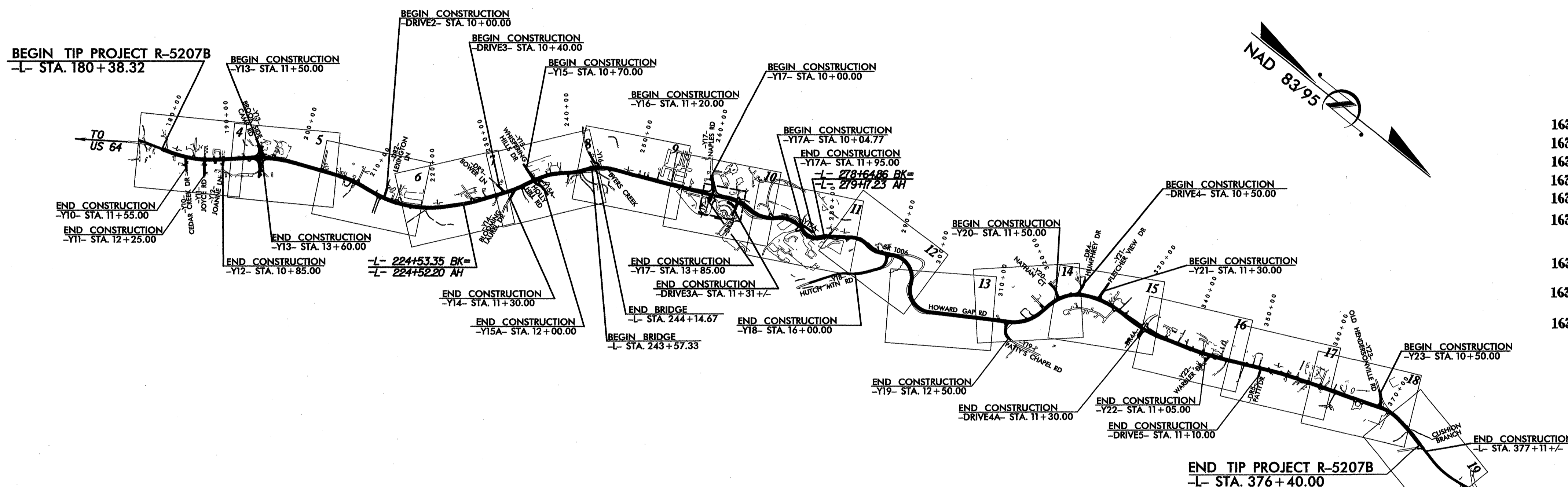


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
HENDERSON COUNTY

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LOCATION: SR 1006 (HOWARD GAP ROAD) FROM BRIDGE 334 TO SR 1539 (JACKSON ROAD)

TYPE OF WORK: STRUCTURE, CULVERT, RETAINING WALLS, GRADING, DRAINAGE, PAVING, SIGNALS



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5207B	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38629		PE	
45393.2.3		RW, UTIL.	
45393.3.3		CONST.	

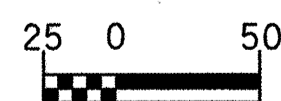
EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	ZZZZZZ
1622.01	Temporary Berms and Slope Drains	TB
	Silt Basin Type B	SB
1633.01	Temporary Rock Silt Check Type-A	RS
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	RS-PAM
	Temporary Rock Silt Check Type-B	RS-B
	Wattle/Coir Fiber Wattle	W
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	W-PAM
1634.01	Temporary Rock Sediment Dam Type-A	RD-A
1634.02	Temporary Rock Sediment Dam Type-B	RD-B
1635.01	Rock Pipe Inlet Sediment Trap Type-A	RPI-A
1635.02	Rock Pipe Inlet Sediment Trap Type-B	RPI-B
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SSB
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	SK
	Tiered Skimmer Basin	TSK
	Infiltration Basin	IB

THIS PROJECT CONTAINS
EROSION CONTROL PLANS
FOR CLEARING AND
GRUBBING PHASE OF
CONSTRUCTION.

CONTRACT #: C202743

GRAPHIC SCALE



PLANS

ADT 2008 = 8,758
ADT 2028 = 13,218
DHV = 11 %
D = 60 %
T = 6 %
TTST = 2% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5207B = 3.692 MILES
LENGTH STRUCTURES TIP PROJECT R-5207B = 0.011 MILES
TOTAL LENGTH TIP PROJECT R-5207B = 3.703 MILES



Plans Prepared By:
TGS ENGINEERS
975 WALNUT STREET
SUITE 141
CARY, NC 27511
PH (919) 319-8850

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

OCTOBER 1, 2006

LETTING DATE:

JULY 17, 2012

NCDOT DIVISION 14
NCDOT Contact:

RALPH CANNADY
DIVISION CONTRACT OFFICER

JIMMY L. TERRY JR.

PROJECT ENGINEER
LEVEL III CERTIFICATION
NUMBER 3145

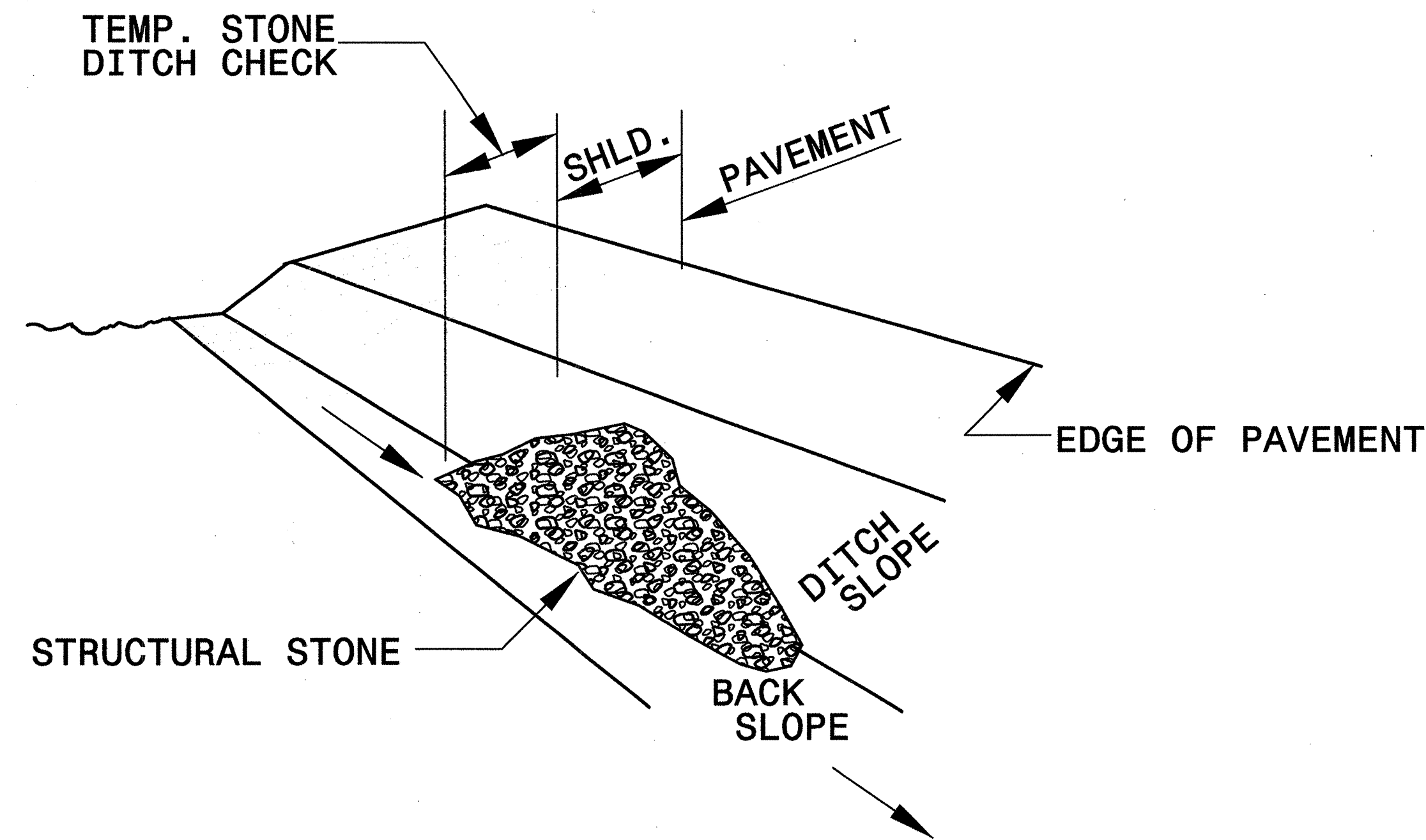
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated July 18, 2006 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

- 1605.01 Temporary Silt Fence
- 1607.01 Gravel Construction Entrance
- 1622.01 Temporary Berms and Slope Drains
- 1630.03 Temporary Silt Ditch
- 1630.04 Stilling Basin
- 1630.05 Temporary Diversion
- 1632.02 Rock Inlet Sediment Trap Type B
- 1632.03 Rock Inlet Sediment Trap Type C
- 1633.01 Temporary Rock Silt Check Type A

PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'B' DETAIL

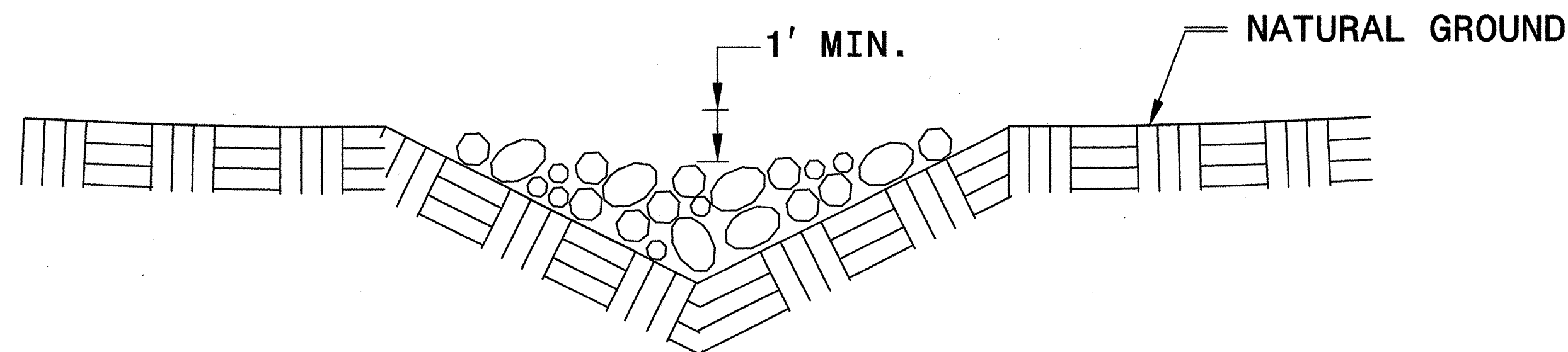


ISOMETRIC VIEW

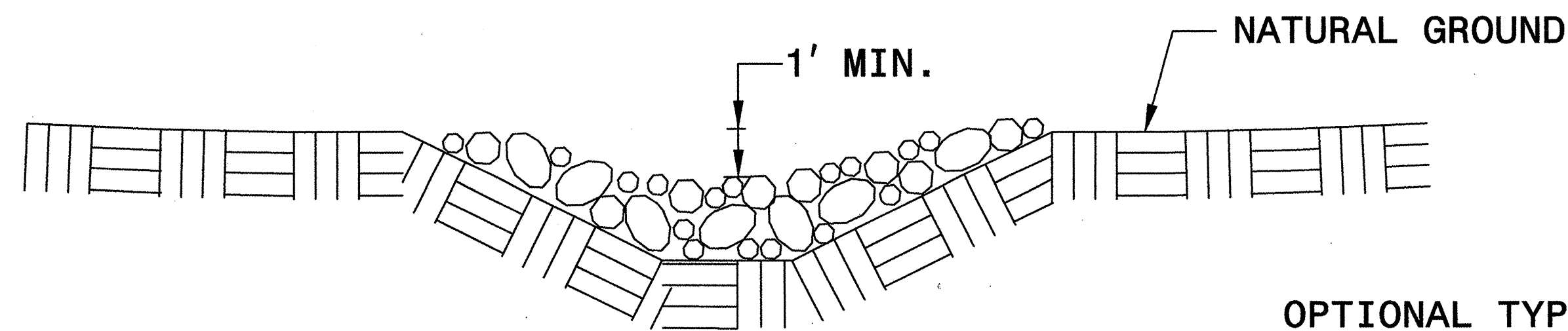
NOTES:

USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.

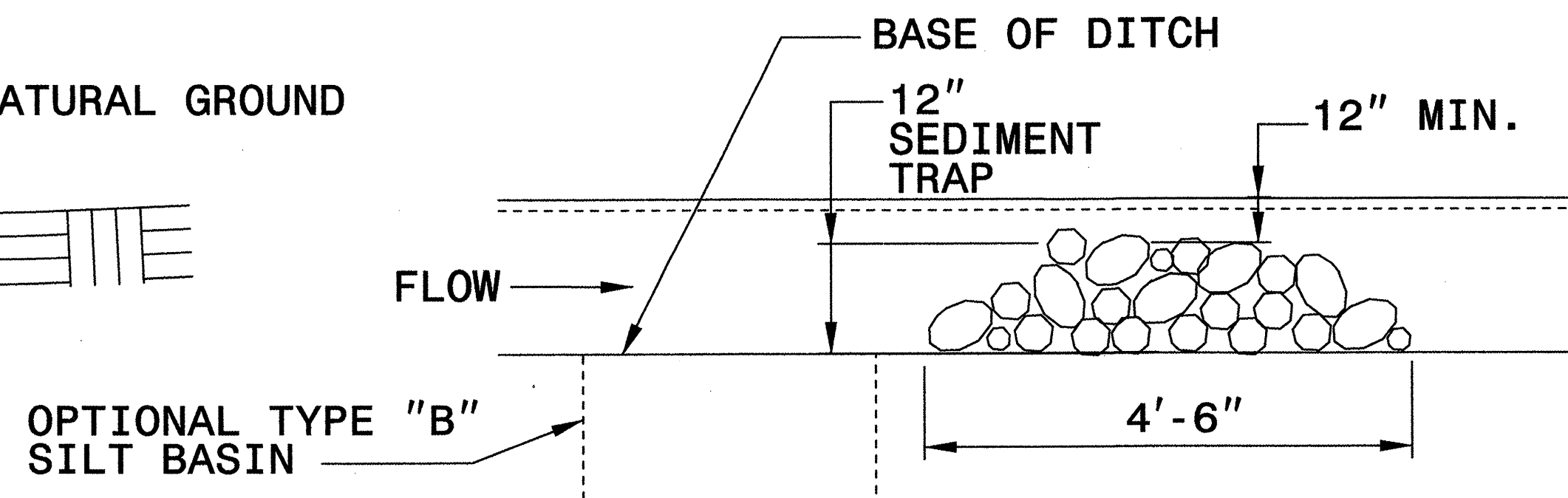
THE ENGINEER MAY DIRECT THE OPTION OF CLASS "A" STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



**CROSS SECTION
VEE DITCH**



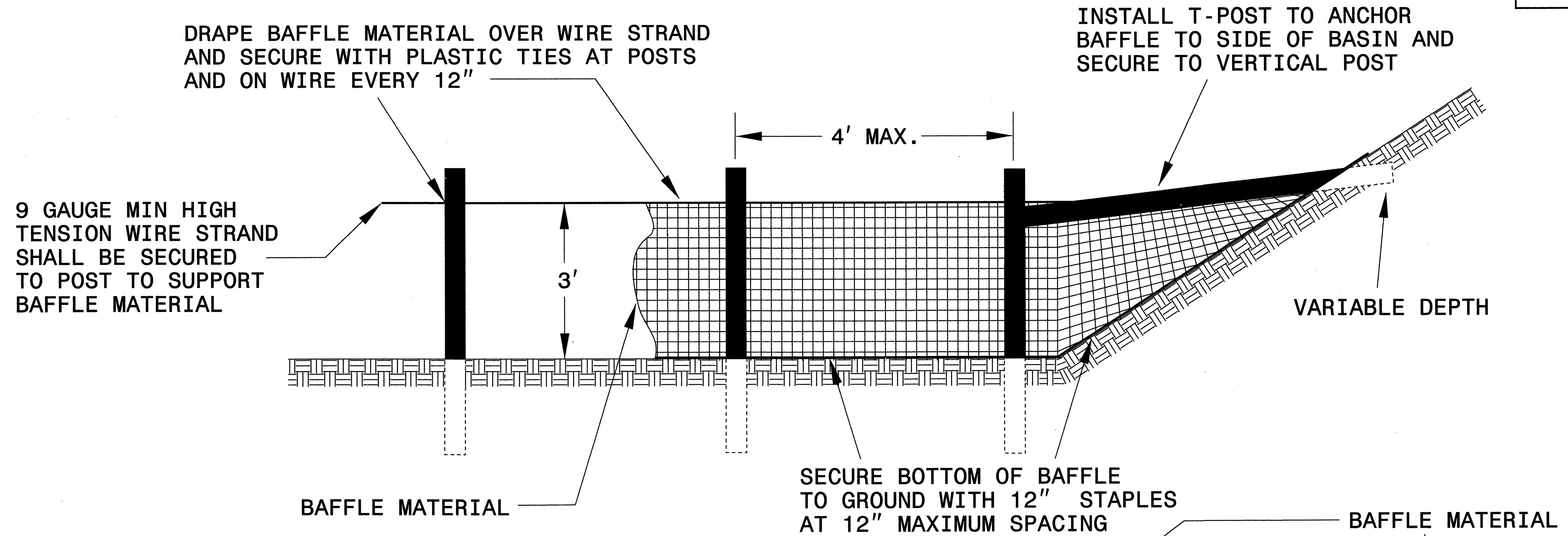
**CROSS SECTION
TRAPEZOIDAL DITCH**



ELEVATION VIEW

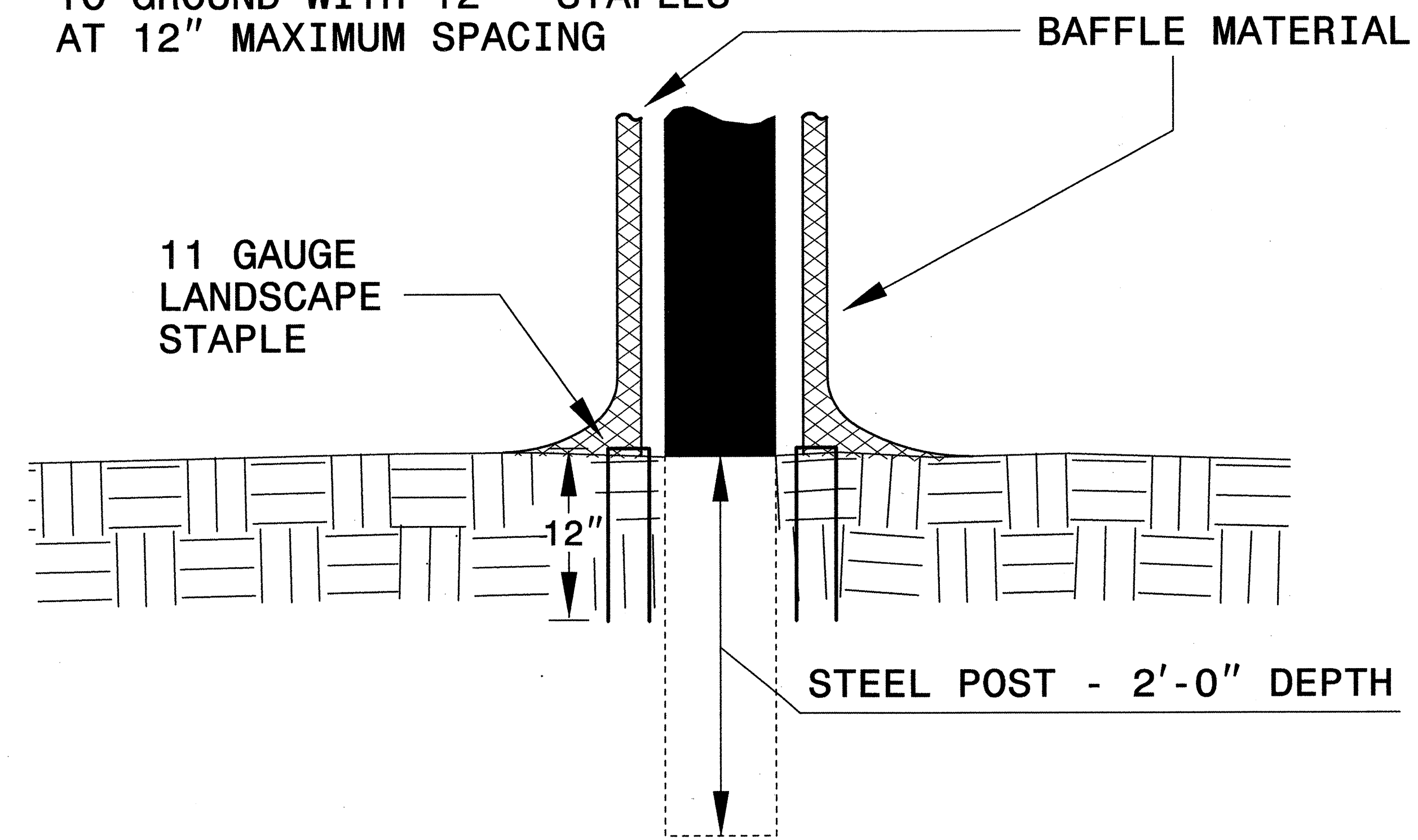
PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER BAFFLE DETAIL



NOTES:

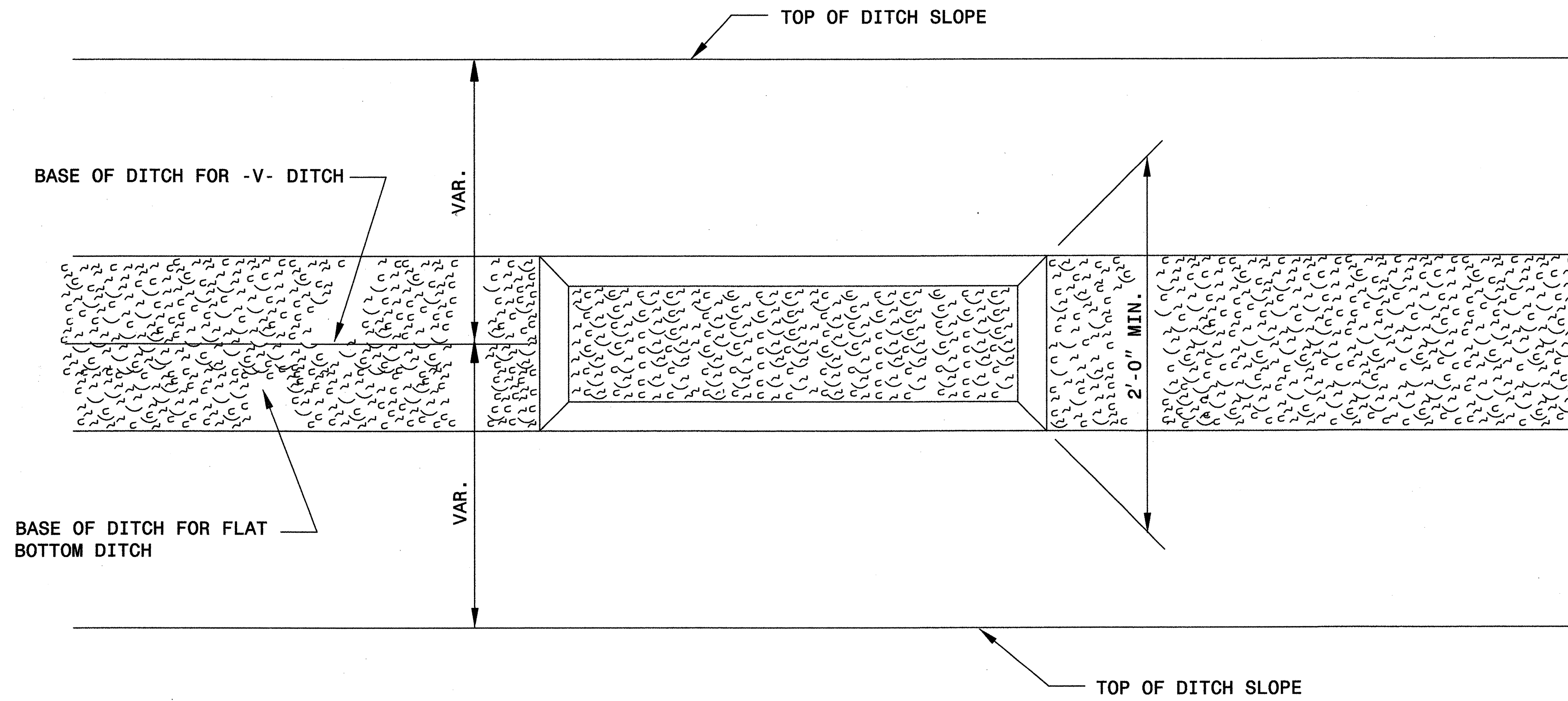
1. INSTALL THREE(3) COIR FIBER BAFFLES IN SILT BASINS AND SEDIMENT DAMS AT DRAINAGE OUTLETS WITH A SPACING OF $\frac{1}{4}$ THE BASIN LENGTH.
2. TWO(2) COIR FIBER BAFFLES CAN BE INSTALLED IN SILT BASINS AND DAMS LESS THAN 20 FT. IN LENGTH WITH A SPACING OF $\frac{1}{3}$ THE BASIN LENGTH.
3. TOP HEIGHT OF COIR FIBER BAFFLES SHALL NOT BE BELOW BASE OF EMERGENCY SPILLWAY ELEVATION.



