

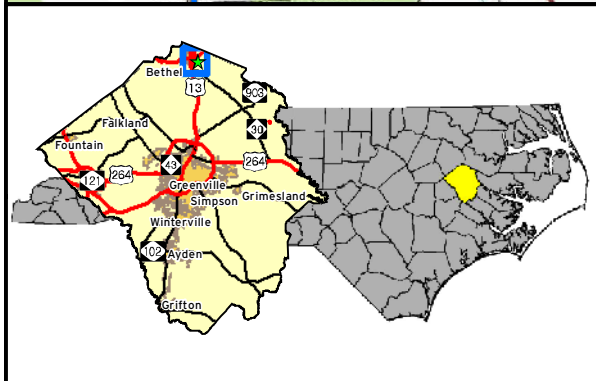
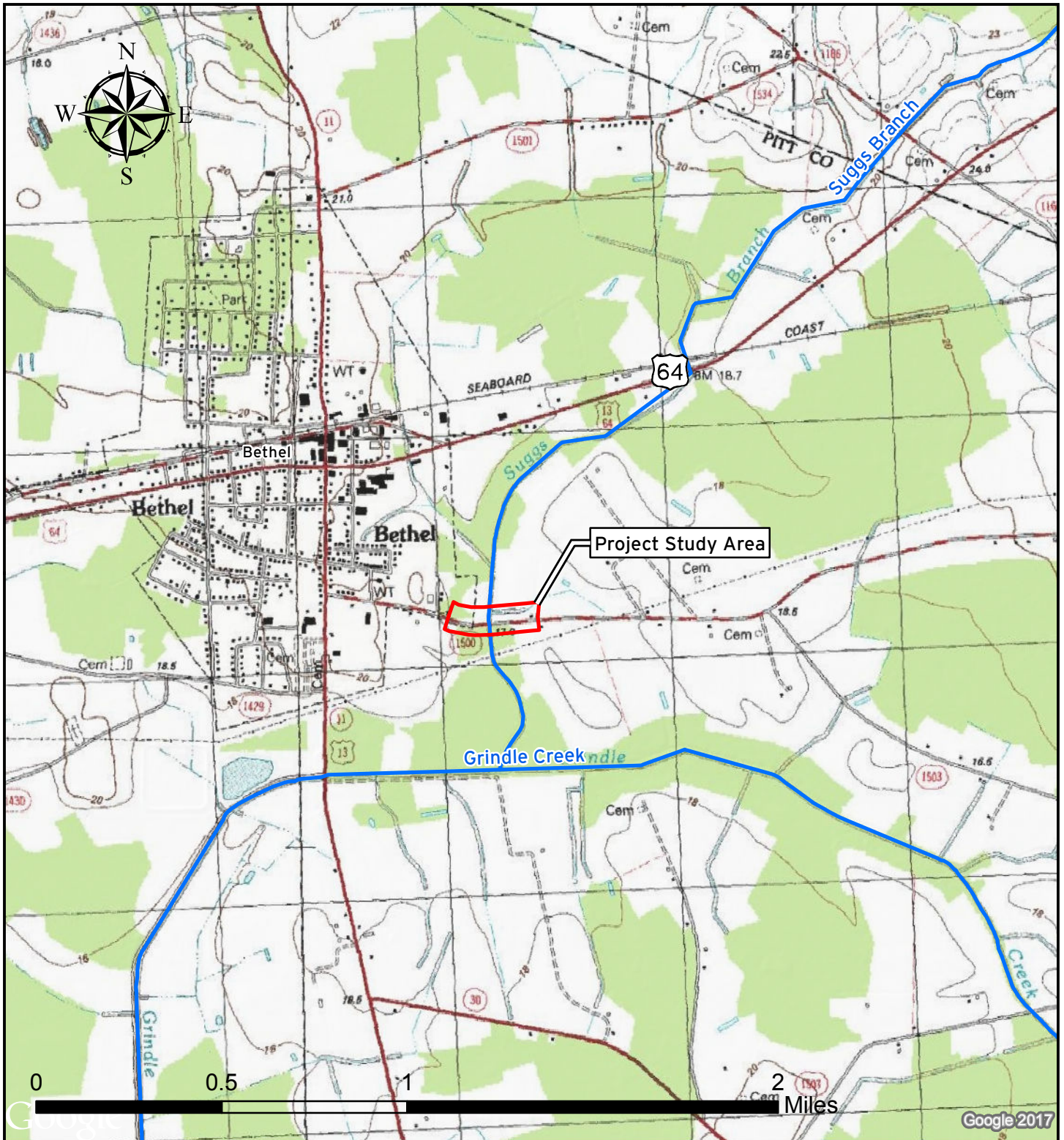
NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS UNIT



