

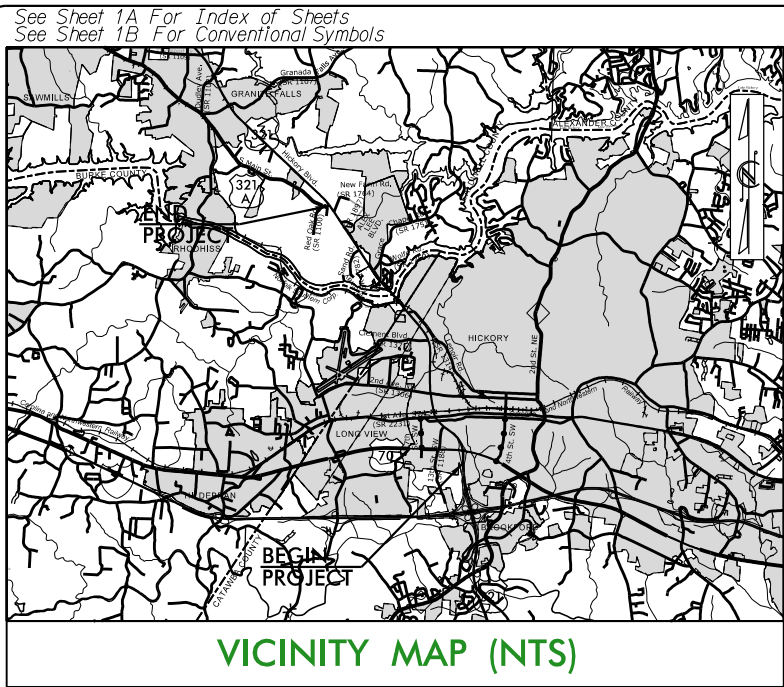
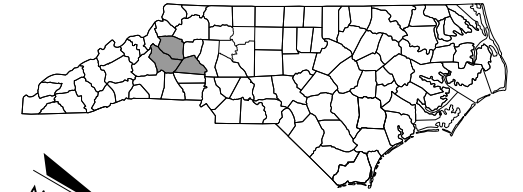
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4700A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35993.1.1	NHF-321(18)	PE	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**BURKE, CALDWELL,
& CATAWBA COUNTIES**

LOCATION: US 321 WIDENING IMPROVEMENTS FROM US 70 IN HICKORY TO JUST SOUTH OF US 321A /NEW FARM RD.

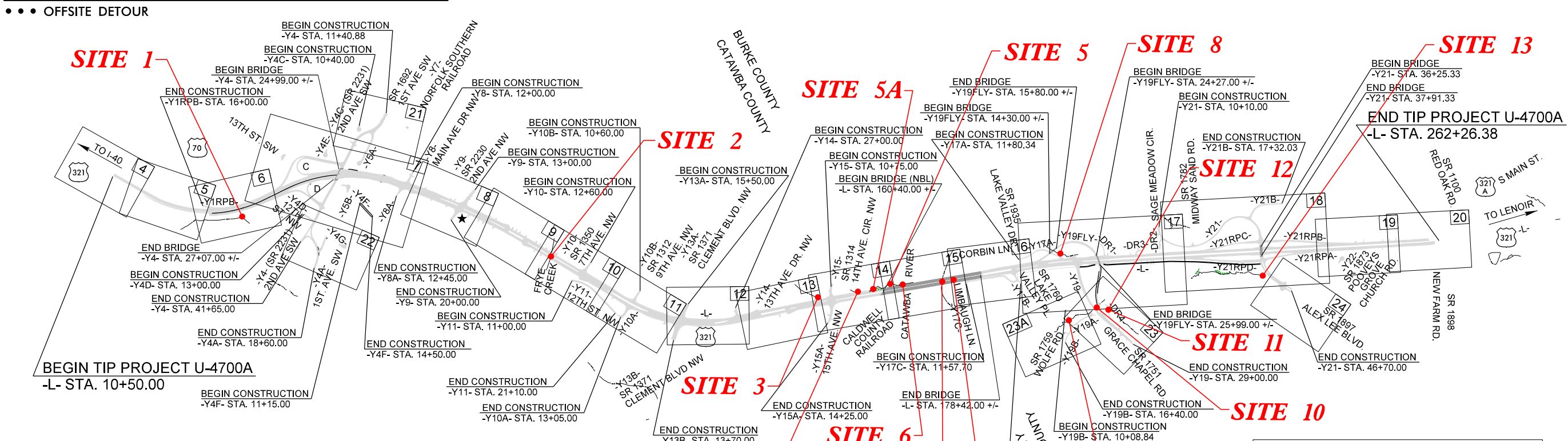
TYPE OF WORK: GRADING, PAVING, WIDENING, DRAINAGE, CULVERTS, SIGNING, STRUCTURES, RETAINING WALL, SIGNALS, & UTILITIES



VICINITY MAP (NTS)

WETLAND AND STREAM IMPACTS

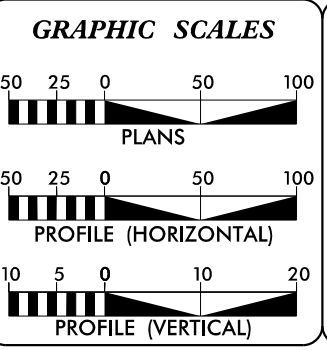
TIP PROJECT: U-4700A



- NOTES:
 1. THIS PROJECT IS PARTIALLY WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF HICKORY.
 2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD
 3. THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS. ★ TRAFFIC SIGNAL

PERMIT DRAWING
SHEET 1 OF 36

CONTRACT:



DESIGN DATA
 ADT 2021 = 50,135
 ADT 2041 = 57,490
 V = 60 MPH
 DHV = 9%
 D = 60%
 T = 8% *
 (* TTST = 4% /* DUAL = 4%)
 FUNC CLASS = ARTERIAL STATEWIDE TIER
 DESIGN EXCEPTIONS AS NOTED ON PLANS

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4700A..... 4.427 miles
 LENGTH STRUCTURE TIP PROJECT U-4700A..... 0.341 miles (NBL)
 TOTAL LENGTH OF PROJECT U-4700A..... 4.768 miles

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

PLANS PREPARED BY:

P: (919) 878-9560
 900 Ridgeway 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

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY DATE: June 19, 2019
 LETTING DATE: August 18, 2021

Brandon McInnis, P.E.
PROJECT ENGINEER

Matthew Lamy, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

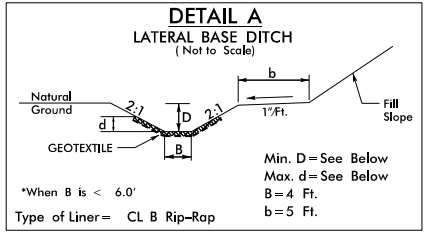
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

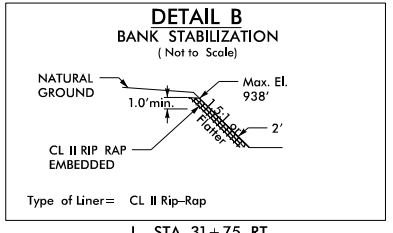
2018 STANDARD SPECIFICATIONS

NCDOT DIVISION 12

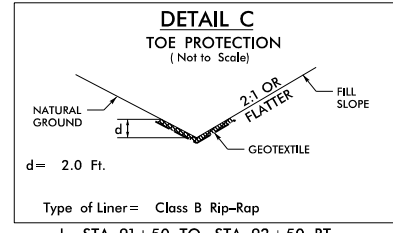
CONTACT: Bryan Sowell, P.E.



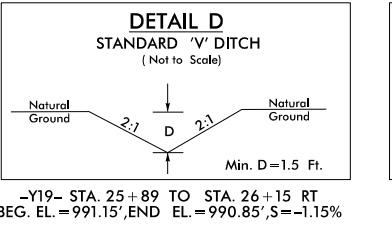
- Y21- STA. 14+00 TO STA. 14+50 RT, D=1.0'
- Y21B- STA. 14+00 TO STA. 16+00 RT, D=1.5'
- Y4RPC- STA. 22+50 TO STA. 23+00 RT, D=1.0'
- YY_DET- STA. 27+45 TO STA. 29+25 RT, D=1.0'



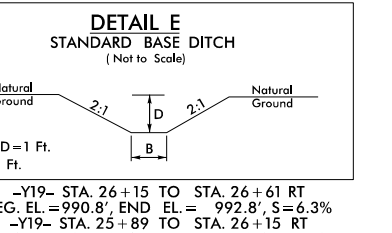
- L- STA. 31+75 RT
- L- STA. 35+42 TO STA. 35+73 RT
- L- STA. 162+79 TO STA. 164+44 LT
- L- STA. 175+05 TO STA. 177+35 LT / RT
- Y21- STA. 42+47 RT



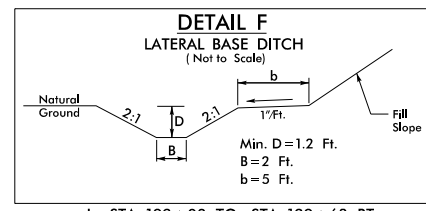
- L- STA. 91+50 TO STA. 92+50 RT
- L- STA. 96+22 TO STA. 96+72 LT
- L- STA. 98+00 TO STA. 101+50 RT
- L- STA. 98+21 TO STA. 99+50 LT
- L- STA. 204+76 TO STA. 205+32 RT
- Y4RPC- STA. 12+90 TO STA. 17+42 LT
- Y4RPC- STA. 23+50 TO STA. 26+60 LT
- Y4- STA. 13+98 TO STA. 15+31 LT
- Y5A- STA. 10+53 TO STA. 11+49 LT
- Y7- STA. 126+45 TO STA. 127+70 LT
- Y7- STA. 131+15 TO STA. 132+50 RT
- Y17A- STA. 18+50 TO STA. 19+50 RT
- Y19- STA. 21+50 TO STA. 22+50 RT
- Y19A- STA. 15+80 TO STA. 17+00 RT
- Y19A- STA. 12+64 TO STA. 13+65 LT
- Y19FLY- STA. 12+00 TO STA. 13+25 LT
- Y19FLY- STA. 13+93 TO STA. 14+37 RT
- Y19FLY- STA. 18+30 TO STA. 18+50 RT
- Y19A- STA. 15+58 TO STA. 16+14 LT
- Y19A- STA. 16+77 TO STA. 17+53 LT
- Y19A- STA. 12+52 TO STA. 14+00 LT
- Y19A- STA. 12+00 TO STA. 12+40 LT
- Y19A- STA. 16+50 TO STA. 17+50 LT
- Y19A- STA. 14+50 TO STA. 15+32 RT
- Y19A- STA. 15+81 TO STA. 16+78 RT
- Y19B- STA. 10+49 TO STA. 10+94 LT
- Y21- STA. 12+80 TO STA. 14+00 RT
- Y21- STA. 39+20 TO STA. 42+50 LT
- Y21- STA. 42+75 TO STA. 43+85 RT
- Y21RPA- STA. 20+00 TO STA. 20+60 LT
- Y19FLY- STA. 27+40 TO STA. 28+00 RT
- Y7_DET- STA. 31+46 TO STA. 32+44 RT



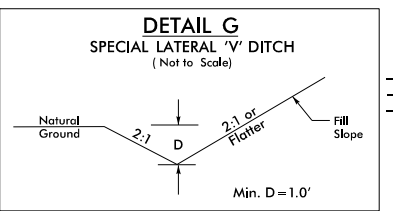
- Y19- STA. 25+89 TO STA. 26+15 RT
- BEG. EL.=991.15', END EL.=990.85', S=-1.15%



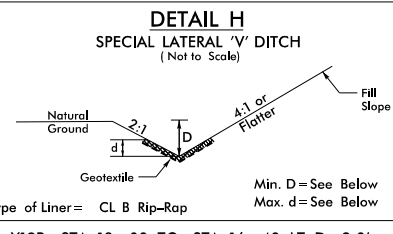
- Y19- STA. 26+15 TO STA. 26+61 RT
- BEG. EL.=990.8', END EL.=992.8', S=6.3%
- Y19- STA. 25+89 TO STA. 26+15 RT
- BEG. EL.=991.2', END EL.=990.8', S=1.15%
- Y19FLY- STA. 14+25 TO STA. 14+63 LT
- BEG. EL.=953.0', END EL.=949.5', S=9.2%
- L- STA. 244+50 LT; BEG. EL.=1112.5', END EL.=1112.0', L=30', S=1.7%



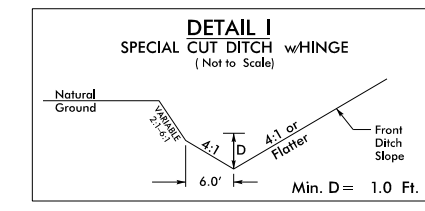
- L- STA. 199+00 TO STA. 199+63 RT
- L- STA. 155+00 TO STA. 158+00 LT
- L- STA. 159+00 TO STA. 162+00 LT
- L- STA. 199+00 TO STA. 199+63 RT
- L- STA. 240+00 TO STA. 241+50 RT
- Y7- STA. 127+50 TO STA. 128+00 RT
- Y17A- STA. 15+50 TO STA. 17+00 RT, B=8'
- Y19FLY- STA. 26+00 TO STA. 26+50 RT
- Y21- STA. 32+00 TO STA. 34+65 LT
- Y21- STA. 21+50 TO STA. 23+00 RT
- Y4RPC- STA. 20+50 TO STA. 23+00 LT
- Y19FLY- STA. 26+05 TO STA. 26+50 RT



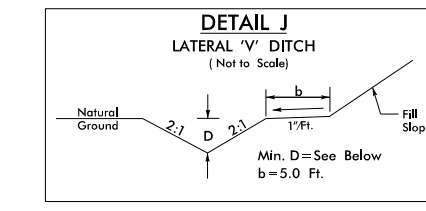
- Y9- STA. 18+35 TO STA. 19+20 RT
- Y13A- STA. 17+50 TO STA. 18+25 RT
- L- STA. 125+00 TO STA. 127+00 LT
- Y19A- STA. 14+00 TO STA. 14+50 LT
- Y19B- STA. 11+00 TO STA. 13+00 LT, D=2.0'
- Y19B- STA. 13+50 TO STA. 16+40 LT, D=2.0'
- Y13A- STA. 17+50 TO STA. 18+25 RT
- L- STA. 125+00 TO STA. 127+00 LT



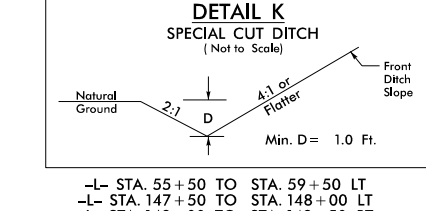
- Y19B- STA. 13+00 TO STA. 16+40 LT, D=2.0'
- L- STA. 194+00 TO STA. 194+65 RT, D=1.0'
- L- STA. 124+50 TO STA. 125+00 LT, D=1.0'



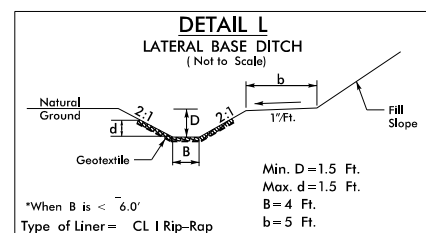
- L- STA. 132+00 TO STA. 133+00 LT
- L- STA. 188+50 TO STA. 191+00 RT
- Y19- STA. 12+00 TO STA. 14+00 RT



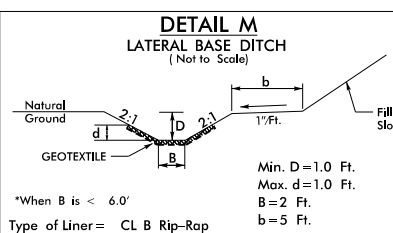
- Y19- STA. 11+20 TO STA. 12+00 RT, D=1.0'
- Y19FLY- STA. 27+50 TO STA. 29+50 RT, D=1.0'
- L- STA. 194+65 TO STA. 196+00 RT, D=1.25'
- Y21- STA. 26+00 TO STA. 29+25 RT, D=1.25'
- Y4- STA. 16+25 TO STA. 19+50 LT, D=1.25'
- L- STA. 43+50 TO STA. 44+50 RT, D=1.0'
- L- STA. 45+50 TO STA. 46+50 RT, D=1.0'
- Y4LPD- STA. 12+35 TO STA. 13+00 LT, D=1.0'
- Y19- STA. 11+20 TO STA. 12+00 RT, D=1.0'
- Y7_DET- STA. 30+86 TO STA. 31+45 RT, D=1.0'



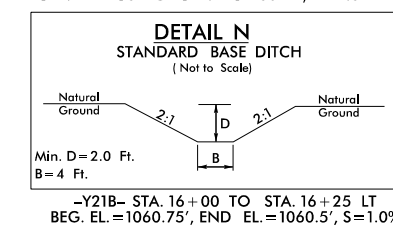
- L- STA. 55+50 TO STA. 59+50 LT
- L- STA. 147+50 TO STA. 148+00 LT
- L- STA. 149+00 TO STA. 149+50 RT
- L- STA. 187+50 TO STA. 189+00 LT
- L- STA. 183+00 TO STA. 184+00 RT
- Y19- STA. 15+50 TO STA. 16+50 LT
- Y19A- STA. 11+00 TO STA. 12+00 LT
- Y21- STA. 23+50 TO STA. 24+00 RT
- Y21- STA. 25+00 TO STA. 25+50 RT
- Y21- STA. 10+00 TO STA. 10+50 LT
- Y22- STA. 10+75 TO STA. 11+50 LT
- Y4LPC- STA. 16+45 TO STA. 17+20 LT, D=1.2'
- DR1- STA. 10+50 TO STA. 11+50 LT
- DR1- STA. 10+50 TO STA. 11+50 RT
- DR4- STA. 10+39 TO STA. 11+00 LT



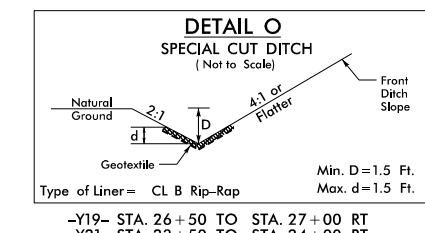
- Y4- STA. 39+33 TO STA. 39+75 LT
- Y4A- STA. 12+56 TO STA. 13+55 RT



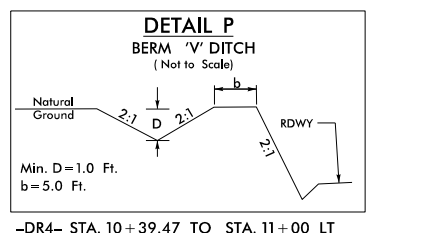
- Y7- STA. 127+00 TO STA. 128+00 RT
- Y19- STA. 16+50 TO STA. 18+00 LT
- Y19- STA. 17+00 TO STA. 18+50 RT
- Y19FLY- STA. 30+00 TO STA. 32+50 RT
- Y4RPC- STA. 18+65 TO STA. 20+50 LT



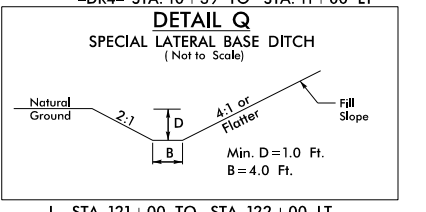
- Y21B- STA. 16+00 TO STA. 16+25 LT
- BEG. EL.=1060.75', END EL.=1060.5', S=1.0%



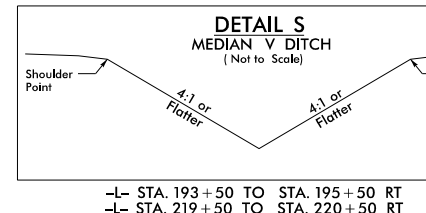
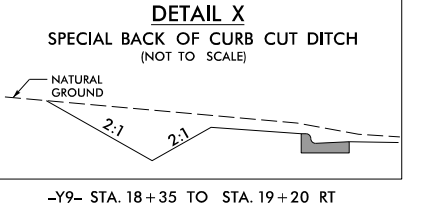
- Y19- STA. 26+50 TO STA. 27+00 RT
- Y21- STA. 23+50 TO STA. 24+00 RT
- Y21- STA. 10+00 TO STA. 11+50 RT



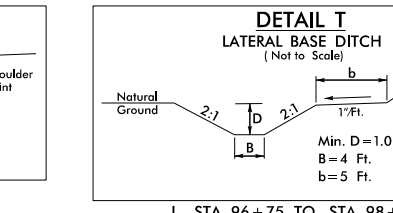
- DR4- STA. 10+39.47 TO STA. 11+00 LT
- L- STA. 61+50 TO STA. 62+00 LT
- L- STA. 199+00 TO STA. 199+50 RT
- Y19A- STA. 11+00 TO STA. 12+00 LT
- Y21- STA. 23+50 TO STA. 26+00 RT
- Y4A- STA. 11+40 TO STA. 14+00 LT
- Y4- STA. 33+00 TO STA. 38+00 LT
- Y4A- STA. 27+50 TO STA. 30+60 LT
- Y4LPD- STA. 14+89 TO STA. 16+39 LT, D=1.0'



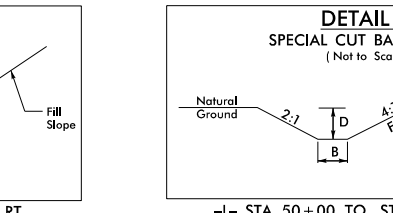
- L- STA. 121+00 TO STA. 122+00 LT
- Y13A- STA. 17+00 TO STA. 17+50 RT



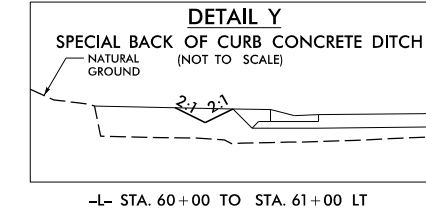
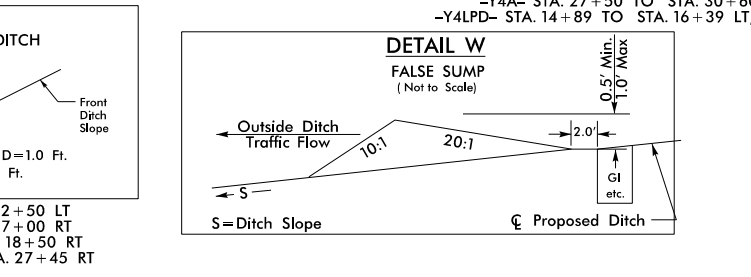
- L- STA. 193+50 TO STA. 195+50 RT
- L- STA. 219+50 TO STA. 220+50 RT
- L- STA. 221+50 TO STA. 222+50 LT
- L- STA. 236+00 TO STA. 237+00 LT
- Y19- STA. 24+00 TO STA. 24+50 RT



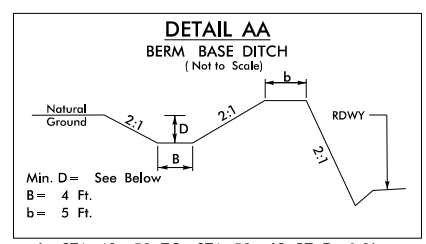
- L- STA. 96+75 TO STA. 98+00 RT
- Y21- STA. 29+25 TO STA. 34+65 RT
- Y21B- STA. 13+00 TO STA. 16+00 LT
- Y17C- STA. 18+50 TO STA. 20+50 RT
- Y4LPC- STA. 14+08 TO STA. 18+93 RT, D=1.5'
- Y4RPC- STA. 18+00 TO STA. 22+50 RT, D=1.5'
- Y4RPC- STA. 23+00 TO STA. 25+50 RT, D=1.5'



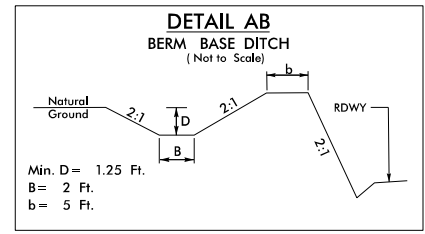
- L- STA. 50+00 TO STA. 52+50 LT
- Y7- 124+50 TO STA. 127+00 RT
- Y17C- STA. 18+00 TO STA. 18+50 RT
- Y7_DET- STA. 25+95 TO STA. 27+45 RT



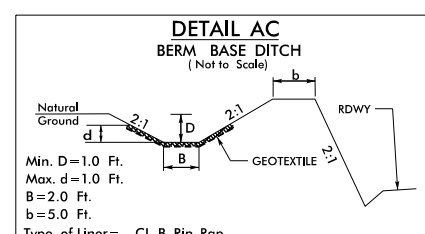
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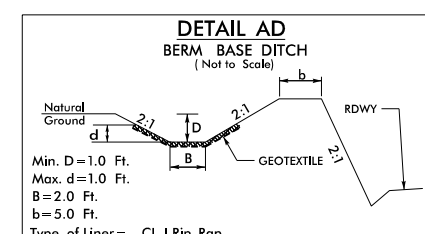
-L- STA. 48+50 TO STA. 50+62 RT, D=1.0'
-L- STA. 61+00 TO STA. 61+65 RT, D=1.3'



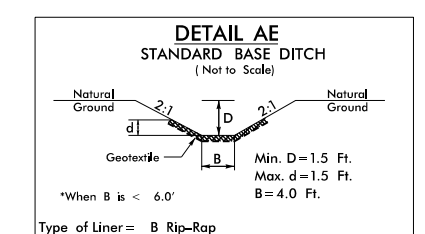
-L- STA. 48+55 TO STA. 50+50 RT
-L- STA. 52+00 TO STA. 54+00 RT
-L- STA. 55+80 TO STA. 57+00 RT
-L- STA. 56+50 TO STA. 57+50 LT
-L- STA. 60+00 TO STA. 61+00 RT
-Y4A- STA. 15+50 TO STA. 17+50 LT