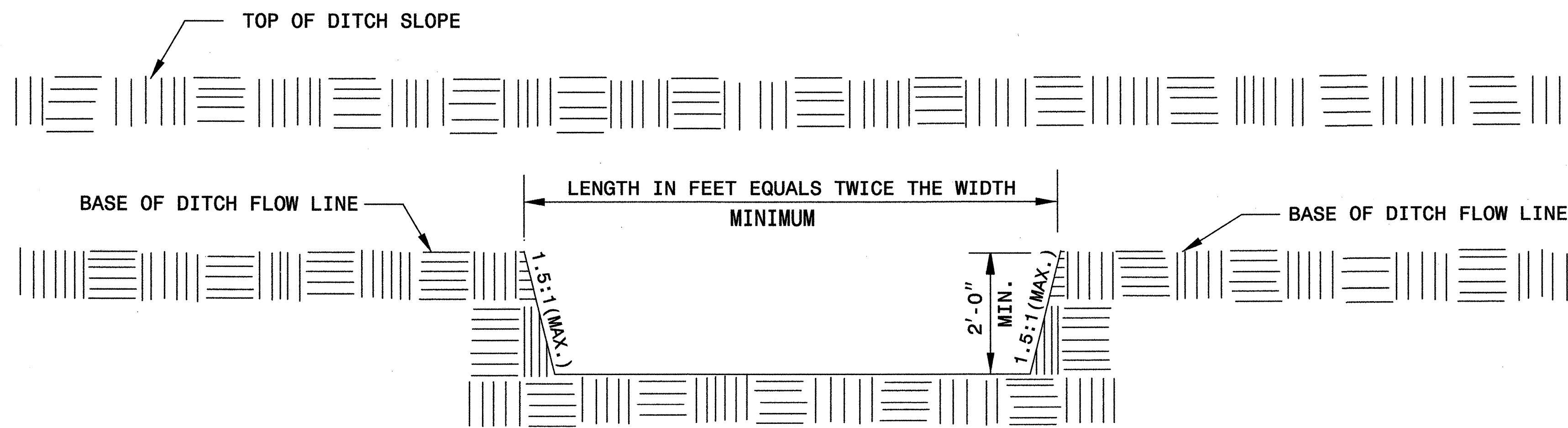
BAFFLE MATERIAL SHALL BE SECURED TO THE BOTTOM AND SIDES OF BASIN USING 12" LANDSCAPE STAPLES

PROJECT REFERENCE NO. <i>R-5207B</i>	SHEET NO. <i>EC-2B</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT BASIN 'B' DETAIL



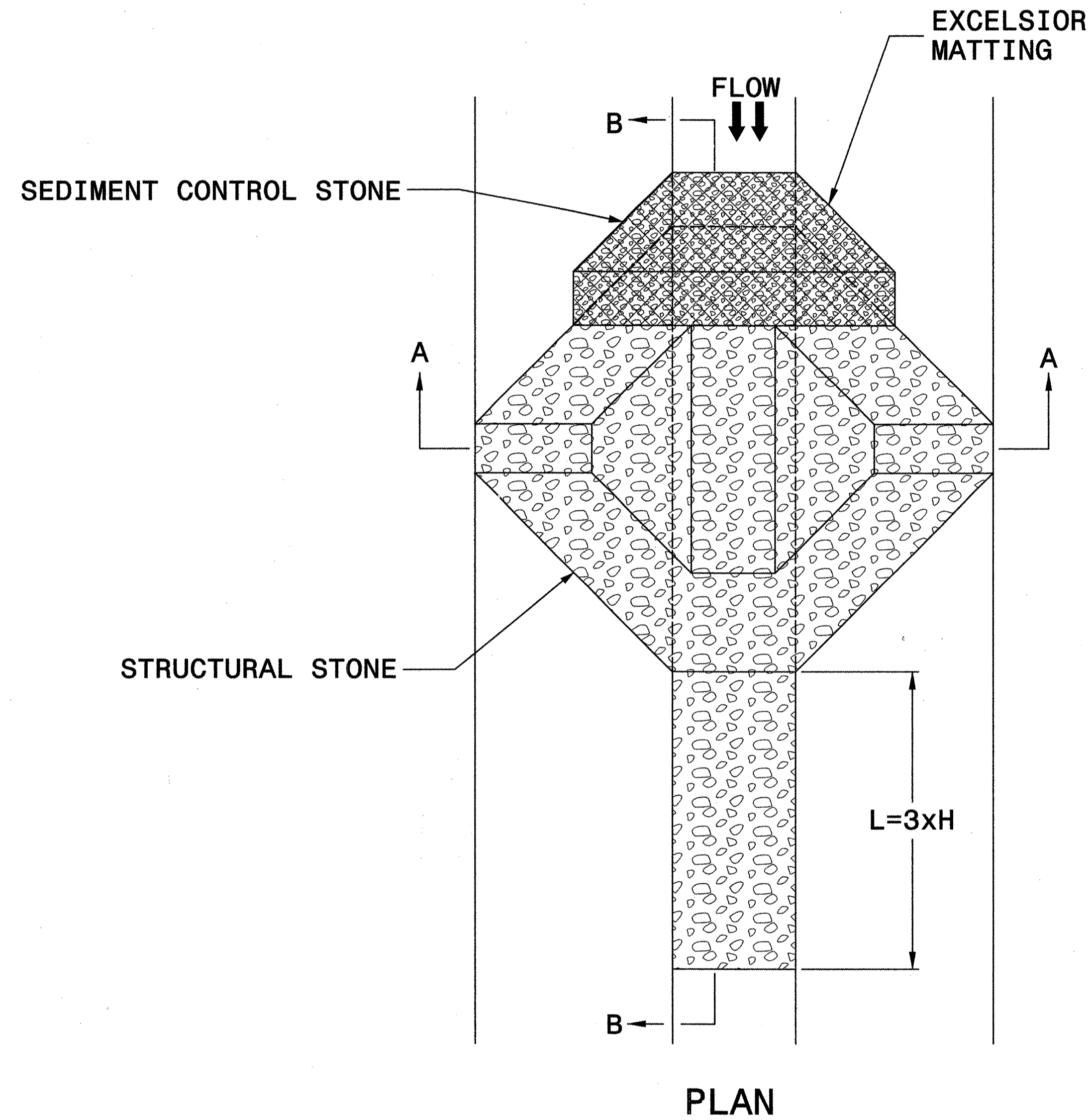
PLAN



ELEVATION

PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-2C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)

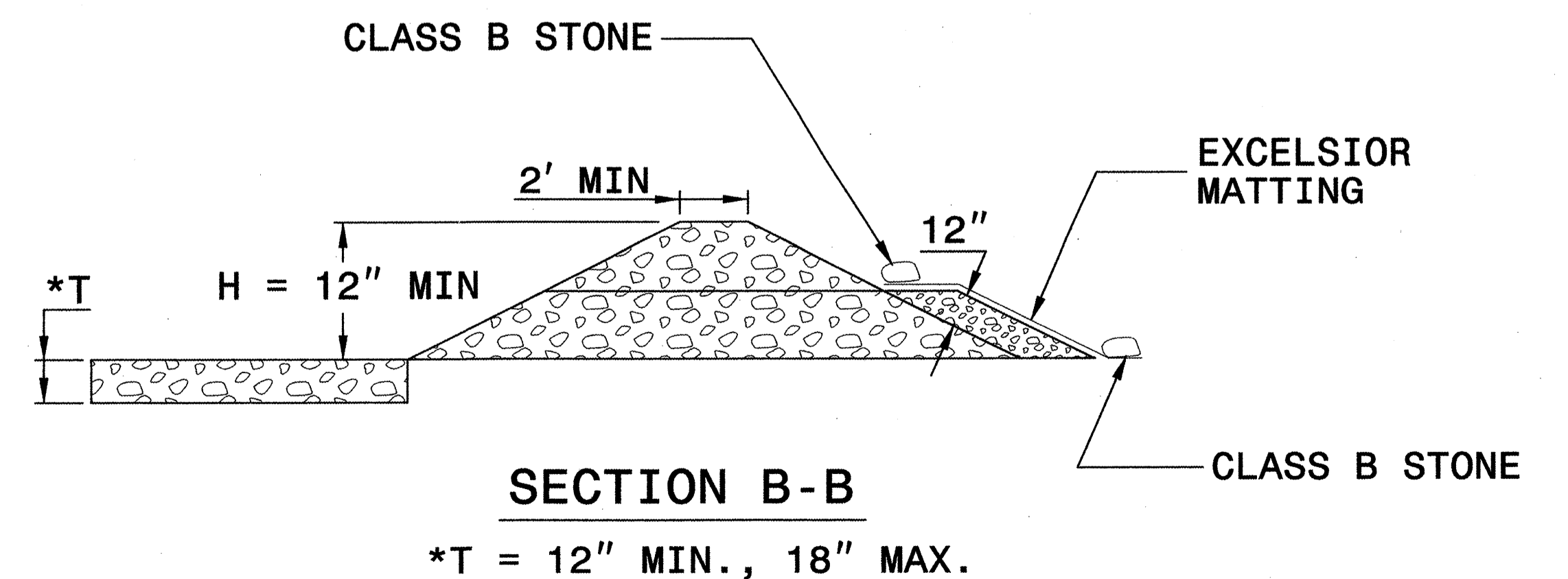
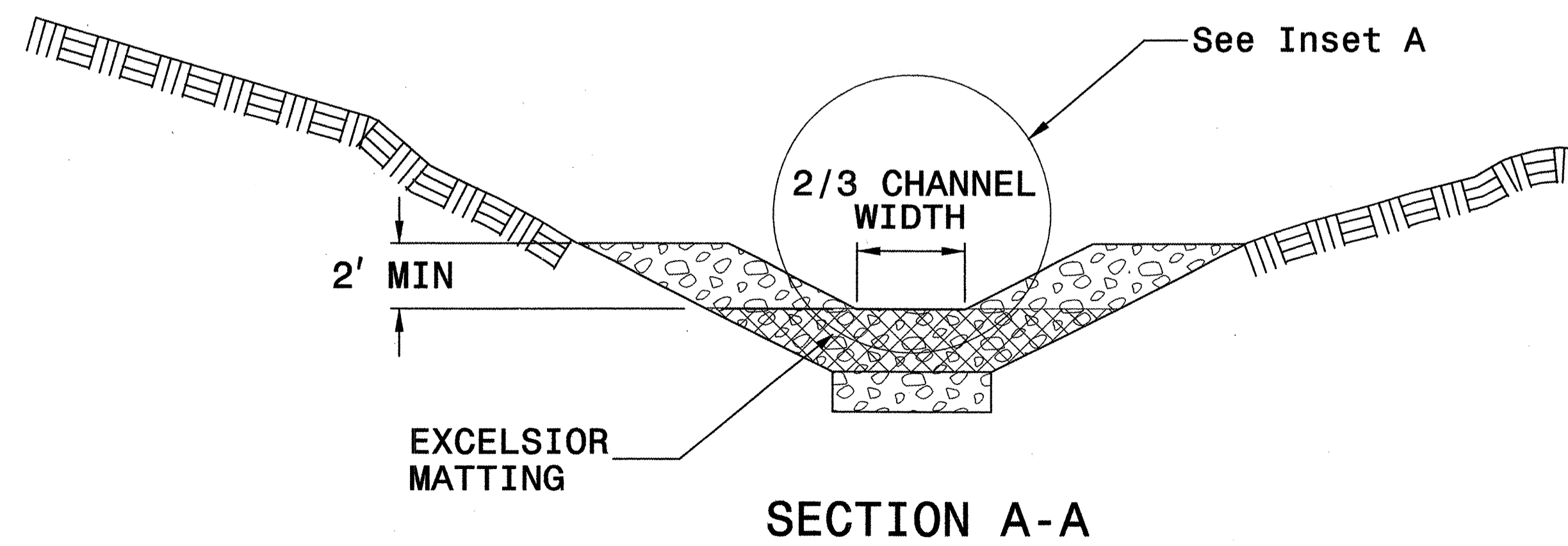
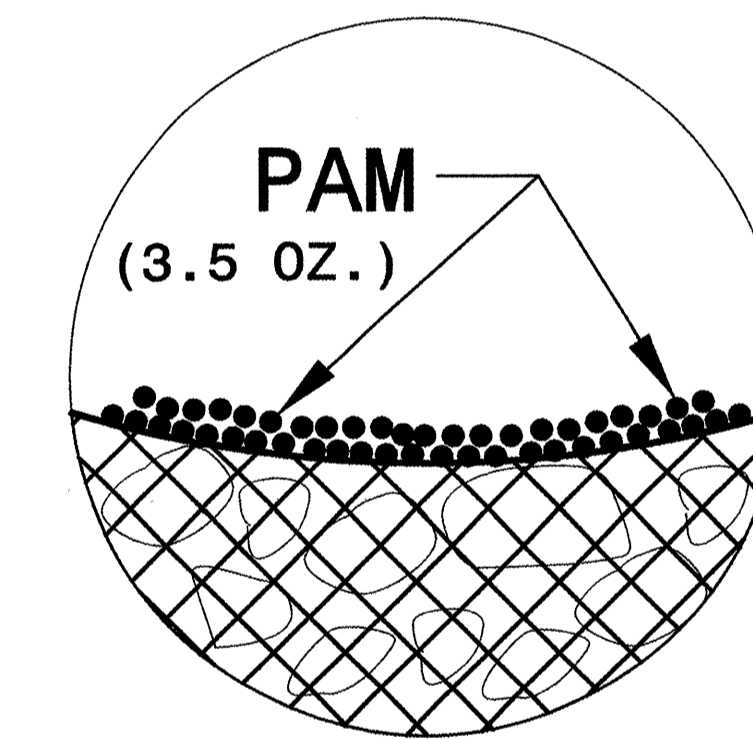


NOTES

USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

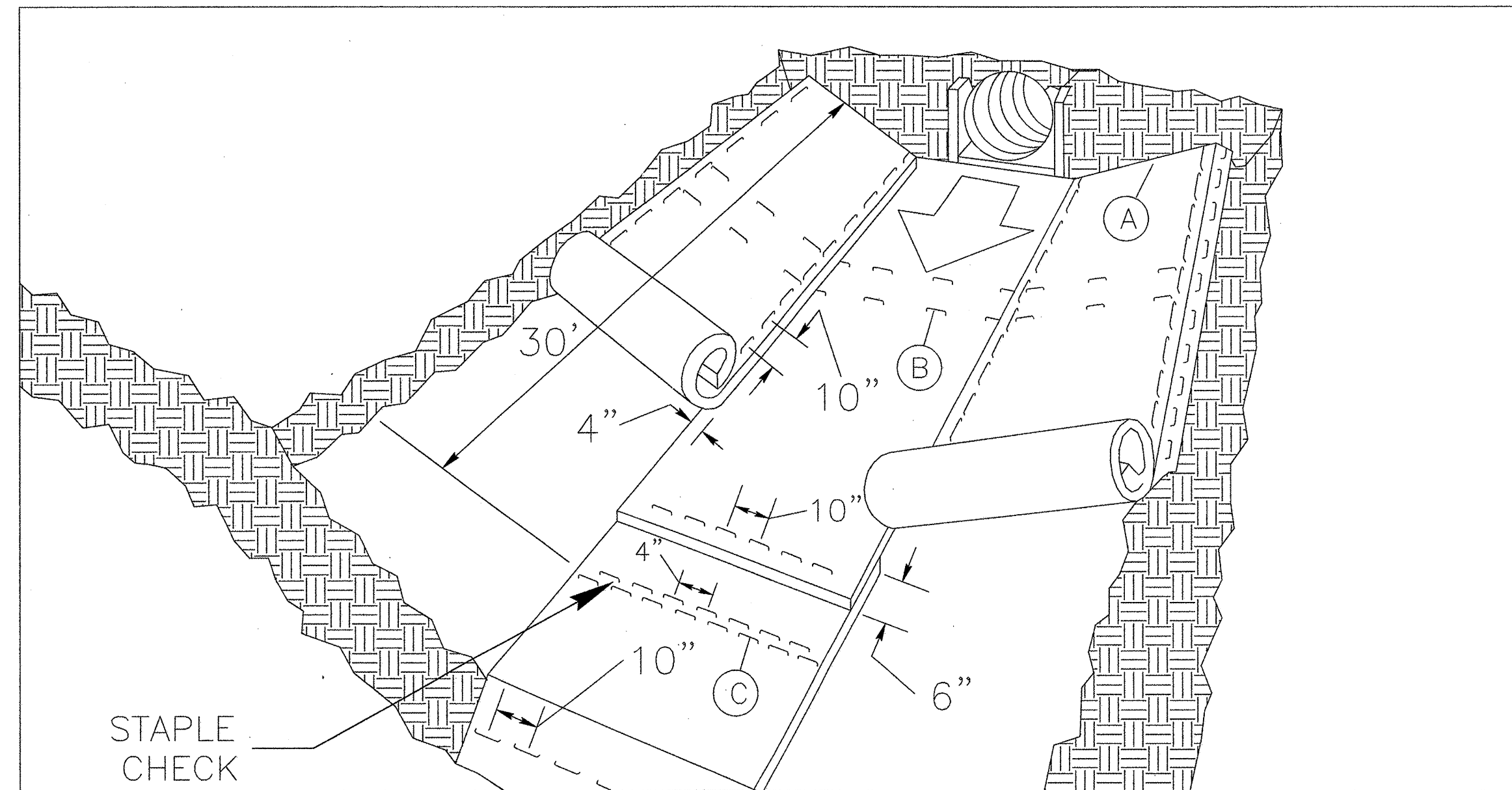
INITIALLY APPLY 3.5 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



NOT TO SCALE

PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-2D
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATTING INSTALLATION DETAIL



MATTING IN DITCHES

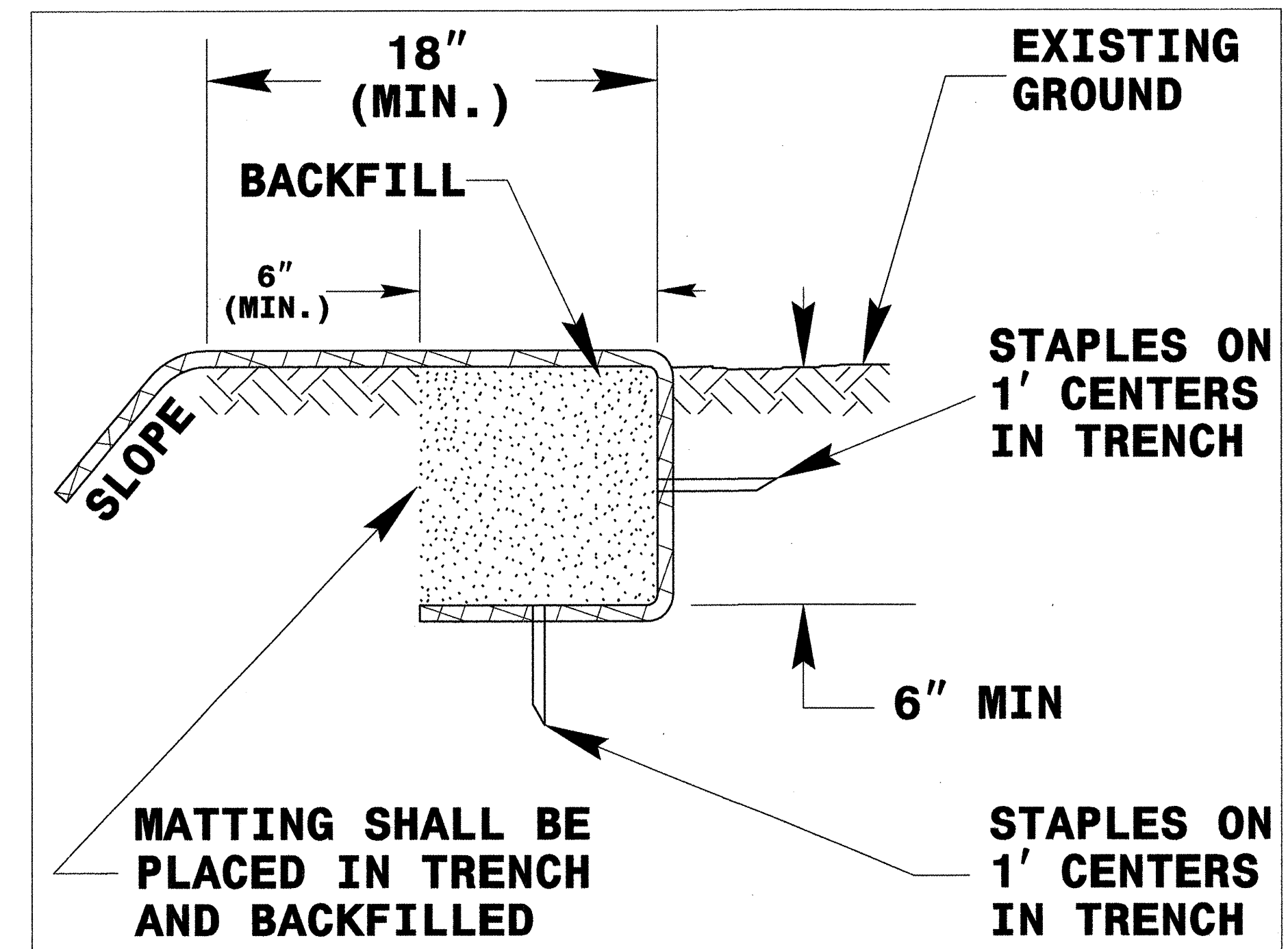
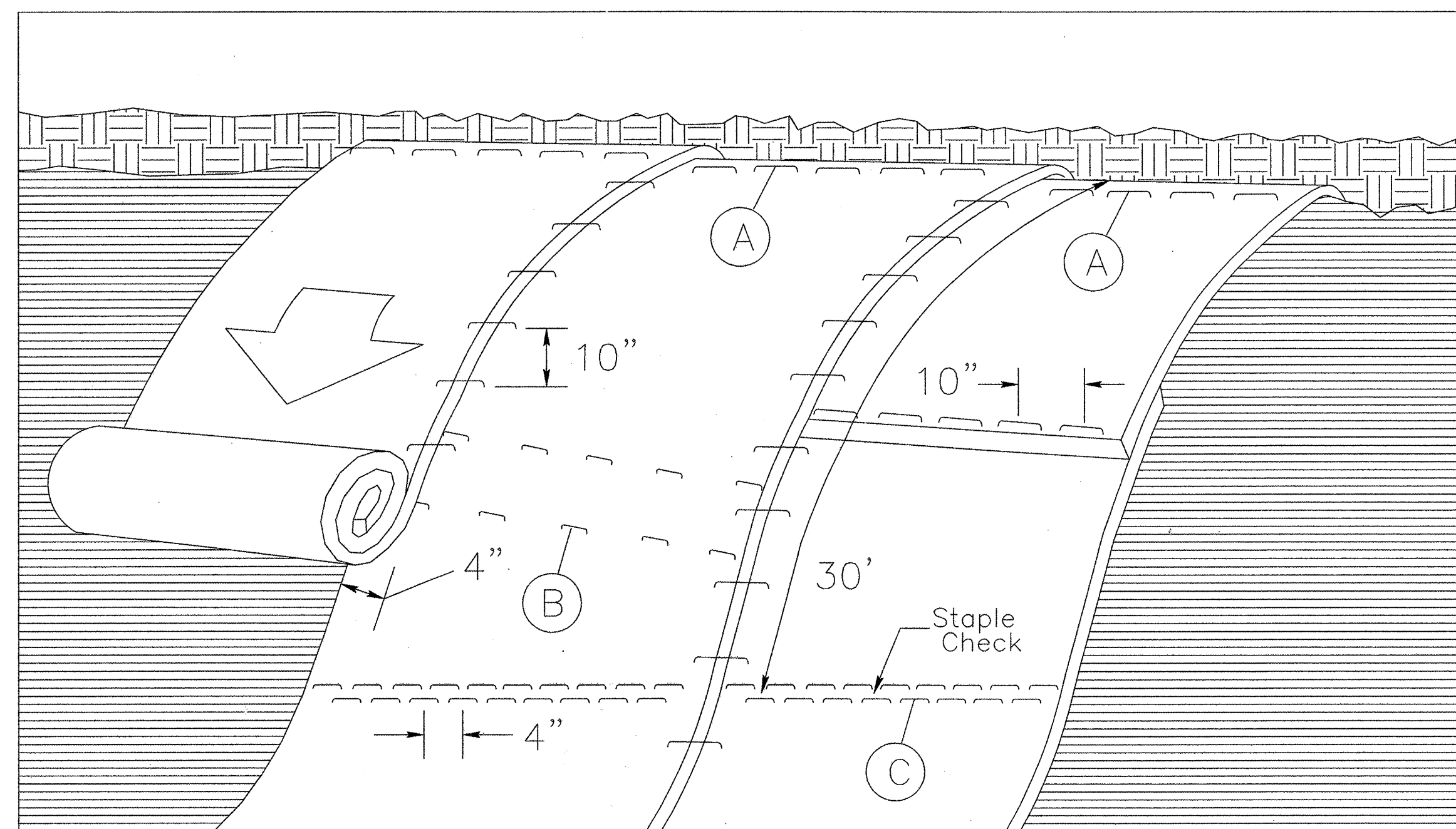


DIAGRAM (A)



MATTING ON SLOPES

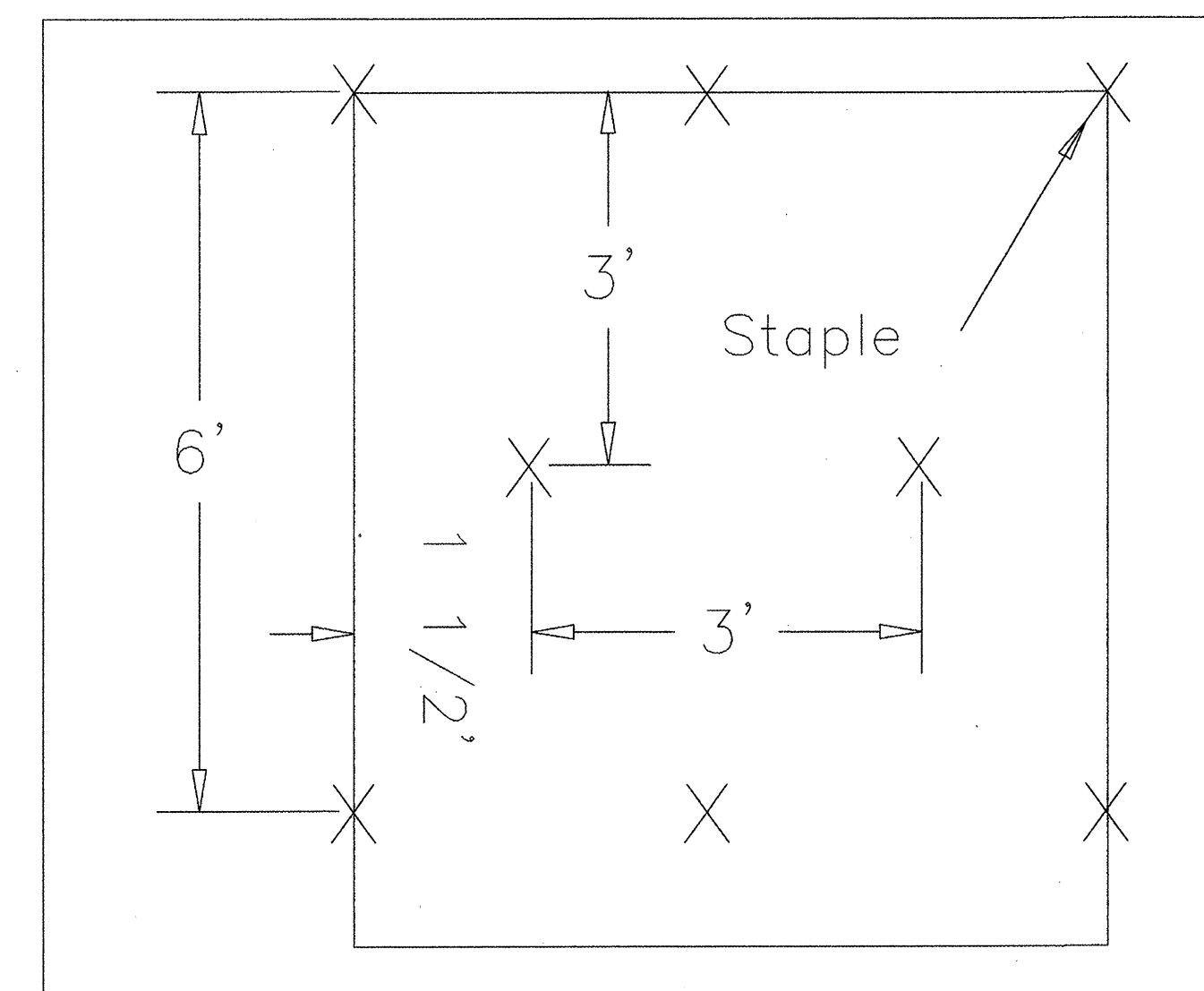


DIAGRAM (B)

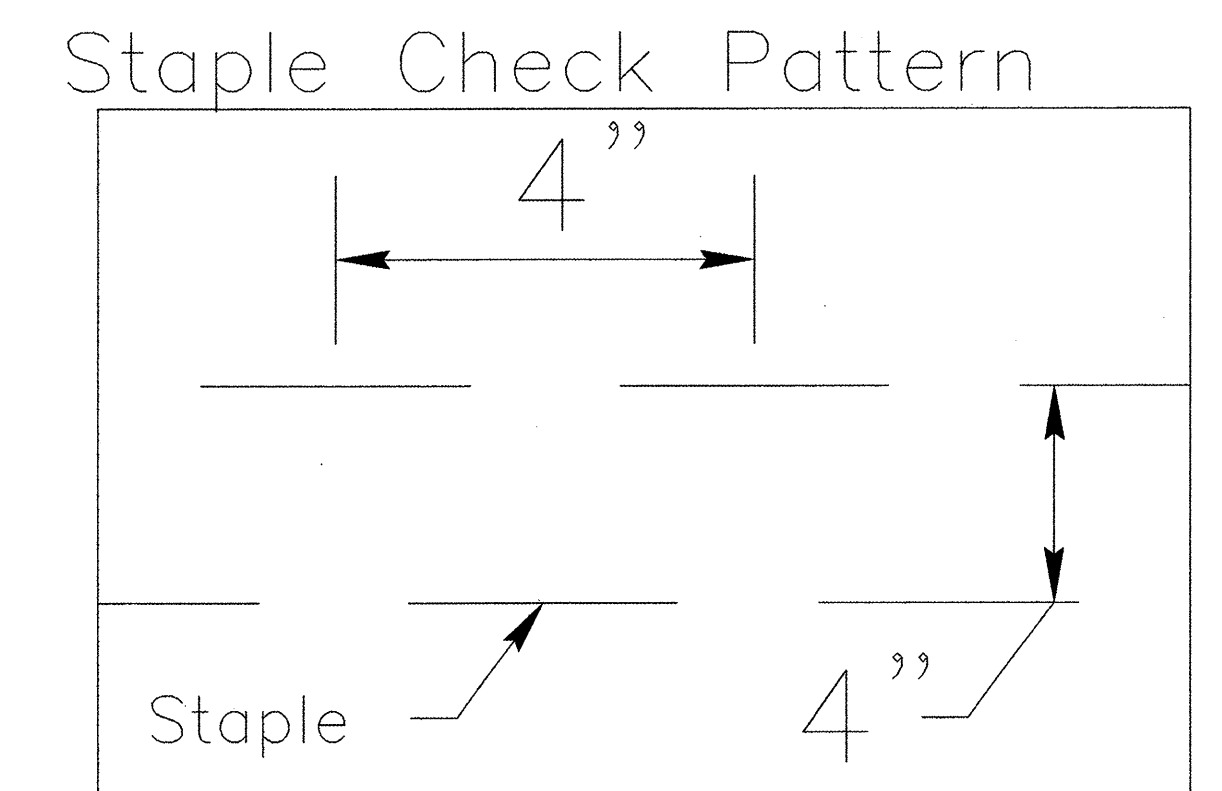


DIAGRAM (C)

NOTES:

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.
 STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.