**17BP.2.R.81
REPLACE BRIDGE 113 ON SR 1500
OVER SUGGS BRANCH
PITT COUNTY**

VICINITY MAP

FIGURE 1



NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS UNIT



**17BP.2.R.81
REPLACE BRIDGE 113 ON SR 1500
OVER SUGGS BRANCH
PITT COUNTY**

USGS MAP

FIGURE 2

Source: USGS 7.5 Minute Quadrangle, Robersonville West, NC

RIPARIAN BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft ²)	ZONE 2 (ft ²)
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)		
1	1 @ 45' - 21" Cored Slab	-L- 11+65 to 13+03		X		3493.0	2120.0	5613.0					
TOTAL:						3493	2120	5613	0	0	0	0	0

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS

 PITT COUNTY
 SF-730113
 17BP.2.R.81

 11/8/2017
 SHEET 3 OF 10

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- 12+25 to 12+47	Bank Stabilization						< 0.01	< 0.01	22	12	
TOTALS*:								< 0.01	< 0.01	22	12	0

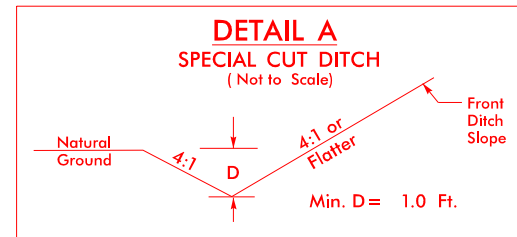
*Rounded totals are sum of actual impacts

NOTES:

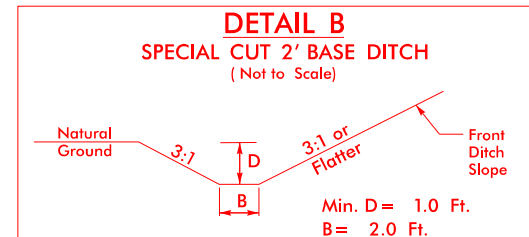
NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 November 8, 2017
 Pitt County
 SF-730113
 17BP.2.R.81
 SHEET 4 OF 10

PROJECT REFERENCE NO. 17BP.2.R.81	SHEET NO. 20-1
HYDRAULIC DESIGN ENGINEER	
PERMIT DRAWING SHEET 5 OF 10	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

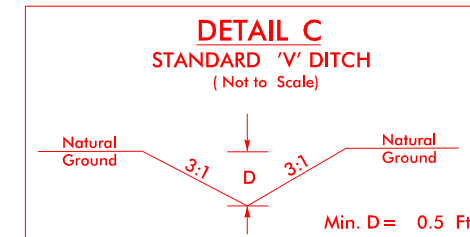
DRAINAGE DETAILS



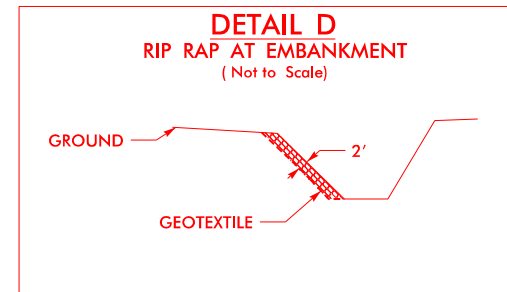
FROM -L- STA. 13+25 TO STA. 13+75 RT



FROM -L- STA. 12+60 TO STA. 13+75 LT



FROM -L- STA. 11+25 TO STA. 11+50 LT
BEG. ELEV=51.65, END ELEV=50.55

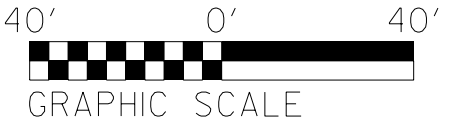


FROM -L- STA. 12+15 TO STA. 12+29
40 TONS CL II RIPRAP W/70 SY GEOTEXTILE
FROM -L- STA. 12+42 TO STA. 12+60
45 TONS CL II RIPRAP W/80 SY GEOTEXTILE

BUFFER IMPACTS PERMIT

PROJECT REFERENCE NO. 17BP.2.R.81	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
BUFFER DRAWING SHEET 6 OF 10	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NAD 83/2011



DITCH DATA			
	STA	EL	
BEG	-L- 12+60	LT	49.61
END	-L- 13+75	LT	50.29
DA =	1.53	AC	
SLOPE =	0.59	%	
Q10 =	5.66	CFS	
V10 =	1.92	FT/S	
D10 =	0.71	FT	
Q2 =	4.37	CFS	
V2 =	1.80	FT/S	
D2 =	0.63	FT	

