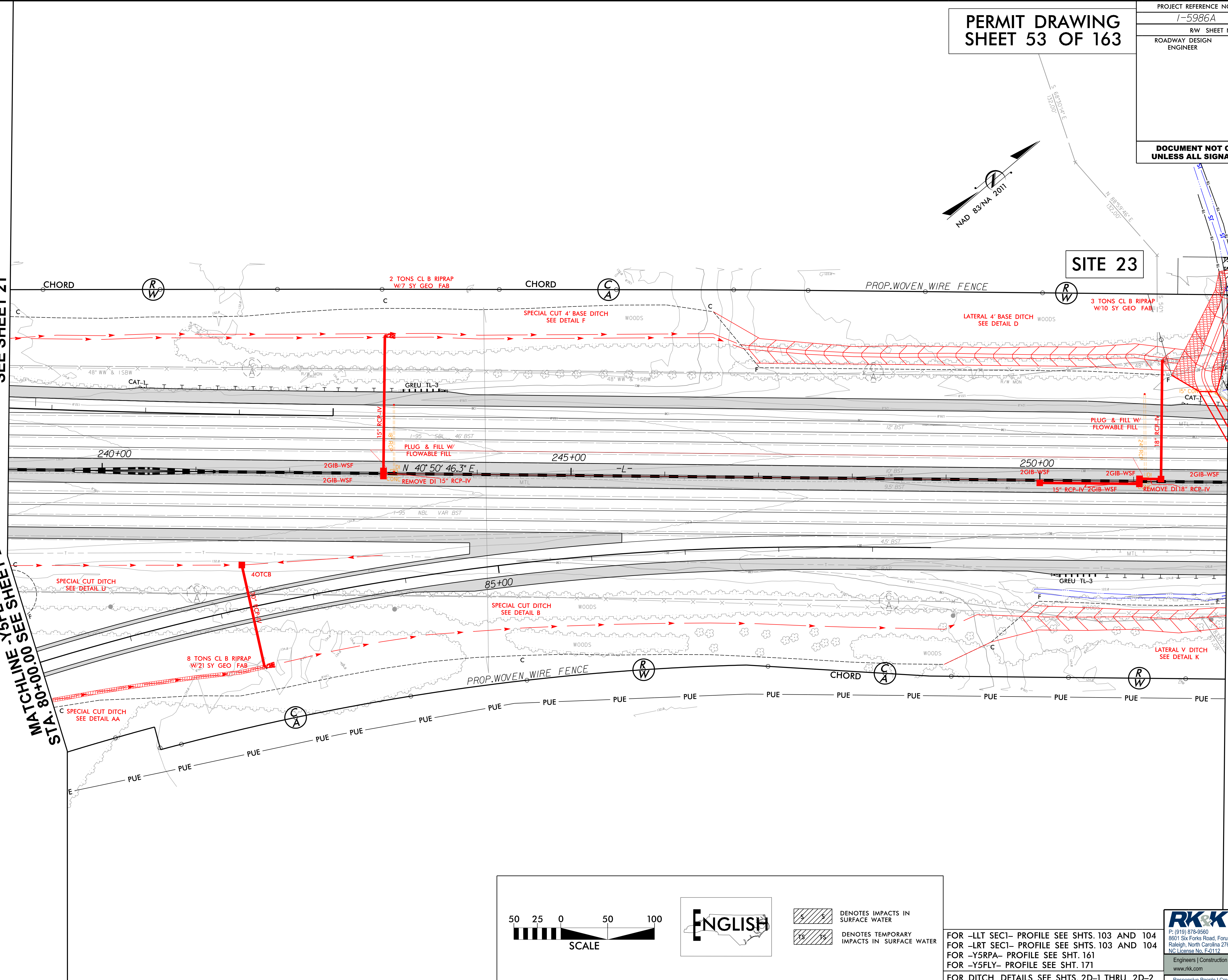
PERMIT DRAWING
SHEET 53 OF 163

PROJECT REFERENCE NO. I-5986A		SHEET NO. 22	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
</			

MATCHLINE -L- STA. 239+00.00
SEE SHEET 21

MATCHLINE -Y5FLYREV-
STA. 80+00.00 SEE SHEET 21

MATCHLINE -L- STA. 252+00.00 SEE SHEET 23



50 25 0 50 100
SCALE

ENGLISH

5 5

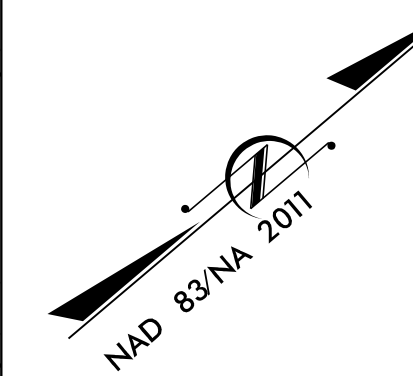
5 DENOTES IMPACTS IN SURFACE WATER

15 15

15 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -LLT SEC1- PROFILE SEE SHTS. 103 AND 104
FOR -LRT SEC1- PROFILE SEE SHTS. 103 AND 104
FOR -Y5RPA- PROFILE SEE SHT. 161
FOR -Y5FLY- PROFILE SEE SHT. 171
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



SEE INSET A

SITE 23

SC-2

LATERAL 4' BASE DITCH
SEE DETAIL D

**SPECIAL CUT DITCH
SEE DETAIL B**

15" CONC HW
CAT-1

PROP.WOVEN WIRE FENCE

BILLBOARD

W
L

N 40° 44' 45.7" E

REMOVE D

PLUG & FILL W/
FLOWABLE FILL

REMOVE

PLUG & FILL

SPECIAL CUT 4' BASE DITCH
SEE DETAIL F

LATERAL 4' BASE DITCH
SEE DETAIL D

SITE 23

SC-1

INSET B

TIE FENCE CUVLERT WALL

TIE FENCE TO CUVLERT WIN WALL

PUE

FOR -LLT SEC1- PROFILE SEE SHTS. 104 AND 105
FOR -LRT SEC1- PROFILE SEE SHTS. 104 AND 105
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

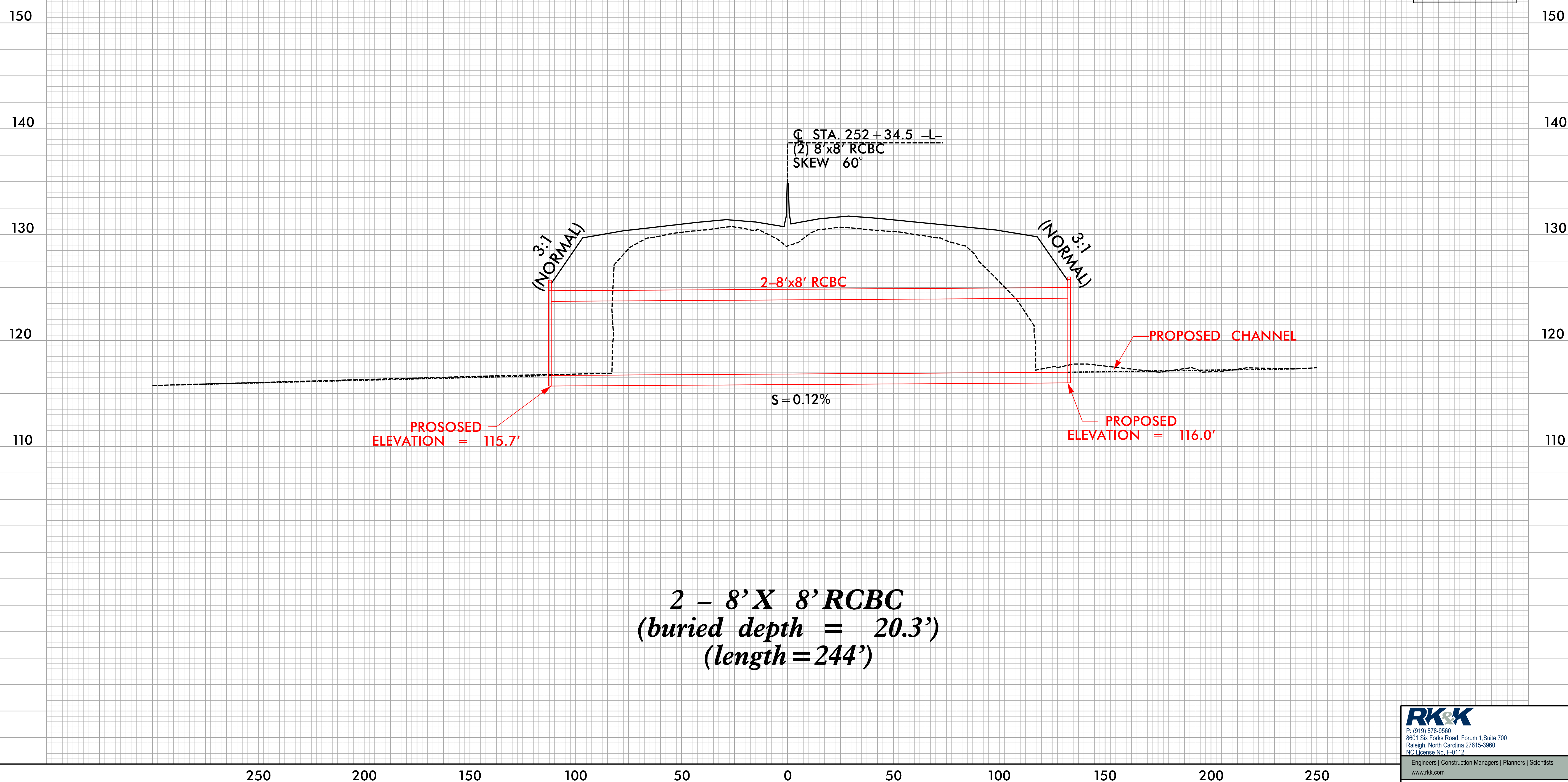
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

SITE 23
-L- STA. 252+34

PERMIT DRAWING
SHEET 56 OF 163

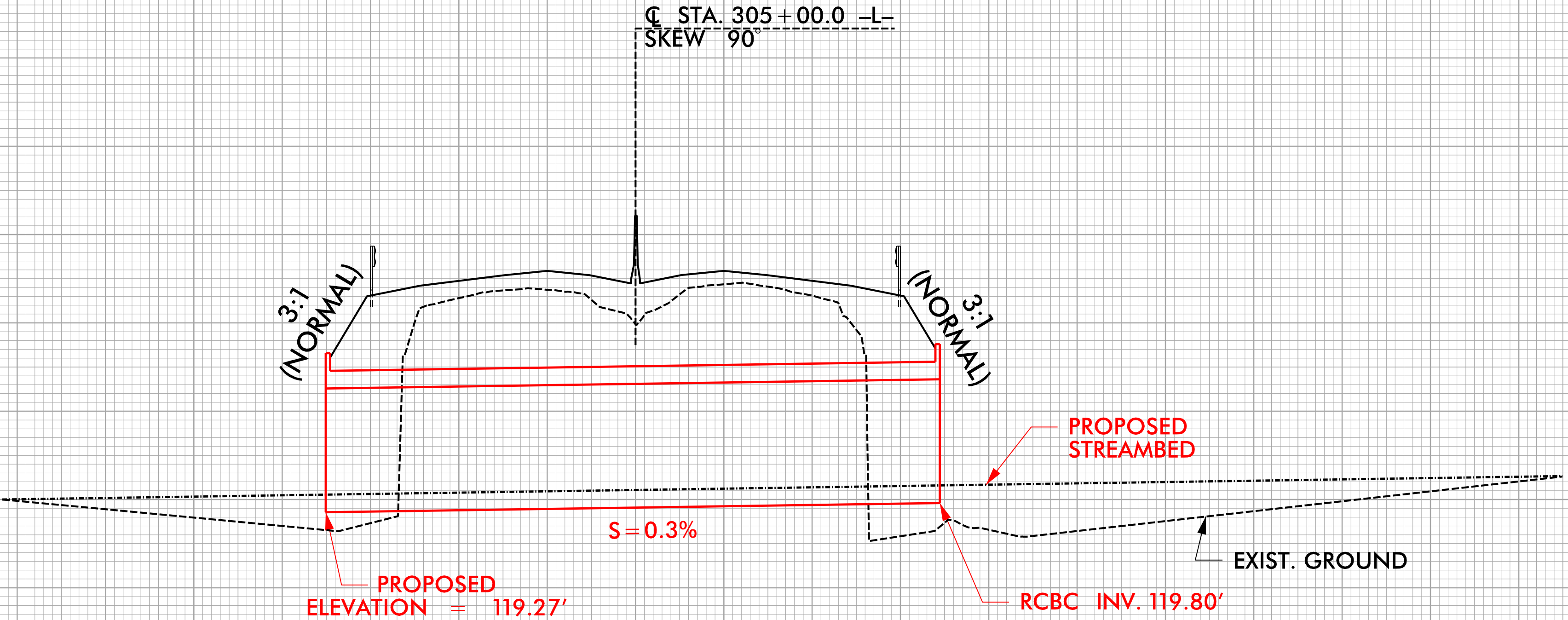
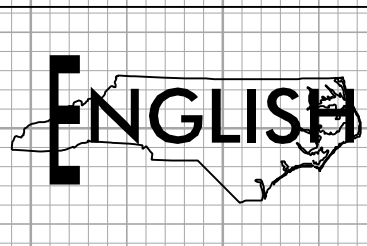


2 - 8' X 8' RCBC
(buried depth = 20.3')
(length = 244')

PROJECT REFERENCE NO.		SHEET NO.
I-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 24
-L- STA. 305 + 00

PERMIT DRAWING
SHEET 59 OF 163



3 @ 10' X 7' RCBC
(length = 174')



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

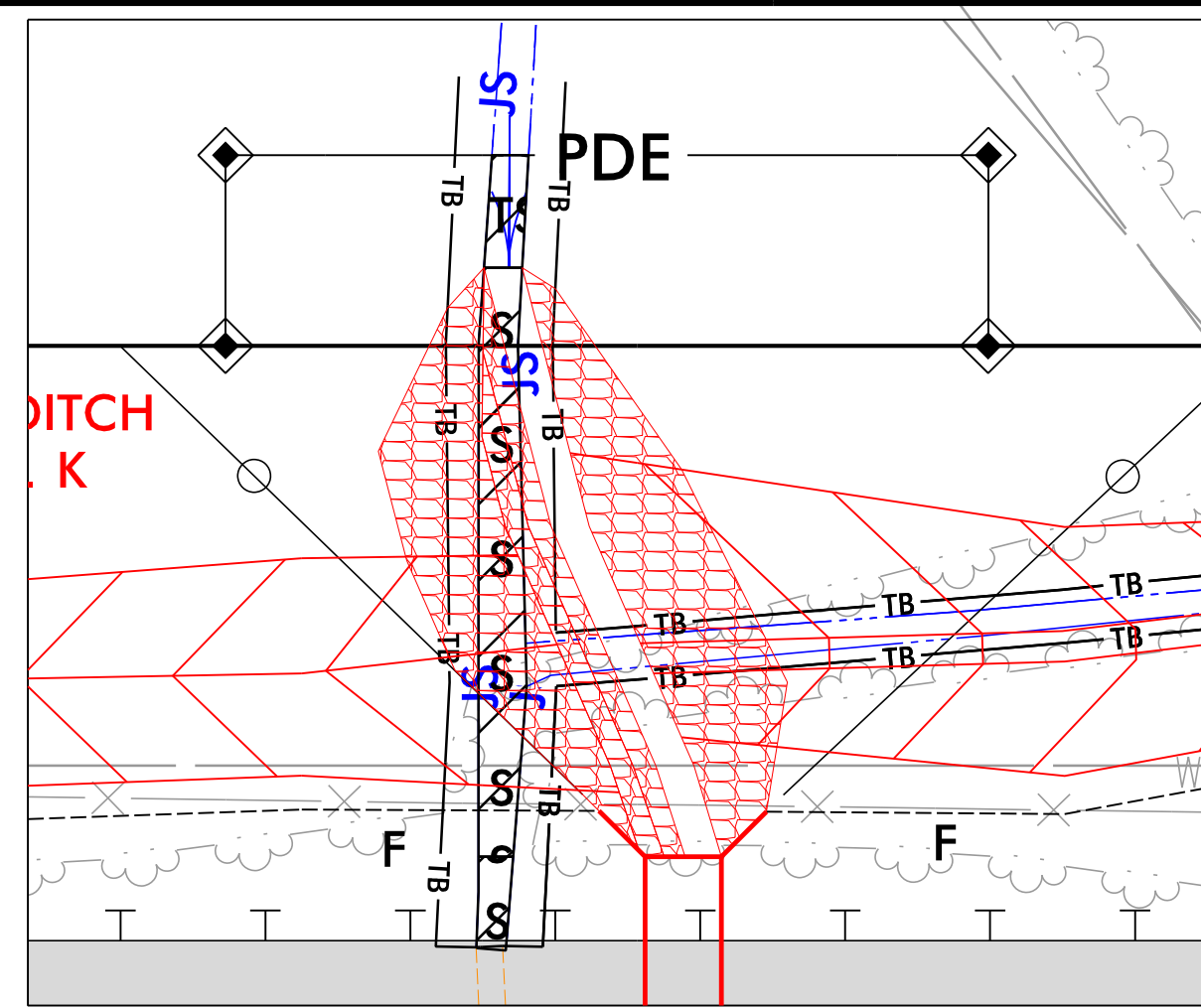
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99

5/1/2020
C:\Users\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh31.dgn
Hydraulics

MATCHLINE -L- STA. 350+00.00 SEE SHEET 30

MATCHLINE -L- STA. 363+00.00 SEE SHEET 32



INSET A

SE-1

SITE 25

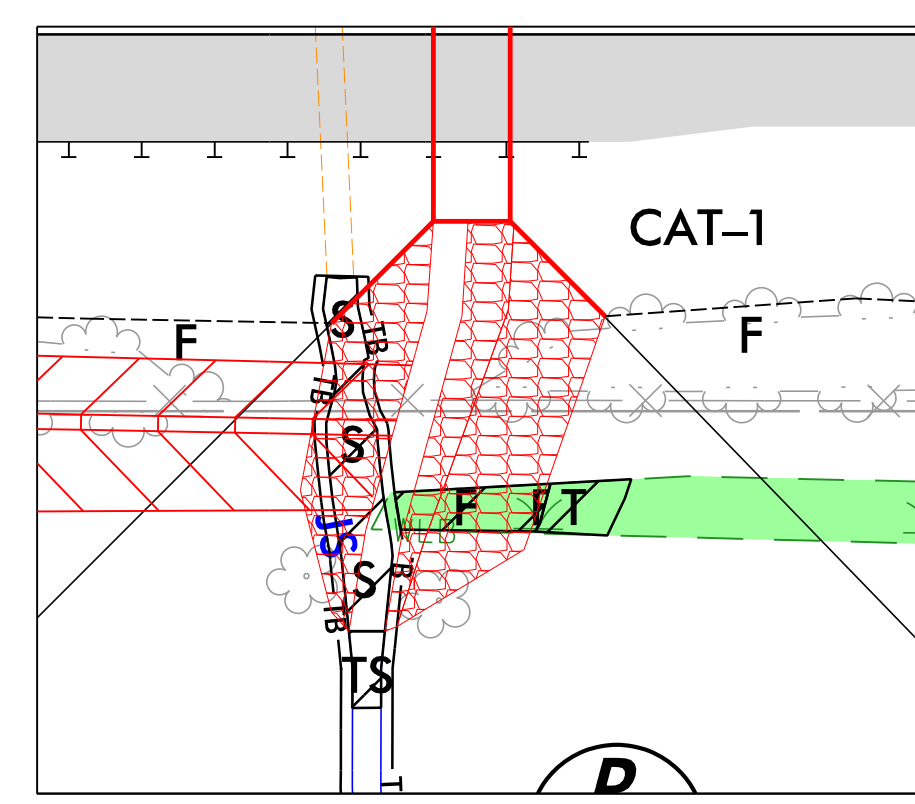
SEE INSET A

SEE INSET B

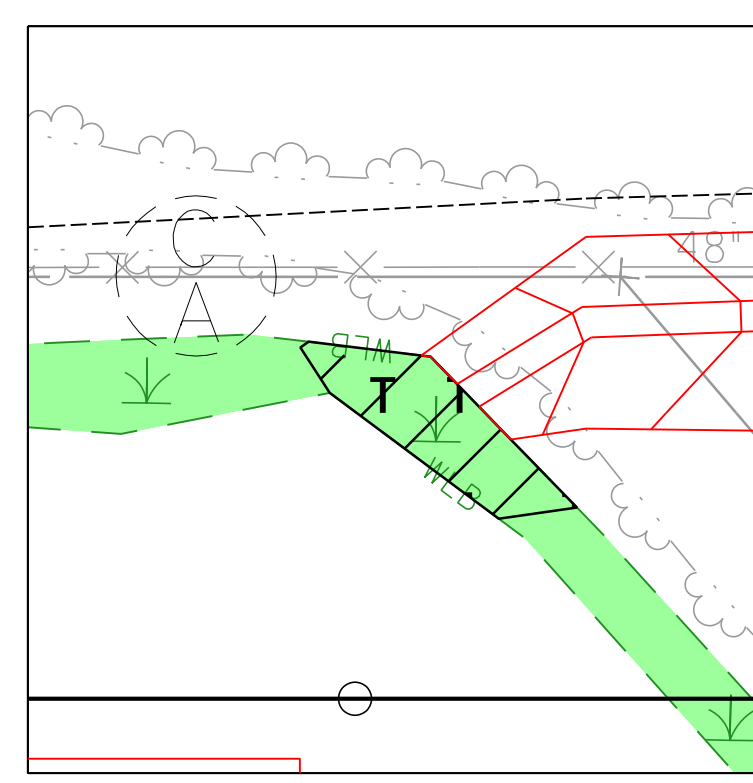
SE-2

SITE 25

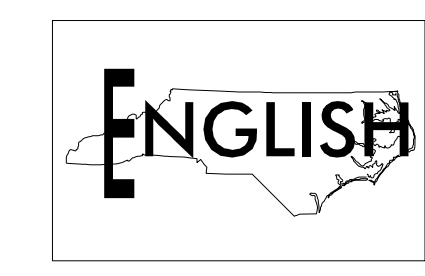
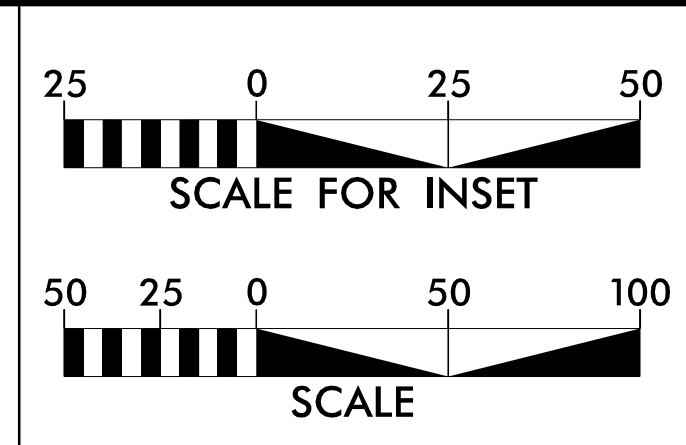
SEE INSET C



INSET B



INSET C



- F F DENOTES FILL IN WETLAND
- S S DENOTES IMPACTS IN SURFACE WATER
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- T T DENOTES TEMPORARY FILL IN WETLAND



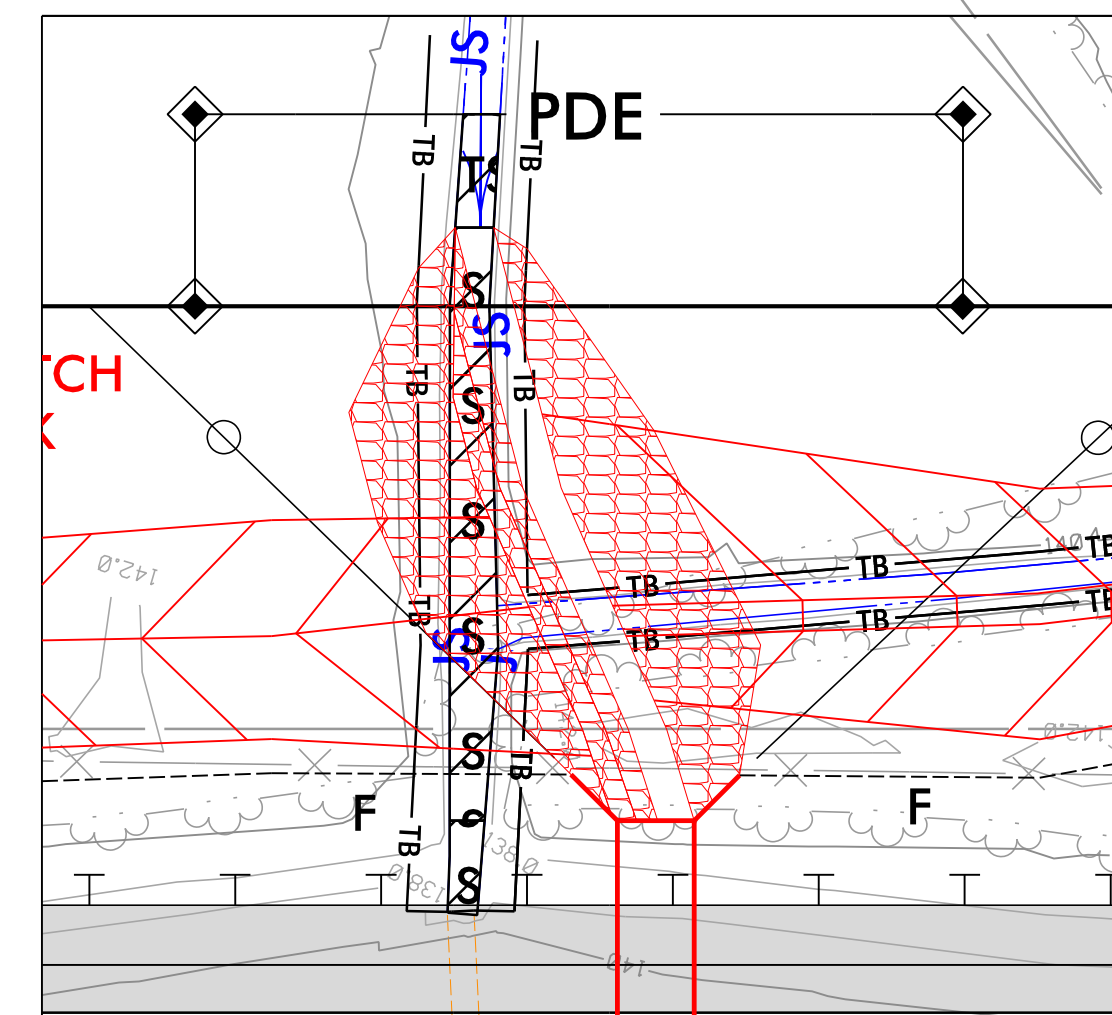
PROJECT REFERENCE NO. 1-5986A		SHEET NO. 31	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 60 OF 163			

FOR -LLT SEC2- PROFILE SEE SHTS. 112 THRU 113
FOR -LRT SEC2- PROFILE SEE SHTS. 112 THRU 113
FOR -Y7RPB- PROFILE SEE SHT. 177
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

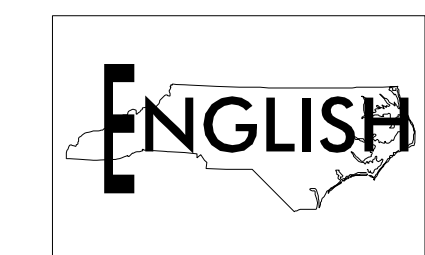
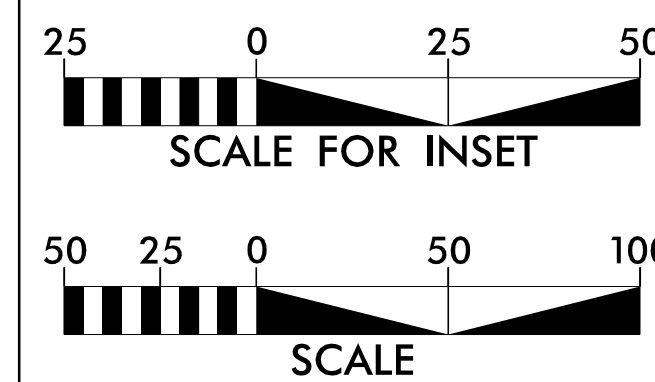
RK&K
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99

5/1/2020
C:\Users\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh31_C0N.dgn
RKK



INSET A

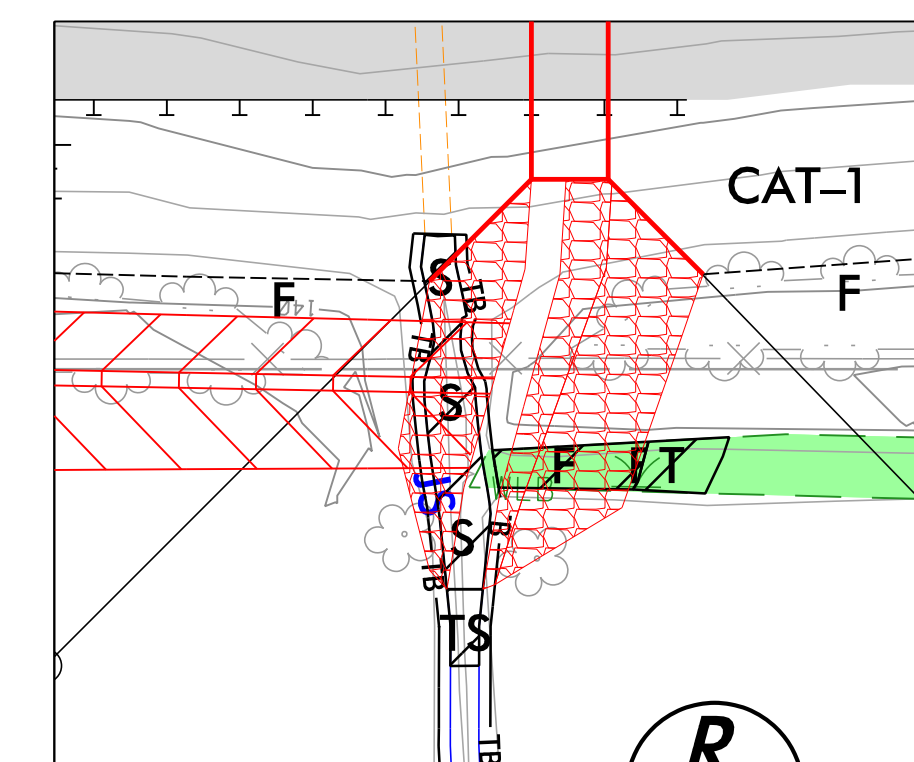
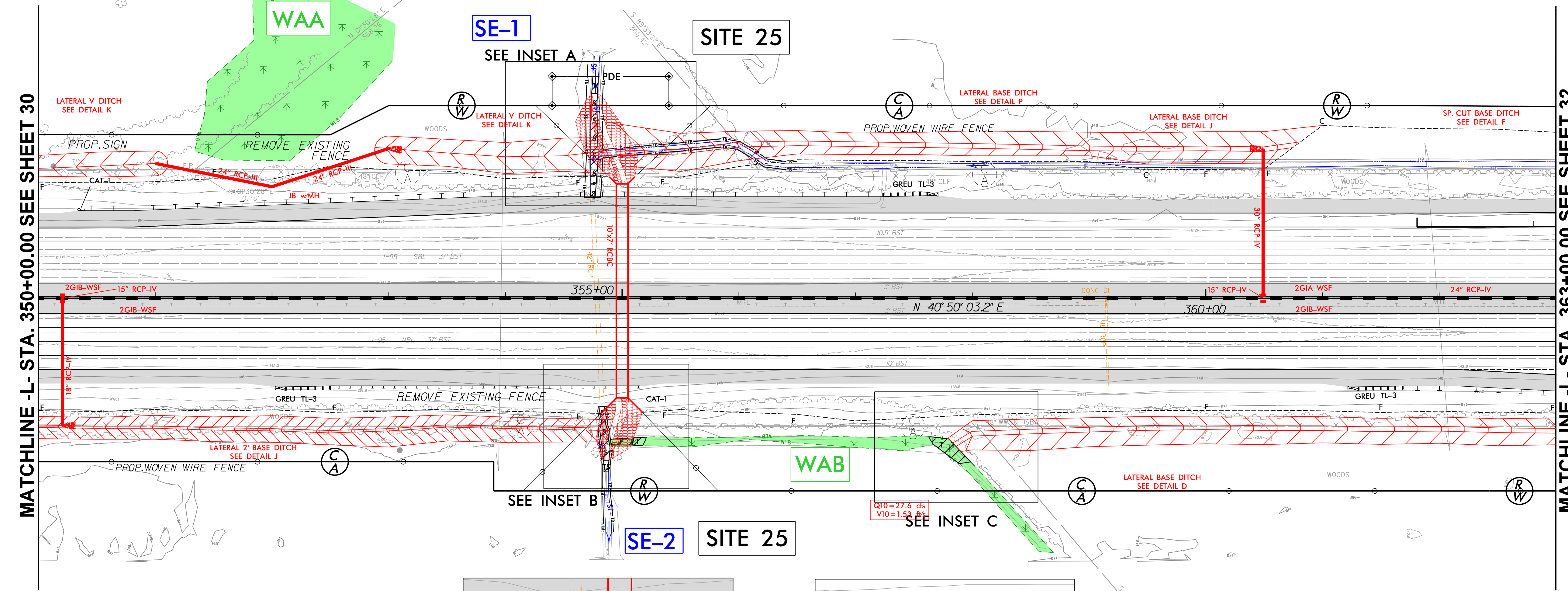


- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY FILL IN WETLAND

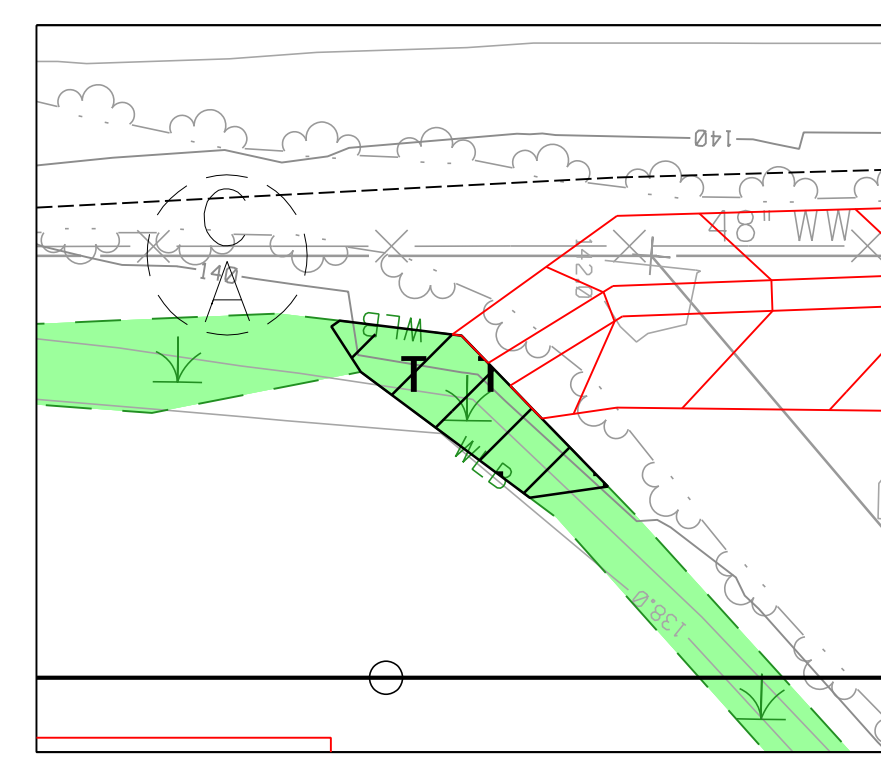
PROJECT REFERENCE NO.	SHEET NO.
1-5986A	31
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 61 OF 163



INSET B



INSET C

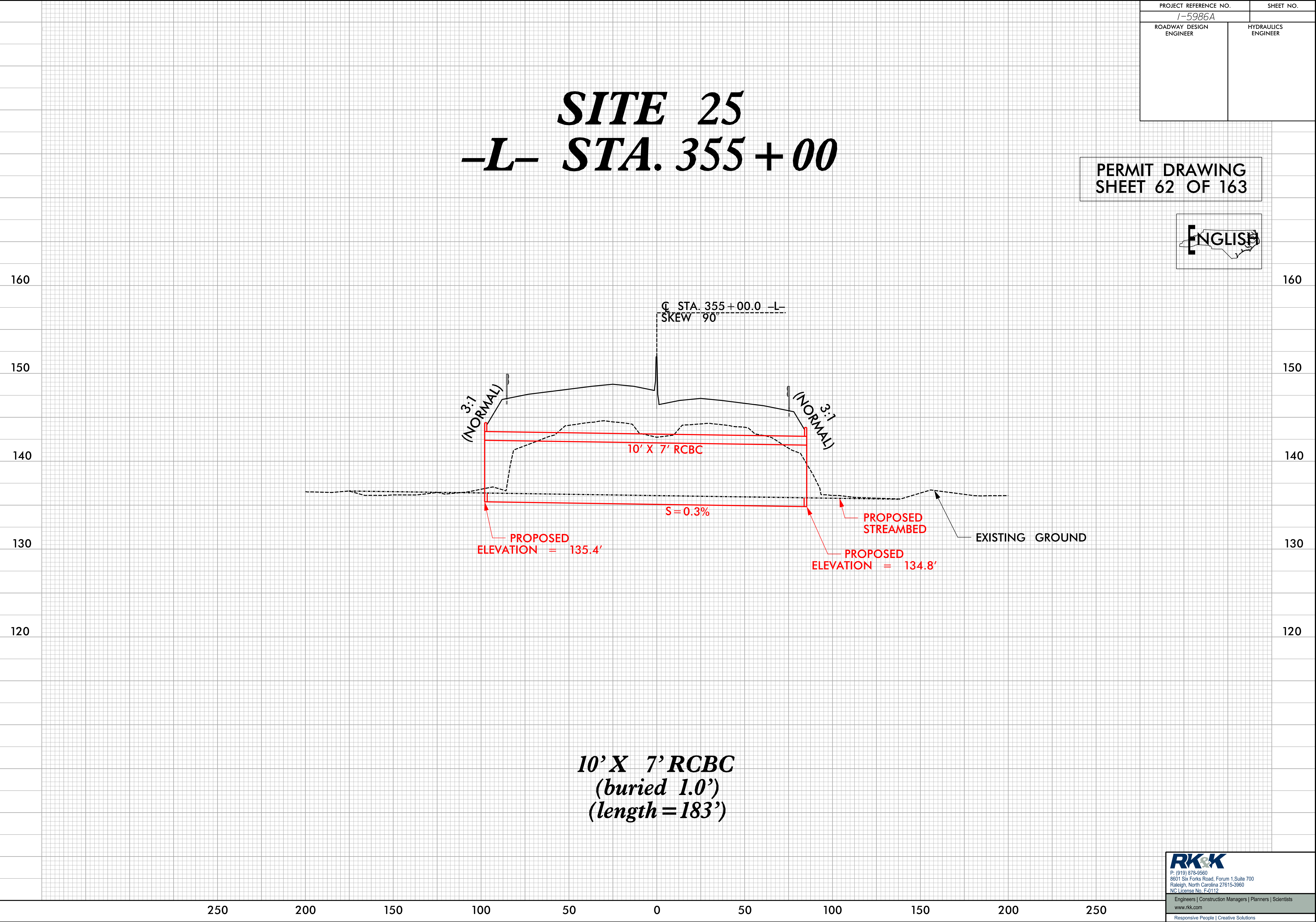
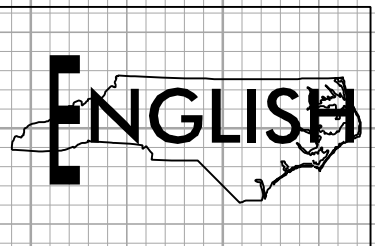
FOR -LLT SEC2- PROFILE SEE SHTS. 112 THRU 113
FOR -LRT SEC2- PROFILE SEE SHTS. 112 THRU 113
FOR -Y7RPB- PROFILE SEE SHT. 177
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

RKK
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO.	SHEET NO.
I-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 25
-L- STA. 355+00

PERMIT DRAWING
SHEET 62 OF 163

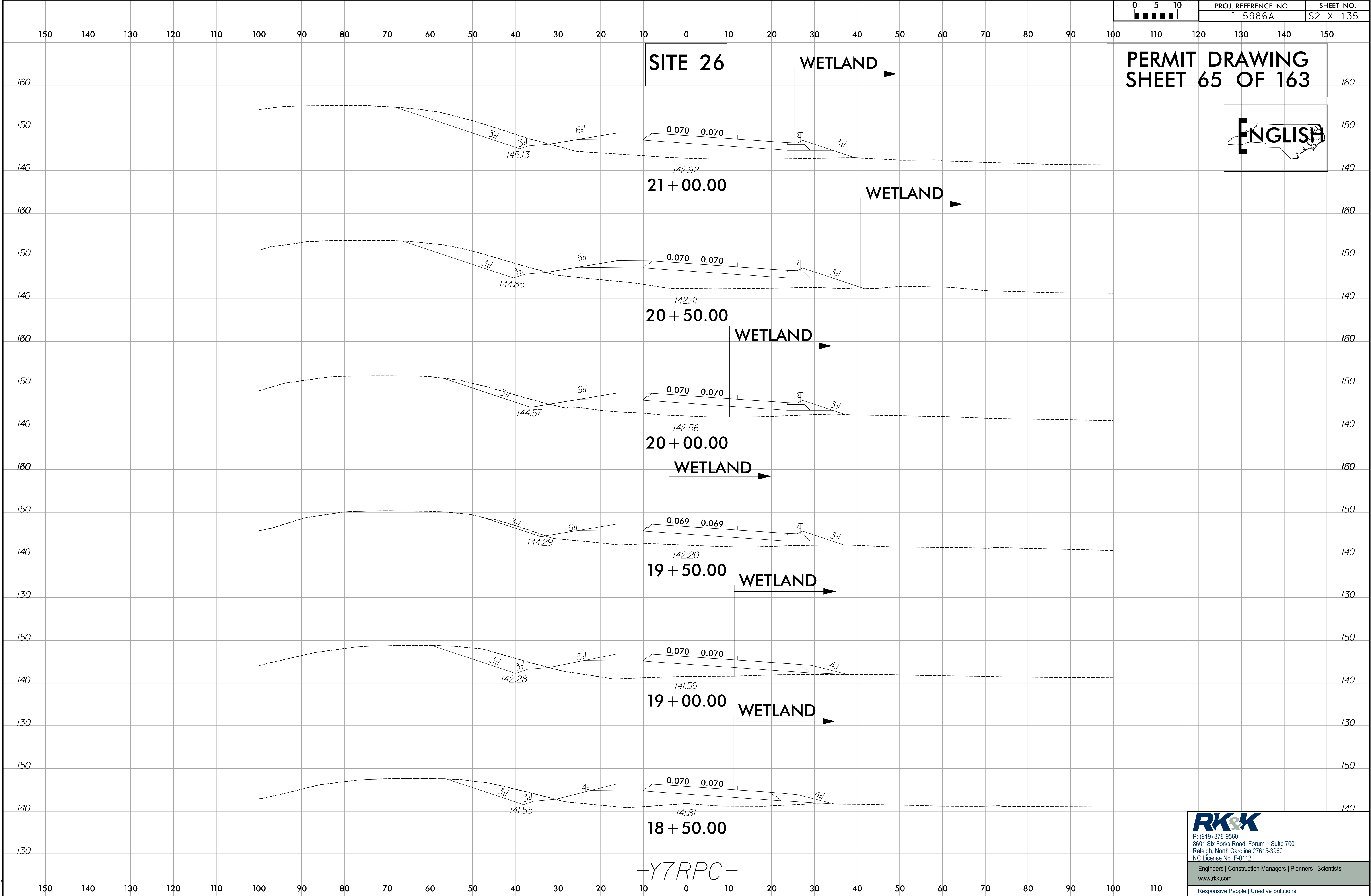


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16

5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL_Y7RPC_SITE26.dgn
kaj



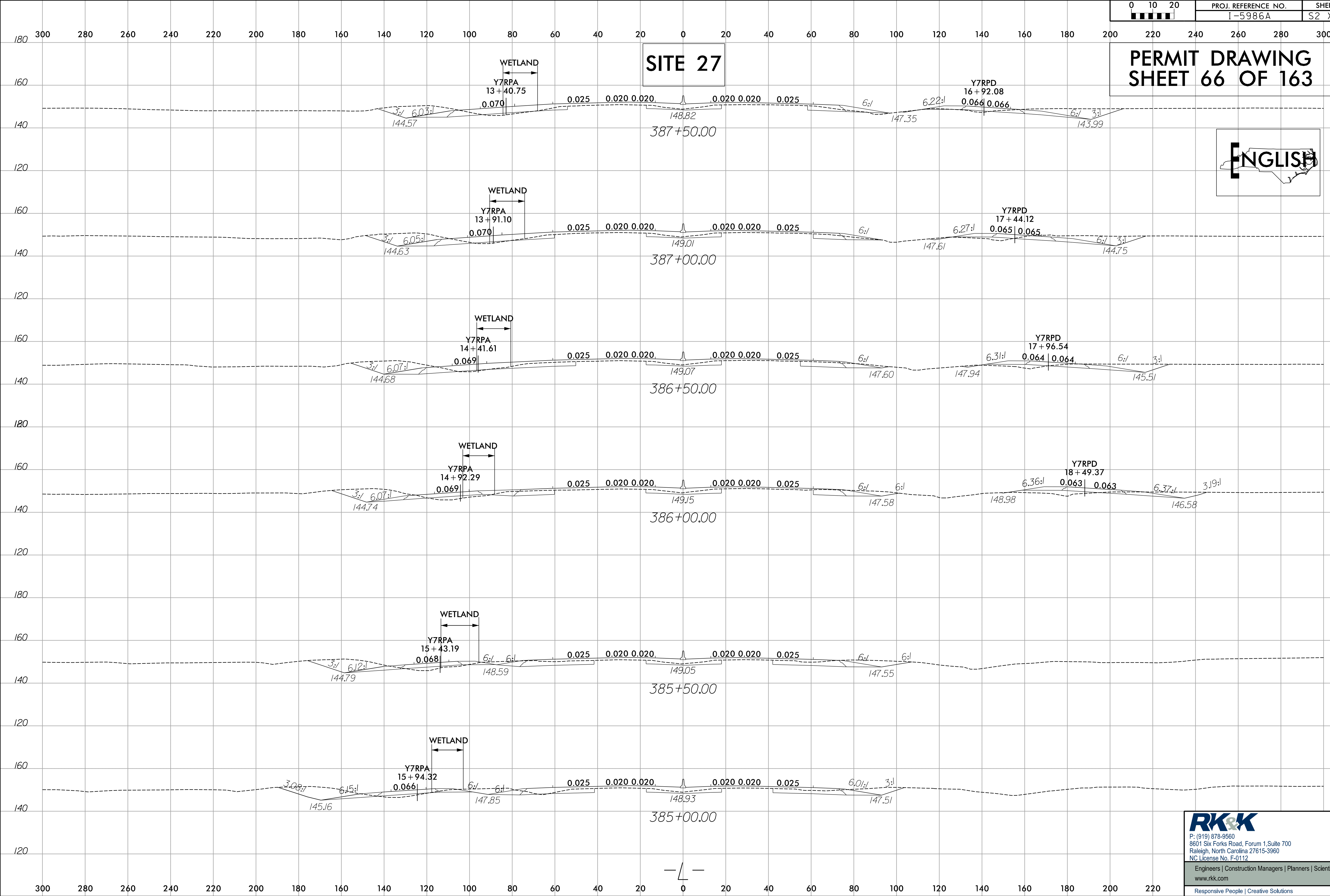
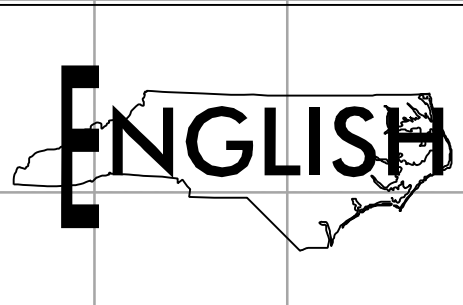
6/23/16

5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4\I-5986A_hyd-prm_wet_XPL_Y7RPA_SITE27.dgn
kell

0 10 20 [Scale Bar]	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S2 X-37

SITE 27

PERMIT DRAWING
SHEET 66 OF 163



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



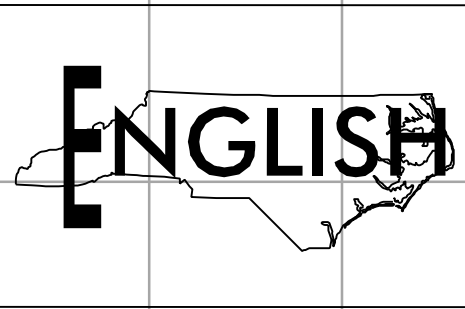


6/23/16

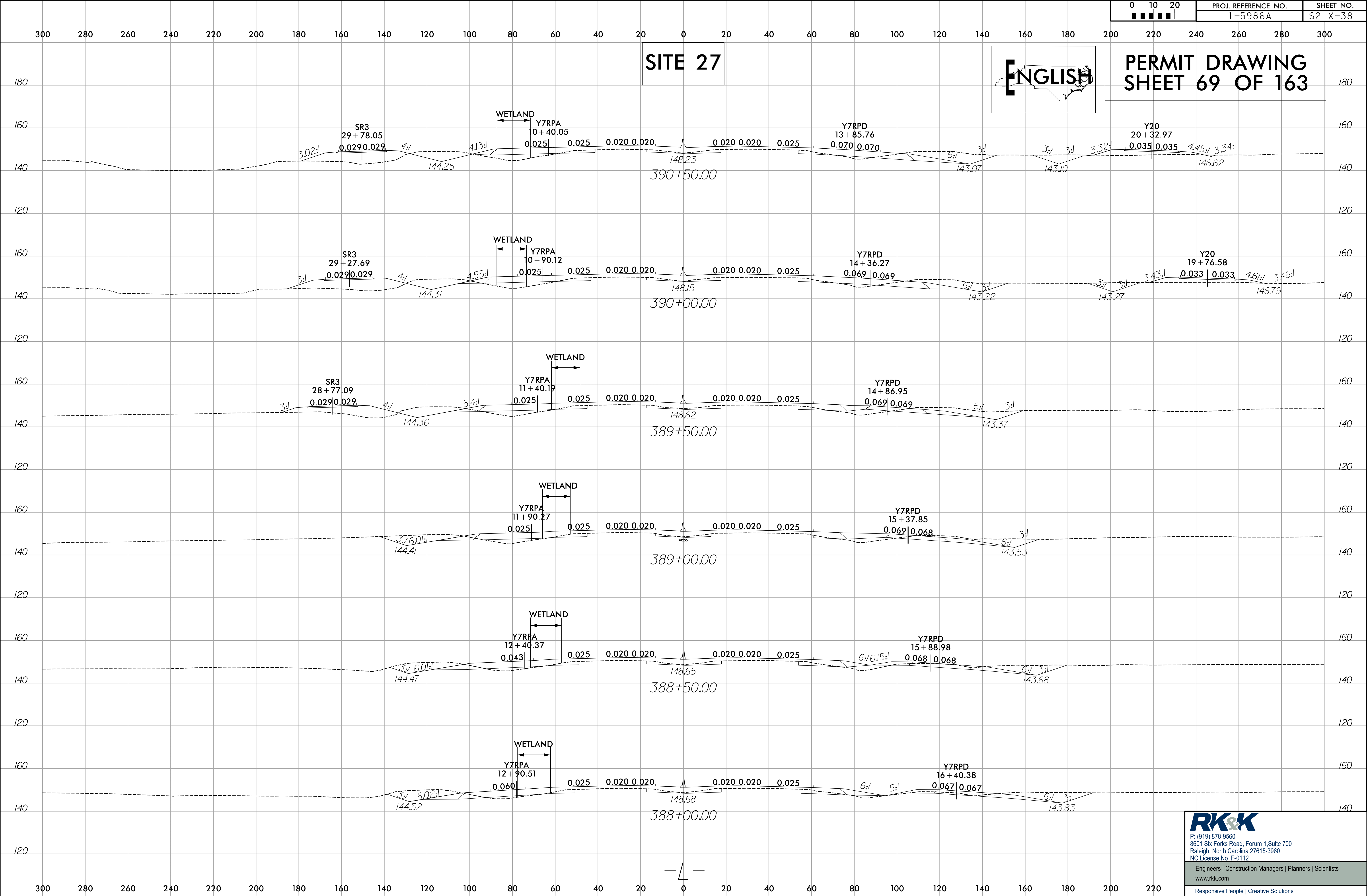
5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4\I-5986A_hyd-prm_wet_XPL_Y7RPA_SITE27.dgn
kaj

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
<div></div>	I-5986A	S2 X-38

SITE 27



PERMIT DRAWING
SHEET 69 OF 163



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

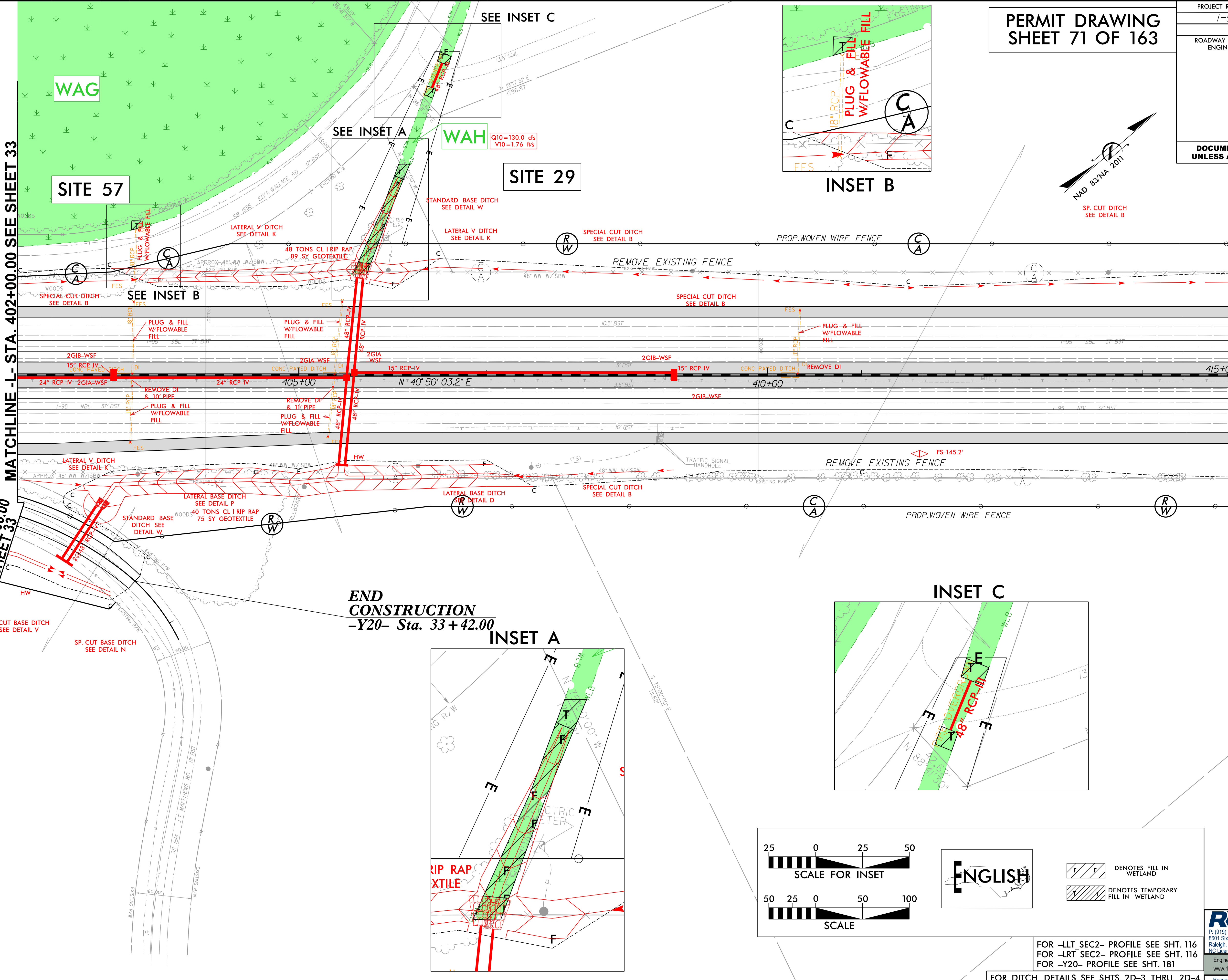
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

ENGLISH

PERMIT DRAWING
SHEET 70 OF 163

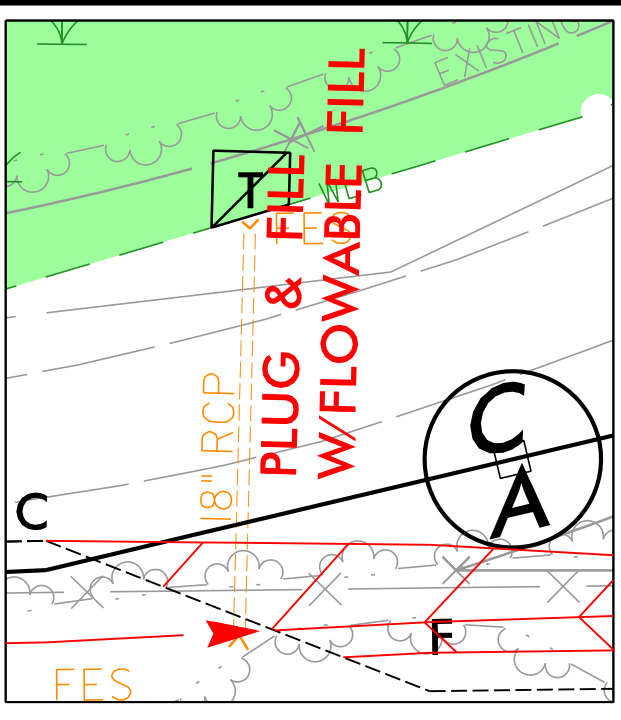


8/17/99
21-59866A_hyd_4B_psh34.dgn
5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 21-59866A_hyd_4B_psh34.dgn
RKK