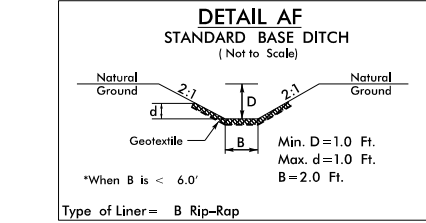
-L- STA. 51+00 TO STA. 52+00 RT
-L- STA. 54+00 TO STA. 55+80 RT
-L- STA. 55+50 TO STA. 56+50 LT
-L- STA. 57+00 TO STA. 59+00 RT



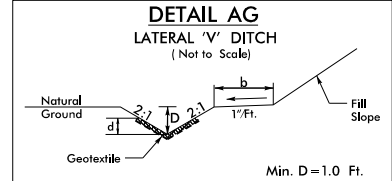
-L- STA. 50+50 TO STA. 51+00 RT
-L- STA. 59+00 TO STA. 60+00 RT



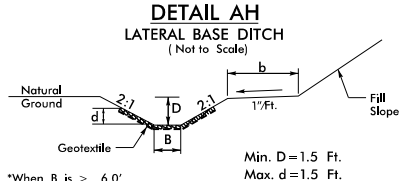
-Y17A- STA. 16+50 LT, L=48'
BEG. EL. = 949.0', END EL. = 947.0', S = 4.76%
-Y4RPC- STA. 18+65 LT, L=84'
BEG. EL. = 1120.0', END EL. = 1119.6', S = 0.48%



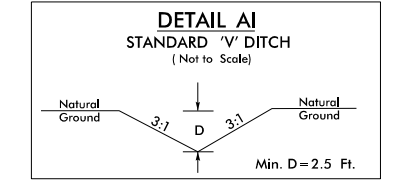
-Y19- STA. 18+50 RT, L=56'
BEG. EL. = 954.7', END EL. = 946.0', S = 15.5%



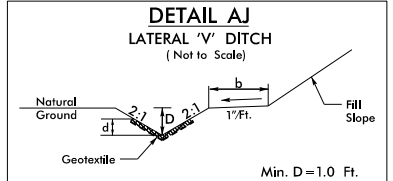
-Y19FLY- STA. 23+00 TO STA. 24+25 LT
-L- STA. 44+50 TO STA. 45+50 RT
-Y4LPD- STA. 13+00 TO STA. 14+89 LT, D = 1.0'



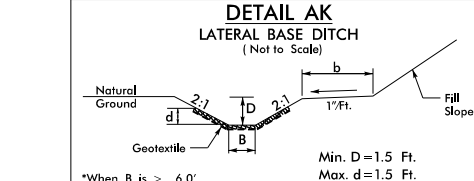
-L- STA. 158+00 TO STA. 161+60 LT



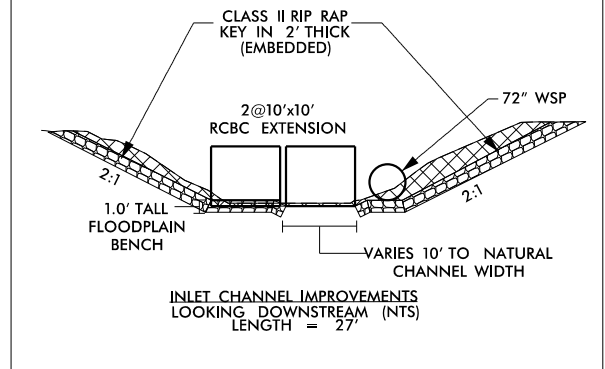
-L- STA. 39+50 TO STA. 41+75 RT
BEG. EL. = 1080.73', END EL. = 1082.2', S = 0.65%



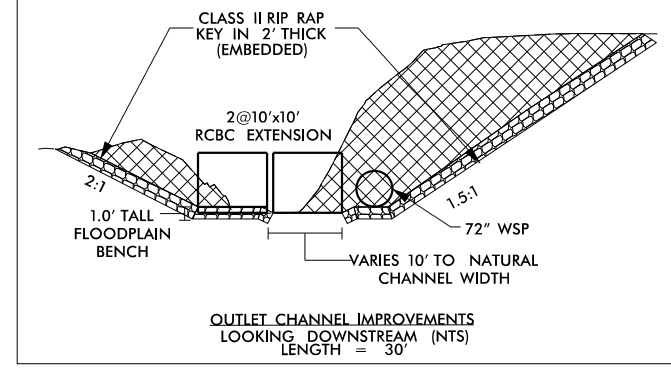
-L- STA. 188+50 TO STA. 189+00 LT, D = 1.0'



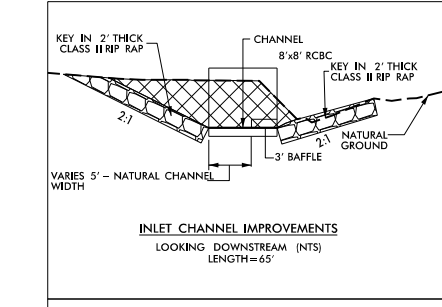
-L- STA. 193+50 TO STA. 198+00 LT



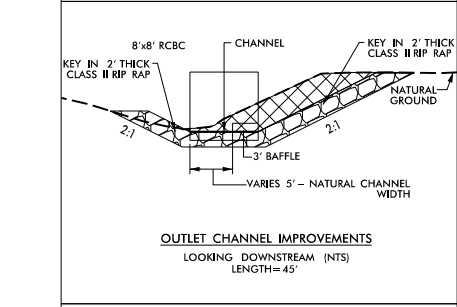
FRYE CREEK INLET CHANNEL IMPROVEMENTS



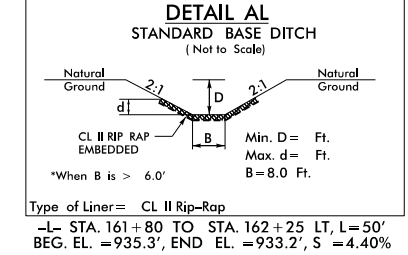
FRYE CREEK OUTLET CHANNEL IMPROVEMENTS



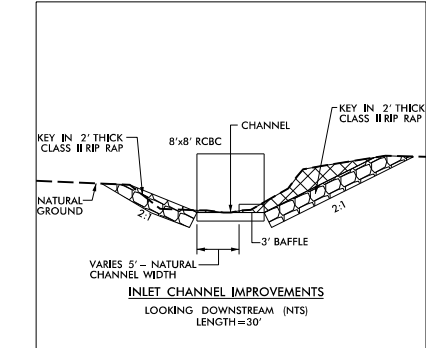
GRACE CHAPEL ROAD INLET CHANNEL IMPROVEMENTS



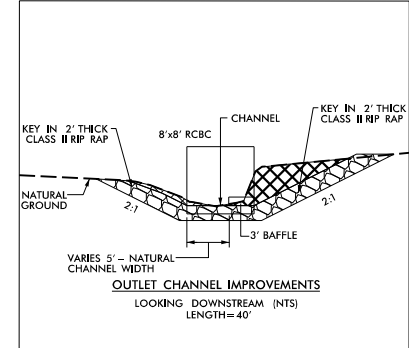
GRACE CHAPEL ROAD OUTLET CHANNEL IMPROVEMENTS



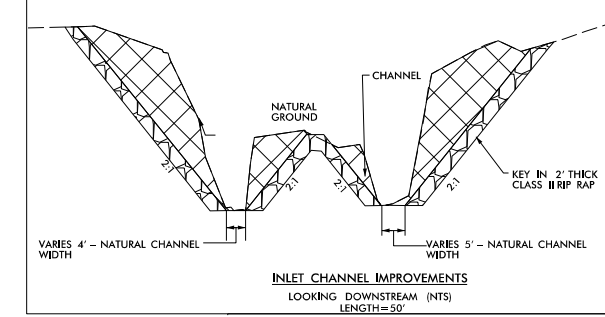
-L- STA. 161+80 TO STA. 162+25 LT, L=50'
BEG. EL. = 935.3', END EL. = 933.2', S = 4.40%



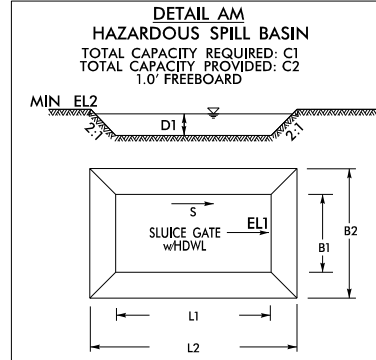
WOLFE ROAD INLET CHANNEL IMPROVEMENTS



WOLFE ROAD OUTLET CHANNEL IMPROVEMENTS

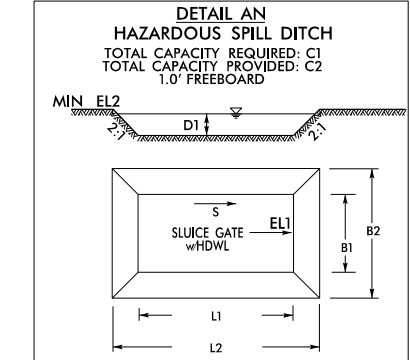


DR4 INLET CHANNEL IMPROVEMENTS



-L- STA. 155+65 RT
C1 = 13015cf
C2 = 15474cf
EL1 = 969.5'
EL2 = 978.0'
D1 = 3.0'
L1 = 160.0'
L2 = 176.0'
B1 = 25.0'
B2 = 41.0'
S = 2.8%

-L- STA. 180+95 LT
C1 = 11143cf
C2 = 13681cf
EL1 = 961.7'
EL2 = 966.7'
D1 = 4.0'
L1 = 95.0'
L2 = 115.0'
B1 = 25.0'
B2 = 45.0'
S = 0.49%



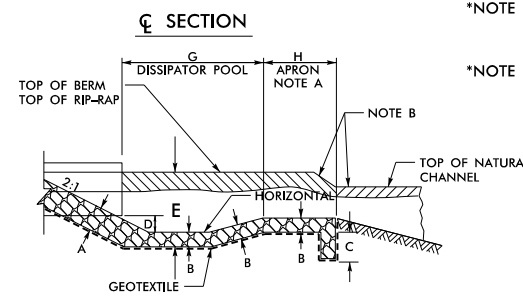
-Y17A- STA. 16+00 LT
C1 = 4748cf
C2 = 4908cf
EL1 = 972.9'
EL2 = 978.5'
D1 = 3.0'
L1 = 110.0'
L2 = 126.0'
B1 = 8.0'
B2 = 24.0'
S = 2.0%

I:\6\2019\Hydro\lics\PERMITS\Environmentals\Drawings\4C\U-4700A_Hyd.prm-Ditch_Detail.dgn

PROJECT REFERENCE NO. U-4700A	SHEET NO. 2D-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

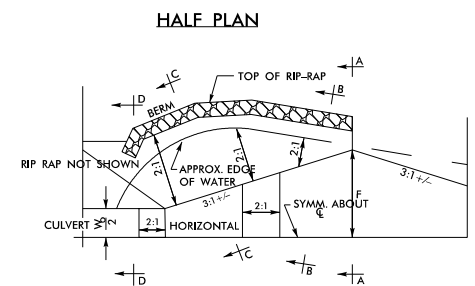
PERMIT DRAWING
SHEET 4 OF 36

DETAIL Z RIP-RAPPED ENERGY DISSIPATOR BASIN



*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A-A SUCH THAT $Q_{des} / (\text{CROSS SECTION AREA AT SEC. A-A}) = \text{SPECIFIED VELOCITY}$.

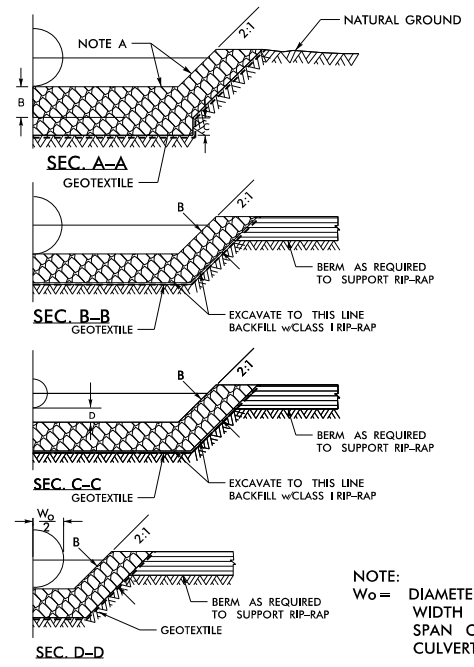
*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	RIP RAP BASIN #							
	1	2	3	4	5	6	7	8
A	2.5							
B	1.5							
C	2.0							
D	1.5							
E	4.5							
F	14.5							
G	24.0							
H	8.0							

BASIN #	LOCATION (AT OUTLET)
1	-161+37 LT
2	
3	
4	
5	
6	
7	
8	

*ALL DIMENSIONS APPROXIMATE IN FT



NOTE:
 $W_0 =$ DIAMETER OF PIPE,
WIDTH OF BOX OR
SPAN OF PIPE-ARCH
CULVERTS

I:\6/2019\PERMITS\Environmenta\Drawings\4\U-4700A-Hyd-prm-Ditch Detail.dgn
R:\Hydro\lics\PERMITS\Environmenta\Drawings\4\U-4700A-Hyd-prm-Ditch Detail.dgn
FKeys

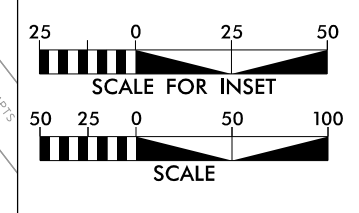
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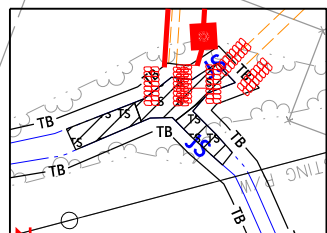
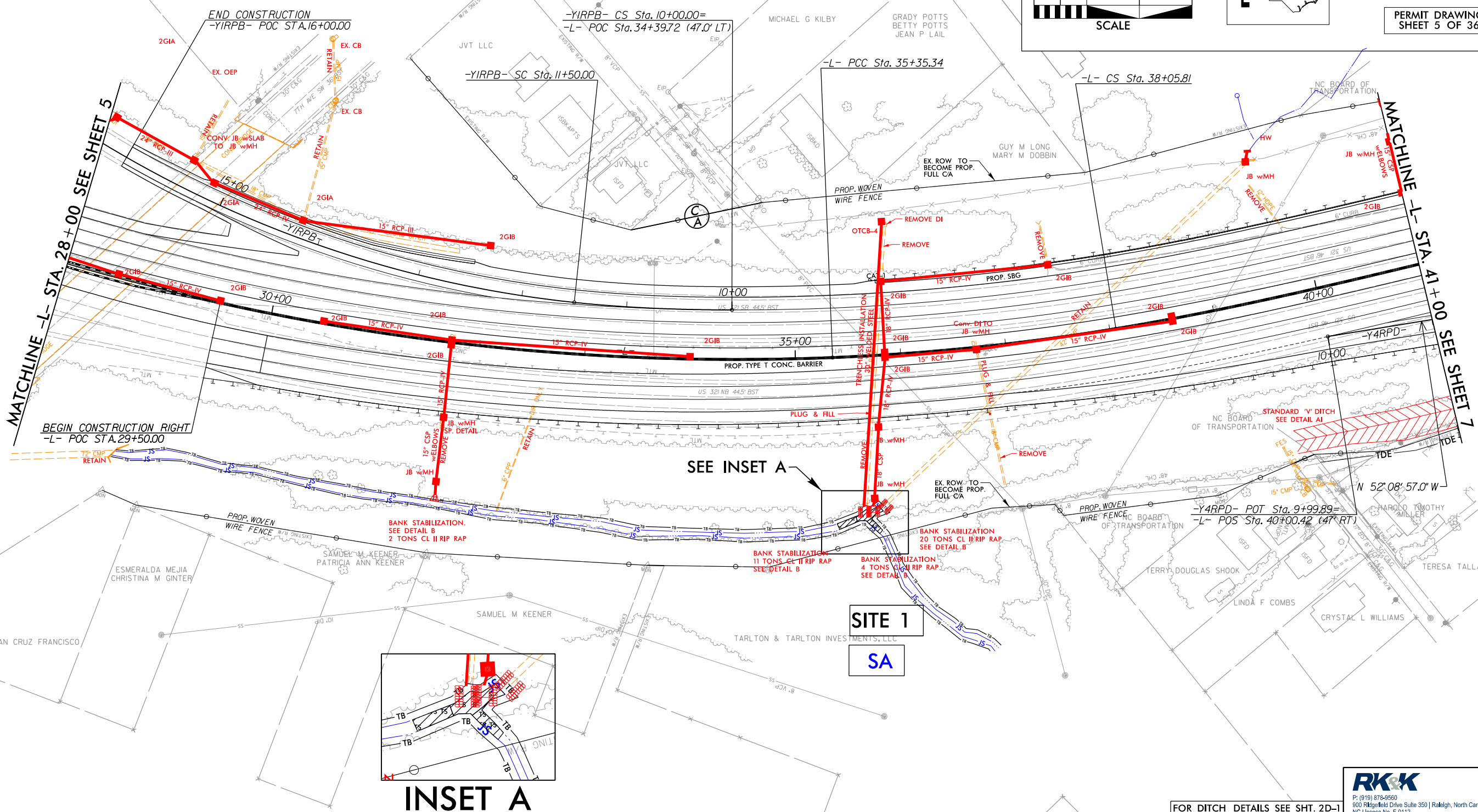
TRAFFIC DIAGRAM			
ADT 2021 6,015 6,850	US 70	21,555 22,555	2,460 2,295
46,225 51,075	US 321	43,795 48,145	7,385 8,895
6,255 7,260	US 70	26,720 29,565	

COUNTY OF CATAWBA

PROJECT REFERENCE NO. U-4700A	SHEET NO. 6
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PERMIT DRAWING
SHEET 5 OF 36



INSET A

SITE 1
SA

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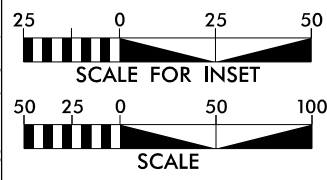
FOR DITCH DETAILS SEE SHT. 2D-1
 FOR -L- PROFILE SEE SHTS. 25A & 26
 FOR -L- RT PROFILE SEE SHTS. 25A & 26
 FOR -YIRPB- PROFILE SEE SHT. 34

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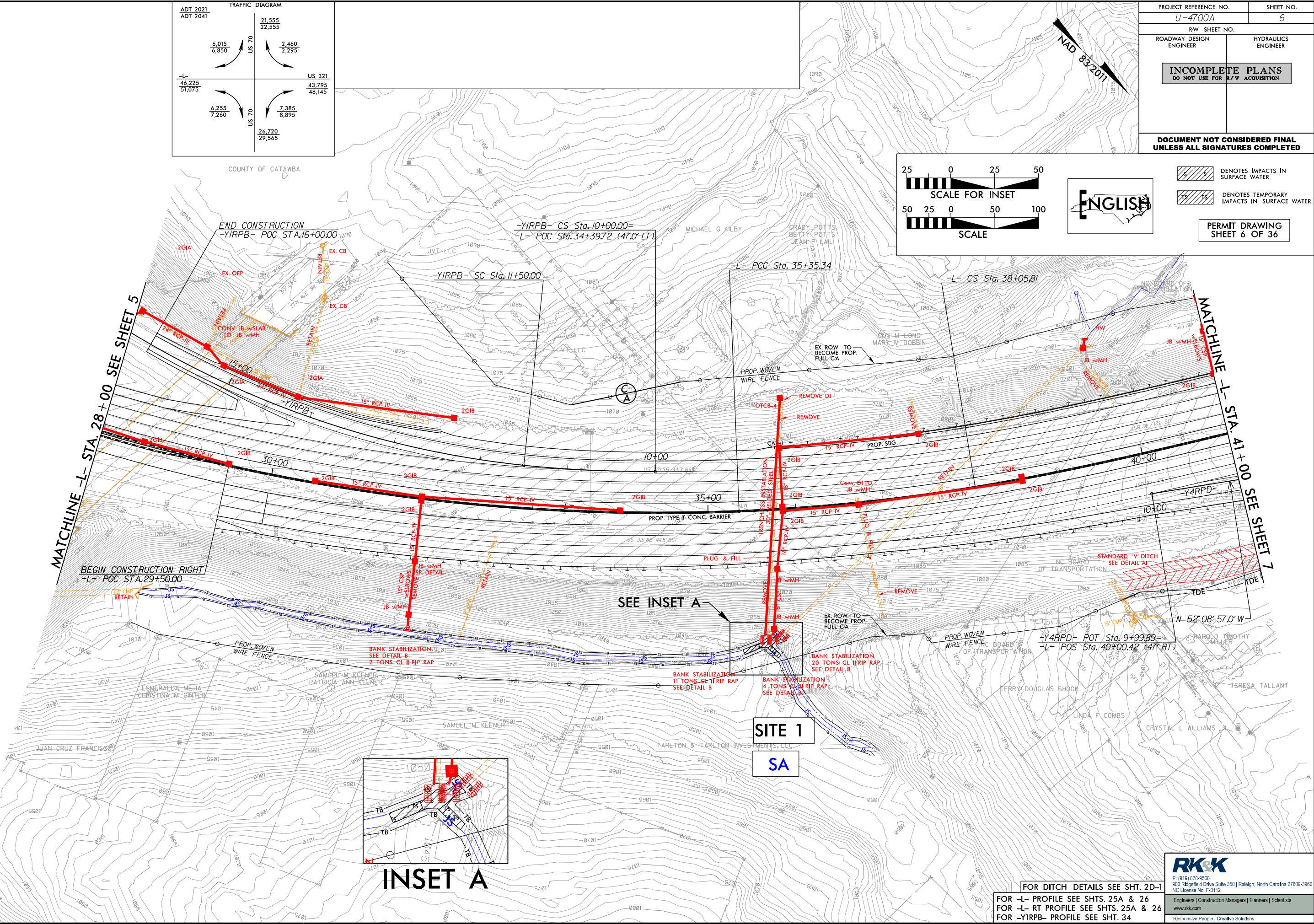
8/17/19

TRAFFIC DIAGRAM			
ADT 2021 6,015	US 70	ADT 2041 21,555	US 321
6,850		2,460	2,295
46,225	US 70	43,795	48,145
51,075		7,385	8,895
6,255	US 70	26,720	29,565
7,260			

PROJECT REFERENCE NO. U-4700A	SHEET NO. 6
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



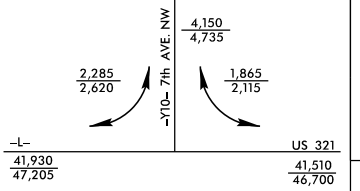
DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PERMIT DRAWING
 SHEET 6 OF 36



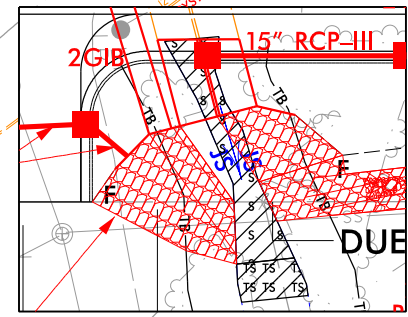
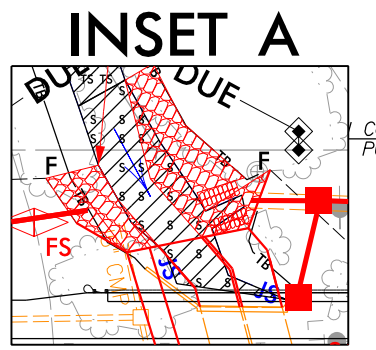
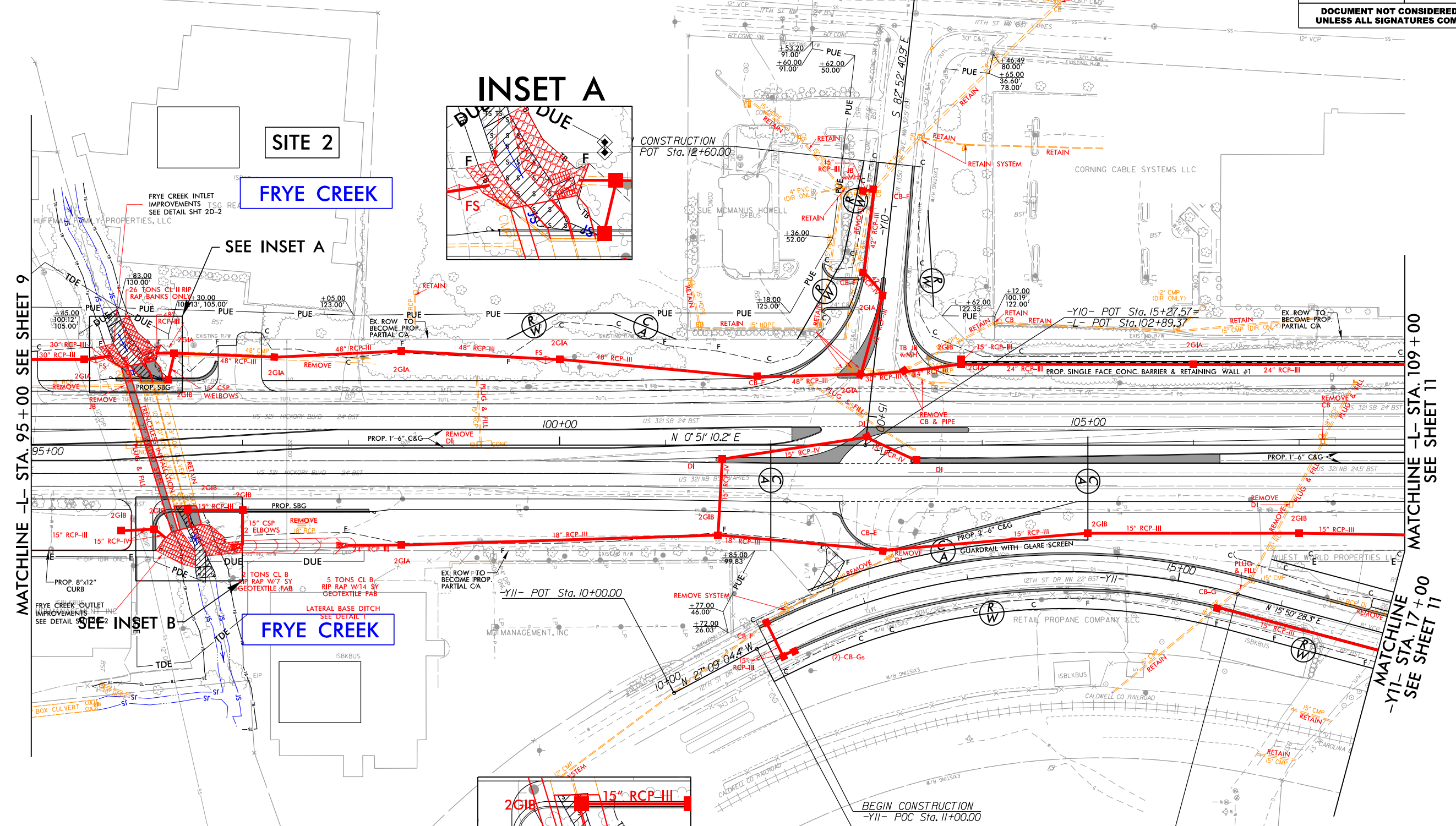
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 8/16/2019
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 FOR -L- PROFILE SEE SHTS. 25A & 26
 FOR -L- RT PROFILE SEE SHTS. 25A & 26
 FOR -YIRPB- PROFILE SEE SHT. 34

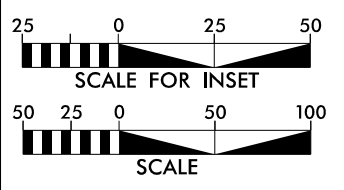


ROADWAY DESIGN ENGINEER	R/W SHEET NO.	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



MATCHLINE -L- STA. 95+00 SEE SHEET 9

MATCHLINE -L- STA. 109+00 SEE SHEET 11
MATCHLINE -L- STA. 17+00 SEE SHEET 11



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 7 OF 36

NOTE: ALL DRIVEWAY RADII ARE 15' UNLESS OTHERWISE NOTED.