B2
ZONE 1 BUFFER IMPACTS = 1,773 SF
ZONE 2 BUFFER IMPACTS = 1,106 SF

B1
ZONE 1 BUFFER IMPACTS = 875 SF
ZONE 2 BUFFER IMPACTS = 528 SF

B3
ZONE 1 BUFFER IMPACTS = 375 SF
ZONE 2 BUFFER IMPACTS = 218 SF

B4
ZONE 1 BUFFER IMPACTS = 470 SF
ZONE 2 BUFFER IMPACTS = 268 SF

LEGEND

	ALLOWABLE IMPACTS ZONE 1
	ALLOWABLE IMPACTS ZONE 2

-L-	-DRI-	-DRI-
PI Sta 10+80.83	PI Sta 10+48.06	PI Sta 10+81.89
$\Delta = 8^{\circ} 02' 28.9" (LT)$	$\Delta = 98^{\circ} 10' 05.2" (RT)$	$\Delta = 97^{\circ} 05' 16.9" (LT)$
$D = 4^{\circ} 58' 56.1"$	$D = 286^{\circ} 28' 44.0"$	$D = 286^{\circ} 28' 44.0"$
$L = 161.40'$	$L = 34.27'$	$L = 33.89'$
$T = 80.83'$	$T = 23.08'$	$T = 22.64'$
$R = 1,150.00'$	$R = 20.00'$	$R = 20.00'$
$SE = 0.06$		
$V = 55 \text{ mph}$		