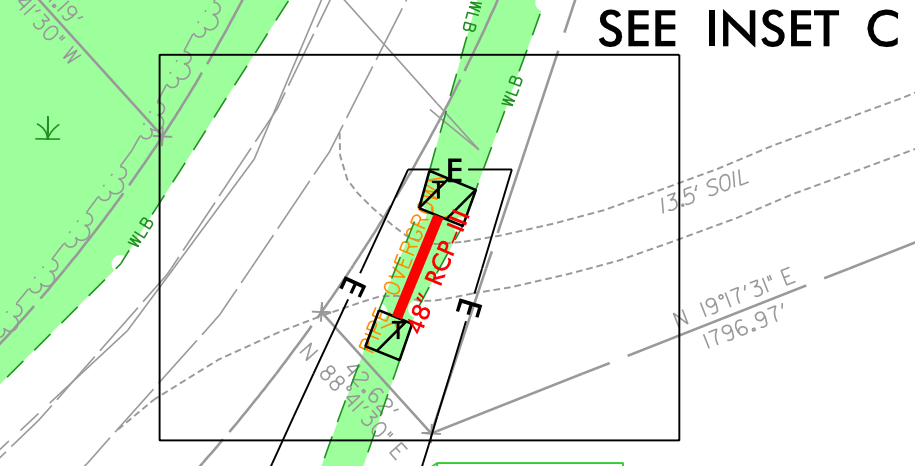


PERMIT DRAWING
SHEET 71 OF 163

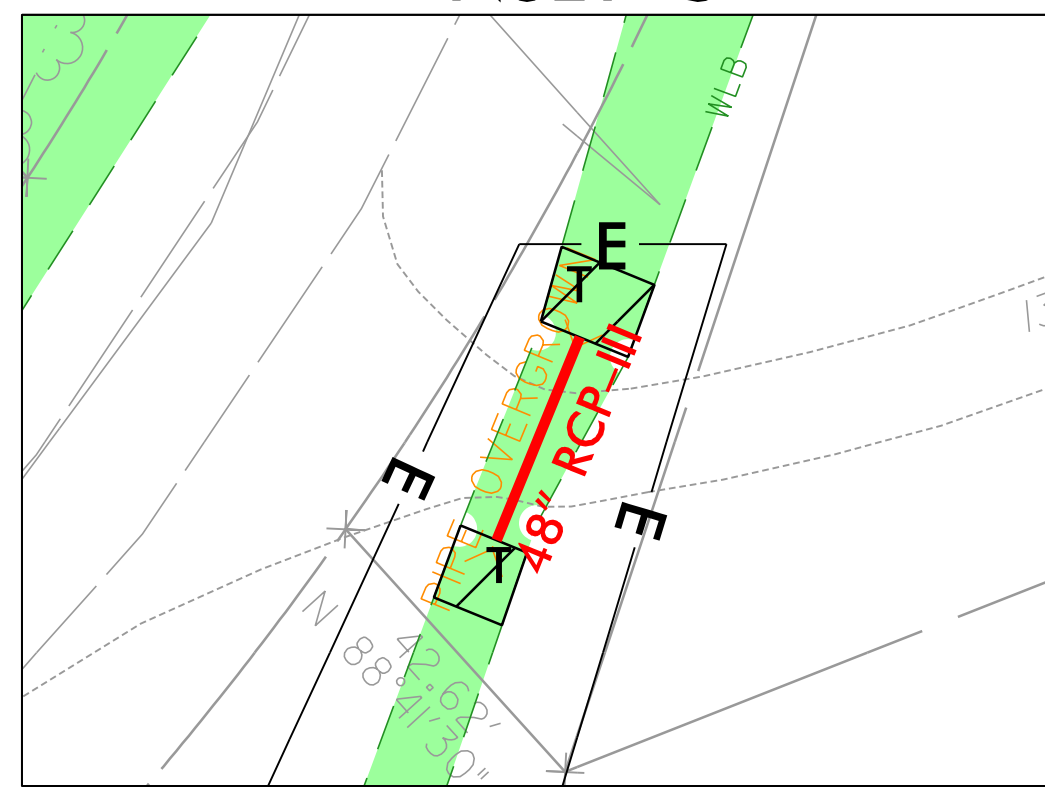
PROJECT REFERENCE NO. 1-5986A		SHEET NO. 34
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



INSET B

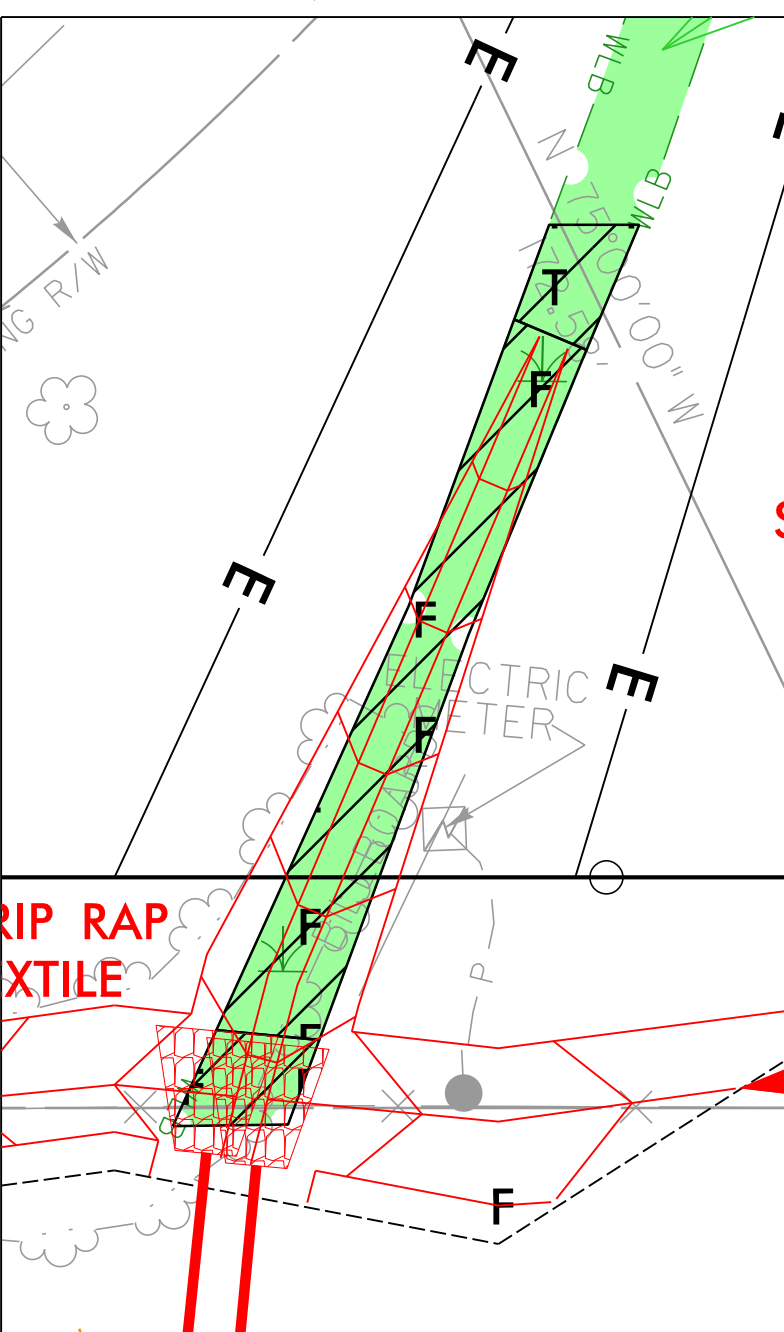


INSET A

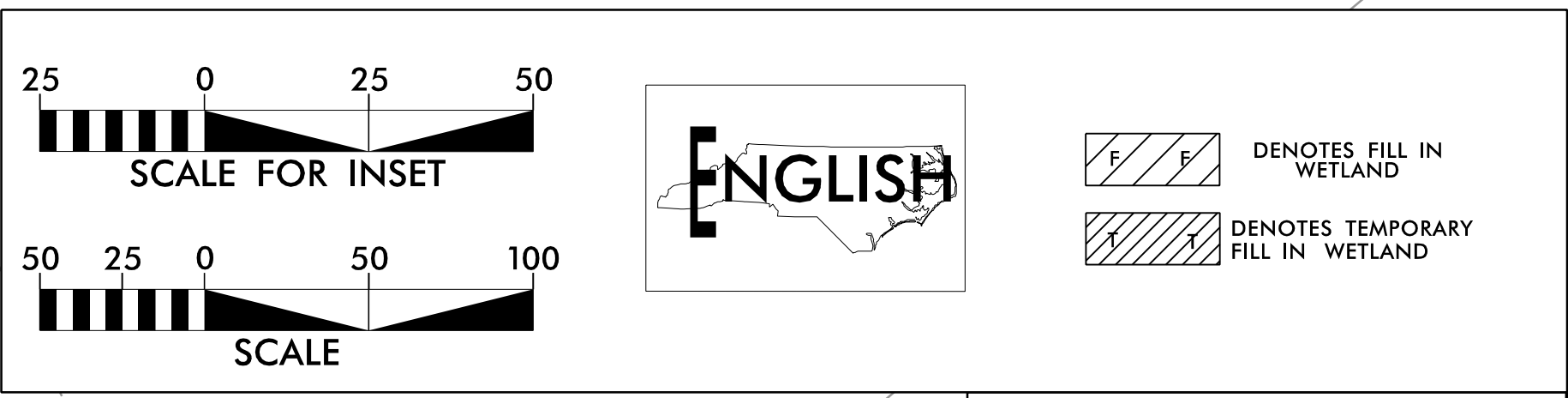


INSET C

END
CONSTRUCTION
-Y20- Sta. 33+42.00



INSET A

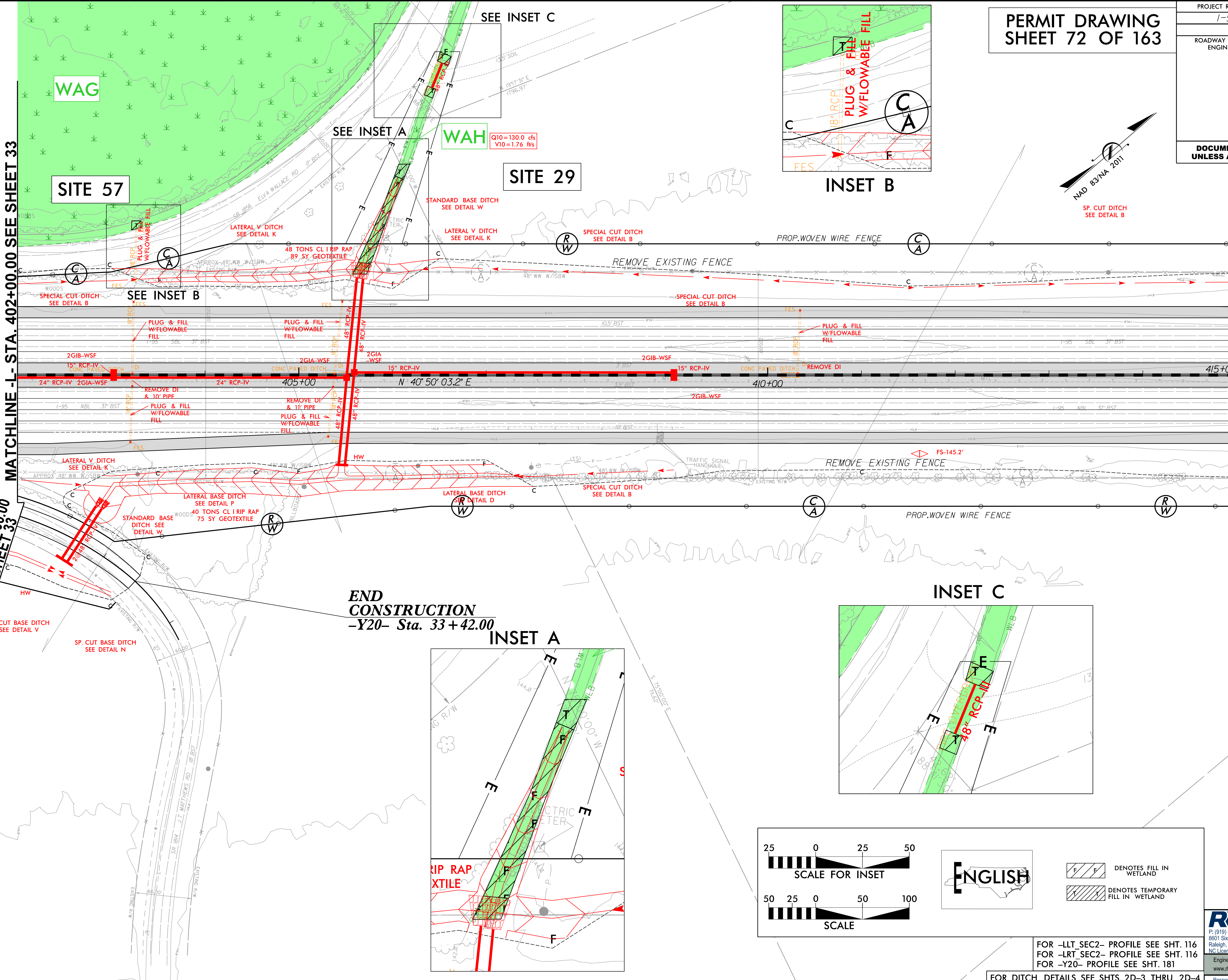


FOR -LLT SEC2- PROFILE SEE SHT. 116
FOR -LRT SEC2- PROFILE SEE SHT. 116
FOR -Y20- PROFILE SEE SHT. 181

FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

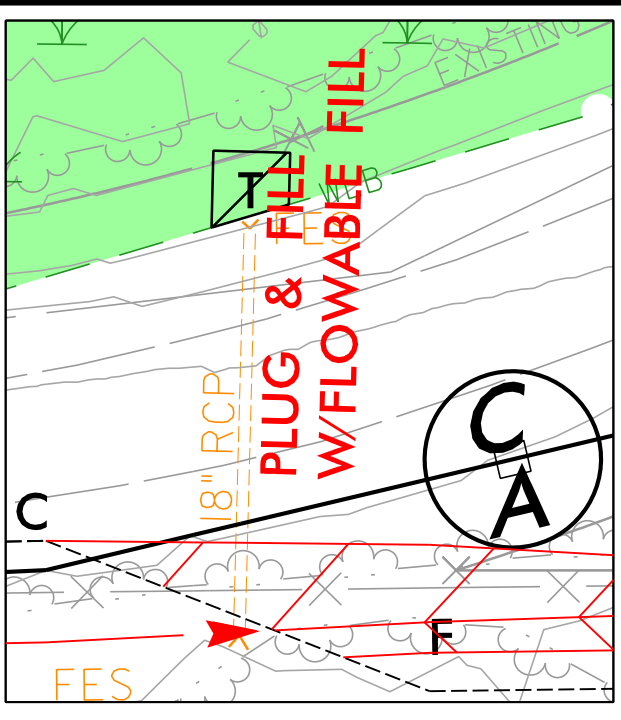
RKK
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
2/1/2020
P:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-59866A_hyd_4B_psh34_CON.dgn
RKK

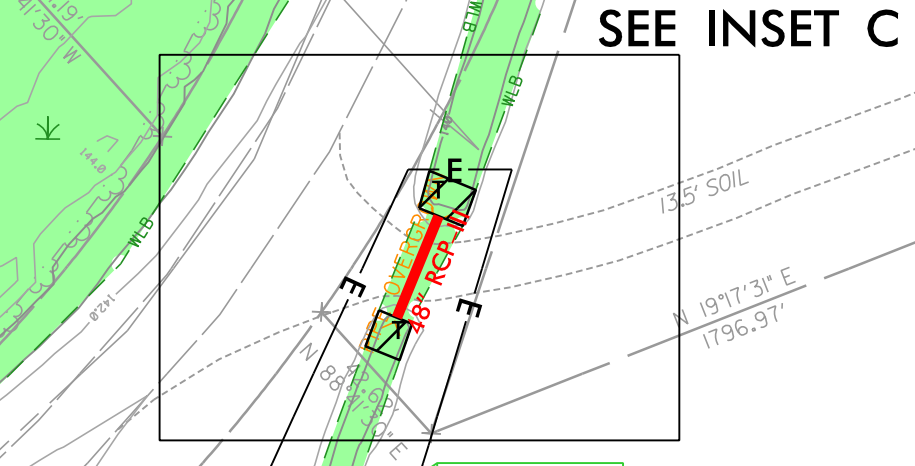


PERMIT DRAWING
SHEET 72 OF 163

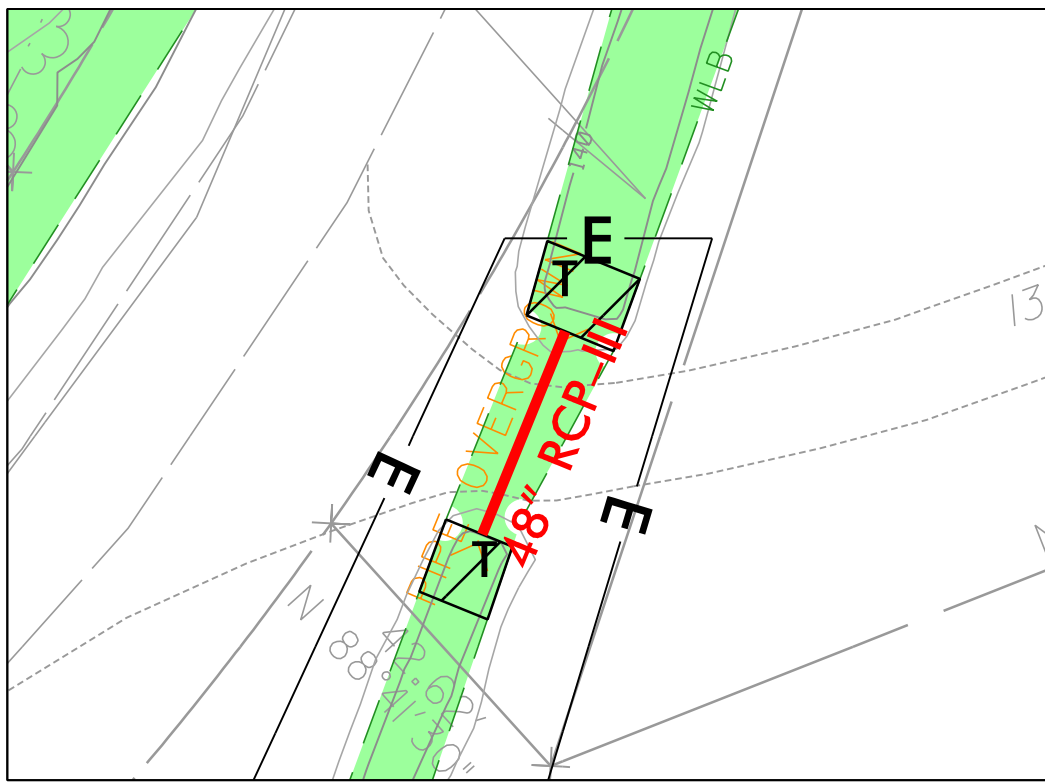
PROJECT REFERENCE NO.		SHEET NO.	
1-5986A		34	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



INSET B

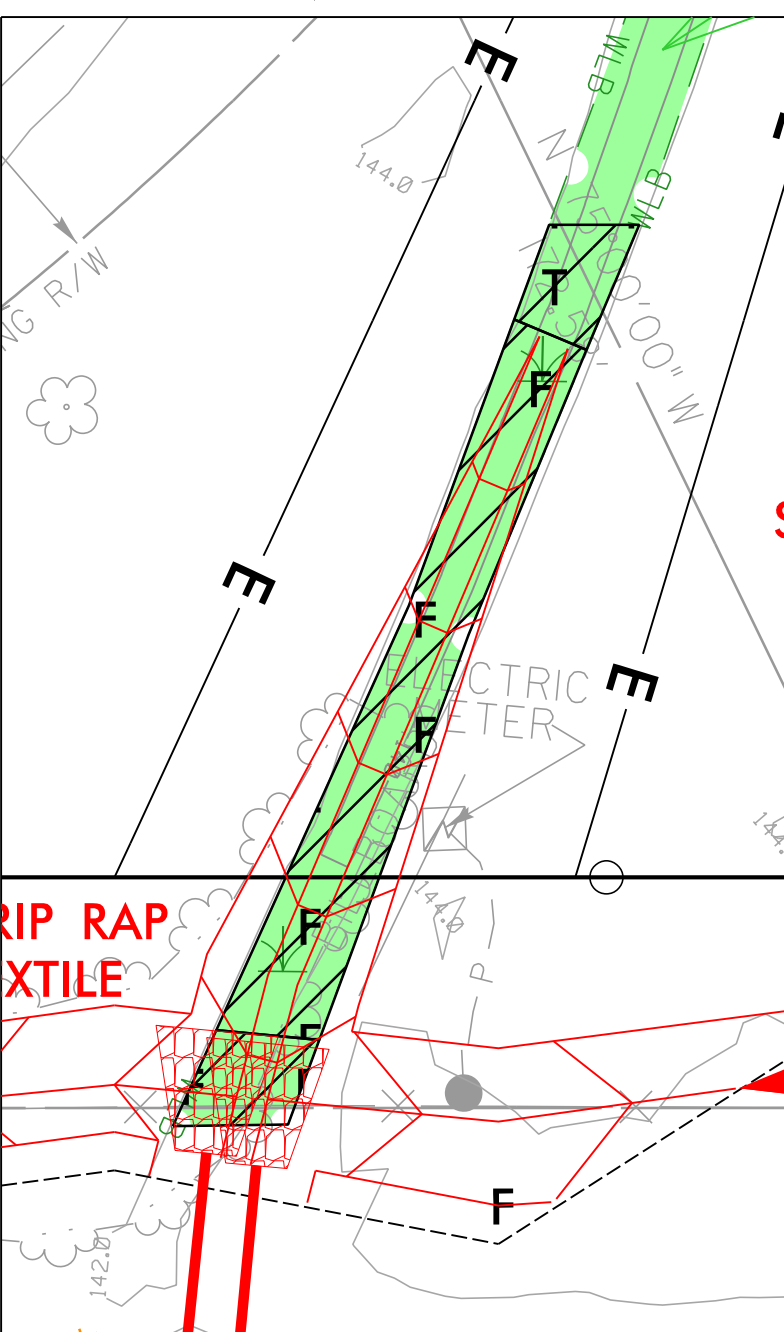


INSET A

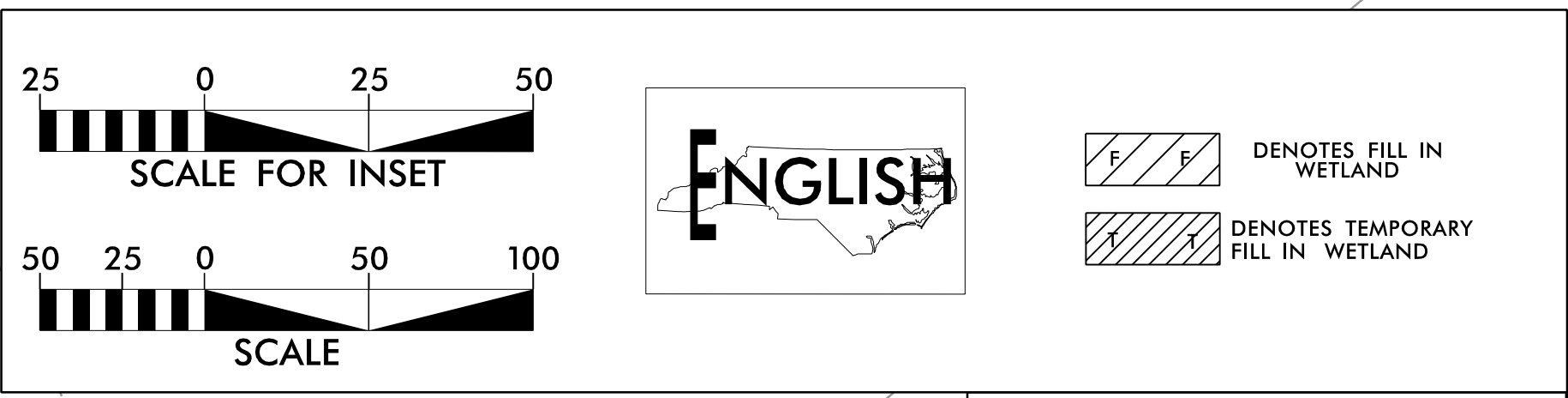


INSET C

END
CONSTRUCTION
-Y20- Sta. 33+42.00



INSET A



FOR -LLT SEC2- PROFILE SEE SHT. 116
FOR -LRT SEC2- PROFILE SEE SHT. 116
FOR -Y20- PROFILE SEE SHT. 181

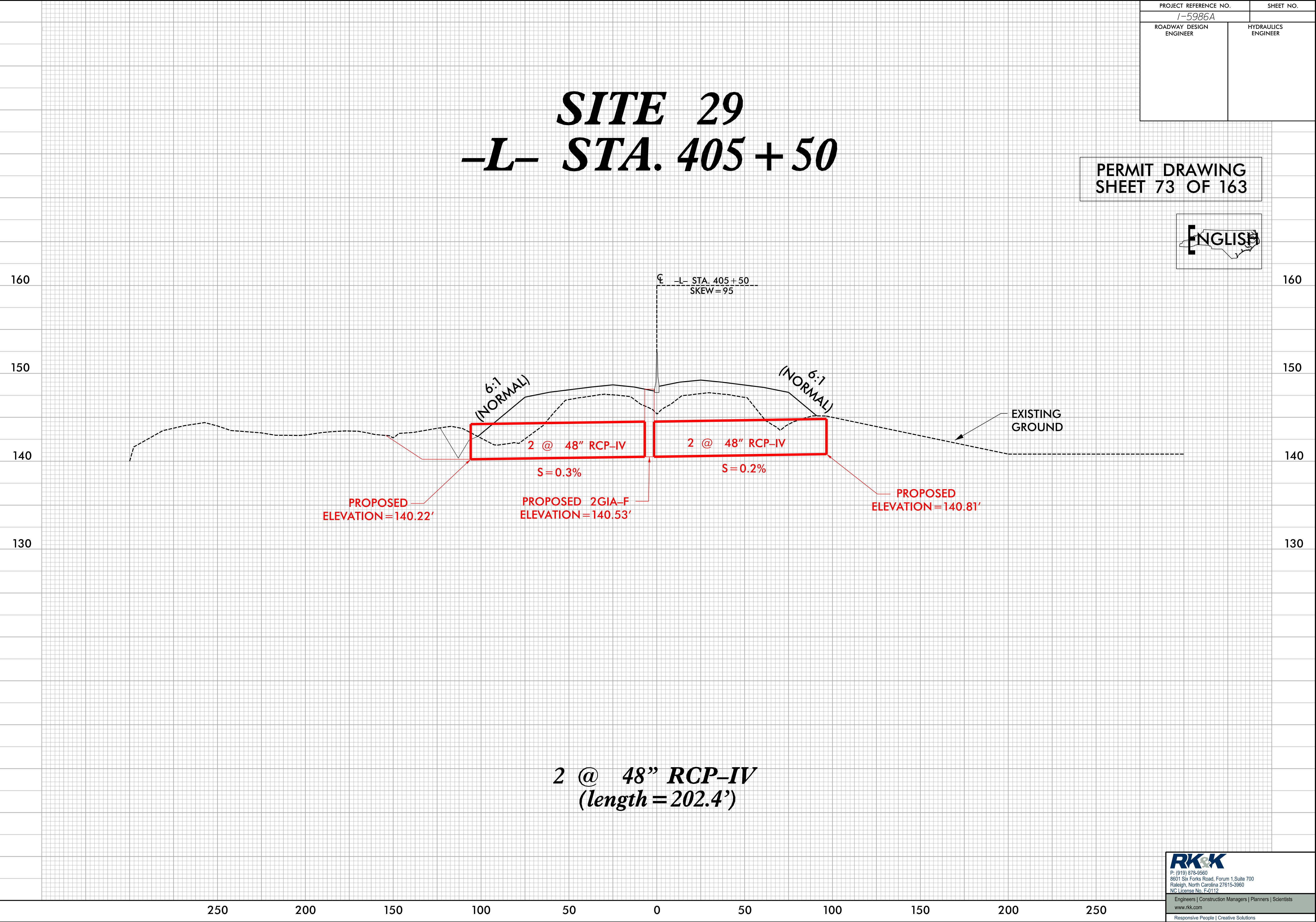
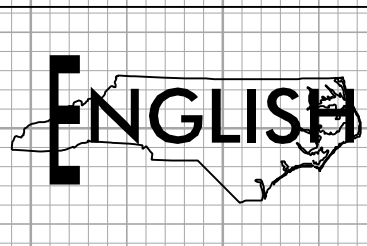
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

RKK
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO.	SHEET NO.
1-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 29
-L- STA. 405 + 50

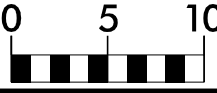
PERMIT DRAWING
SHEET 73 OF 163



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SITE	29
-------------	-----------



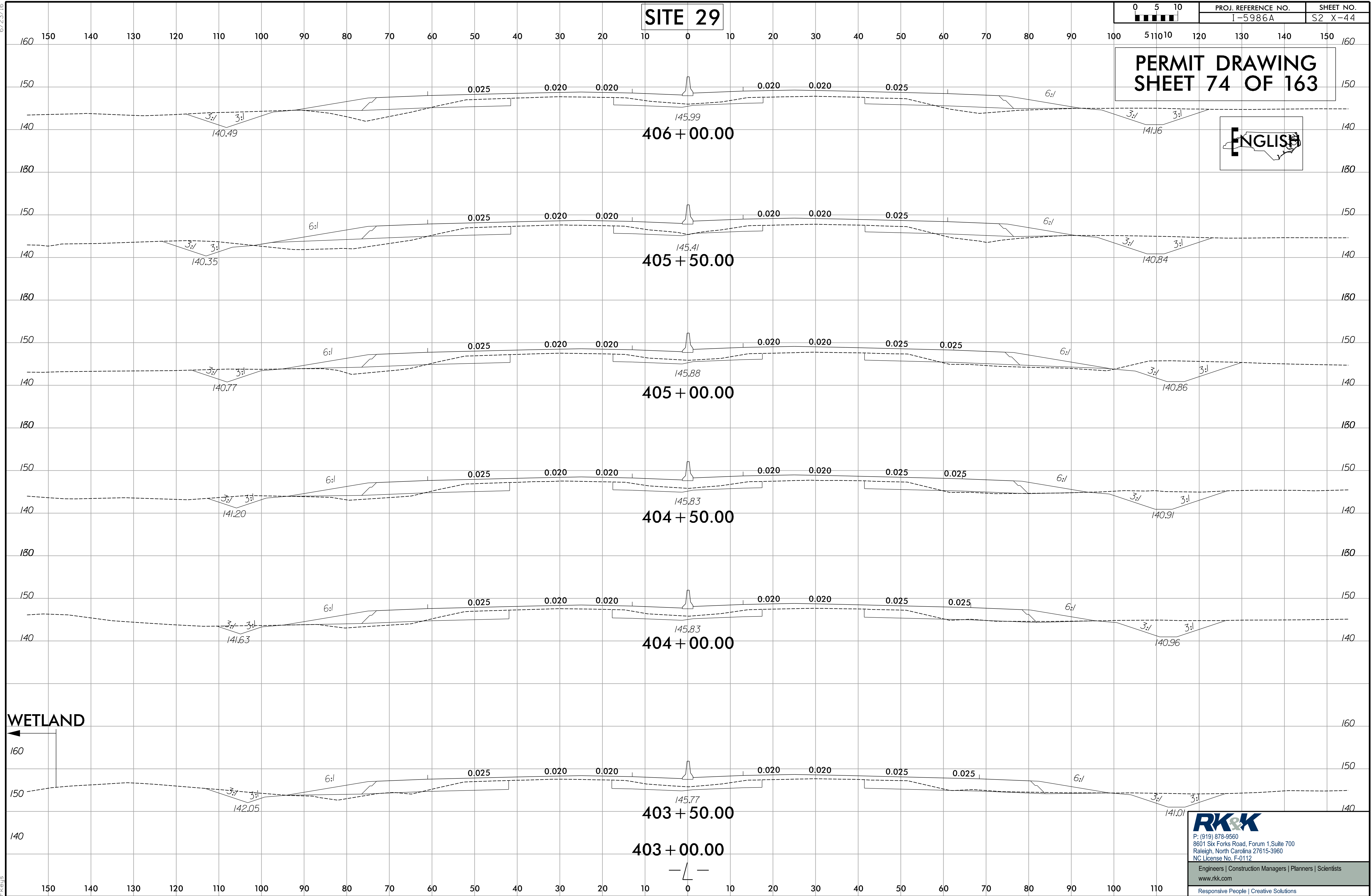
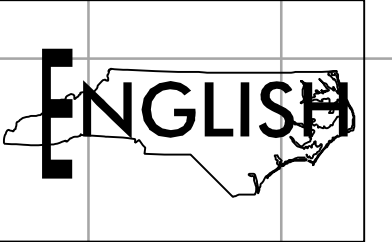
PROJ. REFERENCE NO.

I-5986A

SHEET NO.

52 X-44

PERMIT DRAWING
SHEET 74 OF 163



WETLAND

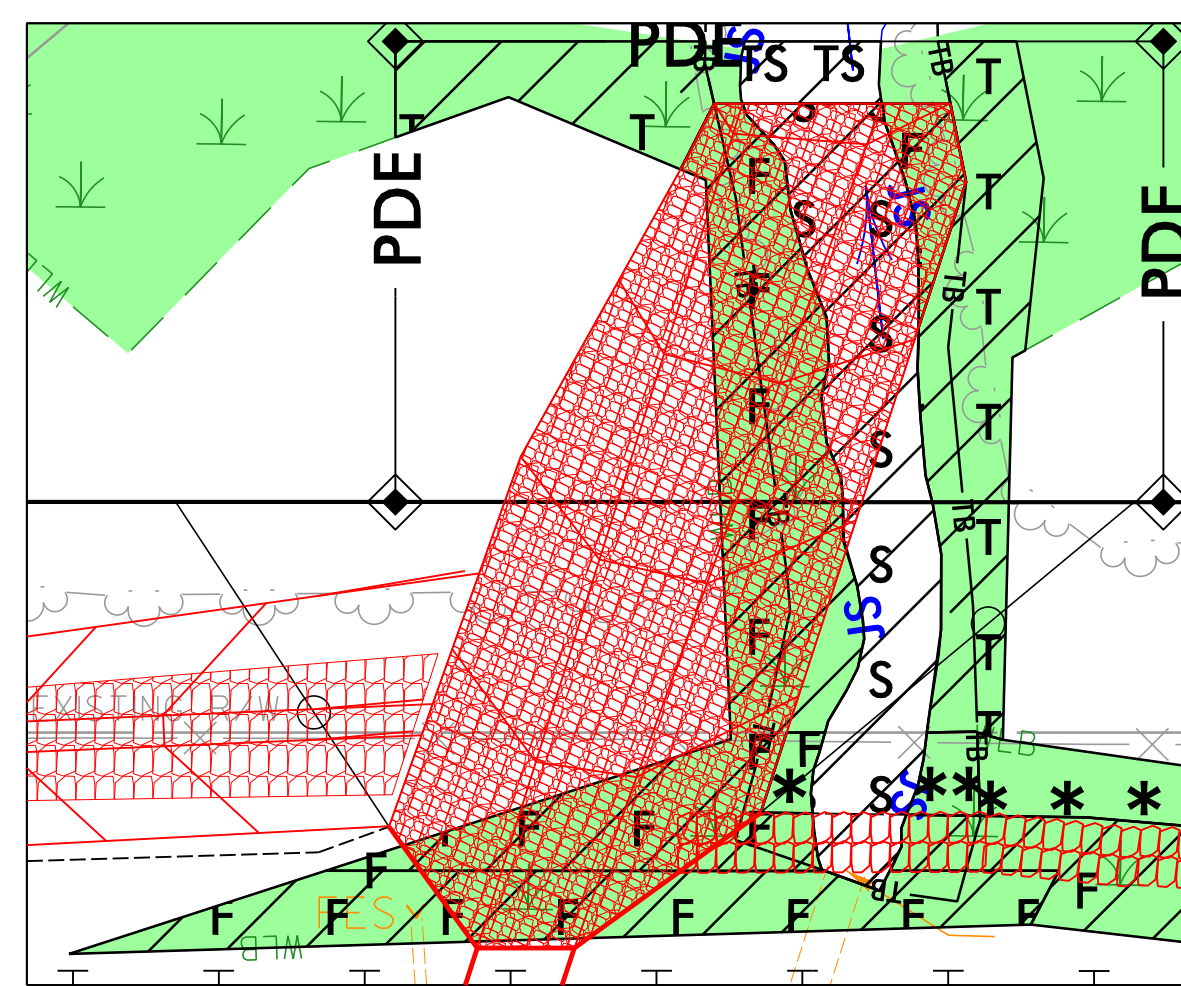


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

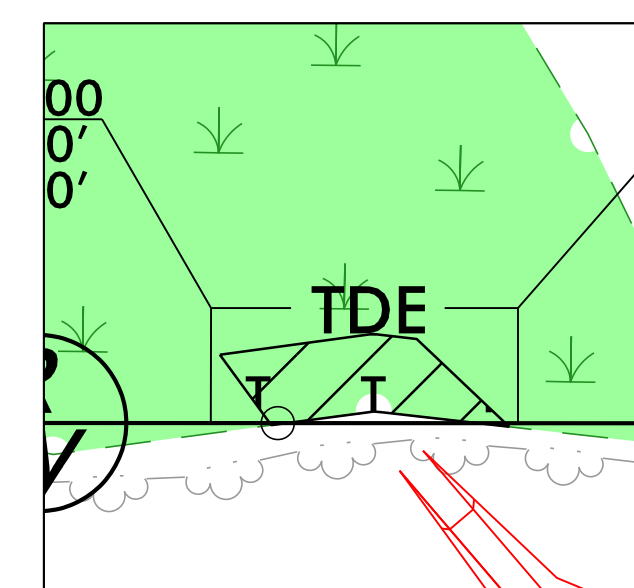
Engineers | Construction Managers | Planners | Scientists

www.rkk.com

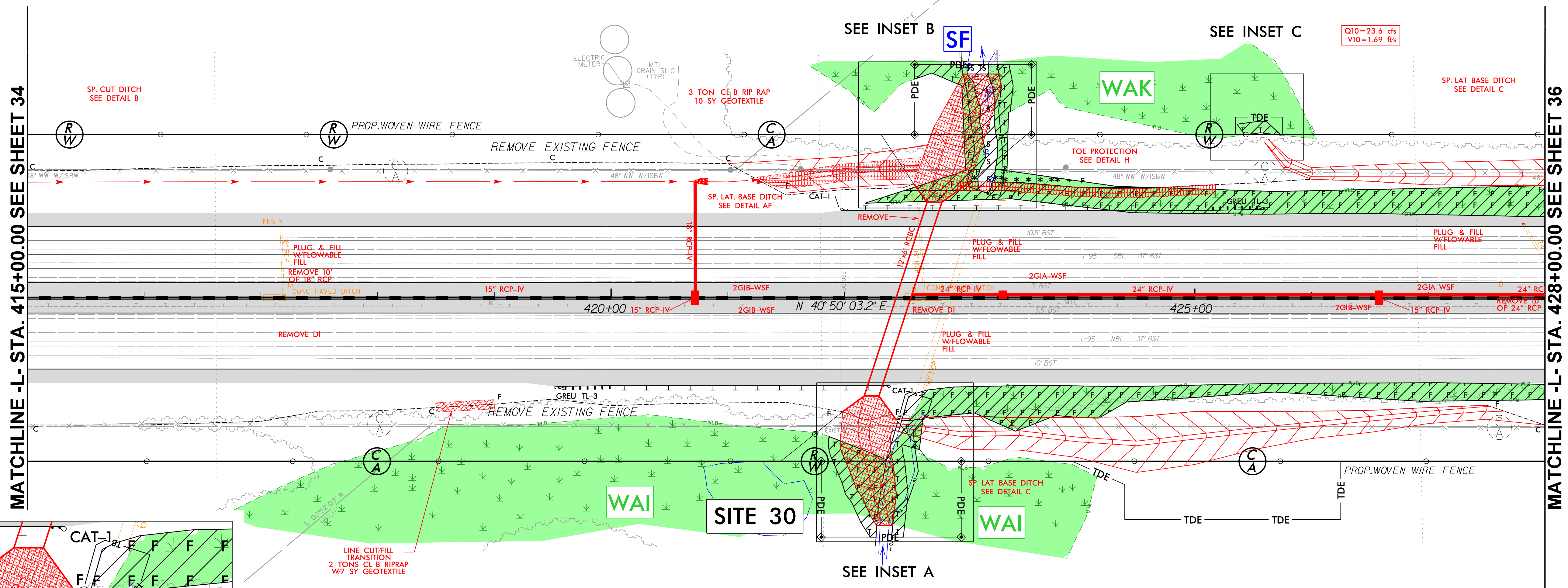
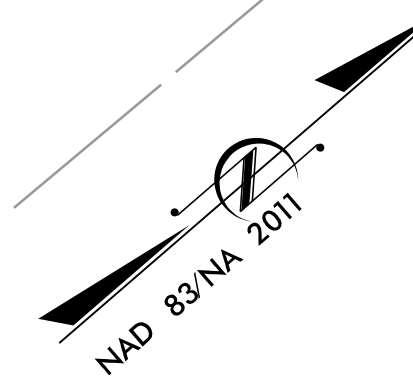
Responsive People | Creative Solutions



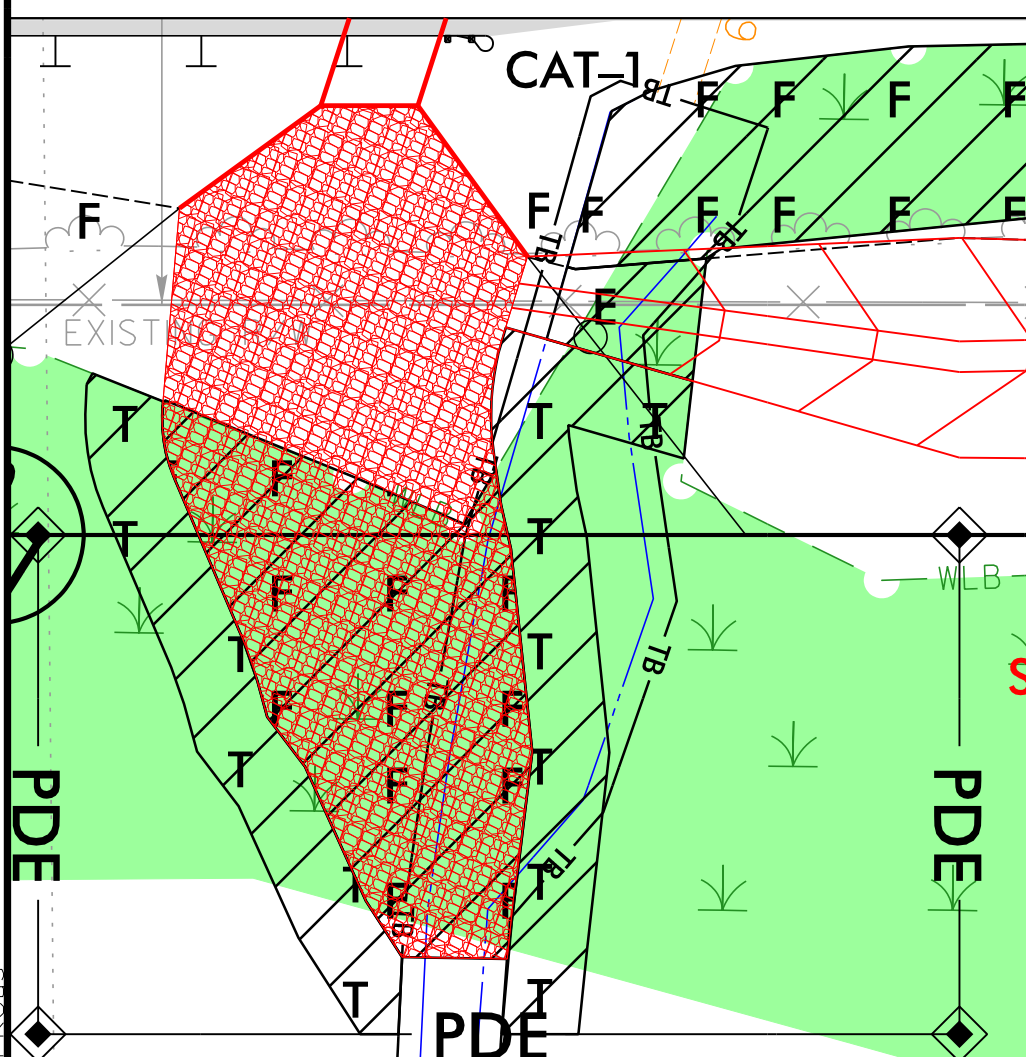
INSET B



INSET C

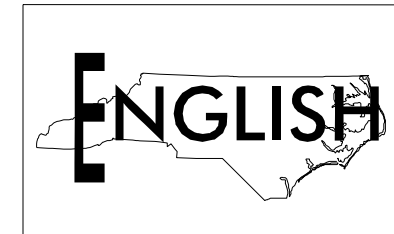
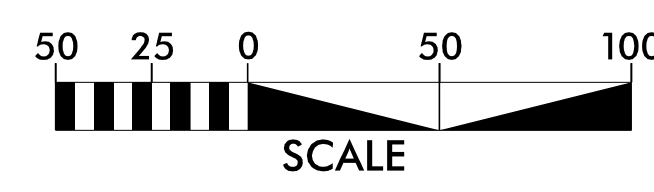
SITE 30

SEE INSET A

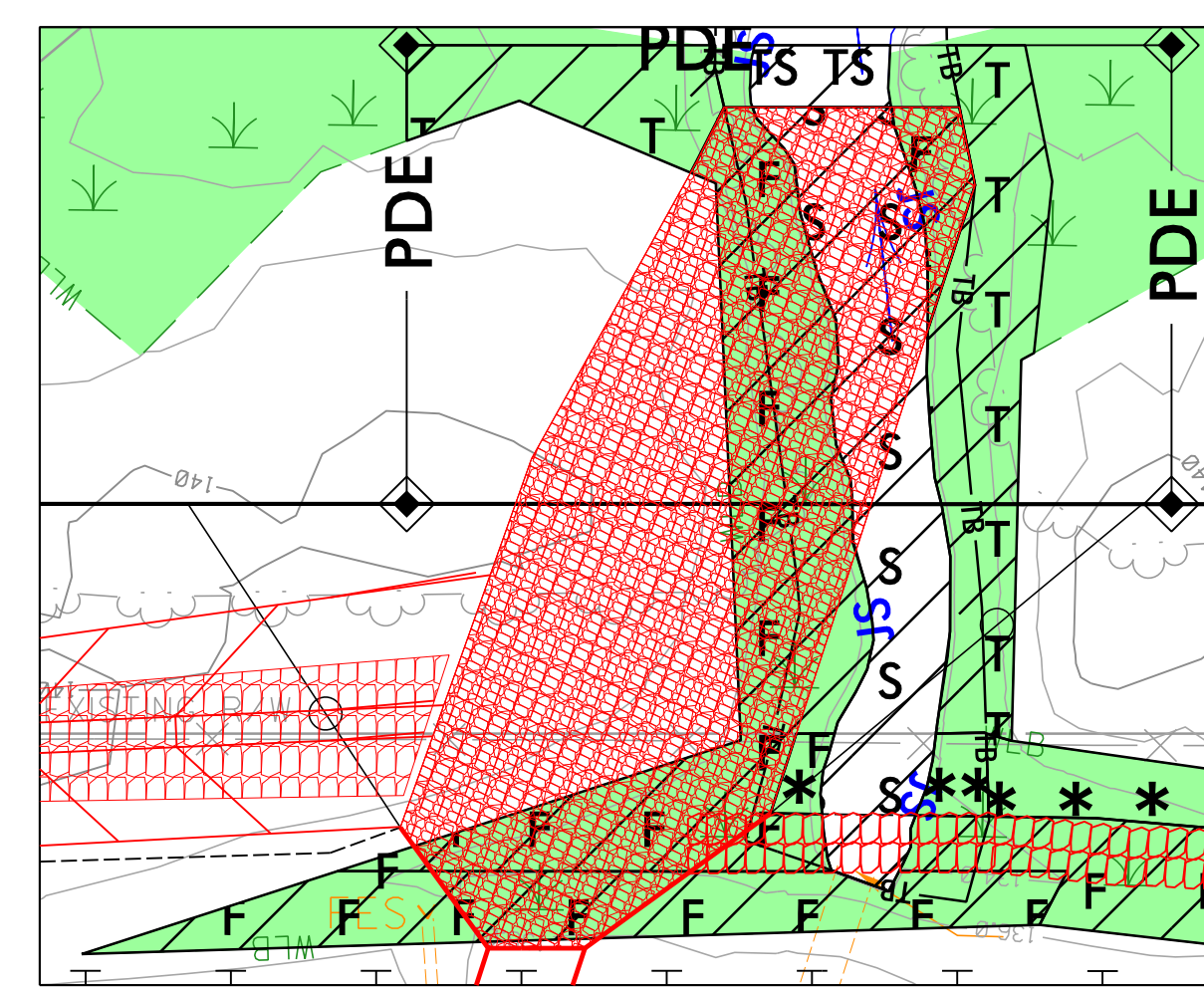


INSET A

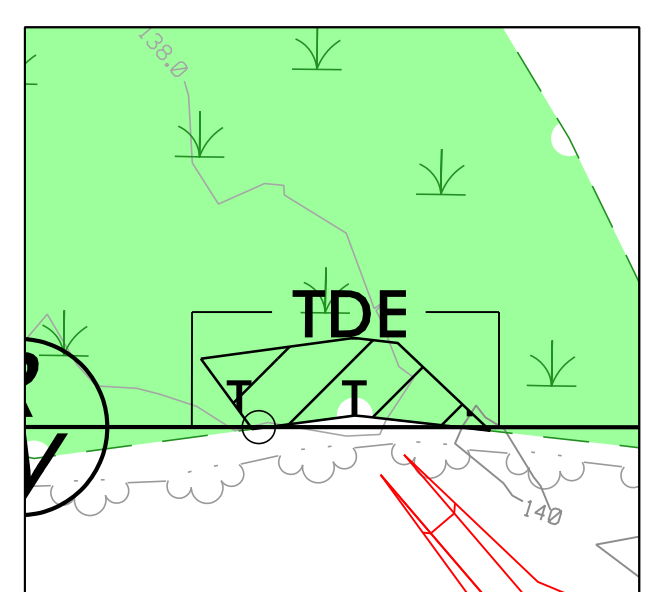
8/17/99
2/1/2020
E:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh35_CON.dgn
RKK



- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES TEMPORARY FILL IN WETLAND



INSET B



INSET C



PROJECT REFERENCE NO.	SHEET NO.
1-5986A	35
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

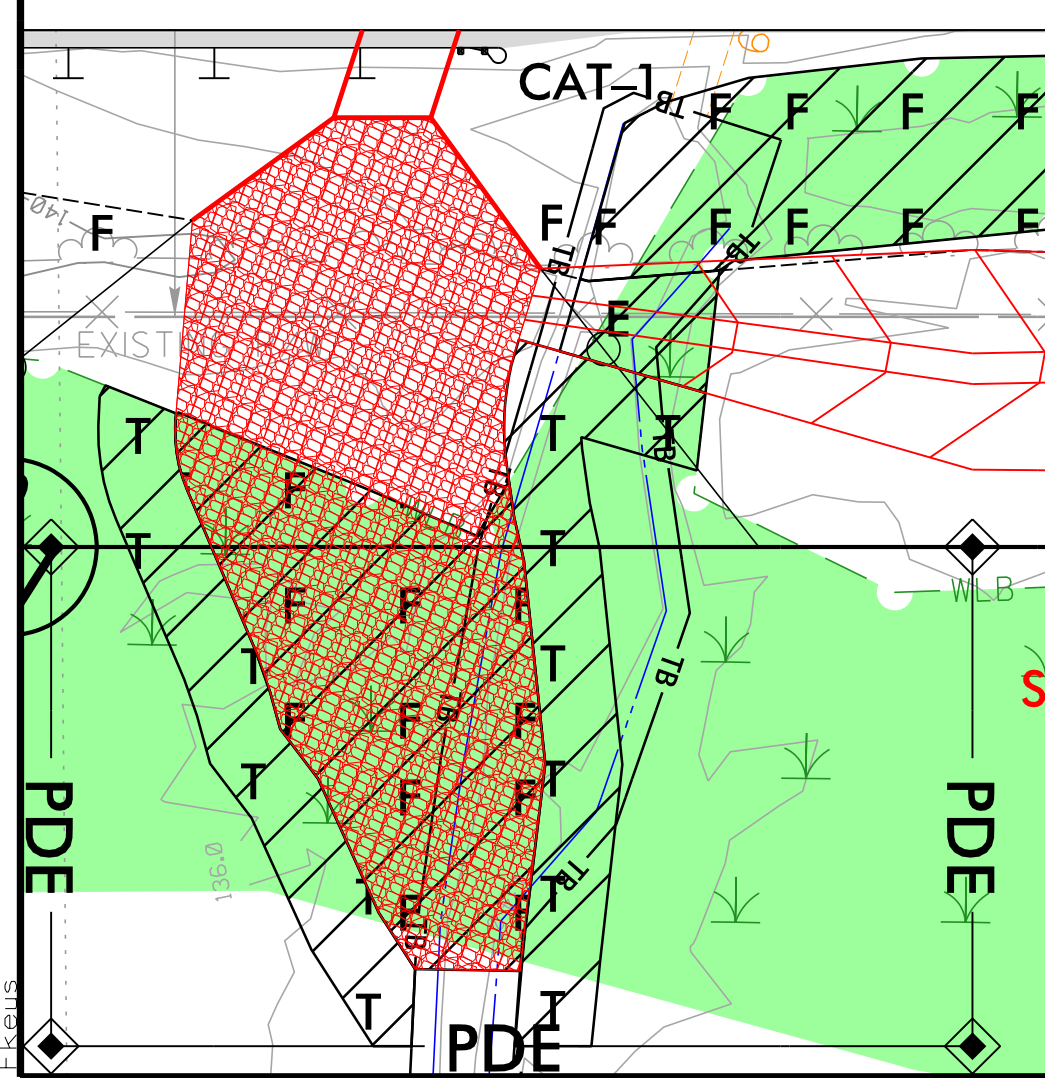
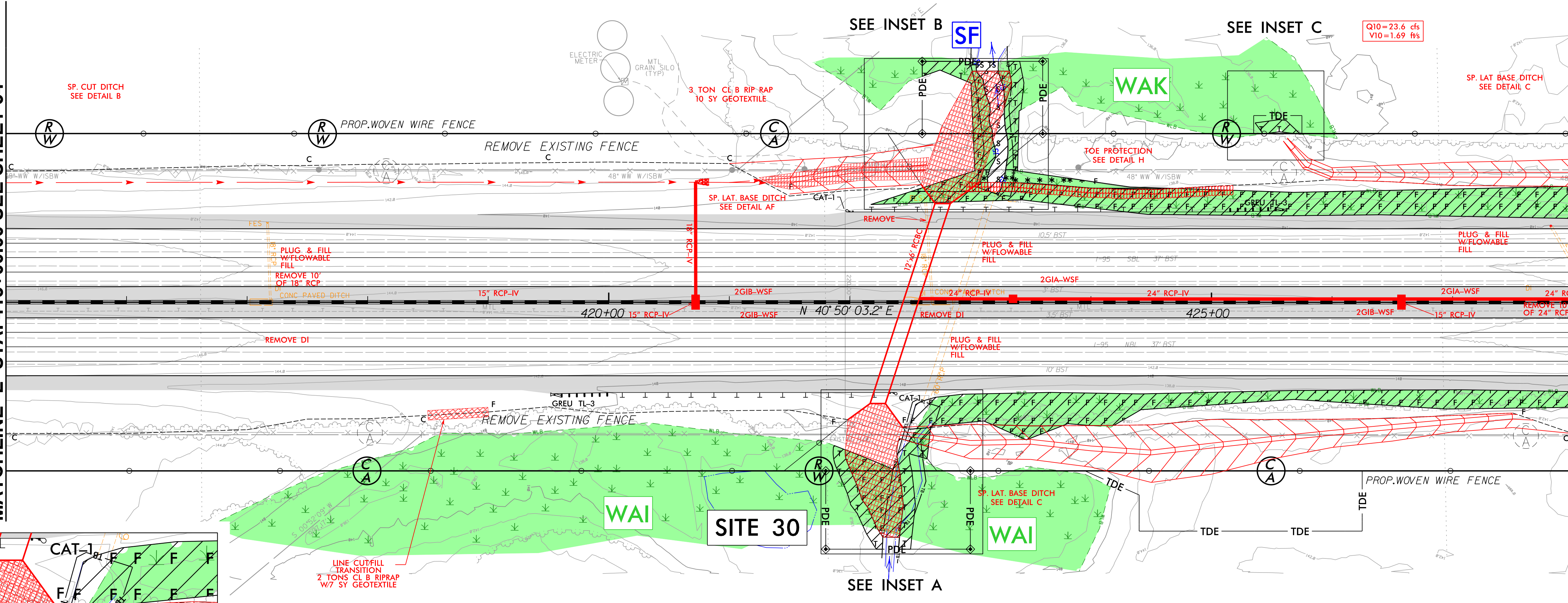
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 76 OF 163