FOR DITCH DETAILS SEE SHT. 2D-1
 FOR -L- PROFILE SEE SHTS. 28 & 28A
 FOR -L- RT PROFILE SEE SHTS. 28 & 28A
 FOR -Y10- PROFILE SEE SHT. 42
 FOR -Y11- PROFILE SEE SHT. 42

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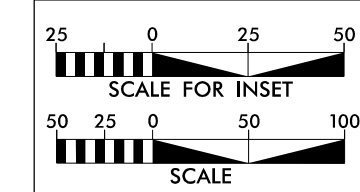
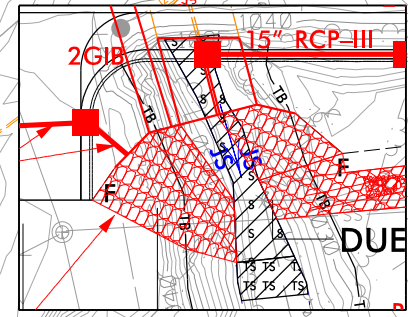
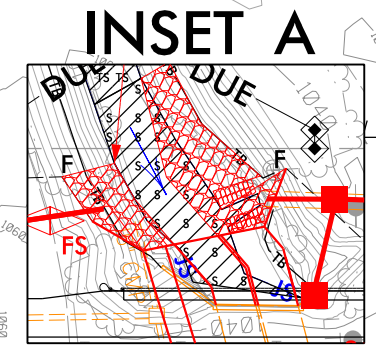
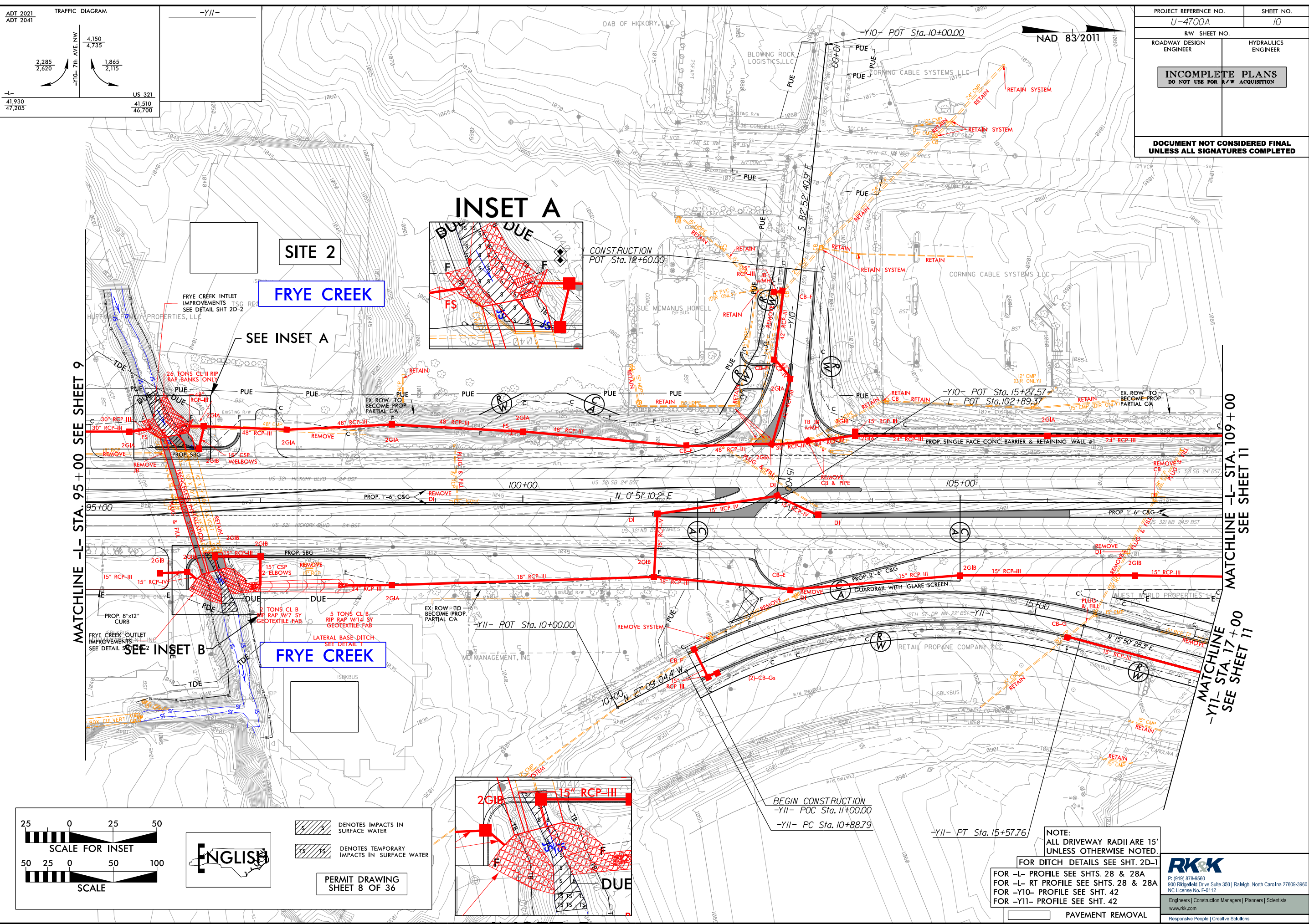
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PAVEMENT REMOVAL

PROJECT REFERENCE NO. U-4700A	SHEET NO. 10
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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11/6/2019
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ENGLISH

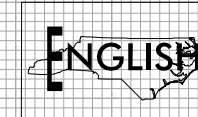
DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PERMIT DRAWING SHEET 8 OF 36

NOTE: ALL DRIVEWAY RADII ARE 15' UNLESS OTHERWISE NOTED.

FOR DITCH DETAILS SEE SHT. 2D-1
FOR -L- PROFILE SEE SHTS. 28 & 28A
FOR -YII- PROFILE SEE SHT. 42
FOR -YII- PROFILE SEE SHT. 42

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5/14/99
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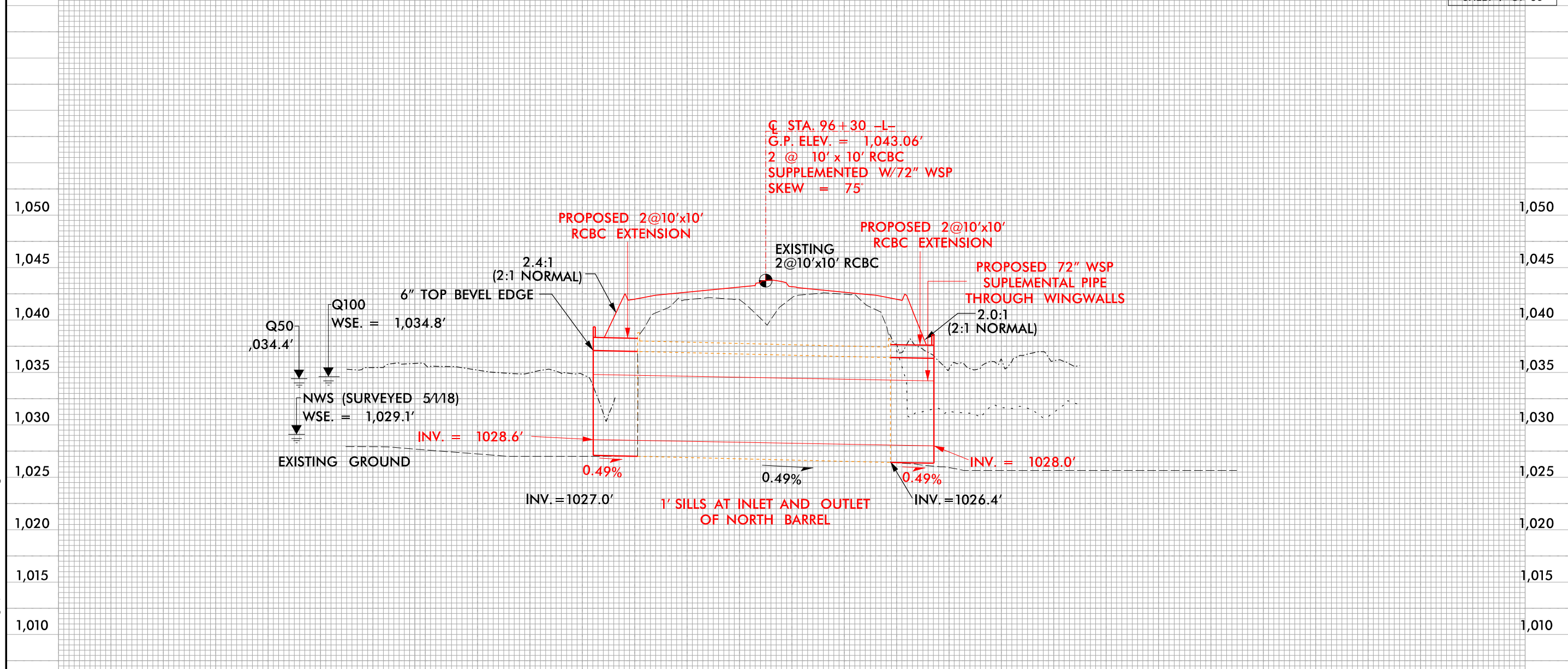


PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 9 OF 36

SITE 2 -L- 96+30



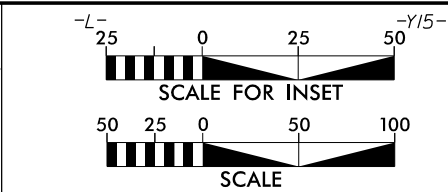
**RETAIN & EXTEND EXISTING 2@10'x10' RCBC, SUPPLEMENT WITH 72" W.S. PIPE
(length = 163')**

PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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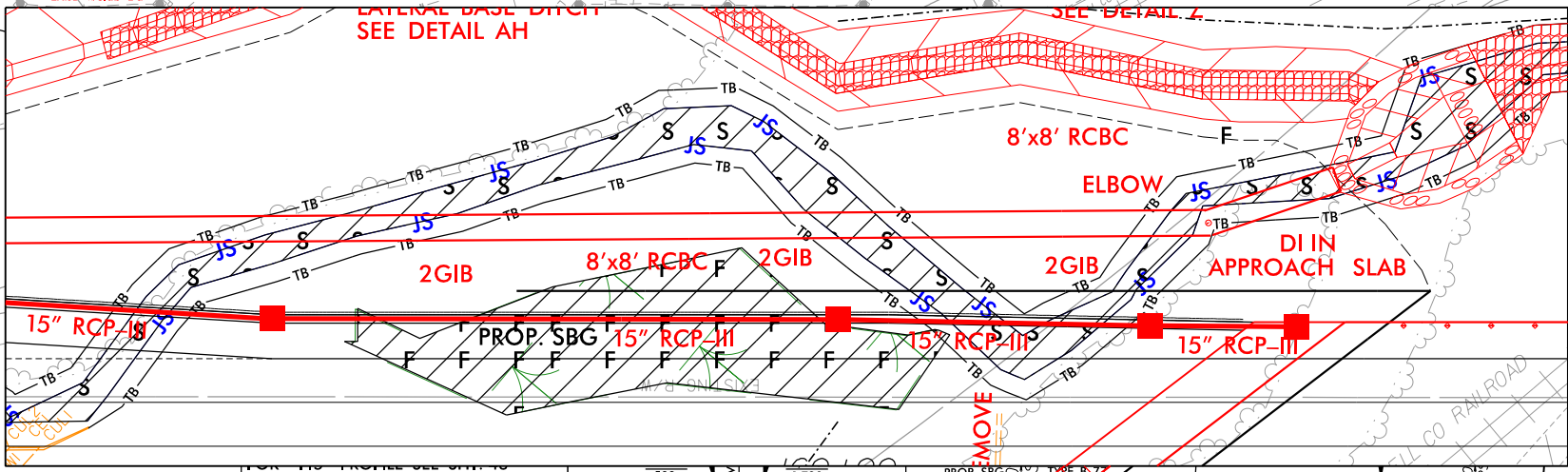
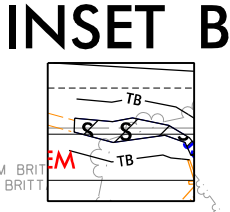
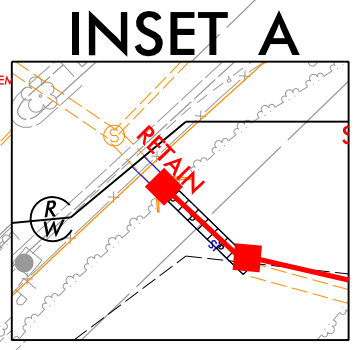
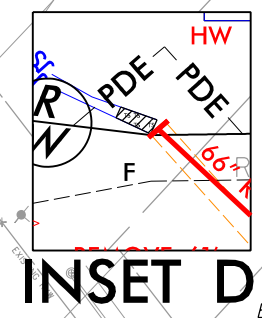
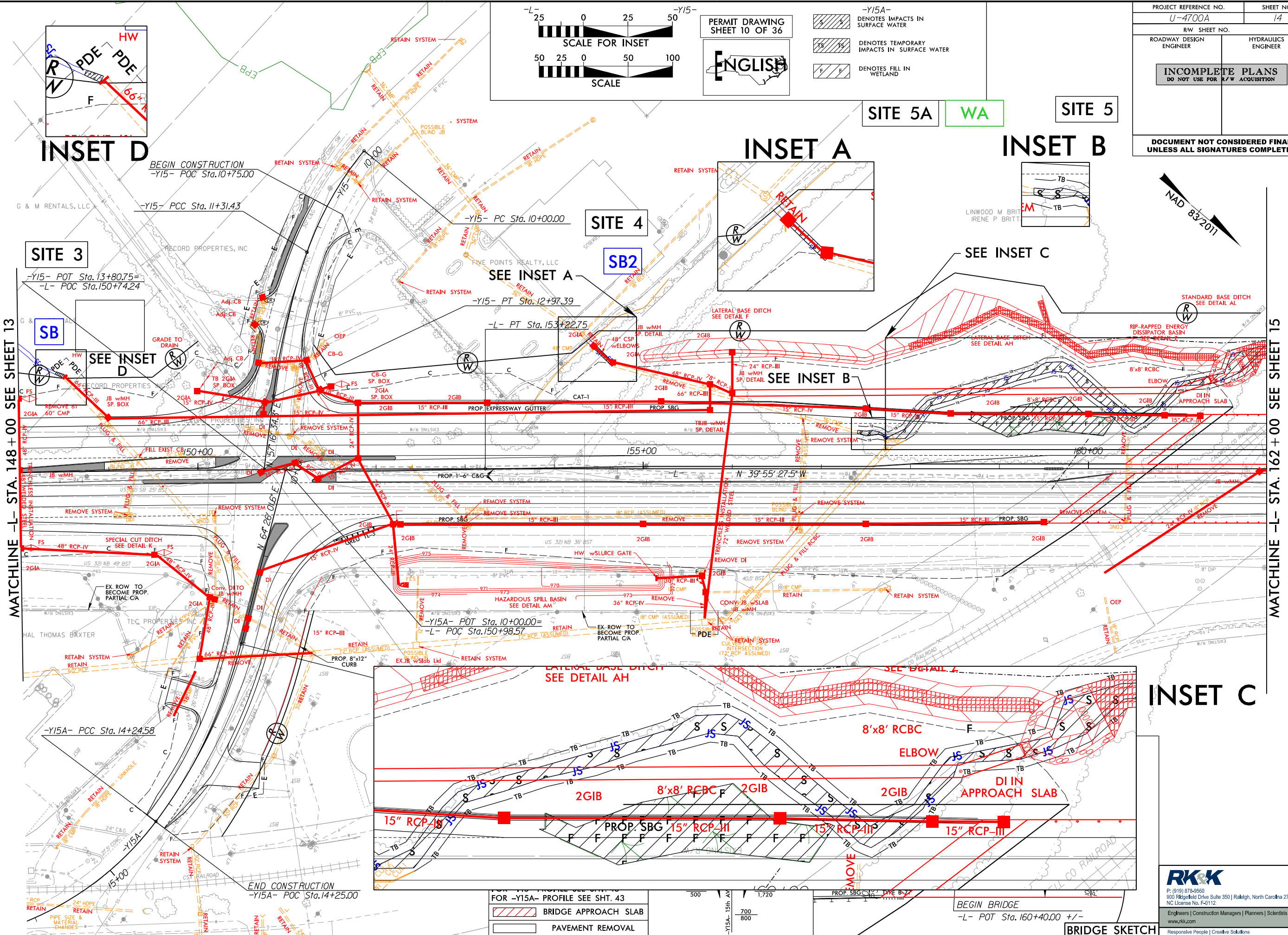


PERMIT DRAWING
SHEET 10 OF 36

ENGLISH

- Y15A- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO. U-4700A	SHEET NO. 14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE -L- STA. 148+00 SEE SHEET 13

MATCHLINE -L- STA. 162+00 SEE SHEET 15

FOR THE PROFILE SEE SHEET 13
FOR -Y15A- PROFILE SEE SHT. 43

BEGIN BRIDGE
-L- POT Sta. 160+40.00 +/-

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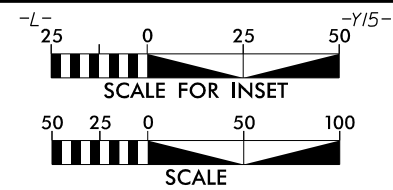
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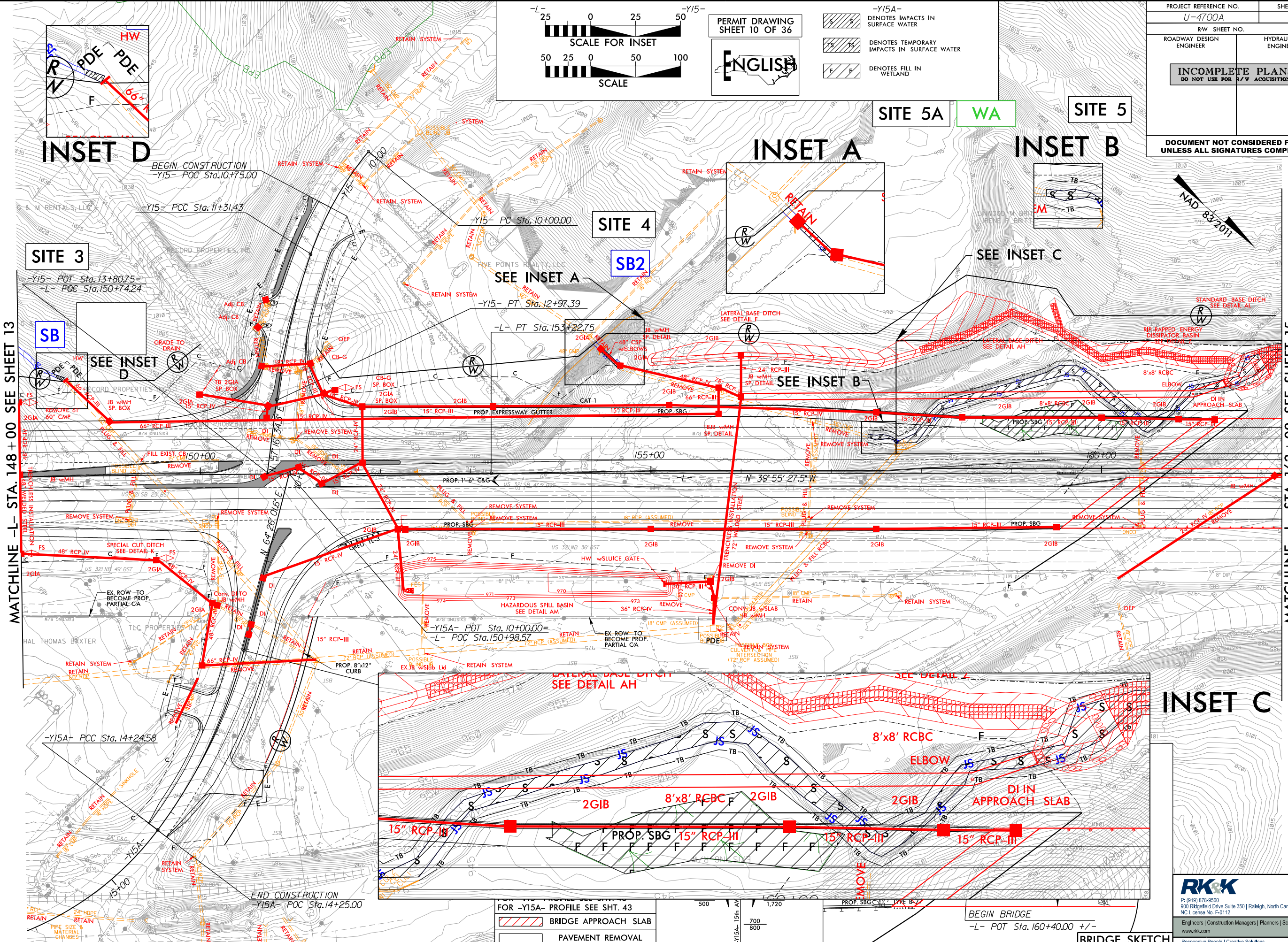


PERMIT DRAWING
SHEET 10 OF 36

ENGLISH

- Y15A- DENOTES IMPACTS IN SURFACE WATER
- Y15- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO. U-4700A	SHEET NO. 14
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



INSET D

INSET A

INSET B

INSET C

MATCHLINE -L- STA. 148+00 SEE SHEET 13

MATCHLINE -L- STA. 162+00 SEE SHEET 15

FOR THE PROFILE SEE SHEET 11
FOR -Y15A- PROFILE SEE SHT. 43

- BRIDGE APPROACH SLAB
- PAVEMENT REMOVAL

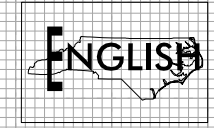
BEGIN BRIDGE
-L- POT Sta. 160+40.00 +/-

BRIDGE SKETCH

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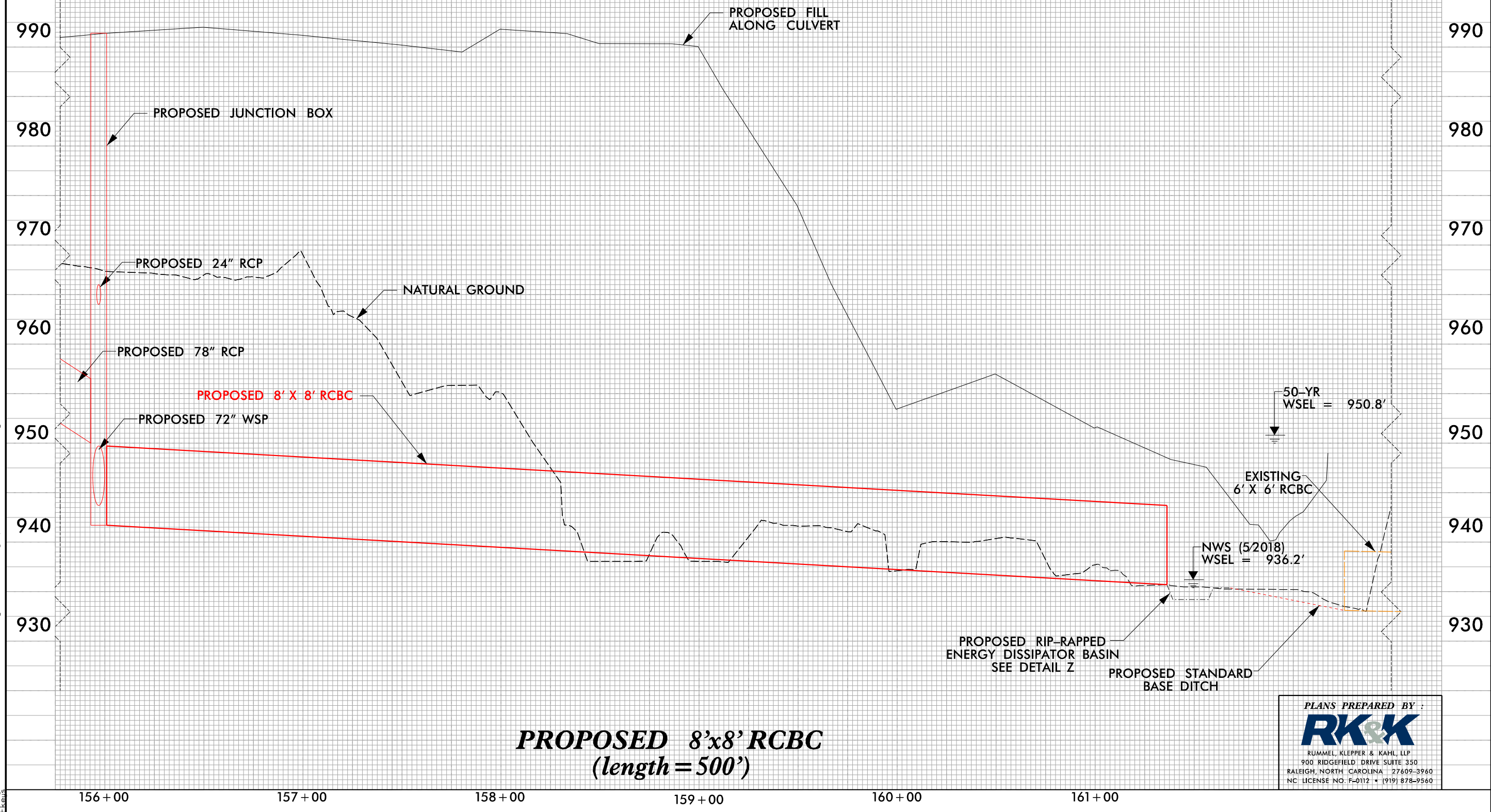
SITE 5 -L- 156+00



PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 12 OF 36



**PROPOSED 8'x8' RCBC
(length = 500')**

PLANS PREPARED BY :

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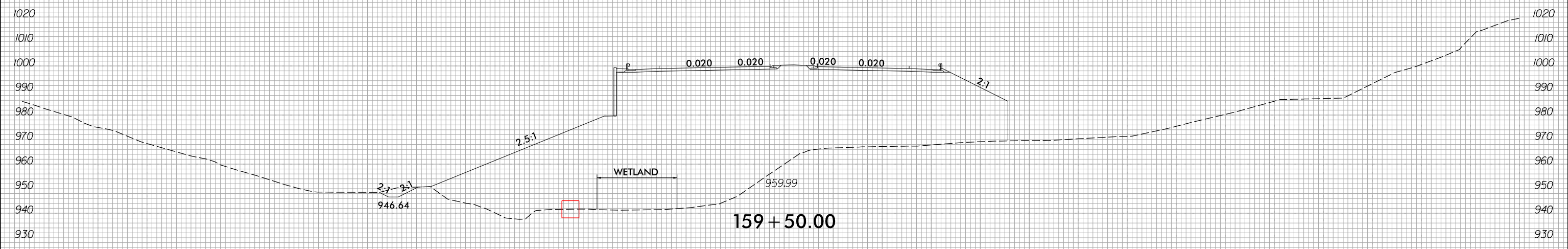
6/23/16



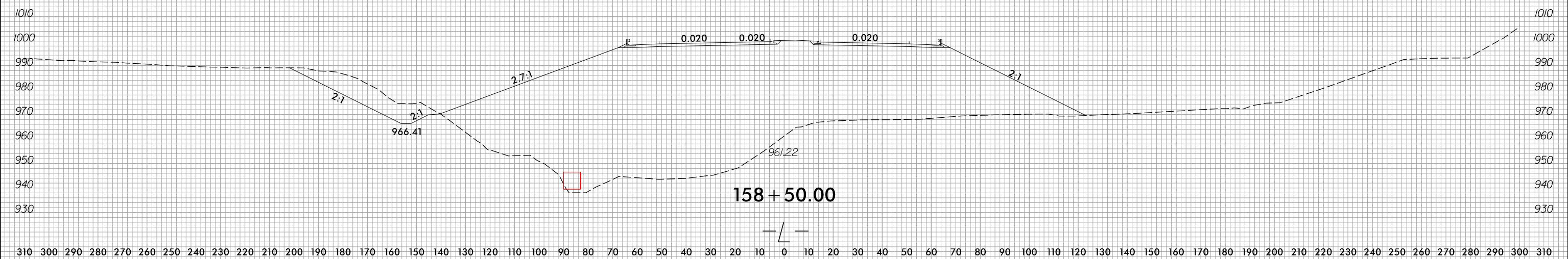
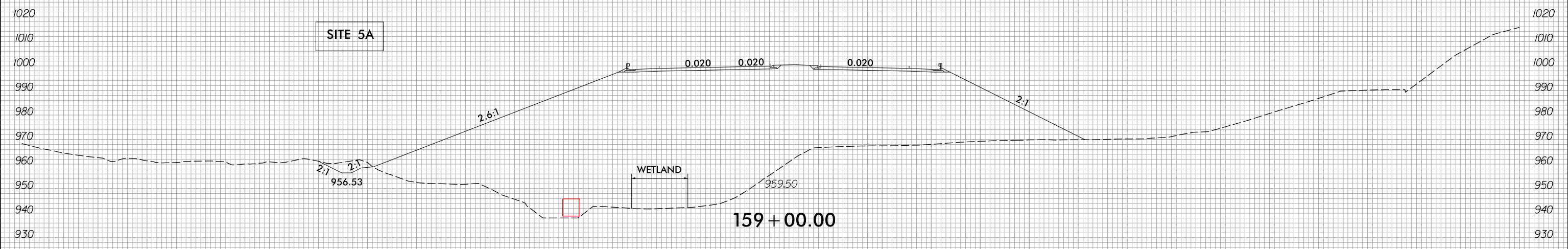
PROJ. REFERENCE NO. U-4700A	SHEET NO. X-78
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310 300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310

PERMIT DRAWING
SHEET 13 OF 36



SITE 5A

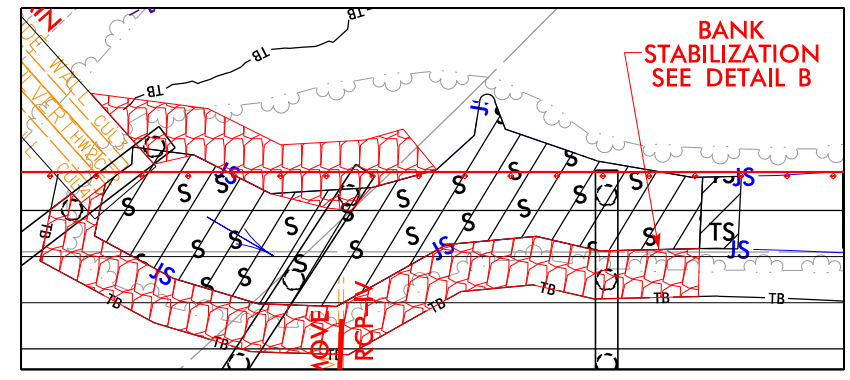


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8/17/99

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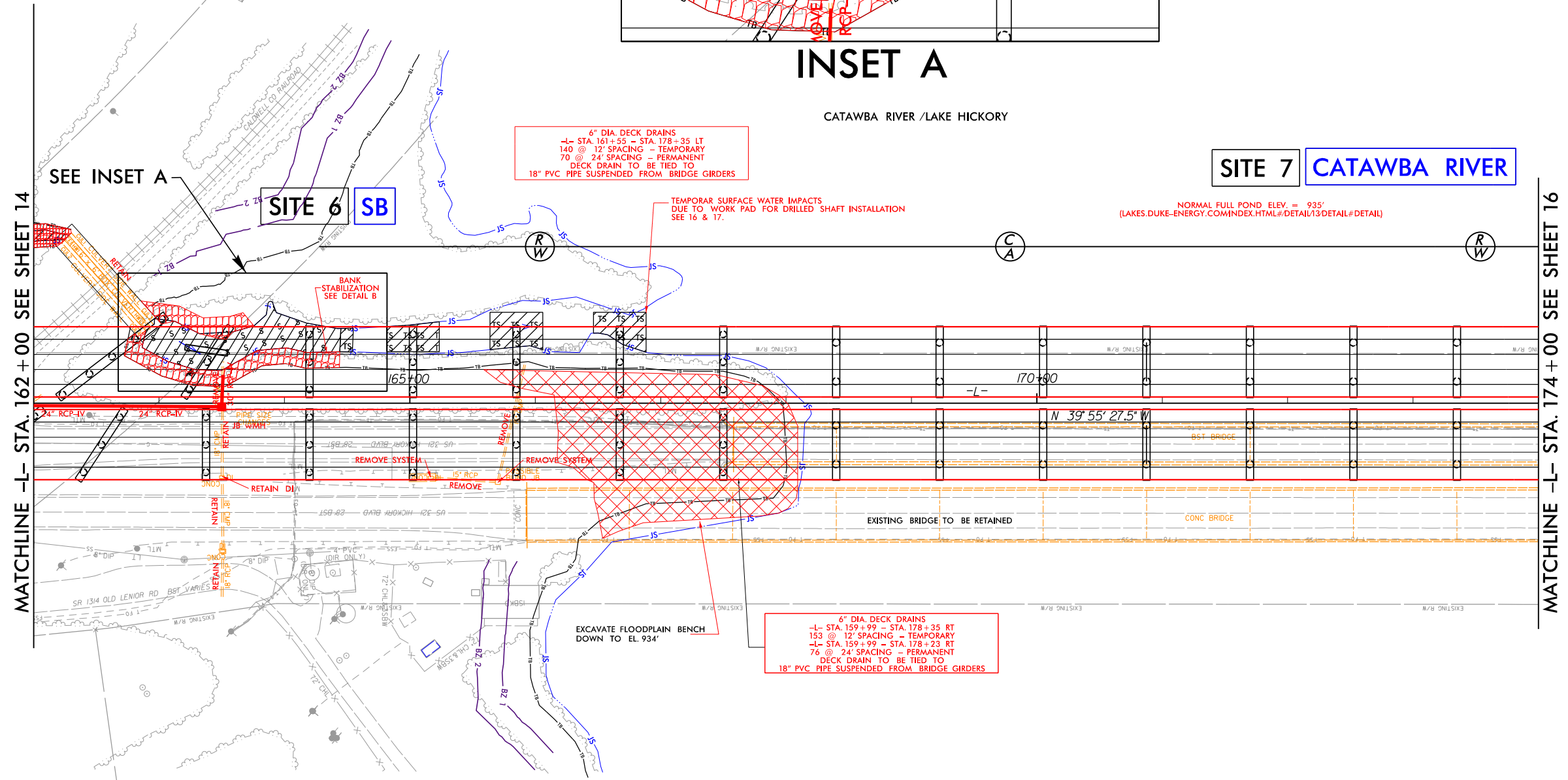
PROJECT REFERENCE NO. U-4700A	SHEET NO. 15
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



INSET A

CATAWBA RIVER /LAKE HICKORY

SITE 7 CATAWBA RIVER



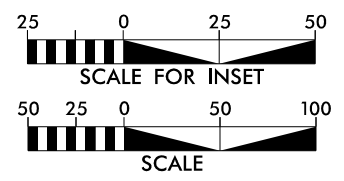
6" DIA. DECK DRAINS
 -L- STA. 161+55 - STA. 178+35 LT
 140 @ 12' SPACING - TEMPORARY
 70 @ 24' SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS

TEMPORARY SURFACE WATER IMPACTS
 DUE TO WORK PAD FOR DRILLED SHAFT INSTALLATION
 SEE 16 & 17.

NORMAL FULL POND ELEV. = 935'
 (LAKES.DUKE-ENERGY.COM/INDEX.HTML#DETAIL/13/DETAIL#DETAIL)

6" DIA. DECK DRAINS
 -L- STA. 159+99 - STA. 178+35 RT
 153 @ 12' SPACING - TEMPORARY
 -L- STA. 159+99 - STA. 178+23 RT
 76 @ 24' SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS

EXCAVATE FLOODPLAIN BENCH
 DOWN TO EL. 934'



PERMIT DRAWING
 SHEET 14 OF 36

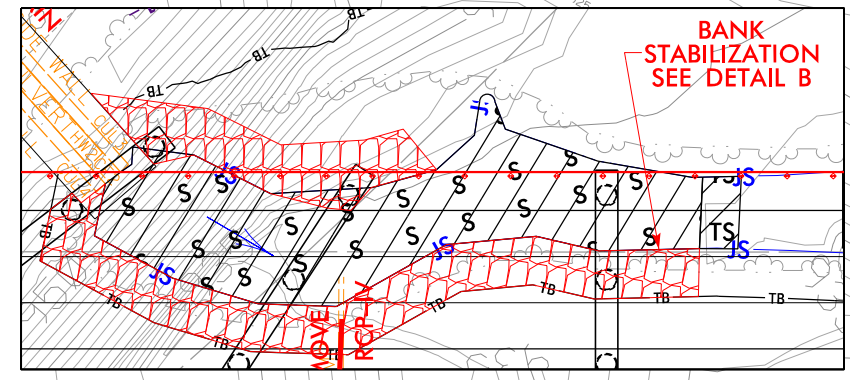
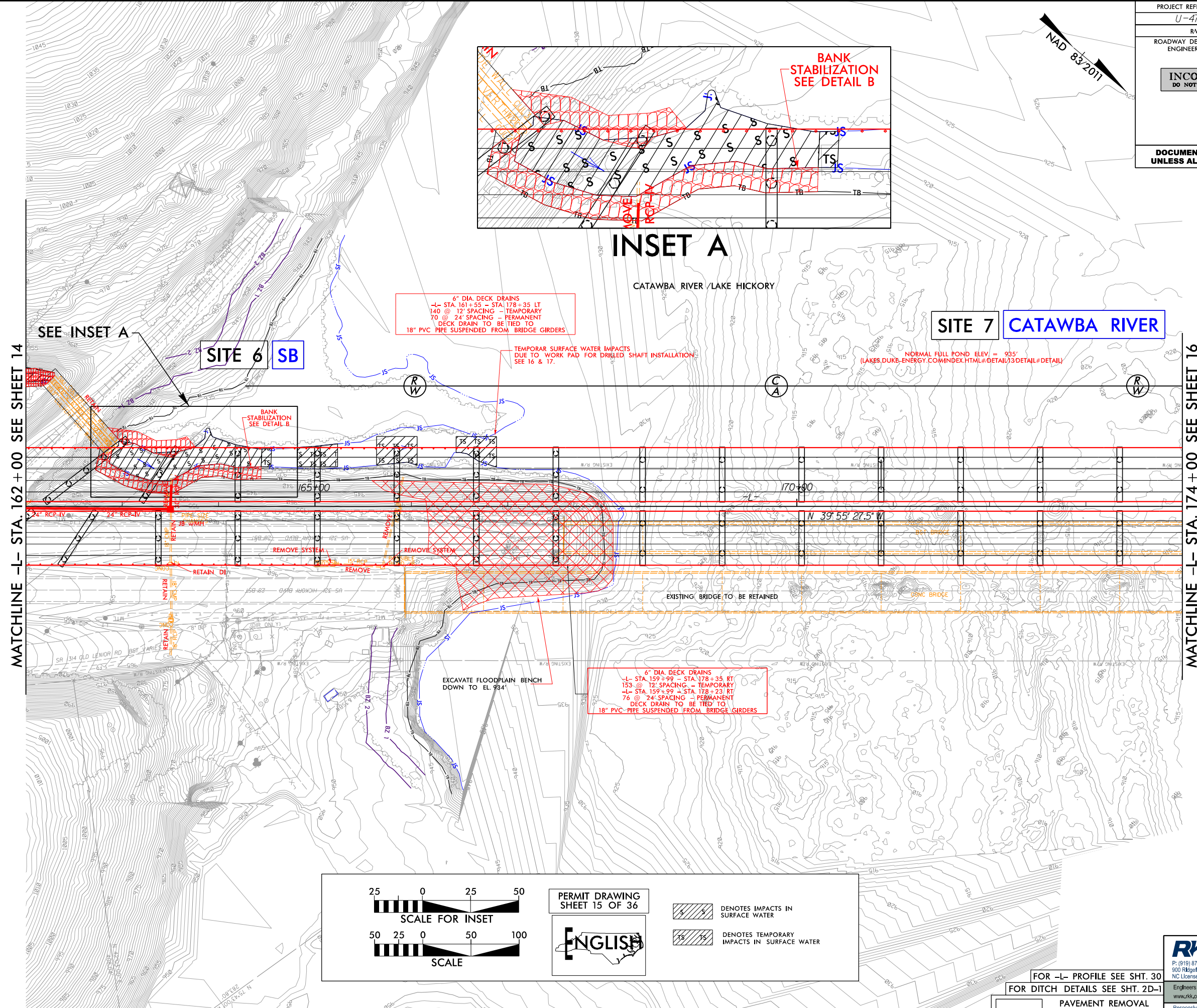


- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 30
 FOR DITCH DETAILS SEE SHT. 2D-1
PAVEMENT REMOVAL

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PROJECT REFERENCE NO. U-4700A	SHEET NO. 15
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



INSET A

CATAWBA RIVER / LAKE HICKORY

6" DIA. DECK DRAINS
 -L- STA. 161+55 - STA. 178+35 LT
 140 @ 12" SPACING - TEMPORARY
 70 @ 24" SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS

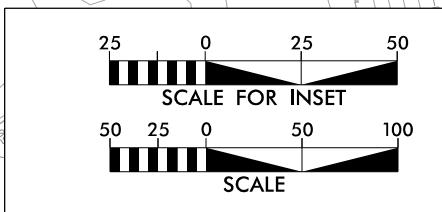
TEMPORARY SURFACE WATER IMPACTS
 DUE TO WORK PAD FOR DRILLED SHAFT INSTALLATION
 SEE 16 & 17.

SITE 7 CATAWBA RIVER

NORMAL FULL POND ELEV. = 935'
 (LAKES.DUKE-ENERGY.COM/INDEX.HTML#DETAIL/3/DETAIL#DETAIL)

MATCHLINE -L- STA. 162+00 SEE SHEET 14

MATCHLINE -L- STA. 174+00 SEE SHEET 16



PERMIT DRAWING
 SHEET 15 OF 36



- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 30
 FOR DITCH DETAILS SEE SHT. 2D-1

PAVEMENT REMOVAL

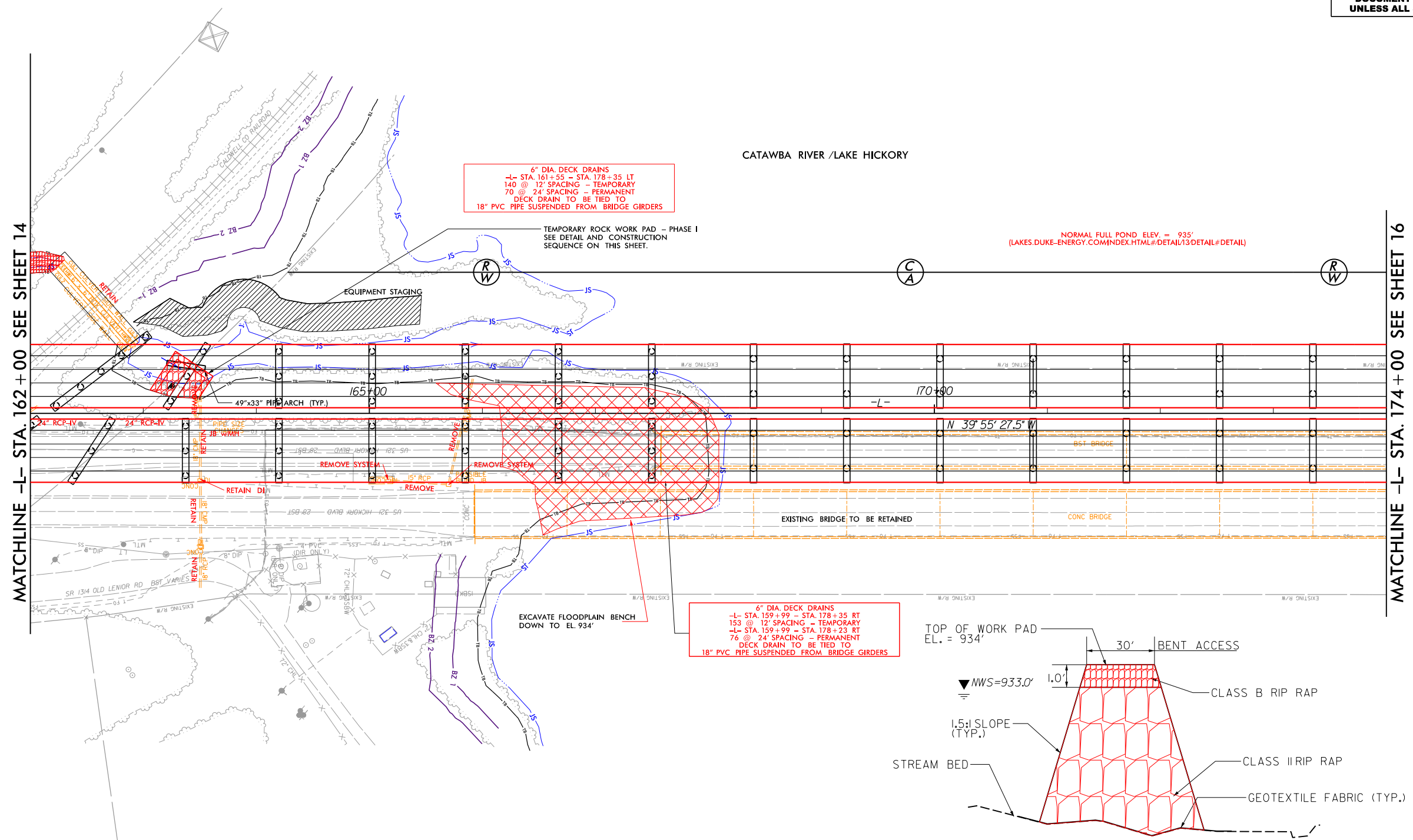
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PROJECT REFERENCE NO. U-4700A	SHEET NO. 15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

WORKPAD CONSTRUCTION SEQUENCE

1. CONSTRUCT WORK PAD FOR BENT ACCESS, WITH FLOW THRU PIPE, AS SHOWN ON PLAN. NO MORE THAN ONE WORK PAD SHALL BE IN THE STREAM AT ANY ONE TIME.
2. INSTALL DRILL SHAFTS AS REQUIRED BY THE STRUCTURES PLANS.
3. REMOVE WORK PAD AFTER COMPLETION OF BENT CONSTRUCTION BEFORE CONSTRUCTING WORK PAD OF PHASE II.
4. INSTALL 2" CORED SLABS FROM MAIN CAUSEWAY.
5. INSTALL BANK STABILIZATION AS SHOWN ON PLANS UPON REMOVAL OF WORK PAD.

PLAN OF WORKPAD - PHASE I

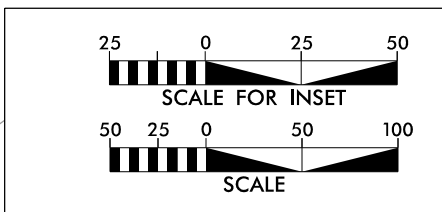
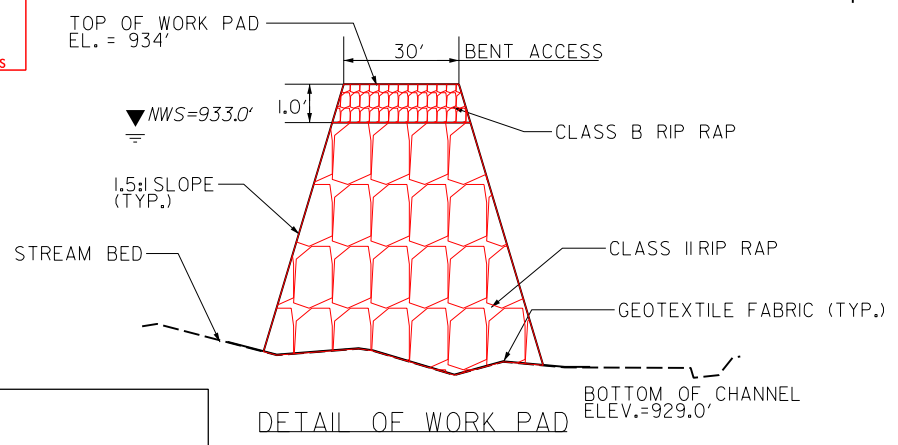


6" DIA. DECK DRAINS
 -L- STA. 161+55 - STA. 178+35 LT
 140 @ 12' SPACING - TEMPORARY
 70 @ 24' SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS

TEMPORARY ROCK WORK PAD - PHASE I
 SEE DETAIL AND CONSTRUCTION
 SEQUENCE ON THIS SHEET.