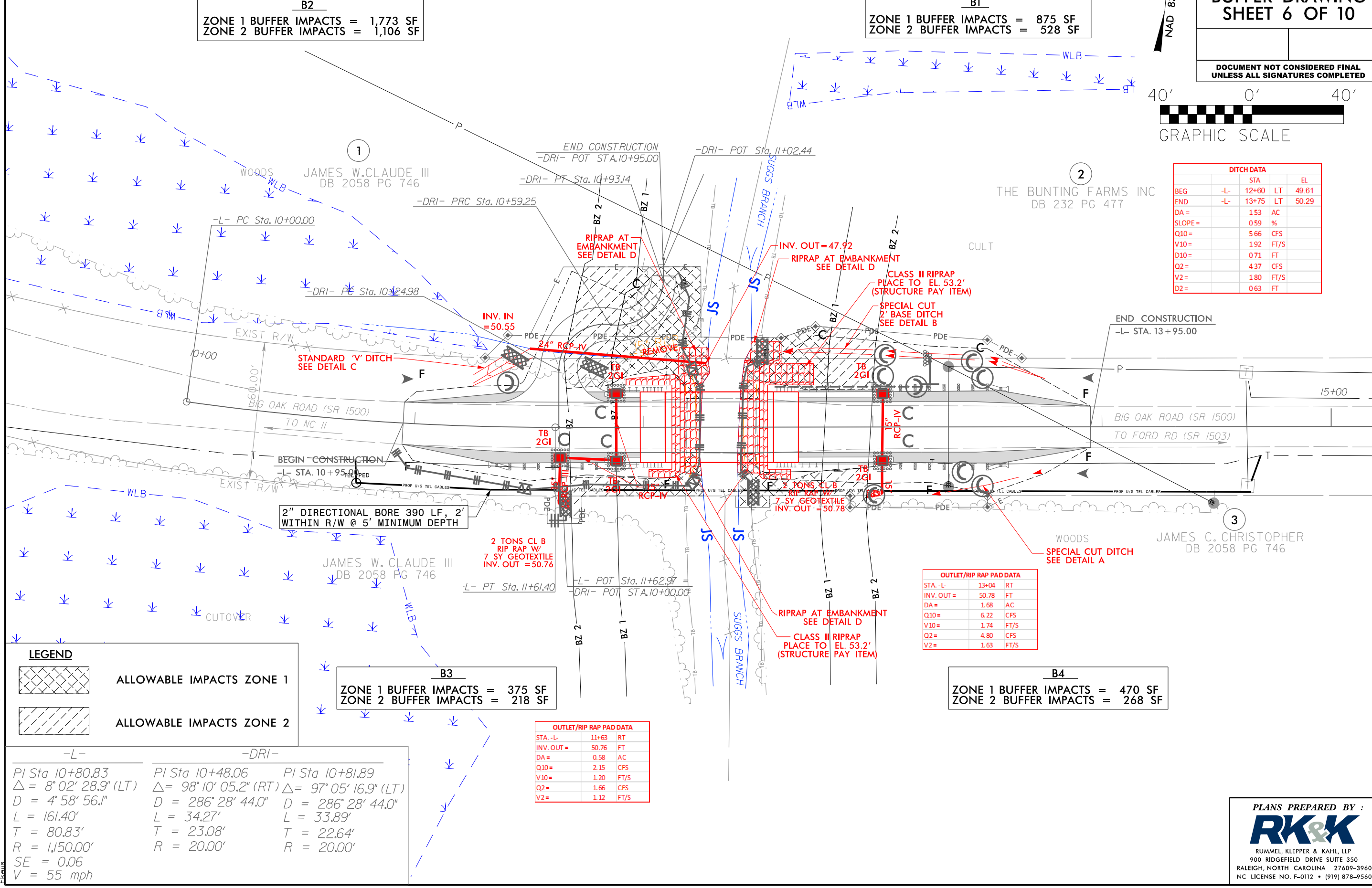
OUTLET/RIP RAP PAD DATA

STA. -L-	11+63	RT
INV. OUT =	50.76	FT
DA =	0.58	AC
Q10 =	2.15	CFS
V10 =	1.20	FT/S
Q2 =	1.66	CFS
V2 =	1.12	FT/S

OUTLET/RIP RAP PAD DATA

STA. -L-	13+04	RT
INV. OUT =	50.78	FT
DA =	1.68	AC
Q10 =	6.22	CFS
V10 =	1.74	FT/S
Q2 =	4.80	CFS
V2 =	1.63	FT/S

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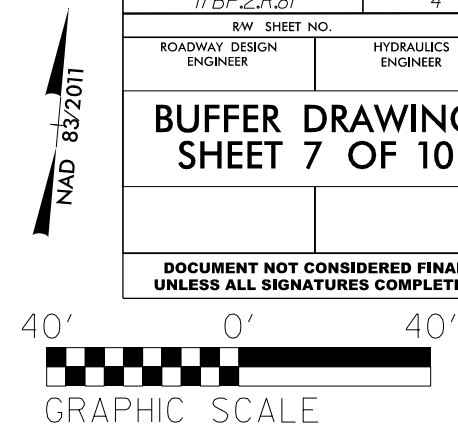


PLANS PREPARED BY :

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

BUFFER IMPACTS PERMIT

PROJECT REFERENCE NO. 17BP.2.R.81	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
BUFFER DRAWING SHEET 7 OF 10	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



B2
 ZONE 1 BUFFER IMPACTS = 1,773 SF
 ZONE 2 BUFFER IMPACTS = 1,106 SF

B1
 ZONE 1 BUFFER IMPACTS = 875 SF
 ZONE 2 BUFFER IMPACTS = 528 SF

DITCH DATA				
BEG	-L-	STA	LT	EL
END	-L-	12+60	LT	49.61
DA =		1.53	AC	
SLOPE =		0.59	%	
Q10 =		5.66	CFS	
V10 =		1.92	FT/S	
D10 =		0.71	FT	
Q2 =		4.37	CFS	
V2 =		1.80	FT/S	
D2 =		0.63	FT	

OUTLET/RIP RAP PAD DATA			
STA. -L-	RT	INVT. OUT =	FT
DA =	1.68	AC	
Q10 =	6.22	CFS	
V10 =	1.74	FT/S	
Q2 =	4.80	CFS	
V2 =	1.63	FT/S	

OUTLET/RIP RAP PAD DATA			
STA. -L-	RT	INVT. OUT =	FT
DA =	0.58	AC	
Q10 =	2.15	CFS	
V10 =	1.20	FT/S	
Q2 =	1.66	CFS	
V2 =	1.12	FT/S	