SITE 30

MATCHLINE -L- STA. 415+00.00 SEE SHEET 34

MATCHLINE -L- STA. 428+00.00 SEE SHEET 36



INSET A

SEE INSET A

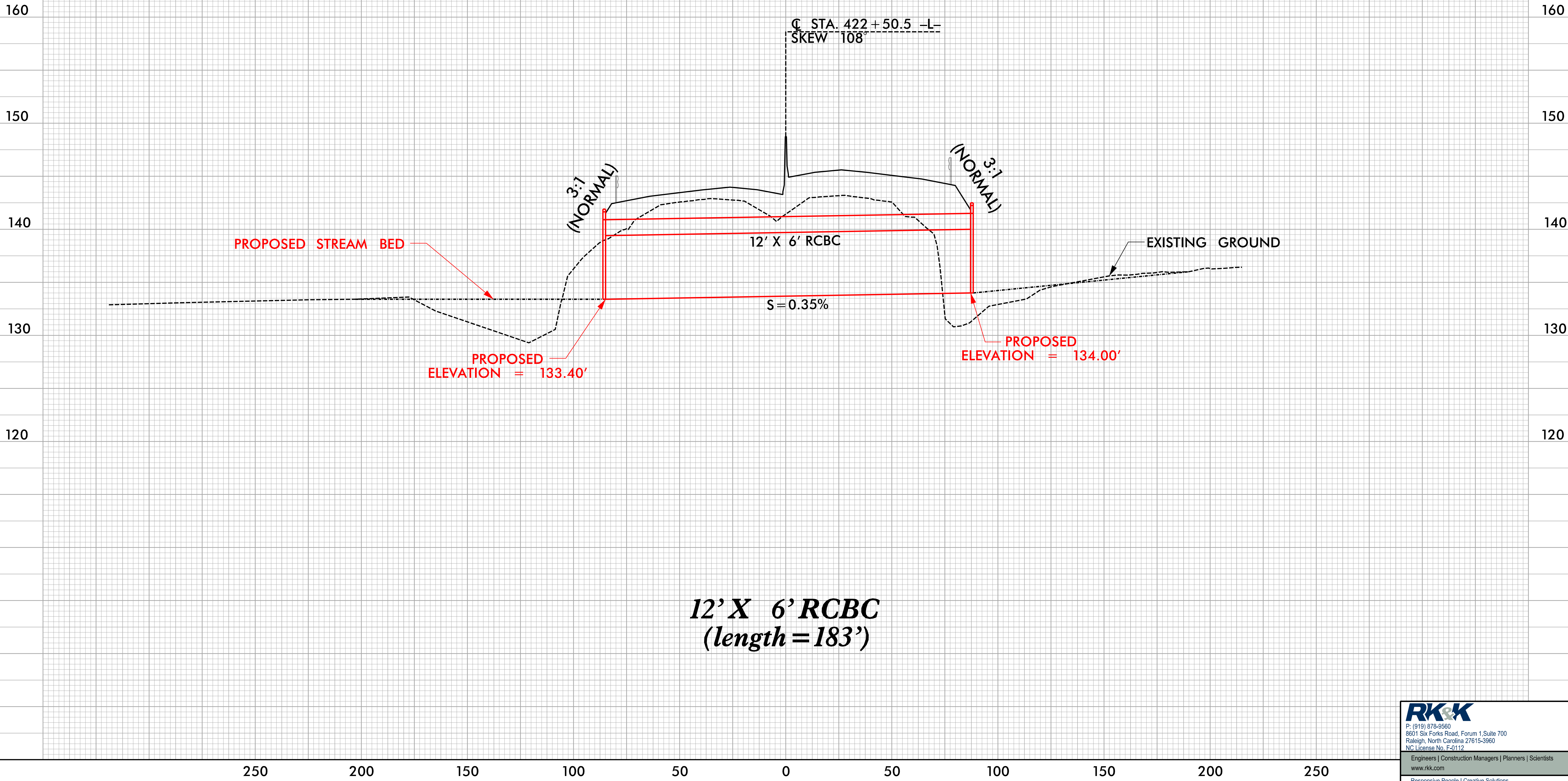
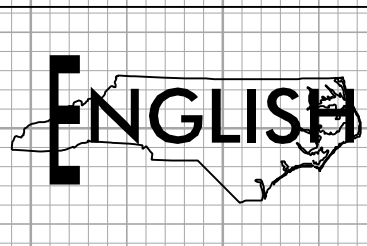
FOR -LLT_SEC2- PROFILE SEE SHT. 117
FOR -LRT_SEC2- PROFILE SEE SHT. 117
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO.		SHEET NO.
I-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

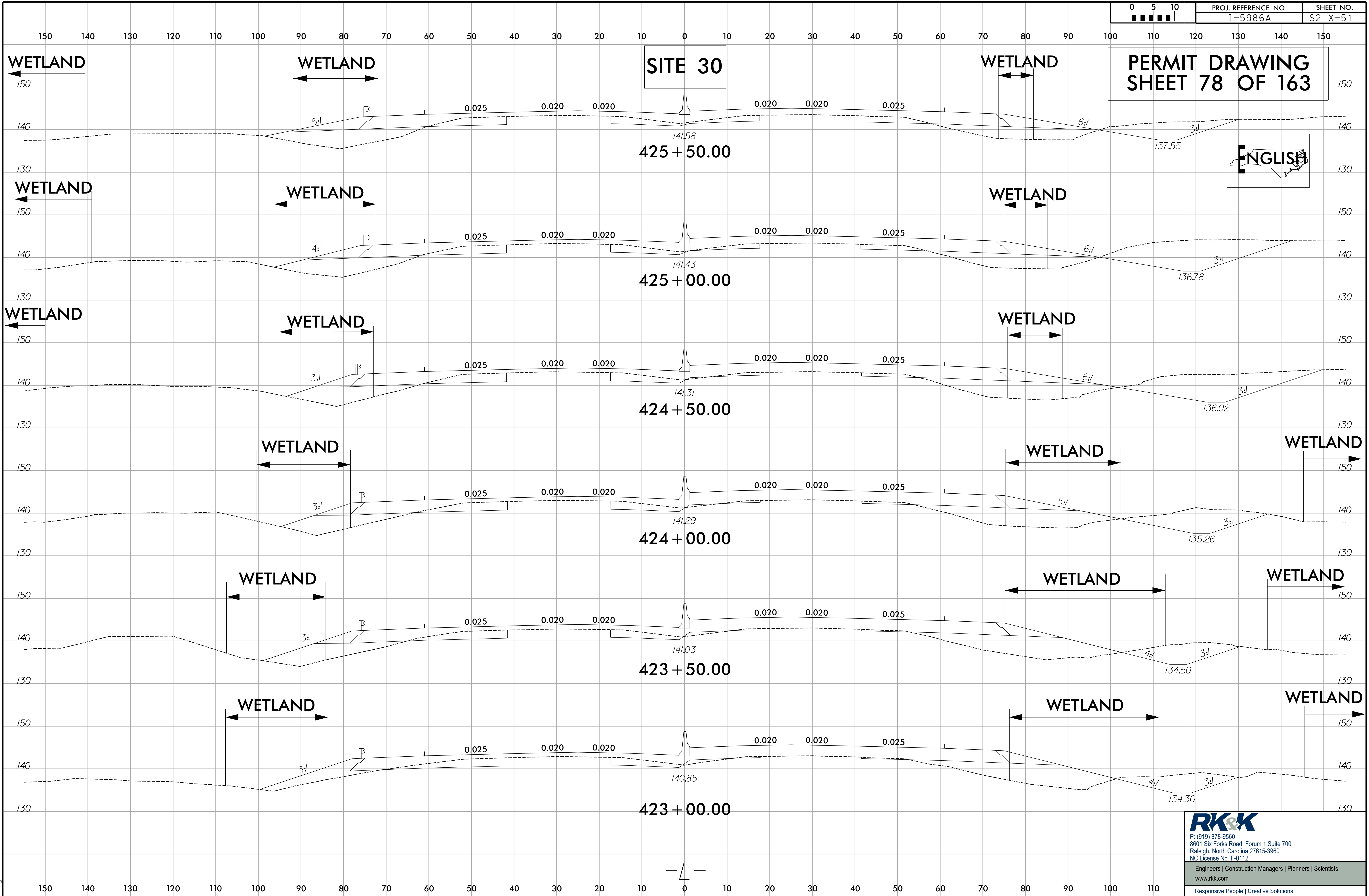
SITE 30
-L- STA. 422 + 50

PERMIT DRAWING
SHEET 77 OF 163

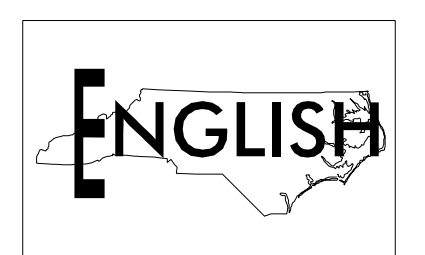
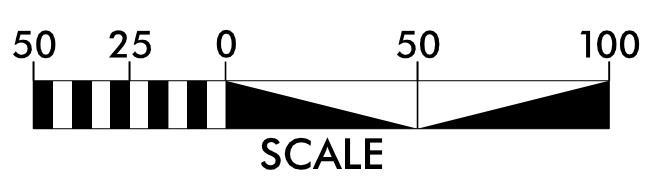


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



8/17/99
21-5986A_hyd_4B_psf36.dgn
8/1/2020
Hydraulics PERMITS_Environmental\Drawings\4B\Section 21-5986A_hyd_4B_psf36.dgn
RKK

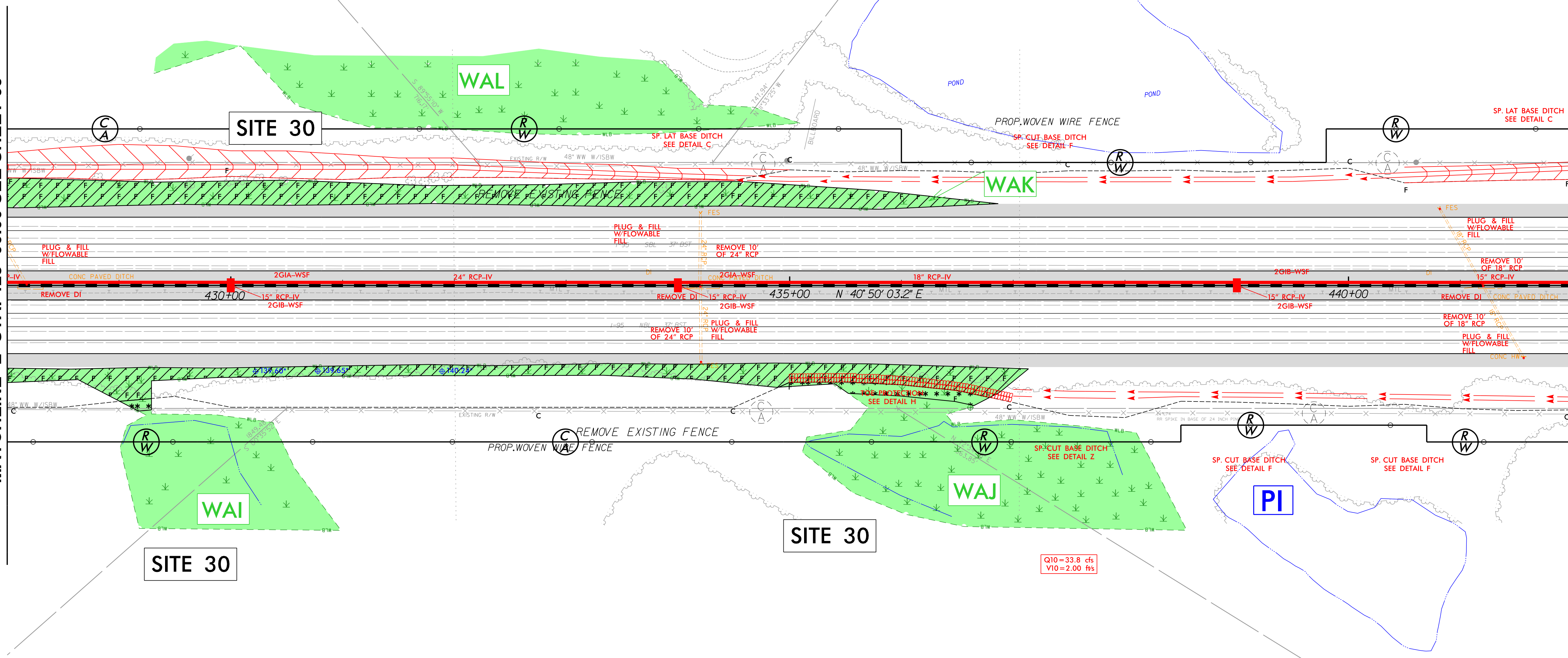


DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO. 1-5986A		SHEET NO. 36
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 79 OF 163		

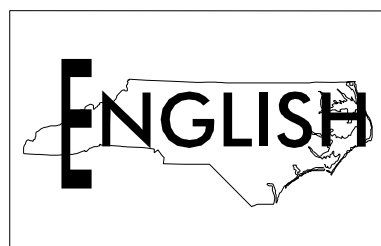
MATCHLINE -L- STA. 428+00.00 SEE SHEET 35


MATCHLINE -L- STA. 442+00.00 SEE SHEET 37

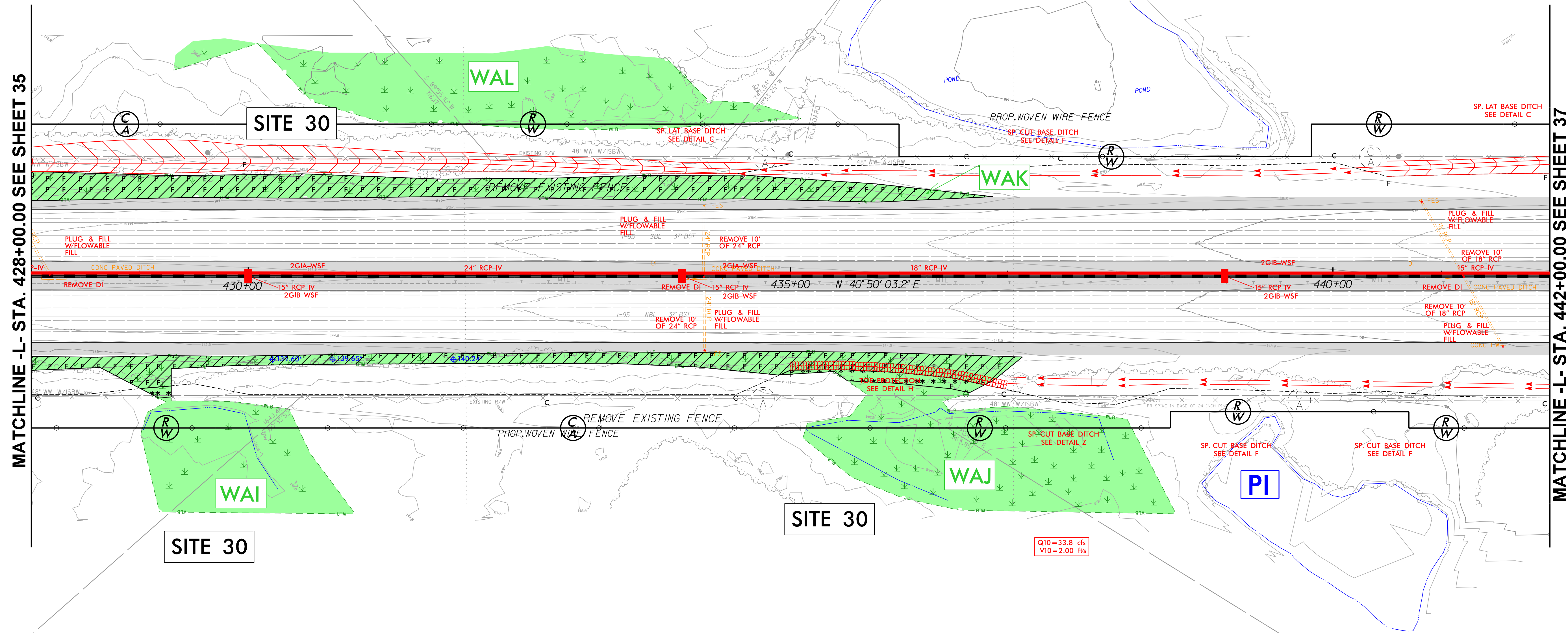
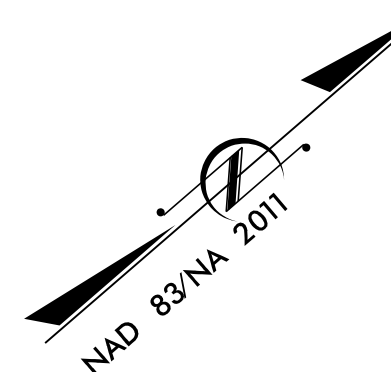


RKK
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

FOR -LLT_SEC2- PROFILE SEE SHTS. 117 THRU 118
FOR -LRT_SEC2- PROFILE SEE SHTS. 117 THRU 118
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4



 DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING



Q10 = 33.8 cfs
V10 = 2.00 ft/s



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

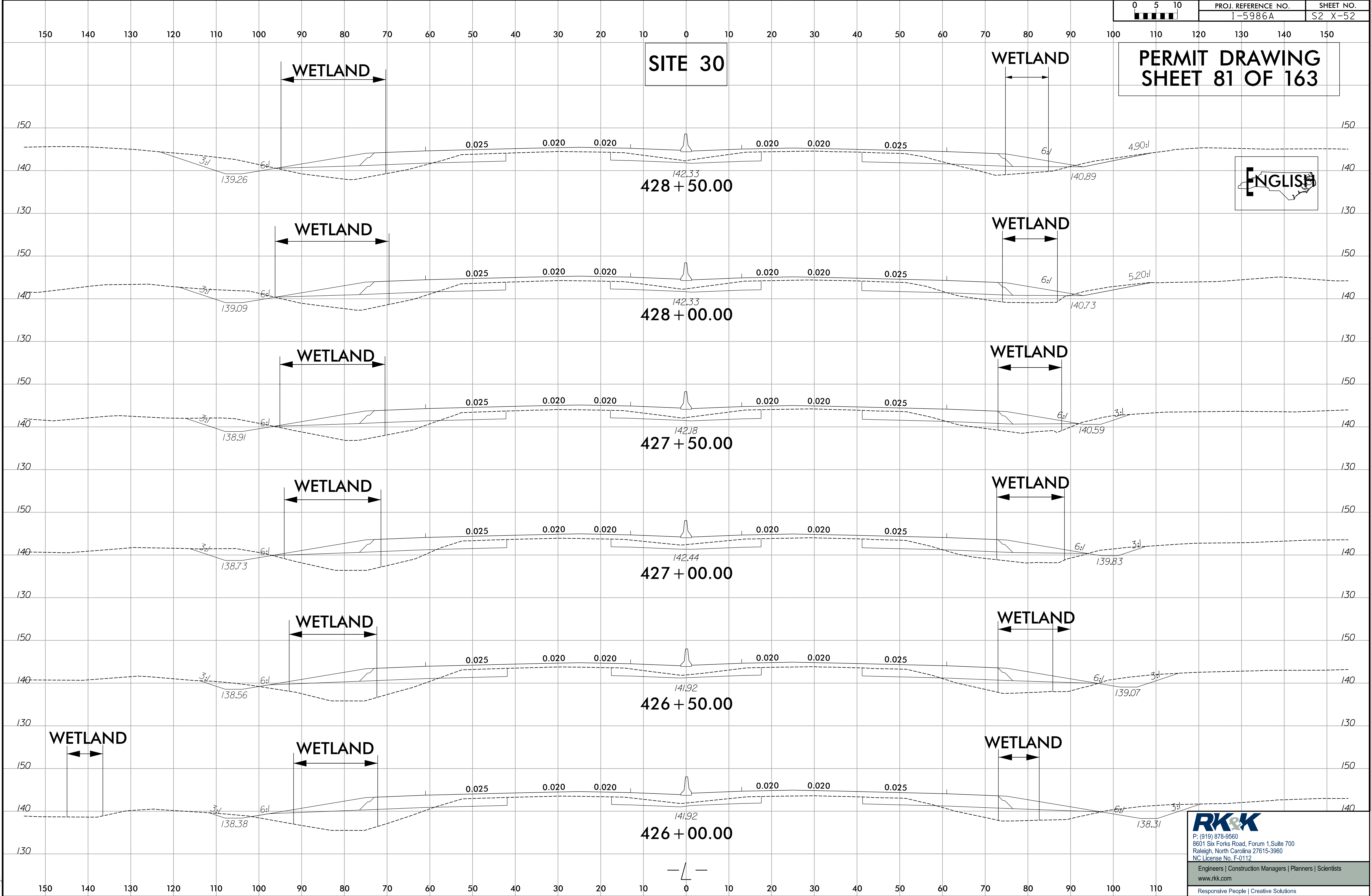
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

FOR -LLT_SEC2- PROFILE SEE SHTS. 117 THRU 118
FOR -LRT_SEC2- PROFILE SEE SHTS. 117 THRU 118
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

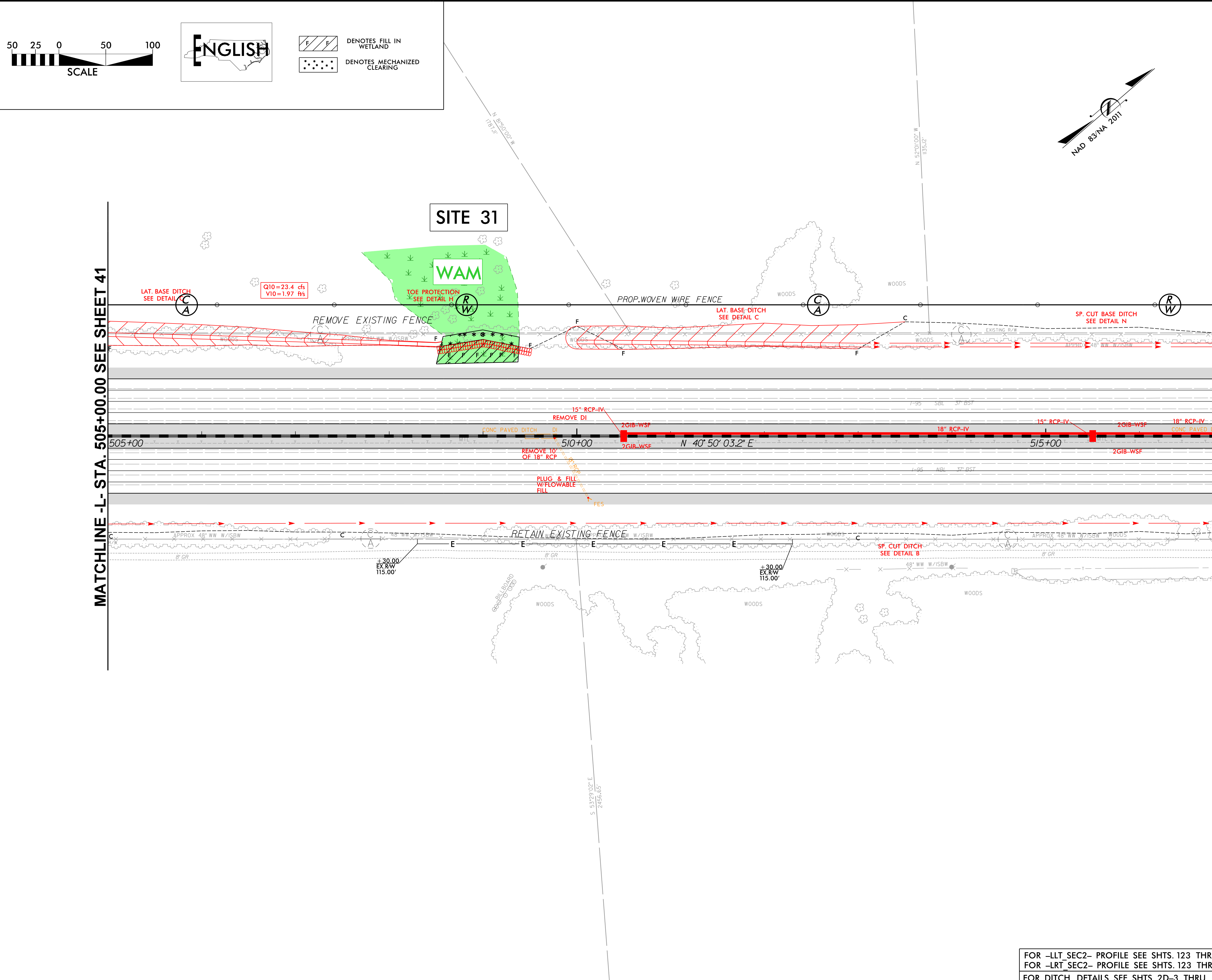
6/23/16

5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL\I-5986A_hyd-prm_wet_XPL.L.SITE30.dgn
Key



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh42.dgn
RKK

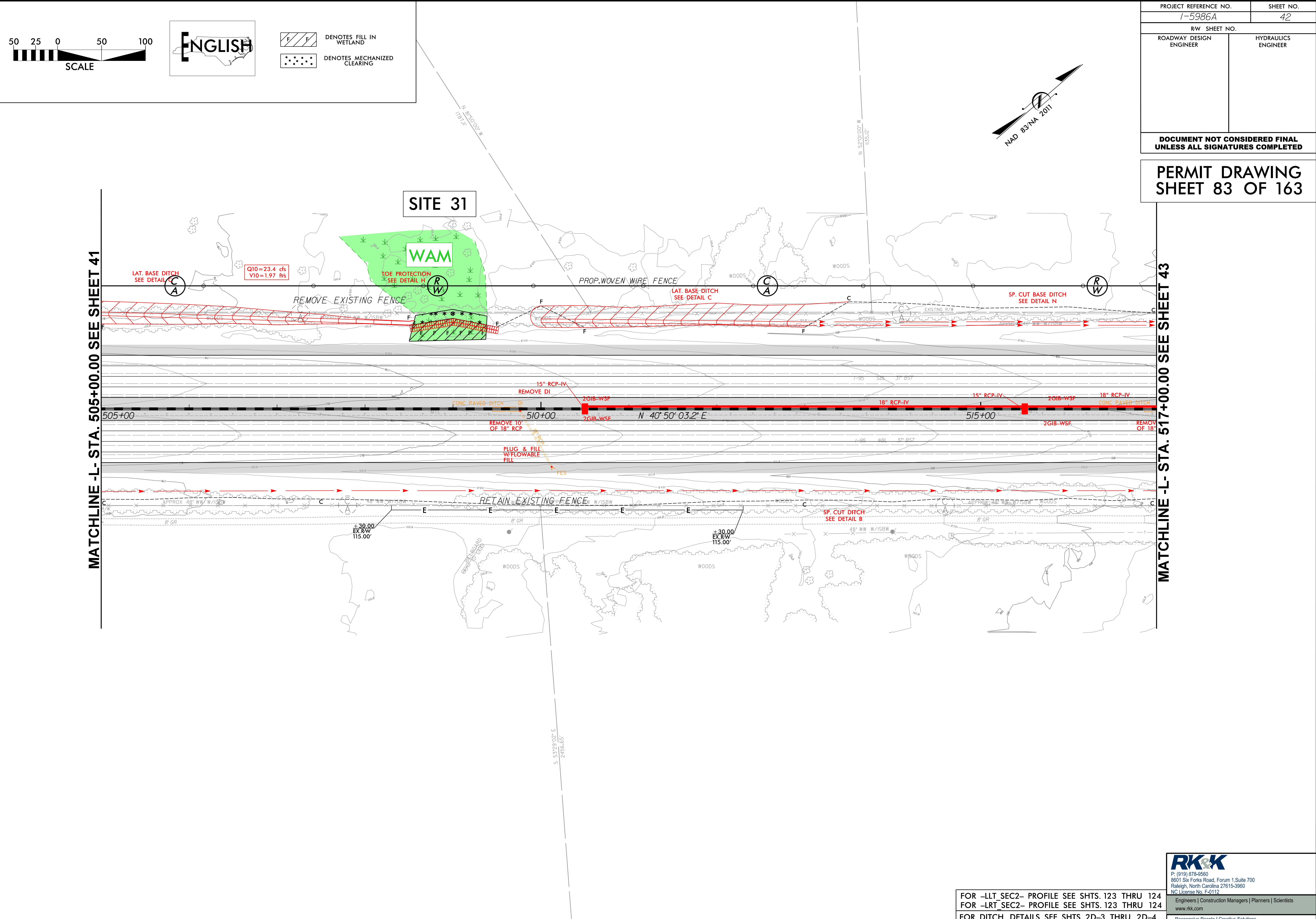


PROJECT REFERENCE NO. 1-5986A		SHEET NO. 42	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 82 OF 163			

RKK
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

FOR -LLT SEC2- PROFILE SEE SHTS. 123 THRU 124
FOR -LRT SEC2- PROFILE SEE SHTS. 123 THRU 124
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

8/17/99
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh42.CON.dgn
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh42.CON.dgn



PROJECT REFERENCE NO.		SHEET NO.	
1-5986A		42	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

PERMIT DRAWING
SHEET 83 OF 163

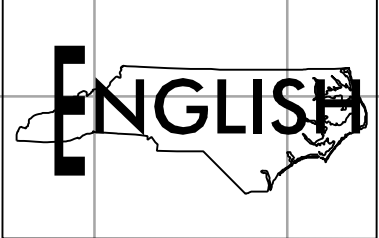
RKK
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

FOR -LLT SEC2- PROFILE SEE SHTS. 123 THRU 124
FOR -LRT SEC2- PROFILE SEE SHTS. 123 THRU 124
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

6/23/16

SITE 31

PERMIT DRAWING
SHEET 84 OF 163



WETLAND

WETLAND

WETLAND



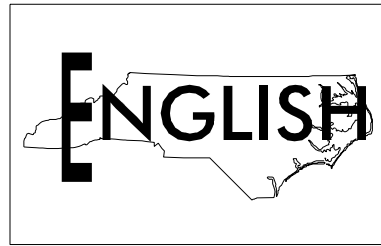
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists

www.rkk.com

Responsive People | Creative Solutions

8/17/99



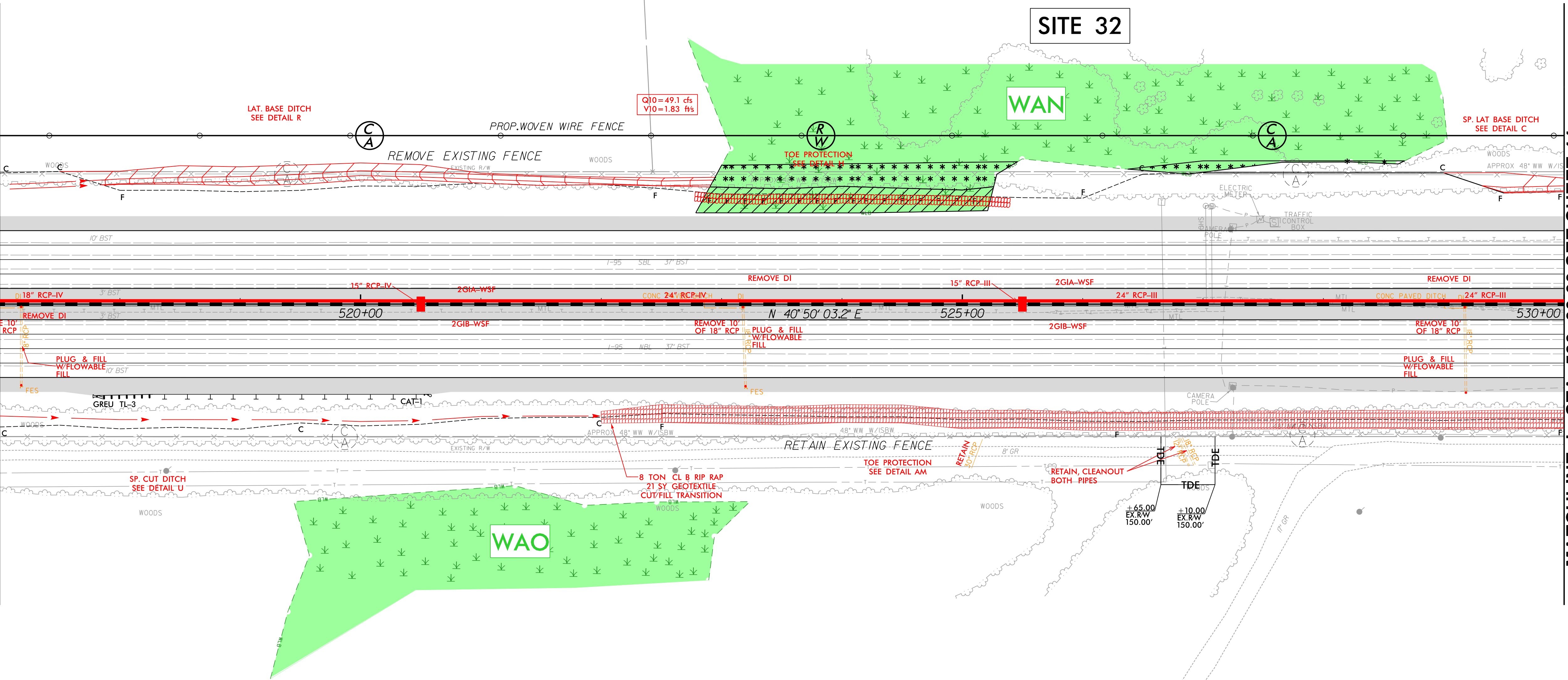
DENOTES MECHANIZED CLEARING
DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
1-5986A	43
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 85 OF 163

MATCHLINE - L- STA. 517+00.00 SEE SHEET 42

MATCHLINE - L- STA. 530+00.00 SEE SHEET 44

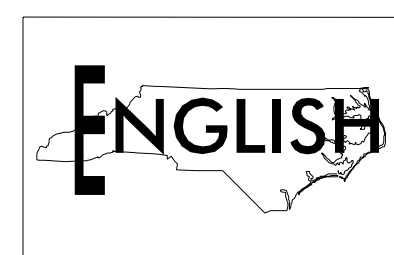
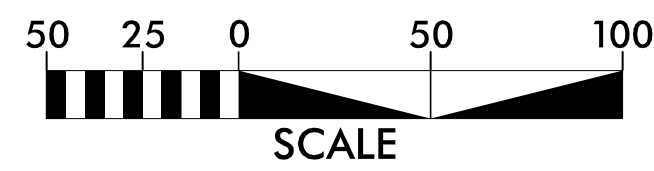


8/17/2020
E:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh43.dgn
E:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh43.dgn

FOR -LLT_SEC2- PROFILE SEE SHTS. 124 THRU 125
FOR -LRT_SEC2- PROFILE SEE SHTS. 124 THRU 125
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

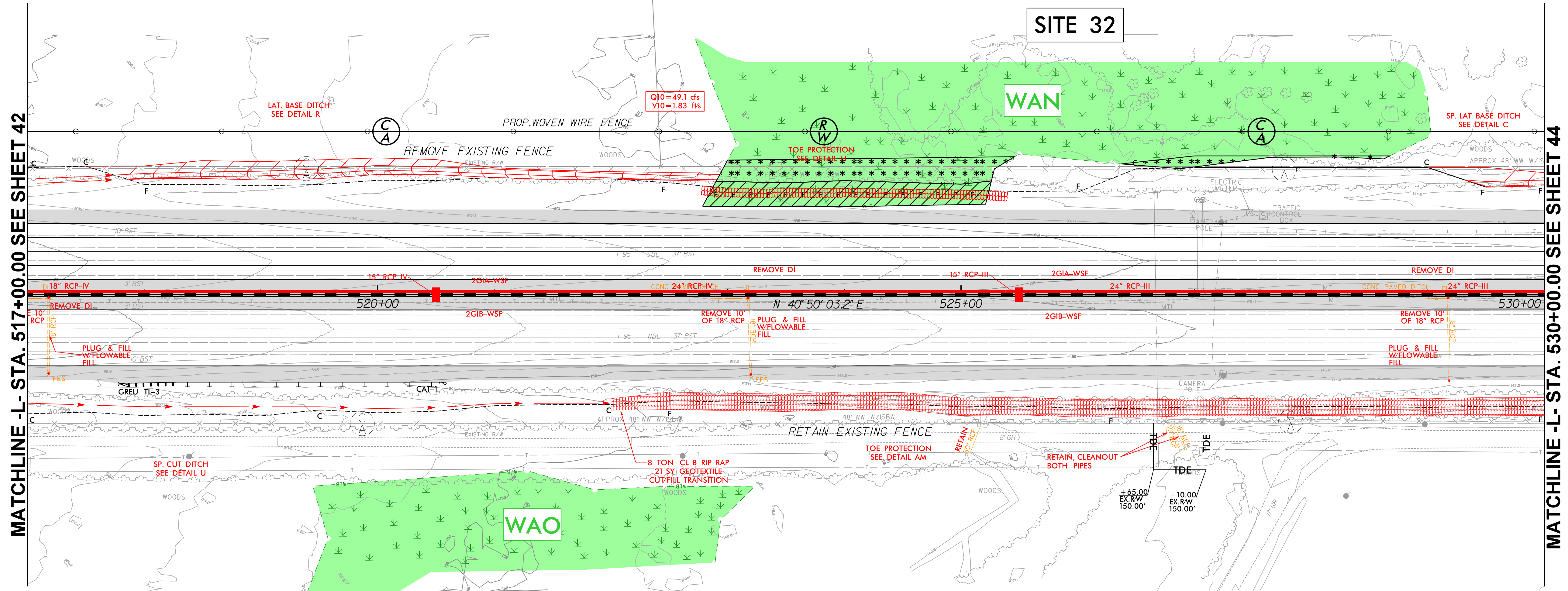
RK&K
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
5/1/2020
E:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 2\1-5986A_hyd_4B_psh43.CON.dgn
RKK



- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
1-5986A	43
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 86 OF 163	



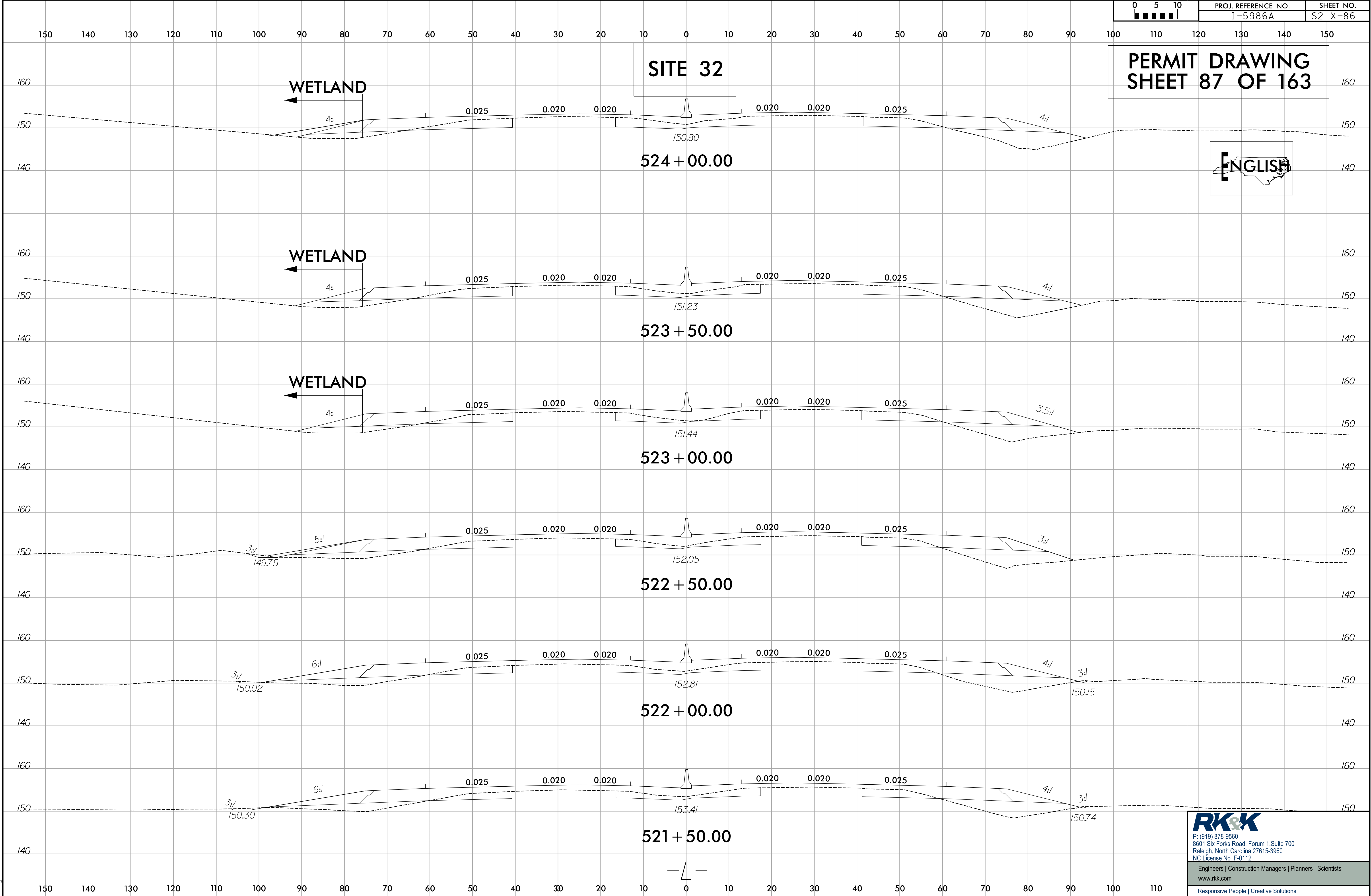
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

FOR -LLT SEC2- PROFILE SEE SHTS. 124 THRU 125
FOR -LRT SEC2- PROFILE SEE SHTS. 124 THRU 125
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

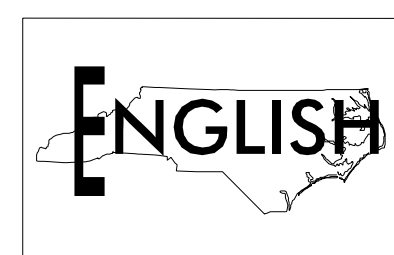
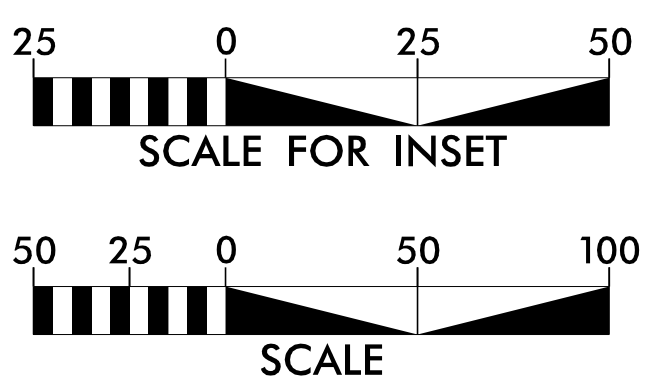
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16

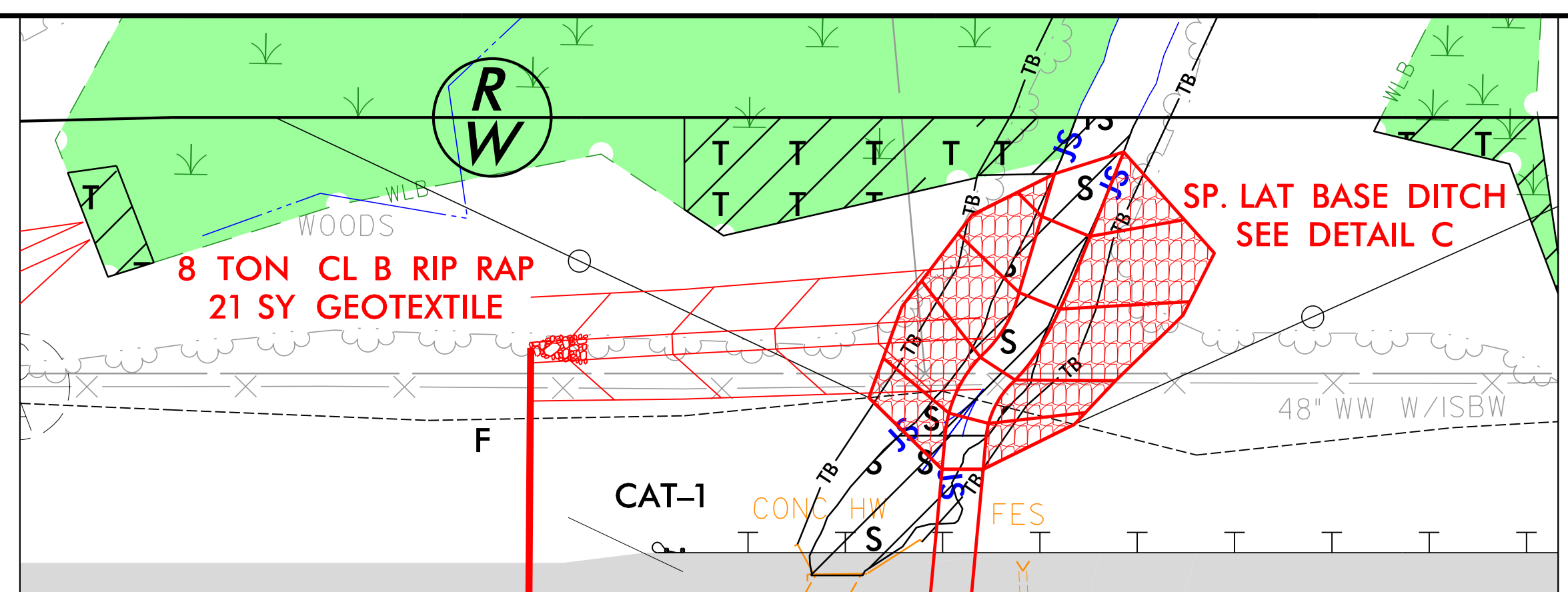
5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet.XPL\L.SITE32.dgn
kelle



8/17/99

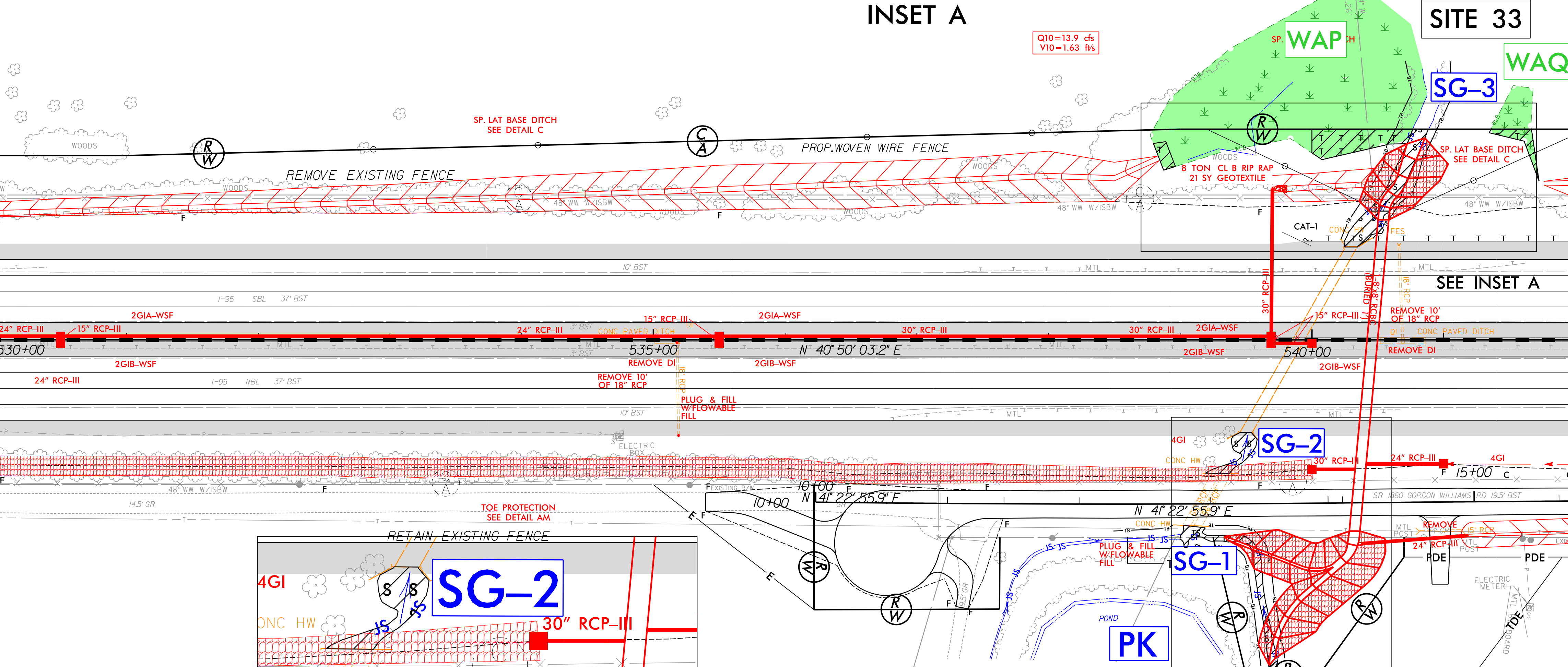


- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



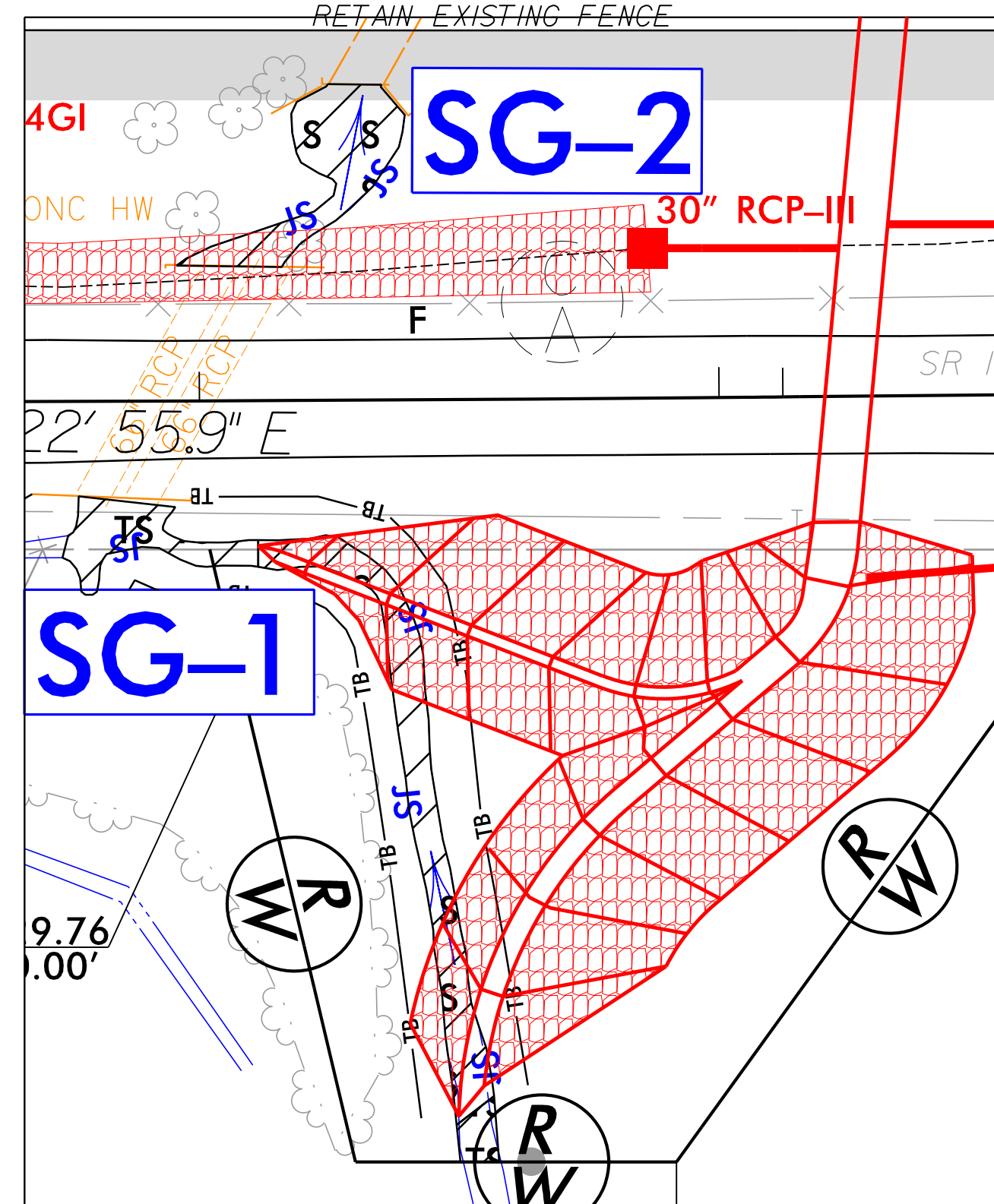
PROJECT REFERENCE NO.		SHEET NO.	
I-5986A		44	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 88 OF 163			

MATCHLINE -L- STA. 530+00.00 SEE SHEET 43



MATCHLINE -L- STA. 542+00.00 SEE SHEET 45

INSET B

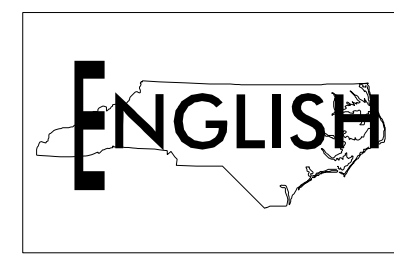
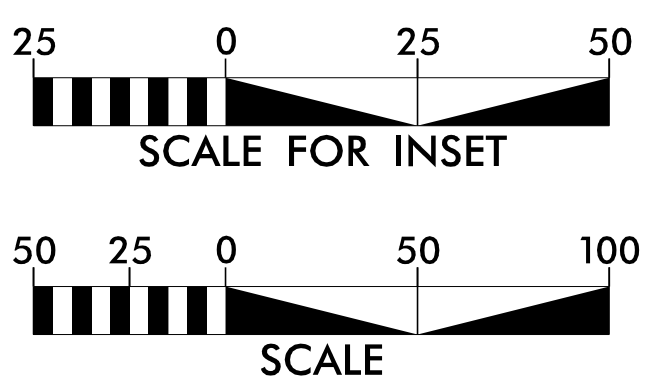


SITE 33
N 40°16' 52.1\"/>

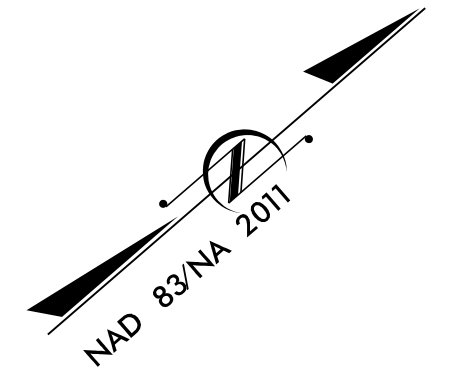
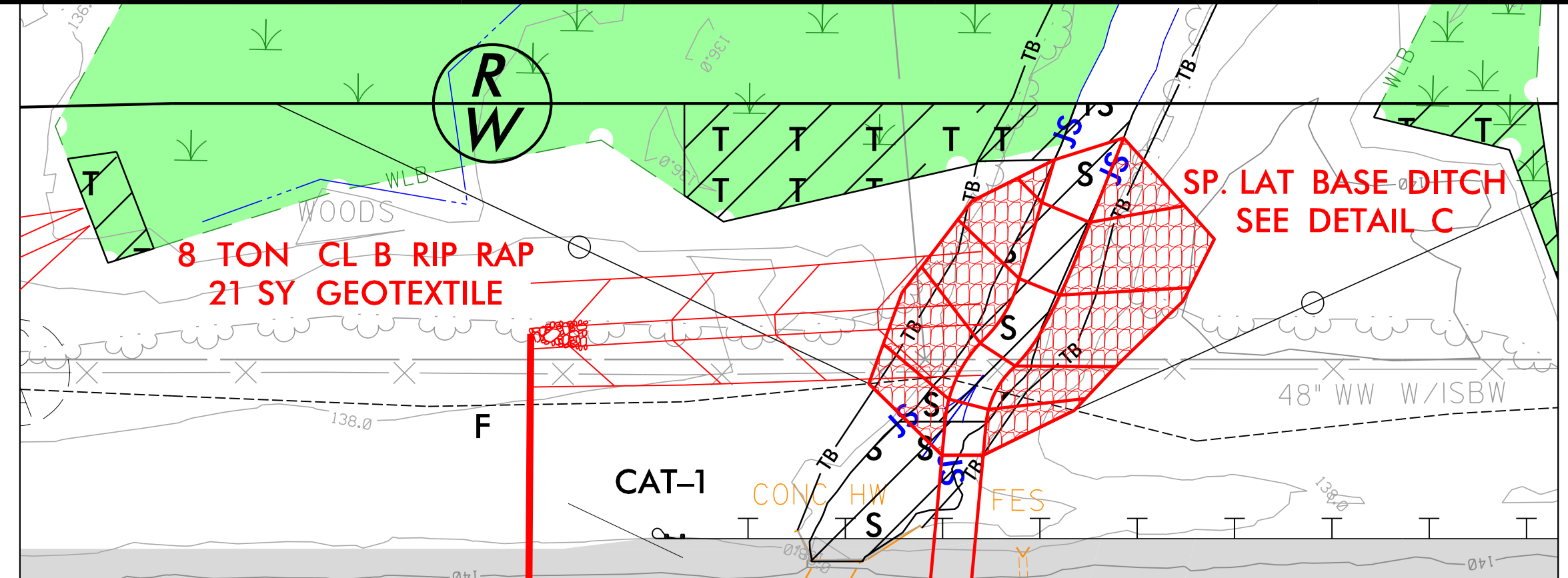
FOR -LLT SEC2- PROFILE SEE SHTS. 125 THRU 126
FOR -LRT SEC2- PROFILE SEE SHTS. 125 THRU 126
FOR -SR5C- PROFILE SEE SHT. 183
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4