NORMAL FULL POND ELEV. = 935'
 (LAKES.DUKE-ENERGY.COM/INDEX.HTML#DETAIL/13DETAIL#DETAIL)

6" DIA. DECK DRAINS
 -L- STA. 159+99 - STA. 178+35 RT
 153 @ 12' SPACING - TEMPORARY
 -L- STA. 159+99 - STA. 178+23 RT
 76 @ 24' SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS



PERMIT DRAWING
 SHEET 16 OF 36

FOR -L- PROFILE SEE SHT. 30
 FOR DITCH DETAILS SEE SHT. 2D-1
 PAVEMENT REMOVAL

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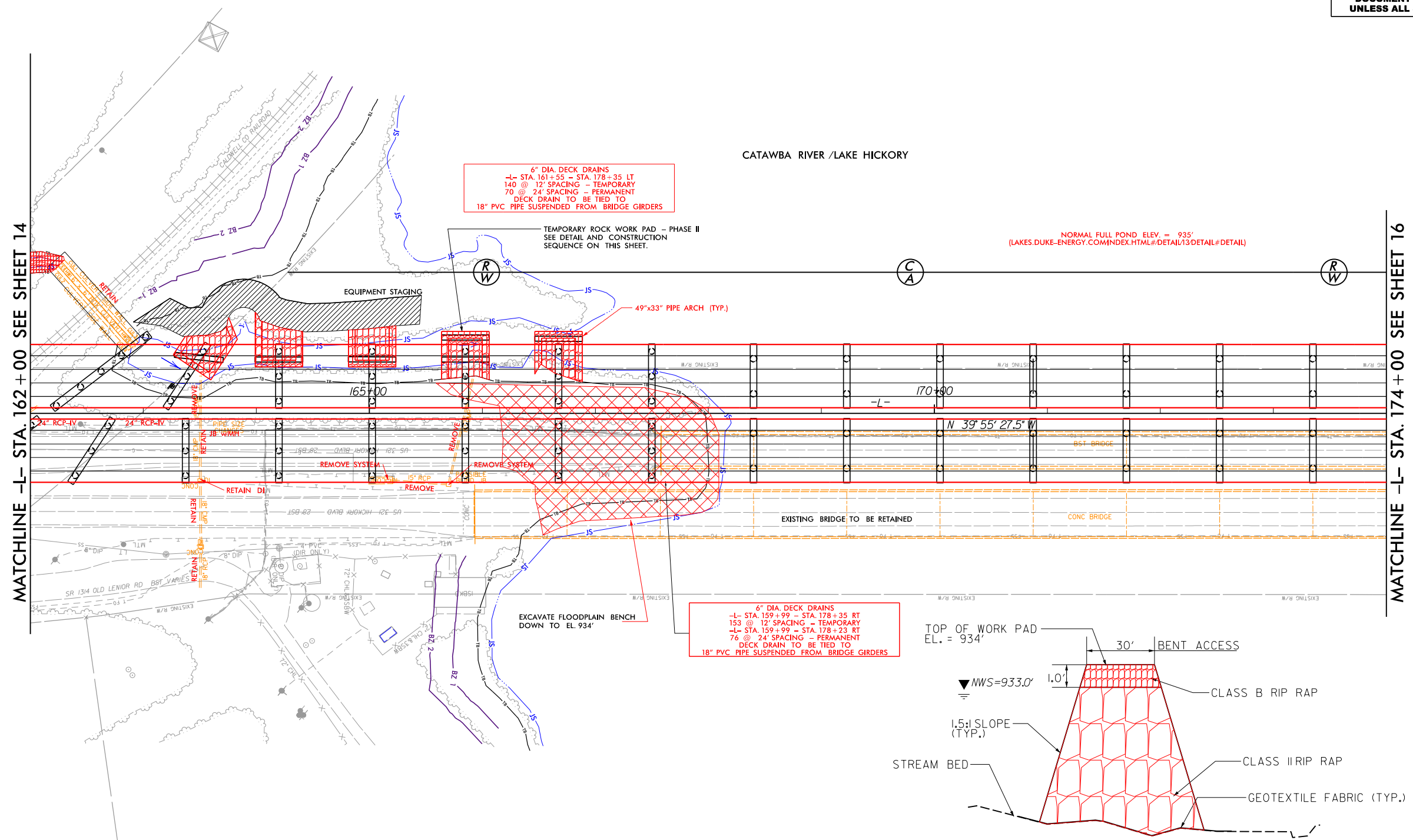
8/17/2019
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PROJECT REFERENCE NO. U-4700A	SHEET NO. 15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

WORKPAD CONSTRUCTION SEQUENCE

1. CONSTRUCT WORK PAD FOR BENT ACCESS, WITH FLOW THRU PIPE, AS SHOWN ON PLAN. NO MORE THAN ONE WORK PAD SHALL BE IN THE STREAM AT ANY ONE TIME.
2. INSTALL DRILL SHAFTS AS REQUIRED BY THE STRUCTURES PLANS.
3. REMOVE WORK PAD AFTER COMPLETION OF BENT CONSTRUCTION BEFORE CONSTRUCTING WORK PAD OF PHASE II.
4. INSTALL 2" CORED SLABS FROM MAIN CAUSEWAY.
5. INSTALL BANK STABILIZATION AS SHOWN ON PLANS UPON REMOVAL OF WORK PAD.

PLAN OF WORK PAD - PHASE II

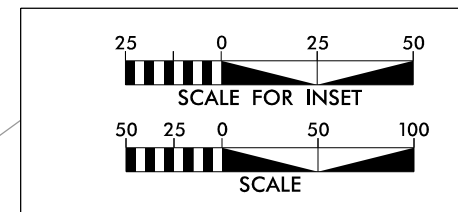
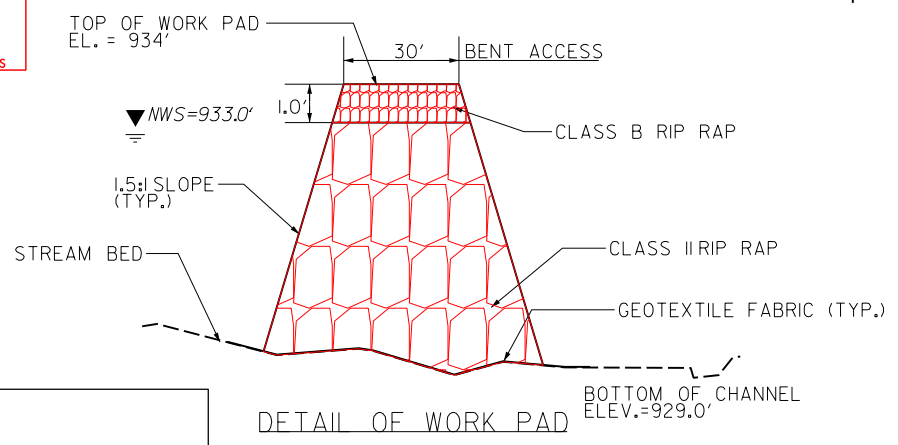


6" DIA. DECK DRAINS
 -L- STA. 161+55 - STA. 178+35 LT
 140 @ 12' SPACING - TEMPORARY
 70 @ 24' SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS

TEMPORARY ROCK WORK PAD - PHASE II
 SEE DETAIL AND CONSTRUCTION
 SEQUENCE ON THIS SHEET.

NORMAL FULL POND ELEV. = 935'
 (LAKES.DUKE-ENERGY.COM/INDEX.HTML#DETAIL/13DETAIL#DETAIL)

6" DIA. DECK DRAINS
 -L- STA. 159+99 - STA. 178+35 RT
 153 @ 12' SPACING - TEMPORARY
 -L- STA. 159+99 - STA. 178+23 RT
 76 @ 24' SPACING - PERMANENT
 DECK DRAIN TO BE TIED TO
 18" PVC PIPE SUSPENDED FROM BRIDGE GIRDERS



PERMIT DRAWING
 SHEET 17 OF 36

FOR -L- PROFILE SEE SHT. 30
 FOR DITCH DETAILS SEE SHT. 2D-1
 PAVEMENT REMOVAL

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 17/2009
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 085.82
 W 100°42'51"N

5/14/99
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159+00 160+00 161+00 162+00 163+00 164+00

SITE 6

-L- 169+15.5

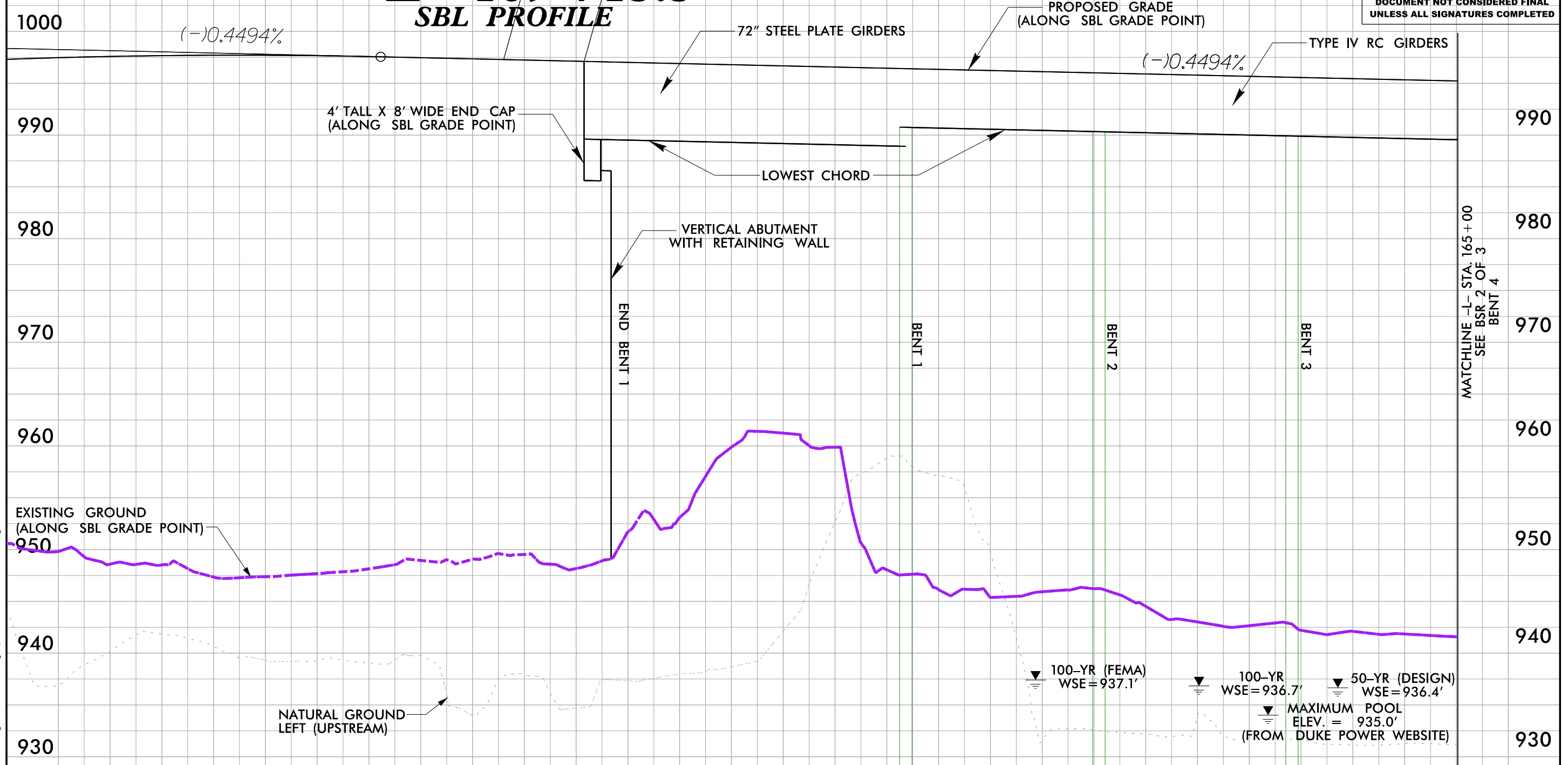
SBL PROFILE



PERMIT DRAWING
SHEET 18 OF 36

PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
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MATCHLINE -L- STA. 165+00
SEE BSR 2 OF 3
BENT 4

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159+00

160+00

161+00

162+00

163+00

164+00

SITE 6 -L- 169+15.5 NBL PROFILE



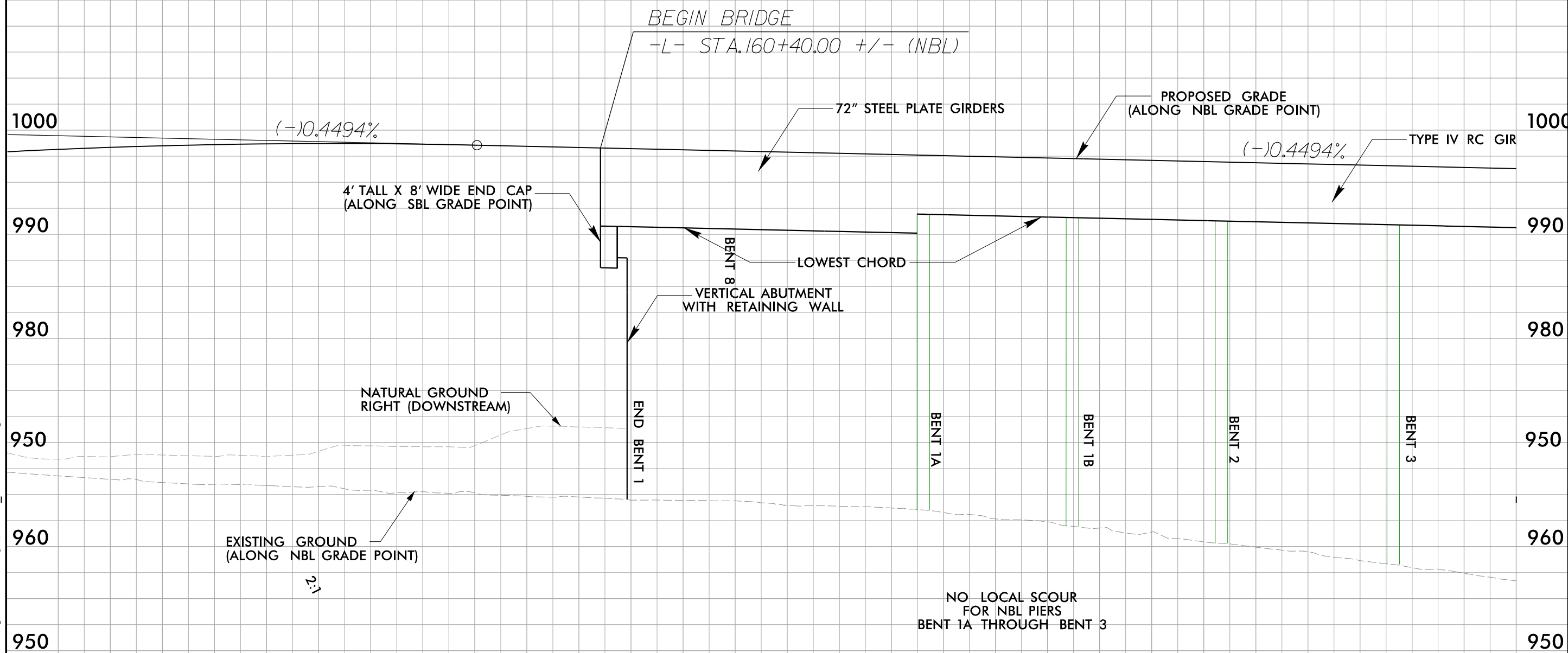
PERMIT DRAWING
SHEET 17 OF 34

PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SPAN LENGTHS
ALONG NBL GRADE POINT
END BENT 1 TO BENT 4:

- 1 @ 154.6'
- 2 @ 71.6'
- 2 @ 82.5'



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100-YR (FEMA)
WSE = 937.1'

10
WSE

MAXIMUM POOL

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166+00

167+00

168+00

169+00

170+00

171+00

PROJECT REFERENCE NO. SHEET NO.

U-4700A	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 18 OF 34

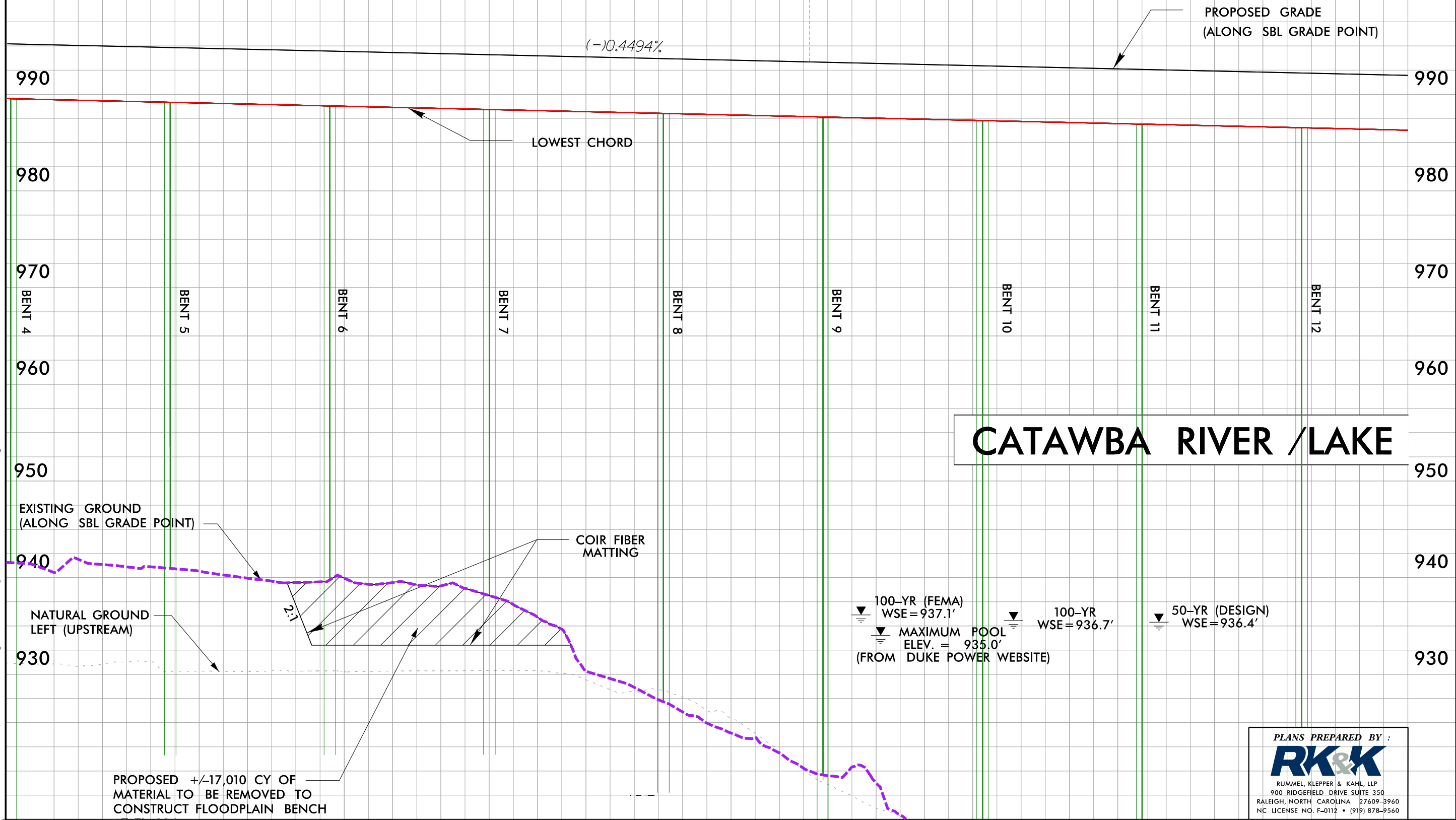
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE 6

-L- 169+15.5

SBL PROFILE

☉ BRIDGE STA. 169+15.5 -L-
 GP ELEV. = 994.4'
 TYPE IV RC GIRDERS
 SKEW = 90°



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5/14/99

166+00

167+00

168+00

169+00

170+00

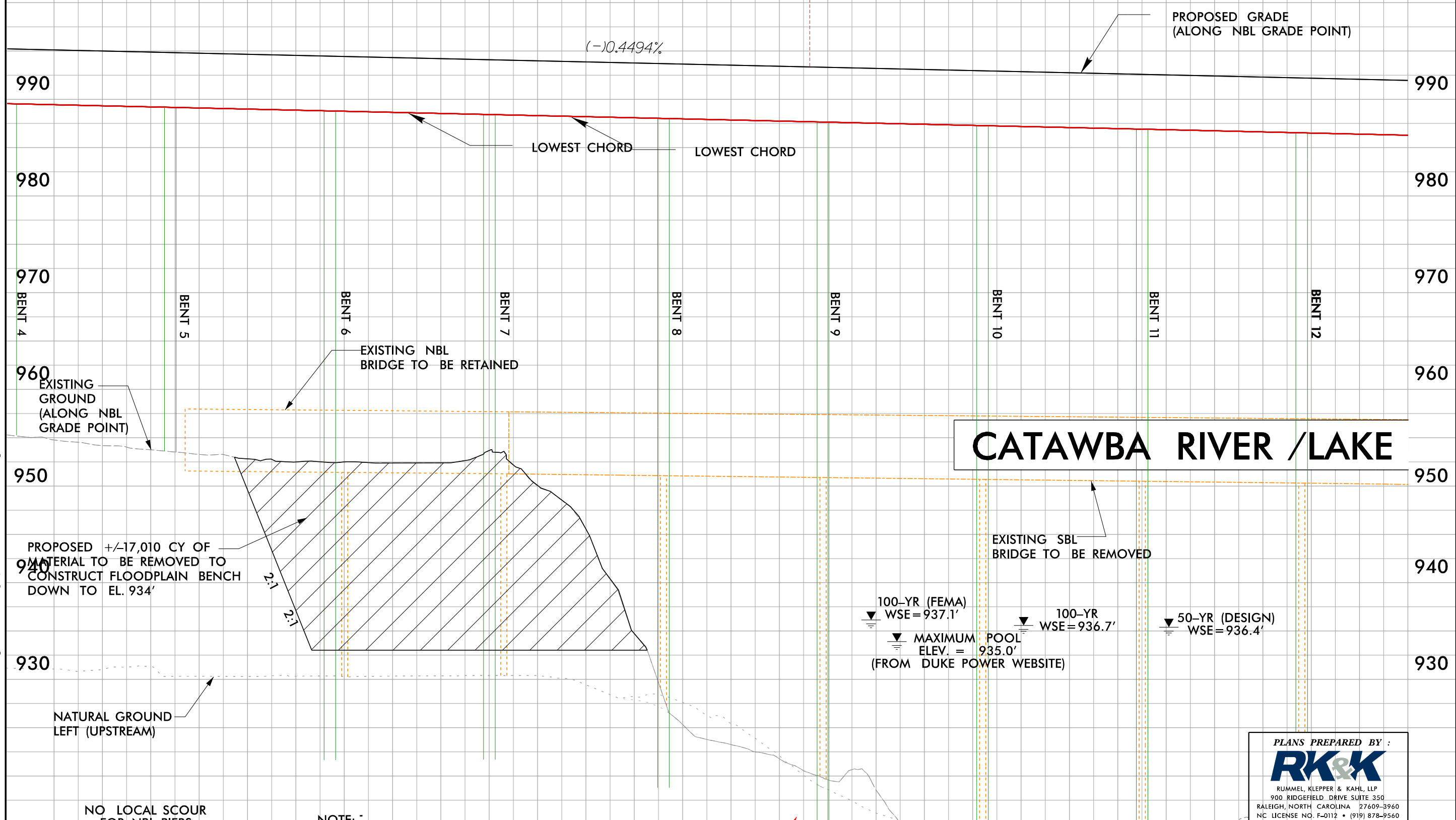
171+00

SITE 6 -L- 169+15.5 NBL PROFILE

PERMIT DRAWING
SHEET 21 OF 36

PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

Q BRIDGE STA. 169+15.5 -L-
GP ELEV. = 994.4'
TYPE IV RC GIRDERS
SKEW = 90°



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PROPOSED +/-17,010 CY OF MATERIAL TO BE REMOVED TO CONSTRUCT FLOODPLAIN BENCH DOWN TO EL. 934'

NATURAL GROUND LEFT (UPSTREAM)

NO LOCAL SCOUR FOR NBL PIERS

NOTE:

CATAWBA RIVER / LAKE

100-YR (FEMA) WSE = 937.1'

100-YR WSE = 936.7'

50-YR (DESIGN) WSE = 936.4'

MAXIMUM POOL ELEV. = 935.0' (FROM DUKE POWER WEBSITE)

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173+00

174+00

175+00

176+00

177+00

178+00

PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



SITE 6

-L- 169+15.5 SBL PROFILE

(-)0.4494%

TYPE IV RC GIRDERS

PROPOSED GRADE
(ALONG SBL GRADE POINT)

LOWEST CHORD

MATCHLINE -L- STA. 172+50
SEE BSR 2 OF 3

BENT 13

BENT 14

BENT 15

BENT 16

BENT 17

BENT 18

BENT 19

END BENT 2

1.5:1 SLOPE (TYP.)
NORMAL TO END CA
SLOPE PROTECTION TO
BE PROVIDED PER
STRUCTURAL DRAWING

CKORY

EXISTING GROUND
(ALONG SBL GRADE POINT)

▼ 100-YR (FEMA)
 WSE = 937.1'
 ▼ MAXIMUM POOL
 ELEV. = 935.0'
 (FROM DUKE POWER WEBSITE)

▼ 100-YR
 WSE = 936.7'

▼ 50-YR (DESIGN)
 WSE = 936.4'