NOT TO SCALE

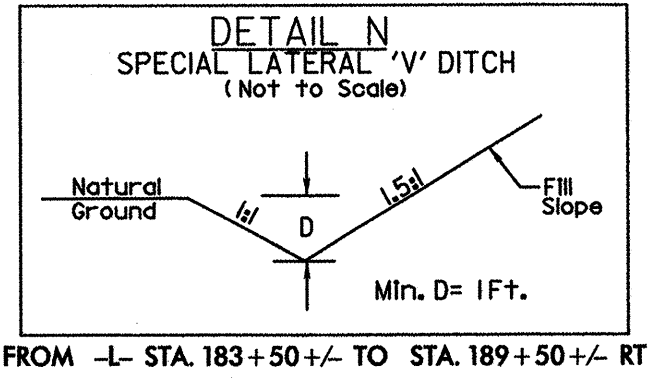
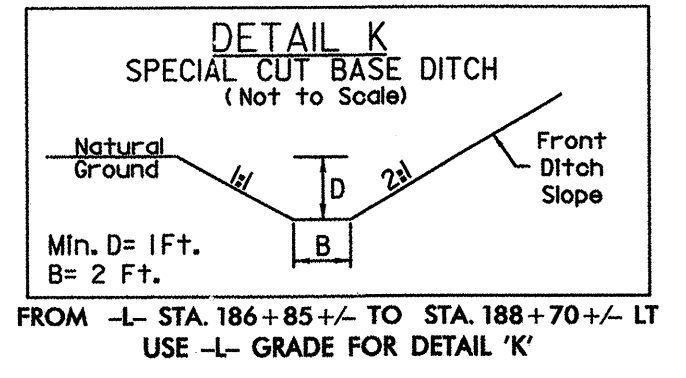
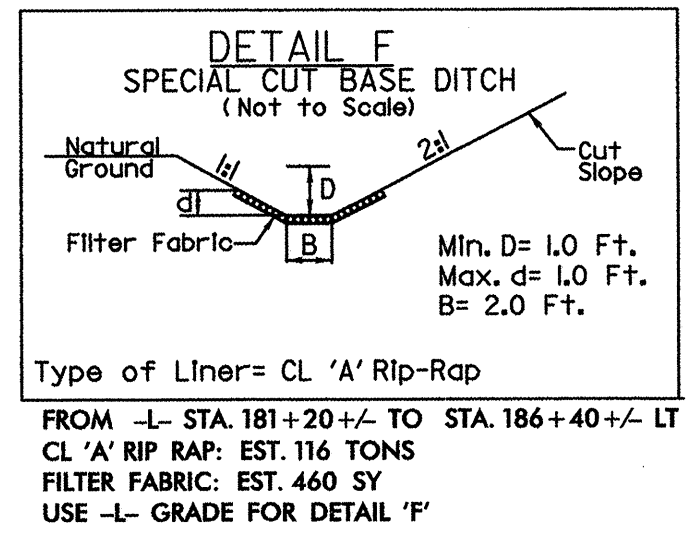
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>R-5207B</i>	SHEET NO. <i>EC-3A</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

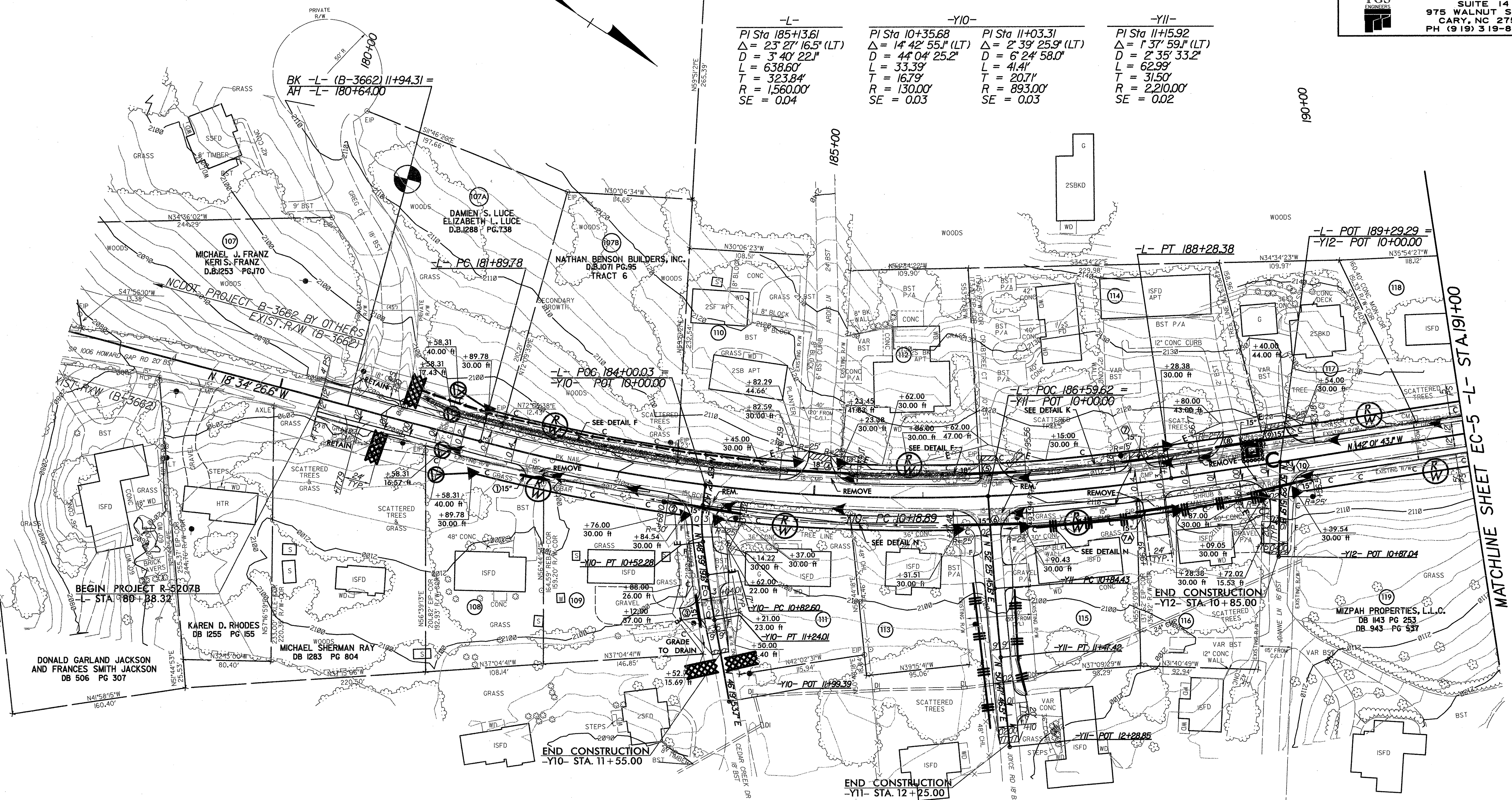
SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

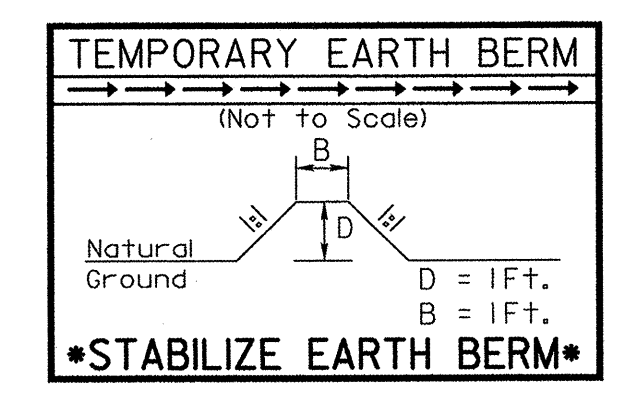
PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-4/CONST.4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			



-L-	-Y10-	-Y11-	-Y12-
PI Sta 185+13.61	PI Sta 10+35.68	PI Sta 11+03.31	PI Sta 11+15.92
$\Delta = 23' 27'' 16.5''$ (LT)	$\Delta = 14' 42'' 55.1''$ (LT)	$\Delta = 2' 39'' 25.9''$ (LT)	$\Delta = 1' 37'' 59.1''$ (LT)
D = 3' 40' 22.1"	D = 4' 04' 25.2"	D = 6' 24' 58.0"	D = 2' 35' 33.2"
L = 638.60'	L = 33.39'	L = 4.41'	L = 62.99'
T = 323.84'	T = 16.79'	T = 20.71'	T = 31.50'
R = 1,560.00'	R = 130.00'	R = 893.00'	R = 2,210.00'
SE = 0.04	SE = 0.03	SE = 0.03	SE = 0.02



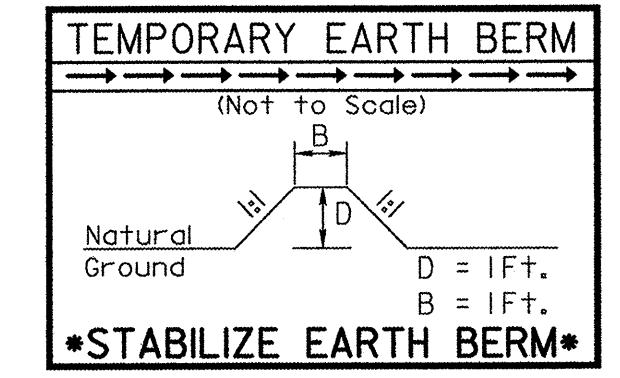
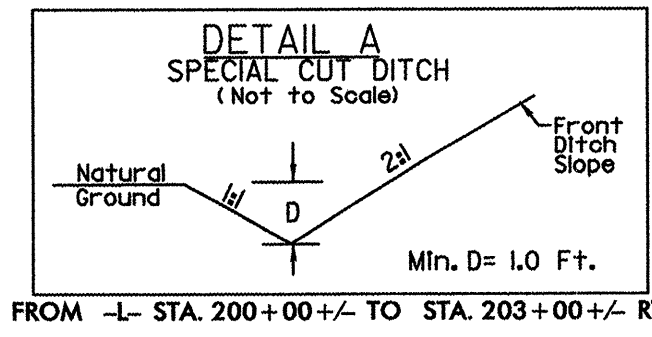
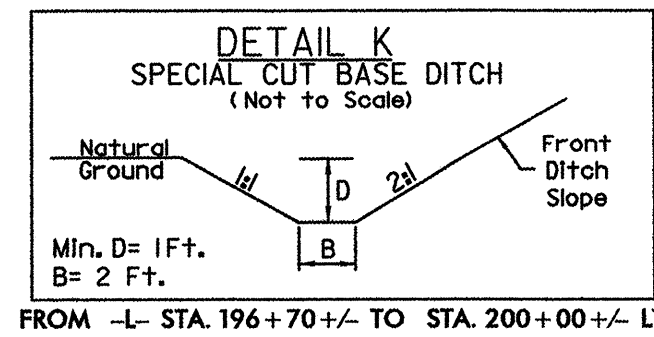
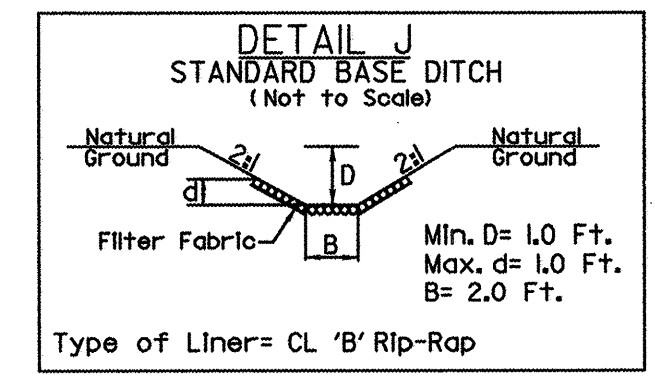
- (108) JOEY JUSTICE DB 1297 PG 672
- (109) KARYN B. SPREEMAN DB 828 PG 397
- (110) NATHAN ALVA BENSON DB N/A PG N/A
- (111) FRANKLIN E. BROWN AND PHYLLIS A. BROWN DB 577 PG 319
- (112) TWIN OAKS CONDOMINIUMS HOMEOWNERS ASSOCIATION DB 656 PG 481
- (113) JOHN H. ROSS DB 1183 PG 463
- (114) JACK H. CRABTREE AND ROBERTA M. CRABTREE DB 769 PG 561
- (115) STANLEY LYURTH DB 1017 PG 447
- (116) DINAH MAE KADUK DB 926 PG 696
- (117) ALFRED W. MAYO AND WANDA P. MAYO DB 845 PG 55
- (118) SHERI H. AYERS DB 1256 PG 115



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

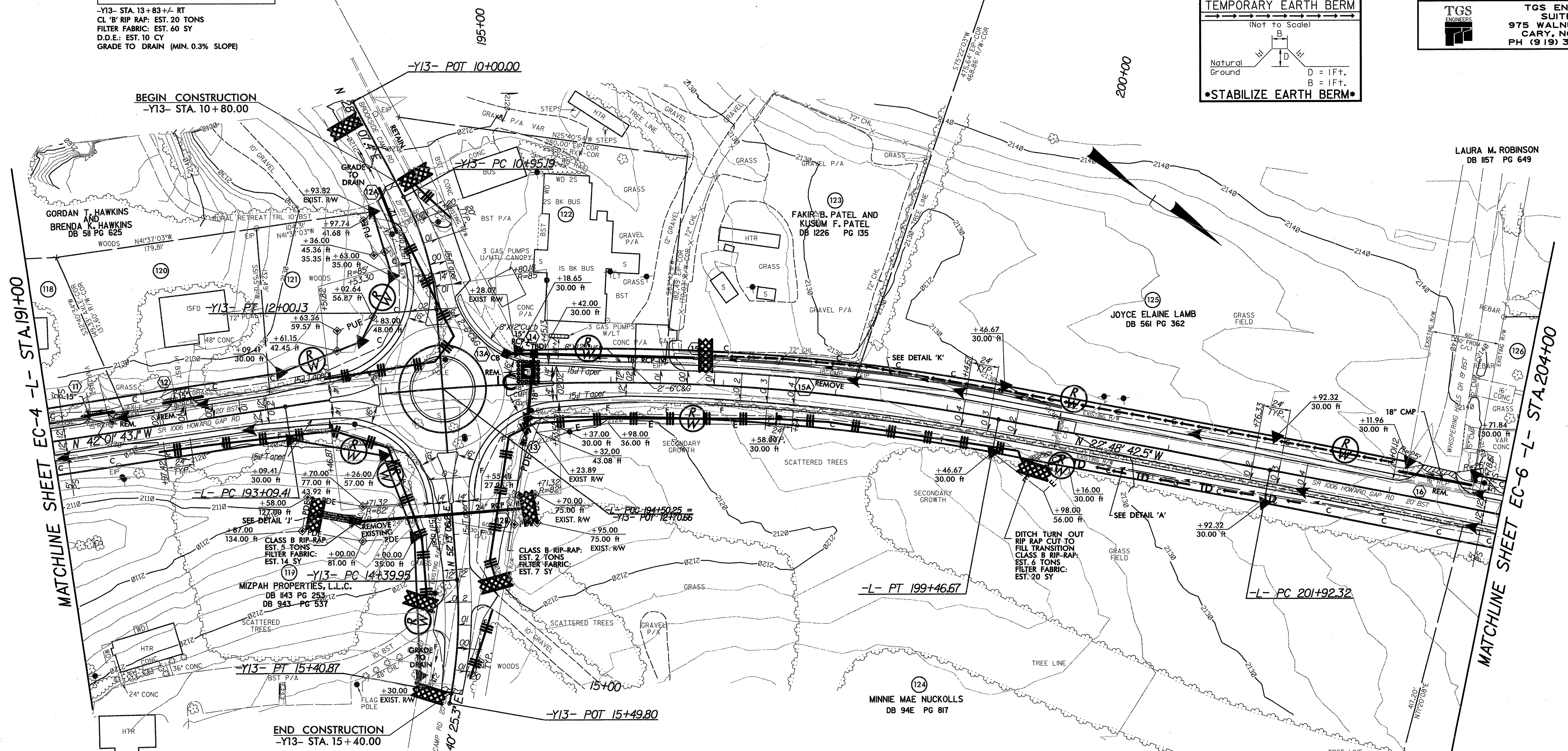
8/17/19

PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-5/CONST.5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	



-Y13- STA. 13+83+/- RT
 CL 'B' RIP RAP: EST. 20 TONS
 FILTER FABRIC: EST. 60 SY
 D.D.E.: EST. 10 CY
 GRADE TO DRAIN (MIN. 0.3% SLOPE)

- (120) ZUDIE WALKER INC. DB 190 PG 239
- (121) YOUNGBLOOD OIL COMPANY, INC. DB 746 PG 209
- (122) FAKIR B. PATEL DB 1154 PG 224



-L-		-Y13-	
PI Sta 196+31.06	PI Sta 203+91.99	PI Sta 11+48.44	PI Sta 14+90.68
$\Delta = 19' 13'' 00.6''$ (RT)	$\Delta = 1' 34'' 52.1''$ (RT)	$\Delta = 24' 02'' 58.8''$ (RT)	$\Delta = 14' 27'' 19.1''$ (RT)
D = 3' 00' 56.0"	D = 0' 23' 45.5"	D = 22' 55' 05.9"	D = 14' 19' 26.2"
L = 637.25'	L = 399.31'	L = 104.94'	L = 100.92'
T = 321.65'	T = 199.67'	T = 53.25'	T = 50.73'
R = 1,900.00'	R = 14,470.00'	R = 250.00'	R = 100.00'
SE = 0.04	SE = 0.04	SE = 0.02	SE = 0.02

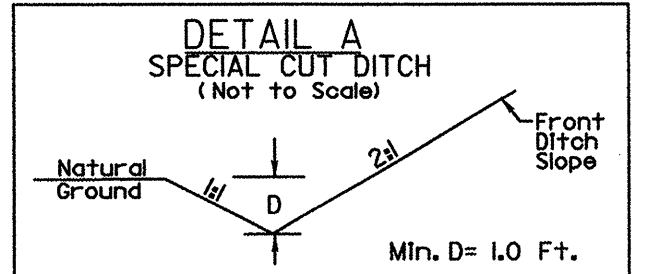
0.0 CLEARING AND GRUBBING
 EROSION CONTROL FOR
 CONSTRUCTION SHEET 5

8/17/19
 TGS ENGINEERS
 SUITE 141
 975 WALNUT STREET
 CARY, NC 27511
 PH (919) 319-8850

3207B_05_05.dgn 11/3/2011 9:52:48 AM

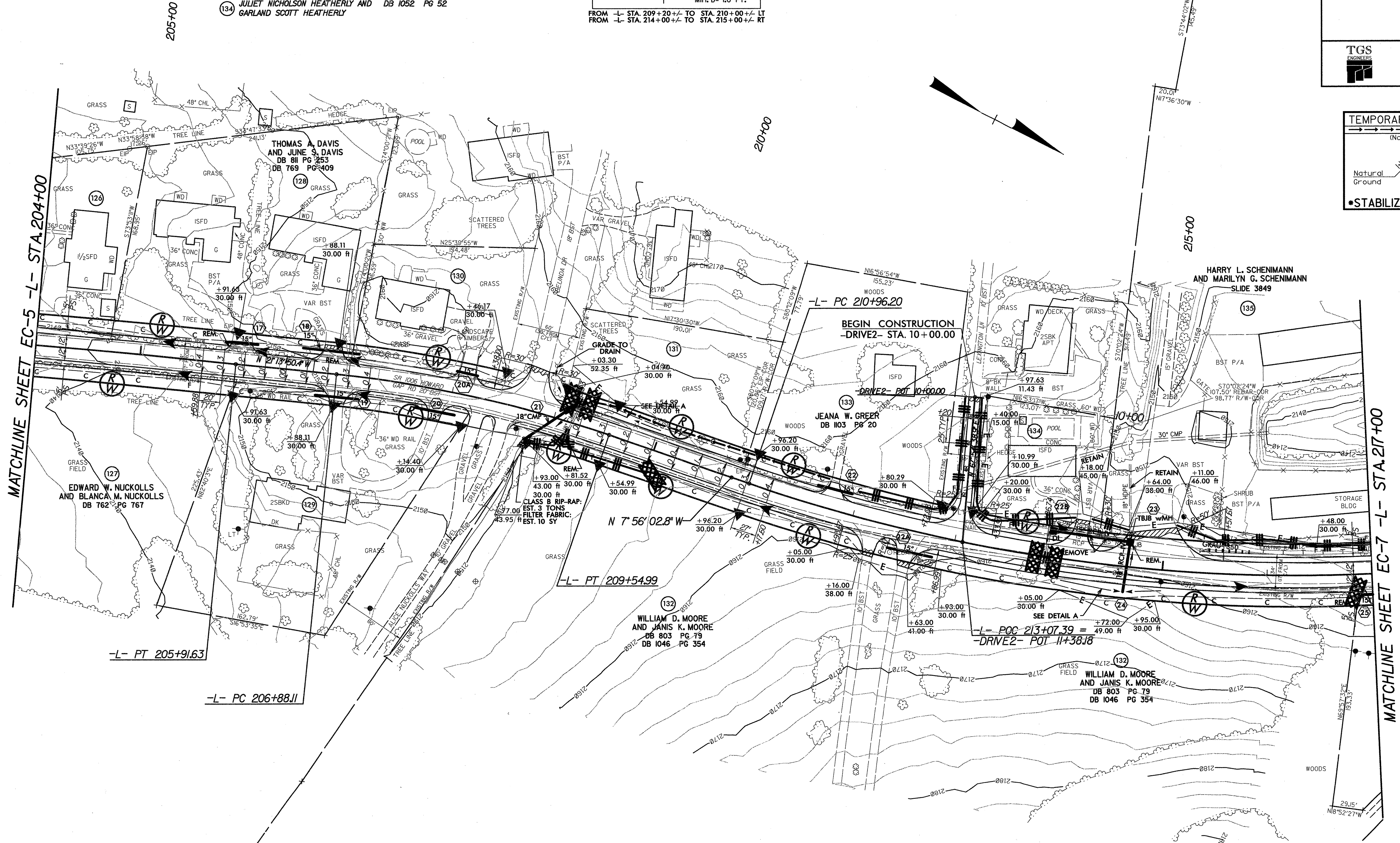
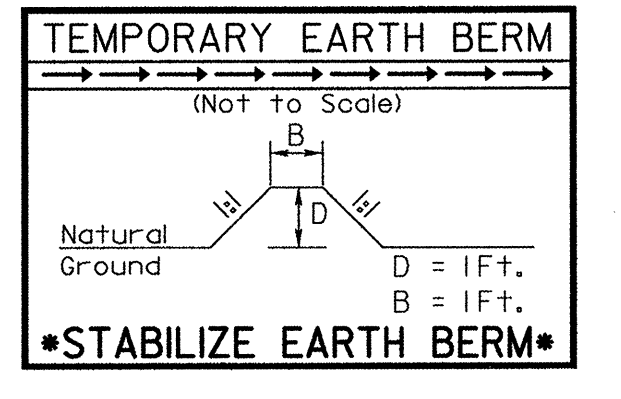
8/17/99

- (126) FRANCES McWHORTER DB 1157 PG 649
- (129) BRIAN W. BYRD AND DB 1145 PG 80
CHARLENE E. BYRD
- (130) PHYLLIS C. HARRIS DB 1189 PG 043
- (131) M. HELENA RUDELL DB 1082 PG 155
- (134) JULIET NICHOLSON HEATHERLY AND DB 1052 PG 52
GARLAND SCOTT HEATHERLY