8/17/99

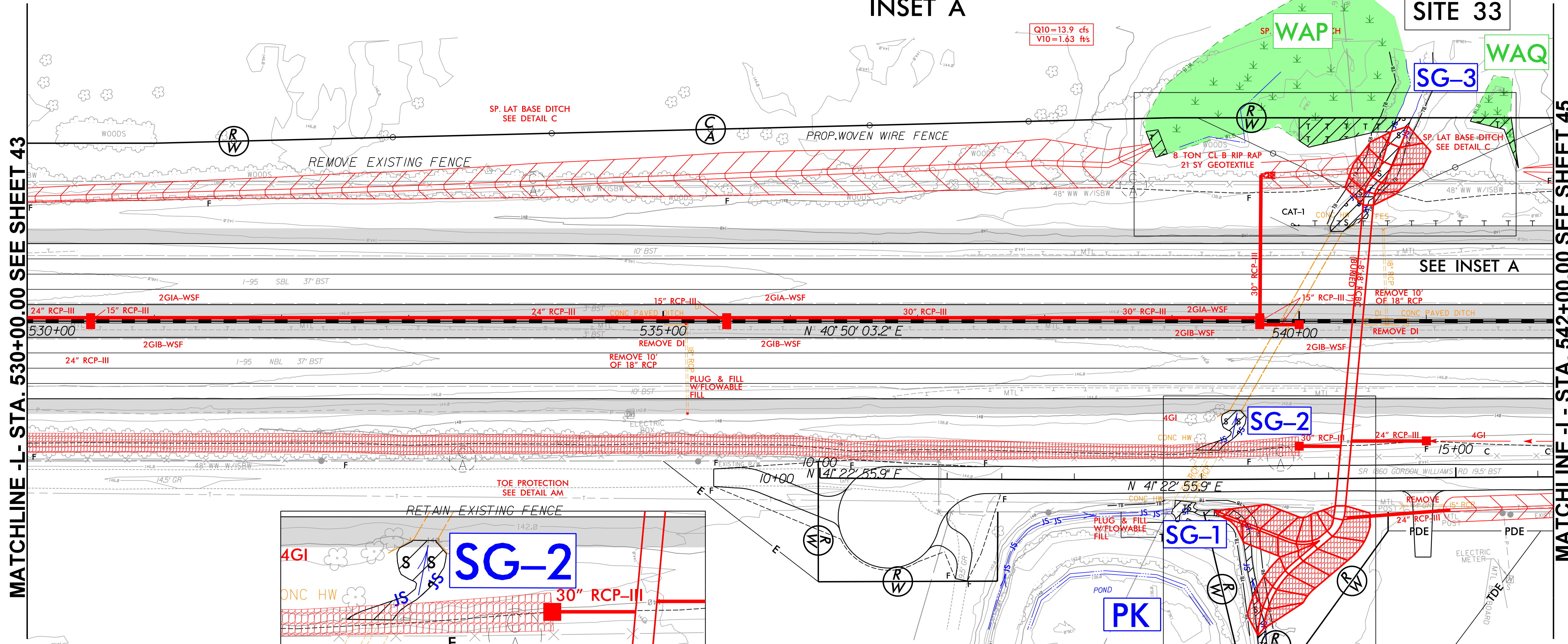


- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

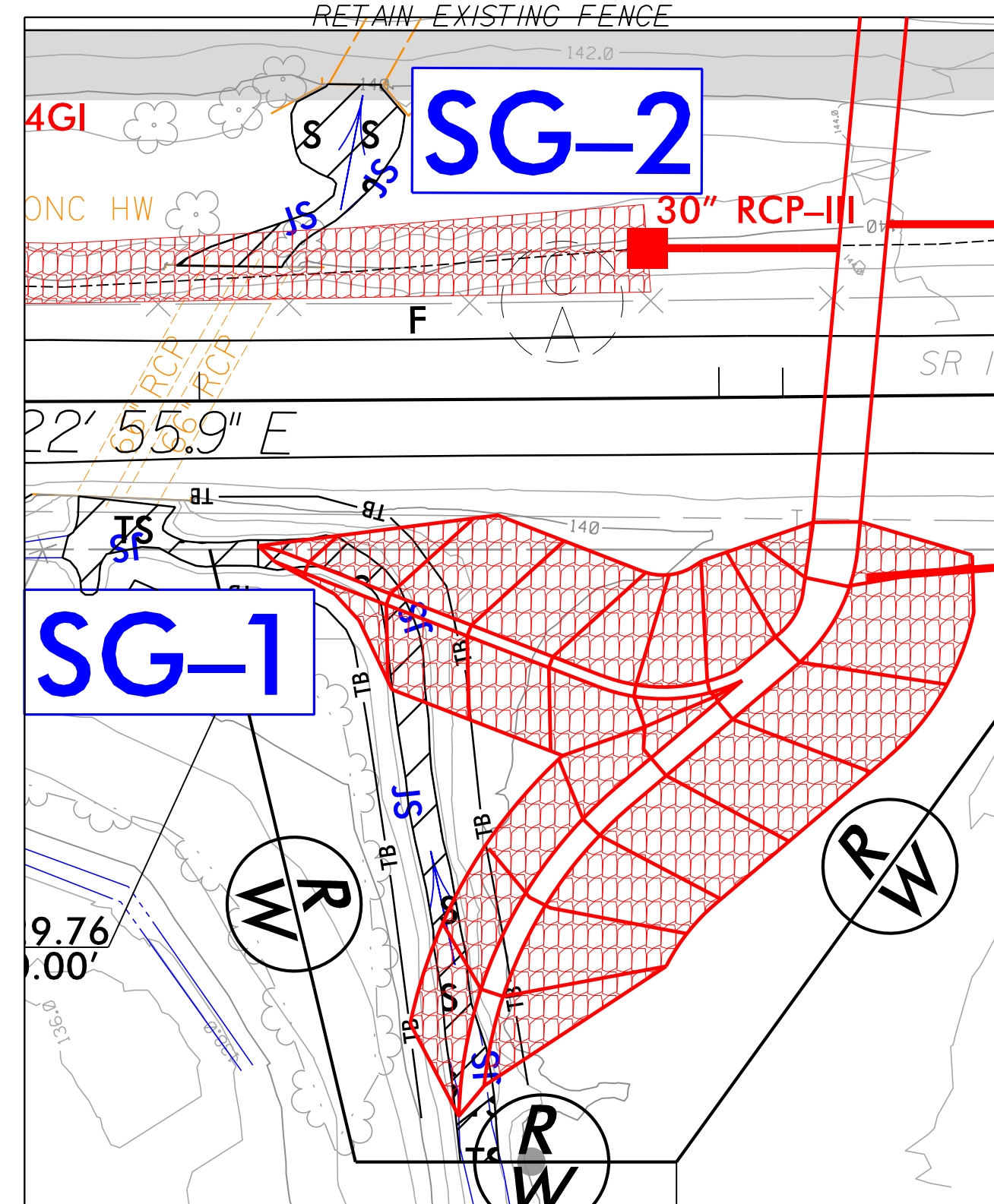


PROJECT REFERENCE NO.	SHEET NO.
1-5986A	44
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 89 OF 163



INSET B



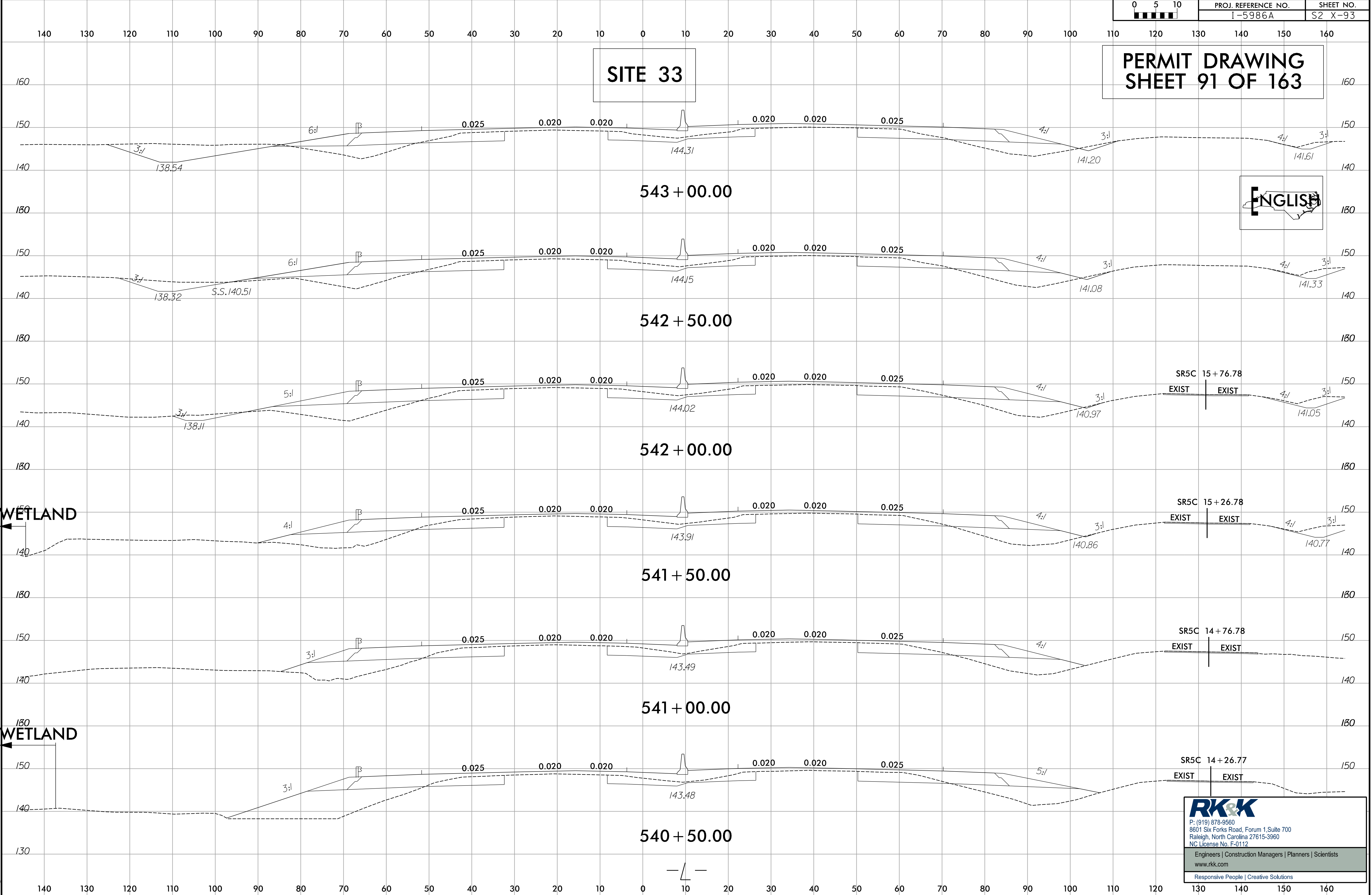
SITE 33
N 40°16' 52.1\"/>

FOR -LLT SEC2- PROFILE SEE SHTS. 125 THRU 126
FOR -LRT SEC2- PROFILE SEE SHTS. 125 THRU 126
FOR -SR5C- PROFILE SEE SHT. 183
FOR DITCH DETAILS SEE SHTS. 2D-3 THRU 2D-4

P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

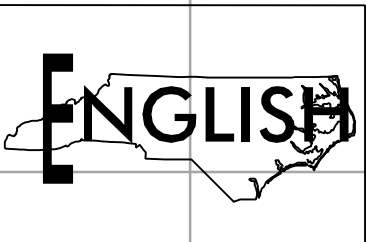
6/23/16

5/1/2020 R:\Hydro\Projects\PERMITS\Environmental\Drawings\4C\I-5986A_hyd_prm_wet.XPL_L-SITE33.dgn F:\keys



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S2 X-93

PERMIT DRAWING
SHEET 91 OF 163

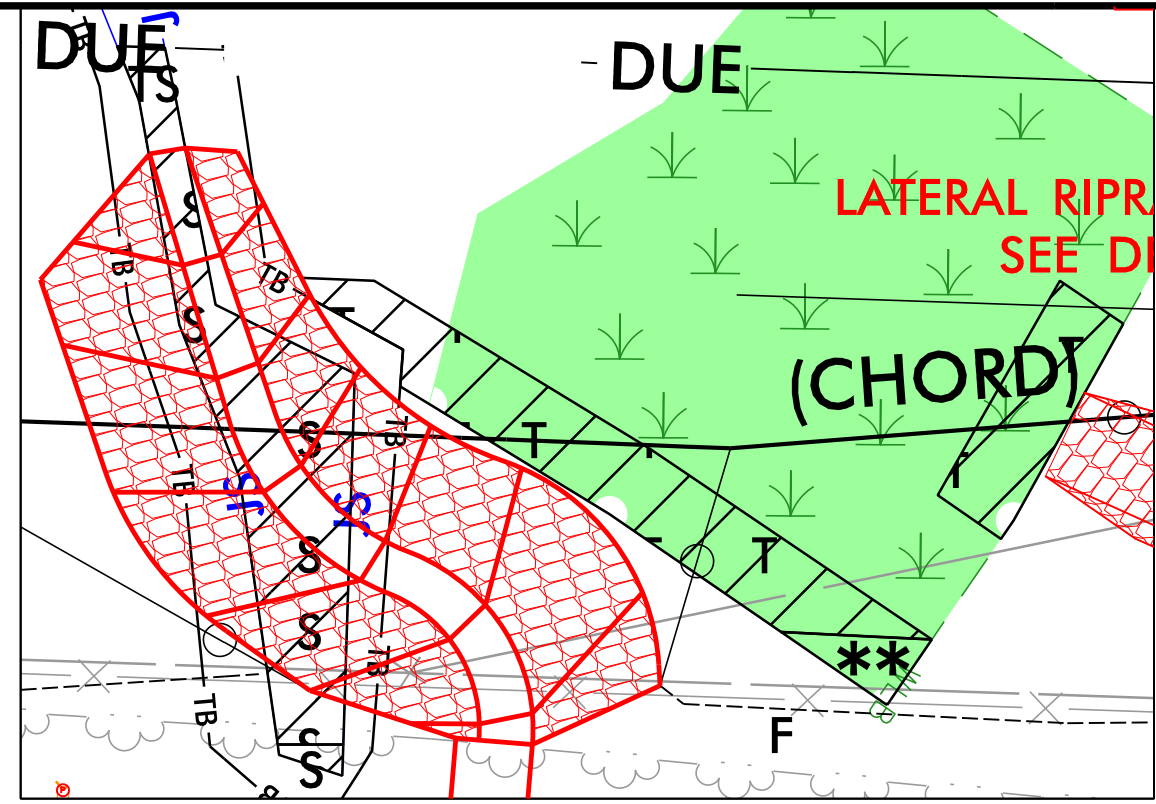
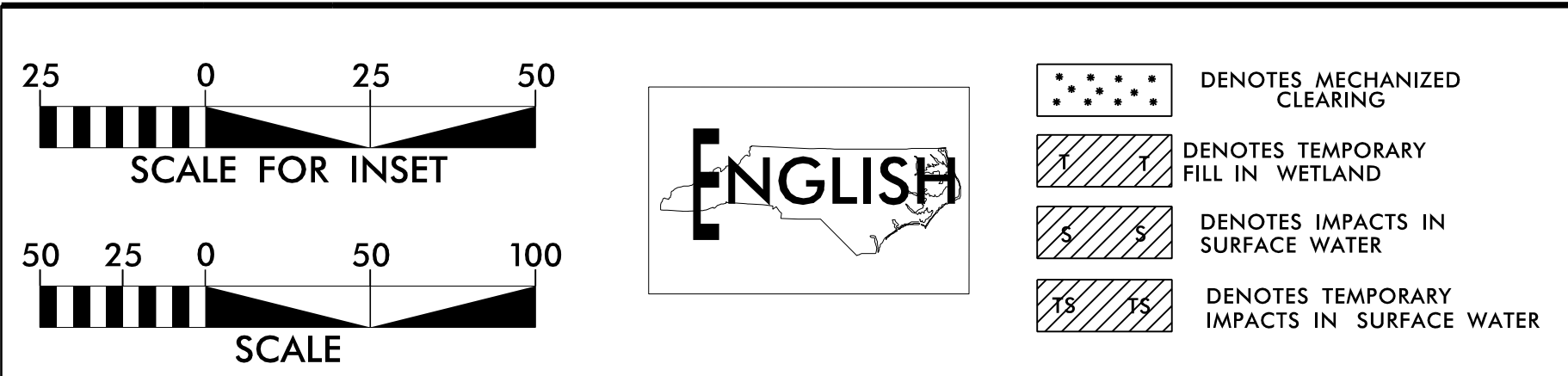


RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4B\Section 3\I-5986A_hyd_4B_psh47.dgn
keus

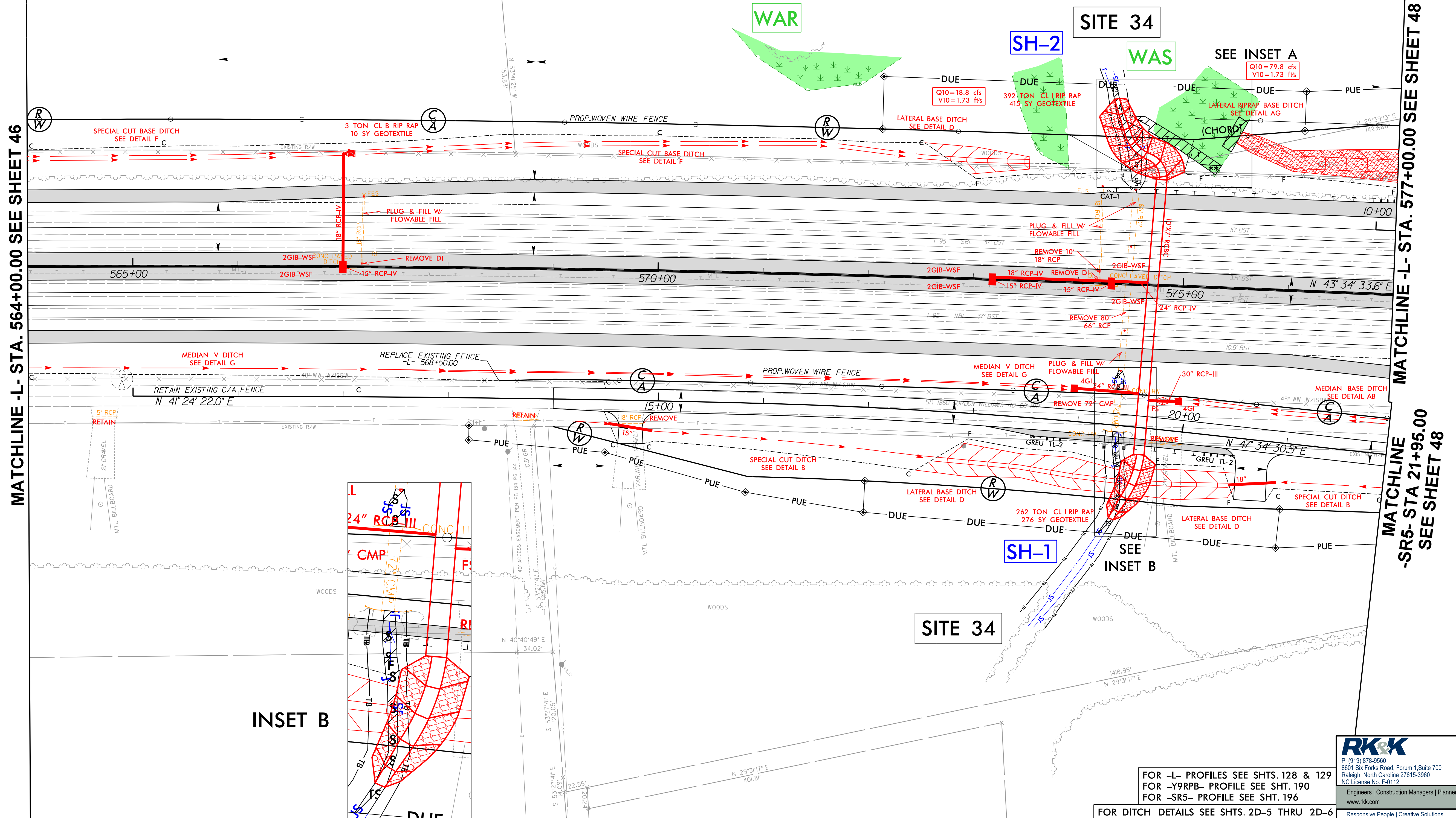


INSET A

PERMIT DRAWING
SHEET 92 OF 163



PROJECT REFERENCE NO.		SHEET NO.	
1-5986A		47	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>			



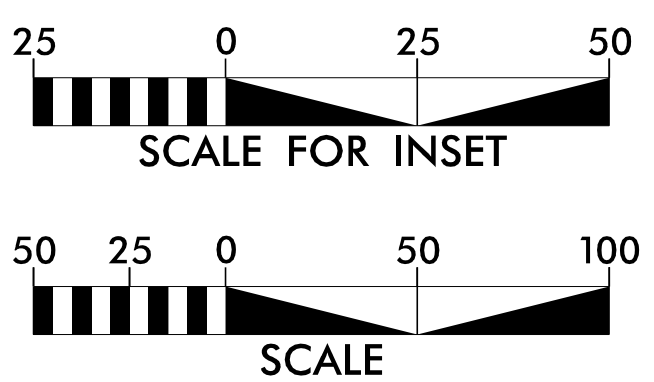
FOR -L- PROFILES SEE SHTS. 128 & 129
FOR -Y9RPB- PROFILE SEE SHT. 190
FOR -SR5- PROFILE SEE SHT. 196

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

8/17/99

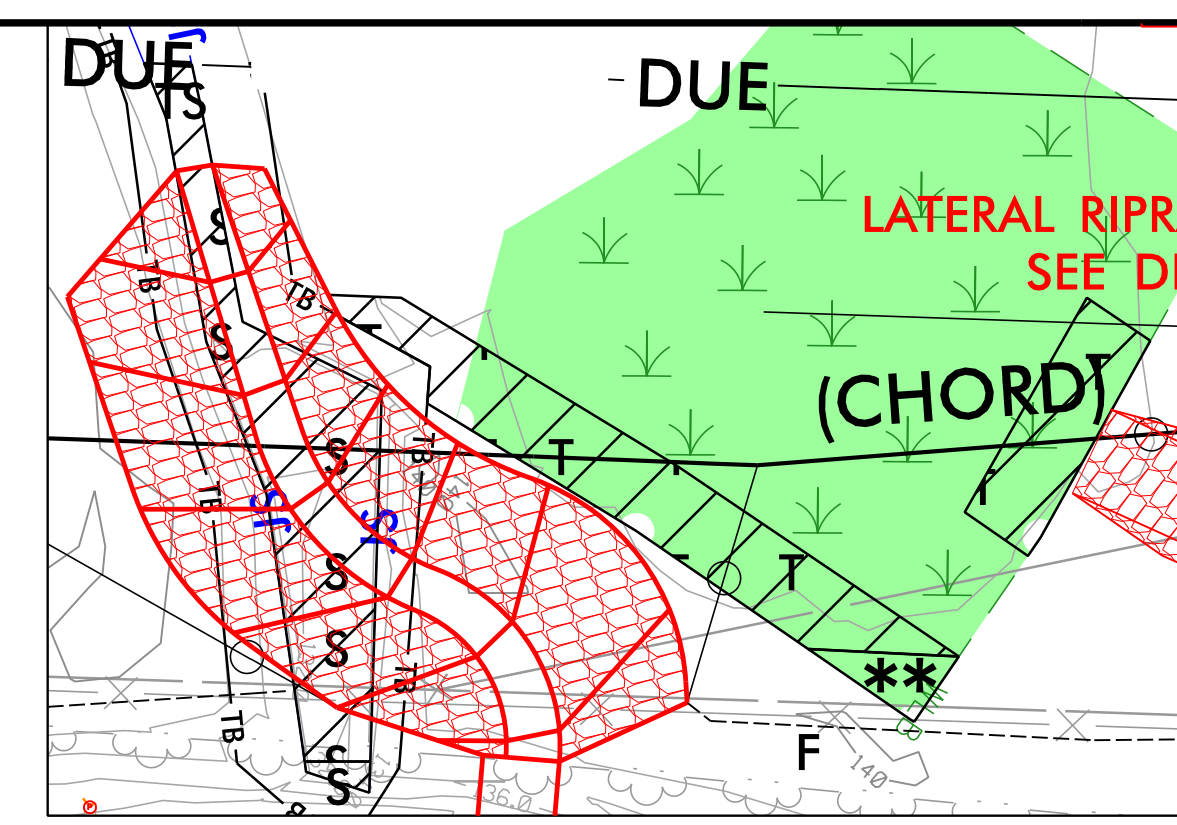


ENGLISH

- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 93 OF 163

PROJECT REFERENCE NO.	1-5986A	SHEET NO.	47
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

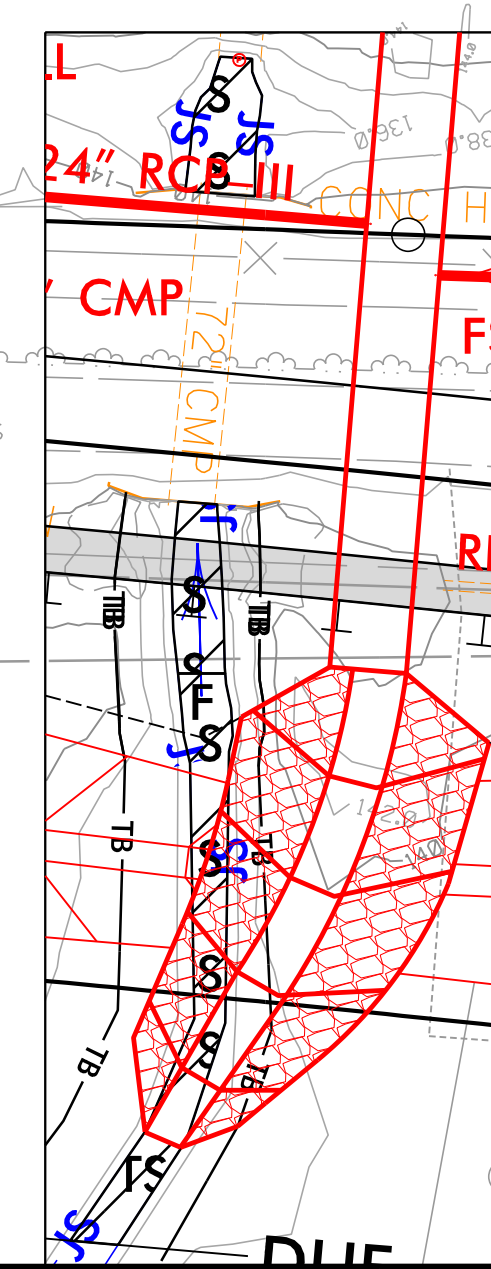
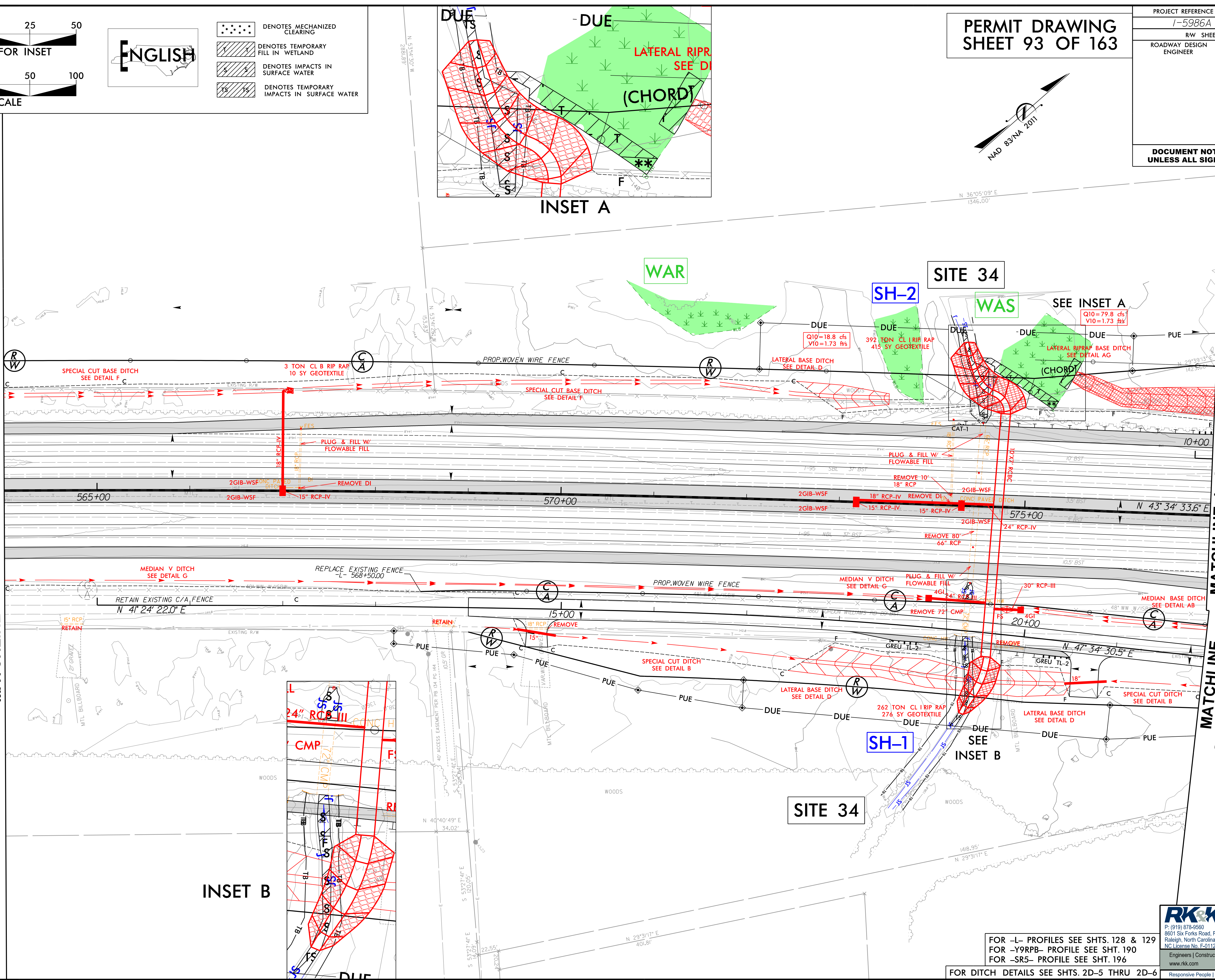


INSET A

MATCHLINE -L- STA. 564+00.00 SEE SHEET 46

MATCHLINE -L- STA. 577+00.00 SEE SHEET 48

MATCHLINE -SR5- STA 21+95.00 SEE SHEET 48



INSET B

FOR -L- PROFILES SEE SHTS. 128 & 129
FOR -Y9RPB- PROFILE SEE SHT. 190
FOR -SR5- PROFILE SEE SHT. 196

FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

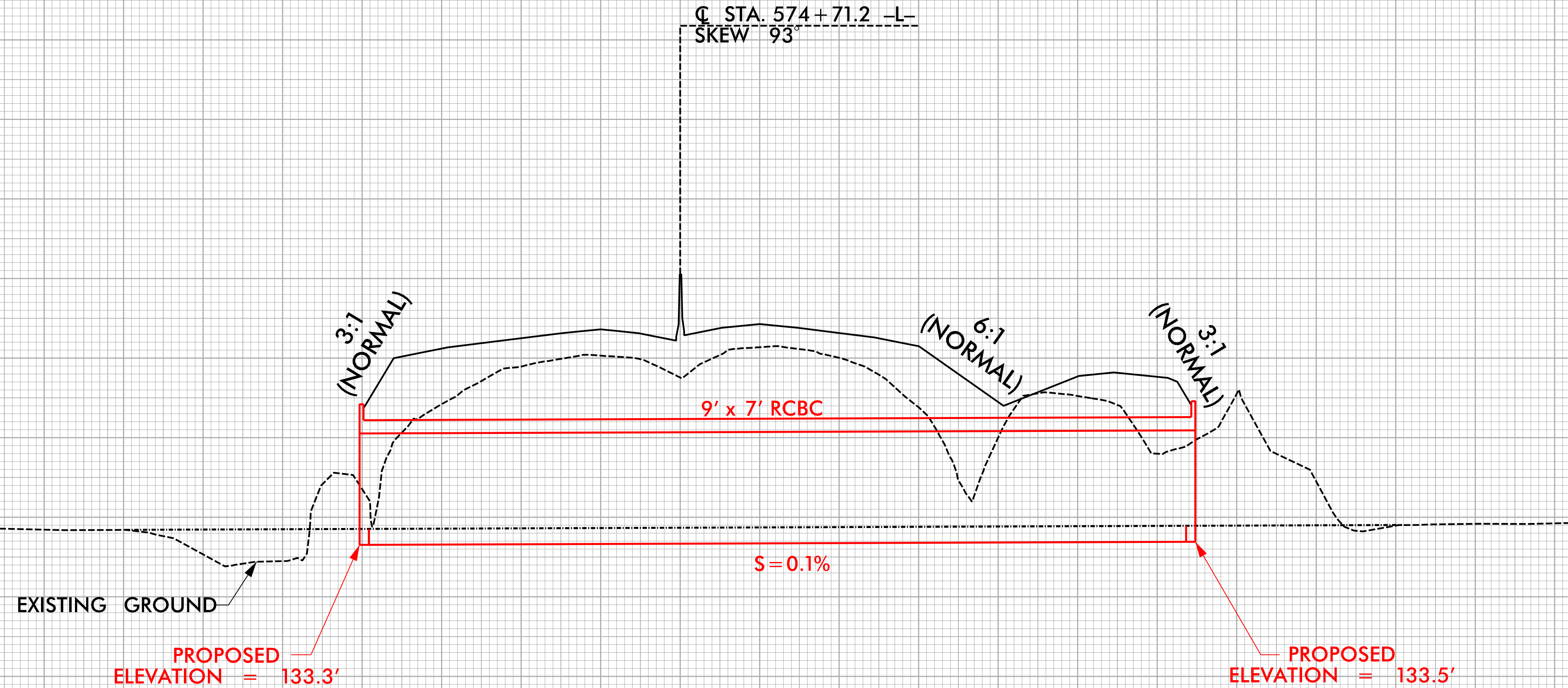
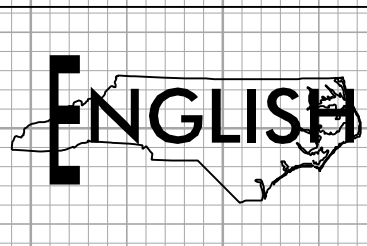
RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

E:\2020\11\11\Hydraulics PERMITS_Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psh47_CON.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 34
-L- STA. 574+71

PERMIT DRAWING
SHEET 94 OF 163



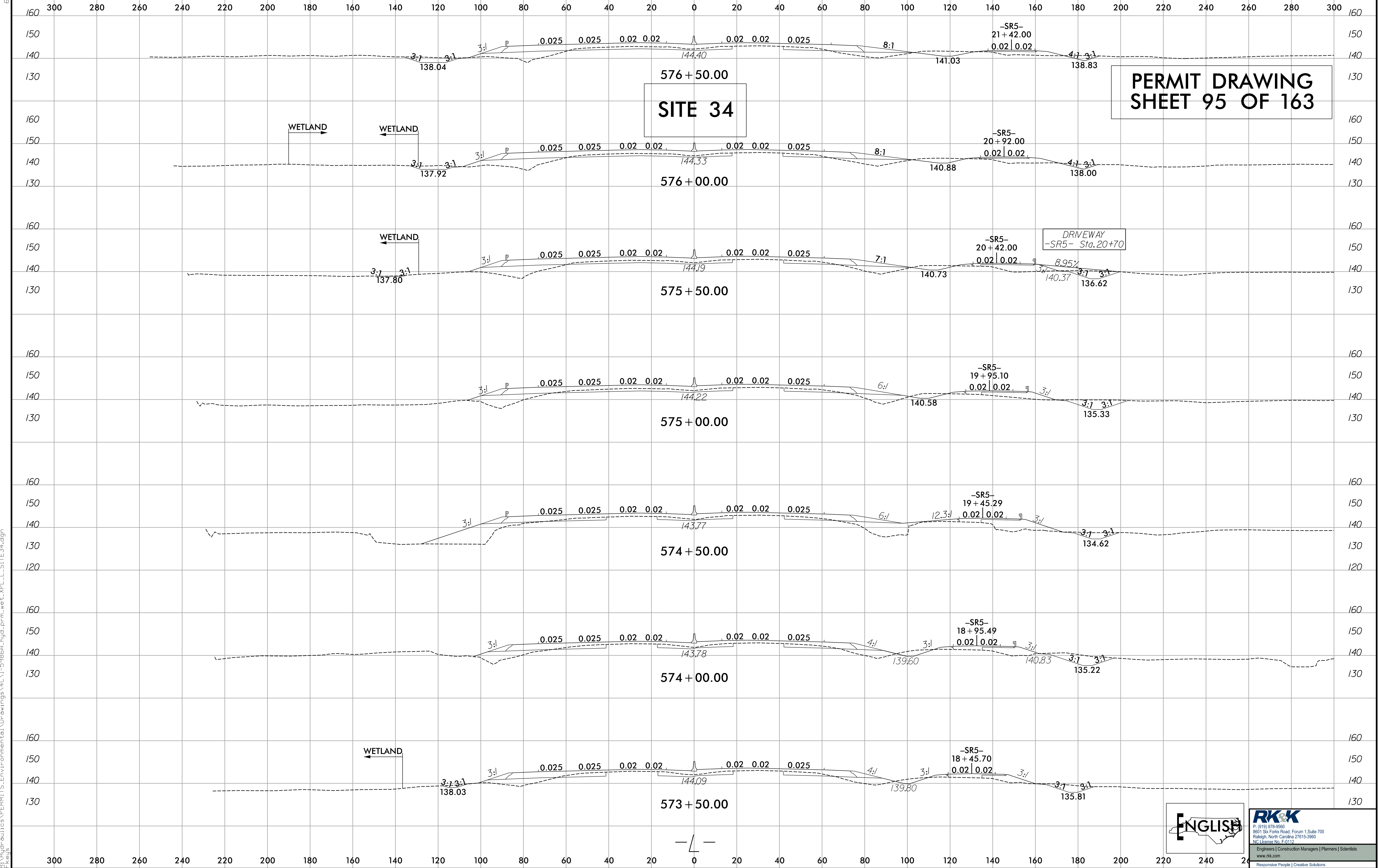
9' X 7' RCBC
(buried 1.0')
(length = 263')

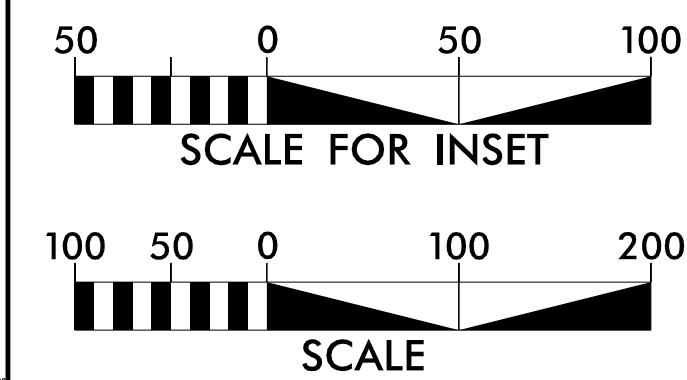
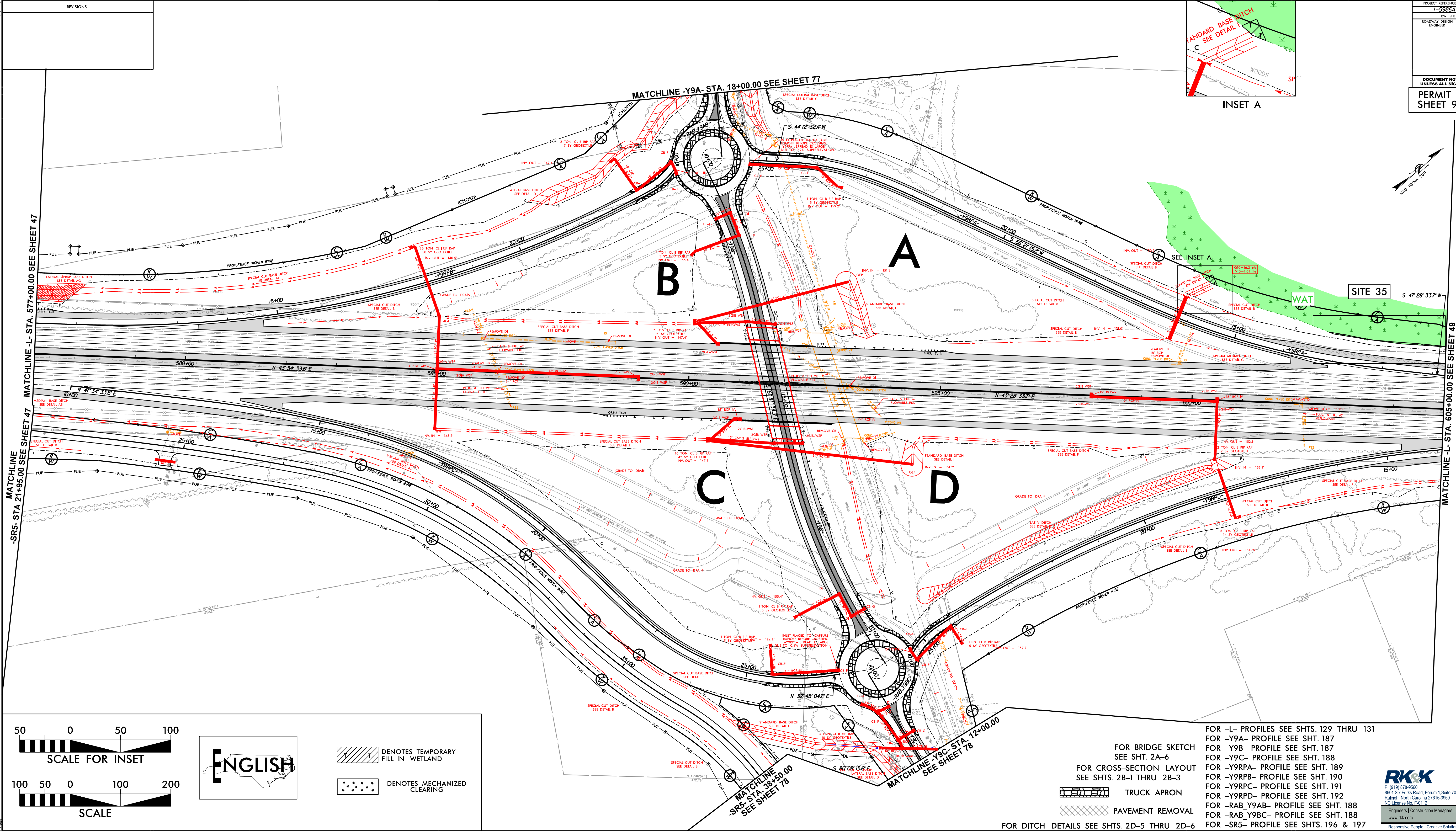
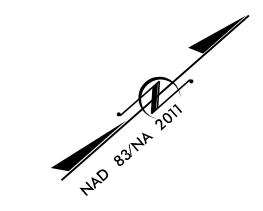
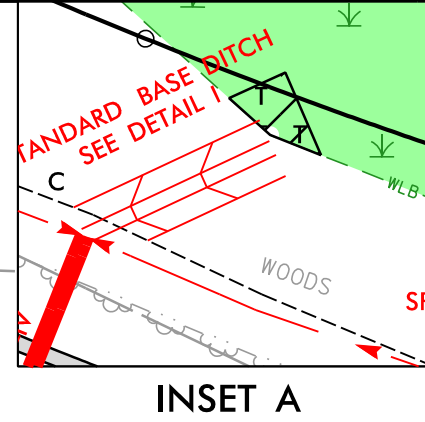


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16



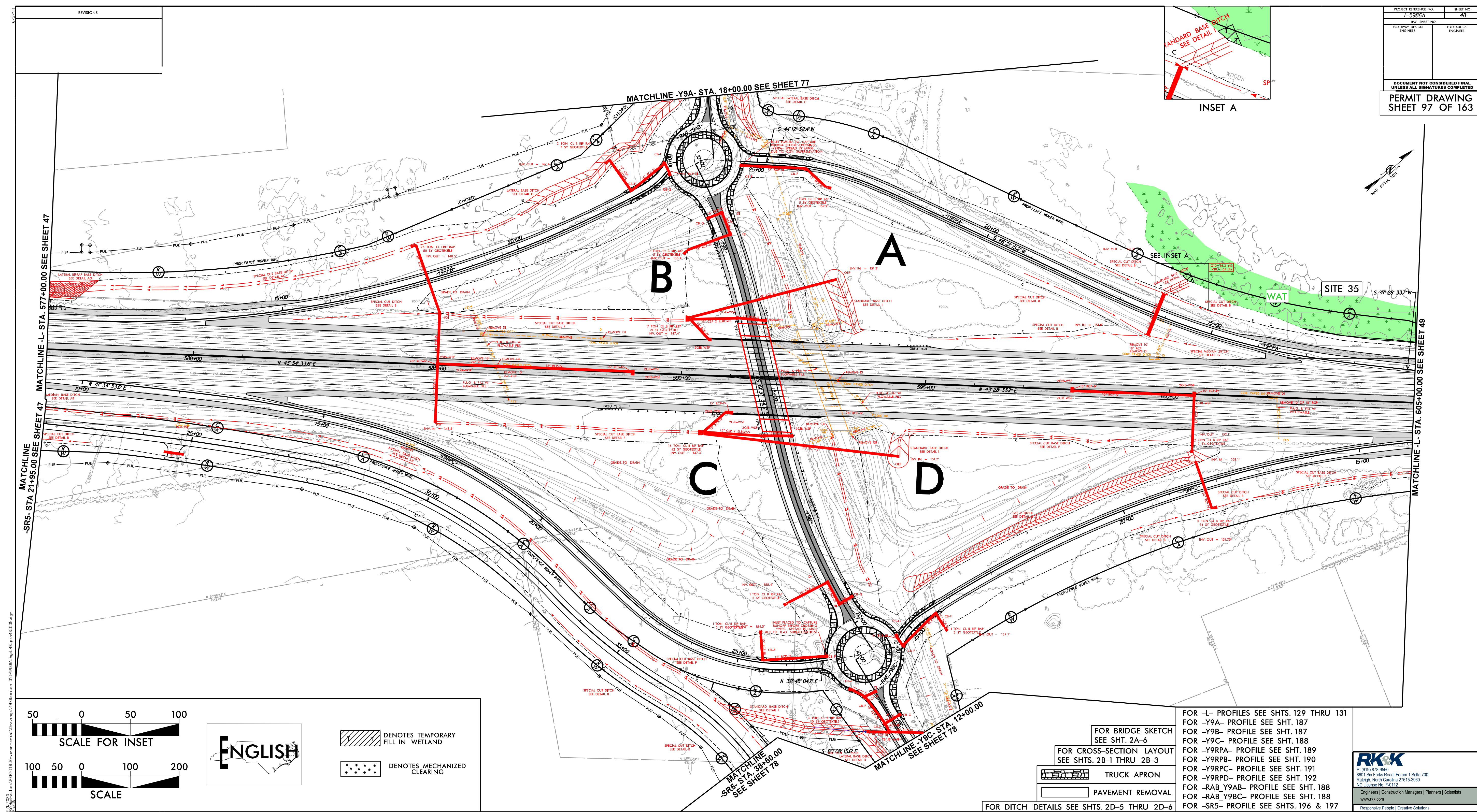


ENGLISH

- DIAGONAL HATCHING DENOTES TEMPORARY FILL IN WETLAND
- DOTTED PATTERN DENOTES MECHANIZED CLEARING

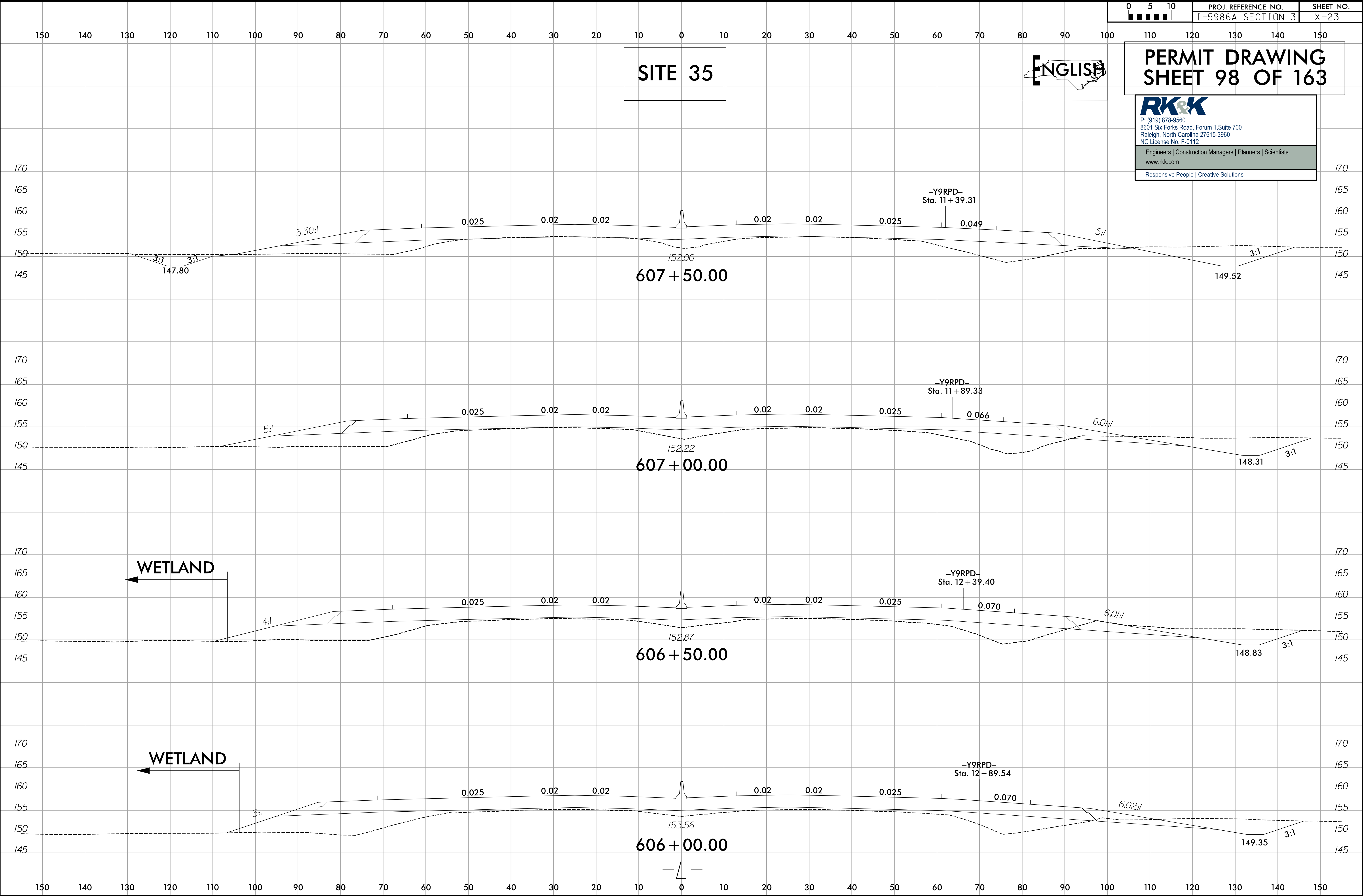
- FOR BRIDGE SKETCH SEE SHT. 2A-6
- FOR CROSS-SECTION LAYOUT SEE SHTS. 2B-1 THRU 2B-3
- TRUCK APRON
- PAVEMENT REMOVAL
- FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

- FOR -L- PROFILES SEE SHTS. 129 THRU 131
- FOR -Y9A- PROFILE SEE SHT. 187
- FOR -Y9B- PROFILE SEE SHT. 187
- FOR -Y9C- PROFILE SEE SHT. 188
- FOR -Y9RPA- PROFILE SEE SHT. 189
- FOR -Y9RPB- PROFILE SEE SHT. 190
- FOR -Y9RPC- PROFILE SEE SHT. 191
- FOR -Y9RPD- PROFILE SEE SHT. 192
- FOR -RAB Y9AB- PROFILE SEE SHT. 188
- FOR -RAB Y9BC- PROFILE SEE SHT. 188
- FOR -SR5- PROFILE SEE SHTS. 196 & 197

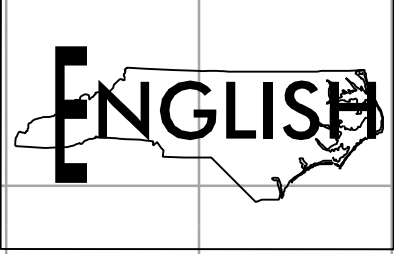


6/23/16

5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL\L_SITE35.dgn
kels

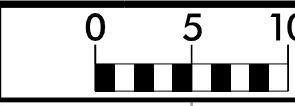


SITE 35



PERMIT DRAWING
SHEET 98 OF 163

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



PROJ. REFERENCE NO.	SHEET NO.
I-5986A SECTION 3	X-23

8/17/99
31-5986A_hyd_4B.psh49.dgn
E:\2020-21\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 31-5986A_hyd_4B.psh49.dgn
E:\2020-21\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 31-5986A_hyd_4B.psh49.dgn

50250100

SCALE

ENGLISH

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

PERMIT DRAWING
SHEET 99 OF 163

PROJECT REFERENCE NO.
1-5986

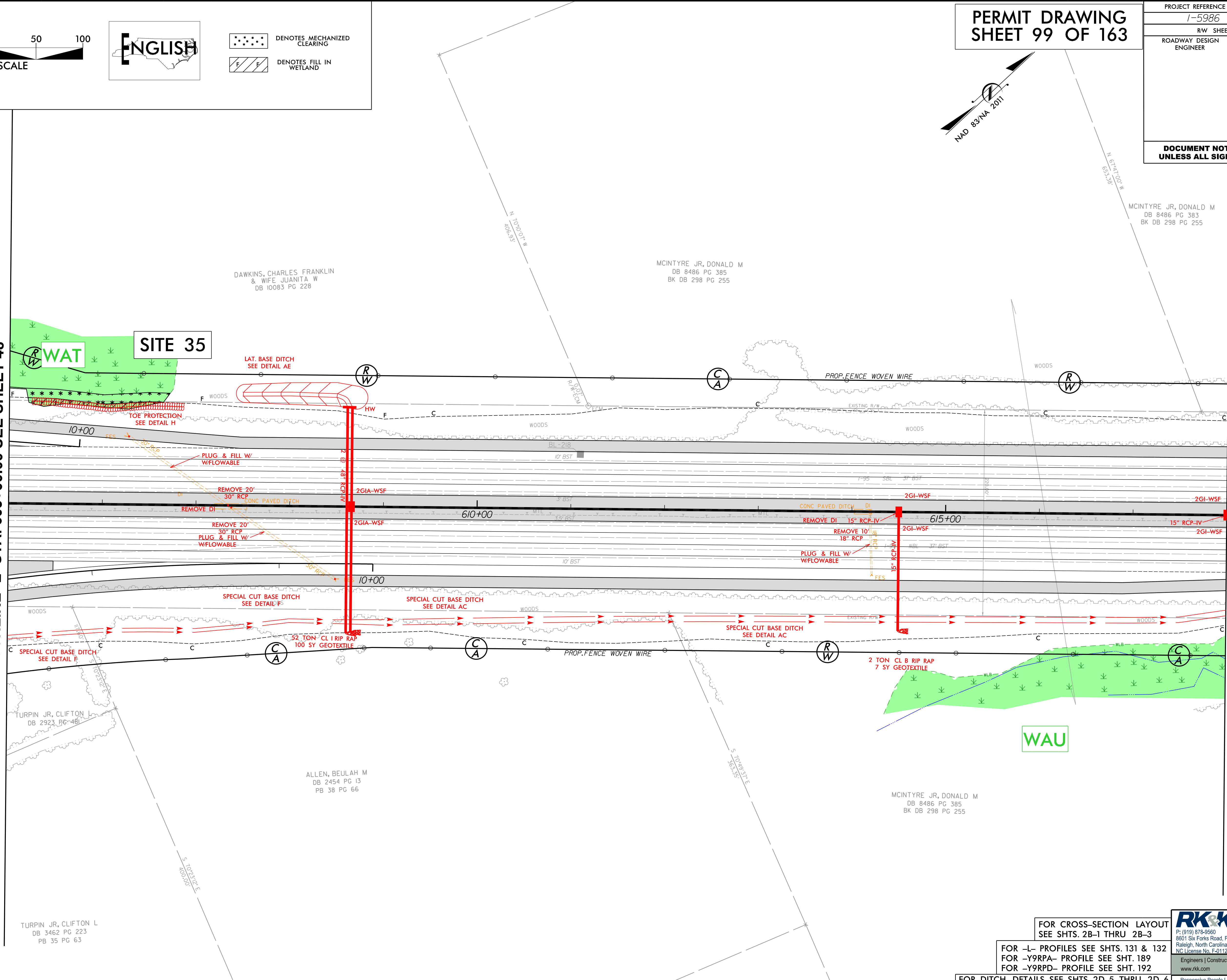
RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

MATCHLINE -L- STA. 605+00.00 SEE SHEET 48



MATCHLINE -L- STA. 618+00.00 SEE SHEET 50

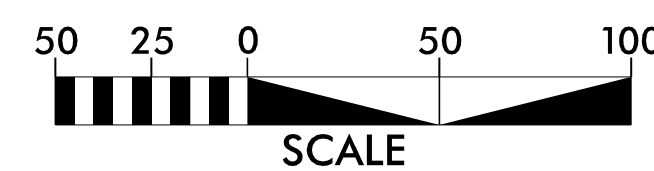
FOR CROSS-SECTION LAYOUT
SEE SHTS. 2B-1 THRU 2B-3

FOR -L- PROFILES SEE SHTS. 131 & 132
FOR -Y9RPA- PROFILE SEE SHT. 189
FOR -Y9RPD- PROFILE SEE SHT. 192

FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

RK&K
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf49_CON.dgn
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf49_CON.dgn