980

970

960

950

940

930

920

910

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

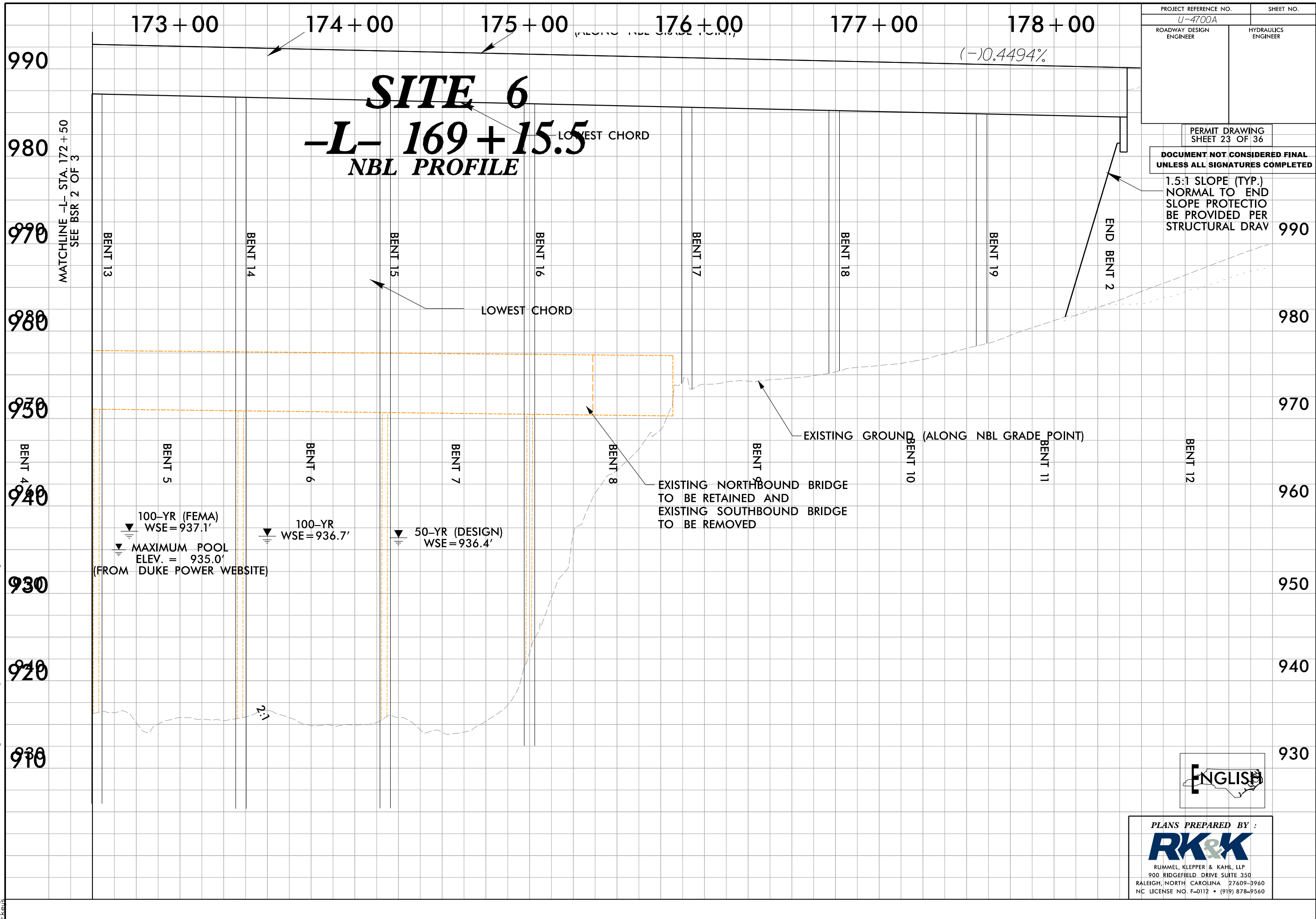
PERMIT DRAWING
SHEET 22 OF 36

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PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
 SHEET 23 OF 36

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

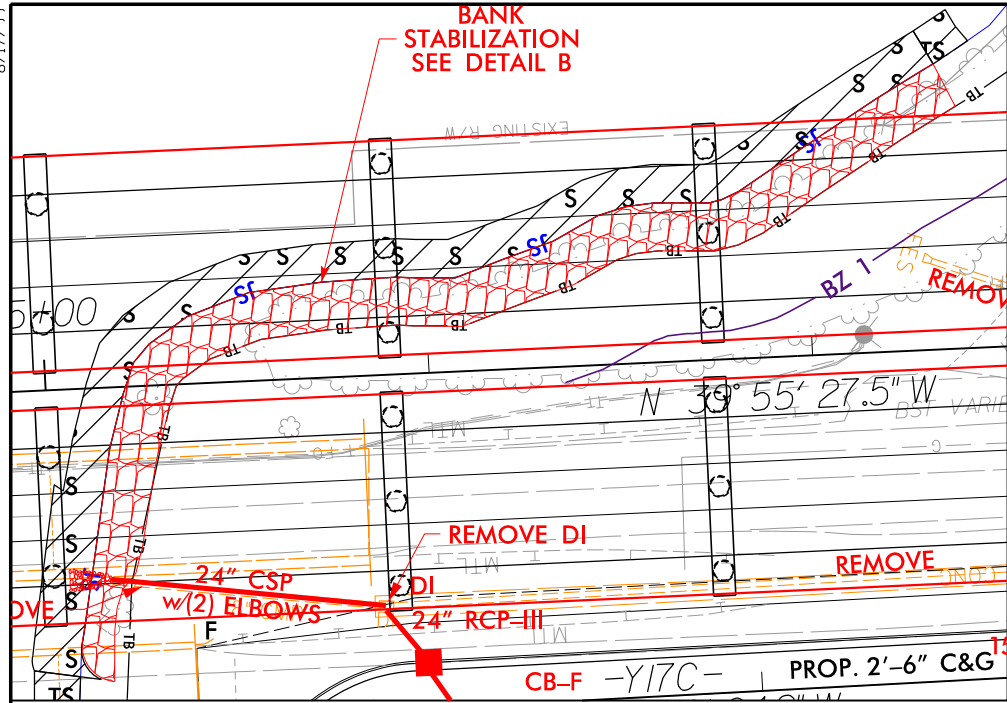
1.5:1 SLOPE (TYP.)
 NORMAL TO END
 SLOPE PROTECTIO
 BE PROVIDED PER
 STRUCTURAL DRAV



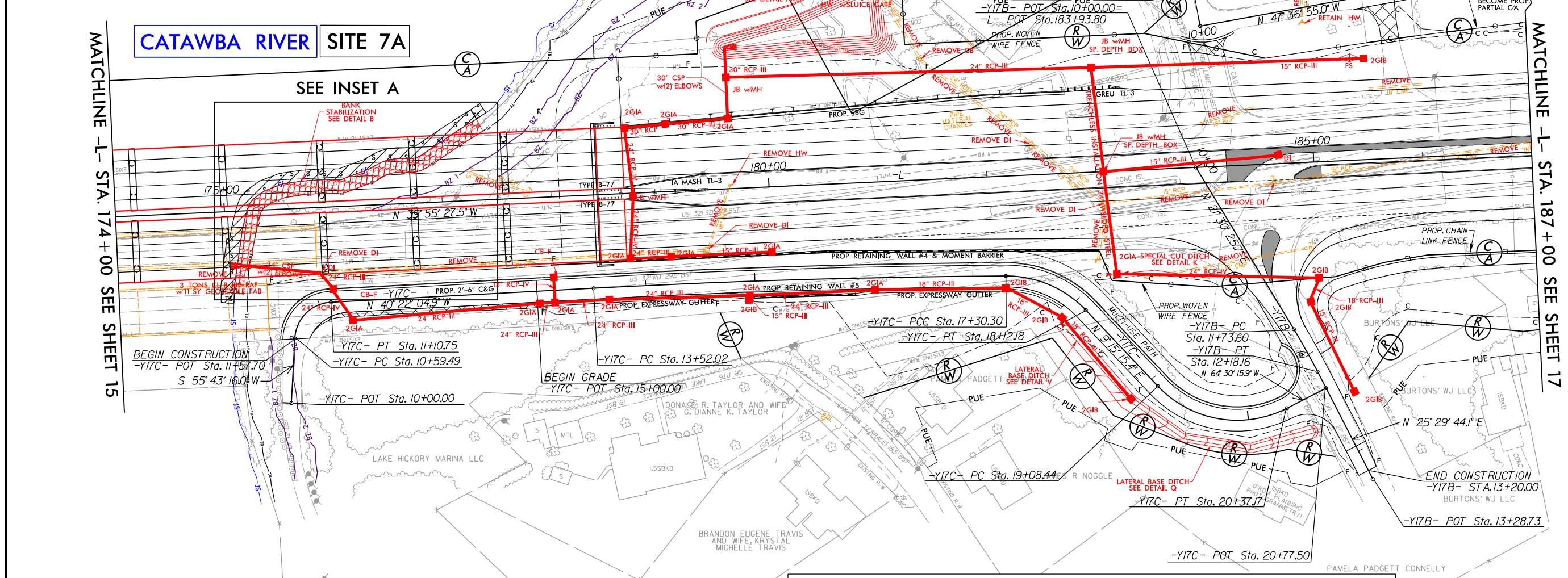
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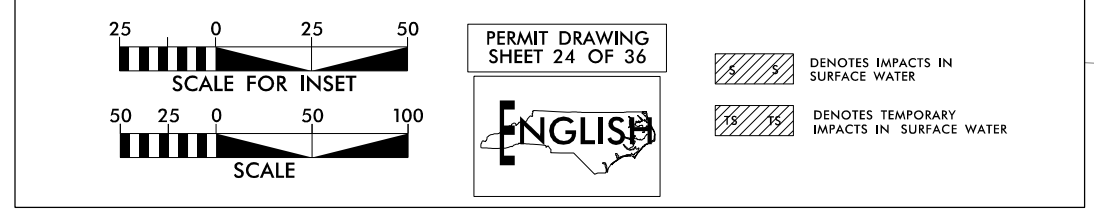
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INSET A



-Y17A-		-Y17B-		-Y17C-	
PI Sta 13+66.40	PI Sta 11+95.89	PI Sta 10+90.96	PI Sta 15+41.9	PI Sta 17+73.69	PI Sta 19+83.47
$\Delta = 19^\circ 30' 40.6''$ (LT)	$\Delta = 3^\circ 59' 18.4''$ (RT)	$\Delta = 83^\circ 54' 39.1''$ (RT)	$\Delta = 2^\circ 42' 33.3''$ (RT)	$\Delta = 46^\circ 54' 46.9''$ (RT)	$\Delta = 73^\circ 45' 31.3''$ (LT)
D = 8' 18' 13.5"	D = 8' 57' 08.9"	D = 163' 42' 08.0"	D = 0' 42' 58.3"	D = 57' 17' 44.8"	D = 57' 17' 44.8"
L = 234.97'	L = 44.55'	L = 51.26'	L = 378.28'	L = 81.88'	L = 128.73'
T = 118.63'	T = 22.28'	T = 31.46'	T = 189.18'	T = 43.39'	T = 75.03'
R = 690.00'	R = 640.00'	R = 35.00'	R = 8,000.00'	R = 100.00'	R = 100.00'
e = 3%	e = 4%	e = NC	e = NC	e = NC	e = NC
Lr = 50'	Lr = 120'	Lr = 40'	Lr = 40'	Lr = 40'	Lr = 40'
V = 30 mph	V = 30 mph	V = 20 mph	V = 20 mph	V = 20 mph	V = 20 mph



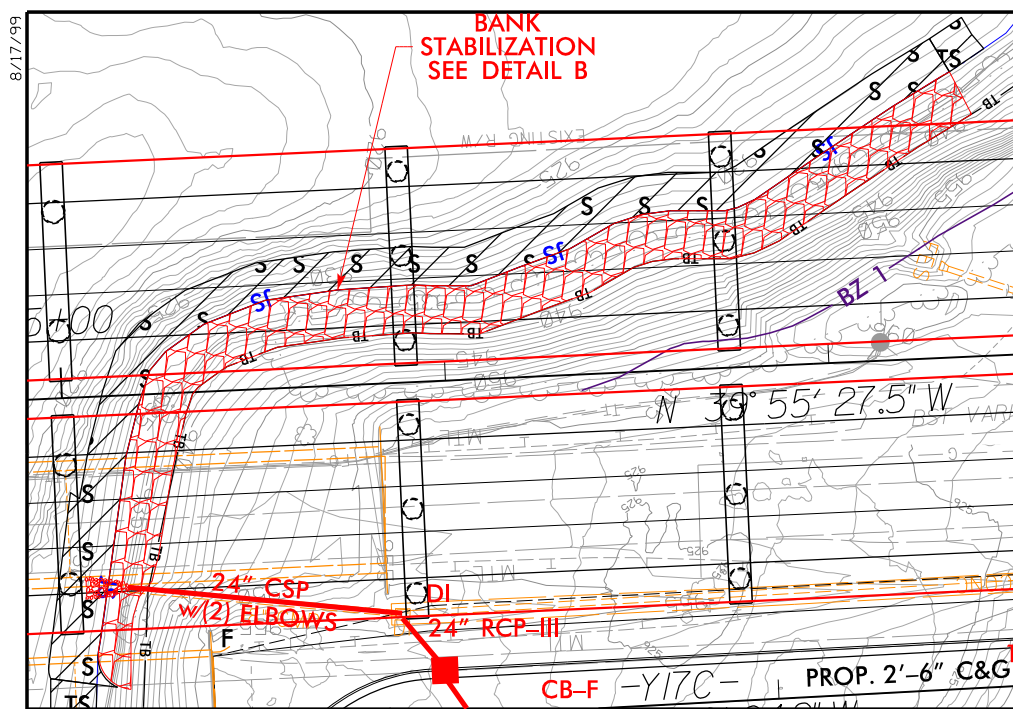
FOR DITCH DETAILS SEE SHT. 2D-1
FOR RETAINING WALL DETAILS SEE SHTS. 2B-10 & 2B-11

FOR -L- PROFILE SEE SHTS. 30 & 31
FOR -Y17A- PROFILE SEE SHT. 44
FOR -Y17B- PROFILE SEE SHT. 44
FOR -Y17C- PROFILE SEE SHT. 44

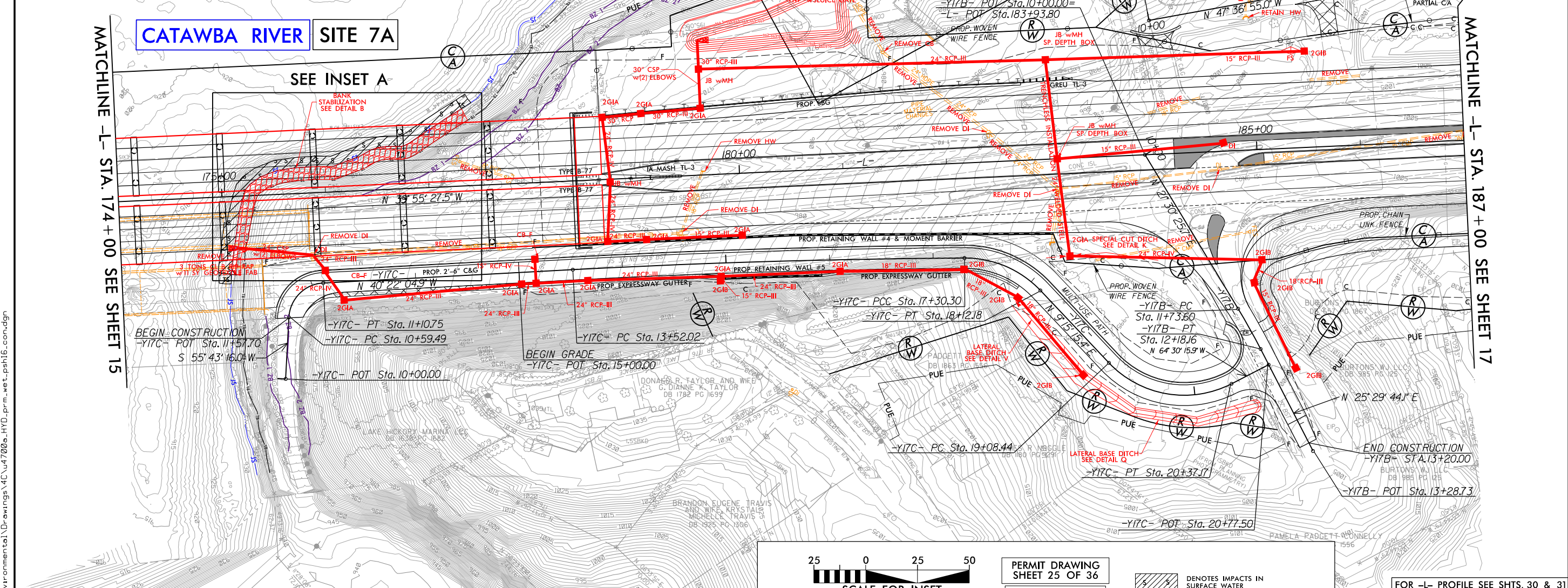
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8/17/99



INSET A

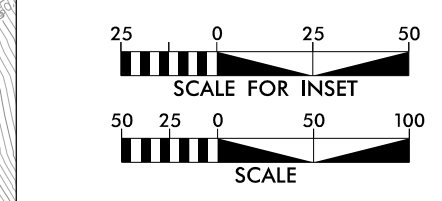


CATAWBA RIVER SITE 7A

MATCHLINE -L- STA. 174+00 SEE SHEET 15

MATCHLINE -L- STA. 187+00 SEE SHEET 17

-Y17A-	-Y17B-	-Y17C-			
PI Sta 13+66.40	PI Sta 11+95.89	PI Sta 10+90.96	PI Sta 15+41.19	PI Sta 17+73.69	PI Sta 19+83.47
$\Delta = 19^\circ 30' 40.6''$ (LT)	$\Delta = 3^\circ 59' 18.4''$ (RT)	$\Delta = 83^\circ 54' 39.1''$ (RT)	$\Delta = 2^\circ 42' 33.3''$ (RT)	$\Delta = 46^\circ 54' 46.9''$ (RT)	$\Delta = 73^\circ 45' 31.3''$ (LT)
D = 8' 18" 13.5"	D = 8' 57" 08.9"	D = 163' 42" 08.0"	D = 0' 42" 58.3"	D = 57' 17" 44.8"	D = 57' 17" 44.8"
L = 234.97'	L = 44.55'	L = 51.26'	L = 378.28'	L = 81.88'	L = 128.73'
T = 118.63'	T = 22.28'	T = 31.46'	T = 189.18'	T = 43.39'	T = 75.03'
R = 690.00'	R = 640.00'	R = 35.00'	R = 8,000.00'	R = 100.00'	R = 100.00'
e = 3%	e = 4%	e = NC	e = NC	e = NC	e = NC
Lr = 50'	Lr = 120'	Lr = 40'	Lr = 40'	Lr = 40'	Lr = 40'
V = 30 mph	V = 30 mph	V = 20 mph	V = 20 mph	V = 20 mph	V = 20 mph



PERMIT DRAWING
SHEET 25 OF 36

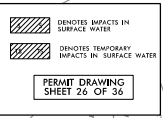
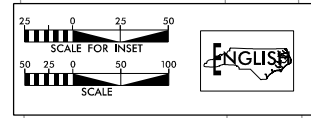
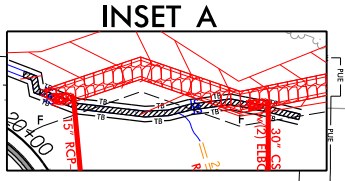
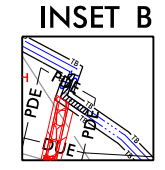
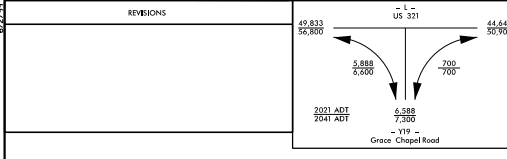
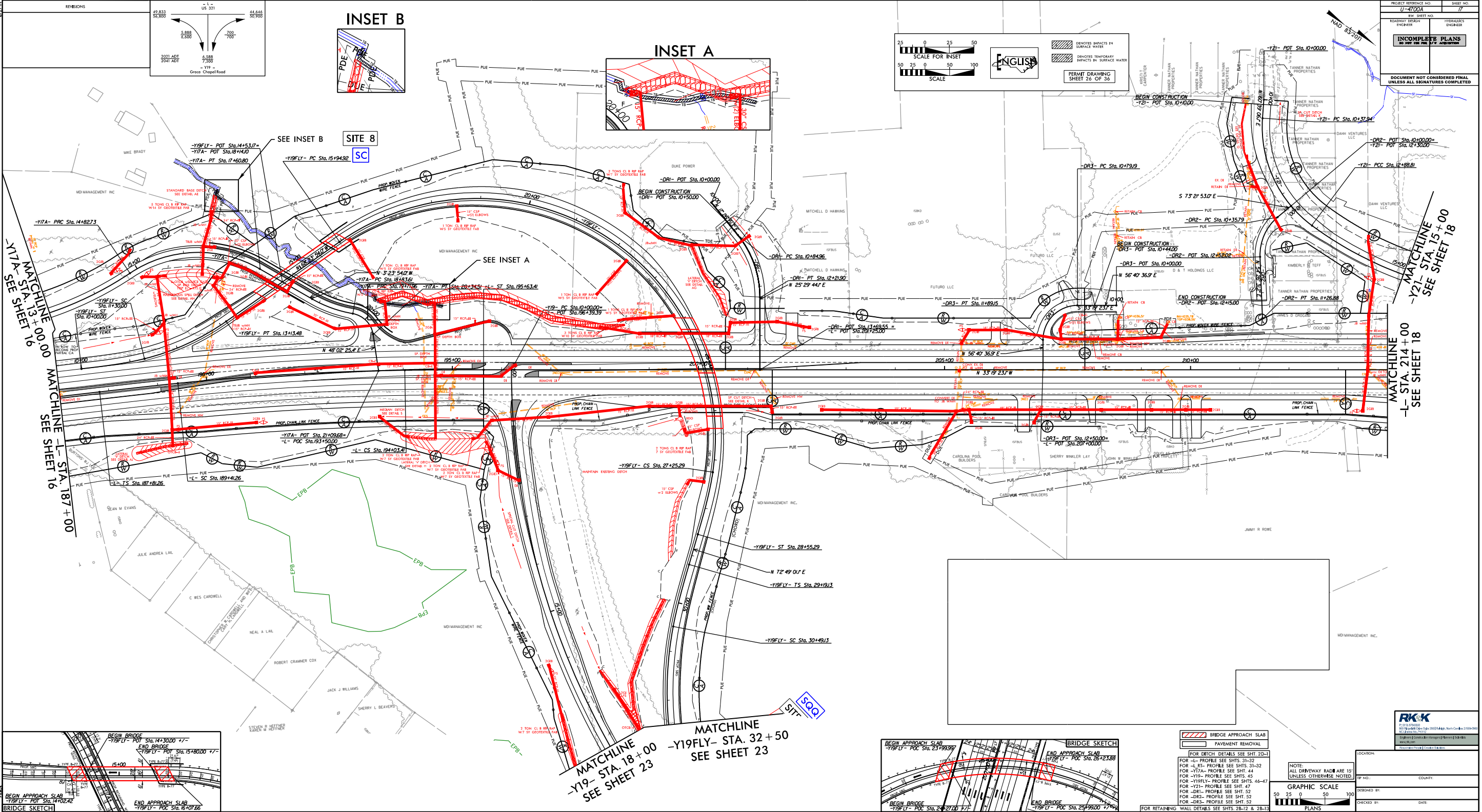
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

- BRIDGE APPROACH SLAB
- PAVEMENT REMOVAL

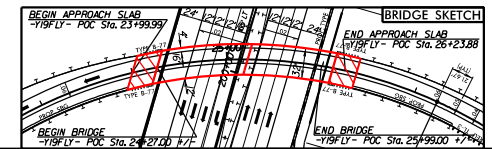
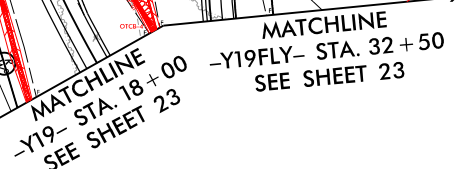
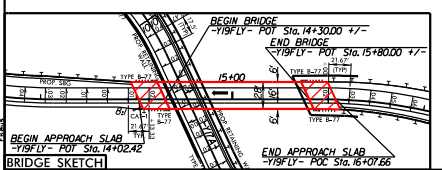
FOR -L- PROFILE SEE SHTS. 30 & 31
FOR -Y17A- PROFILE SEE SHT. 44
FOR -Y17B- PROFILE SEE SHT. 44
FOR -Y17C- PROFILE SEE SHT. 44

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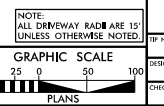
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PROJECT REFERENCE NO. U-4700A	SHEET NO. 17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS BY ANY LAW, THE USE OF ANY PART OF THESE PLANS IS PROHIBITED.	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



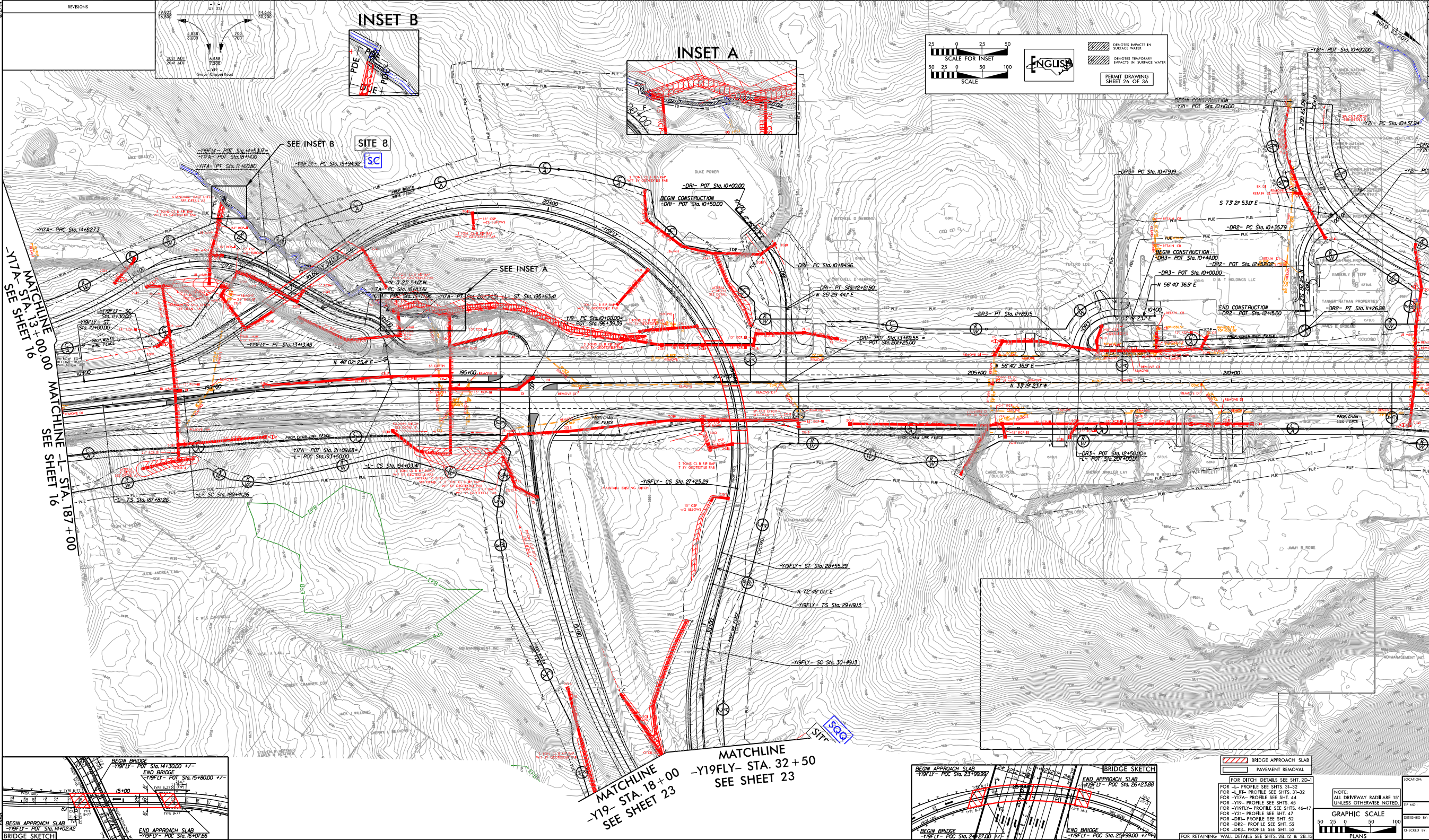
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	PAVEMENT REMOVAL
FOR DITCH DETAILS SEE SHT. 20-1	
FOR -L- PROFILE SEE SHTS. 31-32	
FOR -R- PROFILE SEE SHTS. 31-32	
FOR -Y17A- PROFILE SEE SHT. 44	
FOR -Y19- PROFILE SEE SHTS. 45	
FOR -Y19FLY- PROFILE SEE SHTS. 46-47	
FOR -Y21- PROFILE SEE SHT. 47	
FOR -DR1- PROFILE SEE SHT. 52	
FOR -DR2- PROFILE SEE SHT. 52	
FOR -DR3- PROFILE SEE SHT. 52	
FOR RETAINING WALL DETAILS SEE SHTS. 28-12 & 28-13	



RK-K
REGISTERED PROFESSIONAL ENGINEER
STATE OF NORTH CAROLINA
NO. 14088
EXPIRES 12/31/2025

DESIGNED BY: _____
CHECKED BY: _____
DATE: _____

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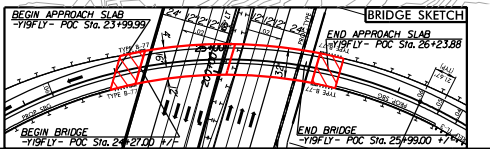
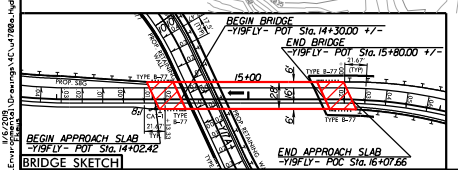


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SEE SHEET 18

MATCHLINE
-L- STA. 187 + 00
SEE SHEET 16

MATCHLINE
-Y19- STA. 18 + 00
SEE SHEET 23

MATCHLINE
-Y19FLY- STA. 32 + 50
SEE SHEET 23



FOR DITCH DETAILS SEE SHT. 20-1

FOR -L- PROFILE SEE SHTS. 31-32
FOR -R- PROFILE SEE SHTS. 31-32
FOR -Y17A- PROFILE SEE SHT. 44
FOR -Y19- PROFILE SEE SHTS. 45
FOR -Y19FLY- PROFILE SEE SHTS. 46-47
FOR -Y21- PROFILE SEE SHT. 47
FOR -DR1- PROFILE SEE SHT. 53
FOR -DR2- PROFILE SEE SHT. 52
FOR -DR3- PROFILE SEE SHT. 52

FOR RETAINING WALL DETAILS SEE SHTS. 28-12 & 28-13

NOTE:
ALL DRIVEWAY RADII ARE 15' UNLESS OTHERWISE NOTED.