FROM -L- STA. 209+20+/- TO STA. 210+00+/- LT
FROM -L- STA. 214+00+/- TO STA. 215+00+/- RT

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-6/CONST.6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			



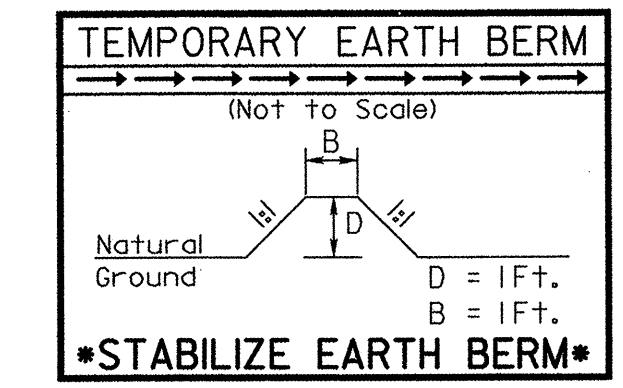
-L-		
PI Sta 203+91.99	PI Sta 208+22.15	PI Sta 216+70.79
$\Delta = 1^{\circ} 34' 52.1''$ (RT)	$\Delta = 13^{\circ} 17' 47.6''$ (RT)	$\Delta = 39^{\circ} 30' 29.3''$ (LT)
D = 0' 23' 45.5"	D = 4' 58' 56.1"	D = 3' 34' 51.6"
L = 399.31'	L = 266.88'	L = 1,103.28'
T = 199.67'	T = 134.04'	T = 574.59'
R = 14,470.00'	R = 1,150.00'	R = 1,600.00'
SE = 0.04	SE = 0.04	SE = 0.04

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 6

C:\TIME\PROJECTS\CONSTRUCTION\EC-6\CONSTR\EC-6.CONST.6.DWG
 8/17/99 10:52 AM
 USER: JSM

8/17/99

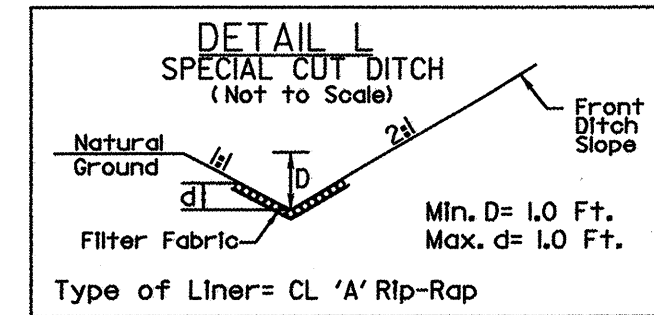
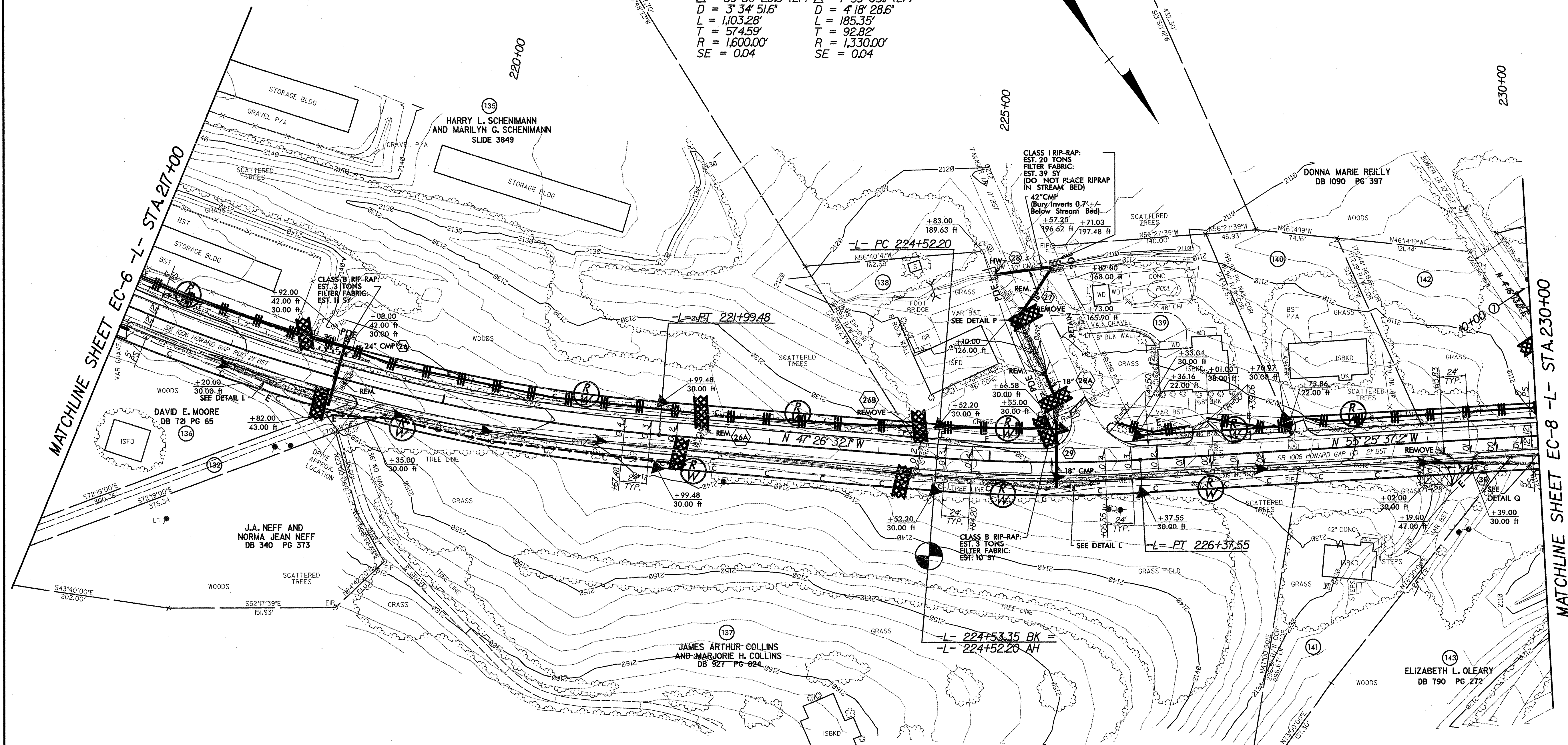
- 138 ROBERT H. JOHNSON DB 495 PG 157
AND NILDA L. JOHNSON
- 139 ROBERT P. POND AND DB 962 PG 174
BARBARA L. POND
- 140 JOSEPH H. KELLEY DB CT02 PG 541
- 141 JOHN L. REESE, JR. DB 818 PG 137
- 142 RONALD W. KAROLYI DB 842 PG 455
AND JOYCE A. DAVIS



PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-7/CONST.7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

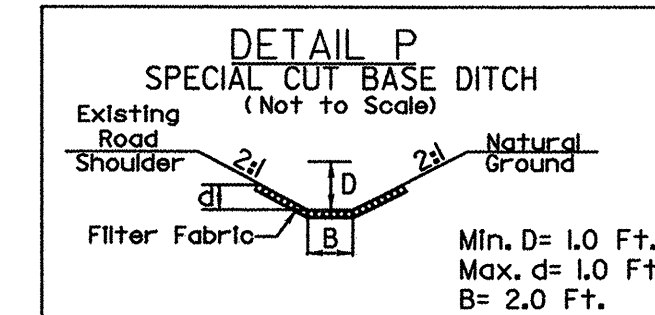
-L-

PI Sta 216+70.79	PI Sta 225+45.02
$\Delta = 39^{\circ} 30' 29.3''$ (LT)	$\Delta = 7^{\circ} 59' 05.1''$ (LT)
D = 3' 34' 51.6"	D = 4' 18' 28.6"
L = 1,103.28'	L = 185.35'
T = 574.59'	T = 92.82'
R = 1,600.00'	R = 1,330.00'
SE = 0.04	SE = 0.04

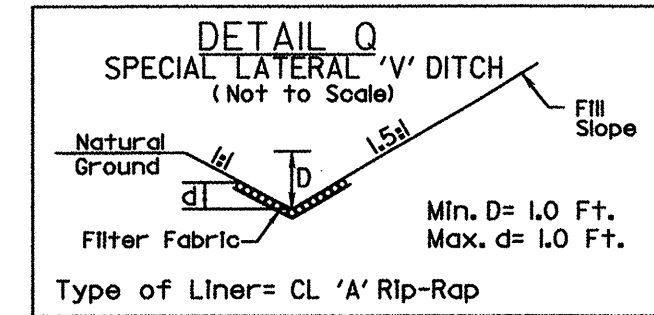


FROM -L- STA. 218+00+/- TO STA. 219+00+/- RT
CL 'A' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 78 SY

FROM -L- STA. 225+00+/- TO STA. 226+00+/- RT
CL 'A' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 78 SY



TANAGER LANE - RT
CL 'A' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 78 SY
D.D.E. : EST. 12CY



FROM STA. 229+50+/- TO STA. 230+00+/- RT
CL 'A' RIP RAP: EST. 9 TONS
FILTER FABRIC: EST. 36 SY

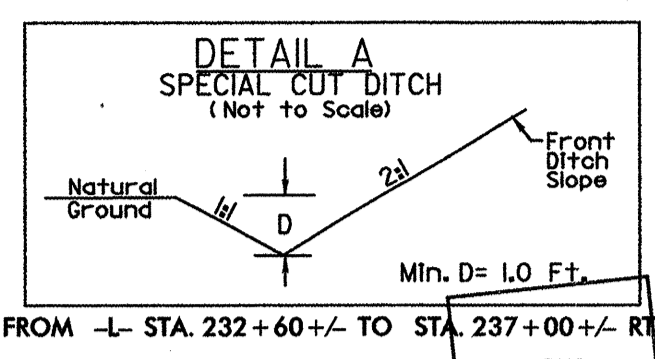
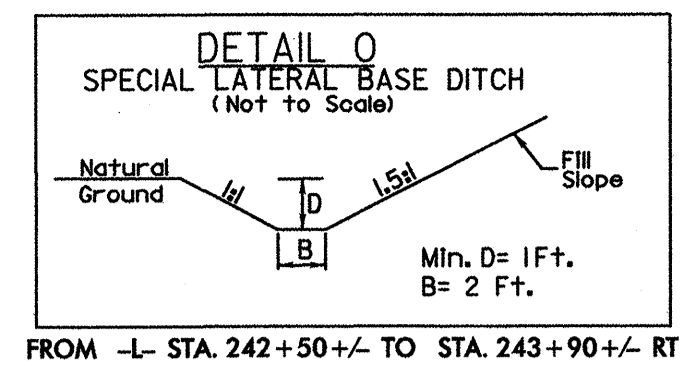
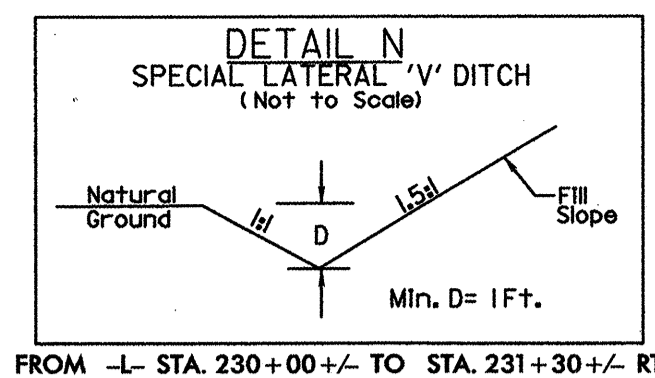
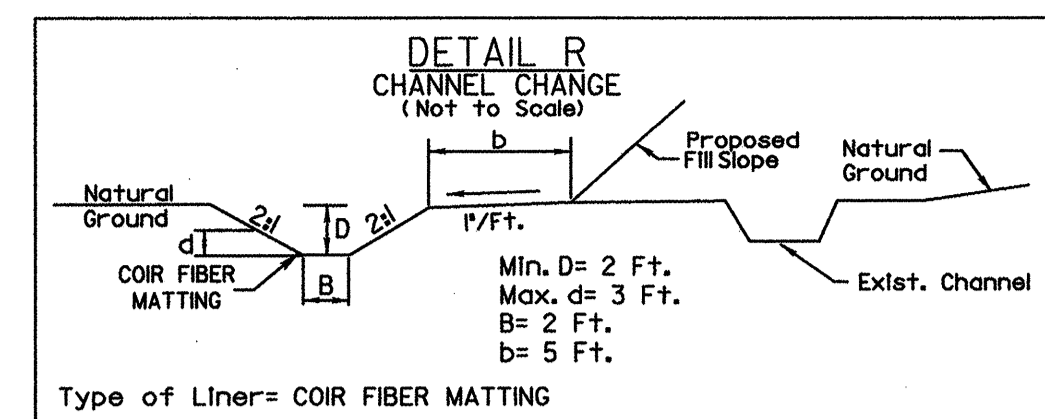
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 7

8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-8/CONST.8	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS		TGS ENGINEERS	
SUITE 141		SUITE 141	
975 WALNUT STREET		975 WALNUT STREET	
CARY, NC 27511		CARY, NC 27511	
PH (919) 319-8850		PH (919) 319-8850	

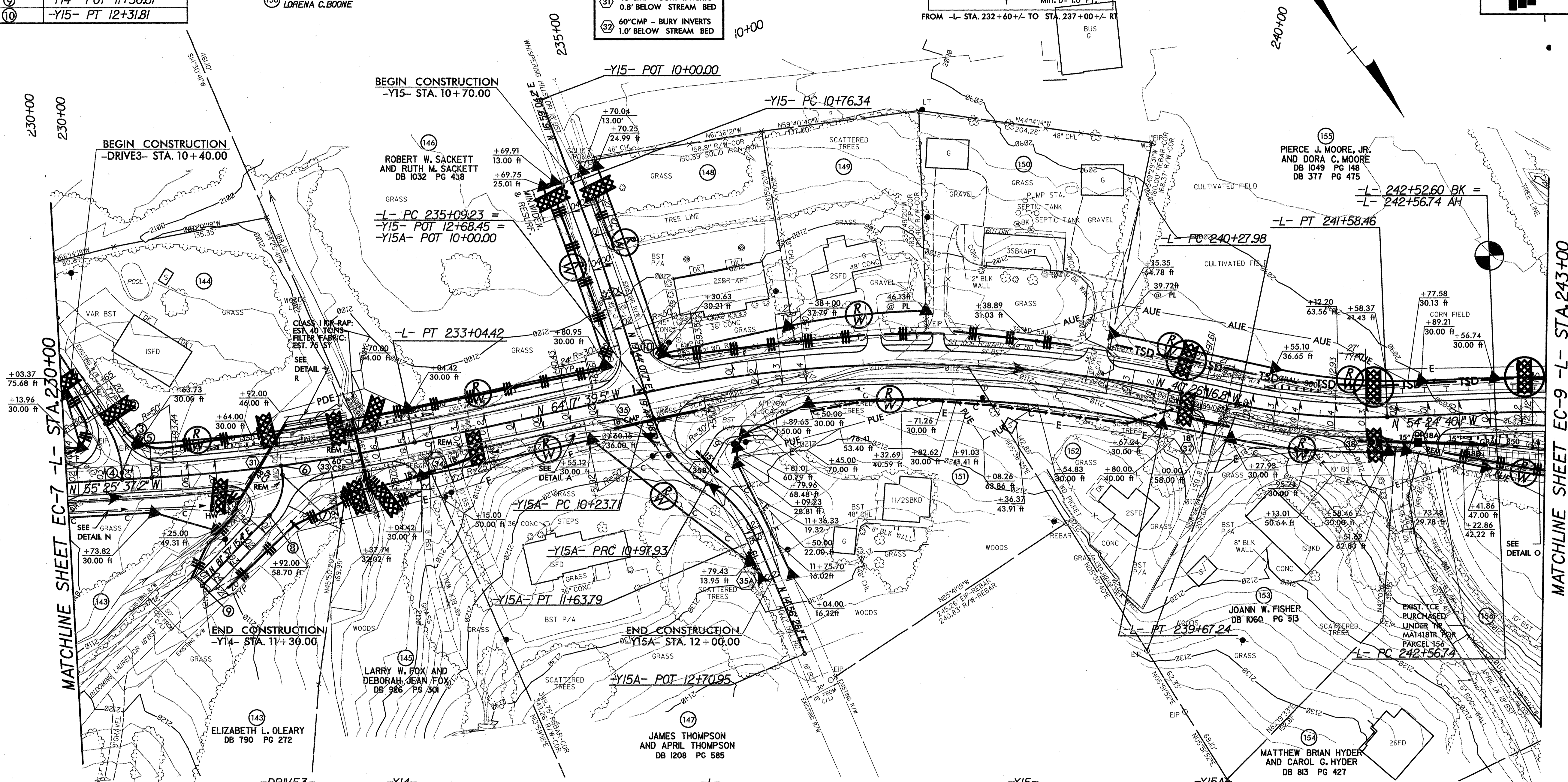
- ① -DRIVE3- POT 10+00.00
- ② -DRIVE3- PC 10+94.51
- ③ -DRIVE3- PT 11+39.99
- ③ to ④ N 34° 34' 21.7" E
- ④ -L- POT 230+48.24 = -DRIVE3- POT 11+45.76
- ⑤ -L- PC 230+73.82
- ⑥ -L- POC 231+86.63 = -Y14- POT 10+00.00
- ⑥ to ⑦ N 29° 56' 03.2" E
- ⑦ -Y14- PC 10+08.31
- ⑧ -Y14- PT 10+46.20
- ⑨ -Y14- POT 11+30.67
- ⑩ -Y15- PT 12+31.81

- ⑭ PHILIP M. CHAVEZ AND CAROLYN M. CHAVEZ DB 930 PG 456
- ⑭ COLONIAL VILLAGE HOMEOWNERS ASSOCIATION DB 1A PG 1055
- ⑭ GARY AND RUTH BIENVENU DB 1260 PG 257
- ⑭ PINE VILLA HOMEOWNERS ASSOCIATION DB 477 PG 575
- ⑭ RICHARD J. SILTZER AND KELLY M. SILTZER DB 1229 PG 762
- ⑭ AMELIA ANN HOUCK DB 1079 PG 665
- ⑭ DAVID F. BOONE AND LORENA C. BOONE DB 950 PG 735



FROM -L- STA. 231+95+/- TO STA. 232+50+/- LT
COIR FIBER MATTING: EST. 150 SY
D.D.E.: EST. 50 CY

- ① 48" CMP - BURY INVERTS 0.8' BELOW STREAM BED
- ② 60" CMP - BURY INVERTS 1.0' BELOW STREAM BED

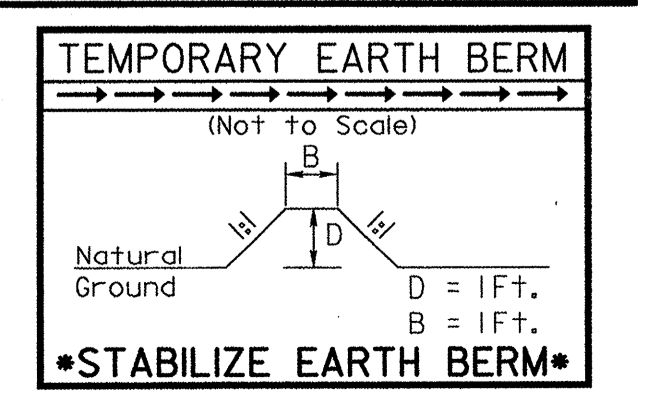


MATCHLINE SHEET EC-7 -L- STA. 230+00


MATCHLINE SHEET EC-9 -L- STA. 243+00

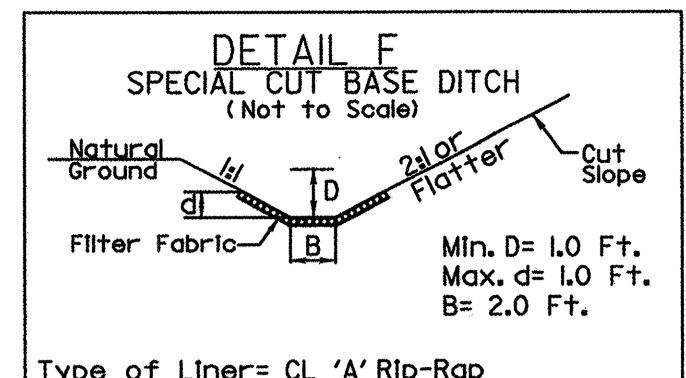
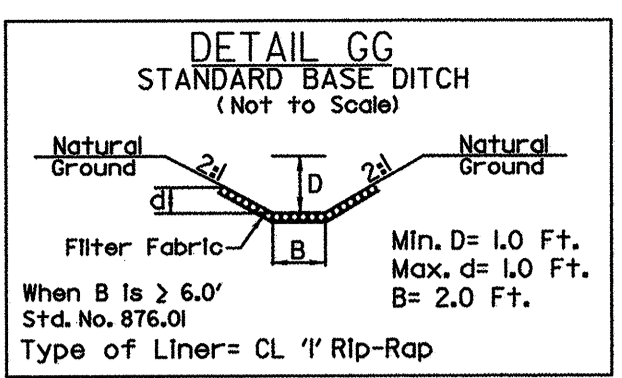
-DRIVE3-	-Y14-	-L-		-Y15-		-Y15A-	
PI Sta 11+17.79	PI Sta 10+28.66	PI Sta 231+89.35	PI Sta 237+41.60	PI Sta 240+93.55	PI Sta 244+82.18	PI Sta 10+62.62	PI Sta 11+32.11
Δ = 30° 18' 07.9" (RT)	Δ = 5° 41' 12.2" (RT)	Δ = 8° 52' 02.3" (LT)	Δ = 23° 51' 22.7" (RT)	Δ = 13° 58' 23.3" (LT)	Δ = 31° 28' 34.0" (RT)	Δ = 42° 31' 43.8" (LT)	Δ = 37° 44' 01.5" (RT)
D = 66' 37" 22.8"	D = 136' 25" 06.7"	D = 3' 50" 43.3"	D = 5' 12" 31.3"	D = 10' 42" 34.2"	D = 7' 09" 43.1"	D = 57' 17" 44.8"	D = 57' 17" 44.8"
L = 45.48'	L = 37.89'	L = 230.60'	L = 458.01'	L = 130.47'	L = 439.49'	L = 74.23'	L = 65.86'
T = 23.29'	T = 20.34'	T = 115.53'	T = 232.37'	T = 65.56'	T = 225.44'	T = 38.92'	T = 34.17'
R = 86.00'	R = 42.00'	R = 1,490.00'	R = 1,100.00'	R = 535.00'	R = 800.00'	R = 100.00'	R = 100.00'
		SE = 0.07	SE = 0.04	SE = 0.04	SE = 0.04		

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 8



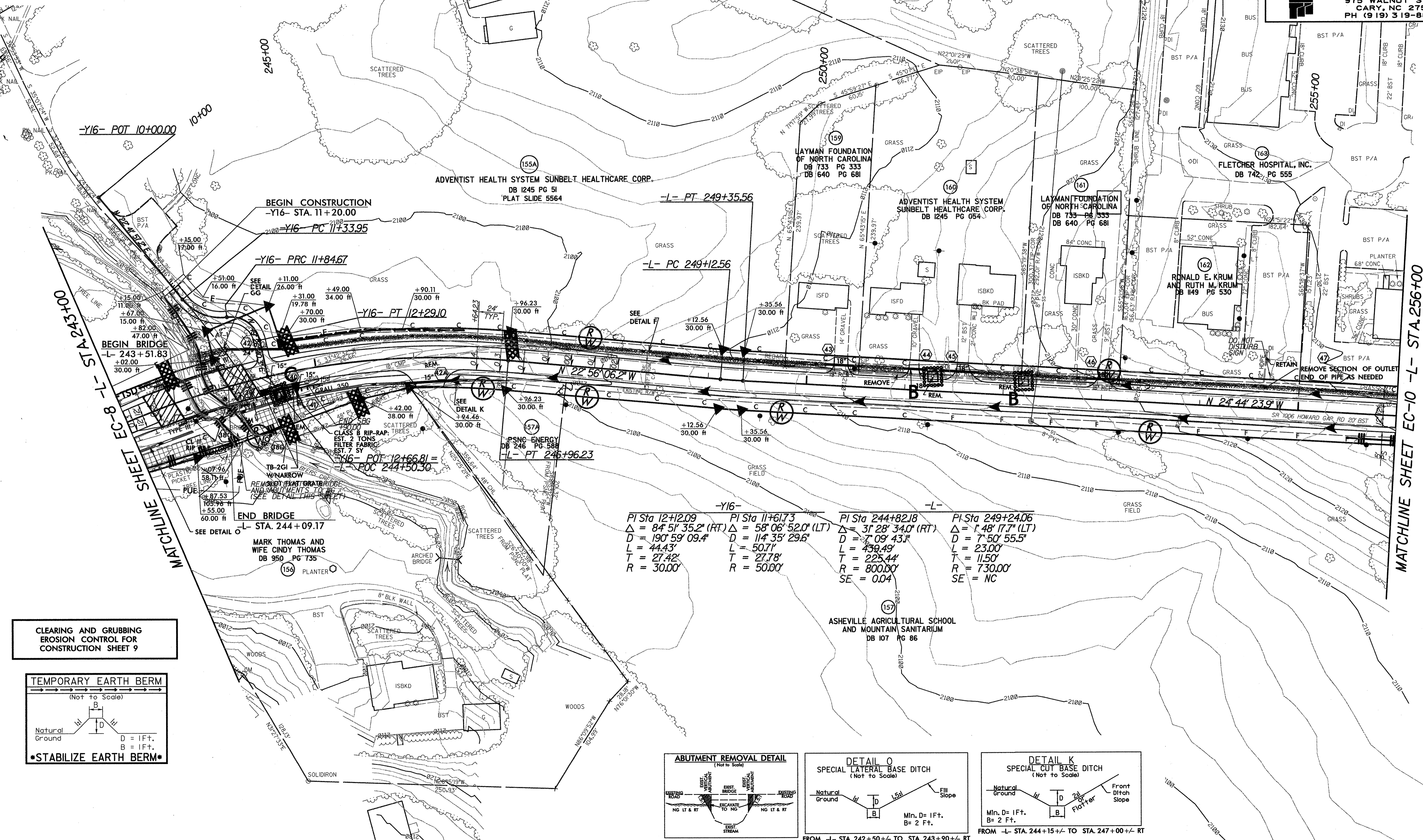
8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-9/CONST.9	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			

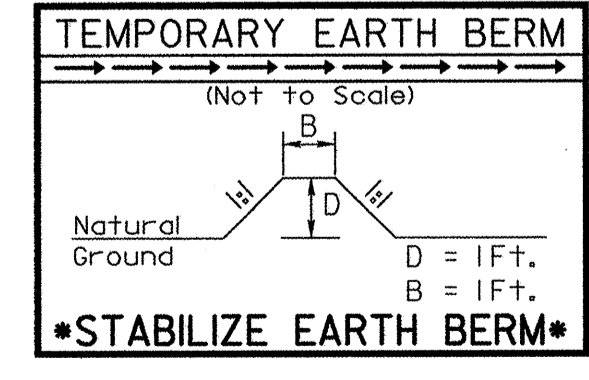


FROM -L- STA. 243+90+/- TO STA. 244+15+/- LT
(SEE -L- PROFILE FOR DITCH GRADE)
CL '1' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 40 SY
D.D.E.: EST. 5 CY