ENGLISH

DENOTES MECHANIZED CLEARING
DENOTES FILL IN WETLAND

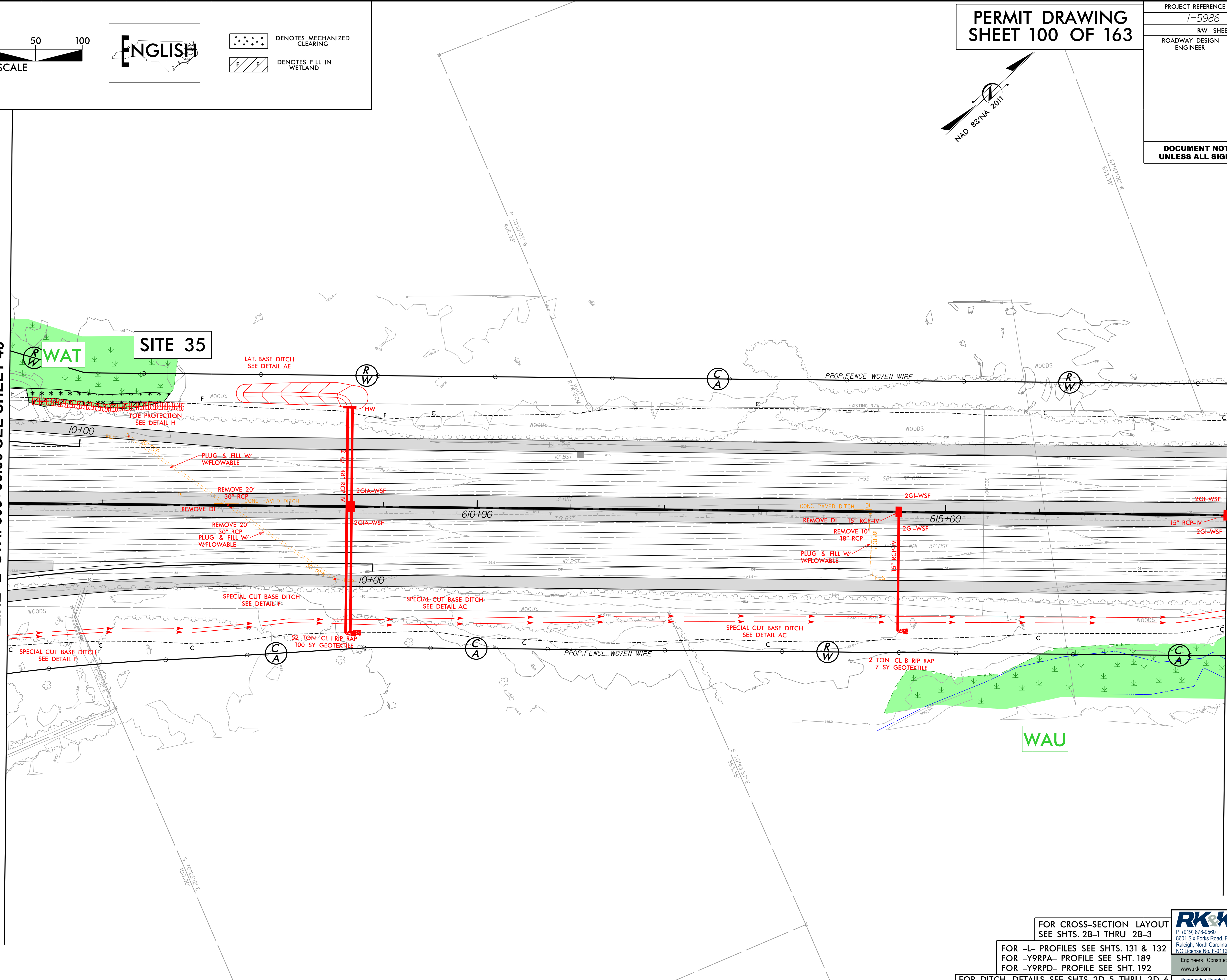
PERMIT DRAWING
SHEET 100 OF 163



PROJECT REFERENCE NO. 1-5986	SHEET NO. 49
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 605+00.00 SEE SHEET 48

MATCHLINE -L- STA. 618+00.00 SEE SHEET 50

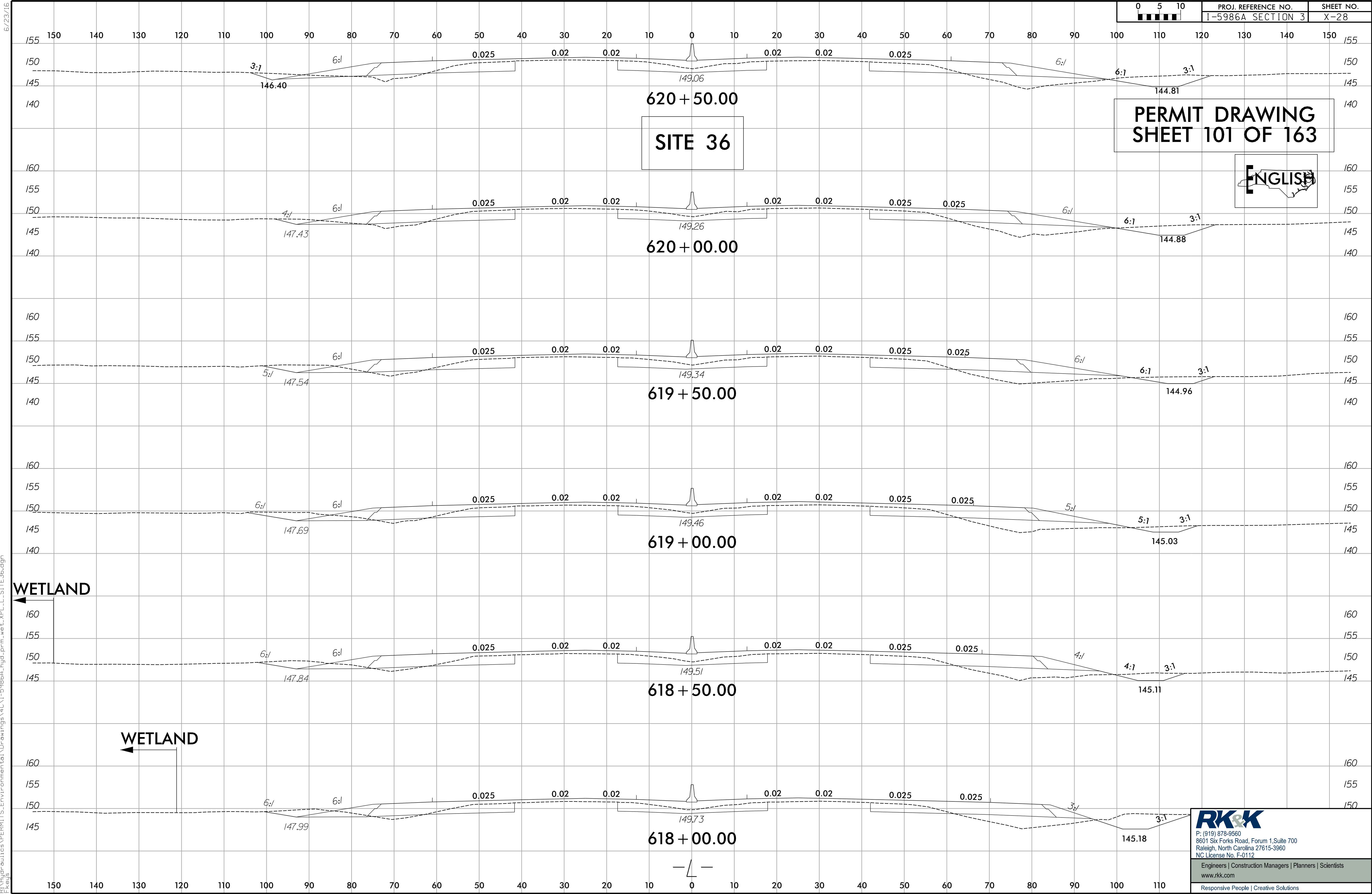


FOR CROSS-SECTION LAYOUT
SEE SHTS. 2B-1 THRU 2B-3

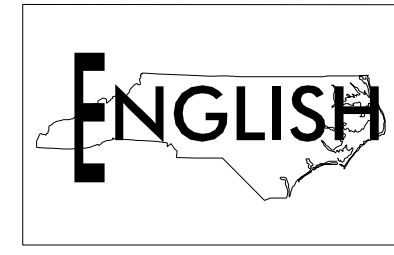
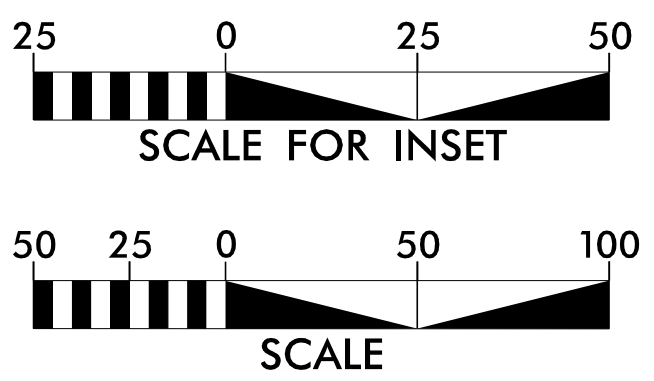
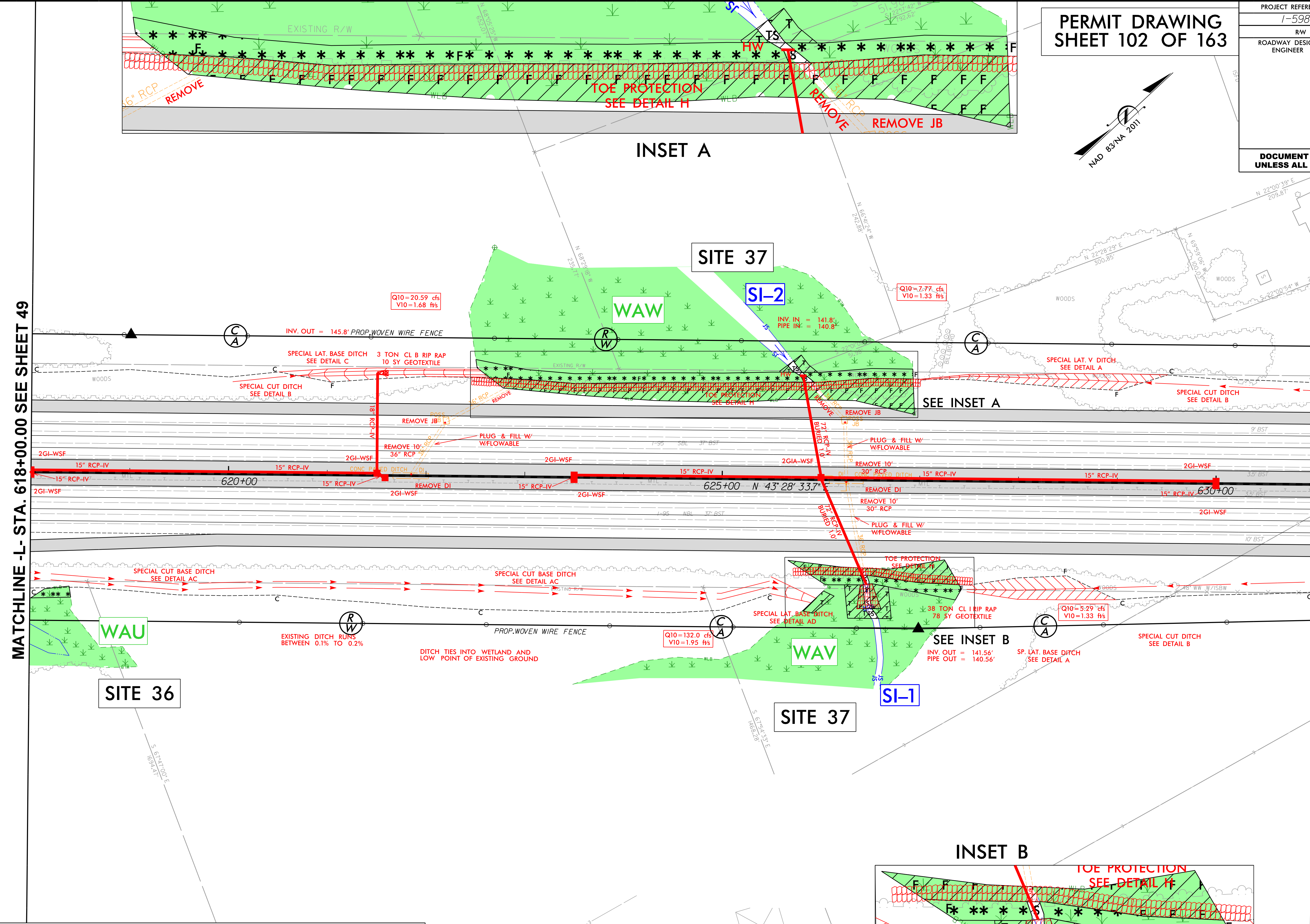
FOR -L- PROFILES SEE SHTS. 131 & 132
FOR -Y9RPA- PROFILE SEE SHT. 189
FOR -Y9RPD- PROFILE SEE SHT. 192

FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

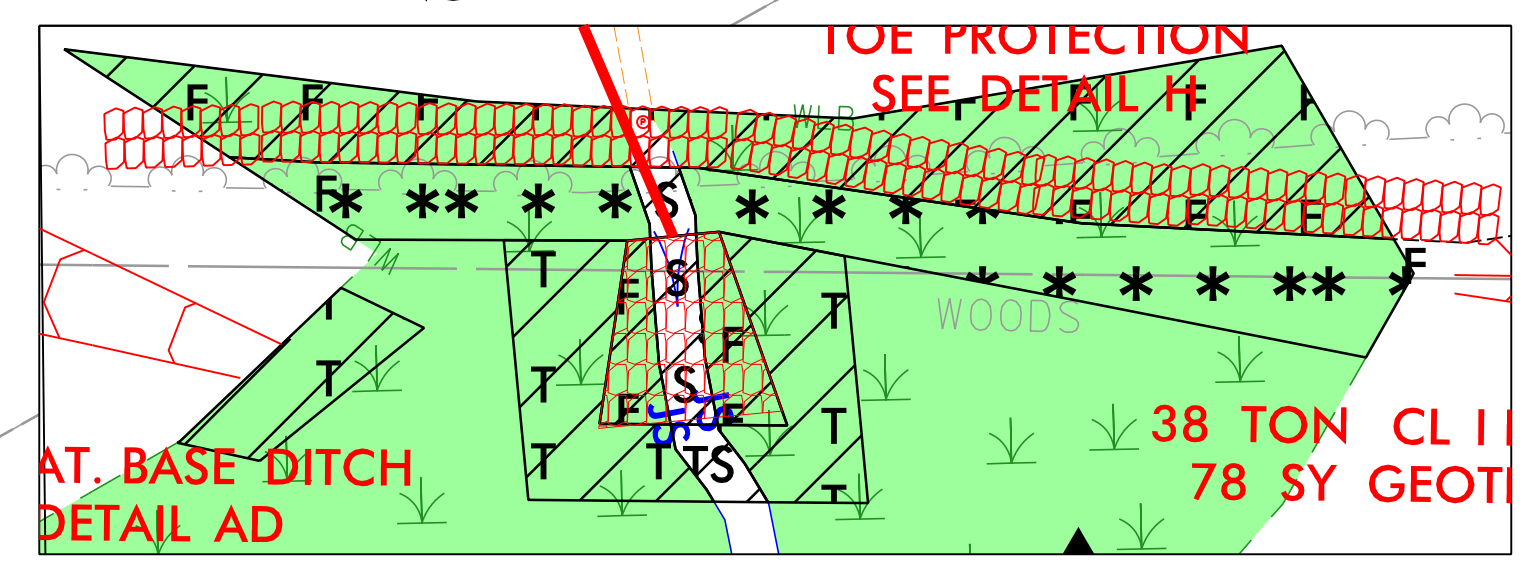
RK&K
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



8/17/99
3/1/2020
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf50.dgn



- | | |
|--|--|
| | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |
| | DENOTES TEMPORARY FILL IN WETLAND |
| | DENOTES IMPACTS IN SURFACE WATER |
| | DENOTES MECHANIZED CLEARING |
| | DENOTES FILL IN WETLAND |



FOR -L- PROFILES SEE SHTS. 132 & 133
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

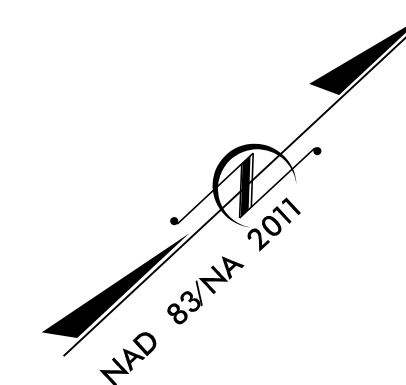
PERMIT DRAWING
SHEET 102 OF 163

PROJECT REFERENCE NO. 1-5986A		SHEET NO. 50
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

MATCHLINE -L- STA. 618+00.00 SEE SHEET 49

MATCHLINE -L- STA. 631+00.00 SEE SHEET 51

PERMIT DRAWING
SHEET 103 OF 163



INSET A

SITE 37

SI-2

WAW

SEE INSET A

MATCHLINE -L- STA. 618+00.00 SEE SHEET 49

MATCHLINE -L- STA. 631+00.00 SEE SHEET 51

SITE 36

SITE 37

SI-1

WAV

SEE INSET B

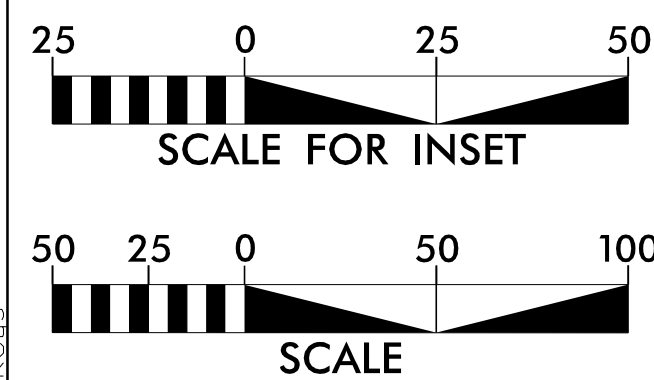
INSET B

TOE PROTECTION
SEE DETAIL 11






WOODS

38 TON CL
78 SY GEO

AT BASE DITCH
DETAIL AD



ENGLISH

	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY FILL IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES MECHANIZED CLEARING
	DENOTES FILL IN WETLAND

FOR -L- PROFILES SEE SHTS. 132 & 133
ITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC license No. F-0112

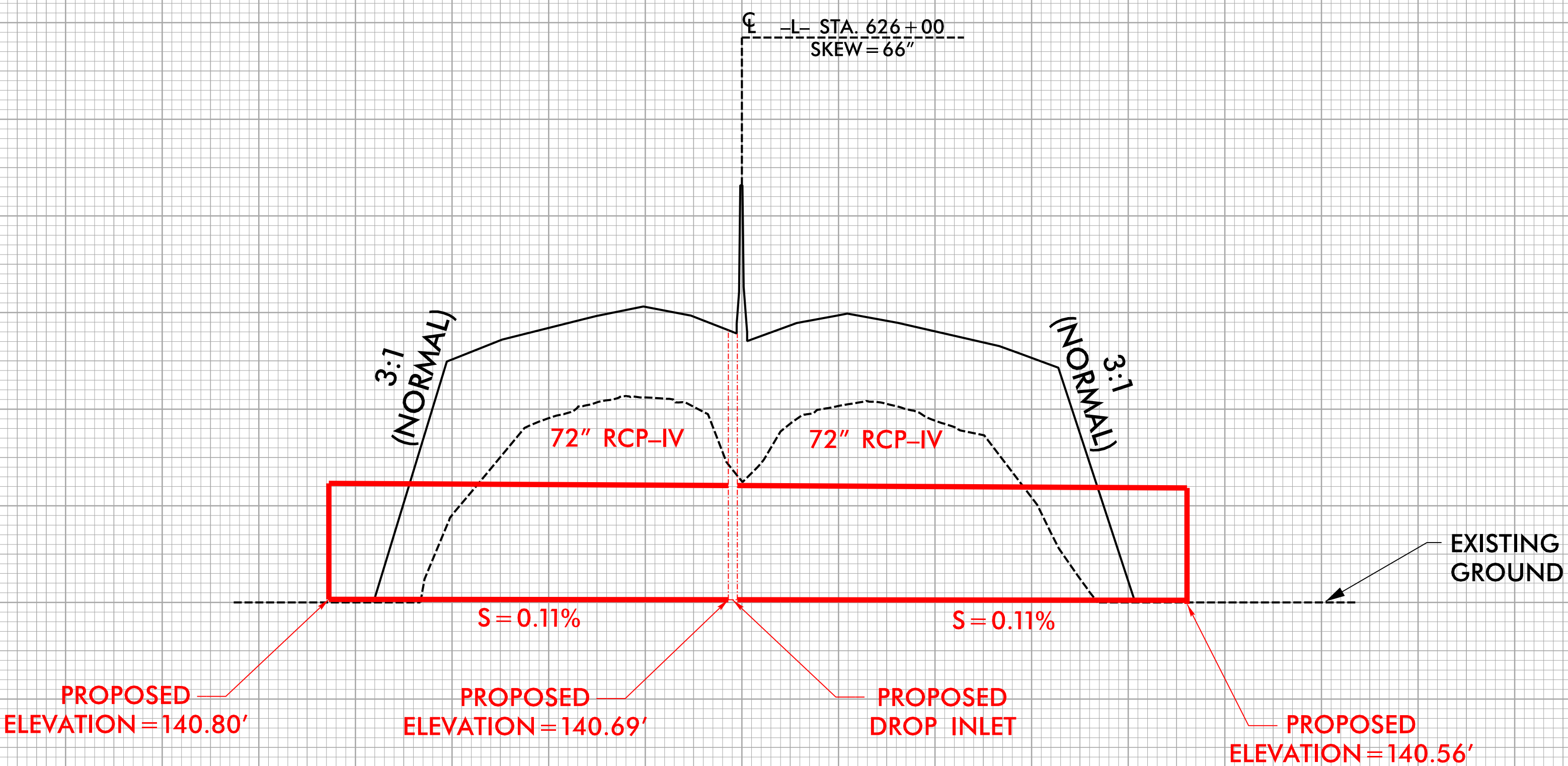
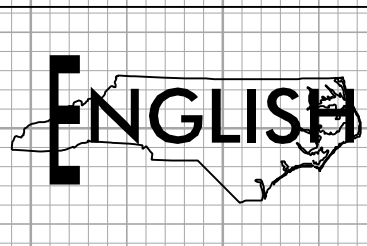
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

PROJECT REFERENCE NO.		SHEET NO.
I-5986A		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

SITE 37
-L- STA. 626+00

PERMIT DRAWING
SHEET 104 OF 163



72" RCP-IV
(buried 1.0 foot)
(total length = 220')



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



8/17/99
31-5986A_hyd_4B_psh51.dgn
5/1/2020
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 31-5986A_hyd_4B_psh51.dgn
RKK

50 25 0 50 100
SCALE

ENGLISH

DENOTES TEMPORARY
FILL IN WETLAND

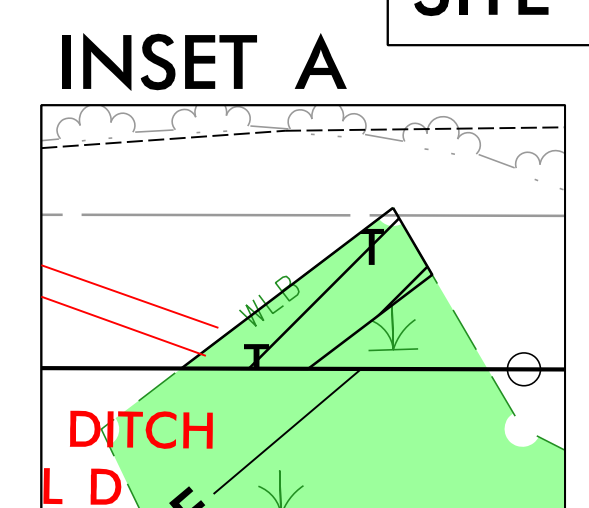
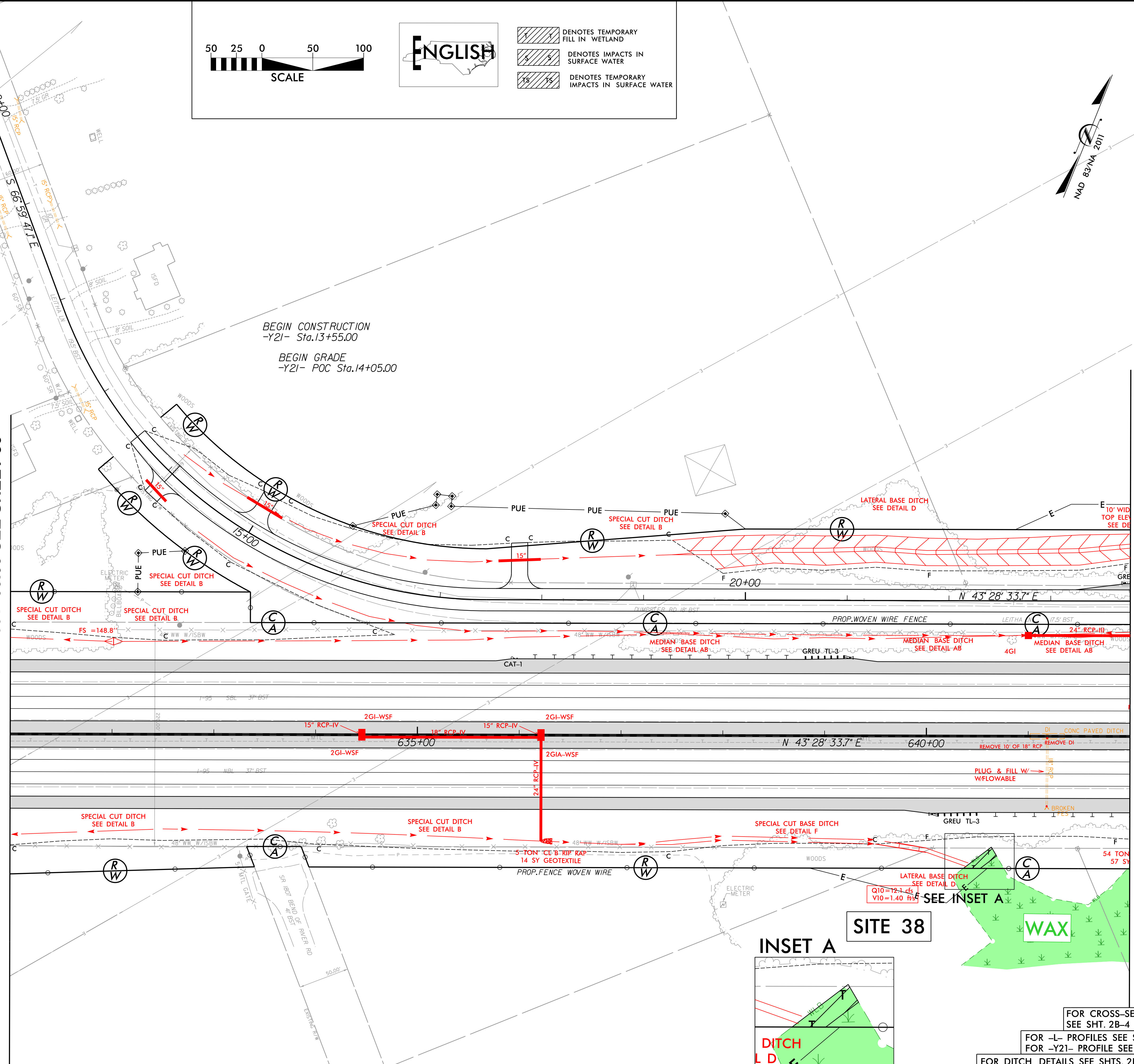
DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. 1-5986A		SHEET NO. 51
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 106 OF 163		

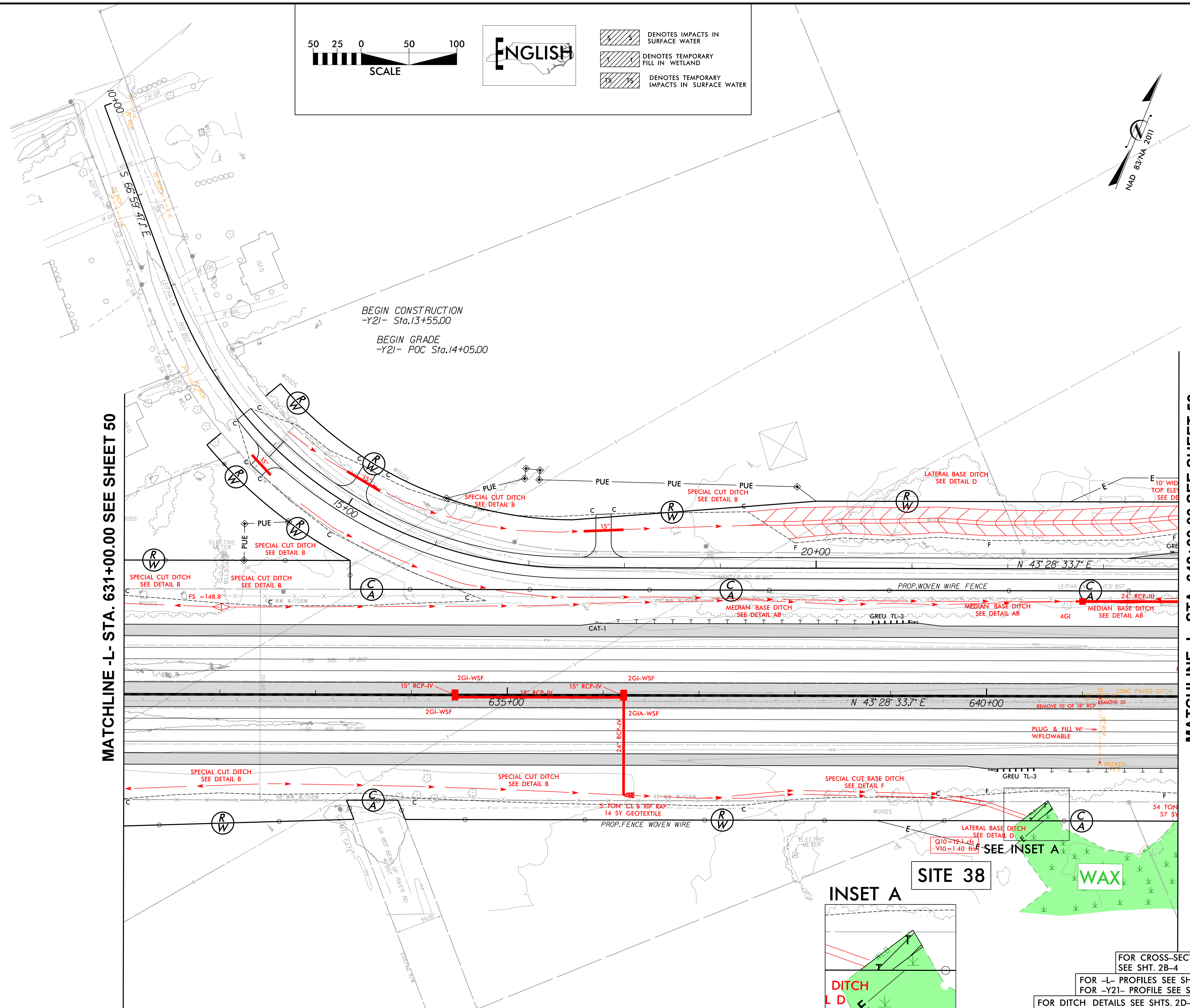
MATCHLINE -L- STA. 631+00.00 SEE SHEET 50

MATCHLINE -L- STA. 642+00.00 SEE SHEET 52



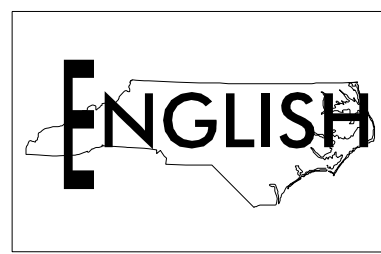
FOR CROSS-SECTION LAYOUT
SEE SHT. 2B-4
FOR -L- PROFILES SEE SHTS. 133 & 134
FOR -Y2I- PROFILE SEE SHT. 195
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

RKK
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions





5/1/2020
B:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 3\I-5986A_hyd_4B_psh52.dgn



PERMIT DRAWING
SHEET 110 OF 163

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



SEE INSET A SJ-2

MATCHLINE -L- STA. 642+00.00 SEE SHEET 51

WAX

INSET B

Plan view of the proposed road alignment. The drawing shows a road layout with stationing from 17+00.00 to 18+00.00. A matchline on the left indicates the connection to sheet Y10. The road alignment is shown with a centerline and edge lines. A circular feature, possibly a manhole or well, is located near station 17+50.00. The drawing also shows existing features such as a creek (Creek) and a road (Road). The alignment is labeled as "PROPOSED" and "EXISTING".

MATCHLINE -L- STA. 655+00.00 SEE SHEET 53

FOR BRIDGE SKETCH SEE SHT. 2A-6	
FOR CROSS-SECTION LAYOUT SEE SHT. 2B-5	
	PAVEMENT REMOVAL
FOR -L- PROFILES SEE SHTS. 134 & 135 FOR -Y10- PROFILE SEE SHT. 193 FOR -Y21- PROFILE SEE SHT. 195	
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6	

ALL EXISTING ROW FENCE TO BE
REMOVED UNLESS OTHERWISE LABELED.

ALL DRIVEWAY RADII 15' UNLESS OTHERWISE LABELED.

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

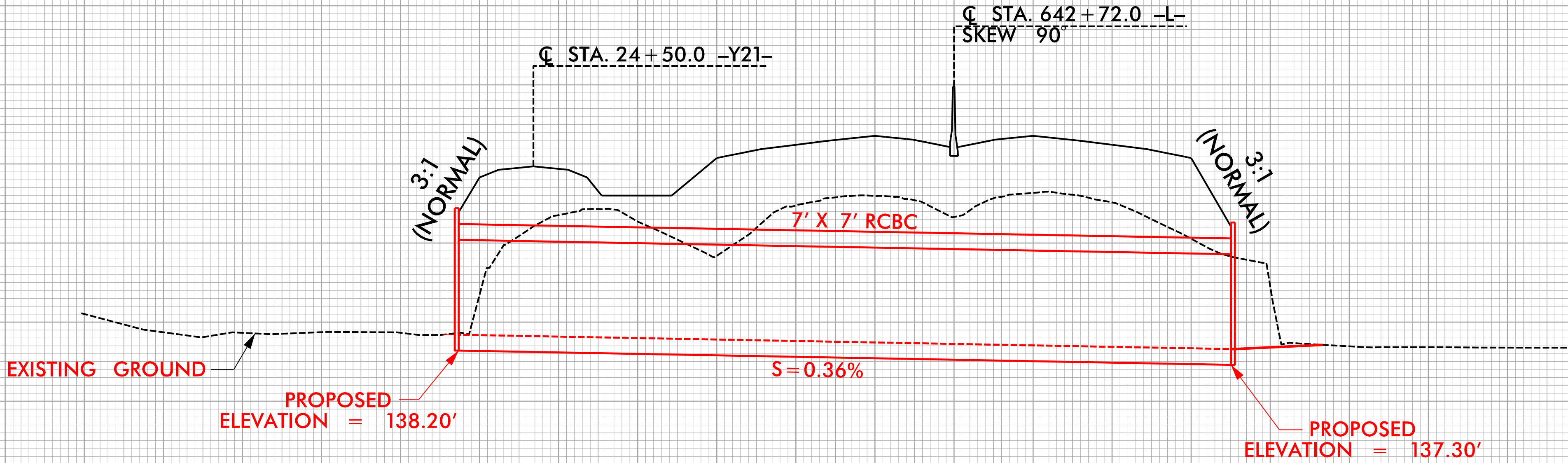
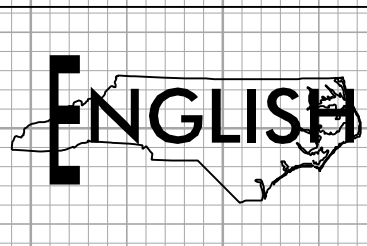
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

PROJECT REFERENCE NO.	SHEET NO.
I-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 39
-L- STA. 642 + 72

PERMIT DRAWING
SHEET 111 OF 163



7' X 7' RCBC
(buried 1.0')
(length = 244')

8/17/99
3/1/2020
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf53.dgn
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf53.dgn

25

0

25

50

SCALE FOR INSET

50

25

0

50

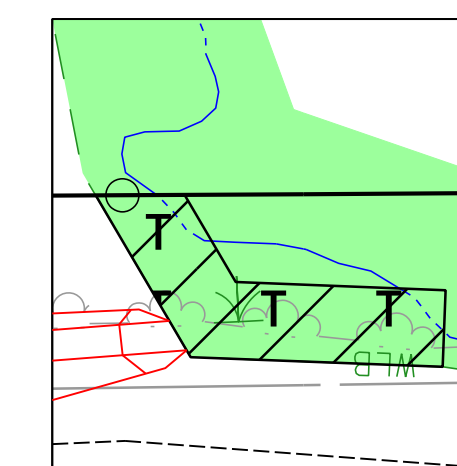
100

SCALE

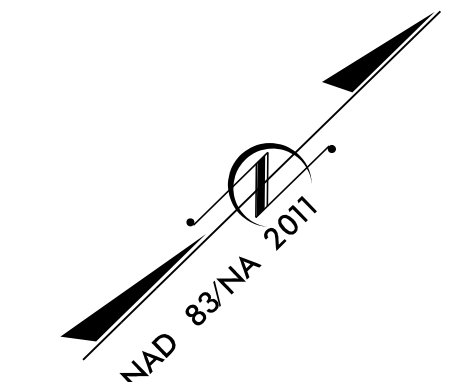
ENGLISH

DENOTES TEMPORARY
FILL IN WETLAND

DENOTES FILL IN
WETLAND

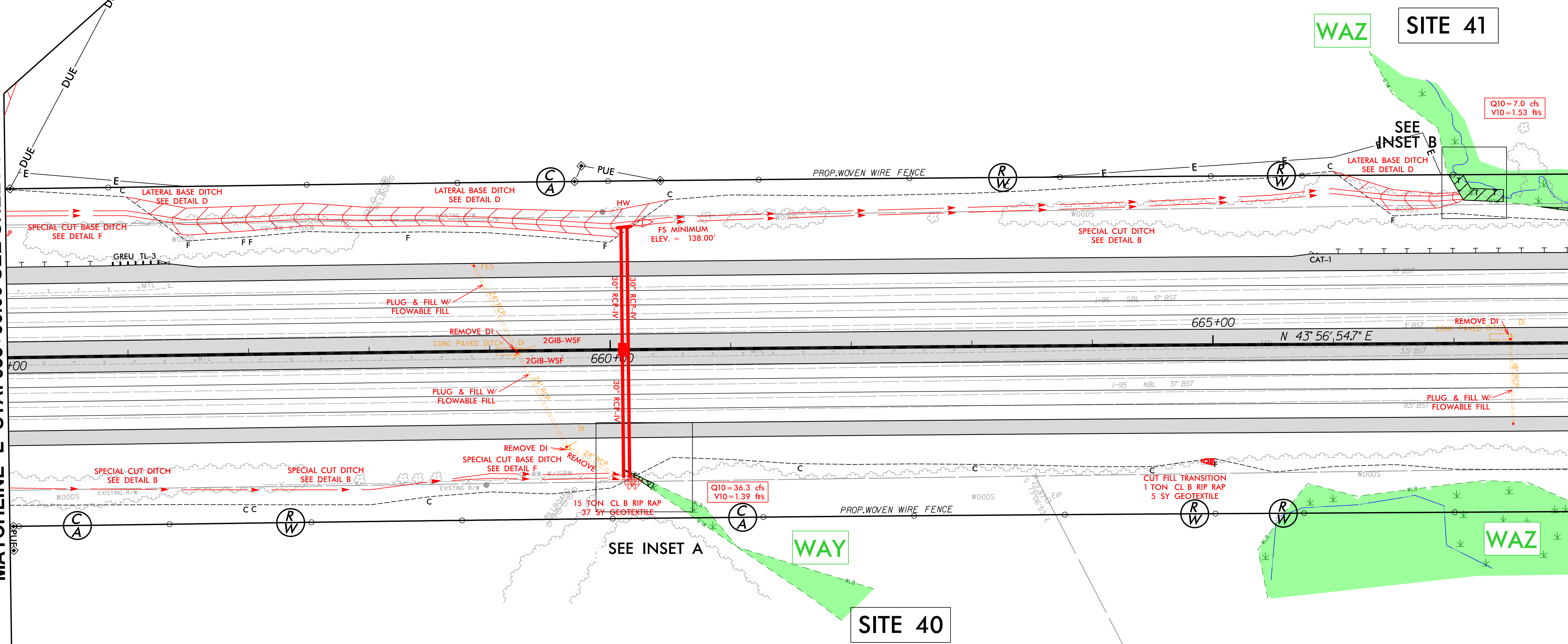


INSET B

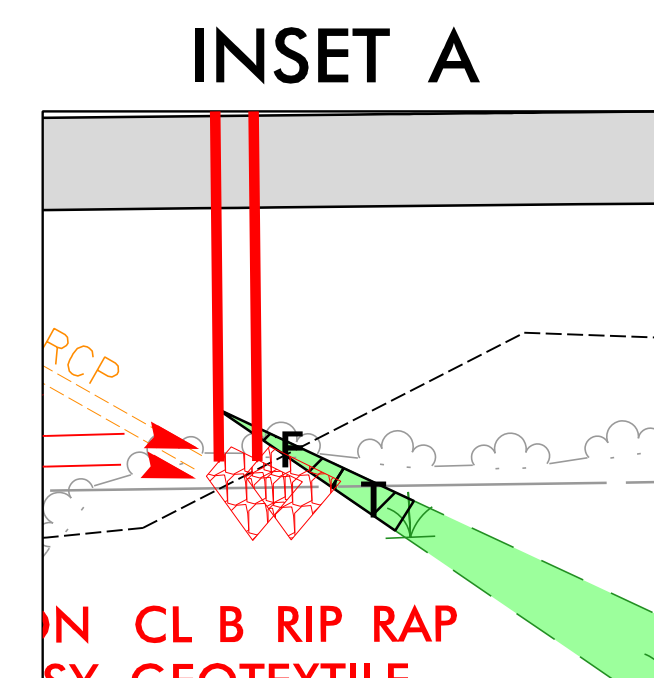


PROJECT REFERENCE NO. 1-5986A		SHEET NO. 53	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 112 OF 163			

MATCHLINE -L- STA. 655+00.00 SEE SHEET 52



MATCHLINE -L- STA. 668+00.00 SEE SHEET 54



INSET A



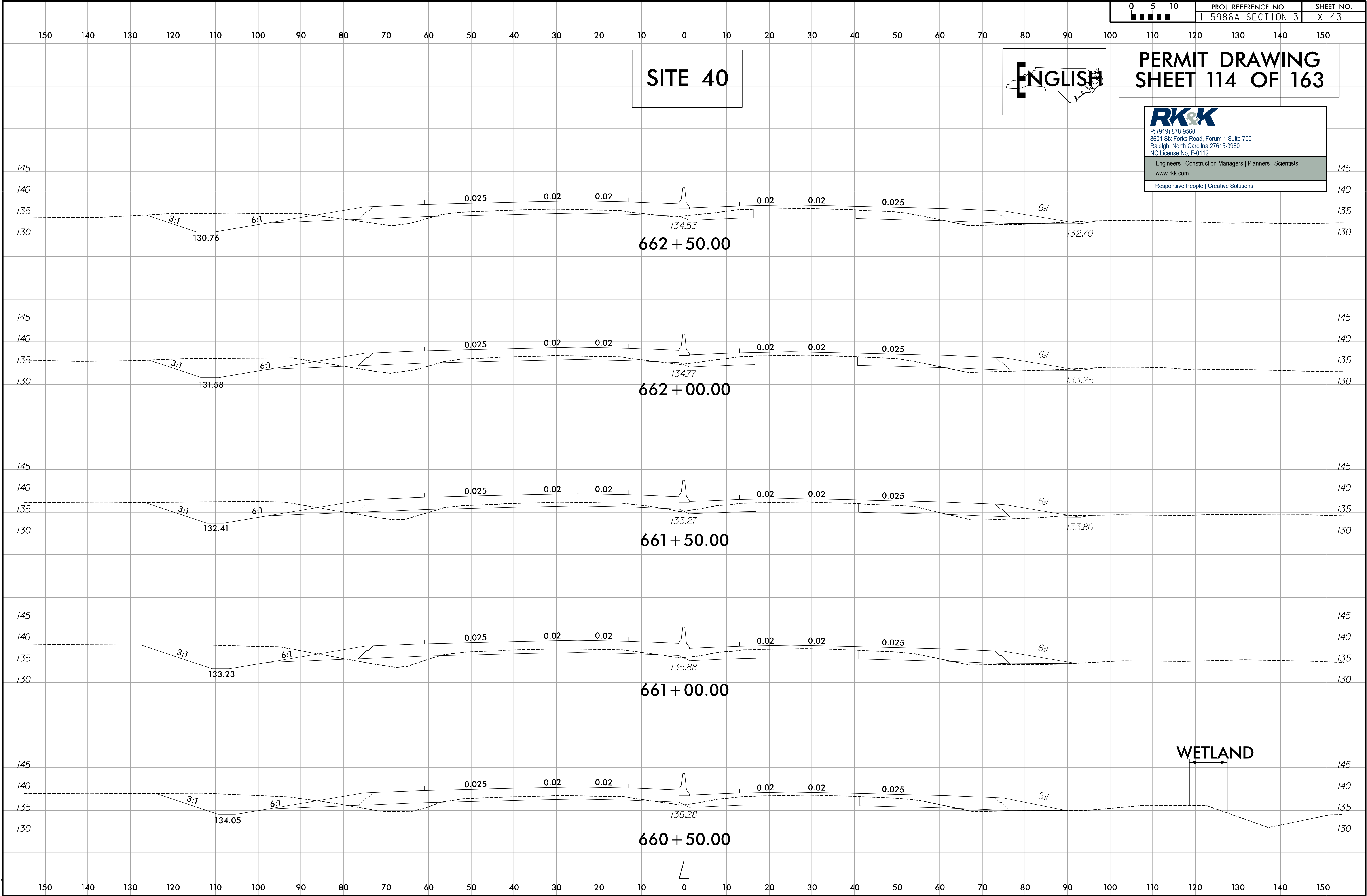
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

ALL EXISTING ROW FENCE TO BE
REMOVED UNLESS OTHERWISE LABELED.
ALL DRIVEWAY RADII 15' UNLESS OTHERWISE LABELED.

FOR -L- PROFILES SEE SHTS. 135 & 136
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

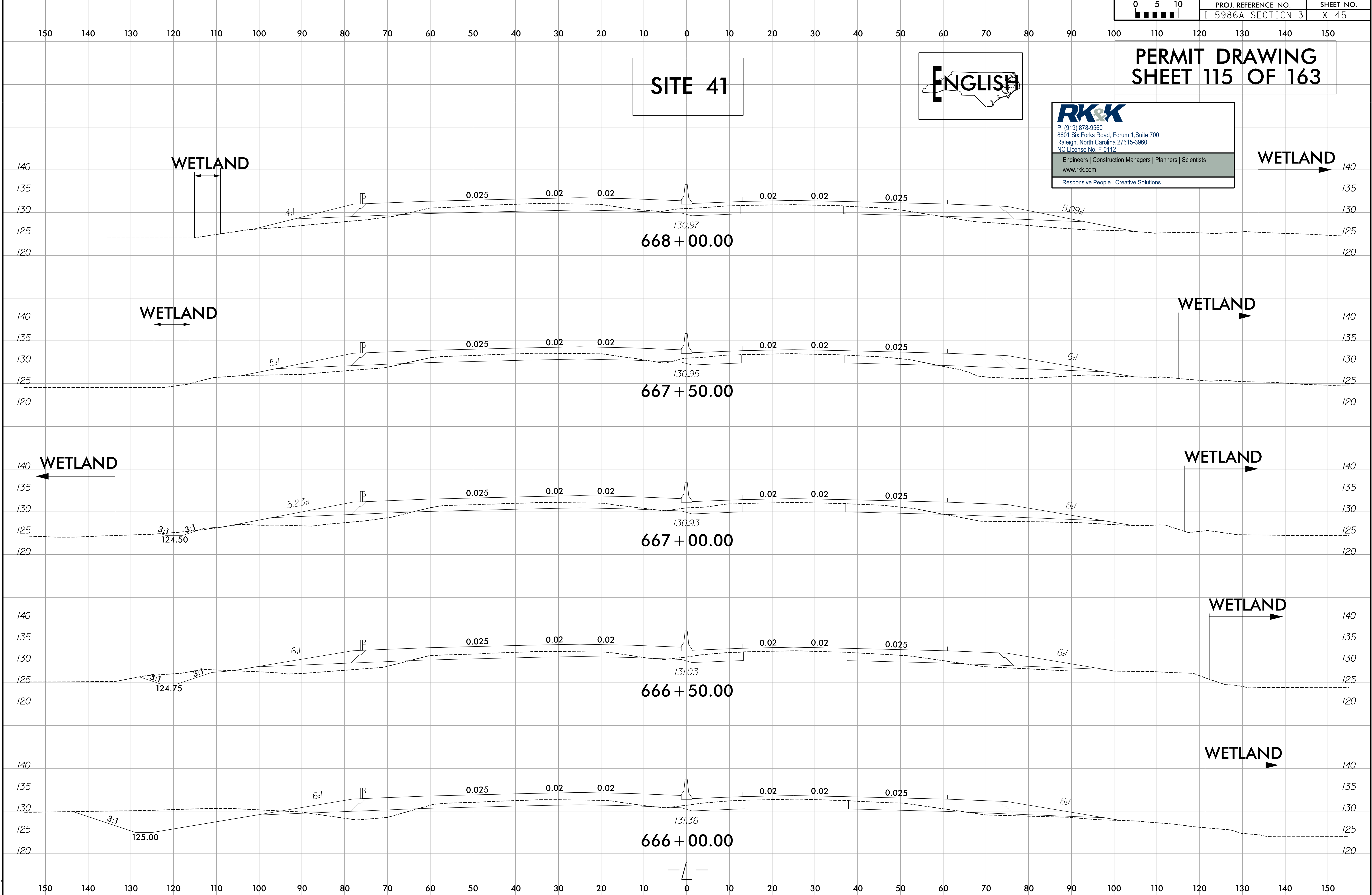
6/23/16

5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL\I-5986A_SITE40.dgn
kells



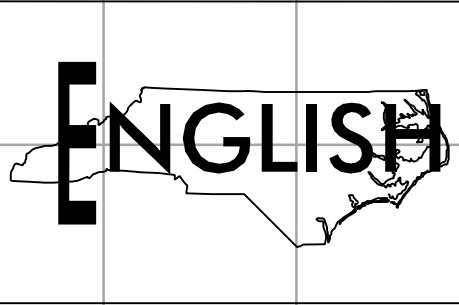
6/23/16

5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4\I-5986A_hyd-prm_wet.XPL\I-5986A_hyd-prm_wet.XPL SITE 41.dgn
kelle



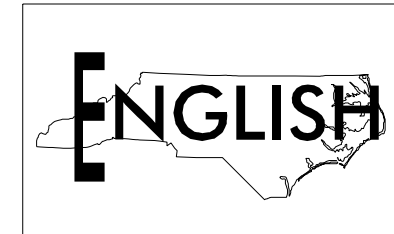
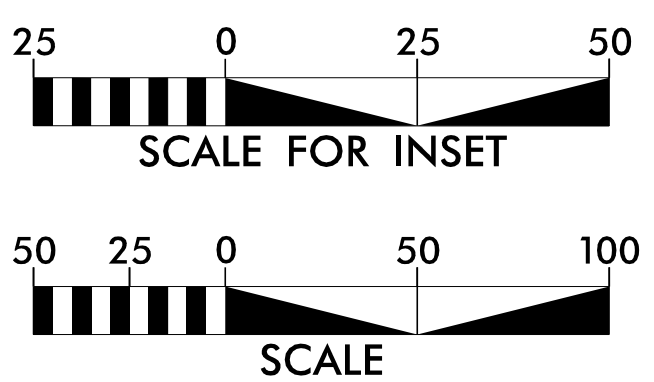
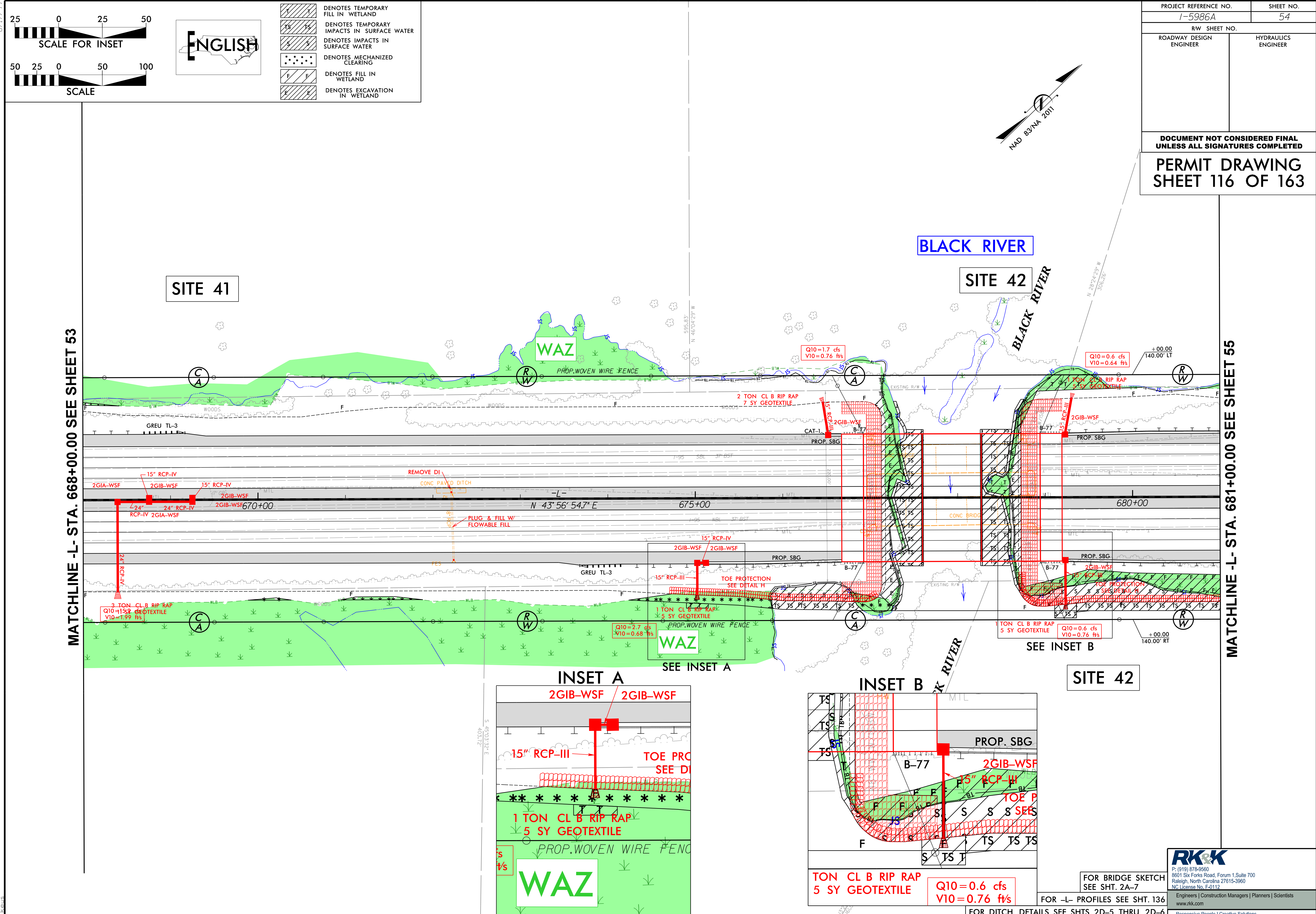
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A SECTION 3	X-45

PERMIT DRAWING SHEET 115 OF 163



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
www.rkk.com
Engineers | Construction Managers | Planners | Scientists
Responsive People | Creative Solutions

8/17/99
31-5986A_hyd_4B_psf54.dgn
5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 31-5986A_hyd_4B_psf54.dgn