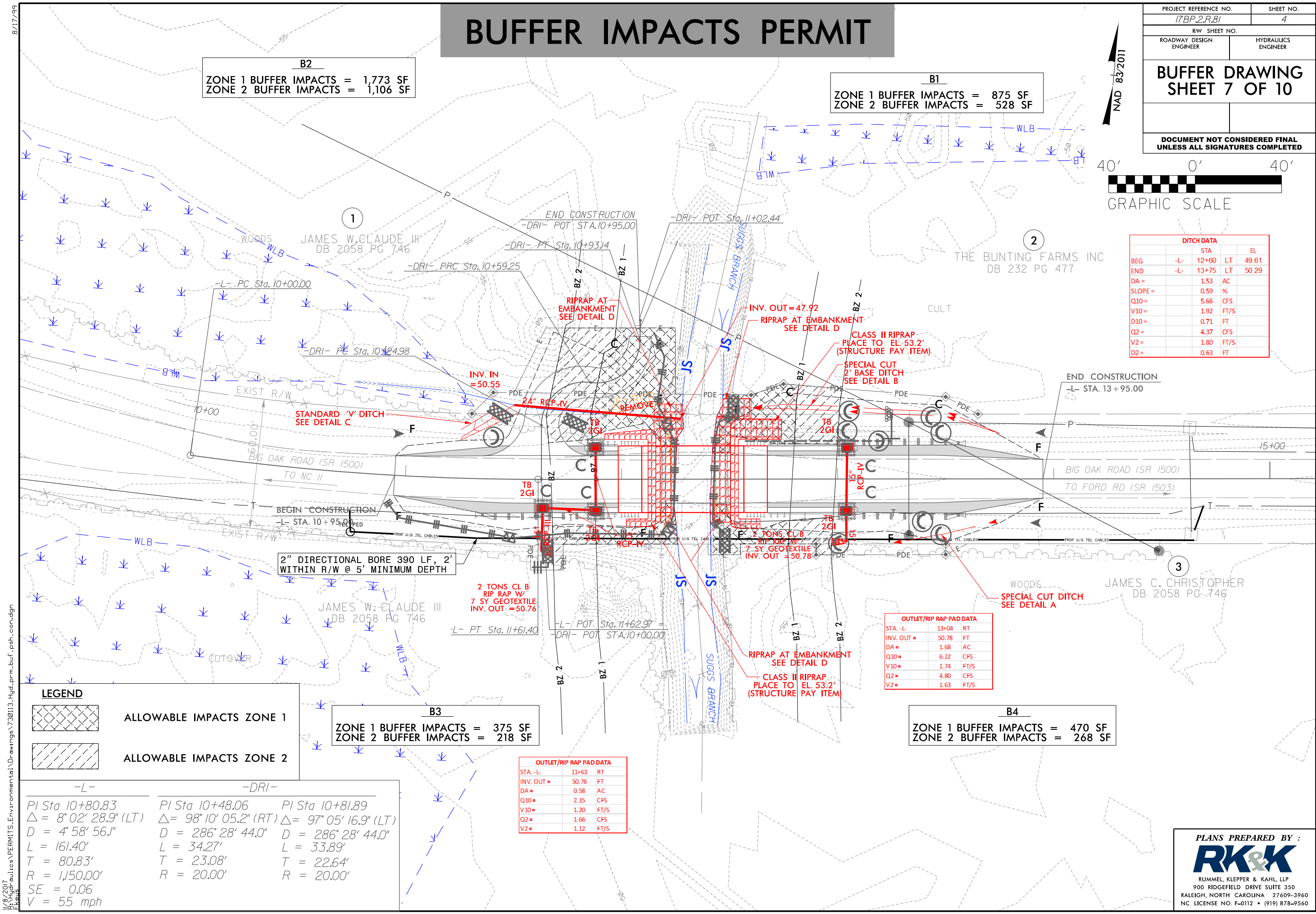
LEGEND

	ALLOWABLE IMPACTS ZONE 1
	ALLOWABLE IMPACTS ZONE 2

-L-	-DRI-	-DRI-
PI Sta 10+80.83	PI Sta 10+48.06	PI Sta 10+81.89
Δ = 8° 02' 28.9" (LT)	Δ = 98° 10' 05.2" (RT)	Δ = 97° 05' 16.9" (LT)
D = 4' 58" 56.1"	D = 286' 28" 44.0"	D = 286' 28" 44.0"
L = 161.40'	L = 34.27'	L = 33.89'
T = 80.83'	T = 23.08'	T = 22.64'
R = 1,150.00'	R = 20.00'	R = 20.00'
SE = 0.06		
V = 55 mph		

B3
 ZONE 1 BUFFER IMPACTS = 375 SF
 ZONE 2 BUFFER IMPACTS = 218 SF

B4
 ZONE 1 BUFFER IMPACTS = 470 SF
 ZONE 2 BUFFER IMPACTS = 268 SF

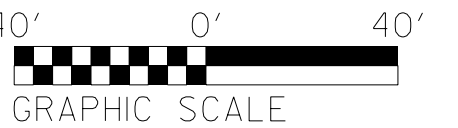


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WETLAND AND SURFACE WATER IMPACTS PERMIT

PROJECT REFERENCE NO. 17BP2.R.81	SHEET NO. 4
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
PERMIT DRAWING SHEET 8 OF 10	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NAD 83/2011



IMPACTS IN SURFACE WATER = 22 LF
TEMP. IMPACTS IN SURFACE WATER = 12 LF

SCALE 1" = 20'

THE BUNTING FARMS INC
DB 232 PG 477

END CONSTRUCTION
-L- STA. 13 + 95.00

2" DIRECTIONAL BORE 390 LF, 2'
WITHIN R/W @ 5' MINIMUM DEPTH

SCALE 1" = 20'