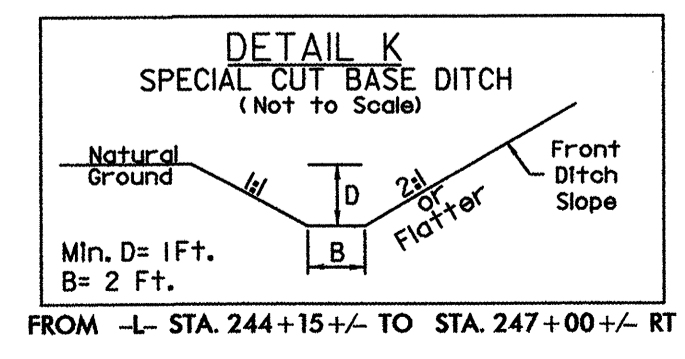
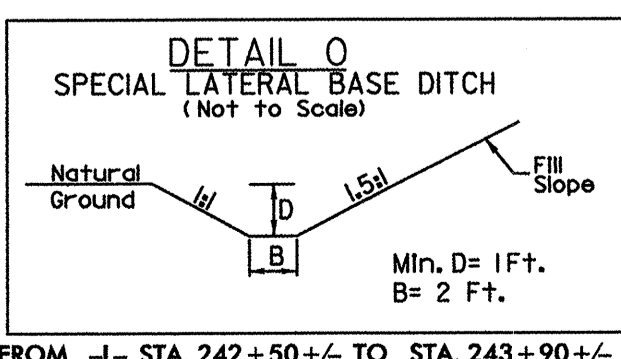
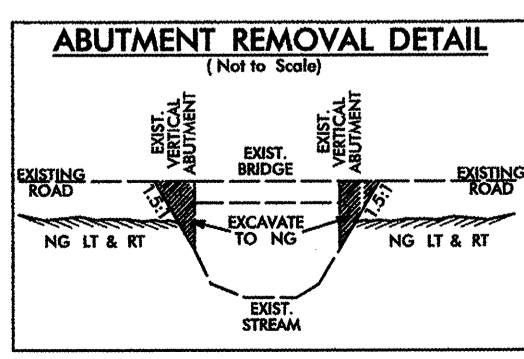
FROM -L- STA. 244+70+/- TO STA. 256+00+/- LT
(USE -L- GRADE FROM STA. 247+50 TO 253+20+/-)
CL 'A' RIP RAP: EST. 260 TONS
FILTER FABRIC: EST. 1025 SY



CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 9



PI Sta	Delta	D	L	T	R	SE
12+2.09	84° 51' 35.2" (RT)	190' 59' 09.4"	44.43'	27.42'	30.00'	
11+61.73	58° 06' 52.0" (LT)	114' 35' 29.6"	50.71'	27.78'	50.00'	
244+82.18	31° 28' 34.0" (RT)	7' 09' 43.1"	439.49'	225.44'	800.00'	0.04
249+24.06	1° 48' 17.7" (LT)	7' 50' 55.5"	23.00'	11.50'	730.00'	NC

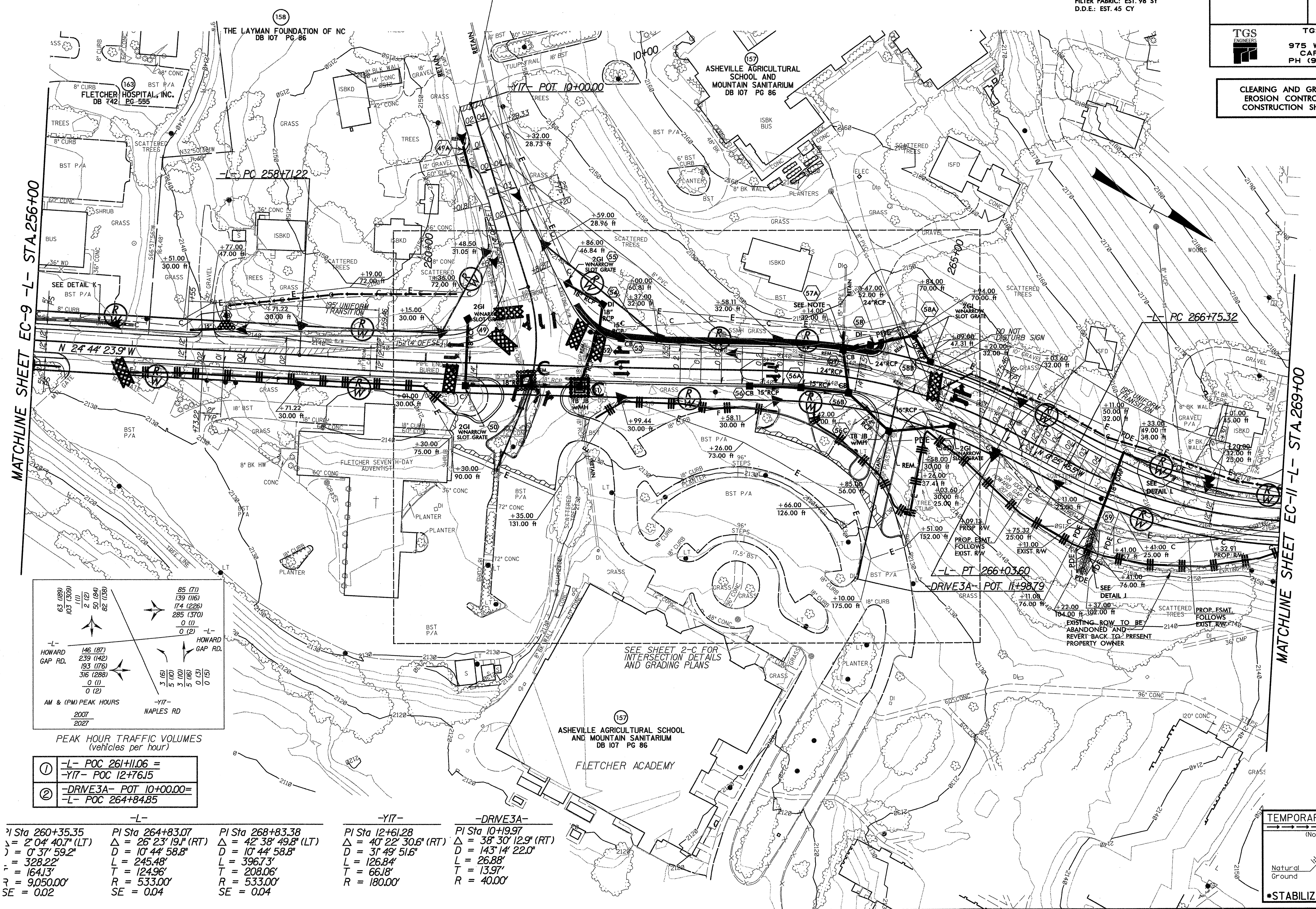
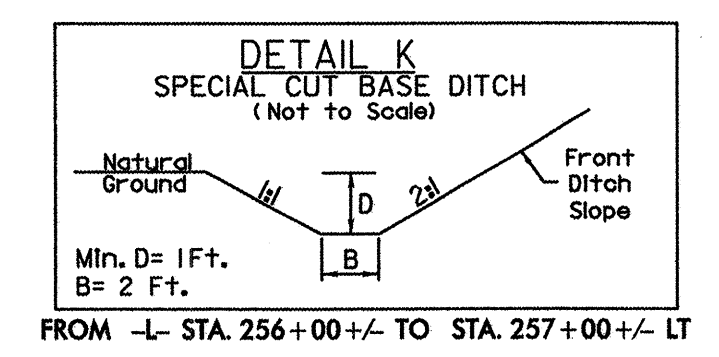
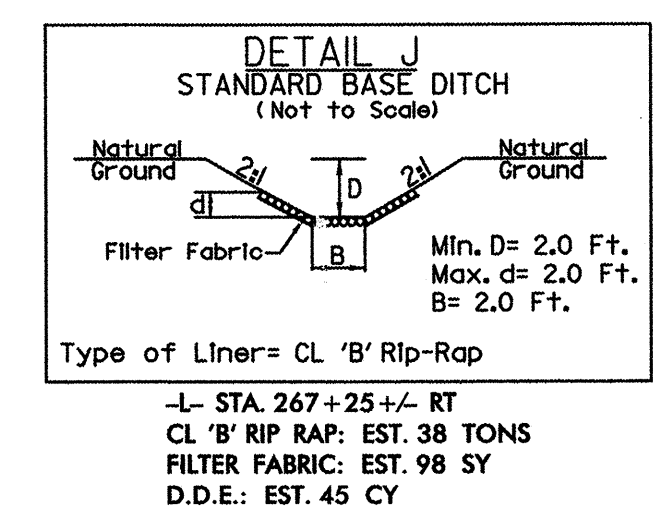
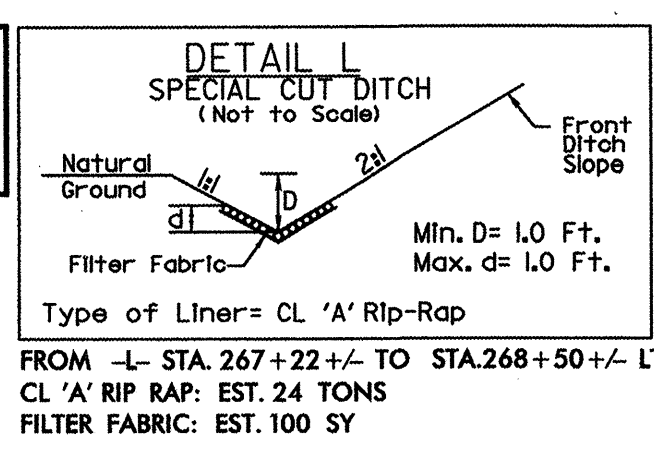


PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-10/CONST.10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 10

NOTE: REMOVE SECTION OF EXISTING 15" PIPE AS NEEDED (APPROX. 30' +/-). TIE EXISTING 15" PIPE INTO CB USING TWO HDPE ELBOWS AND APPROX. 16' NEW HDPE 15" PIPE.



63 (108)	85 (11)	139 (116)	2 (2)	50 (164)	82 (138)
103 (309)	0 (1)	174 (226)	0 (1)	0 (1)	0 (2)
146 (187)	146 (187)	239 (142)	193 (176)	316 (288)	0 (1)
239 (142)	5 (16)	5 (16)	5 (16)	5 (16)	0 (1)
193 (176)	0 (1)	0 (1)	0 (1)	0 (1)	0 (2)
316 (288)	0 (1)	0 (1)	0 (1)	0 (1)	0 (1)
0 (1)	0 (1)	0 (1)	0 (1)	0 (1)	0 (1)
0 (2)	0 (1)	0 (1)	0 (1)	0 (1)	0 (1)

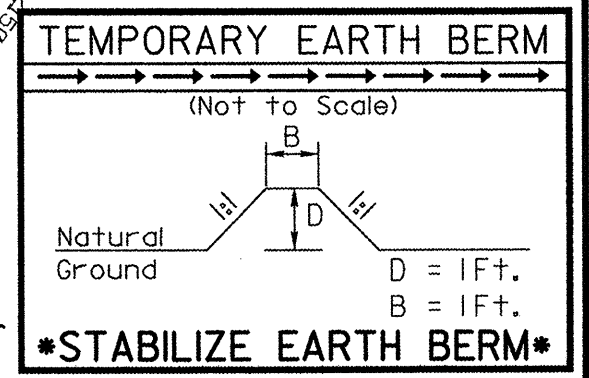
AM & (PM) PEAK HOURS
2007
2027

HOWARD GAP RD.
NAPLES RD.

PEAK HOUR TRAFFIC VOLUMES (vehicles per hour)

① -L- POC 261+11.06 =	-Y17- POC 12+76.15
② -DRIVE3A- POT 10+00.00 =	-L- POC 264+84.85

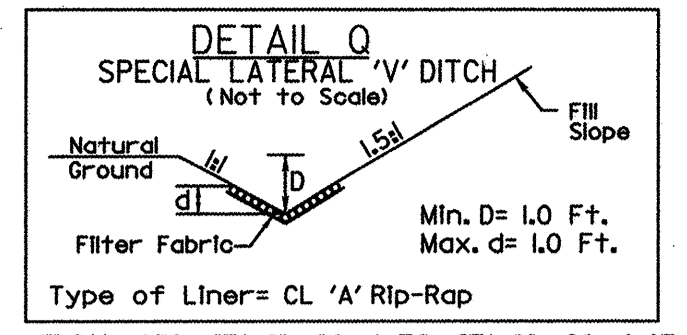
-L-	-Y17-	-DRIVE3A-
PI Sta 260+35.35	PI Sta 12+61.28	PI Sta 10+99.97
Δ = 2° 04' 40.7" (LT)	Δ = 42° 38' 49.8" (LT)	Δ = 38° 30' 12.9" (RT)
Δ = 0° 37' 59.2"	Δ = 10° 44' 58.8"	Δ = 143° 14' 22.0"
L = 328.22'	L = 245.48'	L = 26.88'
T = 164.13'	T = 124.96'	T = 13.97'
R = 9,050.00'	R = 533.00'	R = 40.00'
SE = 0.02	SE = 0.04	SE = 0.04



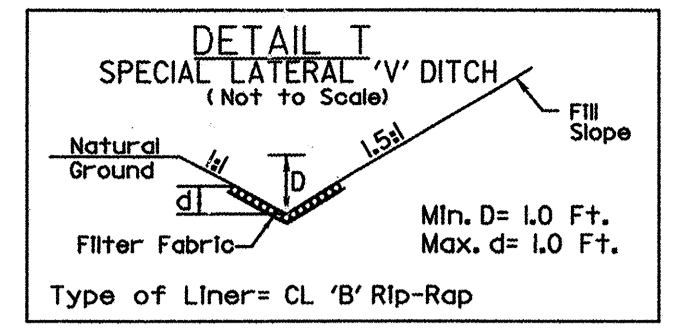
207B_C6_10.dgn 11/3/2011 10:40:35 AM

8/17/99

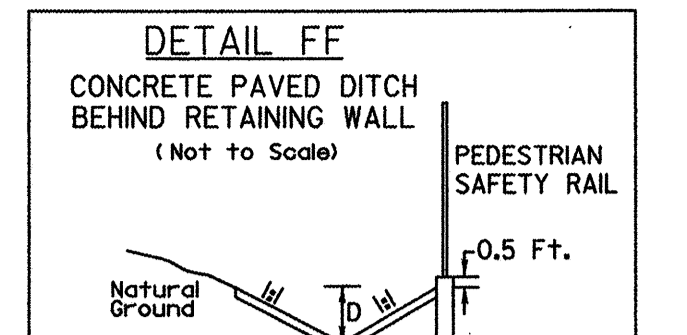
PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-12/CONST.12	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS		TGS ENGINEERS	
SUITE 141		SUITE 141	
975 WALNUT STREET		975 WALNUT STREET	
CARY, NC 27511		CARY, NC 27511	
PH (919) 319-8850		PH (919) 319-8850	



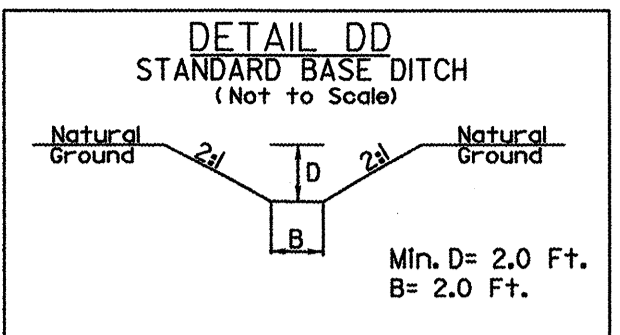
FROM -Y18- STA. 11+30+/- TO STA. 12+20+/- LT
CL 'A' RIP RAP: EST. 15 TONS
FILTER FABRIC: EST. 65 SY



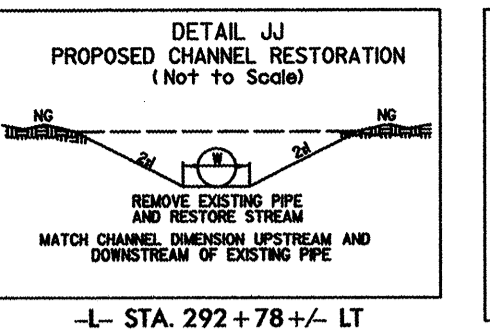
FROM STA. 291+75+/- TO STA. 292+10+/- RT
CL 'B' RIP RAP: EST. 12 TONS
FILTER FABRIC: EST. 34 SY



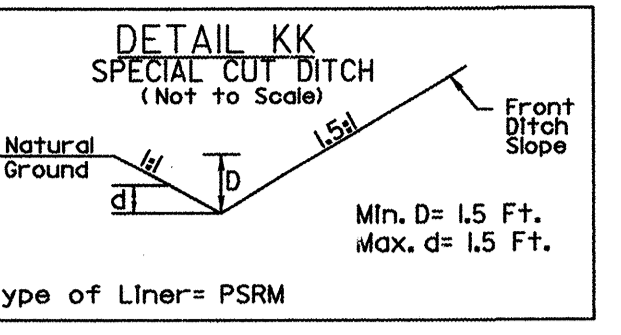
FROM -L- STA. 285+50+/- TO STA. 287+00+/- LT



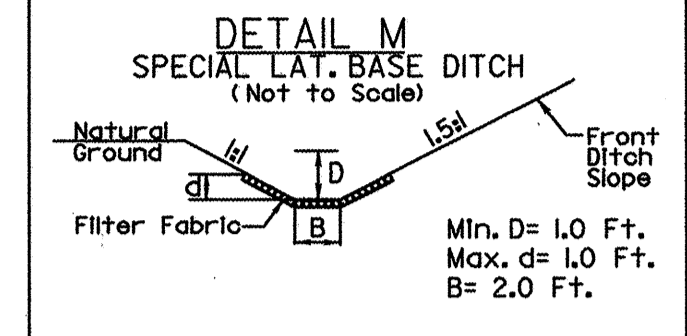
-L- STA. 294+20+/- LT
D.D.E.: EST. 16 CY



-L- STA. 292+78+/- LT

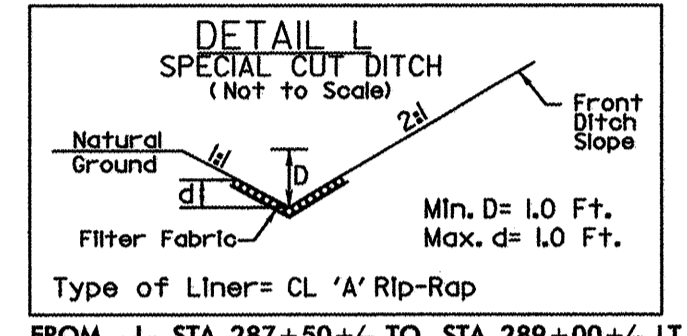


FROM -L- STA. 294+20+/- TO STA. 300+00+/- LT
EST. PSRM = 250 SY



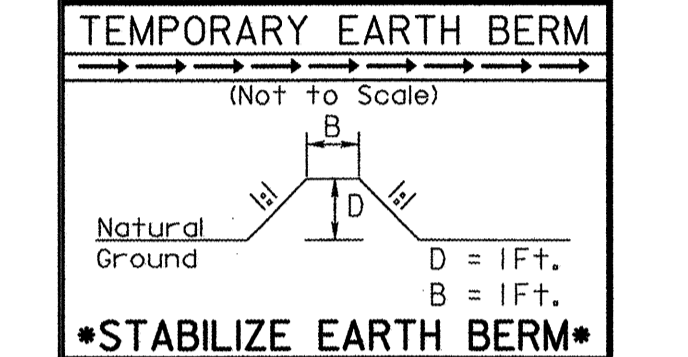
FROM -Y18- STA. 10+43+/- TO STA. 15+50+/- RT
CL 'B' RIP RAP: EST. 194 TONS
FILTER FABRIC: EST. 530 SY

PI Sta 284+37.44 Δ = 46° 15' 36.1" (RT) D = 18' 14" 49.4" L = 253.52' T = 134.13' R = 314.00' SE = 0.04	PI Sta 286+62.38 Δ = 37° 09' 32.1" (LT) D = 18' 14" 49.4" L = 203.64' T = 105.55' R = 314.00' SE = 0.04	PI Sta 293+15.46 Δ = 95° 33' 38.5" (RT) D = 18' 14" 49.4" L = 523.70' T = 346.06' R = 314.00' SE = 0.06	PI Sta 298+69.84 Δ = 100° 22' 40.7" (LT) D = 18' 14" 49.4" L = 550.10' T = 376.73' R = 314.00' SE = 0.06
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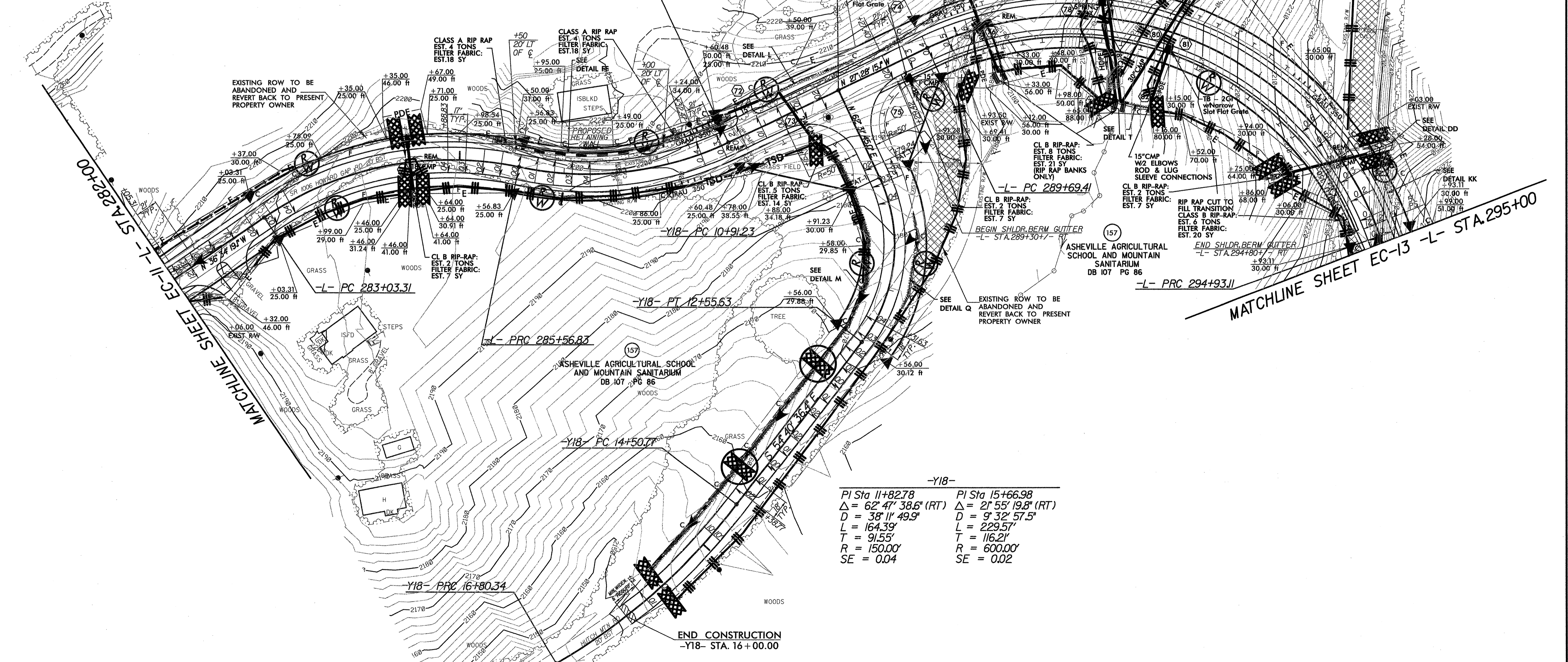


FROM -L- STA. 287+50+/- TO STA. 289+00+/- LT
CL 'A' RIP RAP: EST. 23 TONS
FILTER FABRIC: EST. 117 SY

FROM -L- STA. 294+20+/- TO STA. 296+50+/- LT
CL 'A' RIP RAP: EST. 45 TONS
FILTER FABRIC: EST. 180 SY




STABILIZE EARTH BERM



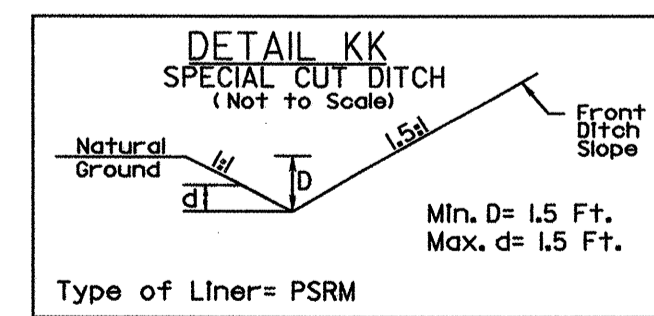
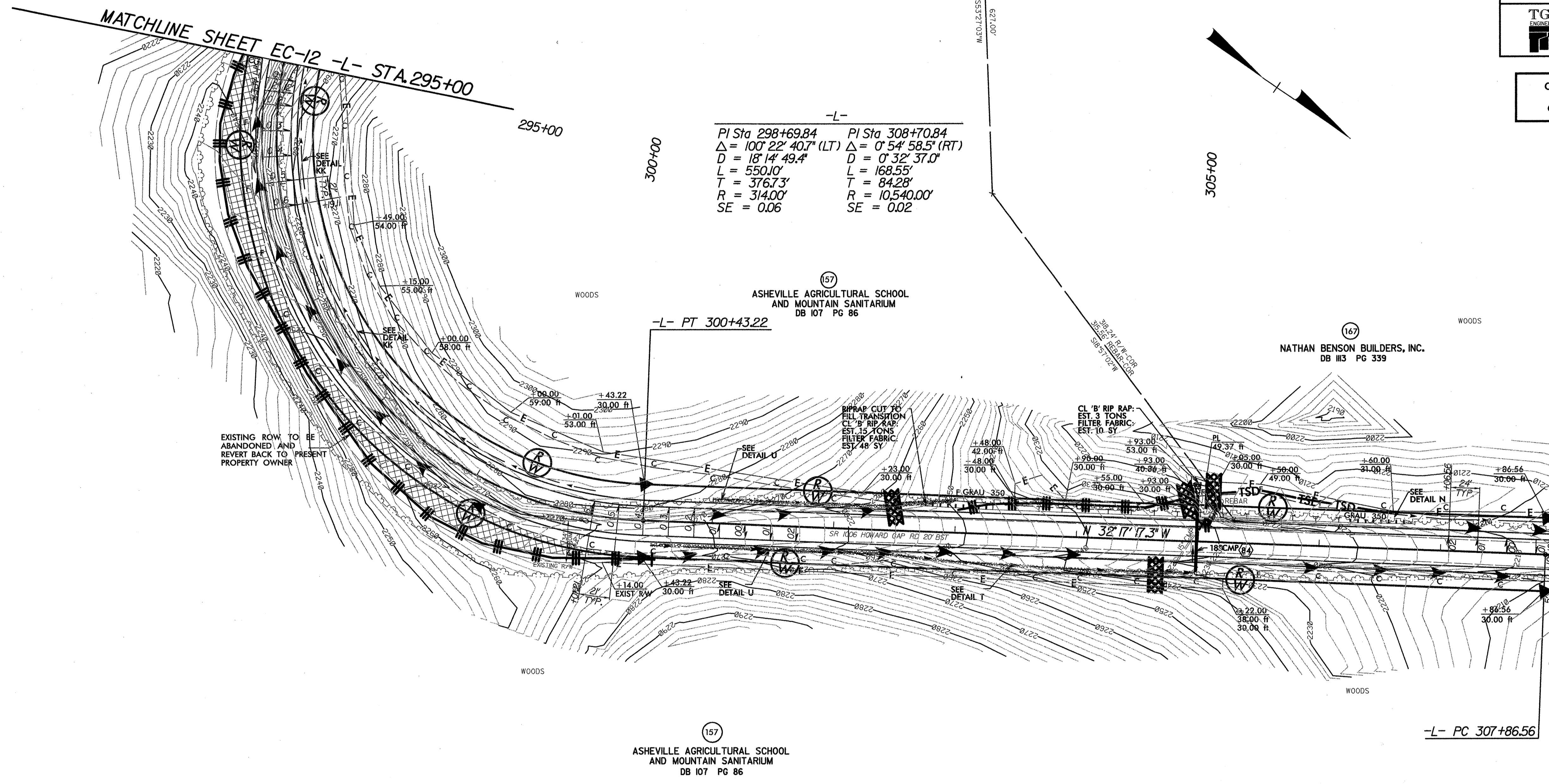
PI Sta 11+82.78 Δ = 62° 47' 38.6" (RT) D = 38' 11" 49.9" L = 164.39' T = 91.55' R = 150.00' SE = 0.04	PI Sta 15+66.98 Δ = 21° 55' 19.8" (RT) D = 9' 32' 57.5" L = 229.57' T = 116.21' R = 600.00' SE = 0.02
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SCHEMATIC