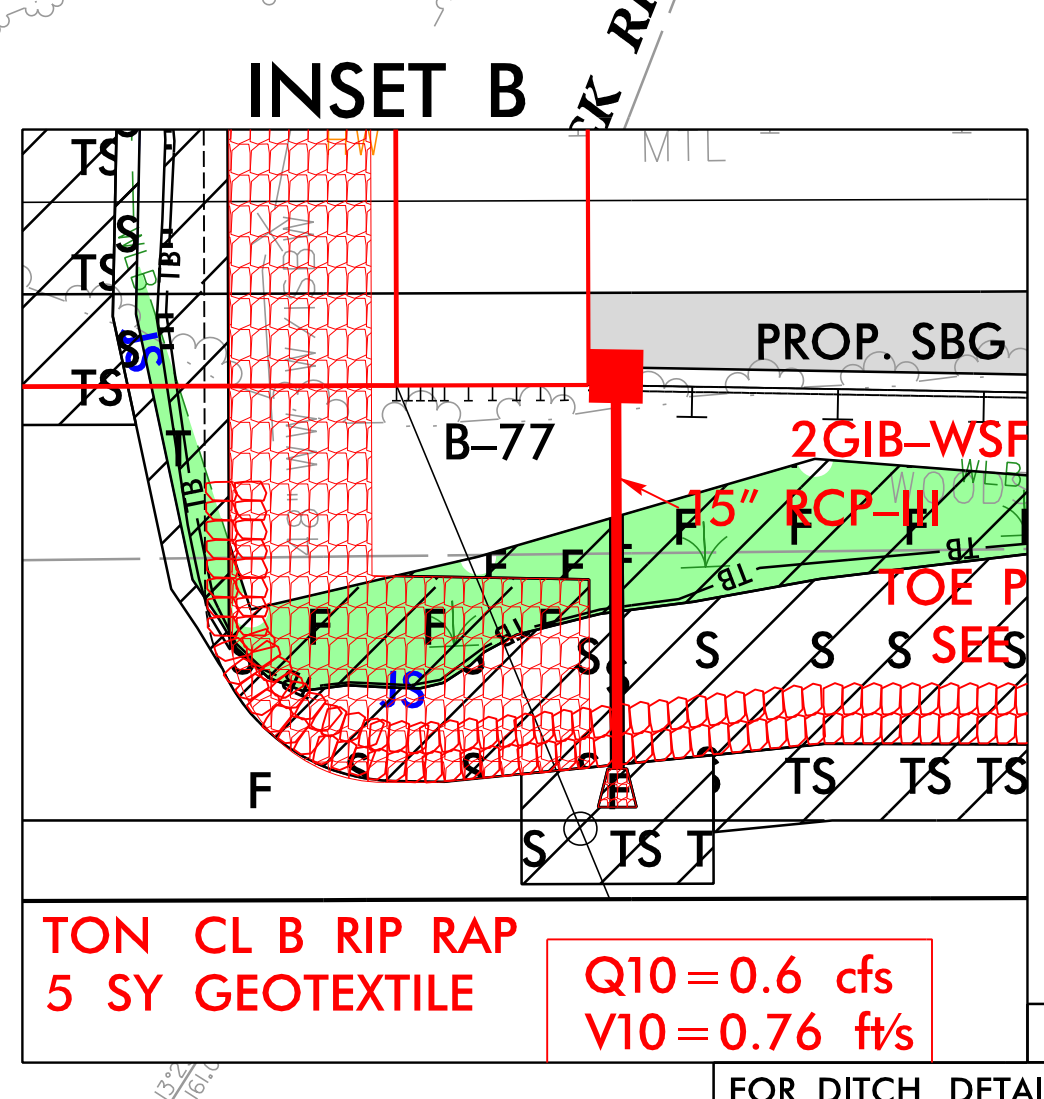
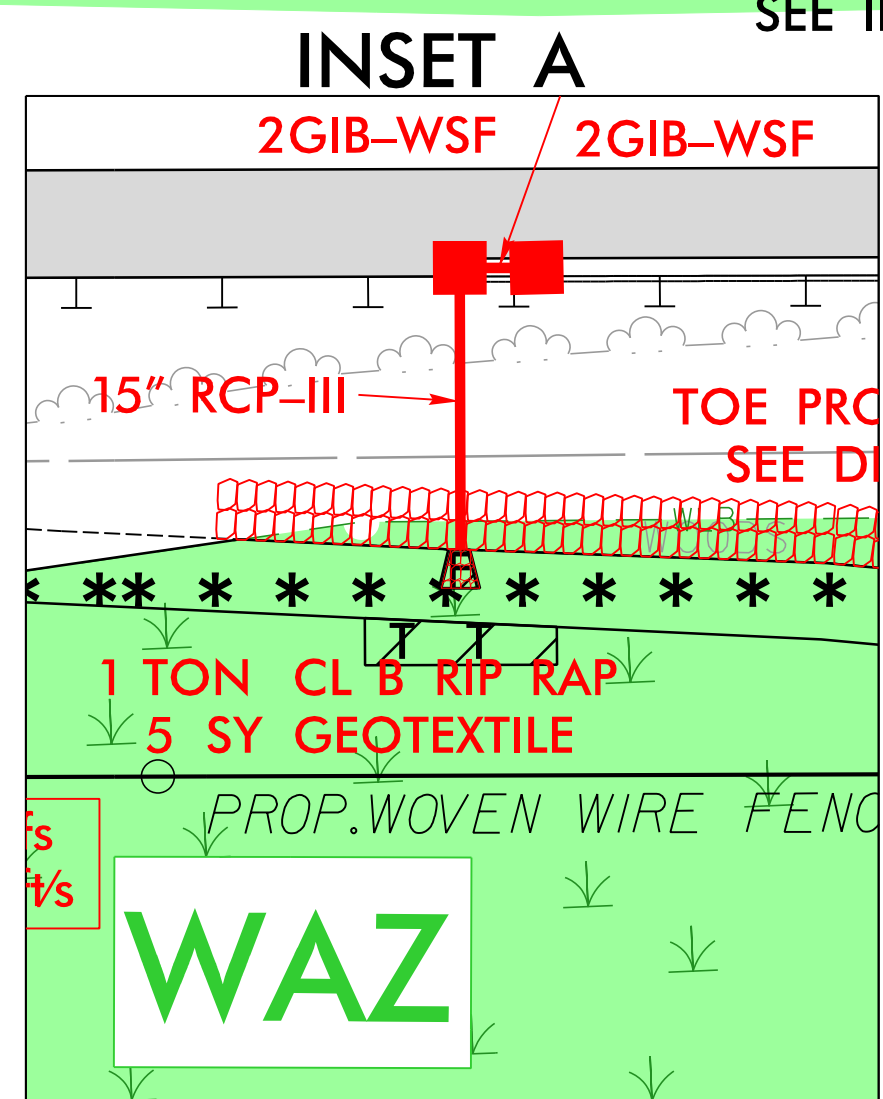


- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
1-5986A	54
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 116 OF 163	

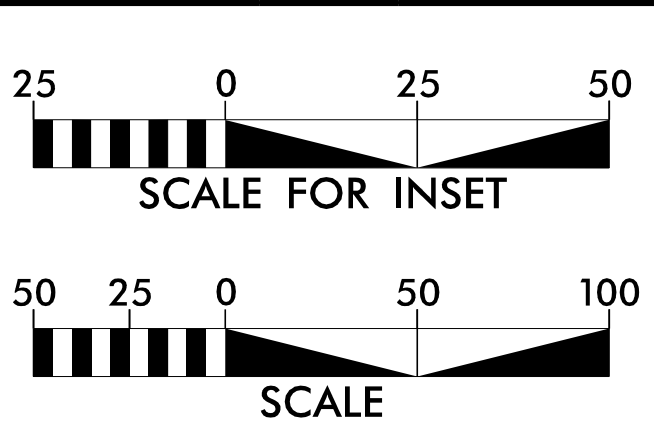
MATCHLINE -L- STA. 668+00.00 SEE SHEET 53

MATCHLINE -L- STA. 681+00.00 SEE SHEET 55



RK&K
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
3/1/2020
C:\Users\Hydraulics\PERMITS\Drawings\4B\Section 3\1-5986A_hyd_4B_psf54_CON.dgn
RKK



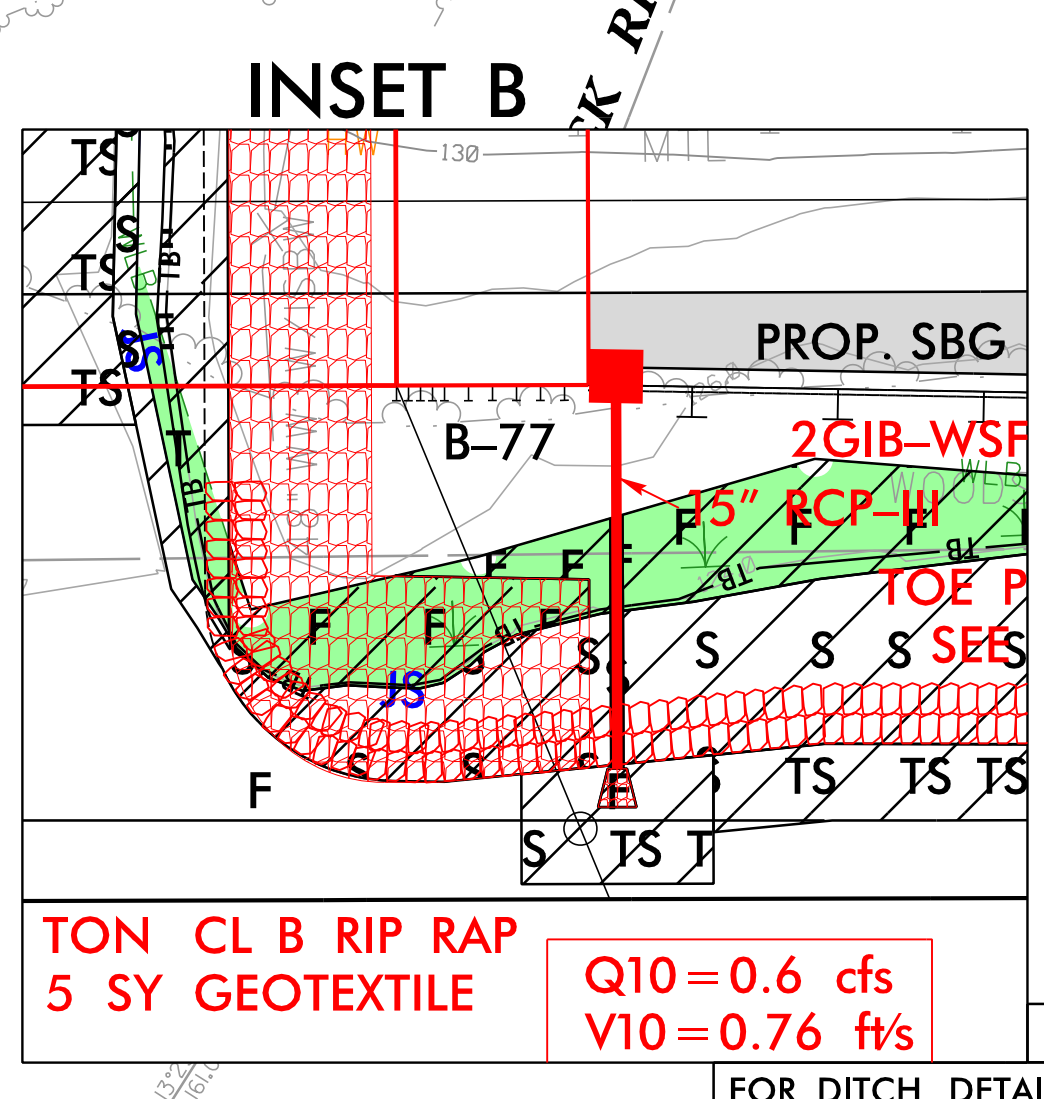
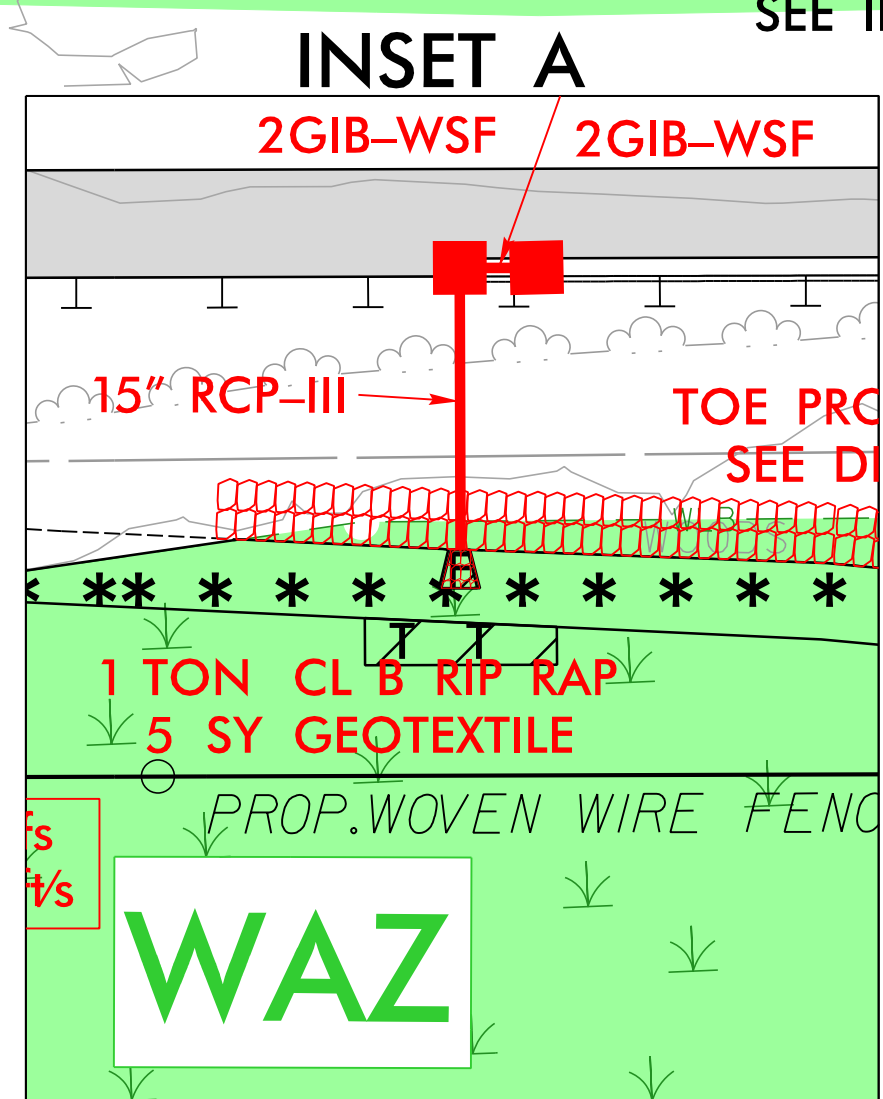
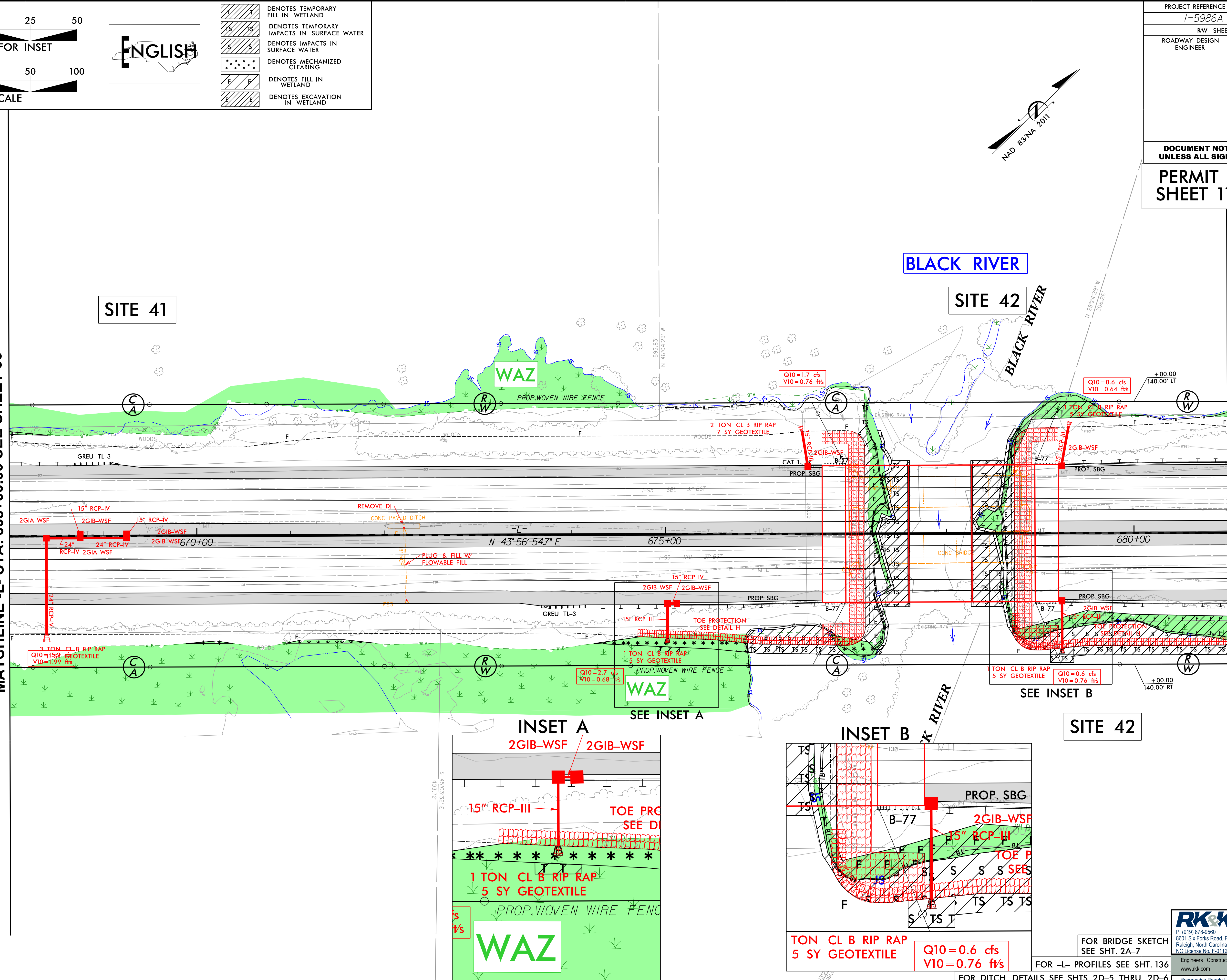
ENGLISH

	DENOTES TEMPORARY FILL IN WETLAND
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES MECHANIZED CLEARING
	DENOTES FILL IN WETLAND
	DENOTES EXCAVATION IN WETLAND

PROJECT REFERENCE NO. 1-5986A		SHEET NO. 54
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 117 OF 163		

MATCHLINE -L- STA. 668+00.00 SEE SHEET 53

MATCHLINE -L- STA. 681+00.00 SEE SHEET 55



P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

FOR BRIDGE SKETCH
SEE SHT. 2A-7

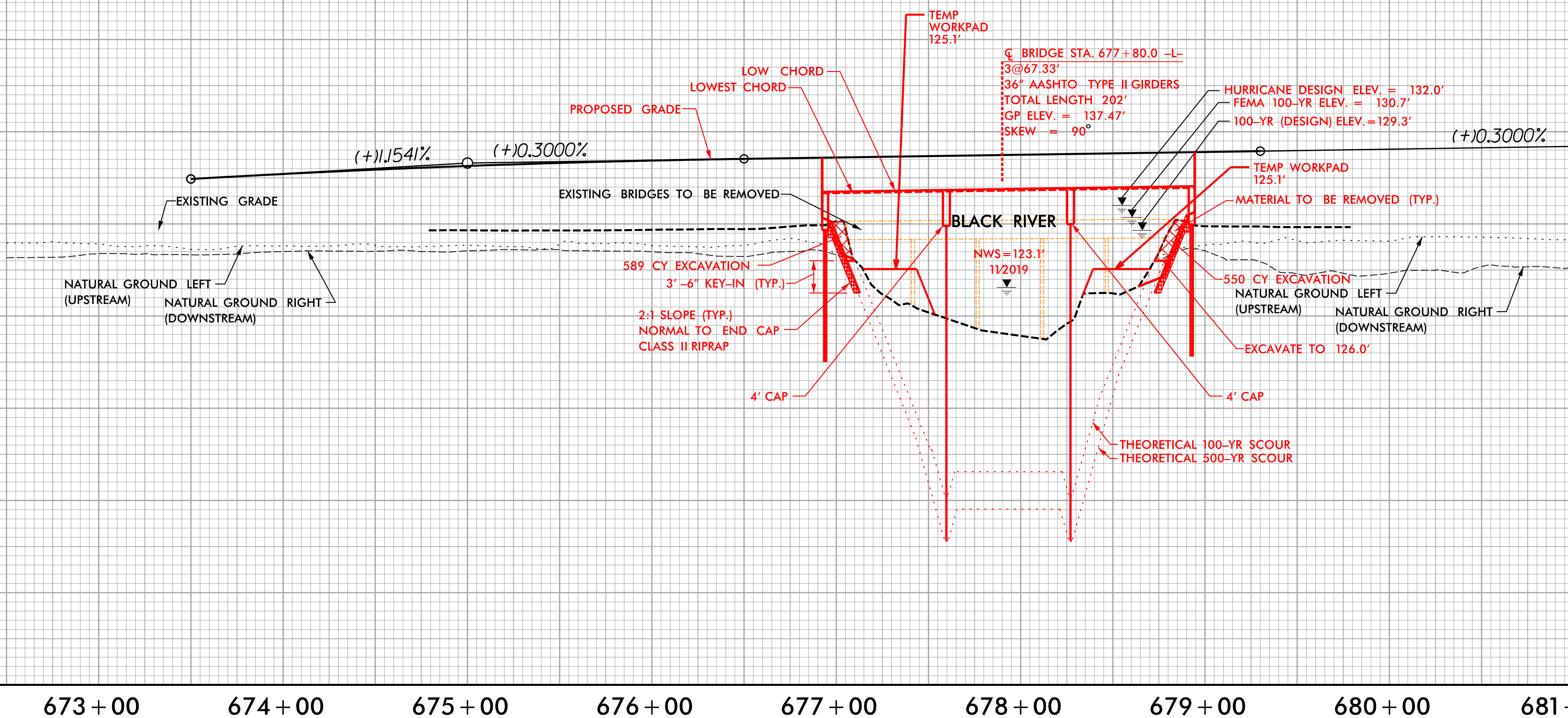
FOR -L- PROFILES SEE SHT. 136

FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

5/28/99

5/1/2020
R:\Projects\PERMITS\Environmental\Drawings\4C1-5986A-hyd.prm.wet_PFL_SITE42.dgn
Elev

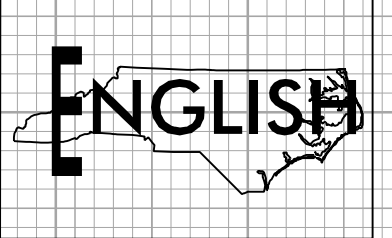
SITE 42
-L- STA. 677+80 LT



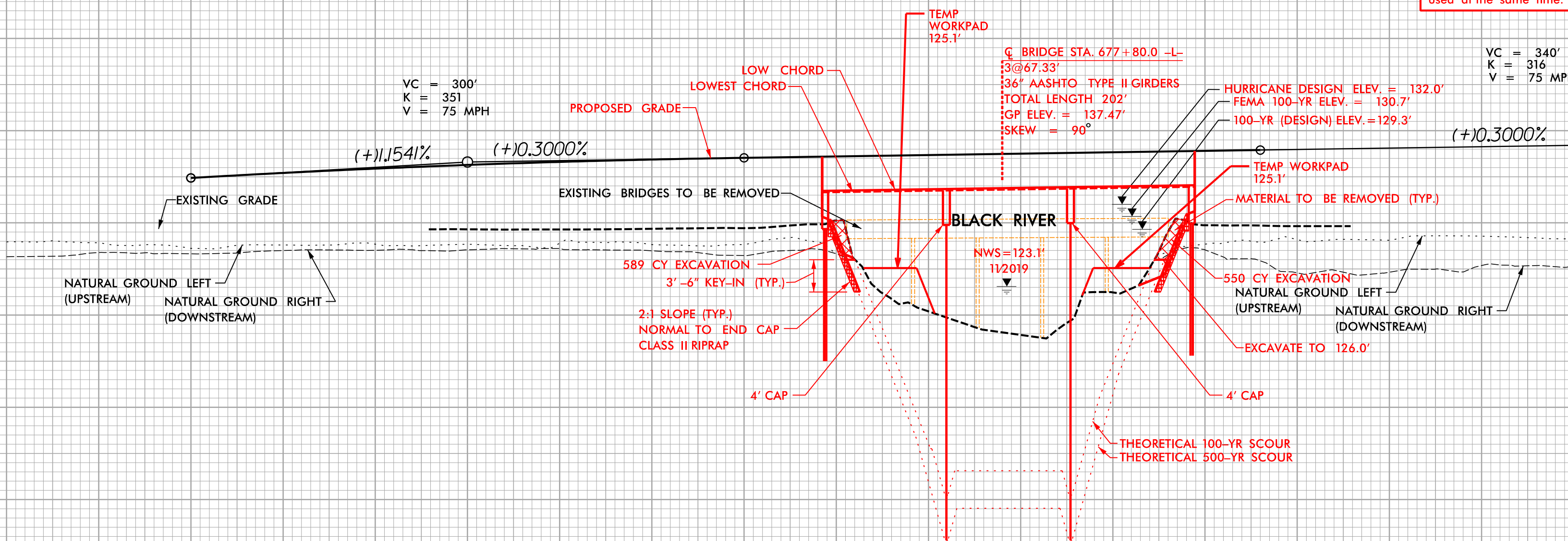
Temporary workpad installation to be determined during bridge construction. Both workpads will not be installed or used at the same time.

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

PERMIT DRAWING
SHEET 118 OF 163



SITE 42
-L- STA. 677+80 RT



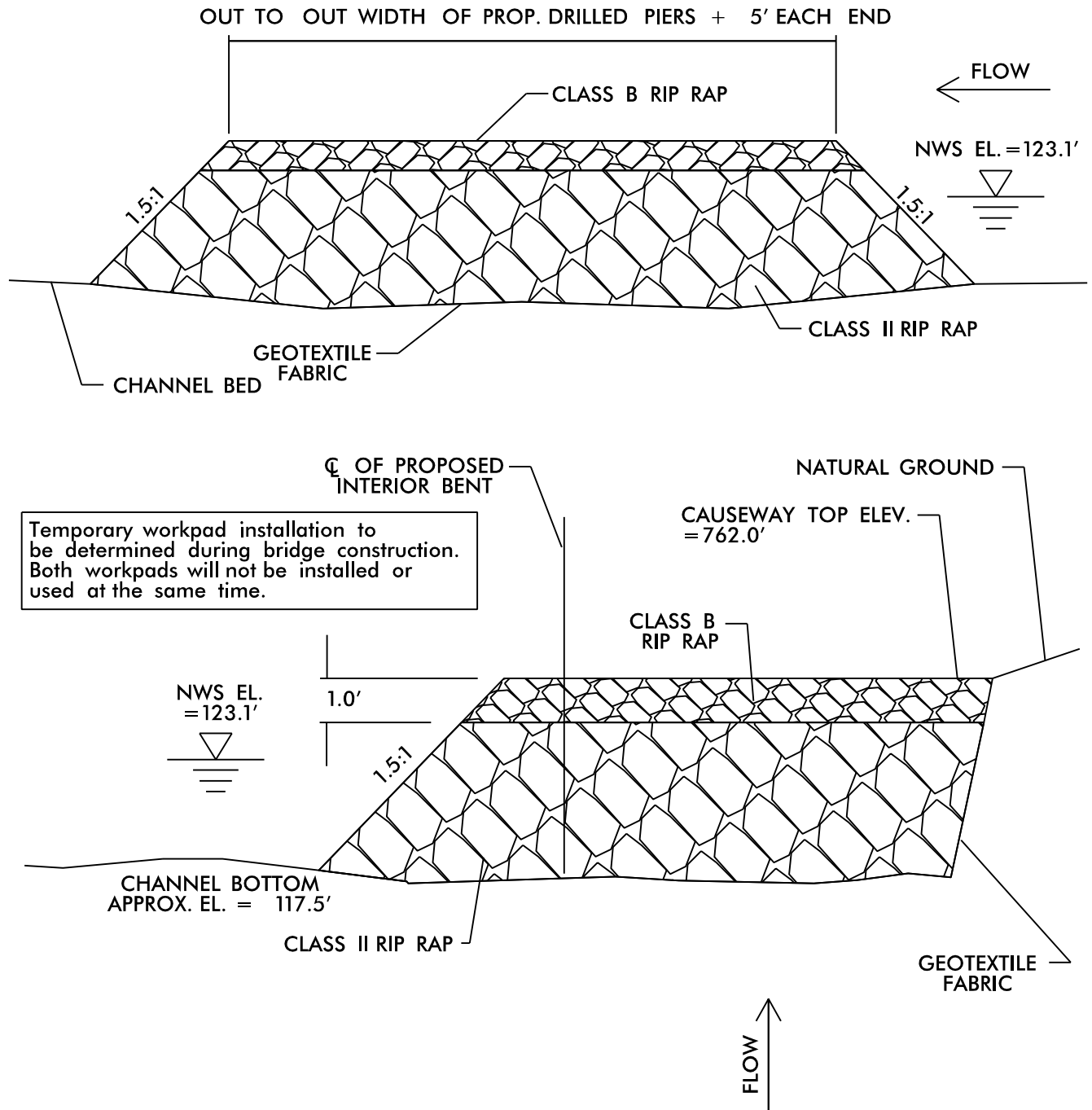
Temporary workpad installation to be determined during bridge construction. Both workpads will not be installed or used at the same time.

VC = 340'
K = 316
V = 75 MPH

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

TEMPORARY WORK PAD DETAIL

NOT TO SCALE



STREAM CROSS SECTION TAKEN ALONG UPSTREAM TOE OF CAUSEWAY (MOST RESTRICTIVE LOCATION)

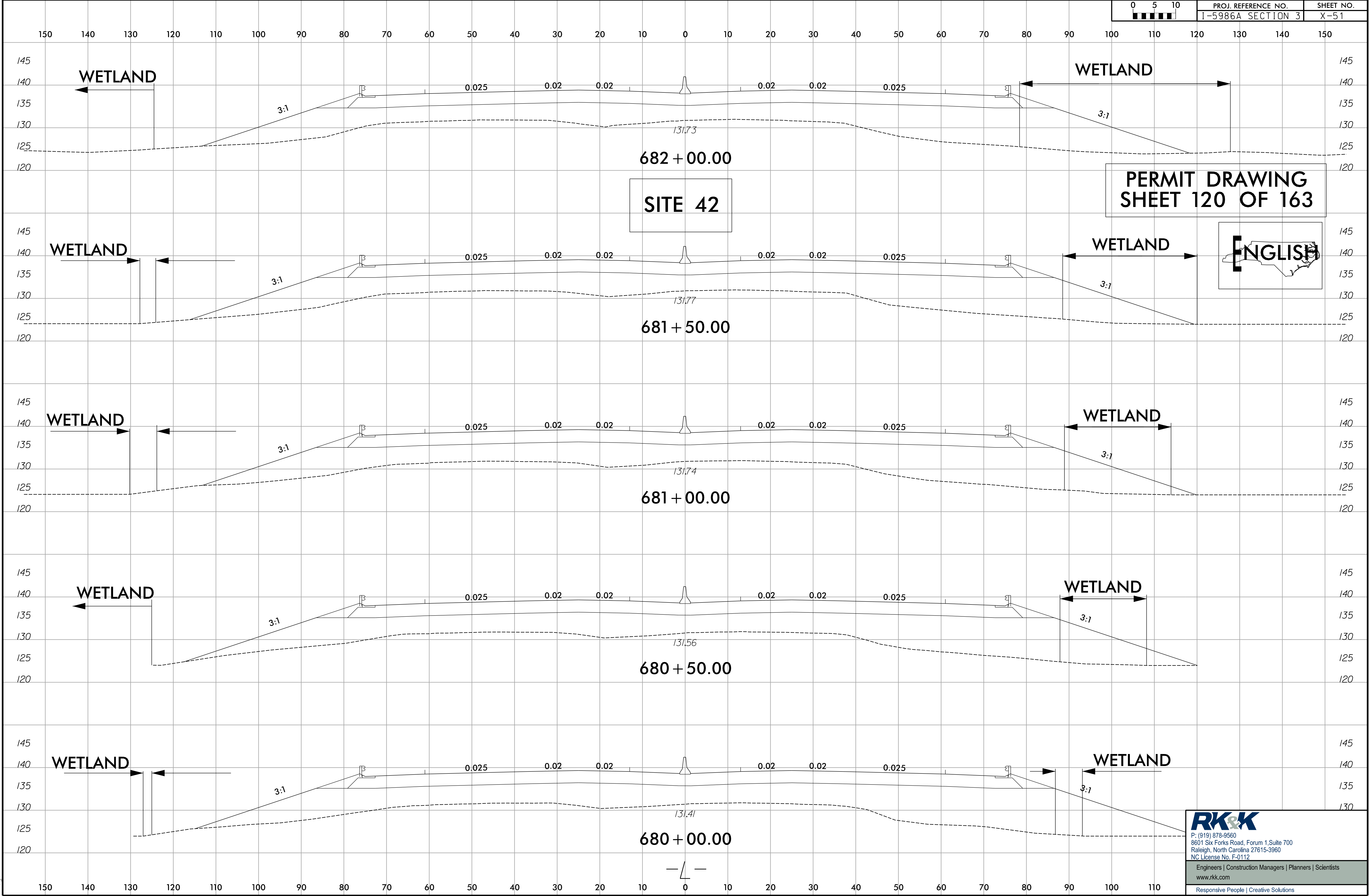
1. CHANNEL FLOW AREA BELOW NWS = 111.5 SF
2. PERCENT OF NWS FLOW AREA REMAINING WHILE CAUSEWAY IS IN PLACE = 54%

NCDOT

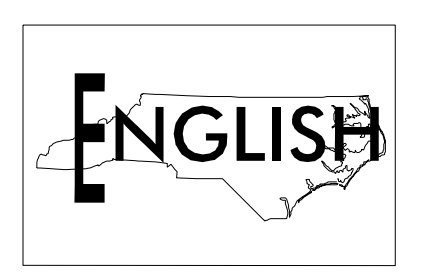
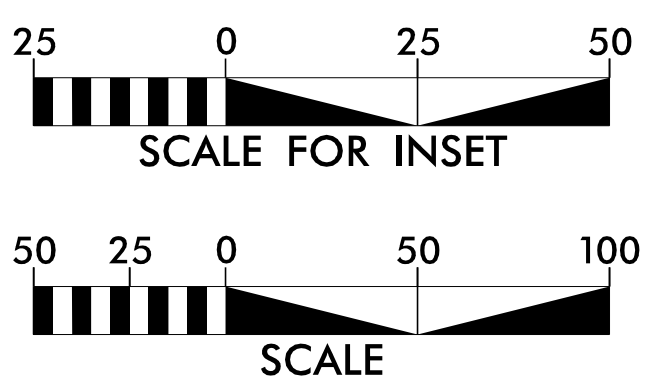
DIVISION OF HIGHWAYS
CUMBERLAND COUNTY

PROJECT: I-5986A / I-5877

BRIDGE NO. XX OVER
BLACK RIVER
ON I-95



8/17/99
3/1/2020
E:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf55_CON.dgn
RKK



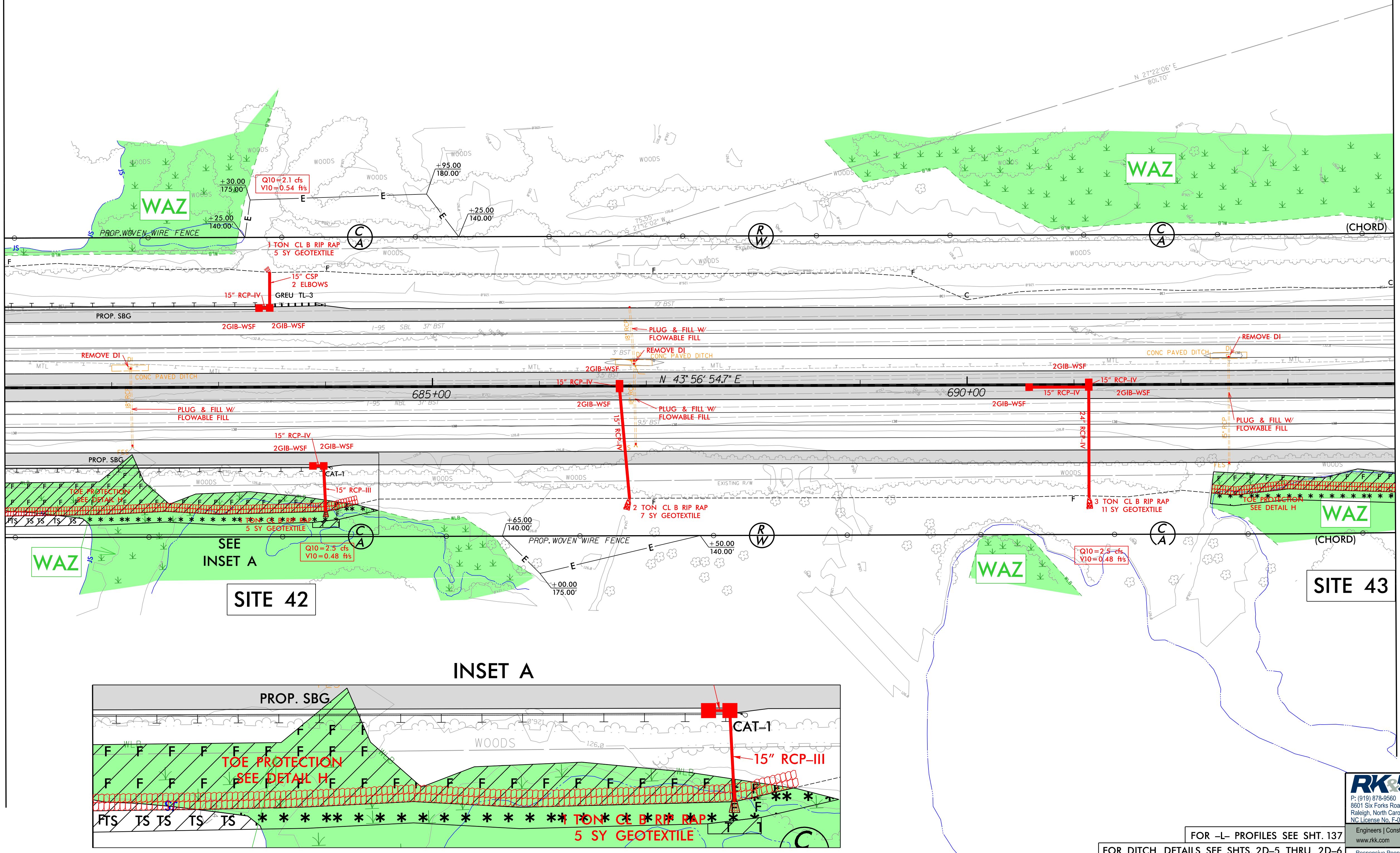
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND



PROJECT REFERENCE NO. 1-5986A		SHEET NO. 55	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 122 OF 163			

MATCHLINE -L- STA. 681+00.00 SEE SHEET 54

MATCHLINE -L- STA. 694+00.00 SEE SHEET 56



SITE 42

SITE 43

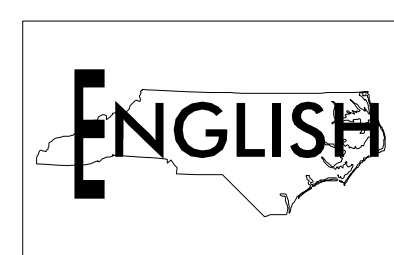
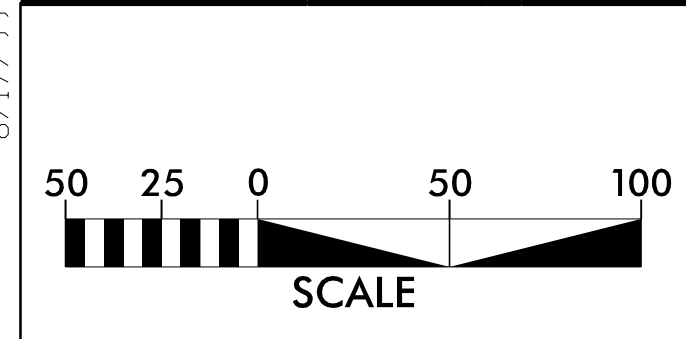
INSET A

FOR -L- PROFILES SEE SHT. 137
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
31-5986A_hyd_4B_psf56_CON.dgn
E:\2020
Hydraulics PERMITS_Environmental\Drawings\4B\Section 31-5986A_hyd_4B_psf56_CON.dgn
E:\2020
Hydraulics PERMITS_Environmental\Drawings\4B\Section 31-5986A_hyd_4B_psf56_CON.dgn



- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO. 1-5986A		SHEET NO. 56
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 124 OF 163		

FOR -L- PROFILES SEE SHTS. 137 & 138
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16

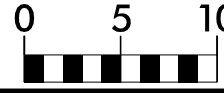
5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\1-5986A_hyd-prm_wet_xpl\L-SITE43&44.dgn
kejs



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

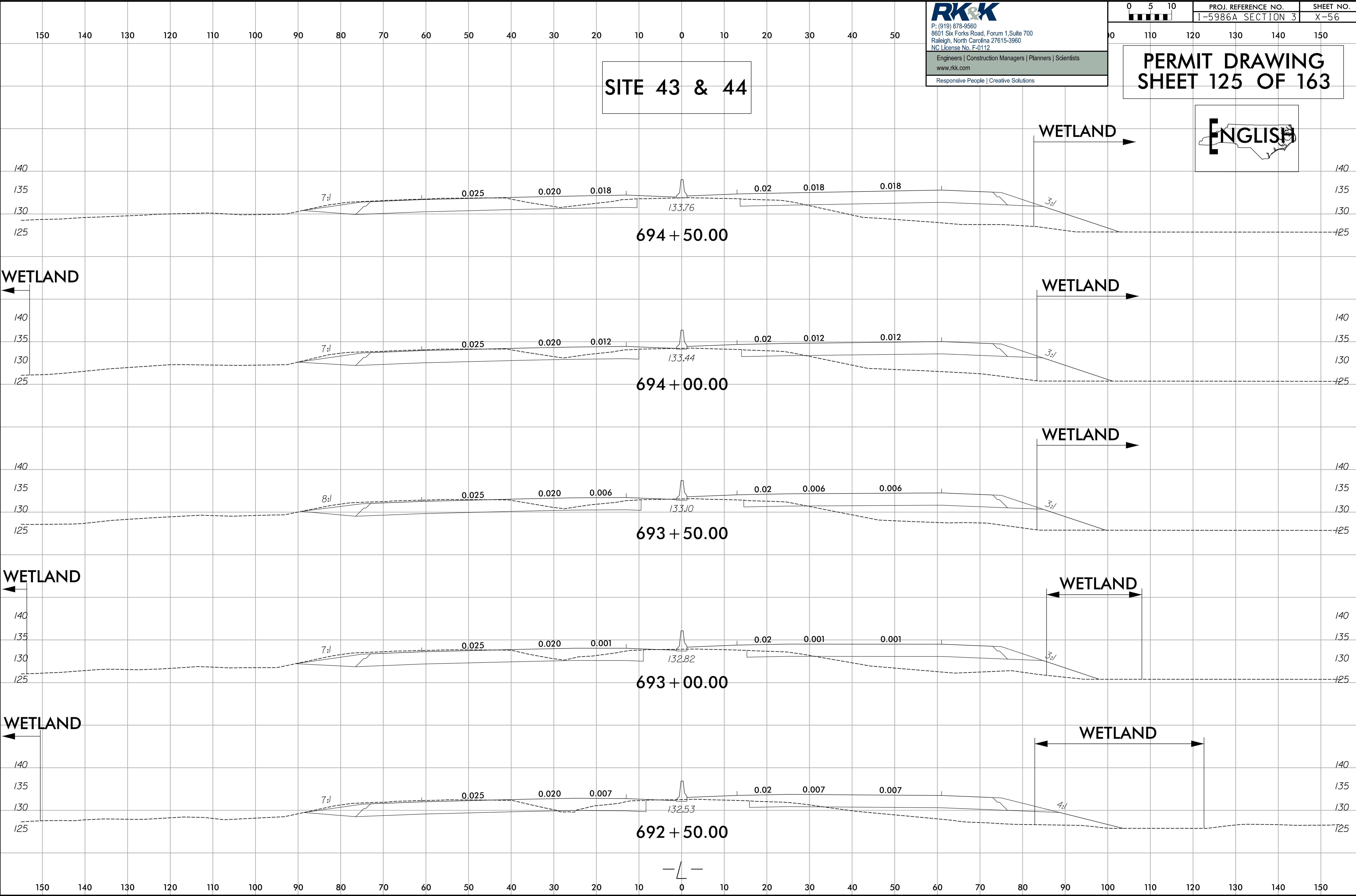


PROJ. REFERENCE NO.	SHEET NO.
1-5986A SECTION 3	X-56

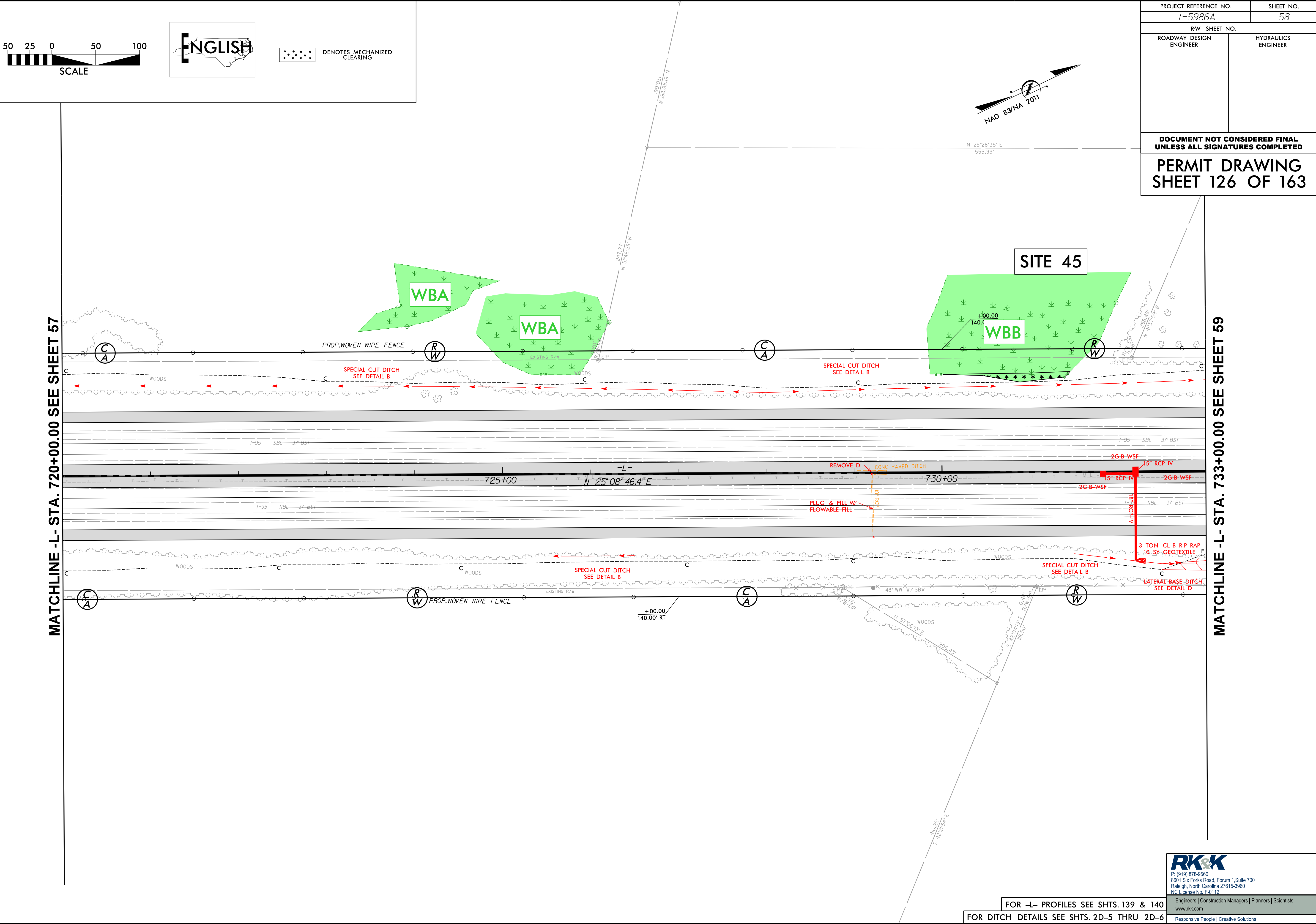
PERMIT DRAWING SHEET 125 OF 163



SITE 43 & 44



8/17/99
5/1/2020
C:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B.psf58.dgn
RKK



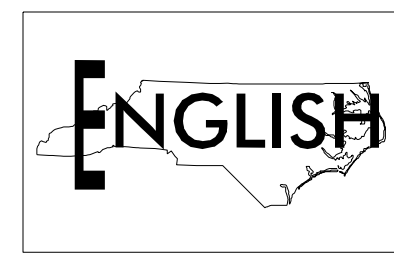
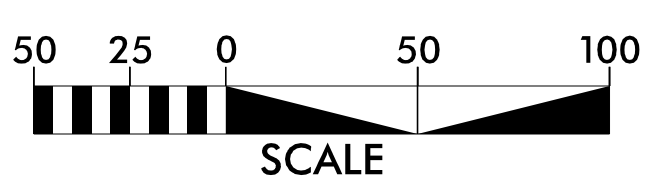
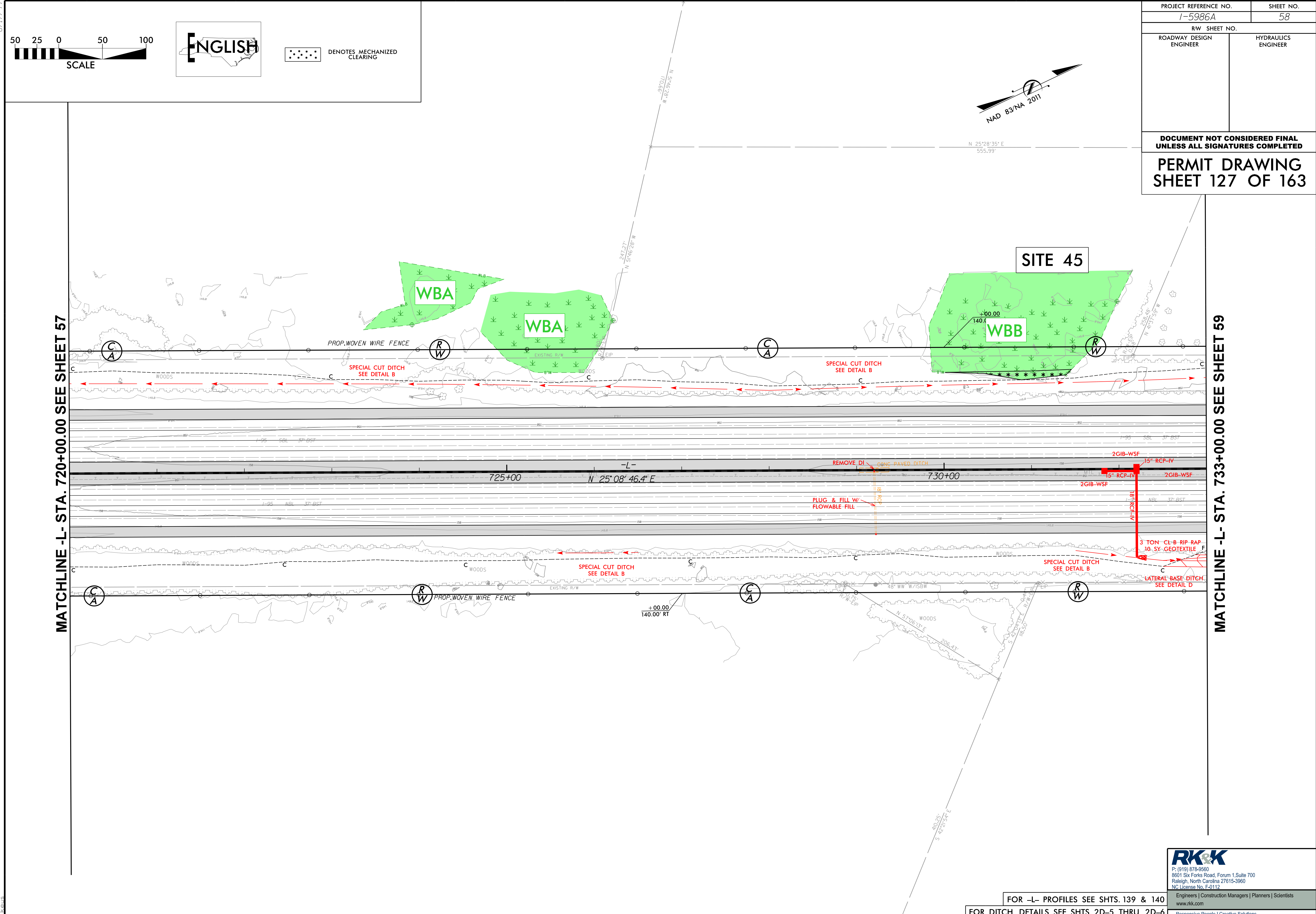
PROJECT REFERENCE NO.		SHEET NO.
1-5986A		58
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 126 OF 163		

FOR -L- PROFILES SEE SHTS. 139 & 140
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

RKK
P: (919) 978-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
3/1/2020
3:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B.psf58_CON.dgn
RKK



DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO.		SHEET NO.
1-5986A		58
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 127 OF 163		

FOR -L- PROFILES SEE SHTS. 139 & 140
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

P: (919) 978-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

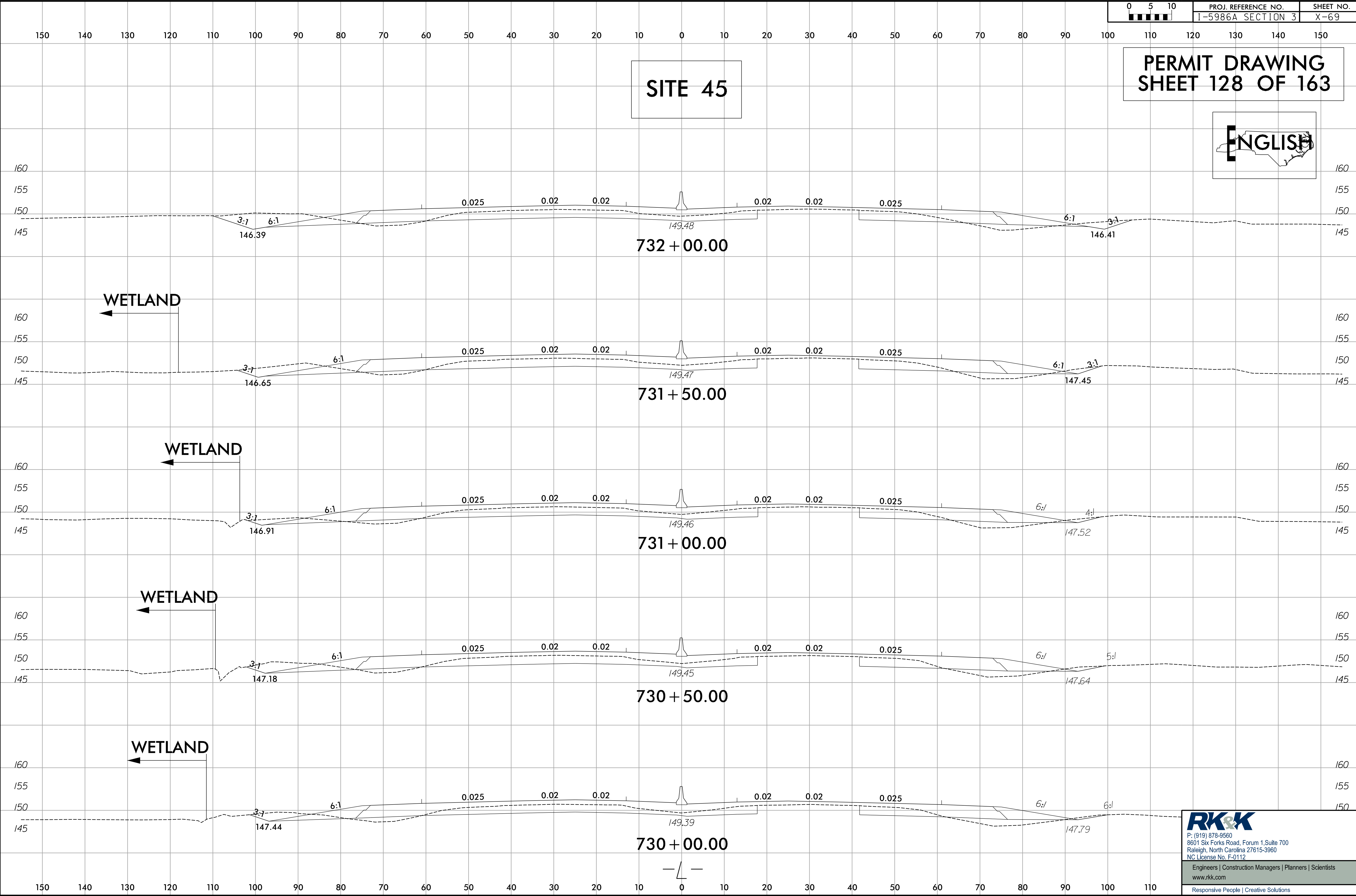
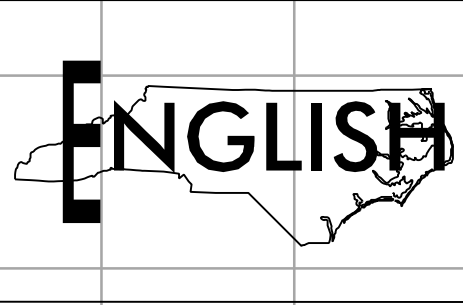
6/23/16

5/1/2020
P:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet.XPL\I-5986A_hyd-prm_wet.XPL SITE45.dgn
kaj

0 5 10 [Scale Bar]	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A SECTION 3	X-69

SITE 45

PERMIT DRAWING
SHEET 128 OF 163

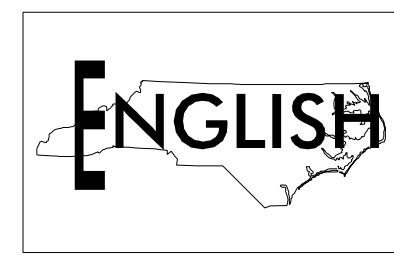
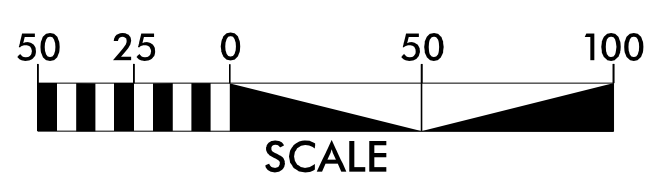