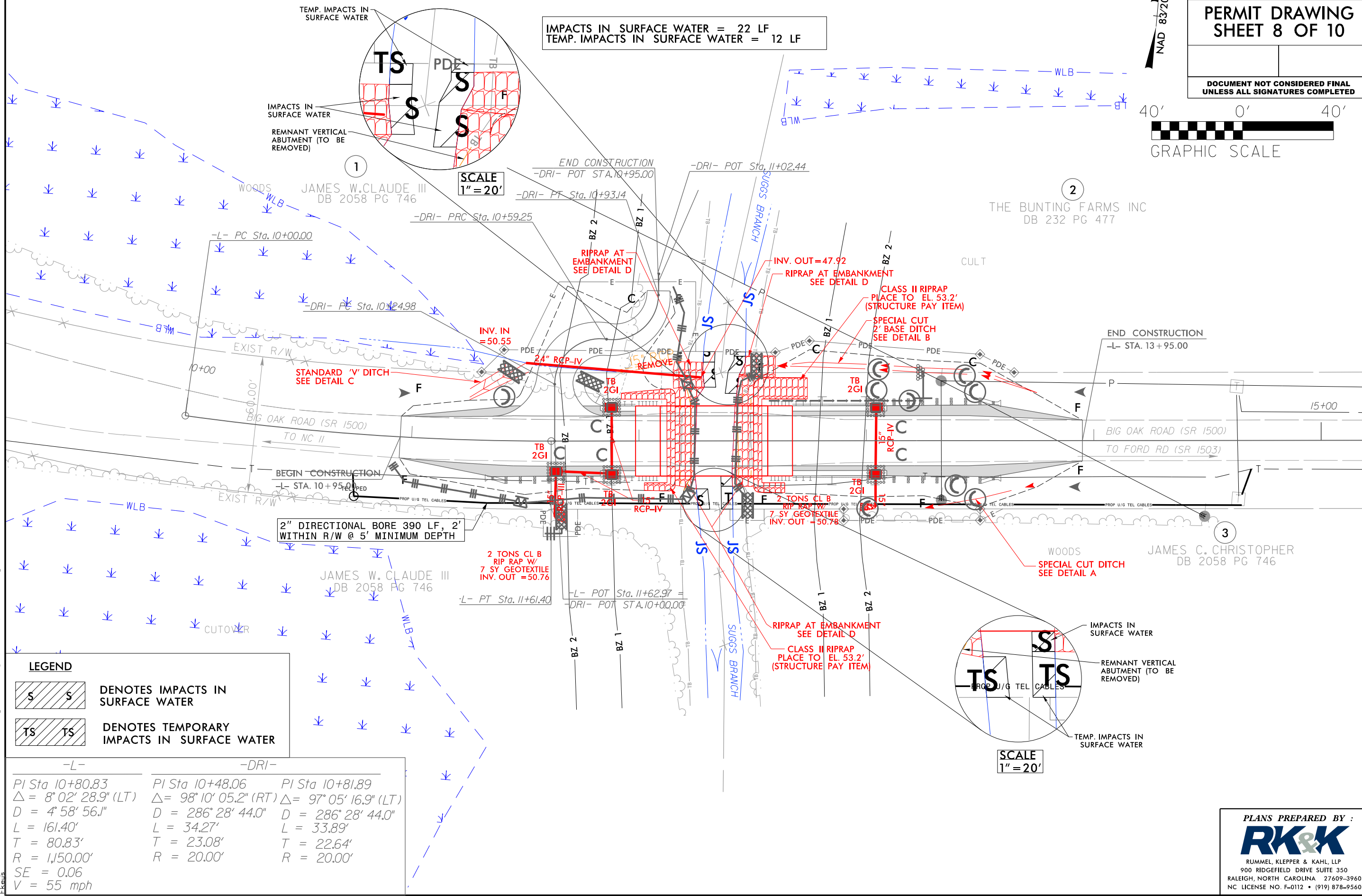
LEGEND

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L-	-DRI-	-DRI-
PI Sta 10+80.83	PI Sta 10+48.06	PI Sta 10+81.89
$\Delta = 8^{\circ} 02' 28.9" (LT)$	$\Delta = 98^{\circ} 10' 05.2" (RT)$	$\Delta = 97^{\circ} 05' 16.9" (LT)$
$D = 4^{\circ} 58' 56.1"$	$D = 286^{\circ} 28' 44.0"$	$D = 286^{\circ} 28' 44.0"$
$L = 161.40'$	$L = 34.27'$	$L = 33.89'$
$T = 80.83'$	$T = 23.08'$	$T = 22.64'$
$R = 1,150.00'$	$R = 20.00'$	$R = 20.00'$
$SE = 0.06$		
$V = 55 \text{ mph}$		