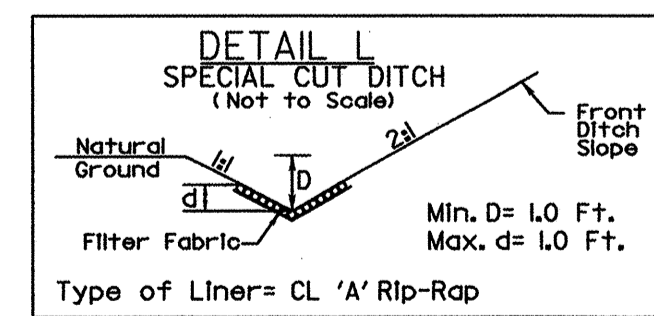
8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-13/CONST.13	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
		TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 13

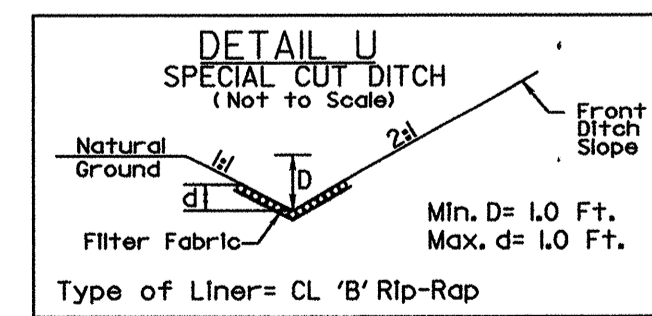


FROM -L- STA. 294+20+/- TO STA. 300+00+/- LT
EST. PSRM = 250 SY



FROM -L- STA. 294+20+/- TO STA. 296+50+/- LT
CL 'A' RIP RAP: EST. 45 TONS
FILTER FABRIC: EST. 180 SY

USE -L- GRADE FOR DETAIL 'L'

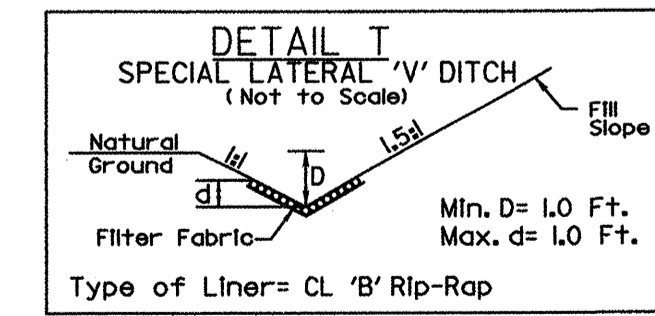


FROM -L- STA. 296+50+/- TO STA. 298+00+/- LT
CL 'B' RIP RAP: EST. 71 TONS
FILTER FABRIC: EST. 205 SY

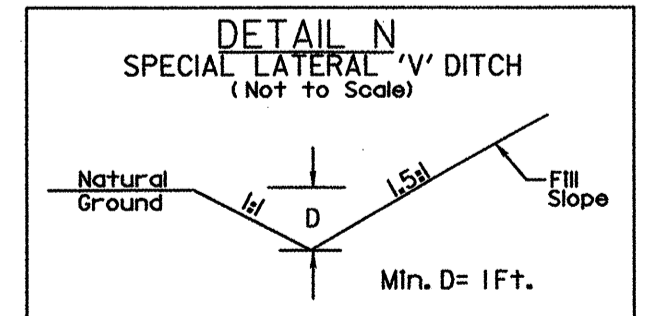
FROM -L- STA. 300+50+/- TO STA. 302+50+/- RT
CL 'B' RIP RAP: EST. 57 TONS
FILTER FABRIC: EST. 164 SY

FROM -L- STA. 301+00+/- TO STA. 302+50+/- LT
CL 'B' RIP RAP: EST. 43 TONS
FILTER FABRIC: EST. 123 SY

USE -L- GRADE FOR DETAIL 'U'



FROM -L- STA. 302+50+/- TO STA. 305+00+/- RT
CL 'B' RIP RAP: EST. 72 TONS
FILTER FABRIC: EST. 206 SY



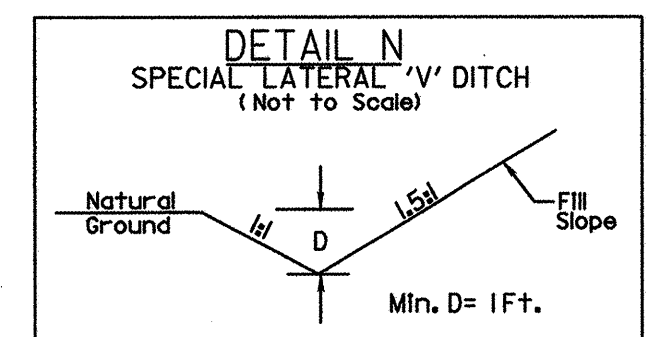
FROM -L- STA. 306+50+/- TO STA. 310+00+/- LT

207B_C6_13.dgn 11/3/2011 10:42:28 AM

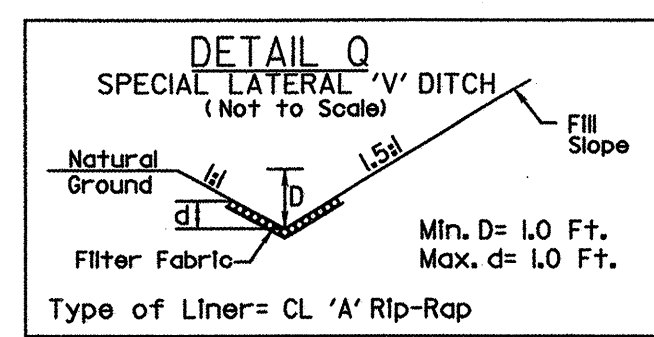
207B_C6_13.dgn 11/3/2011 10:42:28 AM

8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-14/CONST.14	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS		TGS ENGINEERS	
SUITE 141		SUITE 141	
975 WALNUT STREET		975 WALNUT STREET	
CARY, NC 27511		CARY, NC 27511	
PH (919) 319-8850		PH (919) 319-8850	



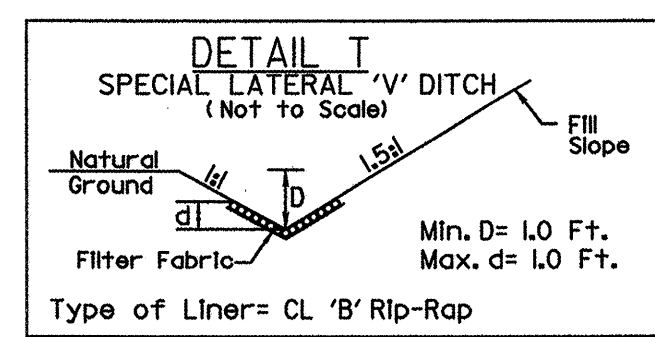
FROM -L- STA. 306+50+/- TO STA. 310+00+/- LT
 CL 'A' RIP RAP: EST. 34 TONS
 FILTER FABRIC: EST. 144 SY



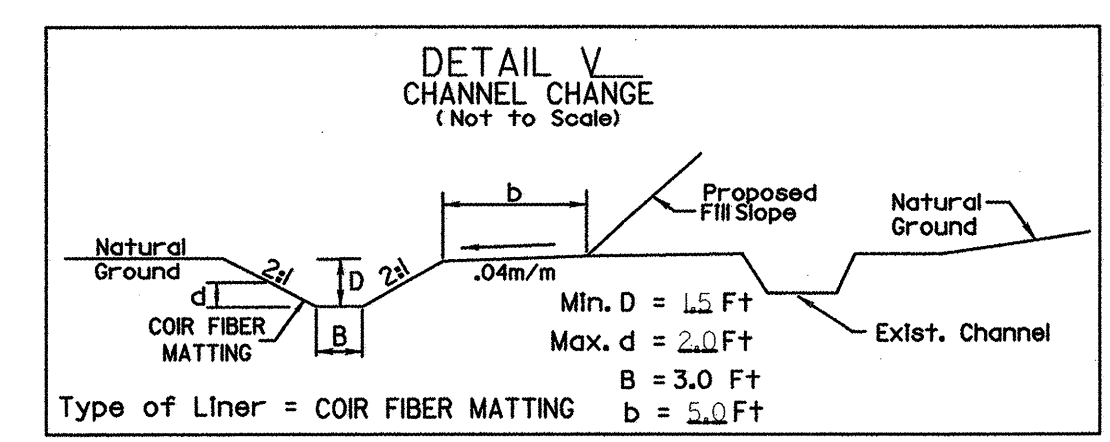
FROM STA. 308+50+/- TO STA. 310+50+/- RT
 CL 'A' RIP RAP: EST. 34 TONS
 FILTER FABRIC: EST. 144 SY

FROM STA. 314+00+/- TO STA. 315+80+/- LT
 CL 'A' RIP RAP: EST. 31 TONS
 FILTER FABRIC: EST. 130 SY

FROM STA. 317+85+/- TO STA. 319+50+/- LT
 CL 'A' RIP RAP: EST. 30 TONS
 FILTER FABRIC: EST. 120 SY



FROM STA. 314+75+/- TO STA. 318+00+/- LT
 CL 'B' RIP RAP: EST. 7 TONS
 FILTER FABRIC: EST. 21 SY

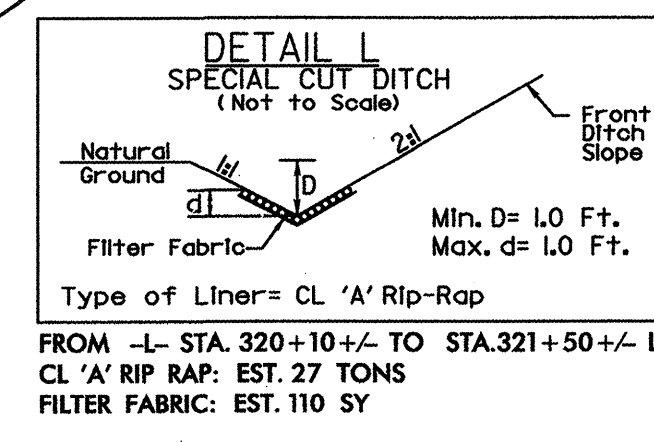
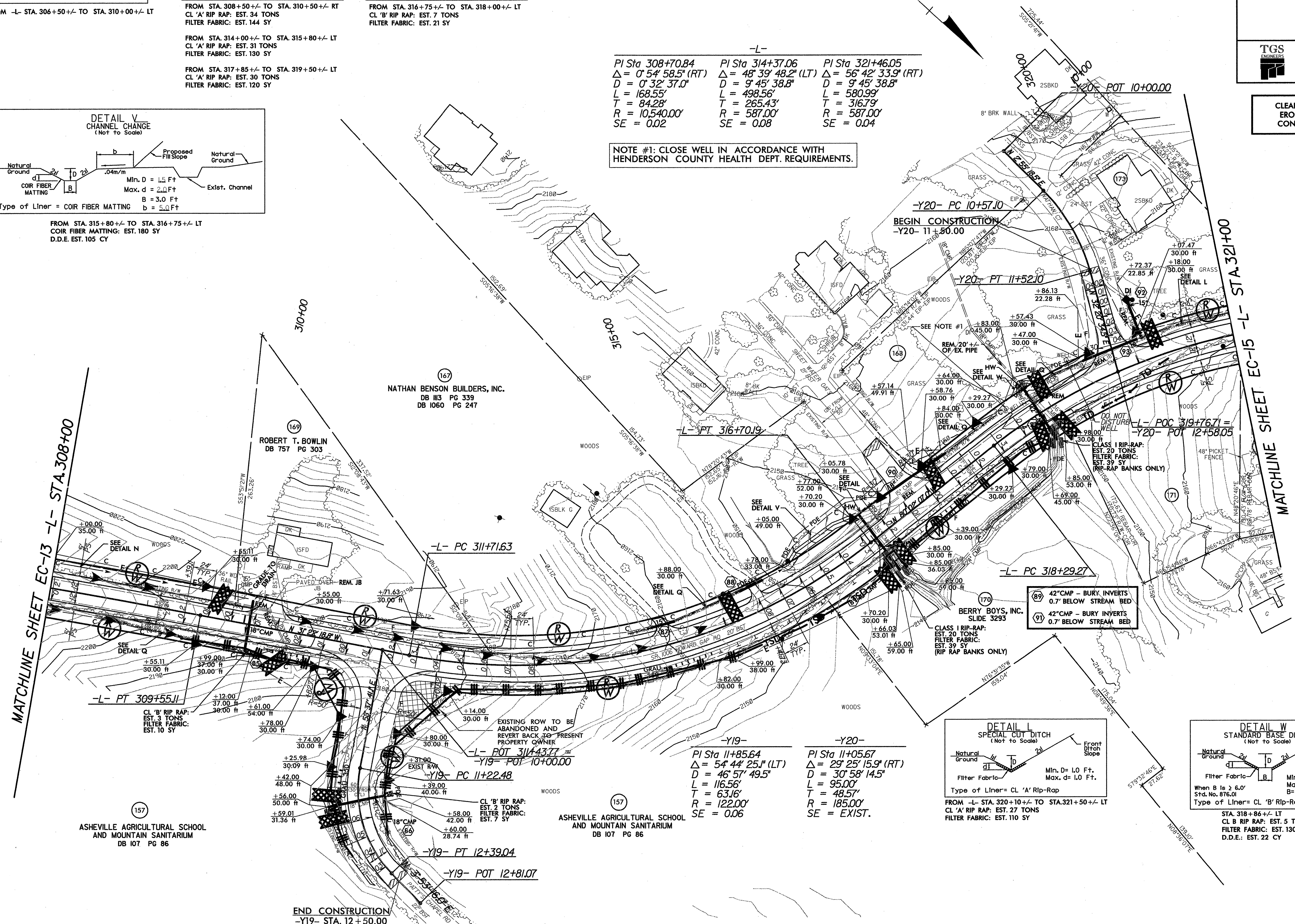


FROM STA. 315+80+/- TO STA. 316+75+/- LT
 COIR FIBER MATTING: EST. 180 SY
 D.D.E. EST. 105 CY

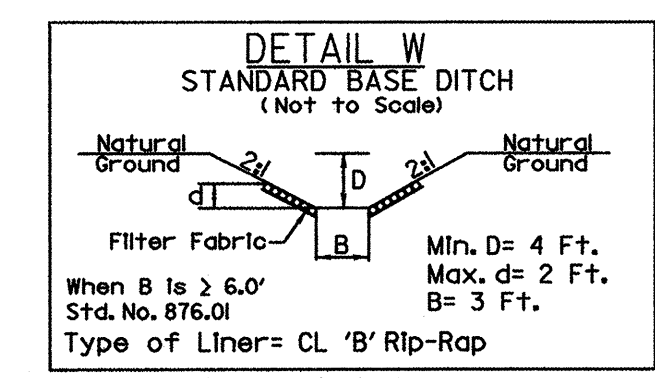
- (168) NATHAN BENSON BUILDERS, INC. DB 1113 PG 339 DB 1060 PG 247
- (171) REBECCA S. CHRISTENSEN DB 1260 PG 94
- (173) LESLIE L. MILLAR DB 1065 PG 430

-L-		
PI Sta 308+70.84	PI Sta 314+37.06	PI Sta 321+46.05
$\Delta = 0^{\circ} 54' 58.5''$ (RT)	$\Delta = 48^{\circ} 39' 48.2''$ (LT)	$\Delta = 56^{\circ} 42' 33.9''$ (RT)
$D = 0^{\circ} 32' 37.0''$	$D = 9^{\circ} 45' 38.8''$	$D = 9^{\circ} 45' 38.8''$
$L = 168.55'$	$L = 498.56'$	$L = 580.99'$
$T = 84.28'$	$T = 265.43'$	$T = 316.79'$
$R = 10,540.00'$	$R = 587.00'$	$R = 587.00'$
$SE = 0.02$	$SE = 0.08$	$SE = 0.04$

NOTE #1: CLOSE WELL IN ACCORDANCE WITH HENDERSON COUNTY HEALTH DEPT. REQUIREMENTS.



FROM -L- STA. 320+10+/- TO STA. 321+50+/- LT
 CL 'A' RIP RAP: EST. 27 TONS
 FILTER FABRIC: EST. 110 SY



STA. 318+86+/- LT
 CL 'B' RIP RAP: EST. 5 TONS
 FILTER FABRIC: EST. 130 SY
 D.D.E.: EST. 22 CY

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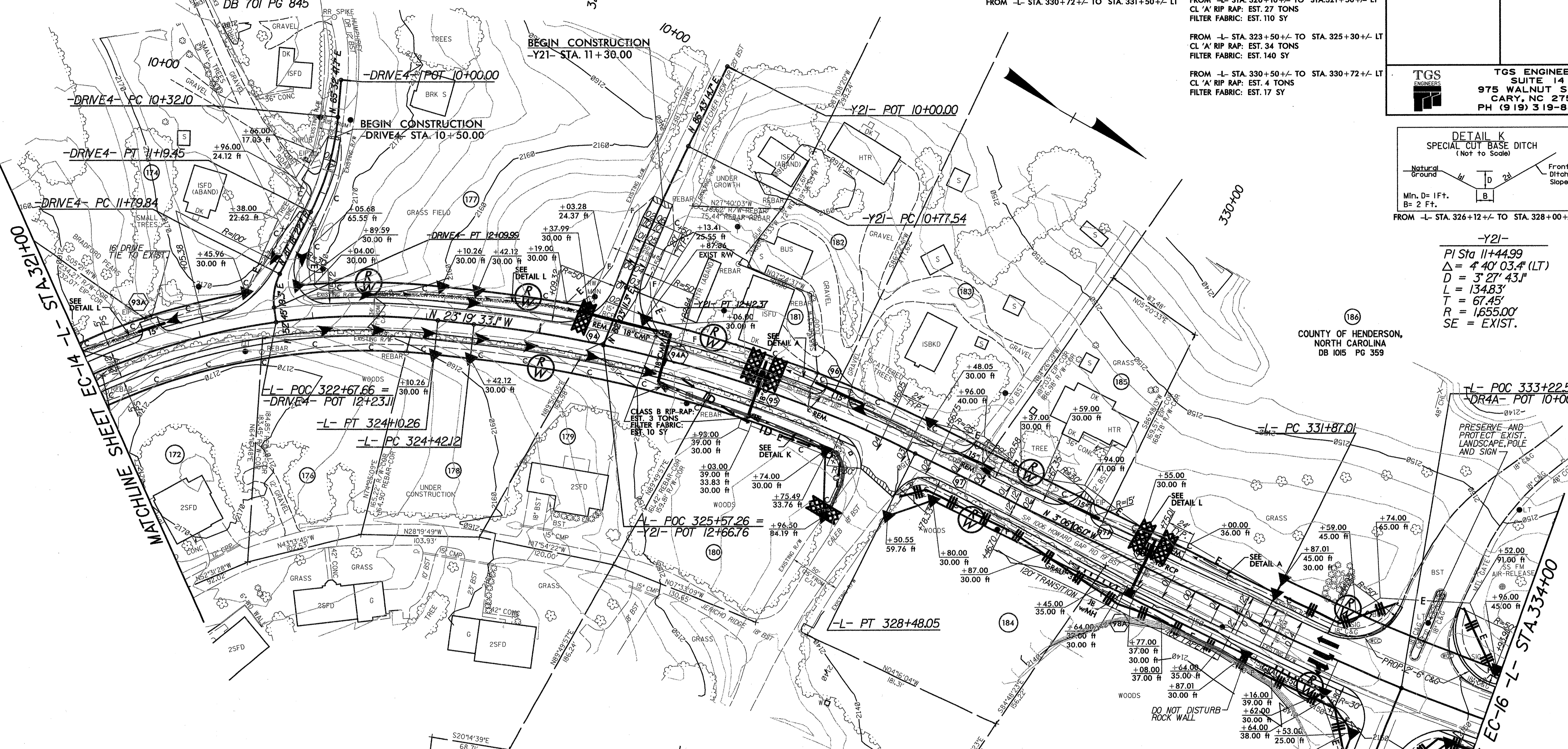
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8/17/09

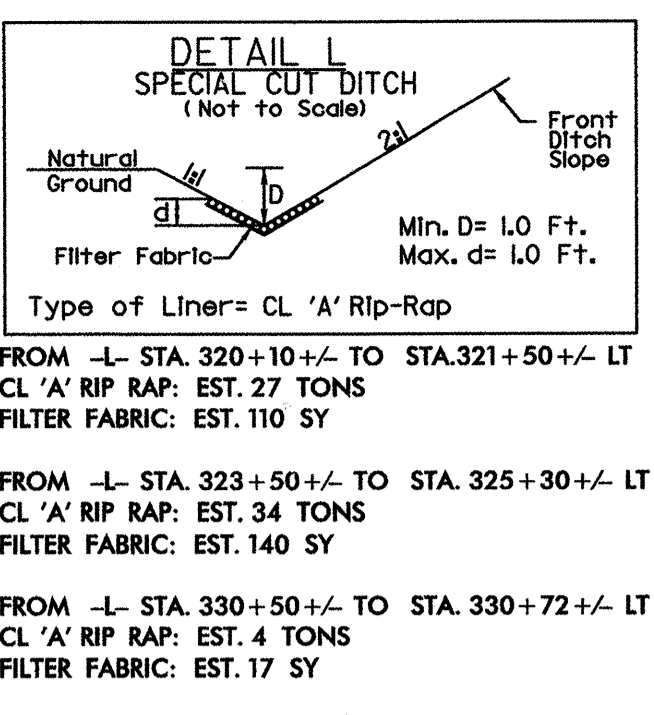
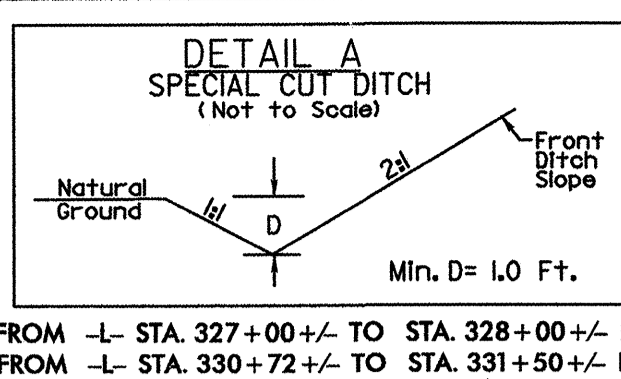
-DRIVE4-

PI Sta 11+95.39 Δ = 3° 33' 02.8" (LT)
 D = 114' 35" 29.6"
 L = 30.15'
 T = 15.55'
 R = 50.00'

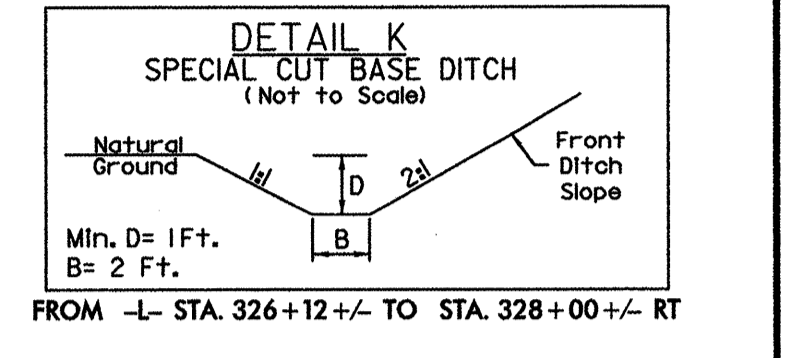
PI Sta 10+76.30 Δ = 2° 45' 34.4" (RT)
 D = 24' 54" 40.4"
 L = 87.35'
 T = 44.21'
 R = 230.00'



**CLEARING AND GRUBBING
 EROSION CONTROL FOR
 CONSTRUCTION SHEET 15**



PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-15/CONST.15	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			



-Y2I-
 PI Sta 11+44.99 Δ = 4° 40' 03.4" (LT)
 D = 3' 27" 43.1"
 L = 134.83'
 T = 67.45'
 R = 1655.00'
 SE = EXIST.