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

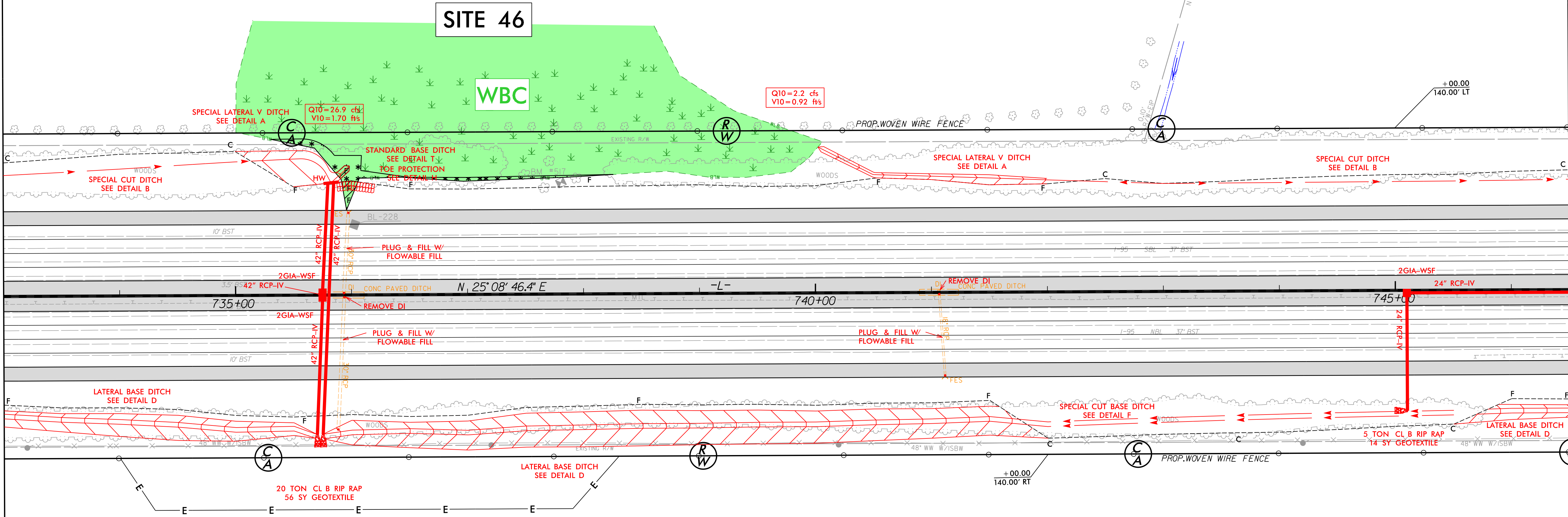
8/17/99
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 3\1-5986A_hyd_4B_psf59.dgn
RKK



- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.		SHEET NO.
1-5986A		59
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 129 OF 163		

MATCHLINE -L- STA. 733+00.00 SEE SHEET 58




MATCHLINE -L- STA. 746+50.00 SEE SHEET 60


FOR -L- PROFILES SEE SHTS. 140 & 141
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6

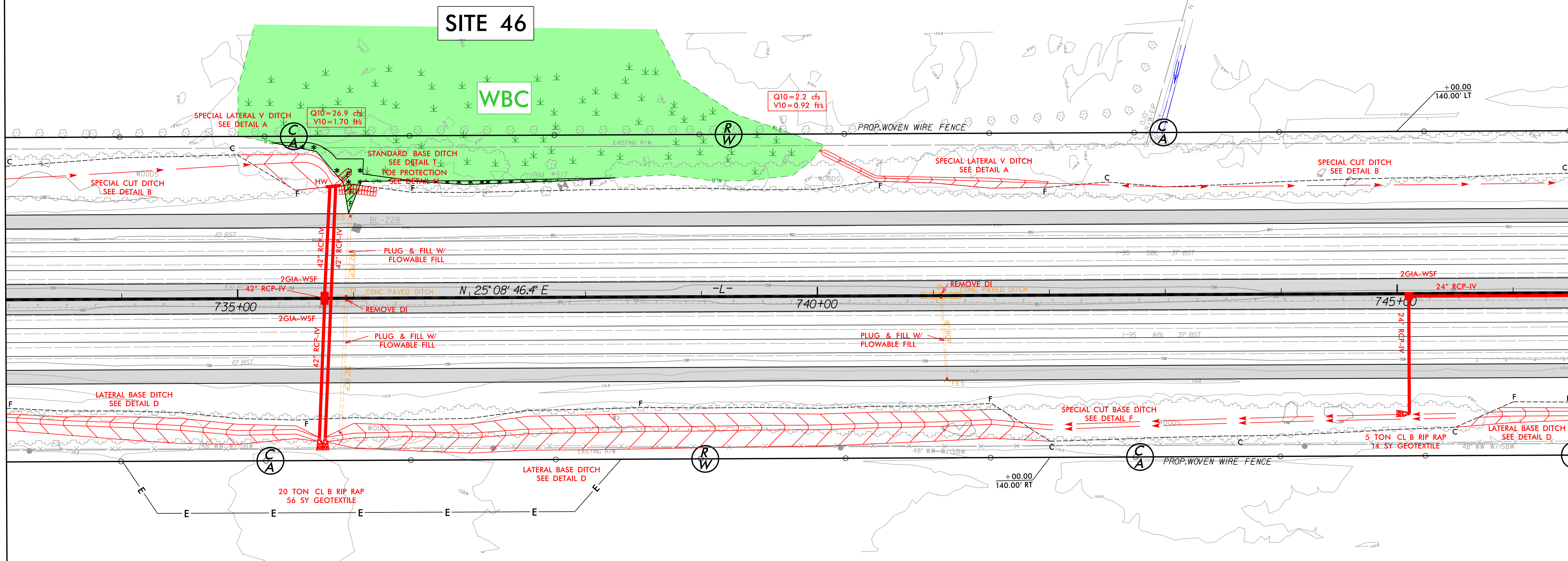
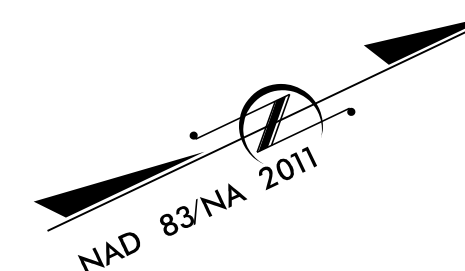
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



 DENOTES MECHANIZED CLEARING

 DENOTES FILL IN WETLAND



MATCHLINE -L- STA. 746+50.00 SEE SHEET 60

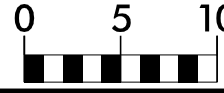
6/23/16



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

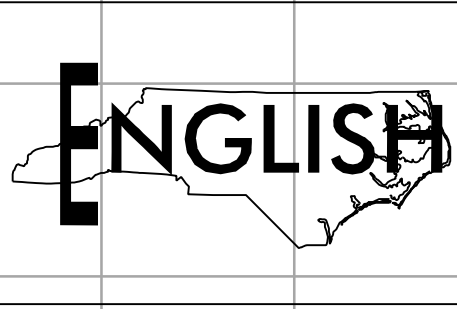
Responsive People | Creative Solutions



PROJ. REFERENCE NO.
I-5986A SECTION 3

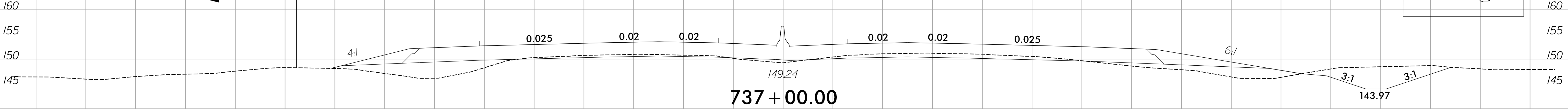
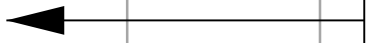
SHEET NO.
X-71

PERMIT DRAWING SHEET 131 OF 163

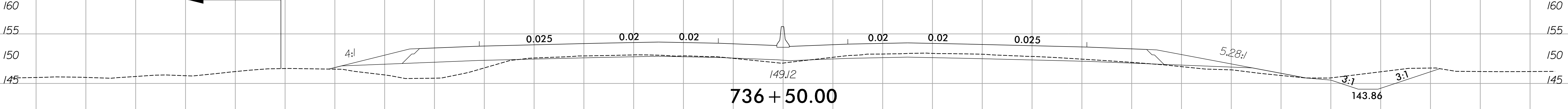


SITE 46

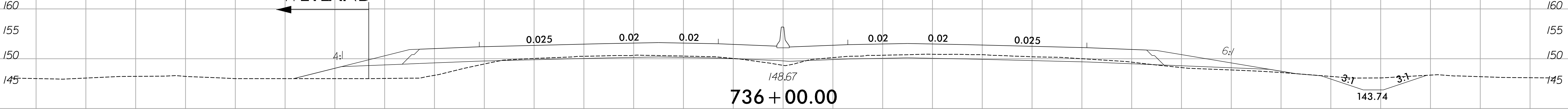
WETLAND



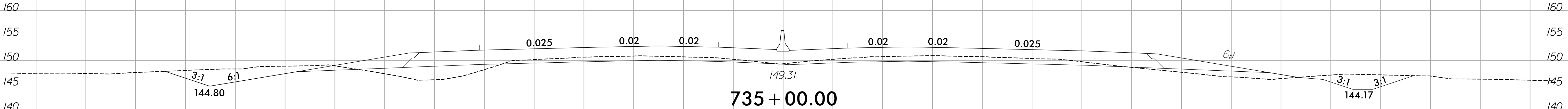
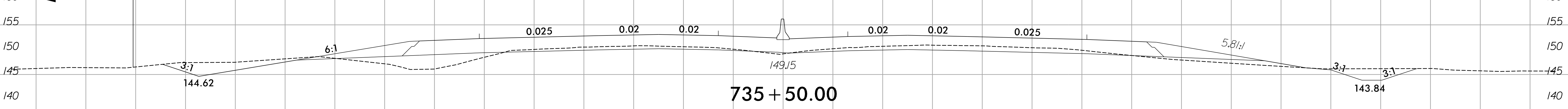
WETLAND



WETLAND



WETLAND



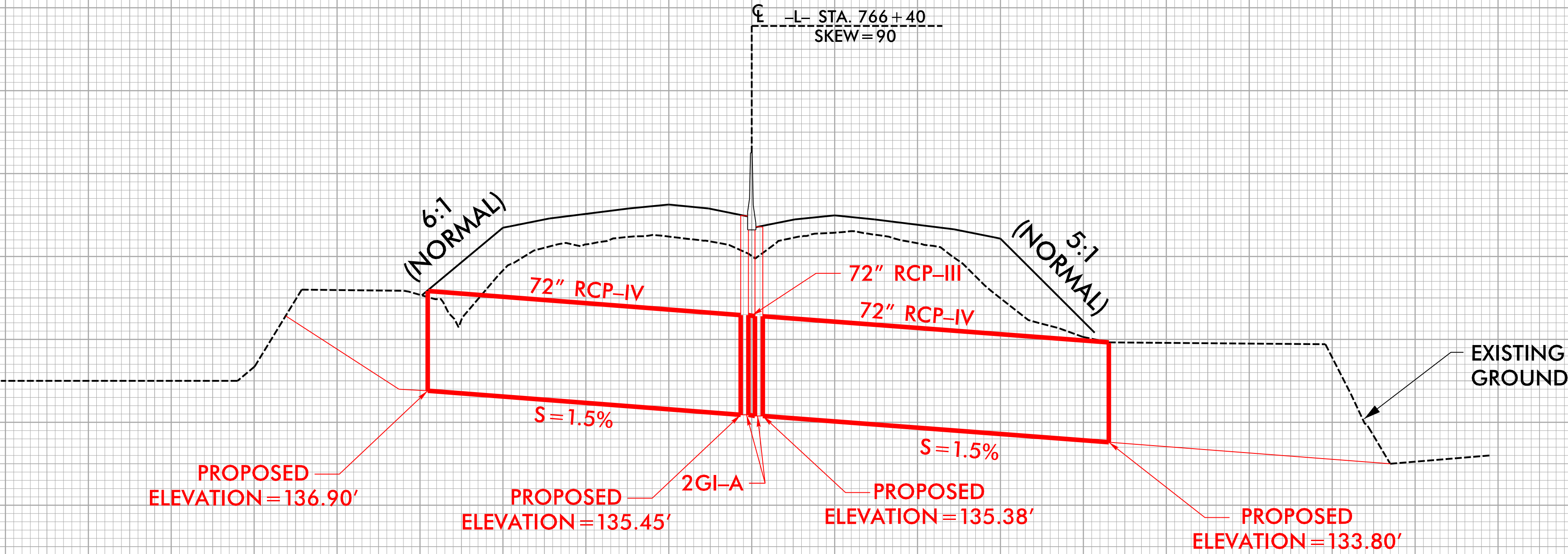
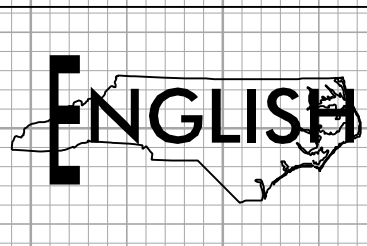
FOR DITCH DETAILS SEE SHTS. 2D-5 THRU 2D-6



PROJECT REFERENCE NO.	SHEET NO.
I-5986A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 47
-L- STA. 766 + 40

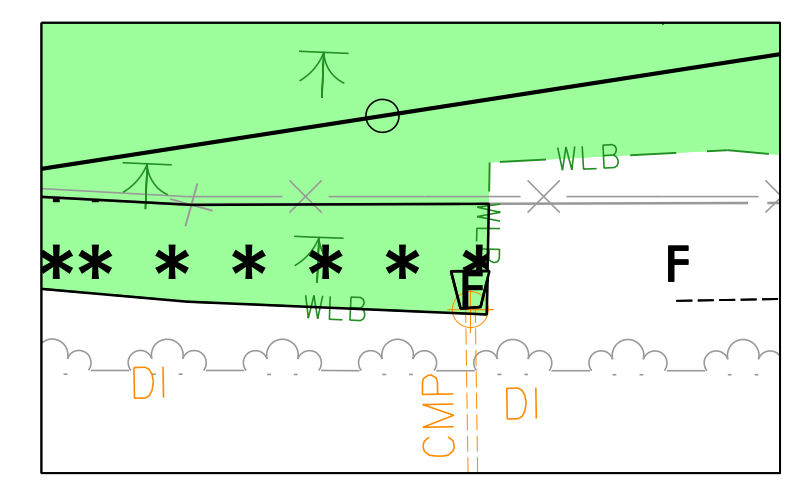
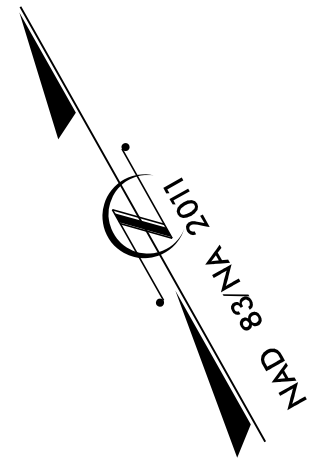
PERMIT DRAWING
SHEET 134 OF 163



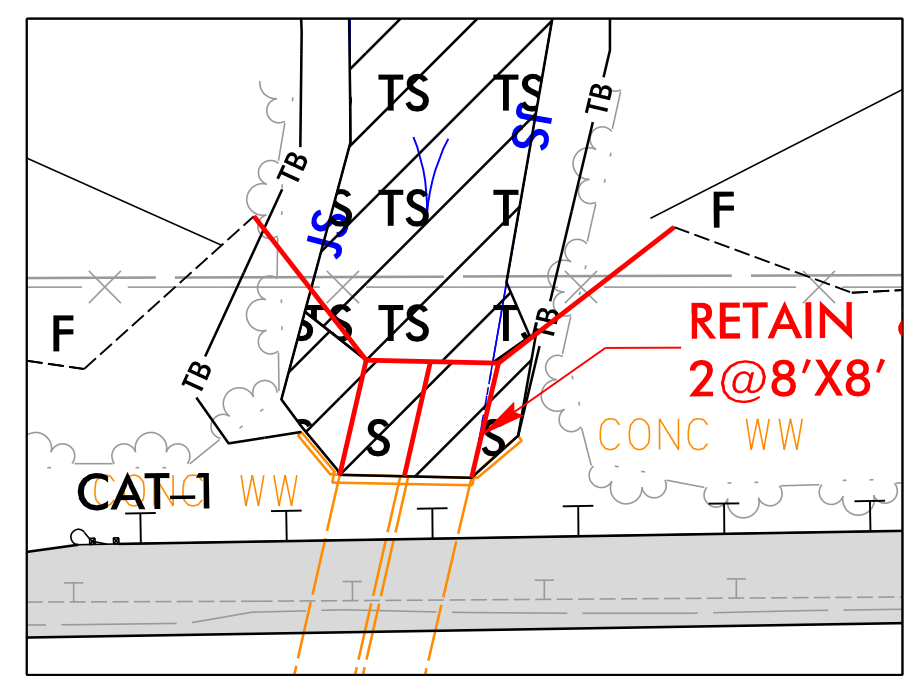
PROPOSED 72" RCP-III
(buried 1.0 foot)
(length = 208')

8/17/99
I:\Projects\Hydro\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psf66.dgn
8/17/2020
R:\Hydro\Hydro\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psf66.dgn

PROJECT REFERENCE NO. I-5986A		SHEET NO. 66
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 135 OF 163		

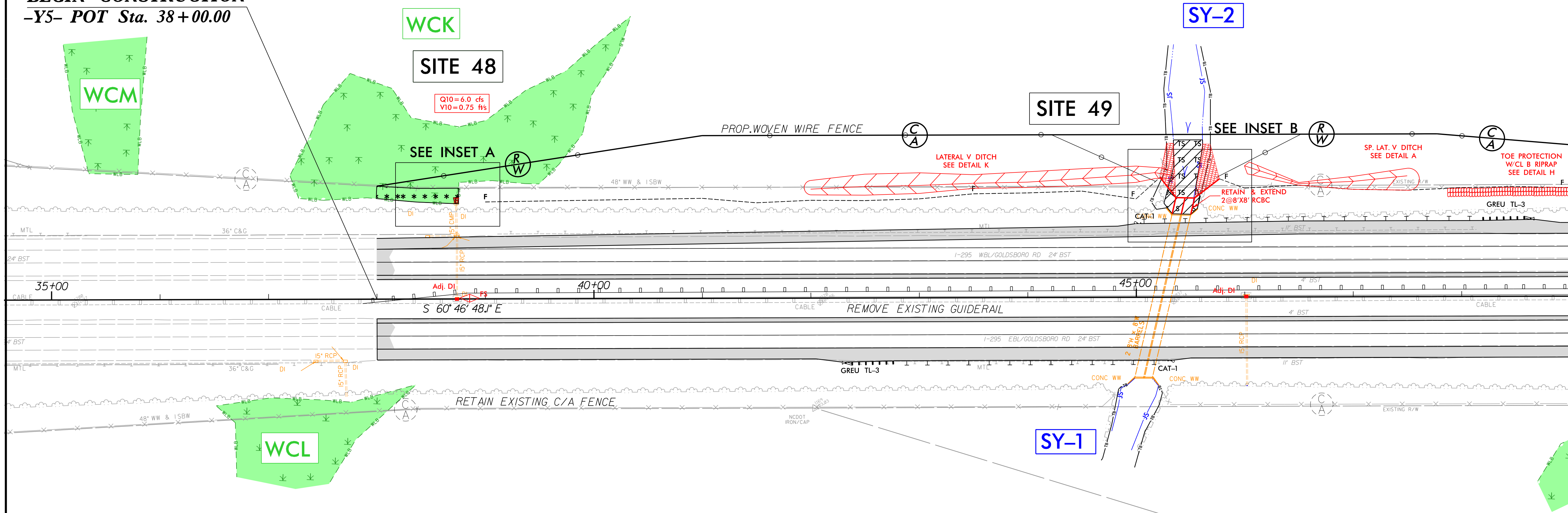


INSET A

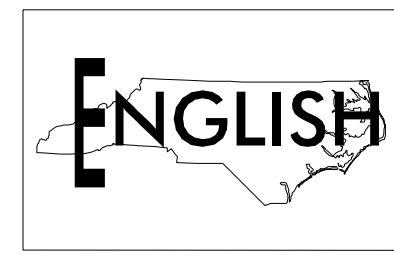
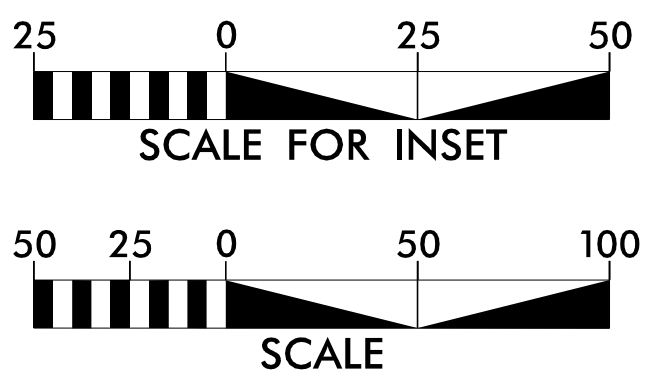


INSET B

BEGIN CONSTRUCTION
-Y5- POT Sta. 38+00.00



MATCHLINE -Y5- STA. 49+00.00 SEE SHEET 67



- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND

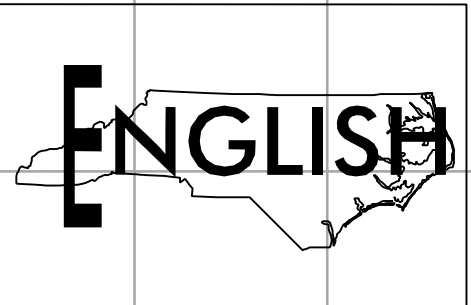
FOR -Y5LT- PROFILE SEE SHTS. 153 AND 154
FOR -Y5RT- PROFILE SEE SHTS. 153 AND 154
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16
5/1/2020
R:\Hydraulics\PERMITS\Environmental\Drawings\4\I-5986A_hyd-prm_wet_XPL_Y5_SITE48.dgn
kels

0 5 10 [Scale Bar]	PROJ. REFERENCE NO. I-5986A	SHEET NO. S1 X-169
-----------------------	--------------------------------	-----------------------

PERMIT DRAWING
SHEET 137 OF 163



39 + 50.00

SITE 48

39 + 00.00

38 + 50.00

38 + 00.00

37 + 50.00

-Y5-

WETLAND

WETLAND

WETLAND

WETLAND

WETLAND

WETLAND

WETLAND



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
25 0 25 50
SCALE FOR INSET
50 25 0 50 100
SCALE
ENGLISH
8/1/2020
C:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh67.dgn
E:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh67.dgn

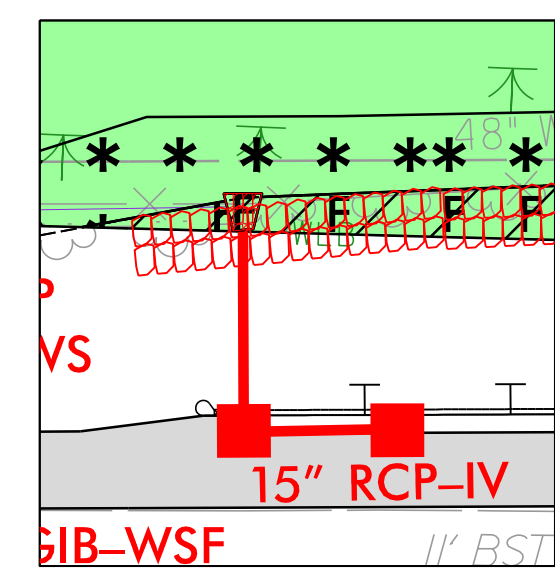
25 0 25 50
SCALE FOR INSET
50 25 0 50 100
SCALE

ENGLISH

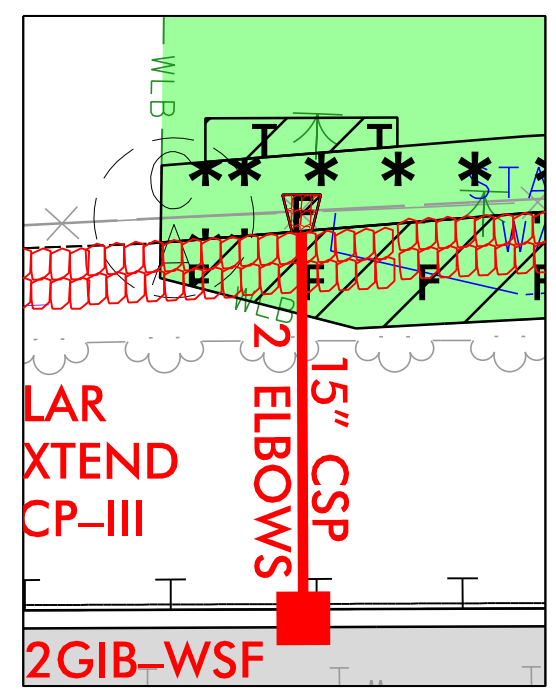
DENOTES TEMPORARY
FILL IN WETLAND

DENOTES MECHANIZED
CLEARING

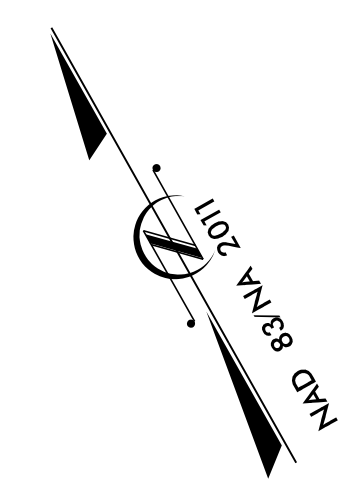
DENOTES FILL IN
WETLAND



INSET A

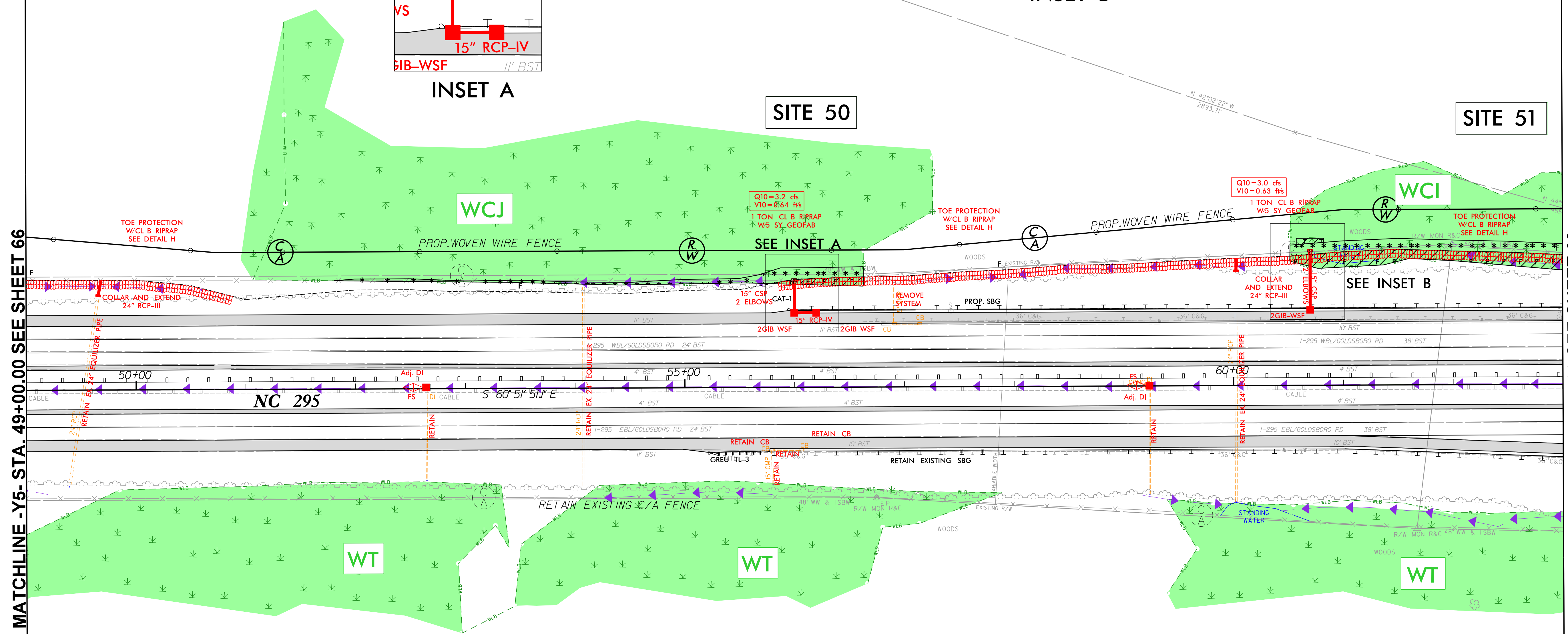


INSET B



PROJECT REFERENCE NO. <i>I-5986A</i>		SHEET NO. <i>67</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

PERMIT DRAWING
SHEET 138 OF 163



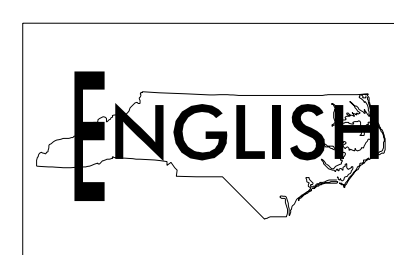
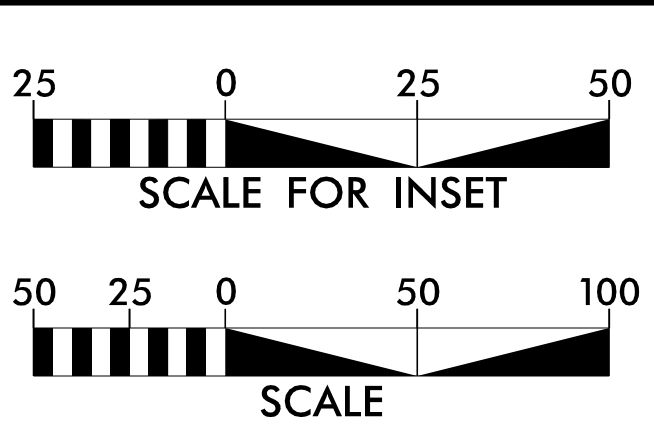
MATCHLINE -Y5- STA. 49+00.00 SEE SHEET 66

MATCHLINE -Y5- STA. 63+00.00 SEE SHEET 68

FOR -Y5LT- PROFILE SEE SHTS. 154 AND 155
FOR -Y5RT- PROFILE SEE SHTS. 154 AND 155
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
8/1/2020
C:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A-hyd-4B-psb67_CON.dgn
E:\k

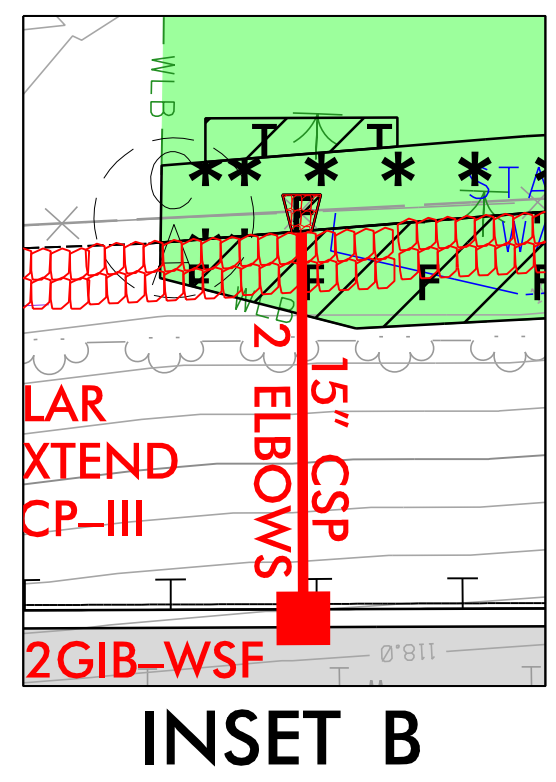
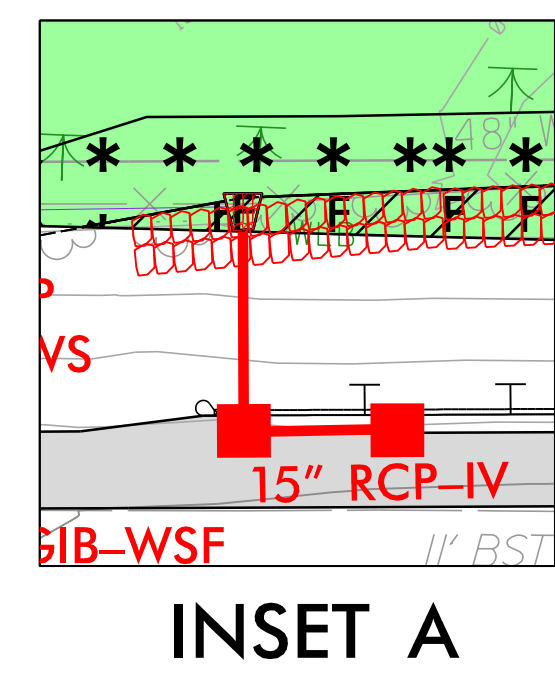
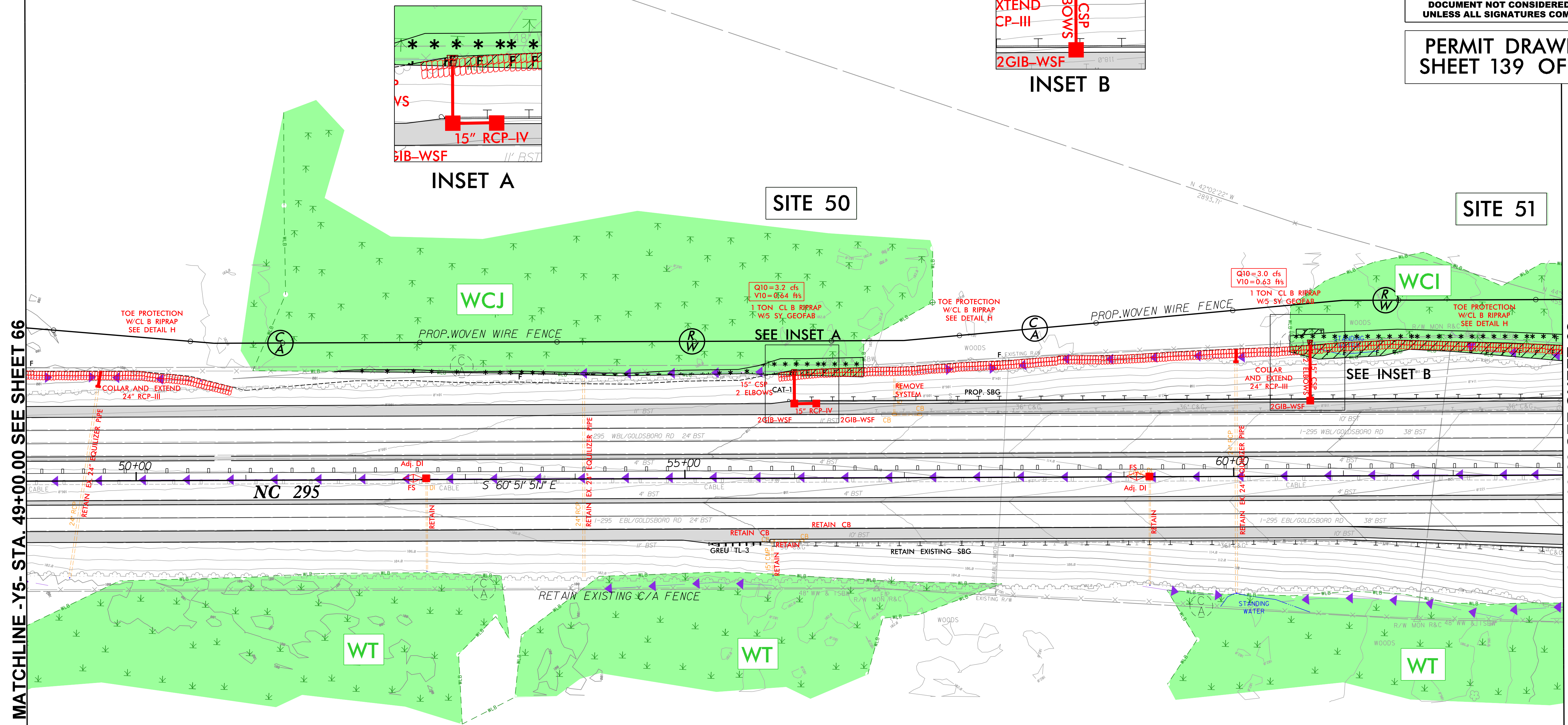


- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
I-5986A	67
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 139 OF 163

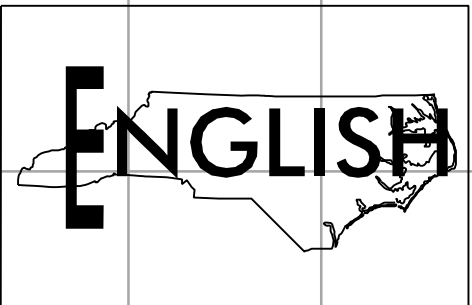


5/1/2020
R:\Hydraulic\PERMITS\Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL_Y5_SITE50.dgn
kelle

6/23/16

<div>0510</div>	PROJ. REFERENCE NO.	SHEET NO.
	I-5986A	S1 X-176

PERMIT DRAWING
SHEET 140 OF 163



58 + 00.00

57 + 50.00

57 + 00.00

56 + 50.00

56 + 00.00

-Y5-

WETLAND

WETLAND

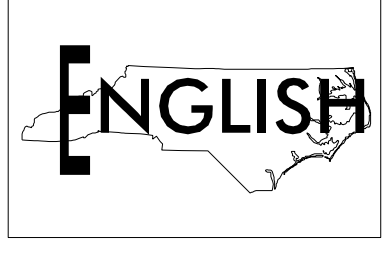
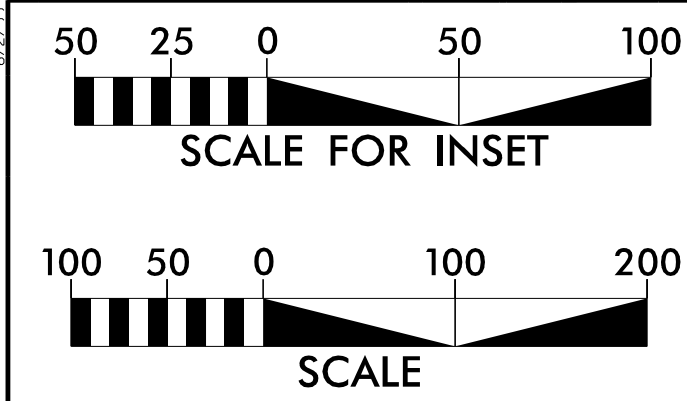
WETLAND

WETLAND

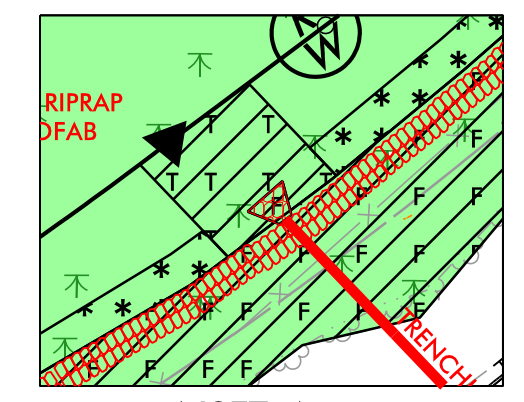


P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

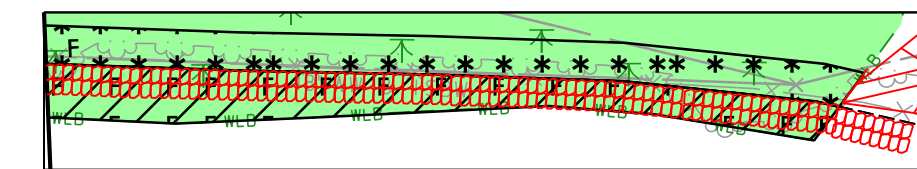
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



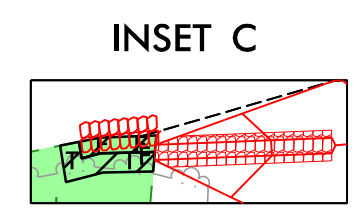
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND



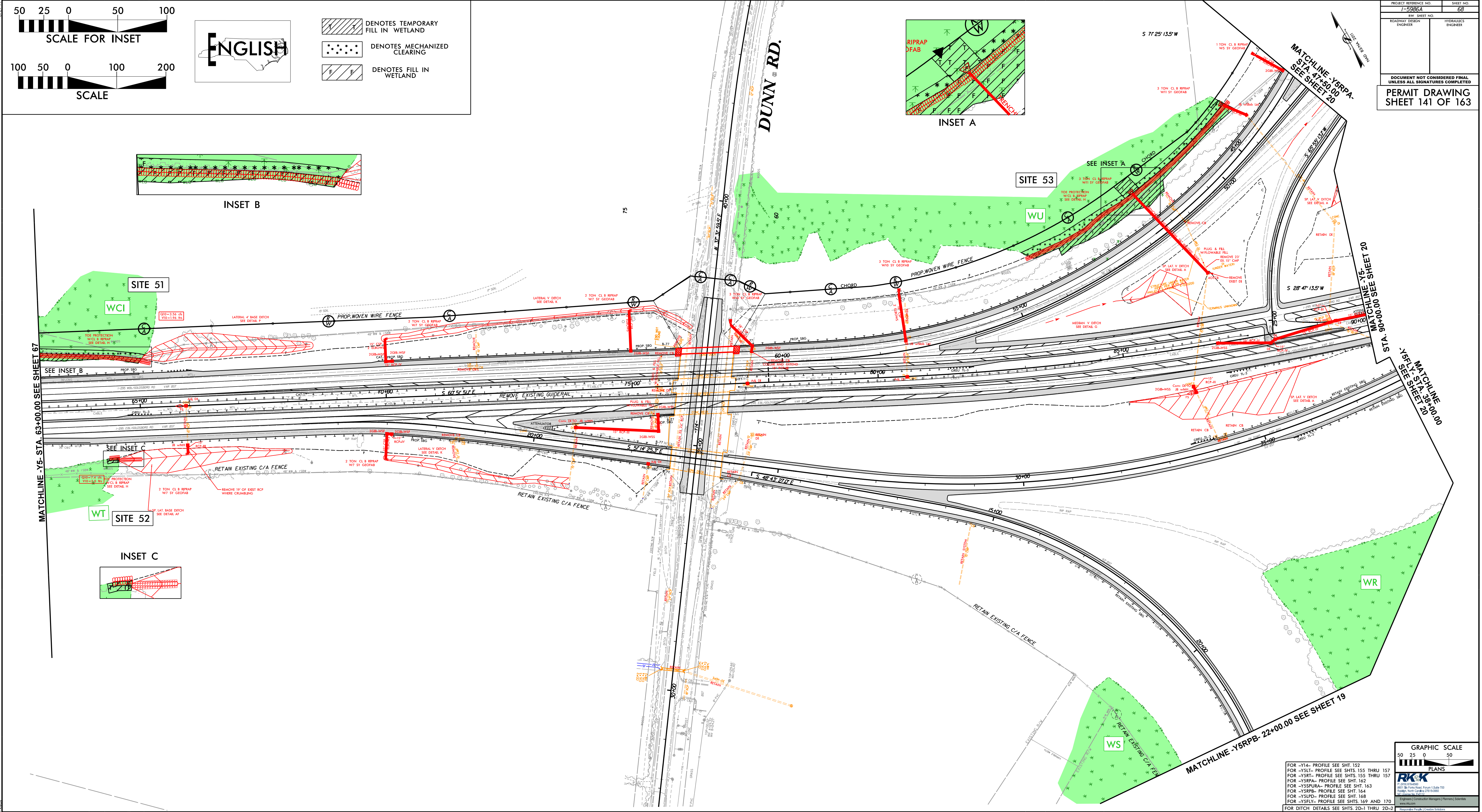
INSET A



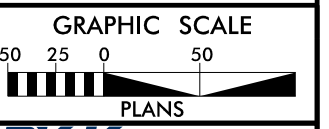
INSET B



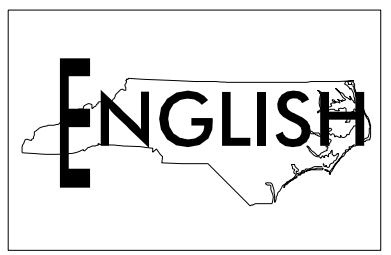
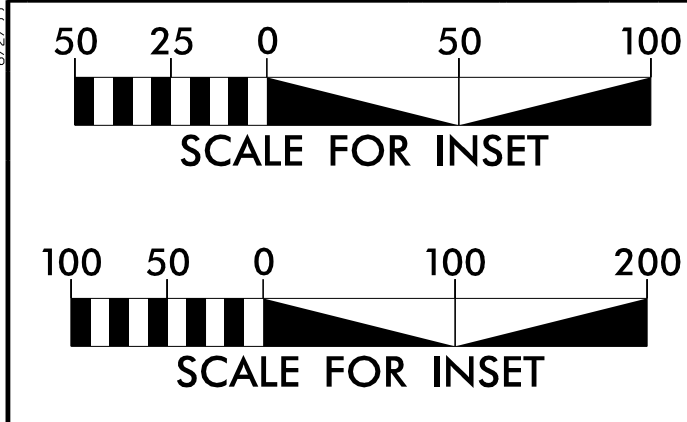
INSET C



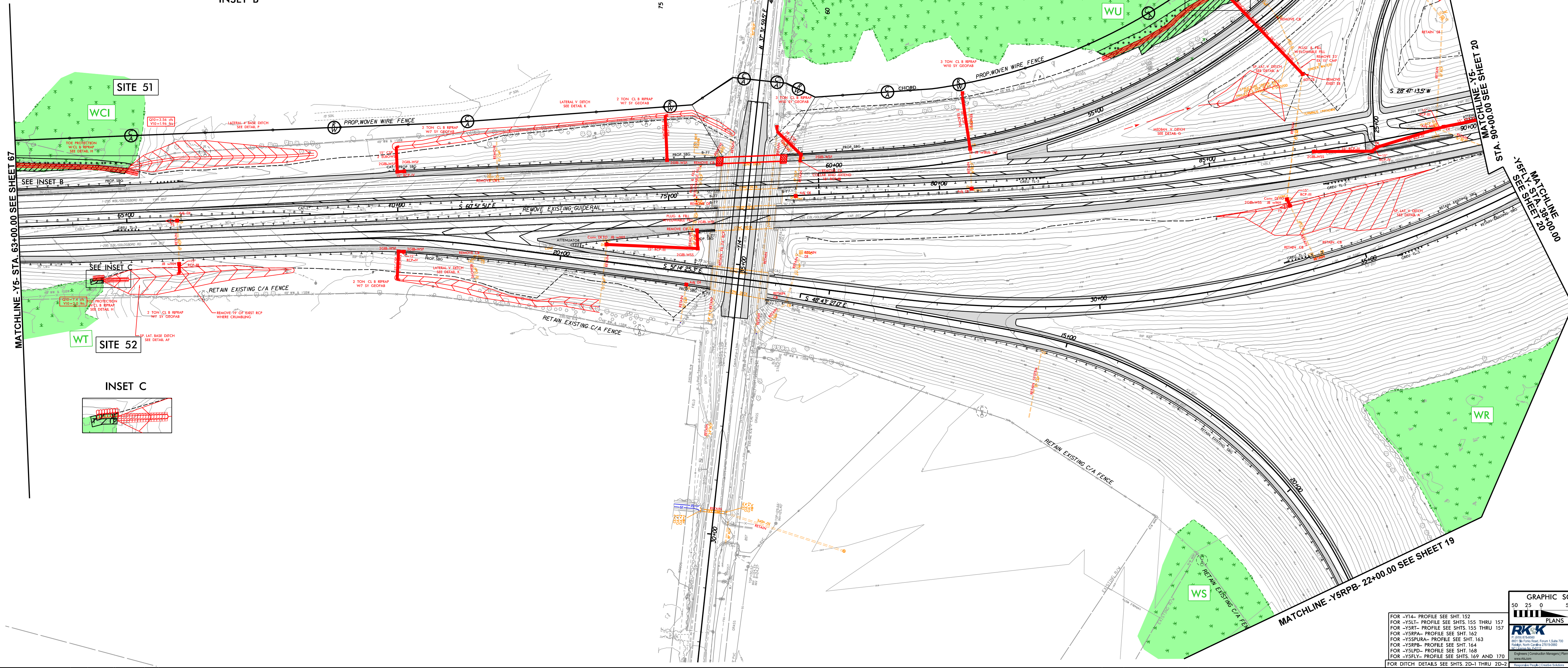
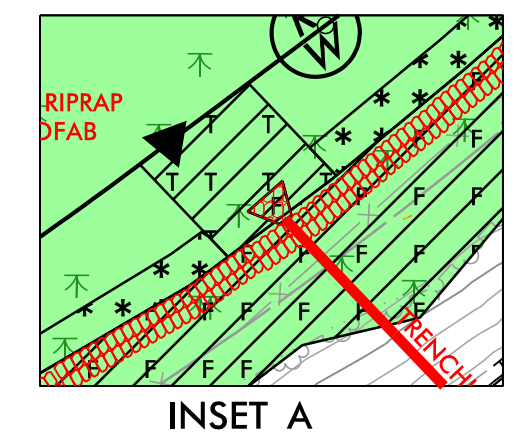
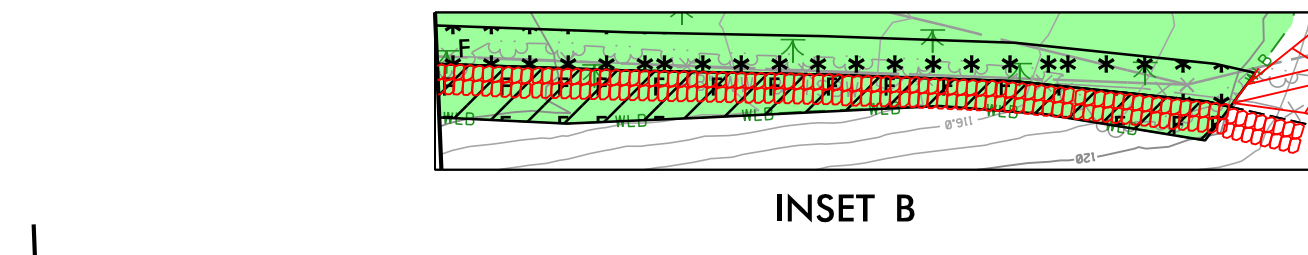
PROJECT REFERENCE NO.	SHEET NO.
7-5986A	68
RDW SHEET NO.	HYDRAULICS
ENGINEER	ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 141 OF 163	



FOR -Y14- PROFILE SEE SHT. 152
FOR -Y51T- PROFILE SEE SHTS. 155 THRU 157
FOR -Y51R- PROFILE SEE SHTS. 155 THRU 157
FOR -Y5RPA- PROFILE SEE SHT. 162
FOR -Y5SPURA- PROFILE SEE SHT. 163
FOR -Y5RPS- PROFILE SEE SHT. 164
FOR -Y5LPD- PROFILE SEE SHT. 168
FOR -Y5RLY- PROFILE SEE SHTS. 169 AND 170
FOR DITCH DETAILS SEE SHTS. 20-1 THRU 20-2

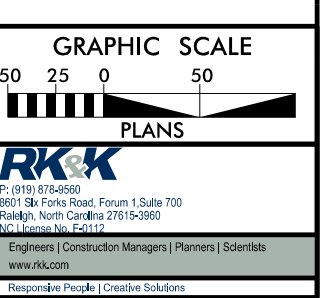


- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND



PROJECT REFERENCE NO.	SHEET NO.
7-5986A	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 142 OF 163	

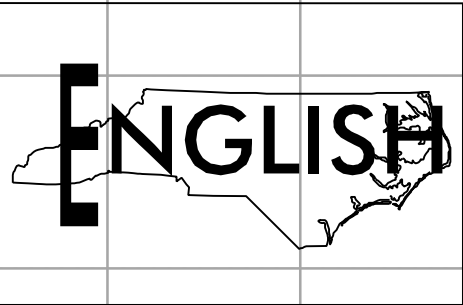
FOR -Y14- PROFILE SEE SHT. 152
FOR -Y5LT- PROFILE SEE SHTS. 155 THRU 157
FOR -Y5RT- PROFILE SEE SHTS. 155 THRU 157
FOR -Y5RPA- PROFILE SEE SHT. 162
FOR -Y5SPURA- PROFILE SEE SHT. 163
FOR -Y5SPB- PROFILE SEE SHT. 164
FOR -Y5SPD- PROFILE SEE SHT. 168
FOR -Y5SLY- PROFILE SEE SHTS. 169 AND 170
FOR DITCH DETAILS SEE SHTS. 20-1 THRU 20-2



6/23/16

SITE 51

PERMIT DRAWING
SHEET 143 OF 163



WETLAND

WETLAND

WETLAND

62 + 00.00

61 + 50.00

61 + 00.00

60 + 50.00

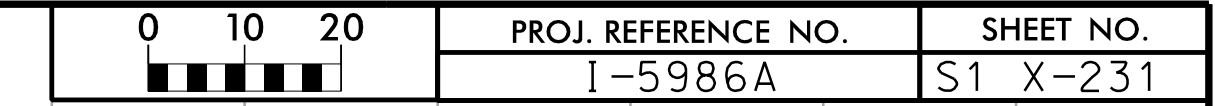
-Y5-



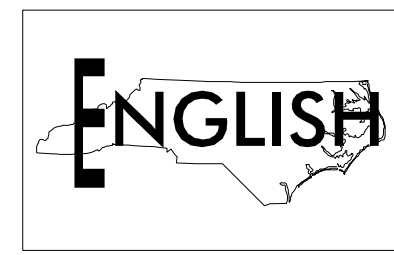
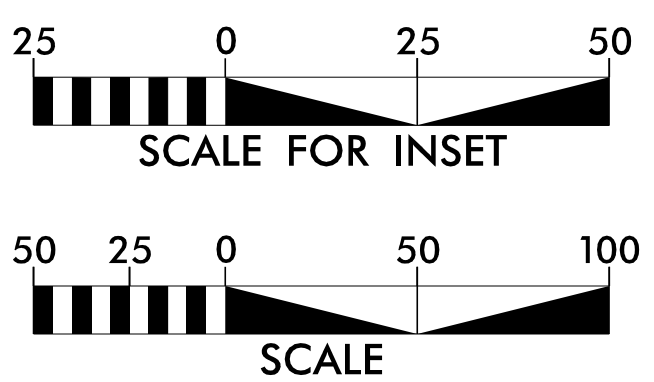
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

5/1/2020
R:\Hydraulic\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm-wet_XPL_Y5_SITE51&52.dgn
kels



8/17/99
S:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh69.dgn
E:\Hydraulics\PERMITS_Environmental\Drawings\4B\Section 1\I-5986A_hyd_4B_psh69.dgn

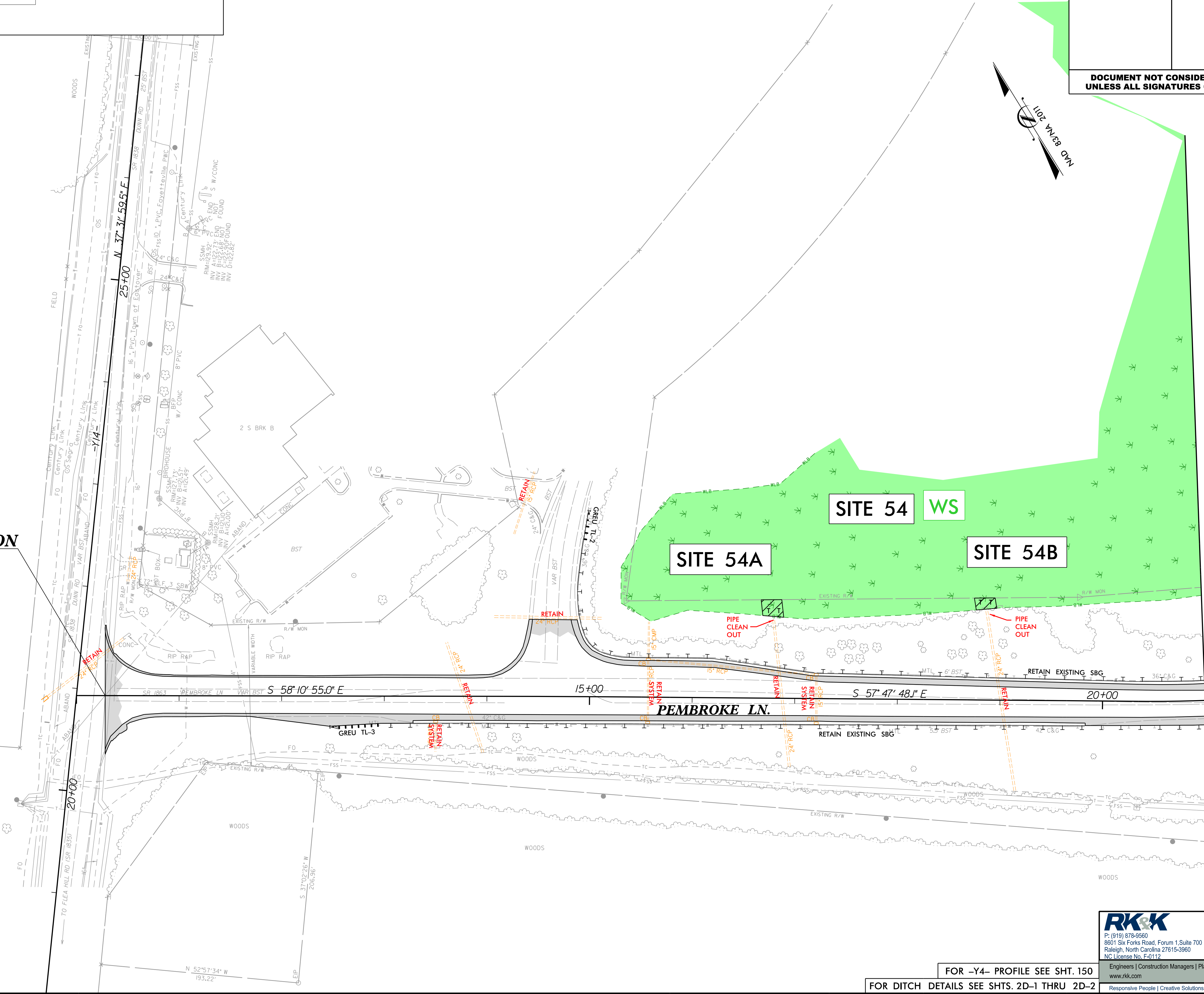


DENOTES TEMPORARY
FILL IN WETLAND

PERMIT DRAWING
SHEET 145 OF 163

PROJECT REFERENCE NO.		SHEET NO.	
I-5986A		69	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