8/17/99

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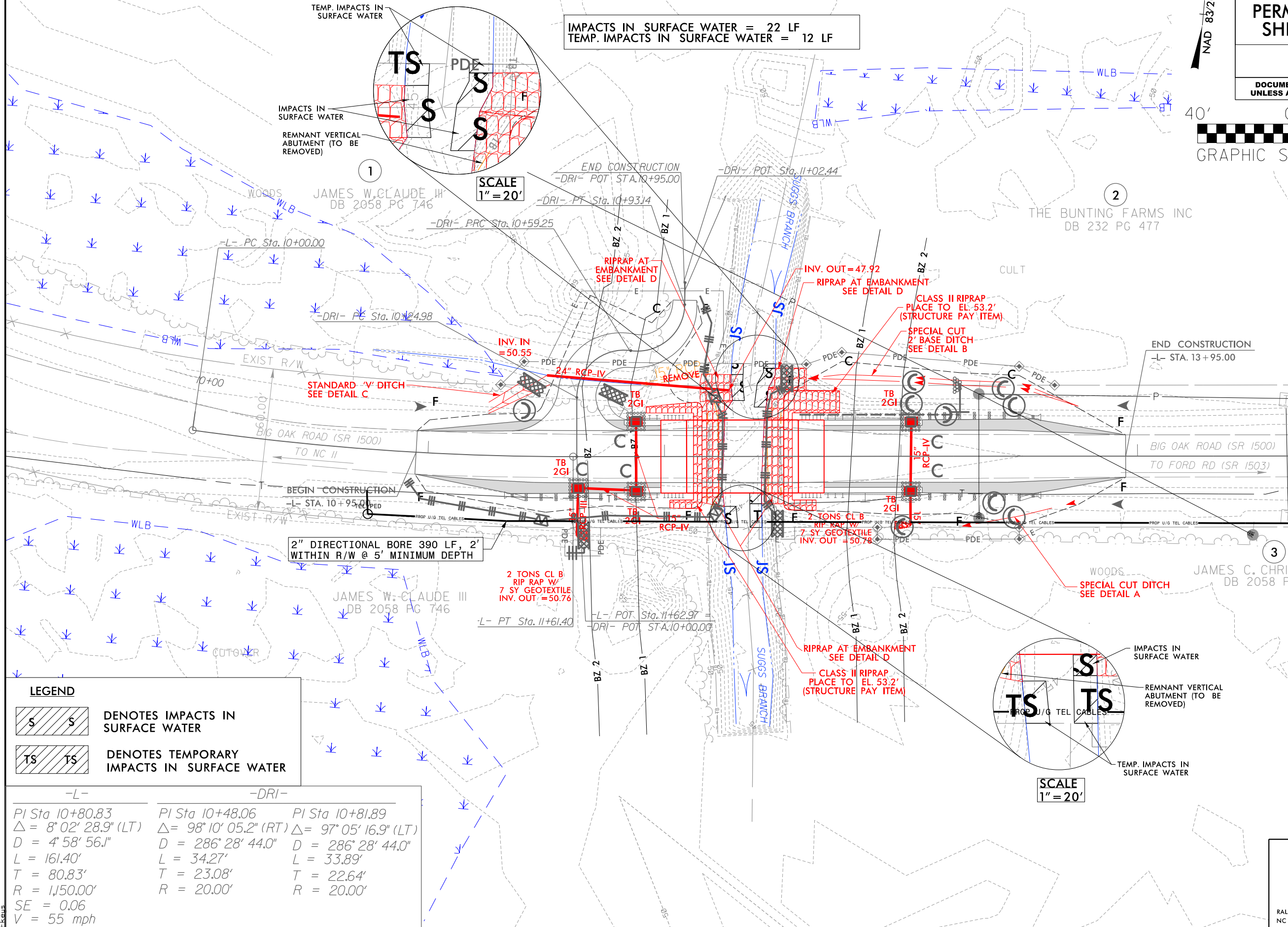
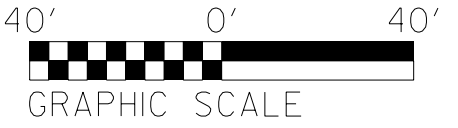
RK&K

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

WETLAND AND SURFACE WATER IMPACTS PERMIT

PROJECT REFERENCE NO. 17BP.2.R.81	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 9 OF 10	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NAD 83/2011



IMPACTS IN SURFACE WATER = 22 LF
TEMP. IMPACTS IN SURFACE WATER = 12 LF

IMPACTS IN SURFACE WATER = 22 LF
TEMP. IMPACTS IN SURFACE WATER = 12 LF

2" DIRECTIONAL BORE 390 LF, 2'
WITHIN R/W @ 5' MINIMUM DEPTH

2 TONS CL B
RIP RAP W/
7 SY GEOTEXTILE
INV. OUT. = 50.76

RIPRAP AT EMBANKMENT
SEE DETAIL D
CLASS II RIPRAP
PLACE TO EL. 53.2'
(STRUCTURE PAY ITEM)

IMPACTS IN SURFACE WATER
REMNANT VERTICAL
ABUTMENT (TO BE
REMOVED)

SCALE
1" = 20'