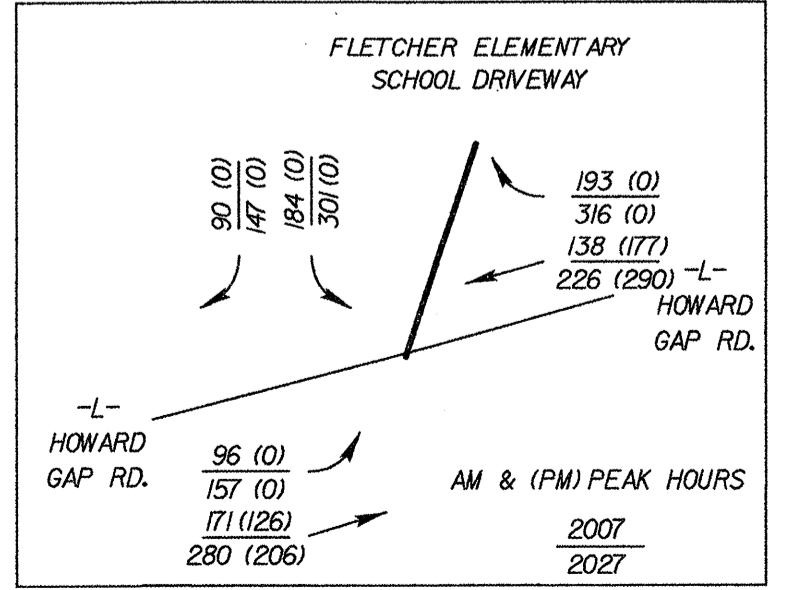
COUNTY OF HENDERSON,
 NORTH CAROLINA
 DB 1015 PG 359

PI Sta 321+46.05 Δ = 56° 42' 33.9" (RT)
 D = 9' 45" 38.8"
 L = 580.99'
 T = 316.79'
 R = 587.00'
 SE = 0.04

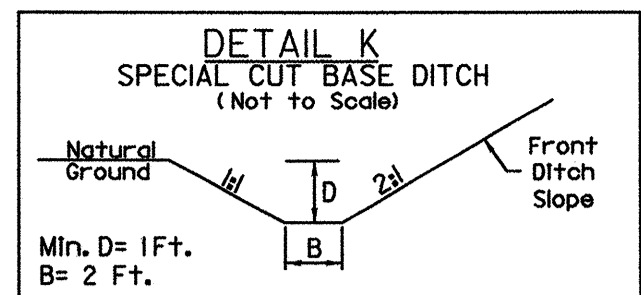
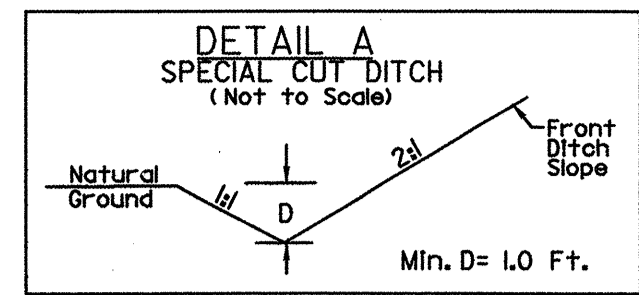
PI Sta 326+47.21 Δ = 20° 13' 27.1" (RT)
 D = 4' 58" 56.1"
 L = 405.93'
 T = 205.10'
 R = 1,150.00'
 SE = 0.04

PI Sta 334+02.73 Δ = 13° 40' 06.4" (LT)
 D = 3' 10" 59.2"
 L = 429.41'
 T = 215.73'
 R = 1,800.00'
 SE = 0.04

- (172) DYLAN C. AND NATASCHA S. GOTESKY DB 1186 PG 648
- (174) ALLEN WALKER AND JAMETTA B. WALKER DB 947 PG 529
- (176) ANDREW D. AND DAWN M. BOYLE DB 1262 PG 379
- (177) JAMES EDWARD BENSON TRUST DB 1190 PG 535
- (178) STEVEN M. MCDOWELL AND ANTJE MCDOWELL DB 1221 PG 530
- (179) JEFFREY W. KLUITZ, PAMELA A. KLUITZ AND MARY E. KLUITZ DB 1142 PG 85
- (180) VANESSA MADDEN DB 1017 PG 161
- (181) OTELIA WILSON DB 806 PG 157
- (182) WILLIAM WILSON, JR. AND KATHY S. WILSON DB 806 PG 175
- (183) ALLEN WALKER AND JAMETTA B. WALKER DB 1082 PG 568
- (184) PATRICIA DROZE DB 1272 PG 130
- (185) JOHN D. DAVIS AND MYRTLE A. DAVIS DB 716 PG 155



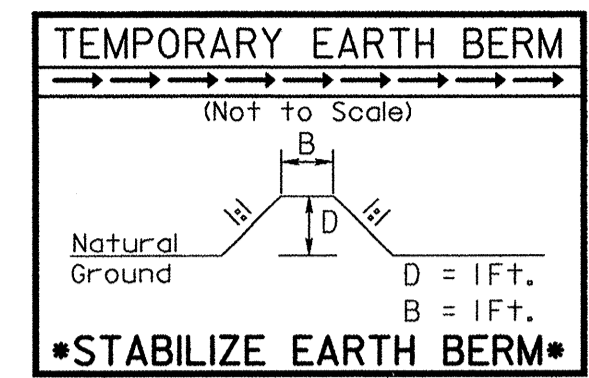
PEAK HOUR TRAFFIC VOLUMES
 (vehicles per hour)



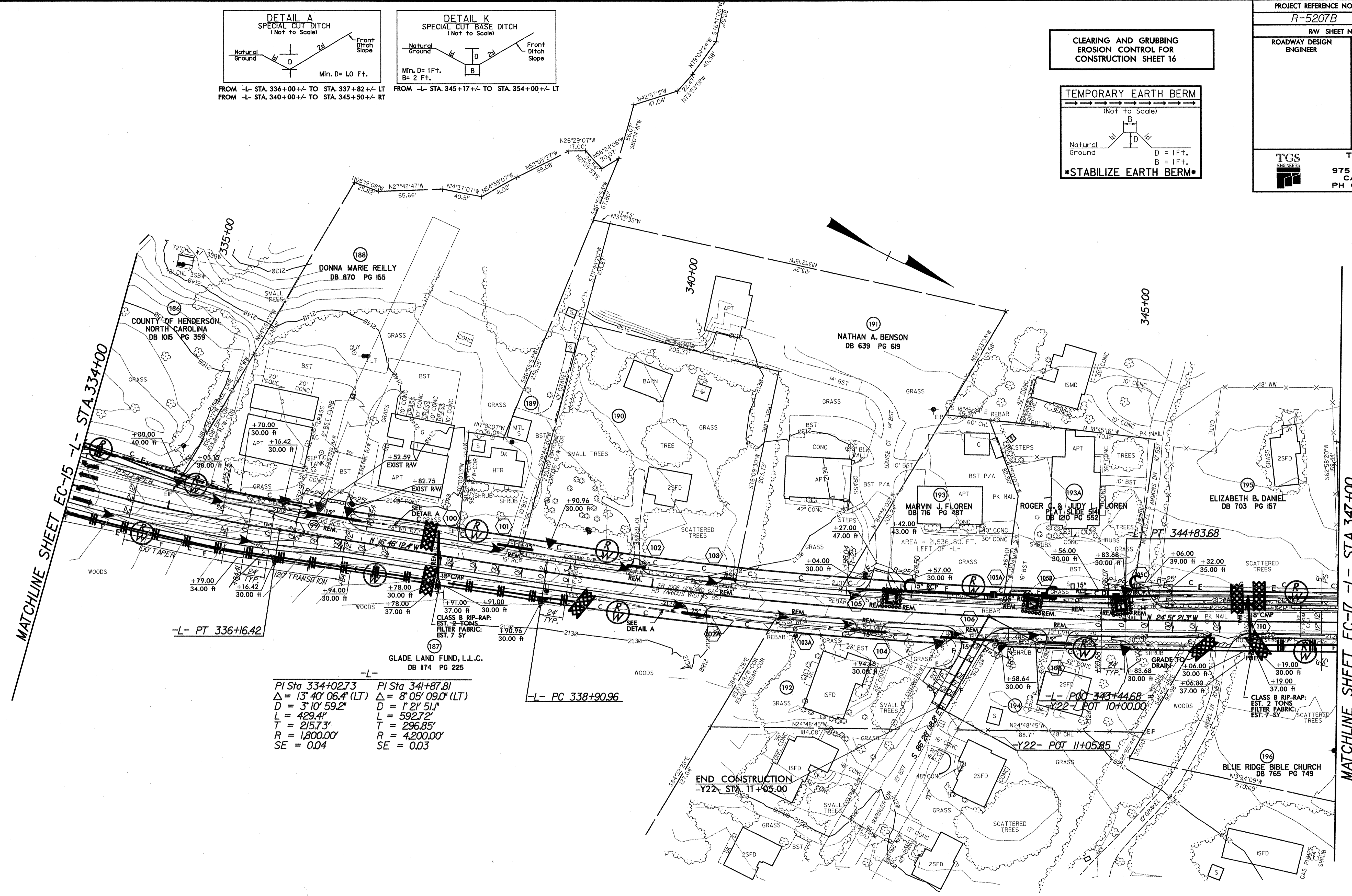
FROM -L- STA. 336+00+/- TO STA. 337+82+/- LT
FROM -L- STA. 340+00+/- TO STA. 345+50+/- RT

FROM -L- STA. 345+17+/- TO STA. 354+00+/- LT

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 16



PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-16/CONST.16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

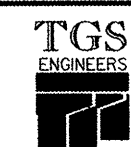


PI Sta 334+02.73	PI Sta 341+87.81
$\Delta = 13^{\circ} 40' 06.4''$ (LT)	$\Delta = 8^{\circ} 05' 09.0''$ (LT)
D = 3' 10' 59.2"	D = 1' 21' 51.1"
L = 429.41'	L = 592.72'
T = 215.73'	T = 296.85'
R = 1,800.00'	R = 4,200.00'
SE = 0.04	SE = 0.03

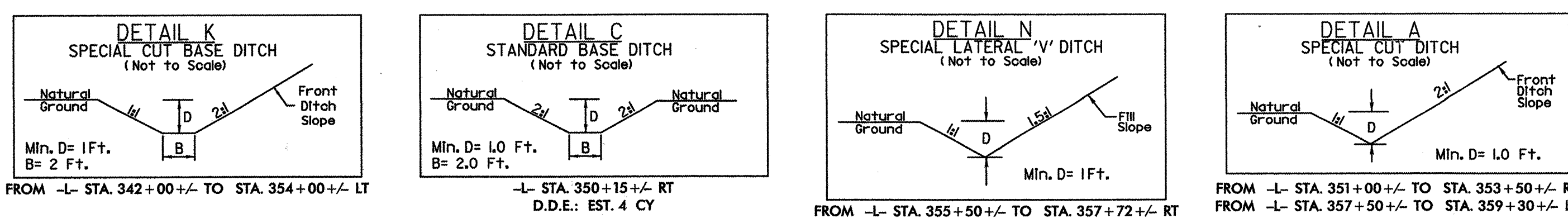
- 189 JOSEPH C. KUYKENDALL DB 597 PG 511 AND EDITH KUYKENDALL
- 190 LARRY WAYNE WALKER DB 533 PG 245
- 192 BRUCE A. JONES AND DARLENE P. JONES DB 1034 PG 297
- 194 CARRIE M. WALKER DB 1180 PG 625

SYSTEMS DESIGN

8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-17/CONST.17	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			

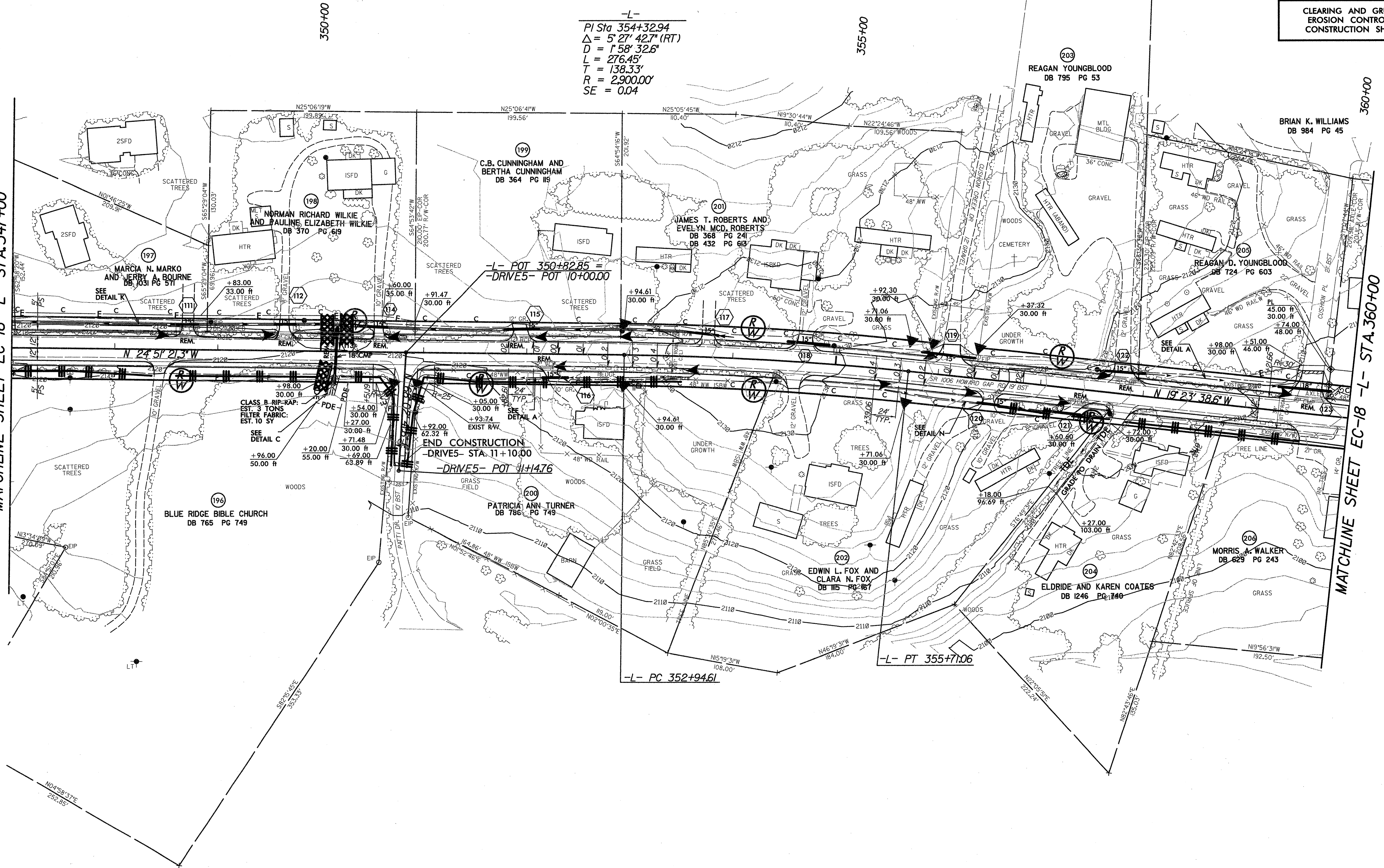
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 17




-L-
 PI Sta 354+32.94
 $\Delta = 5' 27' 42.7''$ (RT)
 $D = 1' 58' 32.6''$
 $L = 276.45'$
 $T = 138.33'$
 $R = 2900.00'$
 $SE = 0.04$

MATCHLINE SHEET EC-16 -L- STA. 347+00

MATCHLINE SHEET EC-18 -L- STA. 360+00

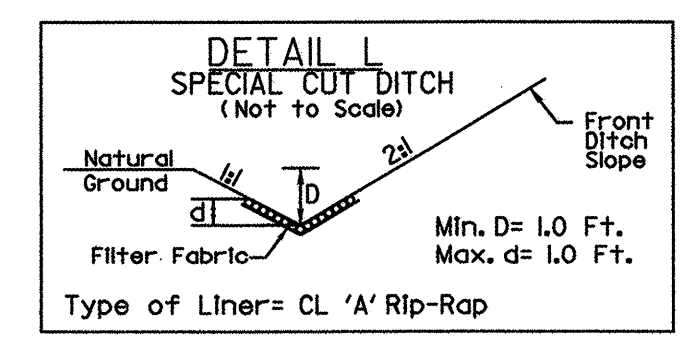
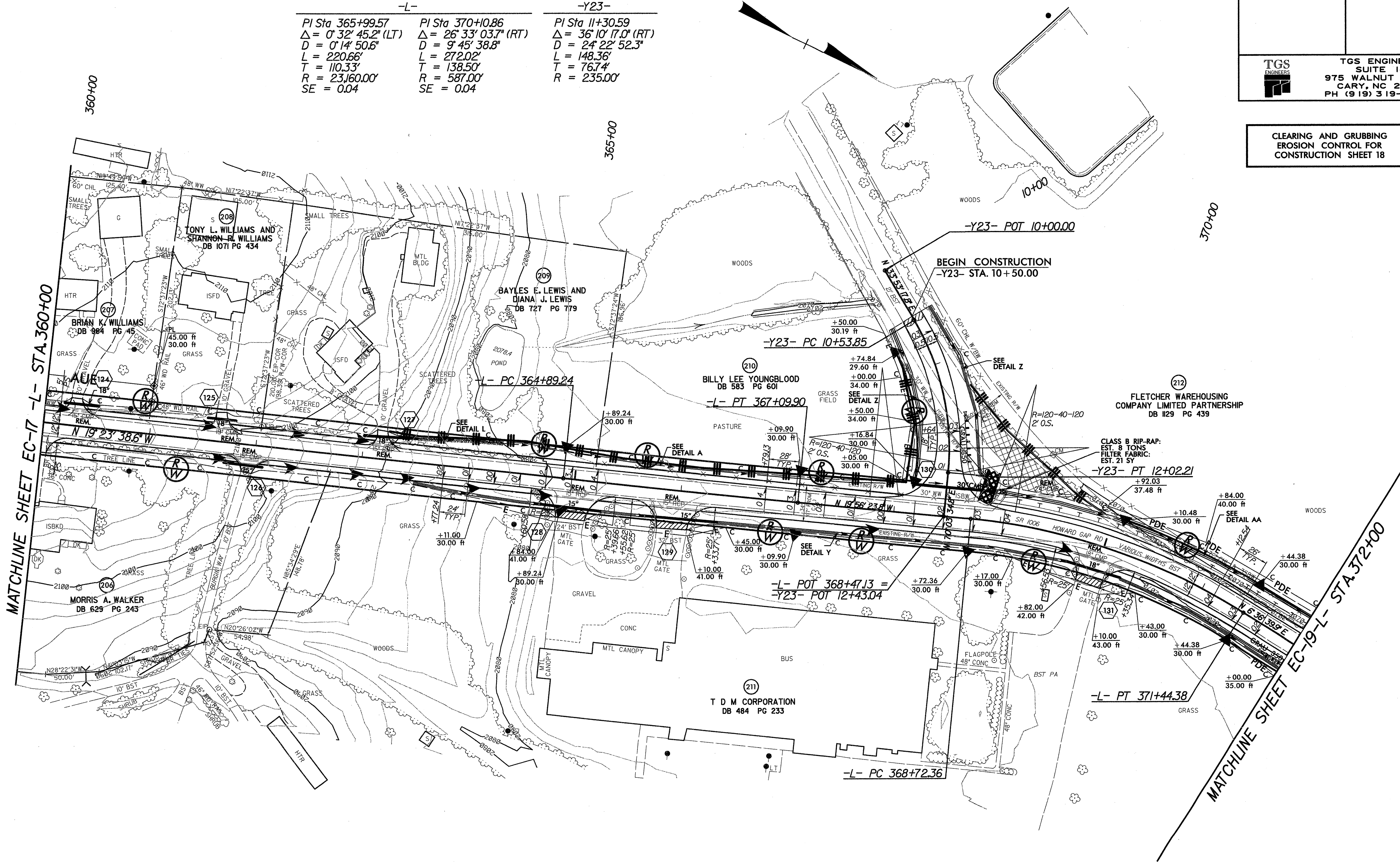


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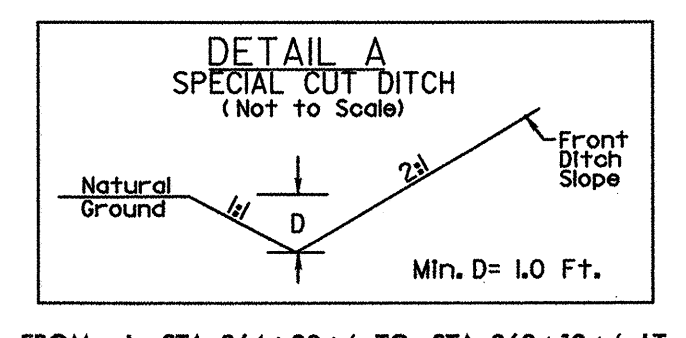
PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-18/CONST.18	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 18

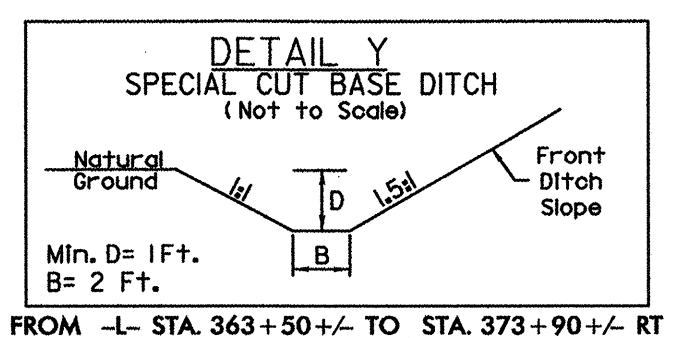
-L-	-Y23-
PI Sta 365+99.57 Δ = 0° 32' 45.2" (LT) D = 0' 14' 50.6" L = 220.66' T = 110.33' R = 23,160.00' SE = 0.04	PI Sta 370+10.86 Δ = 26° 33' 03.7" (RT) D = 9' 45' 38.8" L = 272.02' T = 138.50' R = 587.00' SE = 0.04
PI Sta 11+30.59 Δ = 36° 10' 17.0" (RT) D = 24' 22' 52.3" L = 148.36' T = 76.74' R = 235.00'	



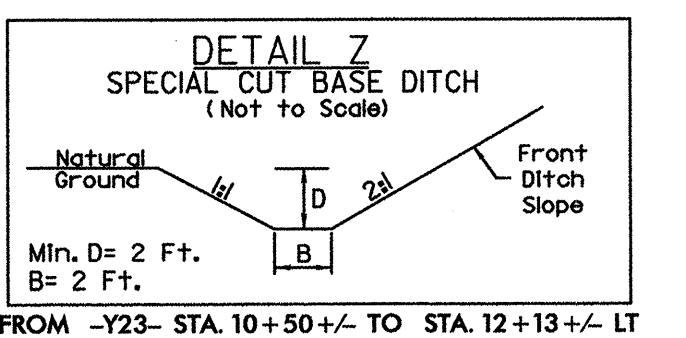
FROM -L- STA. 363+00+/- TO STA. 364+30+/- LT
CL 'A' RIP RAP: EST. 25 TONS
FILTER FABRIC: EST. 101 SY



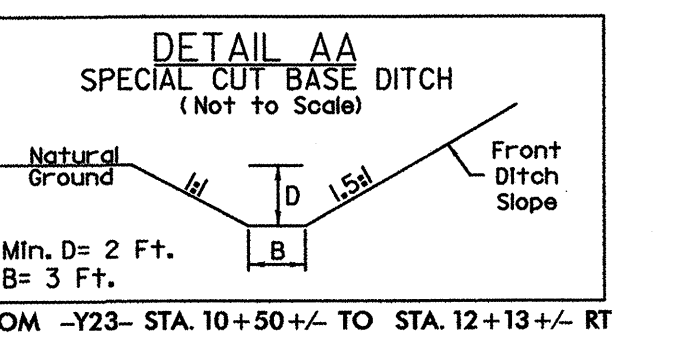
FROM -L- STA. 364+30+/- TO STA. 368+12+/- LT



FROM -L- STA. 363+50+/- TO STA. 373+90+/- RT



FROM -Y23- STA. 10+50+/- TO STA. 12+13+/- LT




FROM -Y23- STA. 10+50+/- TO STA. 12+13+/- RT
FROM -L- STA. 368+90+/- TO STA. 374+04+/- LT

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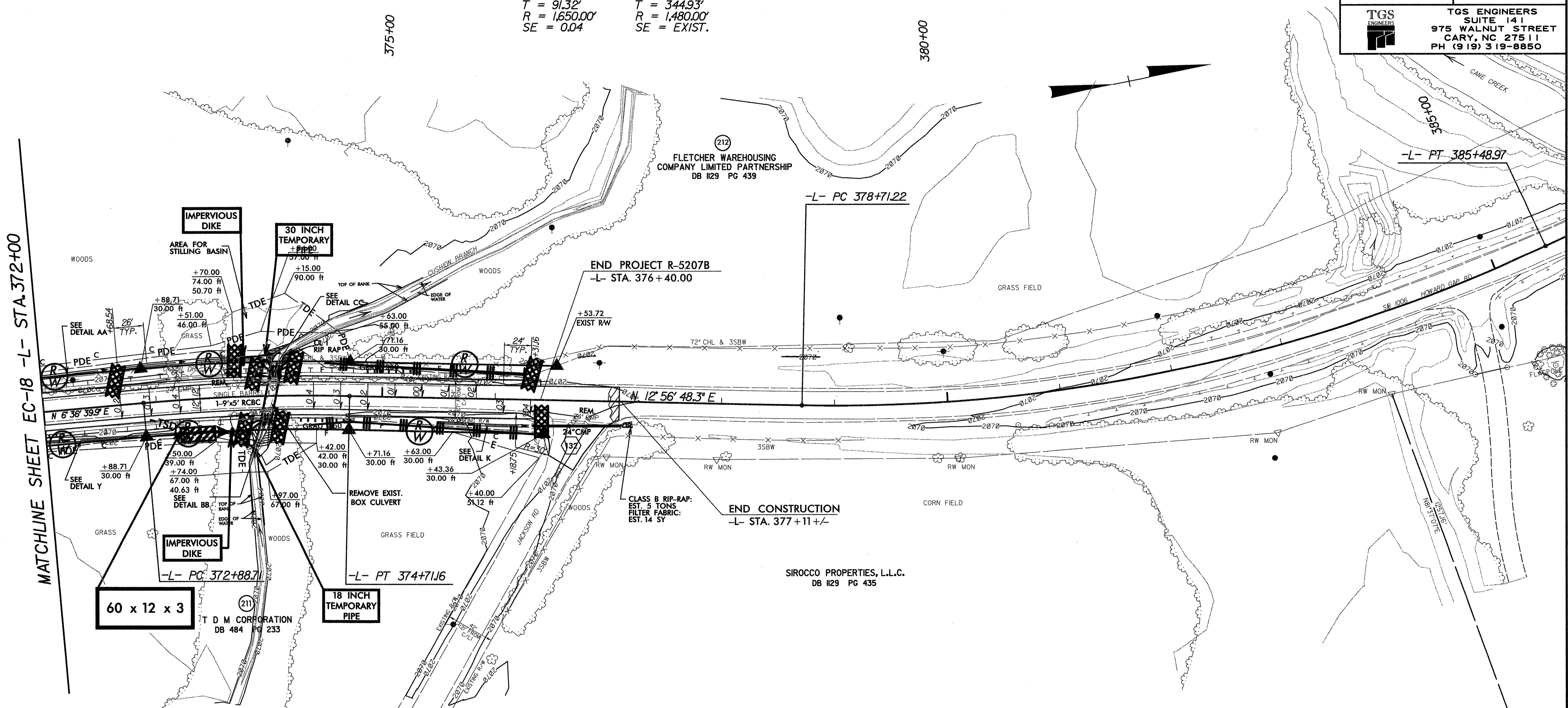
8/17/99