BEGIN CONSTRUCTION
BEGIN OVERLAY
-Y4- POT Sta. 10+28.01

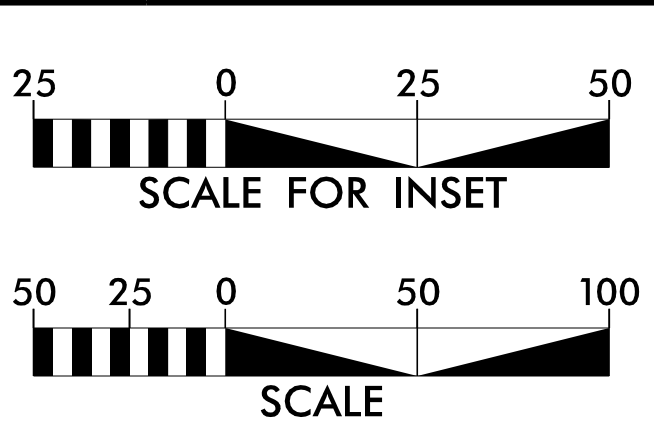


MATCHLINE -Y4- 21+00.00 SEE SHEET 19

FOR -Y4- PROFILE SEE SHT. 150
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
S:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A-hyd-4B-psf69_CON.dgn
E:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section 1\I-5986A-hyd-4B-psf69_CON.dgn

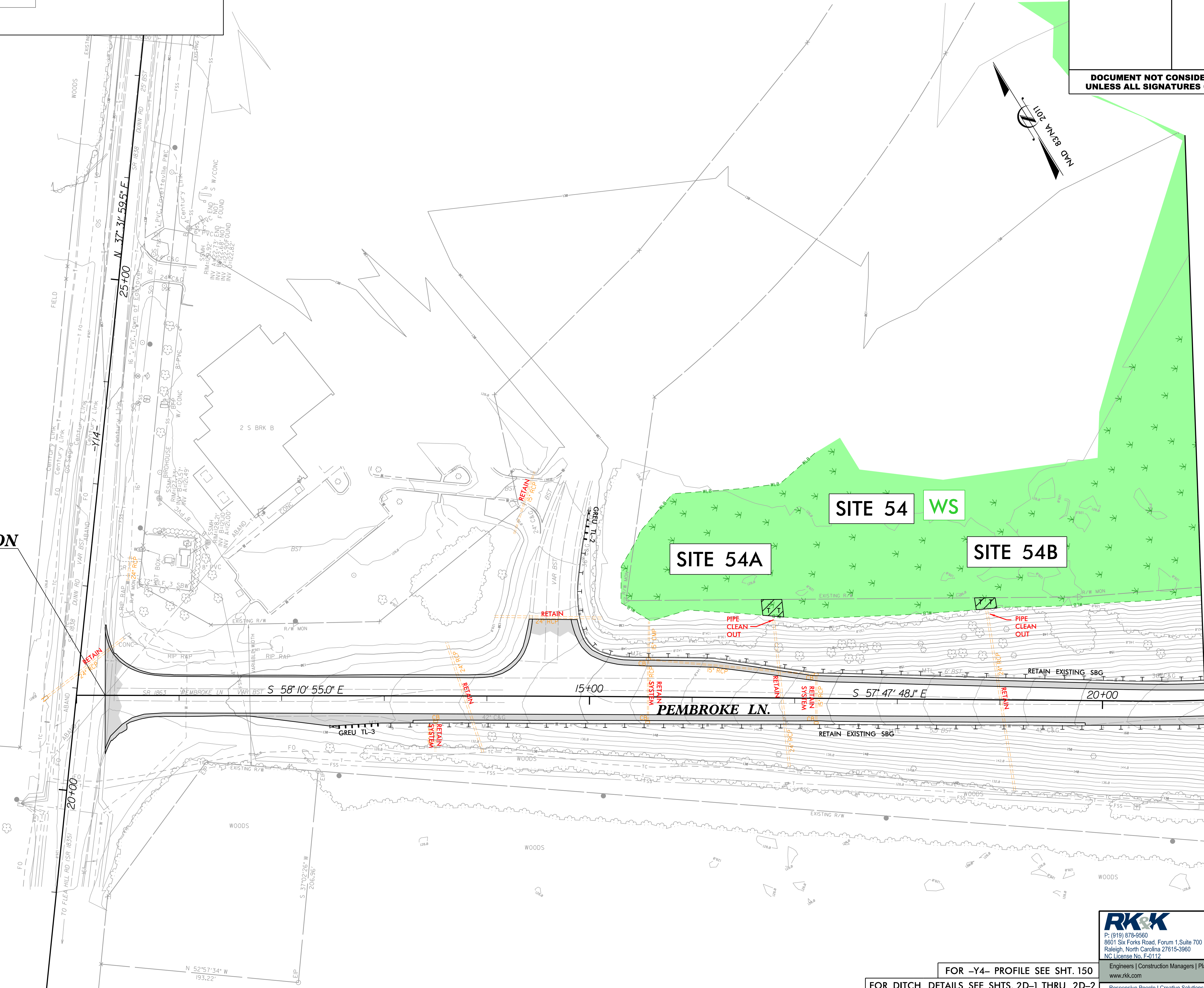


DENOTES TEMPORARY
FILL IN WETLAND

PERMIT DRAWING
SHEET 146 OF 163

PROJECT REFERENCE NO. <i>I-5986A</i>		SHEET NO. <i>69</i>	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

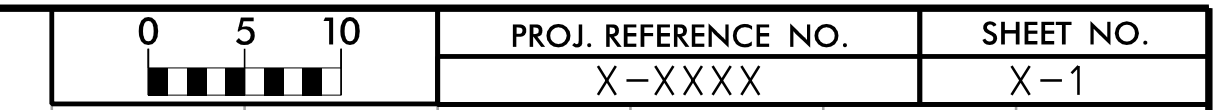
BEGIN CONSTRUCTION
BEGIN OVERLAY
-Y4- POT Sta. 10+28.01



MATCHLINE -Y4- 21+00.00 SEE SHEET 19

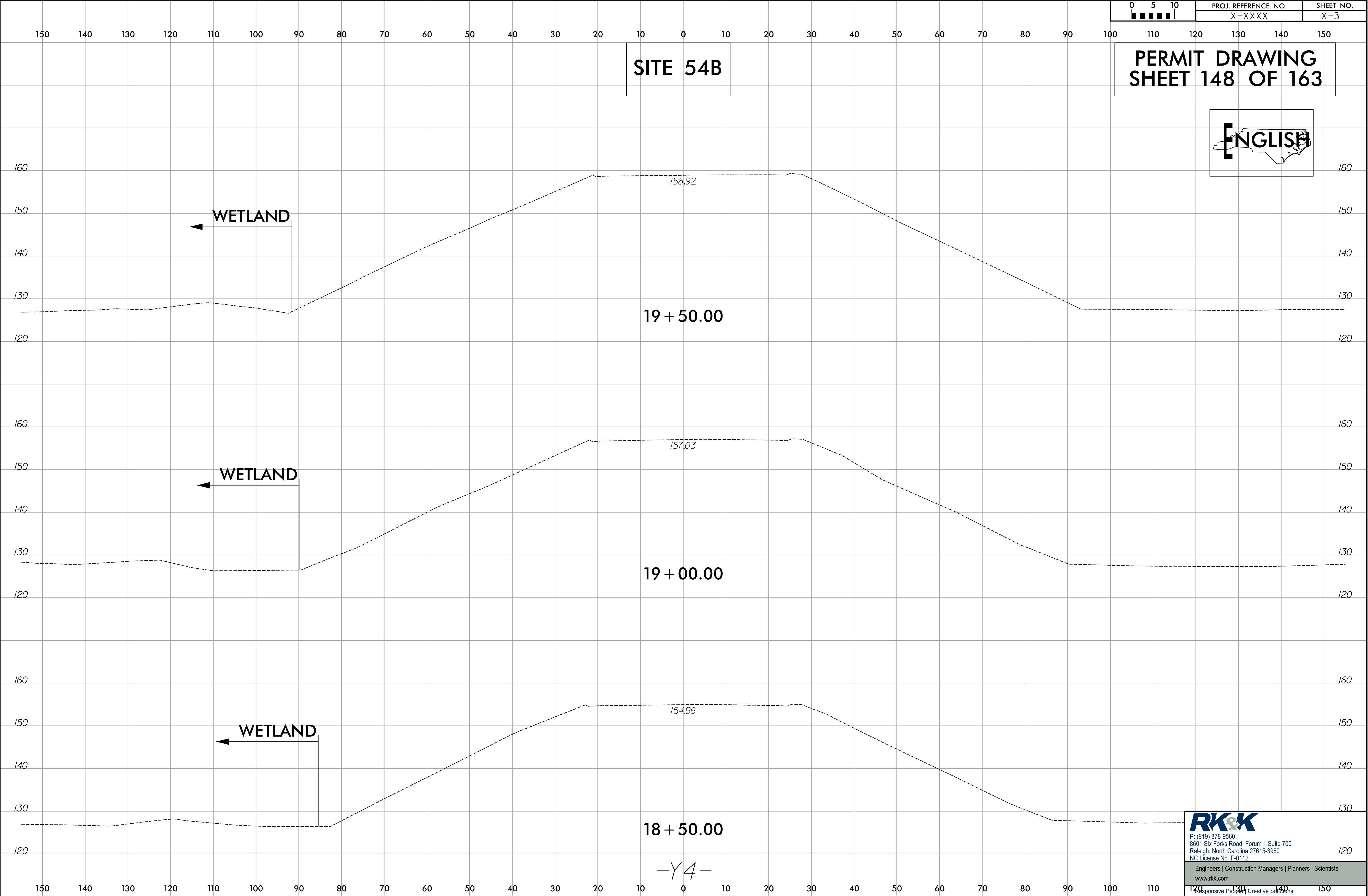
FOR -Y4- PROFILE SEE SHT. 150
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



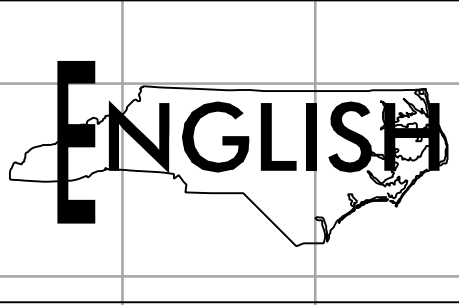
6/23/16

5/1/2020
R:\Hydraulic\PERMITS-Environmental\Drawings\4C\1-5986A_hyd-prm_wet_XPL_Y4_SITE54B.dgn
kajls



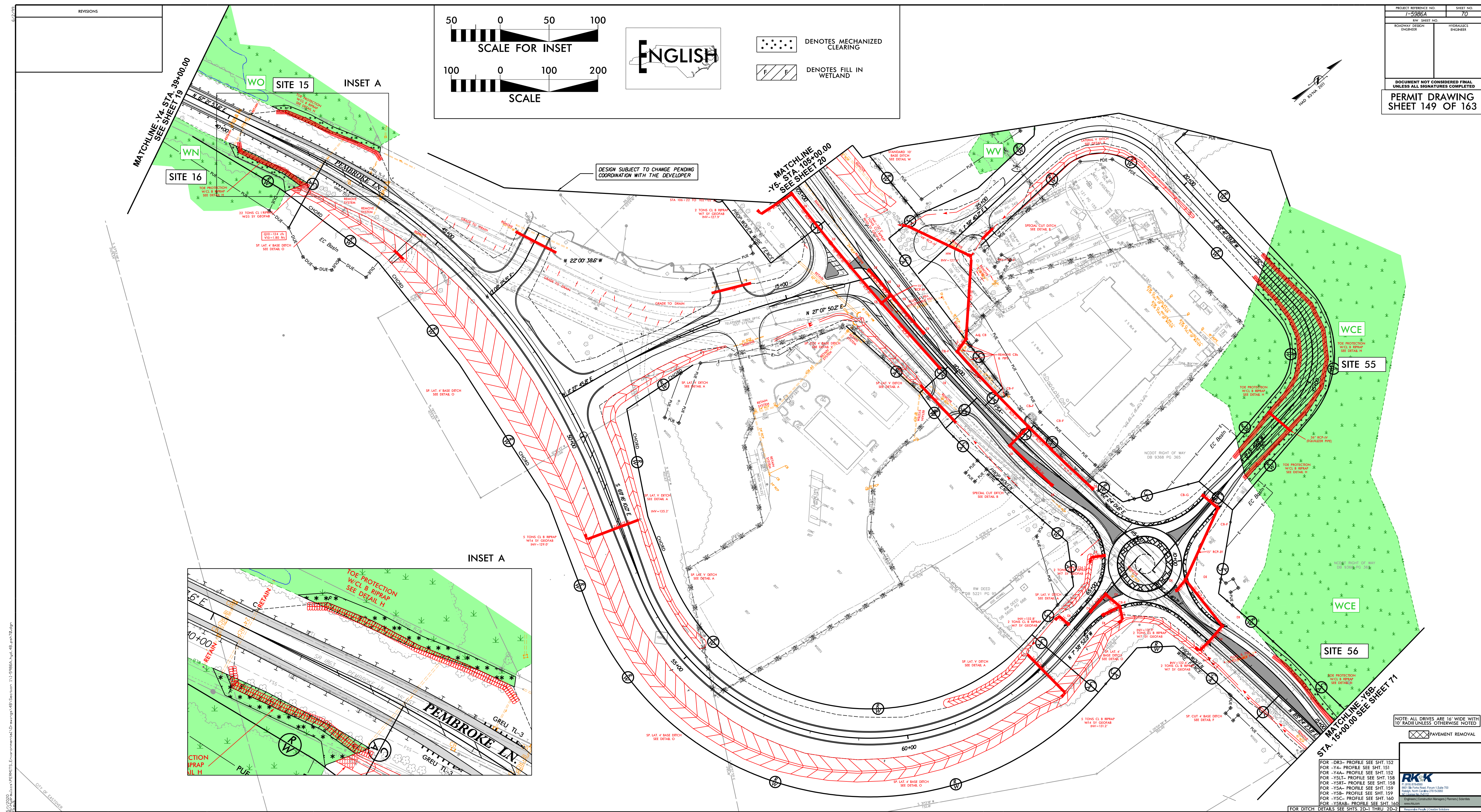
SITE 54B

PERMIT DRAWING
SHEET 148 OF 163

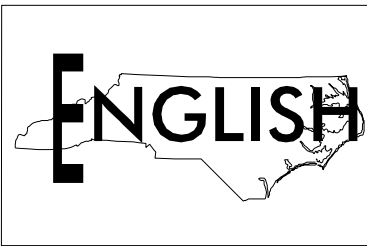
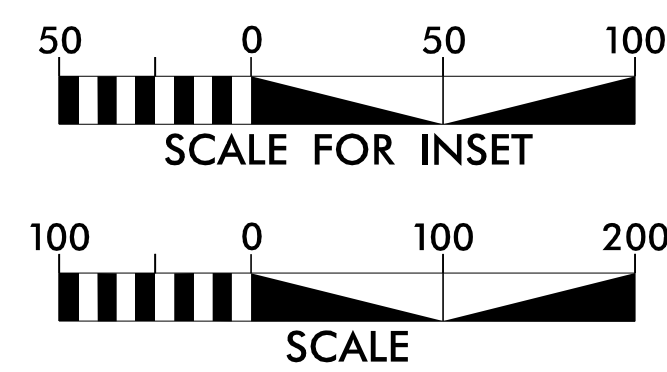


RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

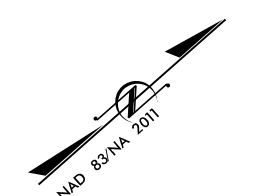
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



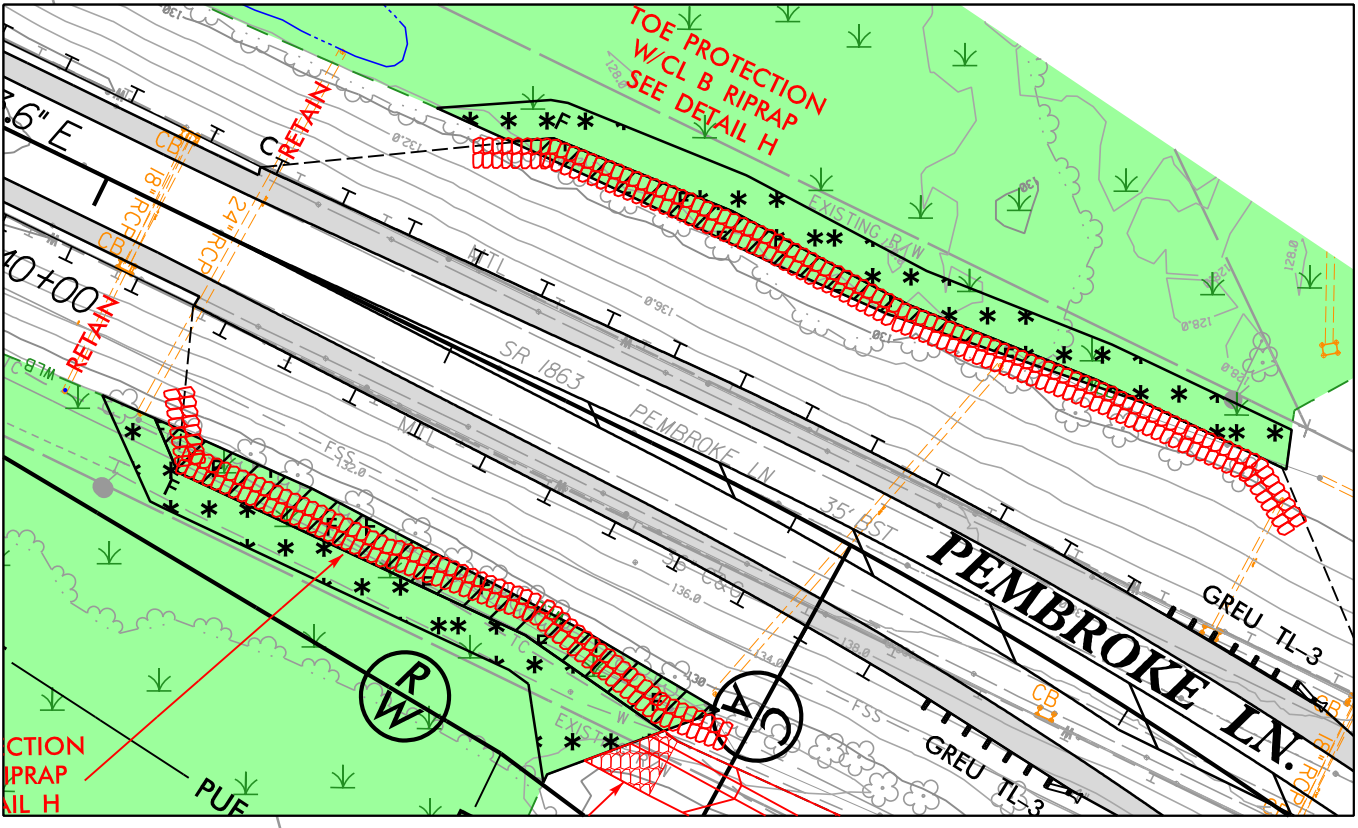
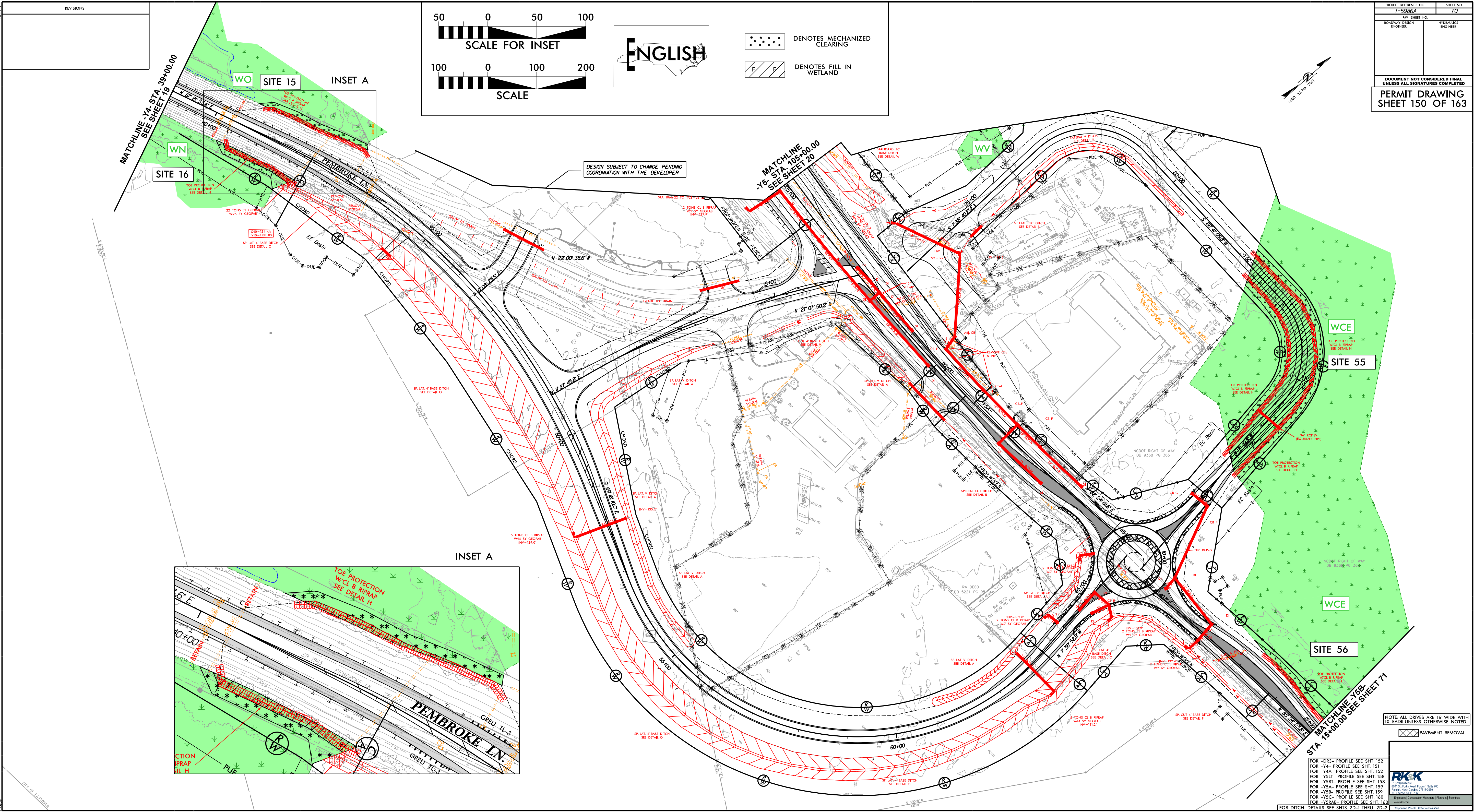
INSET C



- DENOTES MECHANIZED CLEARING
- ▨▨▨▨ DENOTES FILL IN WETLAND



PROJECT REFERENCE NO.	SHEET NO.
7-5086A	70
RDW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS
ENGINEER	ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 150 OF 163	



INSET A

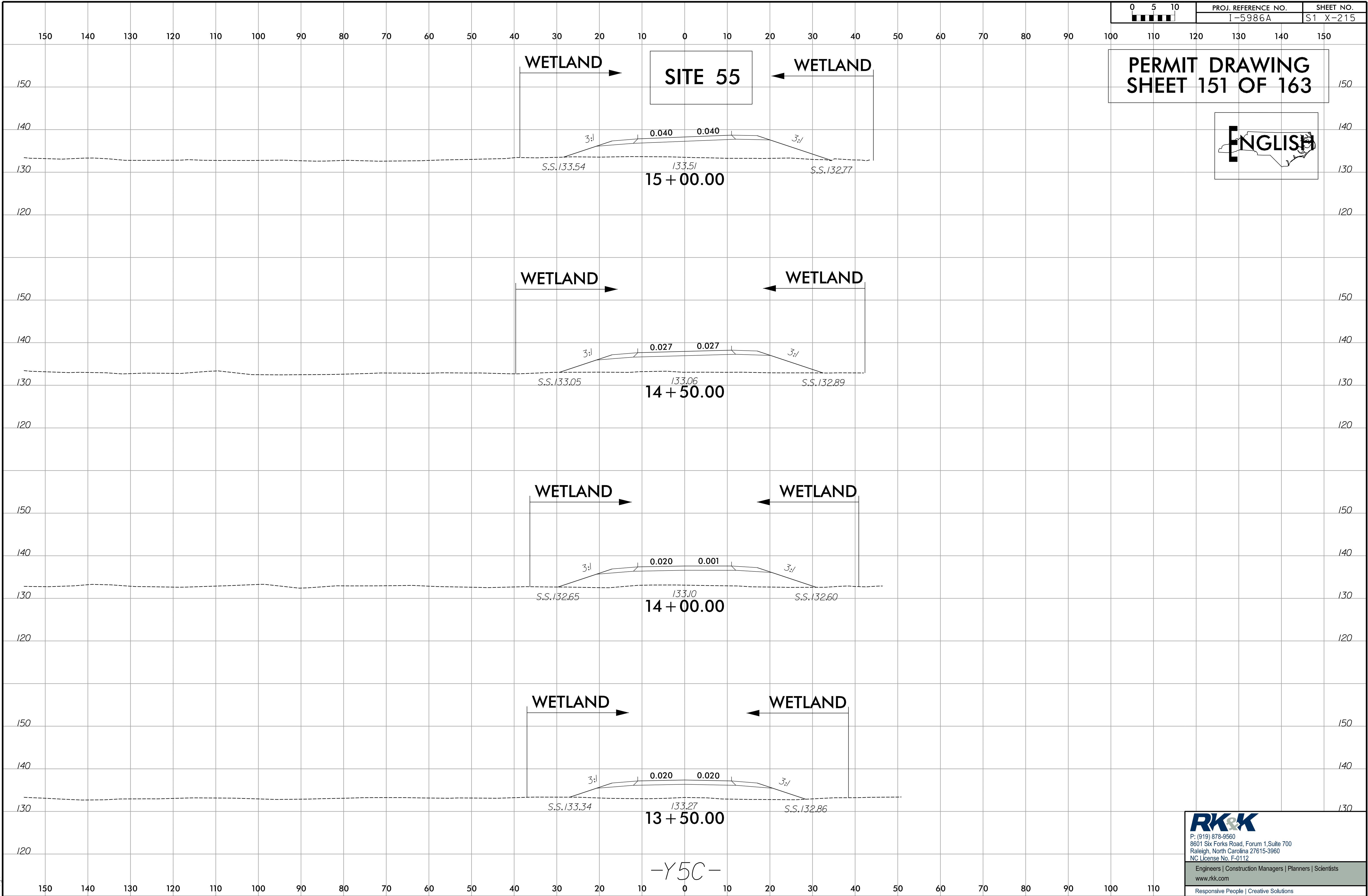
NOTE: ALL DRIVES ARE 16' WIDE WITH 10' RADI UNLESS OTHERWISE NOTED

▨▨▨▨ PAVEMENT REMOVAL

- FOR -DR3- PROFILE SEE SHT. 152
FOR -Y4- PROFILE SEE SHT. 151
FOR -Y4A- PROFILE SEE SHT. 152
FOR -Y3LT- PROFILE SEE SHT. 158
FOR -Y3RT- PROFILE SEE SHT. 158
FOR -Y3A- PROFILE SEE SHT. 159
FOR -Y3B- PROFILE SEE SHT. 159
FOR -Y3C- PROFILE SEE SHT. 160
FOR -Y3RAB- PROFILE SEE SHT. 160

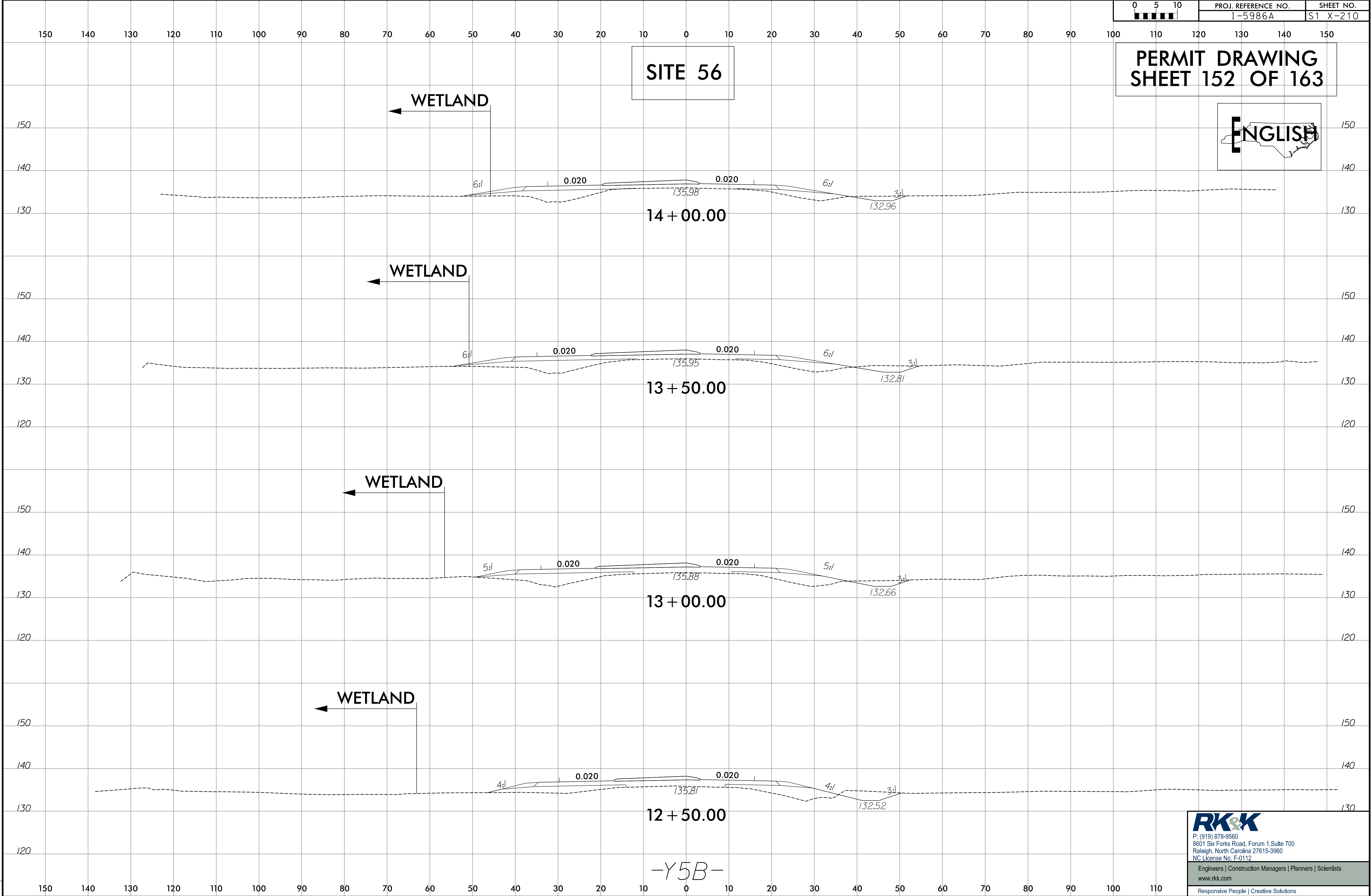


8/2/2020 1:15 PM C:\Users\jld\Documents\7-5086A\7-5086A.dwg 1:1 7-5086A.dwg 150 OF 163 2020-08-02 1:15 PM



6/23/16

5/1/2020
R:\Hydraulics\PERMITS_Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL_Y5B-SITE56.dgn
kaj

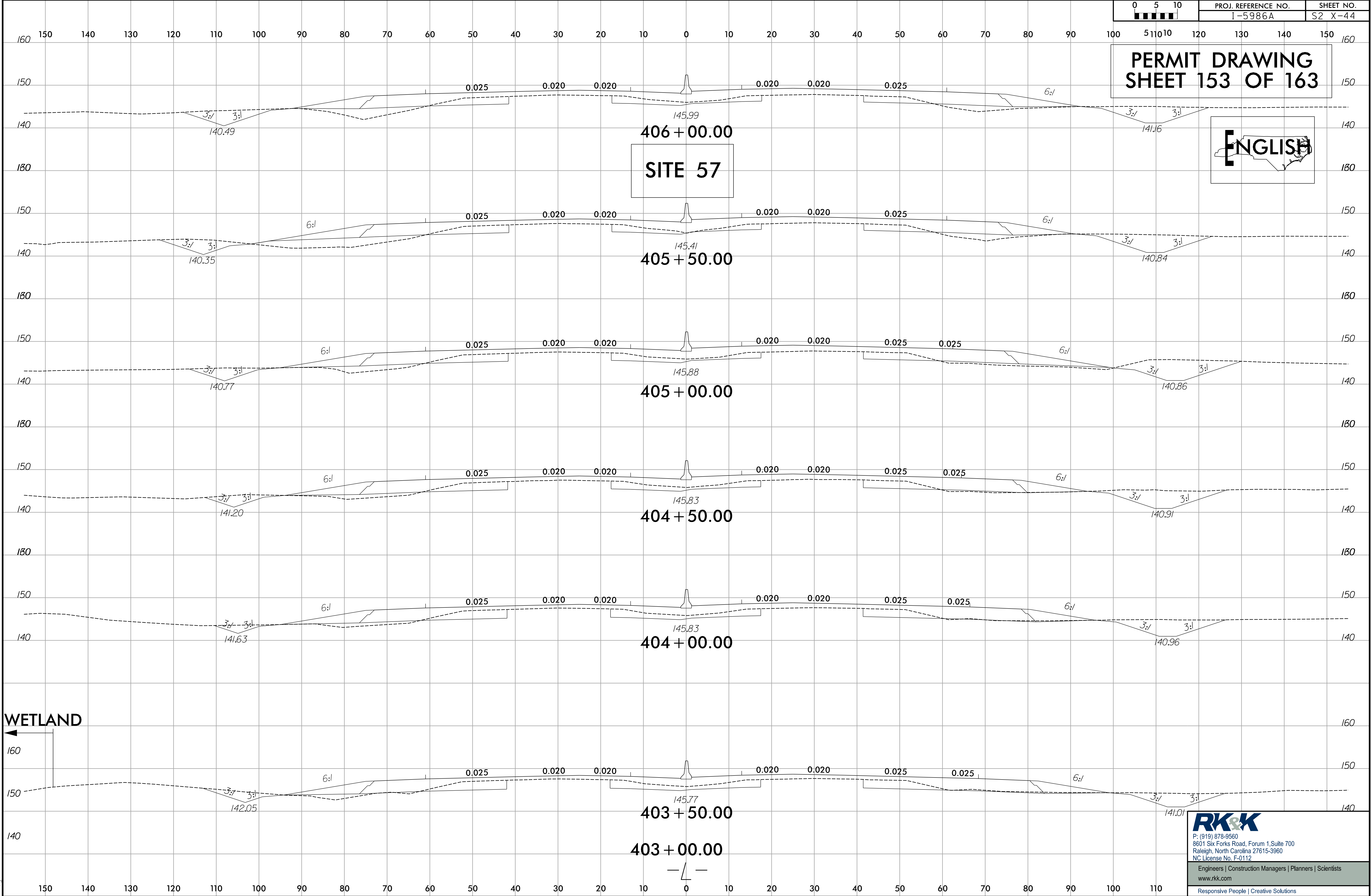


P: (919) 878-9660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

6/23/16

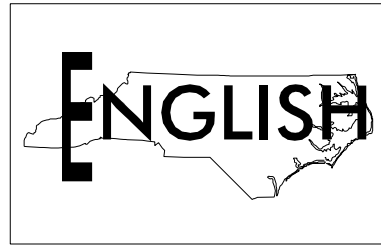
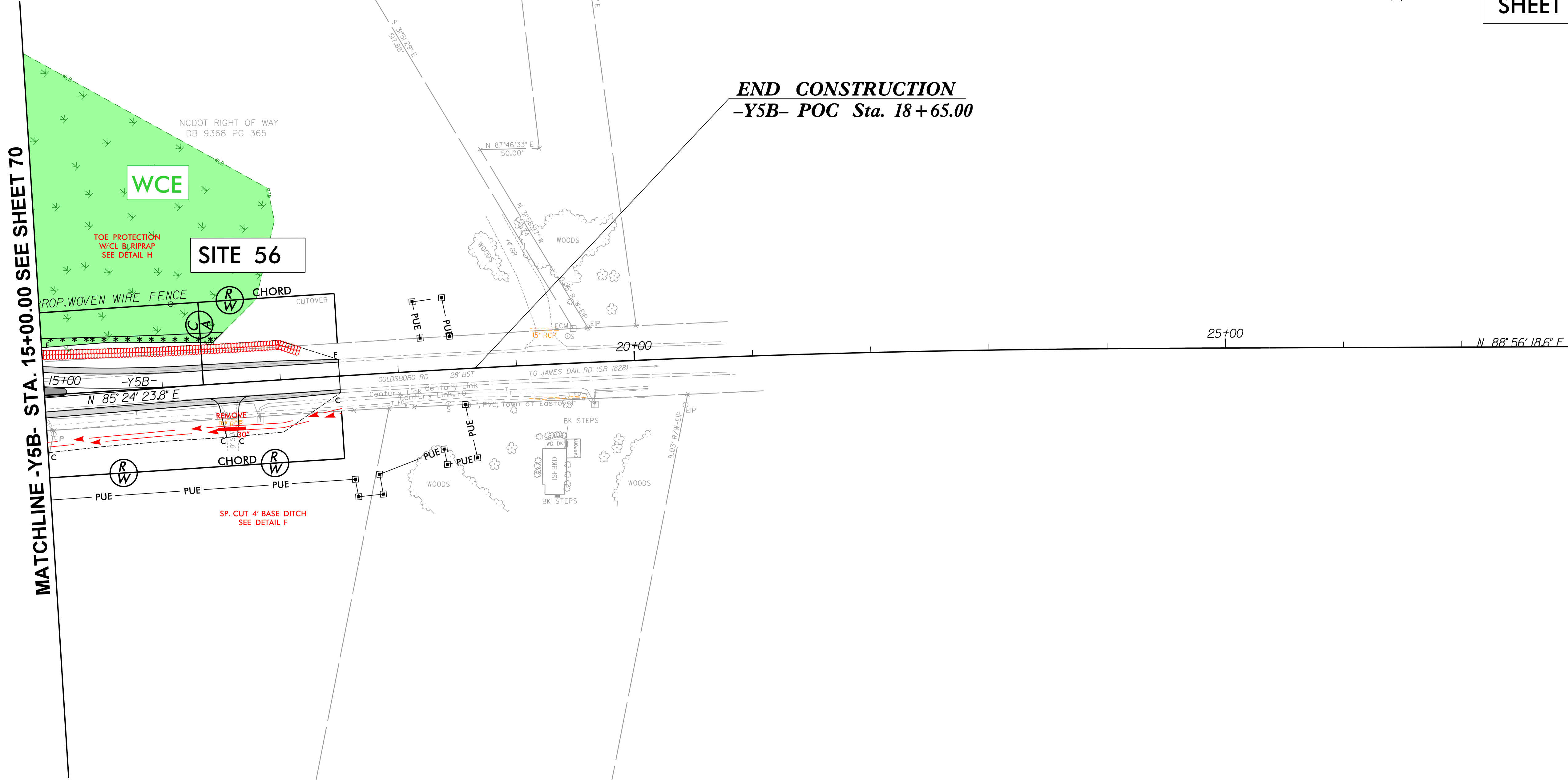
5/1/2020
R:\Hydraulics\PERMITS-Environmental\Drawings\4C\I-5986A_hyd-prm_wet_XPL\L-SITE57.dgn
kyle



8/17/99

F:\2020\Hydraulics\PERMITS\Environmental\Drawings\4B\Section\1-5986A-hyd-4B_psh71.dgn

PROJECT REFERENCE NO.	SHEET NO.
1-5986A	71
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 154 OF 163	



..... DENOTES MECHANIZED CLEARING

NOTE: ALL DRIVES ARE 16' WIDE WITH 10' RADII UNLESS OTHERWISE NOTED

FOR -Y5B- PROFILE SEE SHT. 159

FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K

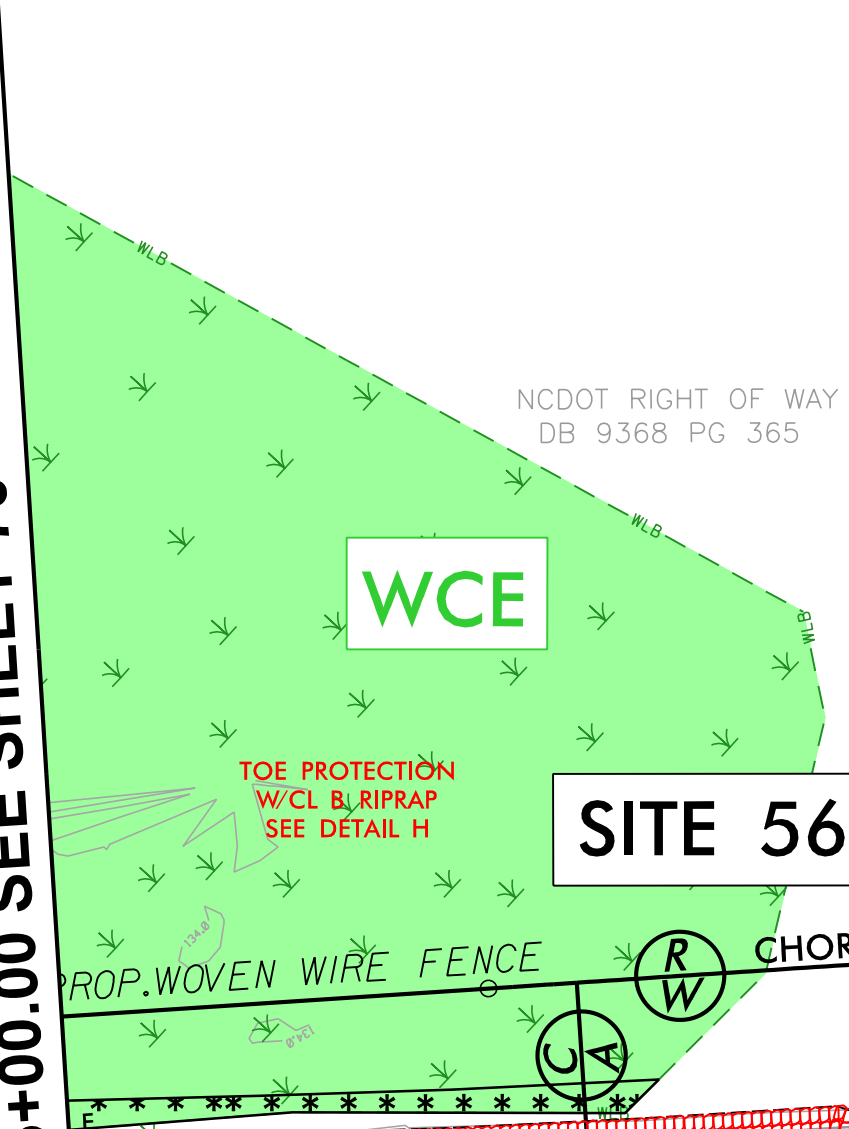
P: (919) 978-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99

8/1/2020
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section\1\I-5986A-hyd_4B_psh71_CDN.dgn
R:\Hydraulics\PERMITS\Environmental\Drawings\4B\Section\1\I-5986A-hyd_4B_psh71_CDN.dgn

MATCHLINE -Y5B- STA. 15+00.00 SEE SHEET 70

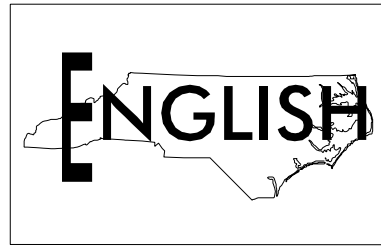


SITE 56

END CONSTRUCTION
-Y5B- POC Sta. 18+65.00



PROJECT REFERENCE NO.		SHEET NO.	
I-5986A		71	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 155 OF 163			



..... DENOTES MECHANIZED CLEARING

NOTE: ALL DRIVES ARE 16' WIDE WITH 10' RADII UNLESS OTHERWISE NOTED

FOR -Y5B- PROFILE SEE SHT. 159
FOR DITCH DETAILS SEE SHTS. 2D-1 THRU 2D-2

RK&K
P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-LSB- 61+50 LT	Rip Rap Outlet Pad - DC						0.001	<0.01	8	10	
2	-LSB- 72+00 RT	Channel work at exist culvert inlet - SV-2, WCB	0.003	0.038				0.001	0.007	5	41	
2	-LNB- 71+75 LT	Channel work at exist culvert outlet - SV-1						0.008	0.010	19	19	
3		Channel work at exist culvert inlet - WB, Reese Creek										
3	-YRPA- 14+00 to -LSB- 95+85 LT	Channel work at exist culvert outlet - WA, Reese Creek	0.091	0.025		0.019		0.014	0.012	17	10	
4	-LSB- 101+16 LT	30" WSP, Channel work inlet - SA, WC	0.001	0.033				0.006	0.001	35	10	
	-LSB- 98+76 LT	Rip Rap Outlet Pad - WA	0.002	0.027								
5	-YINB- 32+80 RT	Rip Rap Outlet Pad - WB	0.009	0.034								
6	-YINB- 39+39 LT	36" WSP HW inlet - WD	<0.001	0.039								
6	-YINB- 38+02 RT	36" WSP, Rip Rap Outlet Pad - WB	0.004	0.050								
7	-L- 92+02 to 100+05 LT	Roadway Cut Slope - WH	0.231									
8	-L- 90+87 RT	Ditch - WE			0.024							
9	-L- 94+37 to 100+20 RT	Ditch, Roadway Fill - WF	0.135		0.021							
9	-L- 100+08 RT	Channel Change - SB						0.011	0.001	60	10	
TOTALS*:			0.48	0.25	0.04	0.02	0.00	0.04	0.03	144	100	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
10	-L- 108+26 to 114+34 LT	Prop Roadway Cut - WI	0.076									
11	-L- 118+98 to 133+53 LT	Prop Roadway Fill - WJ, WK	0.574			0.013						
12	-L- 121+32 to 127+67 RT	Prop Roadway Fill - WL	0.197			0.143						
12	-L- 121+46 RT	Ditch Outfalls - WL		0.066	0.020							
13	-L- 186+79 to 188+17 LT	Prop Roadway Fill - WR	0.020			0.013						
14	-L- 191+87 to 193+24 LT	Ditch Outfall - WR		0.0205		0.001						
15	-L- 192+05 RT	Plug and Fill of Existing Outlet - WO	0.005	0.0055		0.006						
15	-Y5RPC- 14+88 to 19+82 RT	Prop Roadway Fill - WO	0.084			0.143						
15	-Y5RPC- 17+65 RT	Rip Rap Outlet - WO, BASW	0.022					0.018		60		
15	-Y5RPC- 18+50 RT	15" CSP - WO	0.001									
15	-Y4- 40+69 to 43+01 LT	Prop Roadway Fill - WO	0.019			0.053						
16	-Y4- 37+33 LT	54" WSP HW Inlet - WO	<0.001	0.040								
16	-Y4- 36+05 RT	Rip Rap Outlet - WN, BASW	0.005	0.026				0.001	0.015	16	48	
16	-Y4- 40+32 to 42+06 RT	Prop Roadway Fill - WN	0.036			0.044						
TOTALS*:			1.04	0.16	0.02	0.42	0.00	0.02	0.02	76	48	0

*Rounded totals are sum of actual impacts

NOTES:

Sites 15, 16, & 18: Baker Swamp

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
17	-L- 199+16 to 200+49 LT	Prop Roadway Fill - WQ	0.057			0.072						
17	-L- 201+67 LT	Rip Rap Outlet Pad - WQ	0.002	0.009								
18	-L- 198+56 to 202+76 RT	Prop Roadway Fill - WP	0.106	0.0016		0.066						
18	-L- 199+43 RT	Rip Rap Pad - WP, BASW	0.004					0.010	0.004	51	11	
18	-Y5- 99+16 LT	66" WSP, Rip Rap Pad - WP, BASW	0.001	0.004				0.007	0.012	22	28	
19	-Y5LPD- 37+73 to 40+14 LT & RT	Roadway Fill - WH**, WCG	0.857									
19	-Y5LPD- 38+00 RT	Rip Rap Pad Outlet - WH, WCG	<0.001									
20	-Y5LPD- 22+86 to 24+53 LT & RT	Prop Roadway Fill - WX	0.402			0.033						
21	-Y5RPD- 14+97 to 18+86 RT	Prop Roadway Fill - WV	0.225			0.020						
22	-Y5FLY- 57+08 to 62+55 LT & RT	Prop Roadway Fill - WW	1.820			0.145						
22	-Y5LPD- 21+10 LT	Rip Rap Pad Outlet - WV, WW	0.002									
22	-Y5LPD- 18+96 to 21+42 LT & RT	Prop Roadway Fill - WV	0.762			0.056						
23	-L- 252+34	2 @ 8'x8' RCBC - SC-1, SC-2						0.011		39		
23	-L- 252+34	Bank Stabilization - SC-1, SC-2						0.052	0.006	232	38	
TOTALS*:			4.24	0.01	0.00	0.39	0.00	0.08	0.02	343	77	0

*Rounded totals are sum of actual impacts

NOTES:

** Site 19: Area shown in impact table is a total take. Actual impact area is 0.6257 acres.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
24	-L- 304+15	3 @ 10'x7' RCBC - SD-1, SD-2	0.007					0.026	0.002	43		
24	-L- 304+15	Bank Stabilization - SD-1, SD-2	0.047	0.030		0.004		0.062	0.091	86	112	
24	-L- 300+87 to 304+48 LT	Prop Roadway Fill, Rip Rap Pad Outlet - WZ	0.025			0.049						
24	-L- 302+17 RT	Ditch Outfall - WY		0.0053								
24	-L- 307+25 RT	Ditch Outfall - WY		0.0046								
	-L- 306+50 LT	Ditch Outfall - WY		0.0104								
25	-L- 355+00	10'x7' RCBC - SE						0.001		12		
25	-L- 355+00	Bank Stabilization - SE-1, SE-2, WAB	0.002	0.002				0.016	0.003	123	25	
25	-L- 357+75 RT	Ditch Outfall - WAB		0.008								
26	-Y7RPC- 17+51 to 24+28 Lt & RT	Prop Roadway Fill - WAC	0.651			0.150						
26	-Y7RPC- 19+53 RT	15" RCP, Rip Rap Pad Outlet - WAC	<0.001	0.005								
26	-Y7RPC- 23+59 RT	Rip Rap Pad Outlet - WAC	0.002	0.008								
27	-Y7RPA 16+97 RT to -L- 392+99 LT	Prop Roadway Fill - WAF	0.284									
28	-SR3 - 34+13 to 35+87 LT	Prop Roadway Fill - WAG	0.044			0.038						
28	-SR3 - 34+17 LT	30" RCP, Rip Rap Pad Outlet - WAG	0.003	0.005								
29	-L- 405+65 LT	Rip Rap Pad Outlet, Ditch Outfall - WAH	0.027	0.009								
30	-L- 422+50	12'x6' RCBC - WAK, WAI	0.022									
30	-L- 422+50	Bank Stabilization - SF, WAK, WAI	0.092	0.078		0.003		0.031	0.003	103	8	
30	-L- 424+00 to 437+00LT	Prop Roadway Fill - WAK	0.606			0.014						
30	-L- 422+75 to 437+25RT	Prop Roadway Fill - WAI	0.493		0.013	0.037						
30	-L- 425+50 LT	Ditch Outfall - WAK		0.007								
TOTALS*:			2.30	0.17	0.01	0.29	0.00	0.13	0.10	367	145	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
31	-L- 508+50 to 509+37 LT	Prop Roadway Cut - WAM	0.042			0.019						
32	-L- 522+79 to 525+21 LT	Prop Roadway Fill - WAN	0.112			0.110						
33	-L- 540+45	8'x8' Culvert - SG-1, SG-2, SG-3						0.021		52		
33	-L- 540+45	Bank Stabilization - WAP, SG-1, SG-2, SG-3		0.035				0.028	0.013	174	69	
33	-L- 539+30 LT	Ditch Outfall - WAQ		0.005								
34	-L- 574+64	10'x7' RCBC - SH-1, SH-2						0.007		43		
34	-L- 574+76	Bank Stabilization - SH-1, SH-2, WAS		0.018		0.002		0.027	0.004	143	30	
34	-L- 574+76 LT	Ditch Outfall - WAS		0.008								
35	-L- 602+70 to 606+71 LT	Prop Roadway Fill - WAT	0.016	0.0052		0.044						
36	-L- 618+01 to 618+41 RT	Ditch Inlet- WAU				0.007						
37	-L- 625+87 LT	72" RCP, Channel Work, Inlet - SI-1, WAW		0.006				0.002	0.002	12	15	
37	-L- 622+64 to 626+94 LT	Prop Roadway Fill - WAW	0.174			0.103						
37	-L- 626+44 RT	72" RCP, Channel Work, Outlet - SI-1, WAV	0.007	0.023				0.005	0.002	34	10	
37	-L- 625+67 to 627+42 RT	Prop Roadway Fill - WAV	0.046	0.0065		0.033						
38	-L- 640+26 to 640+69 RT	Ditch Outfall - WAX		0.006								
TOTALS*:			0.40	0.11	0.00	0.32	0.00	0.09	0.02	457	124	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
39	-L- 642+88	7'x7' RCBC - SJ-1, SJ-2						0.004		15		
39	-L- 642+88	Bank Stabilization - SJ-1, SJ-2						0.022	0.008	85	40	
40	-L- 660+10 to 660+35 RT	2 @ 30" RCP - WAY	<0.001	<0.01								
41	-L- 667+00 LT	Ditch Outfall- WAZ		0.011		0.002						
42	-L- 678+00	Bridge Construction - BR, WAZ		0.030	0.120			0.066	0.001	230	10	
42	-L- 678+00	Temp Causeway -BR							0.169		157	
42	-L- 670+00 to 675+90 RT	Roadway Fill- WAZ, BR	0.005	0.003		0.038		0.036	0.023	20	10	
42	-L- 679+75 to 684+85 RT	Roadway Fill- WAZ, BR	0.235	0.0035		0.061		0.075	0.062			
43	-L- 692+28 to 694+59 RT	Prop Roadway Fill - WAZ	0.090			0.053						
44	-L- 695+04 to 695+33 LT	Ditch Outfall - WAZ		0.008								
45	-L- 730+02 to 731+46 LT	EL WS - WBB				0.017						
46	-L- 735+85 to 736+57 LT	Plug and Fill Exist. 30" - WBC	0.004			0.015						
47	-L-766+40	72" RCP - SK-1, SK-2						0.009		18		
47	-L-766+40	Bank Stabilization - SK-1, SK-2						0.052	0.007	139	25	
TOTALS*:			0.33	0.06	0.12	0.19	0.00	0.26	0.27	508	85	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
48	-Y5- 38+00 to 38+86 LT	Rip Rap Pad Outlet - WCK	<0.001			0.022						
49	-Y5- 45+24	Culvert Extension Inlet - SY-2						0.010	0.031	15	53	
50	-Y5- 55+67 to 56+63 LT	Prop Roadway Fill - WCJ	0.010			0.044						
50	-Y5- 56+00 LT	Rip Rap Pad Outlet - WCJ	<0.001									
51	-Y5- 60+52 to 65+06 LT	Prop Roadway Fill - WCI	0.114			0.105						
51	-Y5- 60+70 LT	Rip Rap Pad Outlet - WCI	<0.001	0.003								
52	-Y5- 64+28 to 64+53 RT	Ditch Outfall - WT	0.002	0.003								
53	-Y5RPA- 48+78 to 54+38 LT	Prop Roadway Fill - WU	0.264			0.121						
53	-Y5RPA- 48+78 LT	Rip Rap Pad Outlet - WU	0.001	0.004								
53	-Y5RPA- 51+67 LT	Rip Rap Pad Outlet - WU	0.002	0.025								
54A	-Y4- 16+88 LT	Pipe Clean Out - WS		0.075								
54B	-Y4- 19+00 LT	Pipe Clean Out - WS		0.005								
54C	-Y4- 21+67 LT	Pipe Clean Out - WS		0.005								
55	-Y5C- 12+74 to 17+68 RT	Prop Roadway Fill - WCE	0.635			0.220						
56	-Y5B- 12+31 to 16+53 LT	Prop Roadway Fill - WCE	0.013			0.065						
TOTALS*:			1.04	0.12	0.00	0.58	0.00	0.01	0.03	15	53	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
57	-L-403+25 LT	Plug & Fill Exist. 18" RCP - WAG		0.002								
TOTALS for SHEET 1:			0.48	0.25	0.04	0.02	0.00	0.04	0.03	144	100	0
TOTALS for SHEET 2:			1.04	0.16	0.02	0.42	0.00	0.02	0.02	76	48	0
TOTALS for SHEET 3:			4.24	0.01	0.00	0.39	0.00	0.08	0.02	343	77	0
TOTALS for SHEET 4:			2.30	0.17	0.01	0.29	0.00	0.13	0.10	367	145	0
TOTALS for SHEET 5:			0.40	0.11	0.00	0.32	0.00	0.09	0.02	457	124	0
TOTALS for SHEET 6:			0.33	0.06	0.12	0.19	0.00	0.26	0.27	508	85	0
TOTALS for SHEET 7:			1.04	0.12	0.00	0.58	0.00	0.01	0.03	15	53	0
TOTALS for SHEET 8:			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS for ALL SHEETS:			9.83	0.88	0.20	2.20	0.00	0.64	0.49	1911	632	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/1/2020
Cumberland / Harnett Counties
I-5986 / I-5877