LEGEND

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L-	-DRI-	-DRI-
PI Sta 10+80.83	PI Sta 10+48.06	PI Sta 10+81.89
$\Delta = 8^{\circ} 02' 28.9"$ (LT)	$\Delta = 98^{\circ} 10' 05.2"$ (RT)	$\Delta = 97^{\circ} 05' 16.9"$ (LT)
$D = 4^{\circ} 58' 56.1"$	$D = 286^{\circ} 28' 44.0"$	$D = 286^{\circ} 28' 44.0"$
$L = 161.40'$	$L = 34.27'$	$L = 33.89'$
$T = 80.83'$	$T = 23.08'$	$T = 22.64'$
$R = 1,150.00'$	$R = 20.00'$	$R = 20.00'$
$SE = 0.06$		
$V = 55 \text{ mph}$		

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-L-

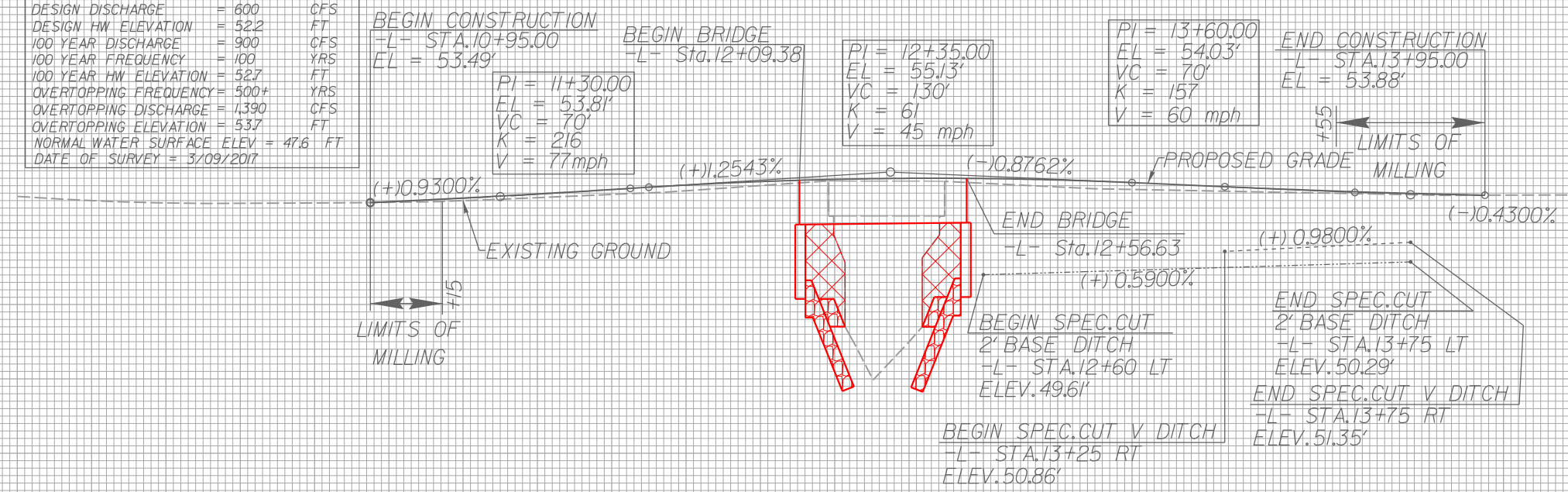
PROJECT REFERENCE NO. 17BP.2.R.81	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 10 OF 10	

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BRIDGE HYDRAULIC DATA
STR #730113 Sta.12+33 -L-

DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 600	CFS
DESIGN HW ELEVATION	= 52.2	FT
100 YEAR DISCHARGE	= 900	CFS
100 YEAR FREQUENCY	= 100	YRS
100 YEAR HW ELEVATION	= 52.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 1,390	CFS
OVERTOPPING ELEVATION	= 53.7	FT
NORMAL WATER SURFACE ELEV.	= 47.6	FT
DATE OF SURVEY	= 3/09/2017	

64
60
56
52
48
44
40

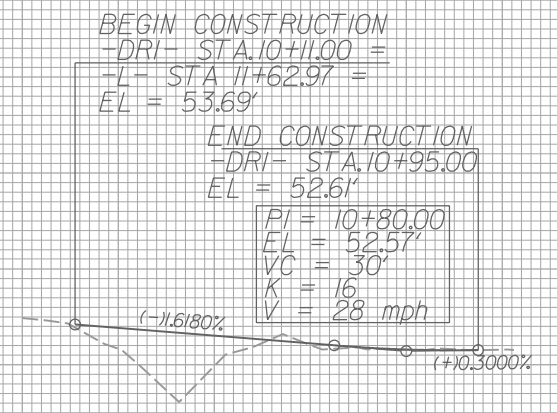


56
52
48
44
40

10+00 11+00 12+00 13+00 14+00

-DR1-

64
60
56
52
48
44
40



64
60
56
52
48
44
40

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

PLANS PREPARED BY :

RK&K

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Elevs