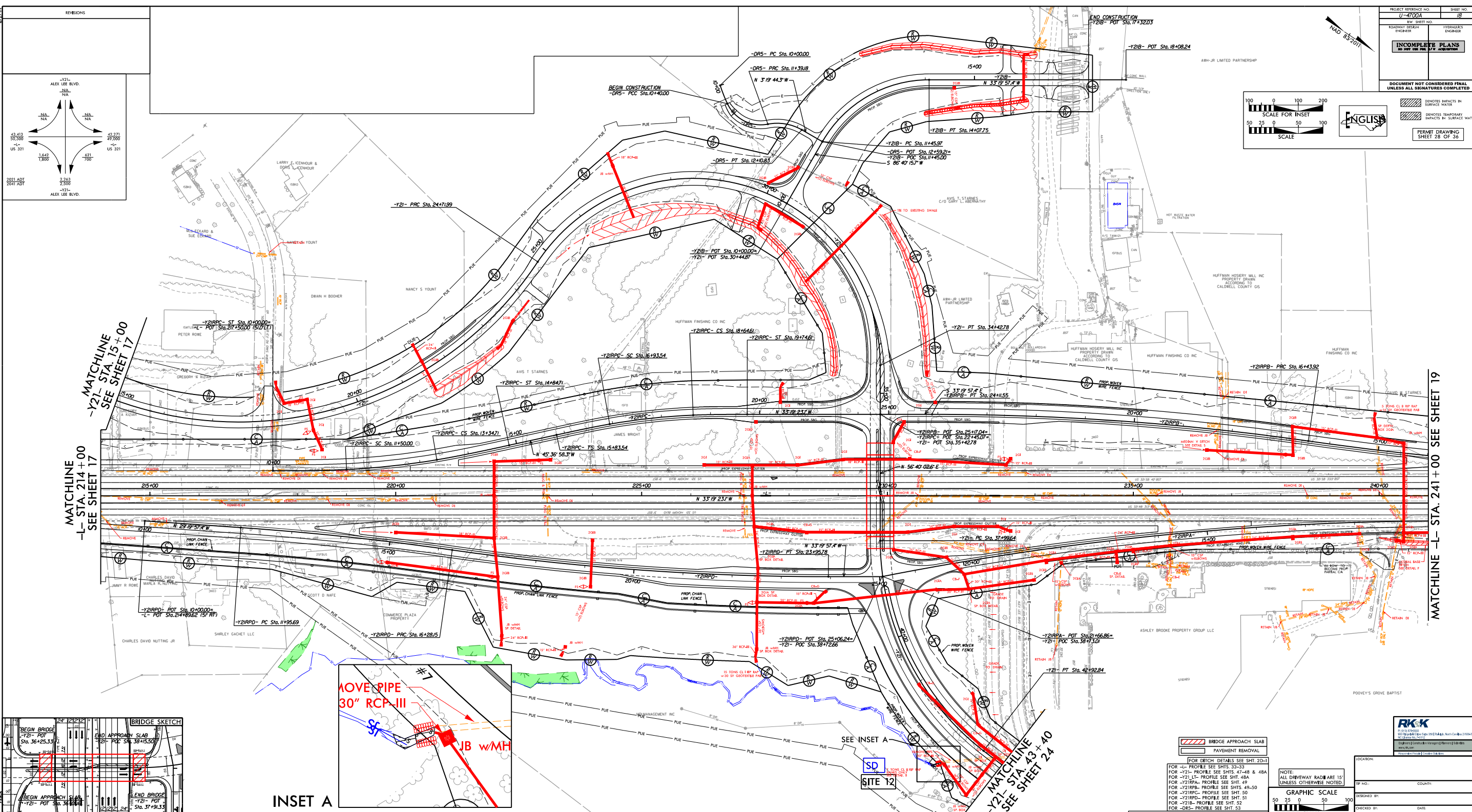
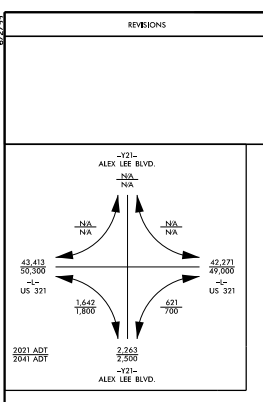
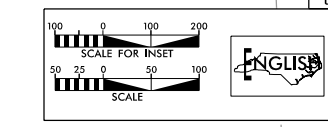
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PLANS

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

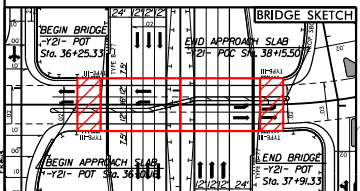
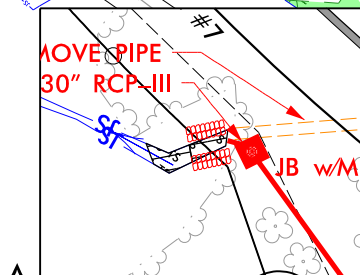
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED							
<table border="0"> <tr> <td></td> <td>DENOTES IMPACTS IN SURFACE WATER</td> </tr> <tr> <td></td> <td>DENOTES TEMPORARY IMPACTS IN SURFACE WATER</td> </tr> <tr> <td colspan="2">PERMIT DRAWING SHEET 28 OF 36</td> </tr> </table>			DENOTES IMPACTS IN SURFACE WATER		DENOTES TEMPORARY IMPACTS IN SURFACE WATER	PERMIT DRAWING SHEET 28 OF 36	
	DENOTES IMPACTS IN SURFACE WATER						
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER						
PERMIT DRAWING SHEET 28 OF 36							



MATCHLINE -L- STA. 214 +00
SEE SHEET 17

MATCHLINE -L- STA. 15 +00
SEE SHEET 17

MATCHLINE -L- STA. 241 +00
SEE SHEET 19



SEE INSET A
SITE 12

MATCHLINE -L- STA. 43 +40
SEE SHEET 24

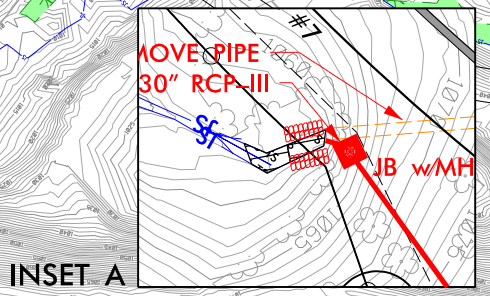
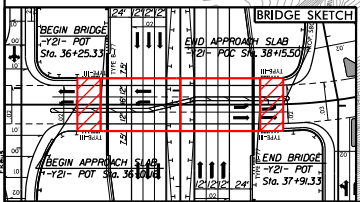
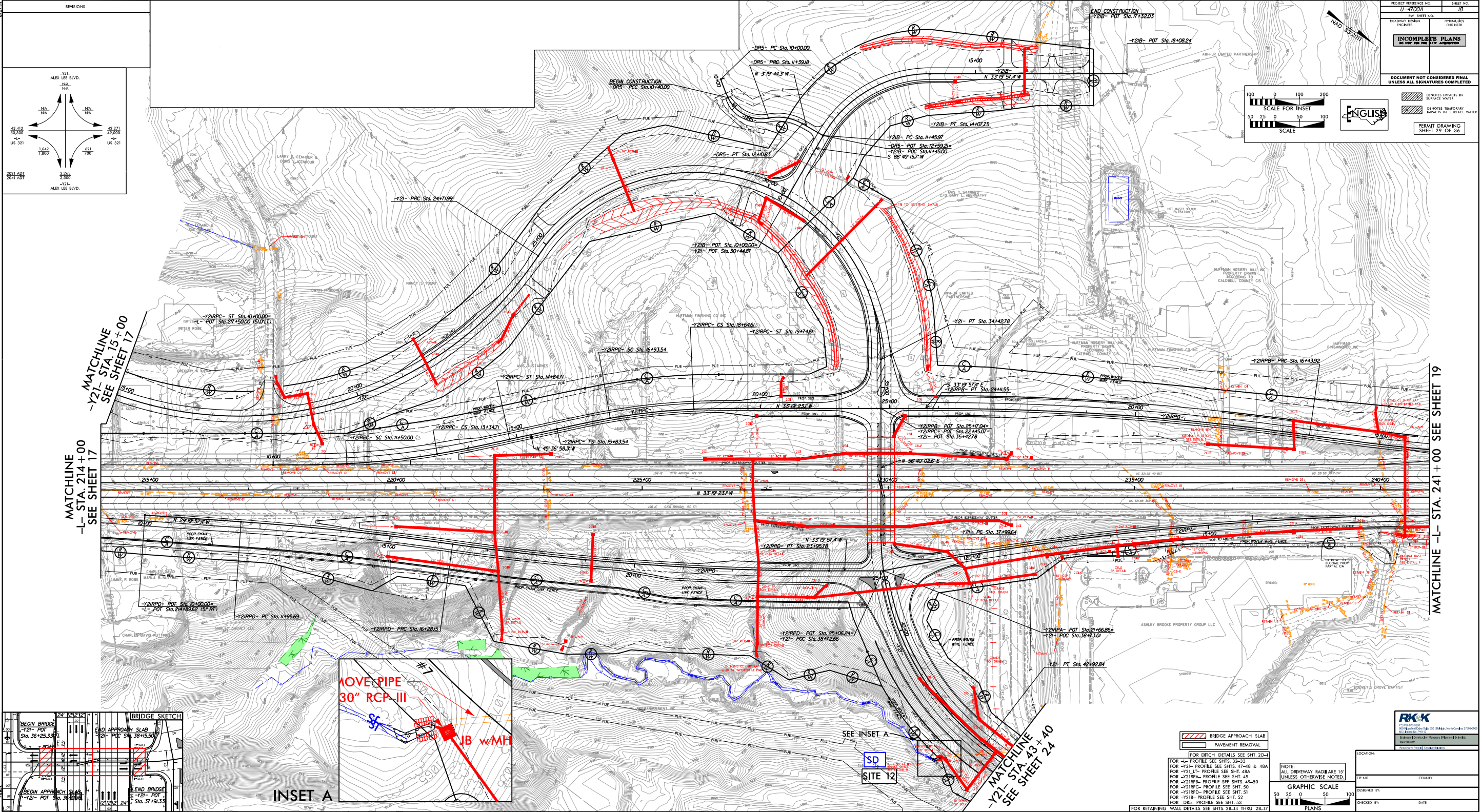
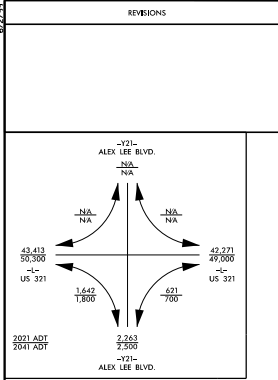
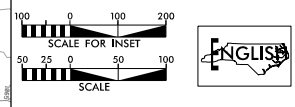
	BRIDGE APPROACH SLAB
	PAVEMENT REMOVAL
FOR DITCH DETAILS SEE SHT. 20-1	
FOR -L- PROFILE SEE SHTS. 32-33	
FOR -Y21- PROFILE SEE SHTS. 47-48 & 48A	
FOR -Y21-LT- PROFILE SEE SHT. 48A	
FOR -Y21-RAL- PROFILE SEE SHT. 49	
FOR -Y21-RPL- PROFILE SEE SHTS. 49-50	
FOR -Y21-RPC- PROFILE SEE SHT. 51	
FOR -Y21- PROFILE SEE SHT. 52	
FOR -DRS- PROFILE SEE SHT. 53	
FOR RETAINING WALL DETAILS SEE SHTS. 28-34 THRU 28-37	

NOTE: ALL DRIVEWAY RADIUS ARE 15' UNLESS OTHERWISE NOTED.

GRAPHIC SCALE
50 25 0 50 100
PLANS

DESIGNED BY:	DATE:
CHECKED BY:	

PROJECT REFERENCE NO.	17-4700A	SHEET NO.	18
REV. SHEET NO.			
ROADWAY DESIGN ENGINEER	INCOMPLETE PLANS		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 29 OF 36			

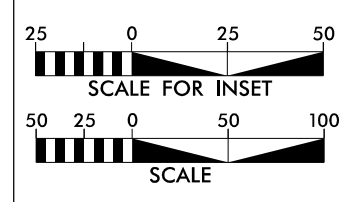


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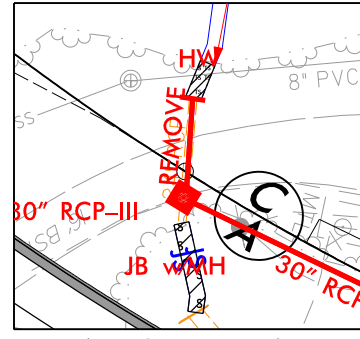
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<p>FOR RETAINING WALL DETAILS SEE SHITS 28-34 THRU 28-37</p>	<p>LOCATION:</p> <p>TP NO.:</p> <p>COUNTY:</p> <p>DESIGNED BY:</p> <p>CHECKED BY:</p> <p>DATE:</p>

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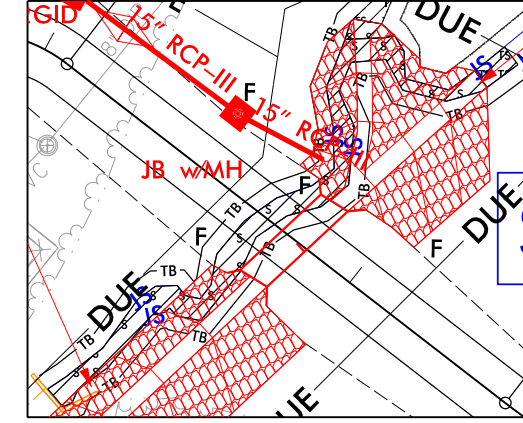
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



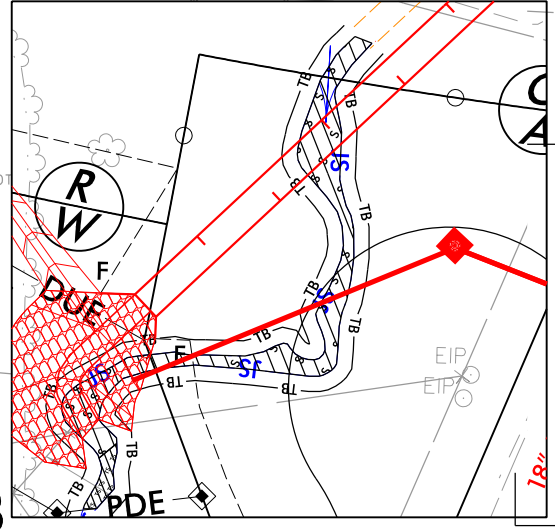
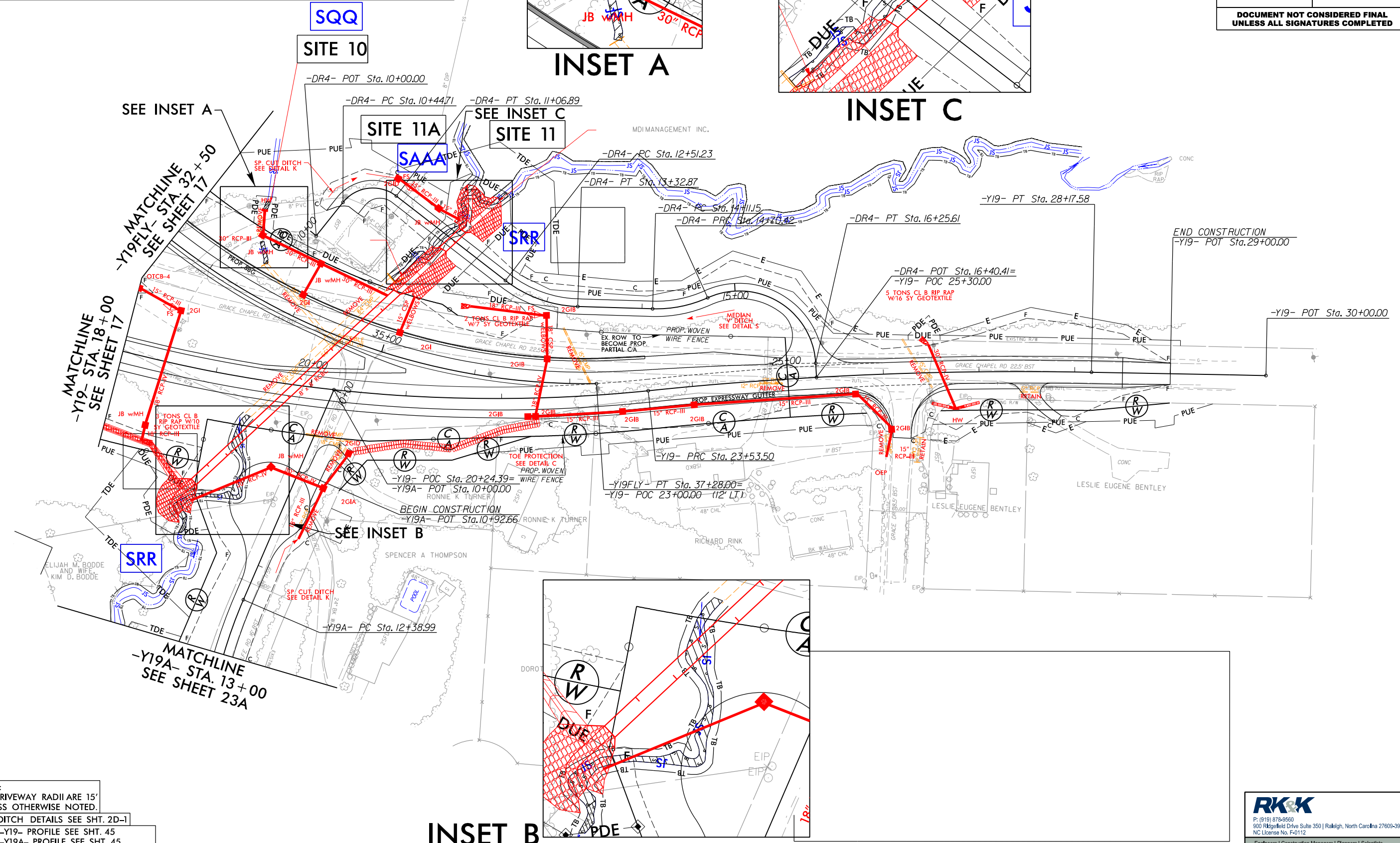
DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PERMIT DRAWING SHEET 30 OF 36



INSET A



INSET C



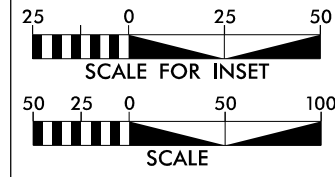
INSET B

NOTE:
 ALL DRIVEWAY RADII ARE 15'
 UNLESS OTHERWISE NOTED.
 FOR DITCH DETAILS SEE SHT. 2D-1
 FOR -Y19- PROFILE SEE SHT. 45
 FOR -Y19A- PROFILE SEE SHT. 45
 FOR -Y19FLY- PROFILE SEE SHTS. 46-47
 FOR -DR4- PROFILE SEE SHT. 53

PAVEMENT REMOVAL

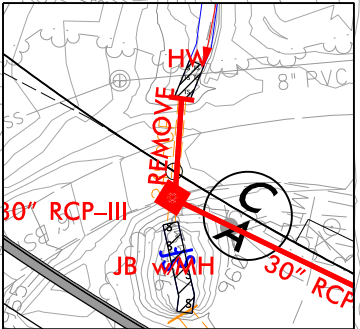
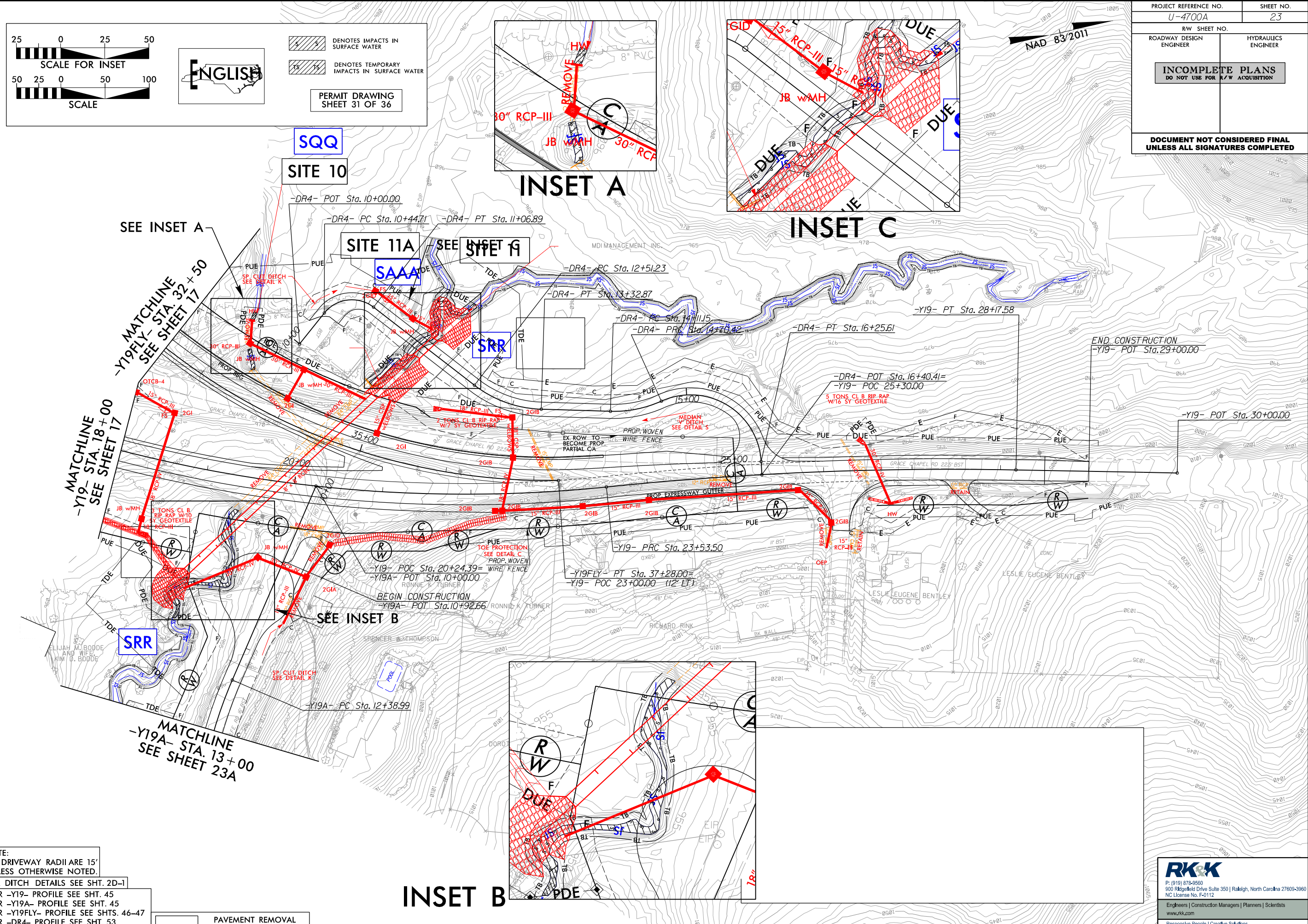
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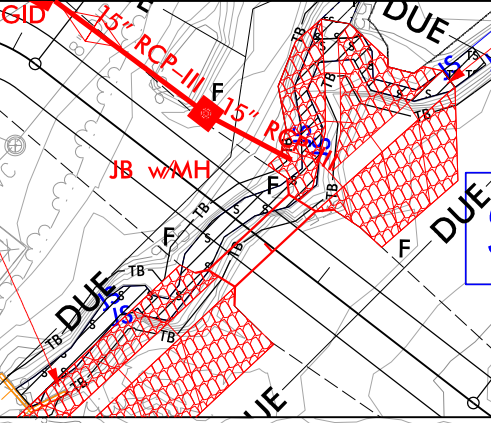


DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 PERMIT DRAWING SHEET 31 OF 36

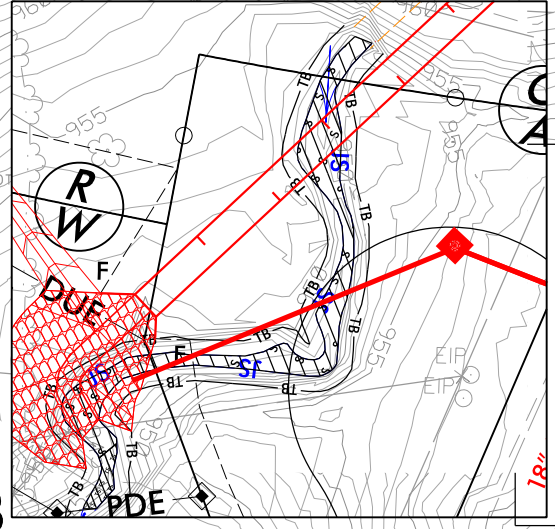
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R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



INSET A



INSET C



INSET B

NOTE:
 ALL DRIVEWAY RADII ARE 15'
 UNLESS OTHERWISE NOTED.
 FOR DITCH DETAILS SEE SHT. 2D-1
 FOR -Y19- PROFILE SEE SHT. 45
 FOR -Y19A- PROFILE SEE SHT. 45
 FOR -Y19FLY- PROFILE SEE SHTS. 46-47
 FOR -DR4- PROFILE SEE SHT. 53

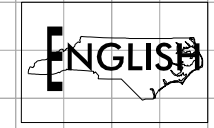
PAVEMENT REMOVAL

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SITE 11

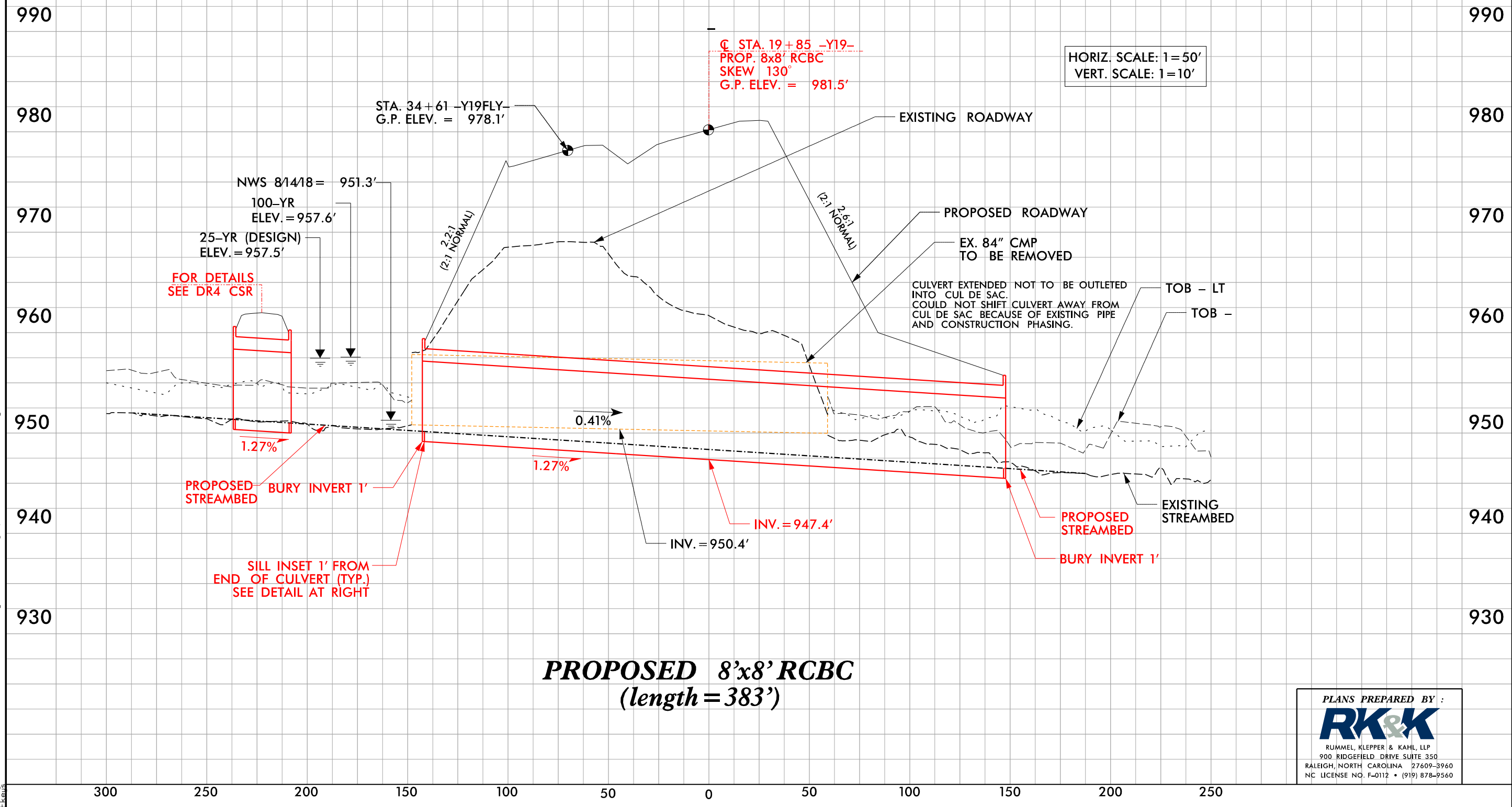
-Y19- 19+85 & -DR4- 11+81



PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
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PERMIT DRAWING
SHEET 32 OF 36



PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO. U-4700A	SHEET NO. 23A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



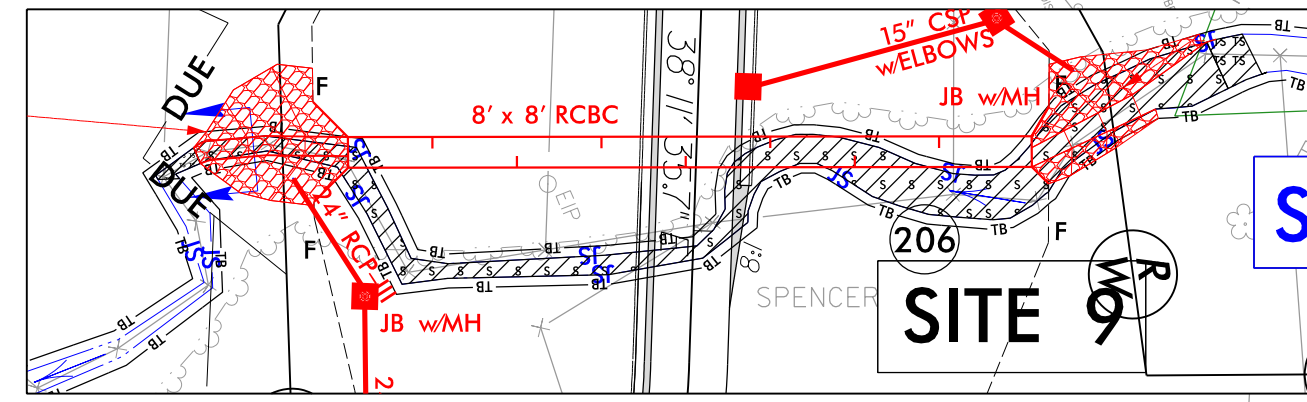
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ENGLISH

DENOTES IMPACTS IN SURFACE WATER

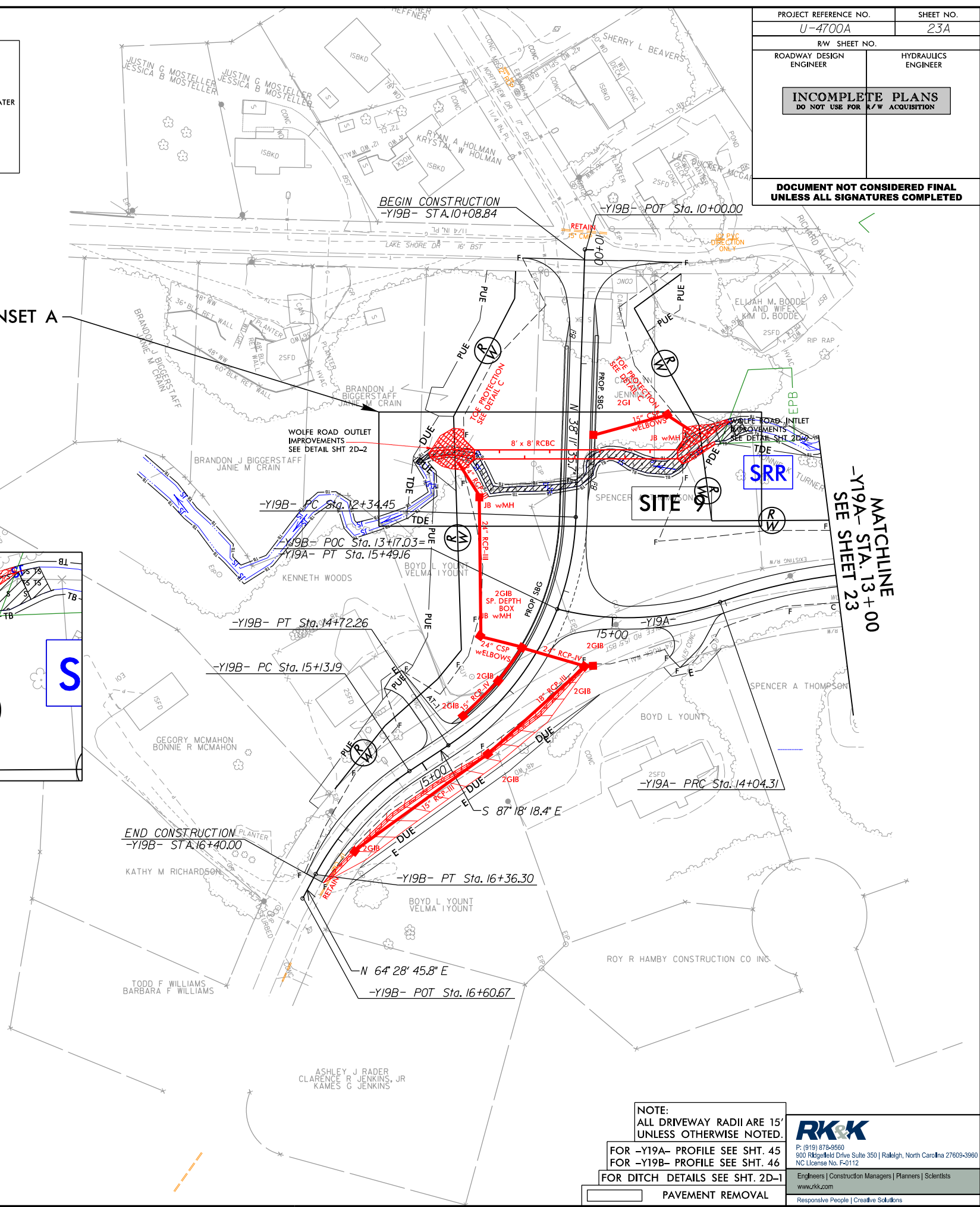
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PERMIT DRAWING SHEET 33 OF 36



INSET A

SEE INSET A



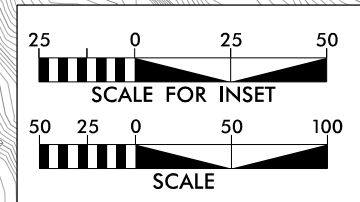
MATCHLINE
-Y19A- STA. 13+00
SEE SHEET 23

NOTE:
ALL DRIVEWAY RADII ARE 15'
UNLESS OTHERWISE NOTED.
FOR -Y19A- PROFILE SEE SHT. 45
FOR -Y19B- PROFILE SEE SHT. 46
FOR DITCH DETAILS SEE SHT. 2D-1

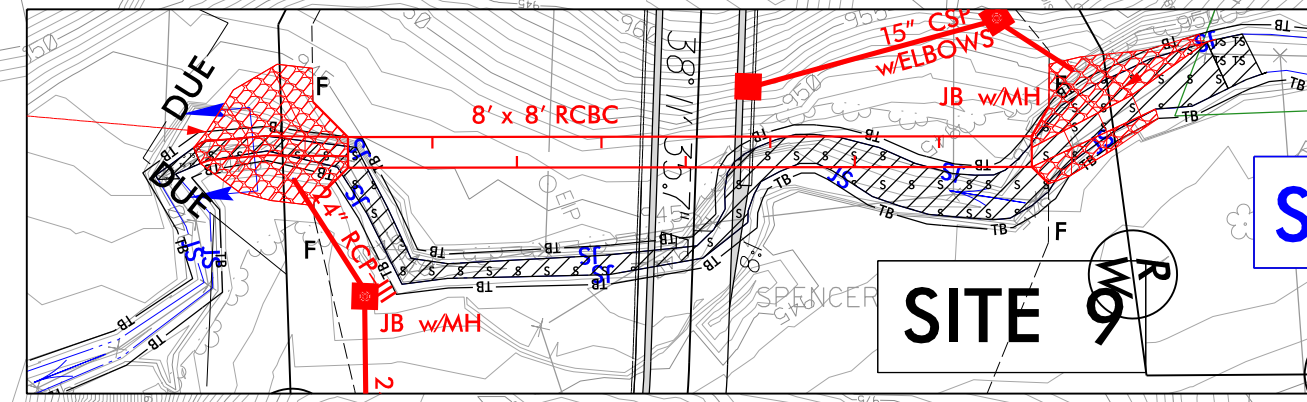
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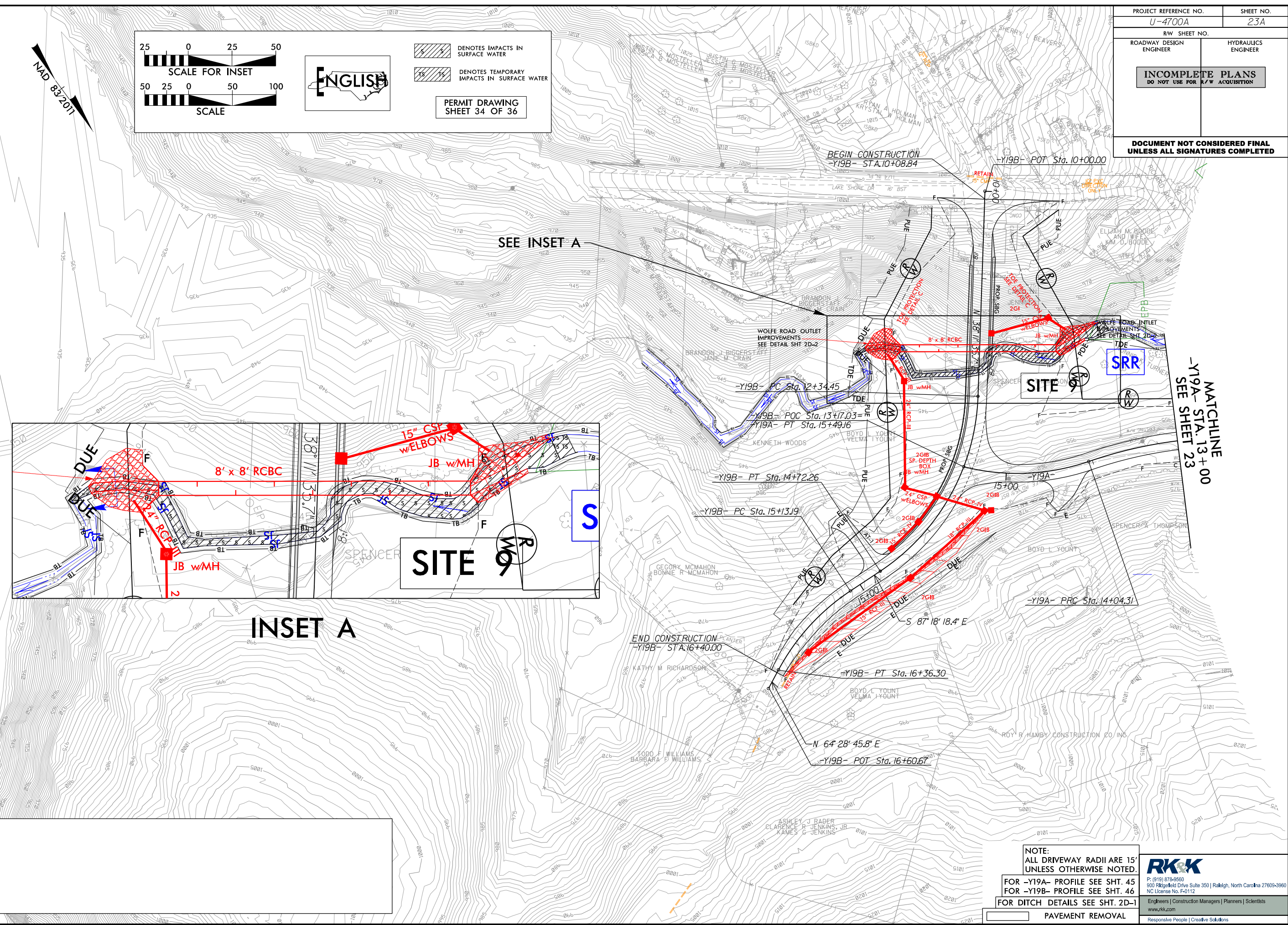
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 PERMIT DRAWING SHEET 34 OF 36



INSET A



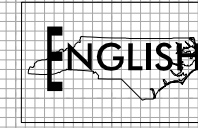
NOTE:
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 FOR -Y19A- PROFILE SEE SHT. 45
 FOR -Y19B- PROFILE SEE SHT. 46
 FOR DITCH DETAILS SEE SHT. 2D-1

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5/14/99

PROJECT REFERENCE NO. U-4700A	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

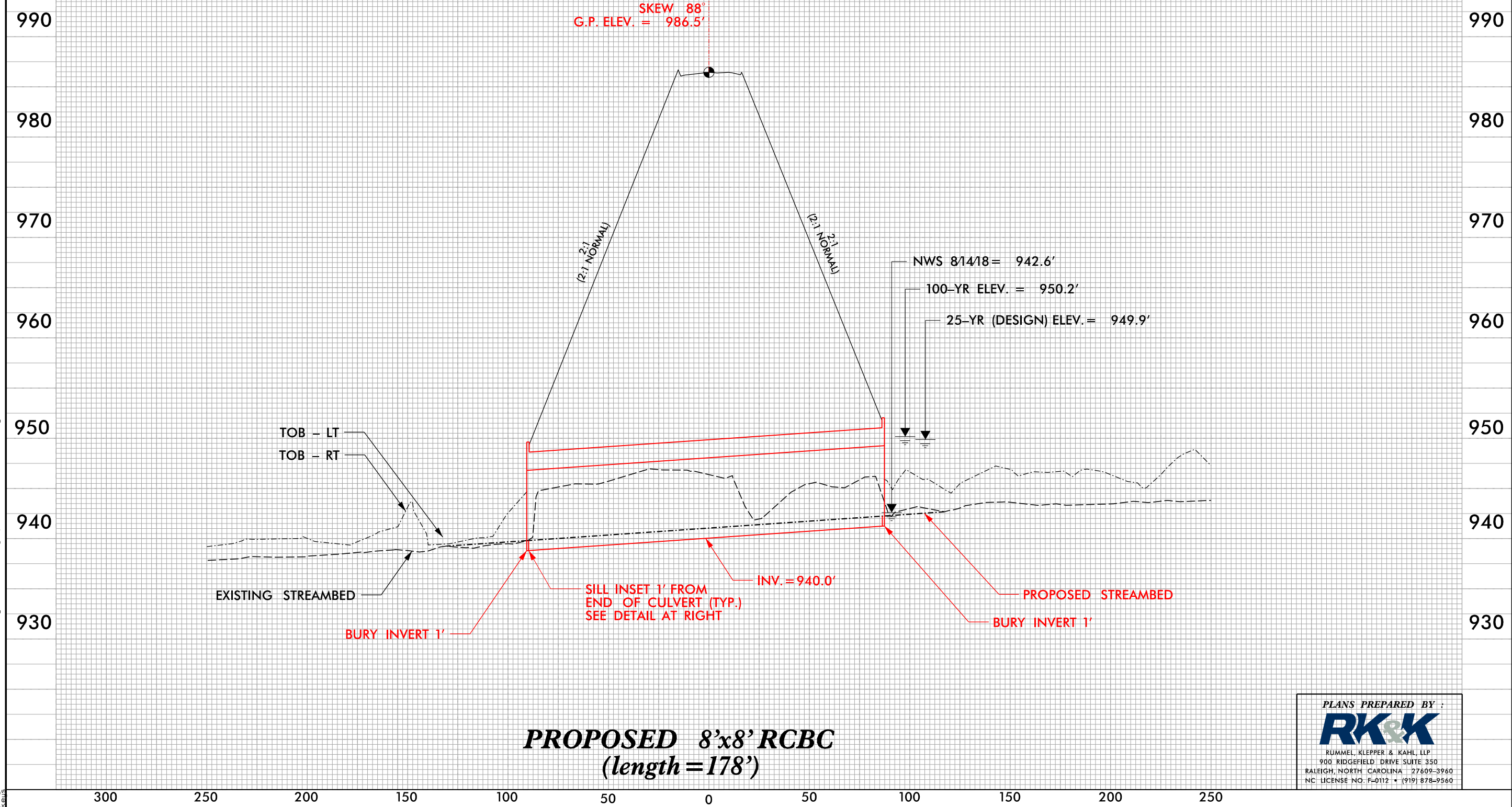


SITE 9 -Y19B- 11+79

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PERMIT DRAWING
SHEET 35 OF 36

Q STA. 11+79.5 -Y19B-
PROP. 8'x8' RCBC
SKEW 88°
G.P. ELEV. = 986.5'



**PROPOSED 8'x8' RCBC
(length = 178')**

PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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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	-L- 35+42 to 35+73 RT	BANK STABILIZATION - SA						0.0041	0.0042	25.0136	34.9600	
2	-L- 95+86 to -L- 96+71 LT/RT	10'X10' RCBC, 72" WSP - FRYE CREEK						0.0090	0.0071	36.0500		
2	-L- 95+86 to -L- 96+71 LT/RT	BANK STABILIZATION - FRYE CREEK								83.8900	20.1799	
3	-L- 148+42 to 148+51 LT	66" RCP - SB							0.0008		10.0507	
4	-L- 154+38 to 157+73 LT	EXIST 48" CMP AND 2GI - SB2						0.0060		66.2000		
5/5A	-L- 157+41 to 162+10 LT	7'X7' RCBC - WA, SB	0.0935					0.1061		519.3580		
6	-L- 162+92 to 164+55 LT	BANK STABILIZATION - SB								160.2000	10.0100	
6	-L- 162+92 to 166+ LT	WORK PADS FOR DRILLED SHAFTS - SB							0.0708			
7	-L- 167+50 to 177+60	NEW DRILLED SHAFTS IN CATAWBA RIVER *						0.0279				
7A	-L- 174+96 to 177+35 LT	BANK STABILIZATION - CATAWBA RIVER						0.0746	0.0050	316.2226	20.0000	
8	-L- 190+51 to 194+81 LT	CHANNEL IMPROVEMENTS - SC						0.0095	0.0010	138.2714	14.5200	
9	-Y19B- 11+78	FILL-IN STREAM 8'X8' RCBC - SRR						0.0352		217.1000		
9	-Y19B- 11+78	BANK STABILIZATION INLET - SRR						0.0165	0.0027	55.9000	9.5000	
9	-Y19B- 11+78	OUTLET IMPACTS 8'X8' RCBC - SRR						0.0043	0.0009	41.4000	11.0000	
10	-Y19FLY- 33+15 LT	30" RCP & Permanent Fill - SQQ						0.0022	0.0009	23.6600	10.0136	
11	-DR4- 11+65 LT	8'x8' RCBC - SRR						0.0199	0.0013	179.9000	10.0000	
11A	-DR4- 11+65 LT	8'x8' RCBC - SAAA						0.0010	0.0011	4.5000	11.1800	
12	-Y21- 42+47 RT	BANK STABILIZATION - SD						0.0010	0.0012	10.1017	10.4613	
TOTALS*:												

*Rounded totals are sum of actual impacts

NOTES:

- * 6' DRILLED SHAFTS FOR INTERIOR BENTS 8 THRU 16. AREA PER SHAFT=28.3 SF. TOTAL AREA =28.3*(SHAFTS)* 9(BENTS)*2 (BRIDGES)=1017.4SF
- * 5' DRILLED SHAFTS FOR INTERIOR BENTS 1 THRU 7,17-18 . AREA PER SHAFT=19.625 SF. 10(SHAFTS IN THE WATER) TOTAL AREA=196.25 SF.

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 October 2019
 Catawba, Burke, and Caldwell
 U-4700A