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 19

PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-19/CONST.19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

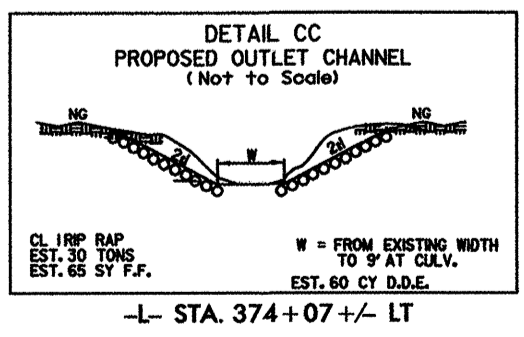
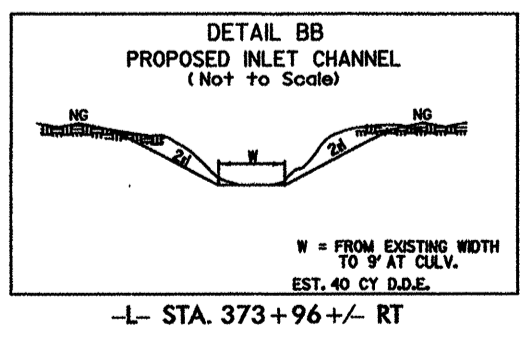
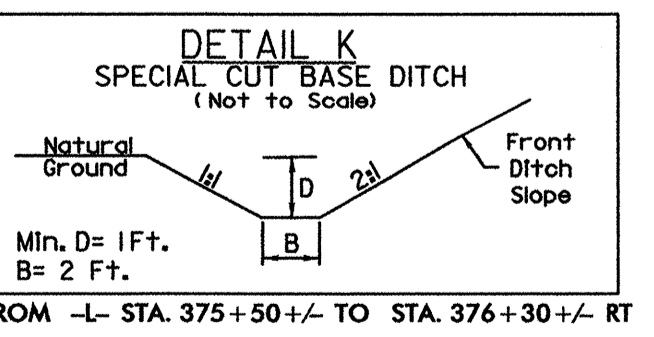
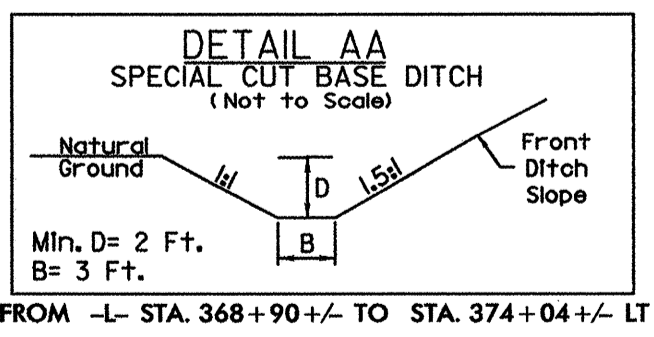
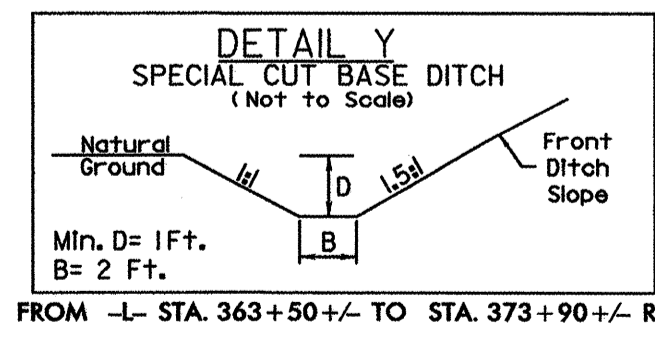
-L-

PI Sta 373+80.03	PI Sta 382+16.14
$\Delta = 6^{\circ} 20' 08.4" (RT)$	$\Delta = 26^{\circ} 14' 17.0" (LT)$
$D = 3^{\circ} 28' 20.9"$	$D = 3^{\circ} 52' 16.8"$
$L = 182.45'$	$L = 677.75'$
$T = 91.32'$	$T = 344.93'$
$R = 1,650.00'$	$R = 1,480.00'$
$SE = 0.04$	$SE = EXIST.$



MATCHLINE SHEET EC-18 -L- STA. 372+00

SEE SHEET S-24 TO S-27 FOR CULVERT DESIGN



2075_EC_19.dgn 11/8/2011 8:42:05 AM

2075_EC_19.dgn 11/8/2011 8:42:05 AM



TGS ENGINEERS
 SUITE 141
 975 WALNUT STREET
 CARY, NC 27511
 PH (919) 319-8850

PROJECT REFERENCE NO.

R-5207B

SHEET NO.

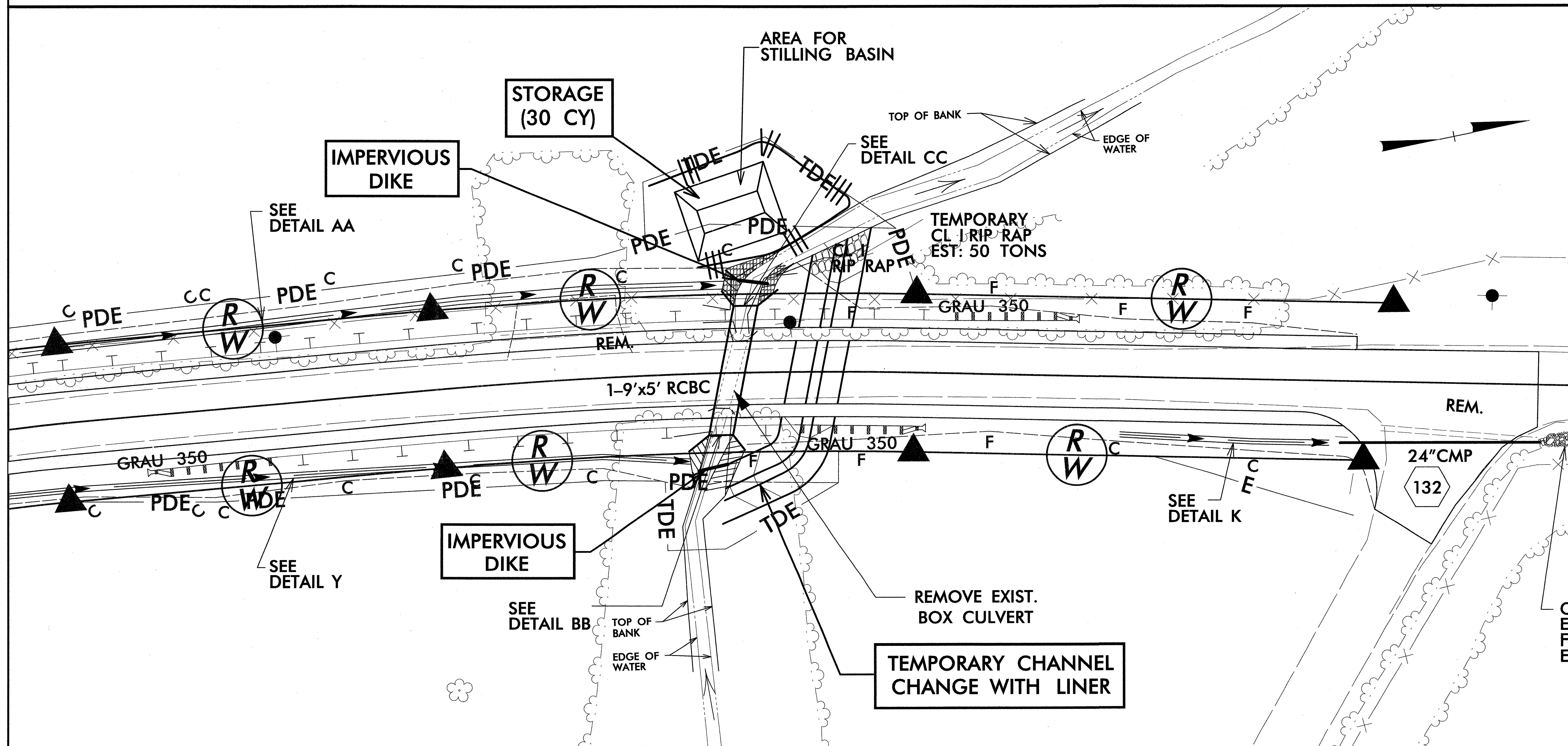
EC-19A/CONST.19

R/W SHEET NO.

CULVERT CONSTRUCTION SEQUENCE STA. 374+00 -L-

PHASING

1. Close Howard Gap Road to through traffic at culvert location.
2. Install sediment control devices necessary for culvert construction. Construct a stilling basin with 30 cubic yards of storage.
3. Excavate temporary channel change with liner (4 ft. min. depth, 4 ft. base, 2:1 sideslopes).
4. Construct impervious dikes and direct flow into temporary channel change with liner.
5. Remove existing box culvert and construct proposed 9 ft x 5 ft RCBC.
6. Upon completion of culvert, remove impervious dikes and redirect stream flow into culvert.
7. Fill temporary channel change with liner and remove stilling basin. Upon stabilization of all disturbed areas, remove temporary sediment control devices.



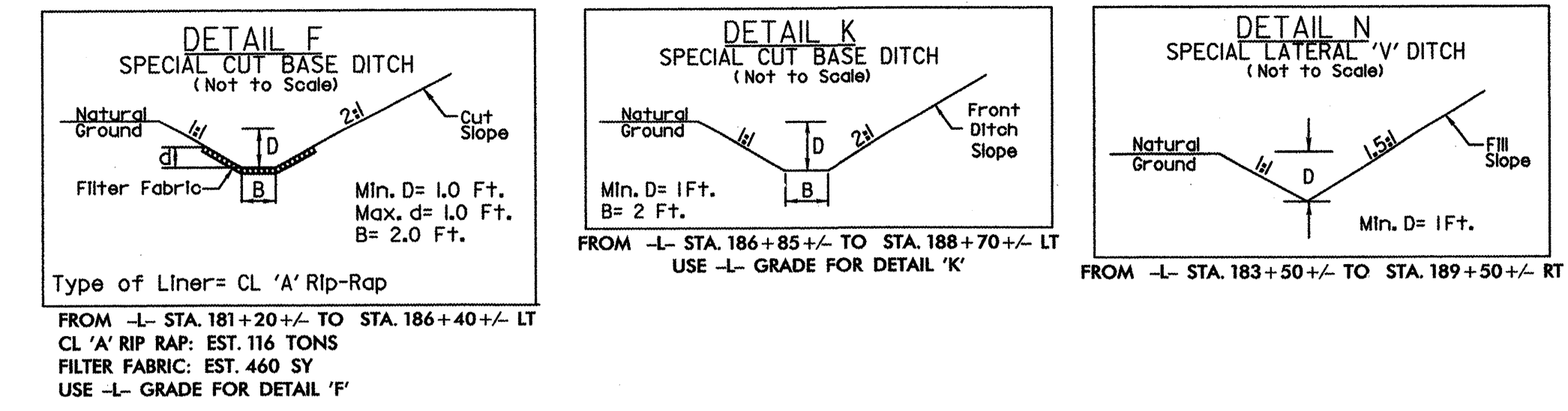
PROJECT REFERENCE NO. **R-5207B** SHEET NO. **EC-20/CONST. 4**

RW SHEET NO.

ROADWAY DESIGN ENGINEER

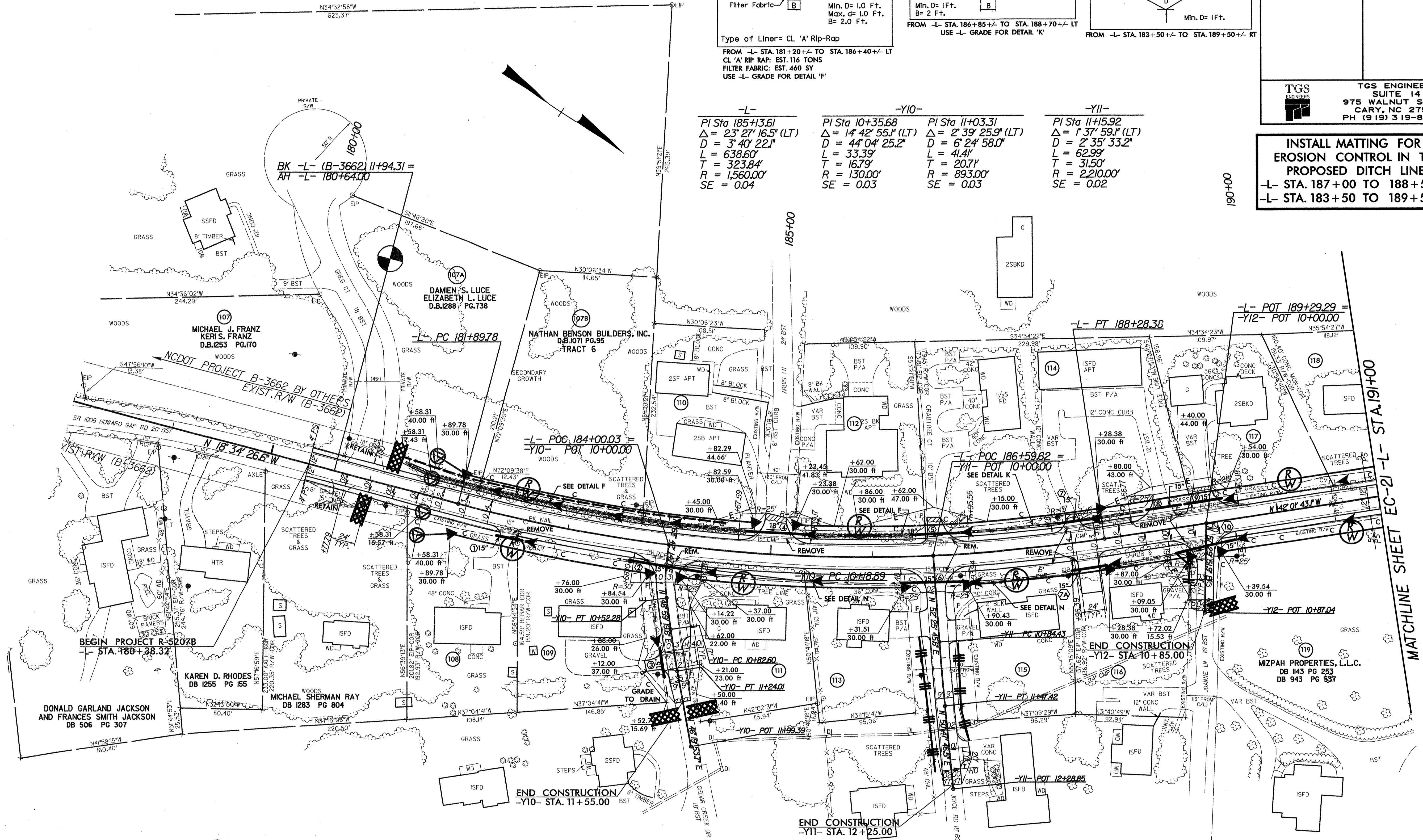
HYDRAULICS ENGINEER

TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

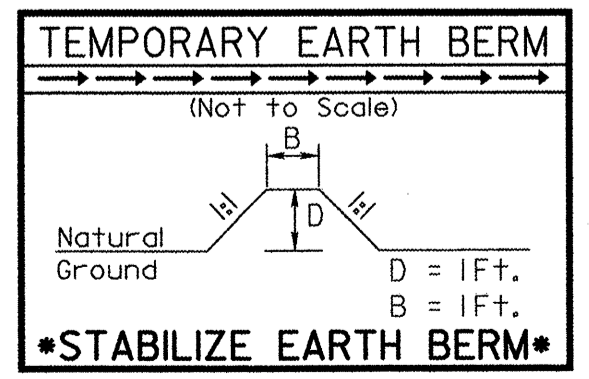


-L-	-Y10-	-Y11-	-Y12-
PI Sta 185+13.61	PI Sta 10+35.68	PI Sta 11+03.31	PI Sta 11+15.92
$\Delta = 23^{\circ} 27' 16.5''$ (LT)	$\Delta = 14^{\circ} 42' 55.1''$ (LT)	$\Delta = 2^{\circ} 39' 25.9''$ (LT)	$\Delta = 1^{\circ} 37' 59.1''$ (LT)
D = 3' 40" 22.1"	D = 44' 04" 25.2"	D = 6' 24" 58.0"	D = 2' 35' 33.2"
L = 638.60'	L = 33.39'	L = 4.41'	L = 62.99'
T = 323.84'	T = 16.79'	T = 20.71'	T = 31.50'
R = 1,560.00'	R = 130.00'	R = 893.00'	R = 2,210.00'
SE = 0.04	SE = 0.03	SE = 0.03	SE = 0.02

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
-L- STA. 187+00 TO 188+50 LT
-L- STA. 183+50 TO 189+50 RT



- (108) JOEY JUSTICE DB 1297 PG 672
- (109) KARYN B. SPREEMAN DB 828 PG 397
- (110) NATHAN ALYA BENSON DB N/A PG N/A
- (111) FRANKLIN E. BROWN AND PHYLLIS A. BROWN DB 577 PG 319 HOMEOWNERS ASSOCIATION
- (112) TWIN OAKS CONDOMINIUMS DB 656 PG 481 HOMEOWNERS ASSOCIATION
- (113) JOHN H. ROSS DB 1183 PG 463
- (114) JACK H. CRABTREE AND ROBERTA M. CRABTREE DB 769 PG 561 DB 816 PG 795
- (115) STANLEY LYURTH DB 1017 PG 447
- (116) DINAH MAE KADUK DB 926 PG 696
- (117) ALFRED W. MAYO AND WANDA P. MAYO DB 845 PG 55
- (118) SHERI H. AYERS DB 1256 PG 115

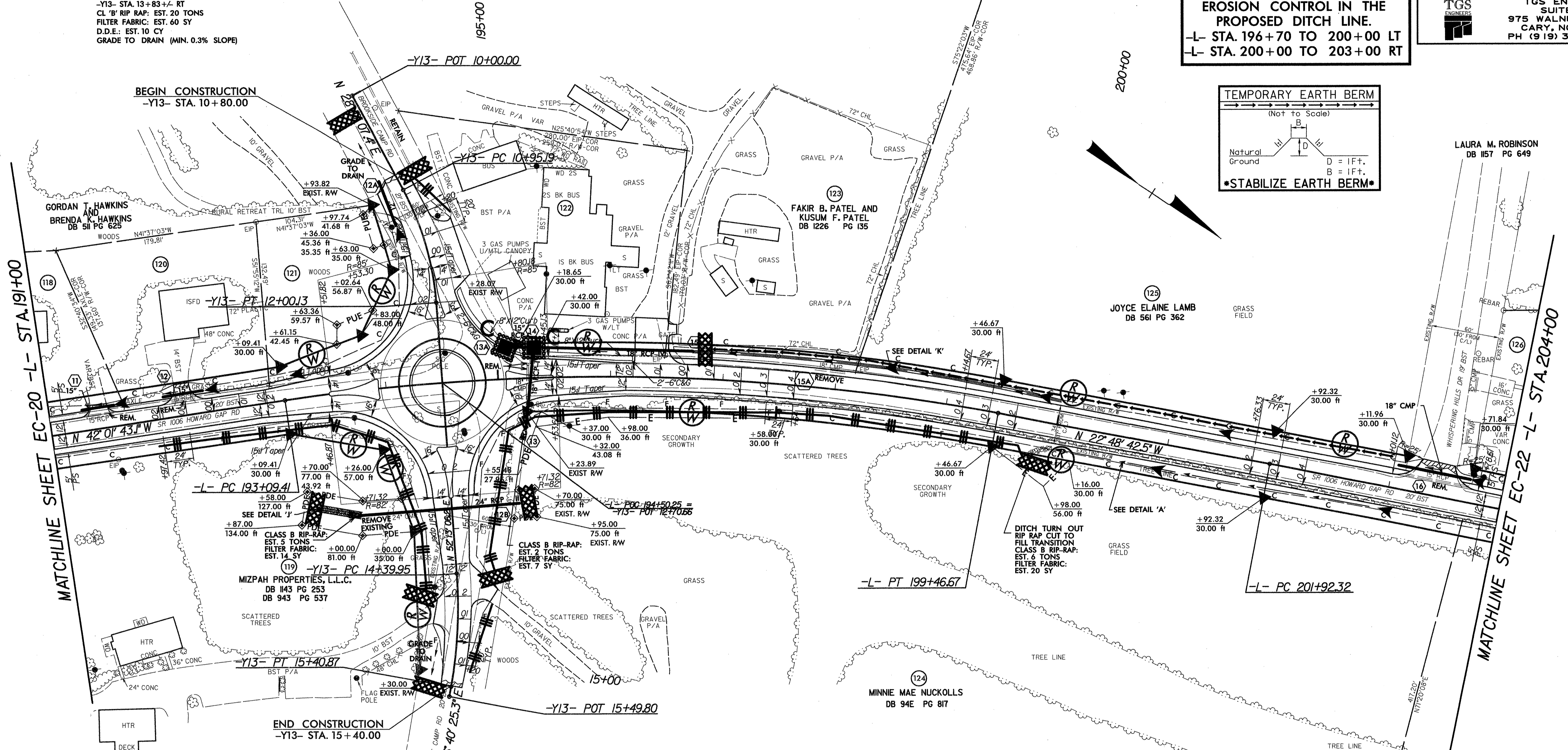
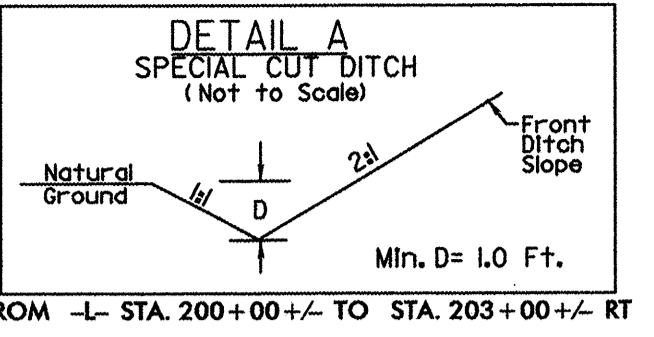
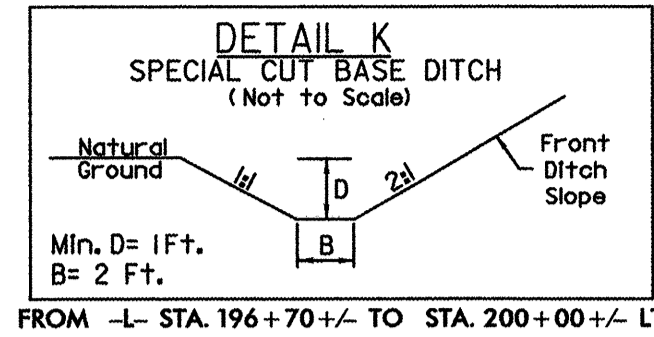
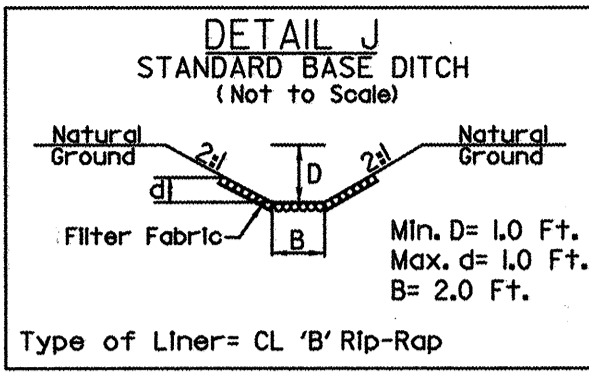
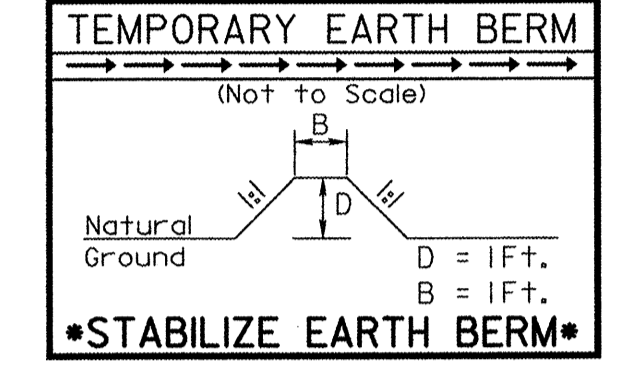


RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TGS ENGINEERS
 SUITE 141
 975 WALNUT STREET
 CARY, NC 27511
 PH (919) 319-8850


- (120) ZUDIE WALKER INC. DB 1190 PG 239
- (121) YOUNGBLOOD OIL COMPANY, INC. DB 746 PG 209
- (122) FAKIR B. PATEL DB 1154 PG 224

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
 -L- STA. 196+70 TO 200+00 LT
 -L- STA. 200+00 TO 203+00 RT

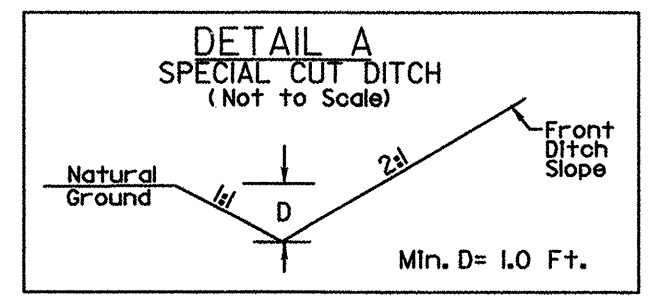
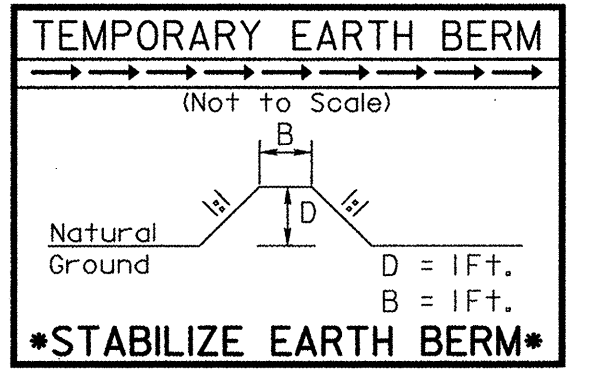


-L-		-Y13-	
PI Sta 196+31.06	PI Sta 203+91.99	PI Sta 11+48.44	PI Sta 14+90.68
$\Delta = 19' 13' 00.6''$ (RT)	$\Delta = 1' 34' 52.1''$ (RT)	$\Delta = 24' 02' 58.8''$ (RT)	$\Delta = 14' 27' 19.1''$ (RT)
D = 3' 00' 56.0'	D = 0' 23' 45.5'	D = 22' 55' 05.9'	D = 14' 19' 26.2'
L = 637.25'	L = 399.31'	L = 104.94'	L = 100.92'
T = 321.65'	T = 199.67'	T = 53.25'	T = 50.73'
R = 1,900.00'	R = 1,447.00'	R = 250.00'	R = 400.00'
SE = 0.04	SE = 0.04	SE = 0.02	SE = 0.02

C:\TEMP\DRAWING\CON\EC-21\CONST.5.DWG
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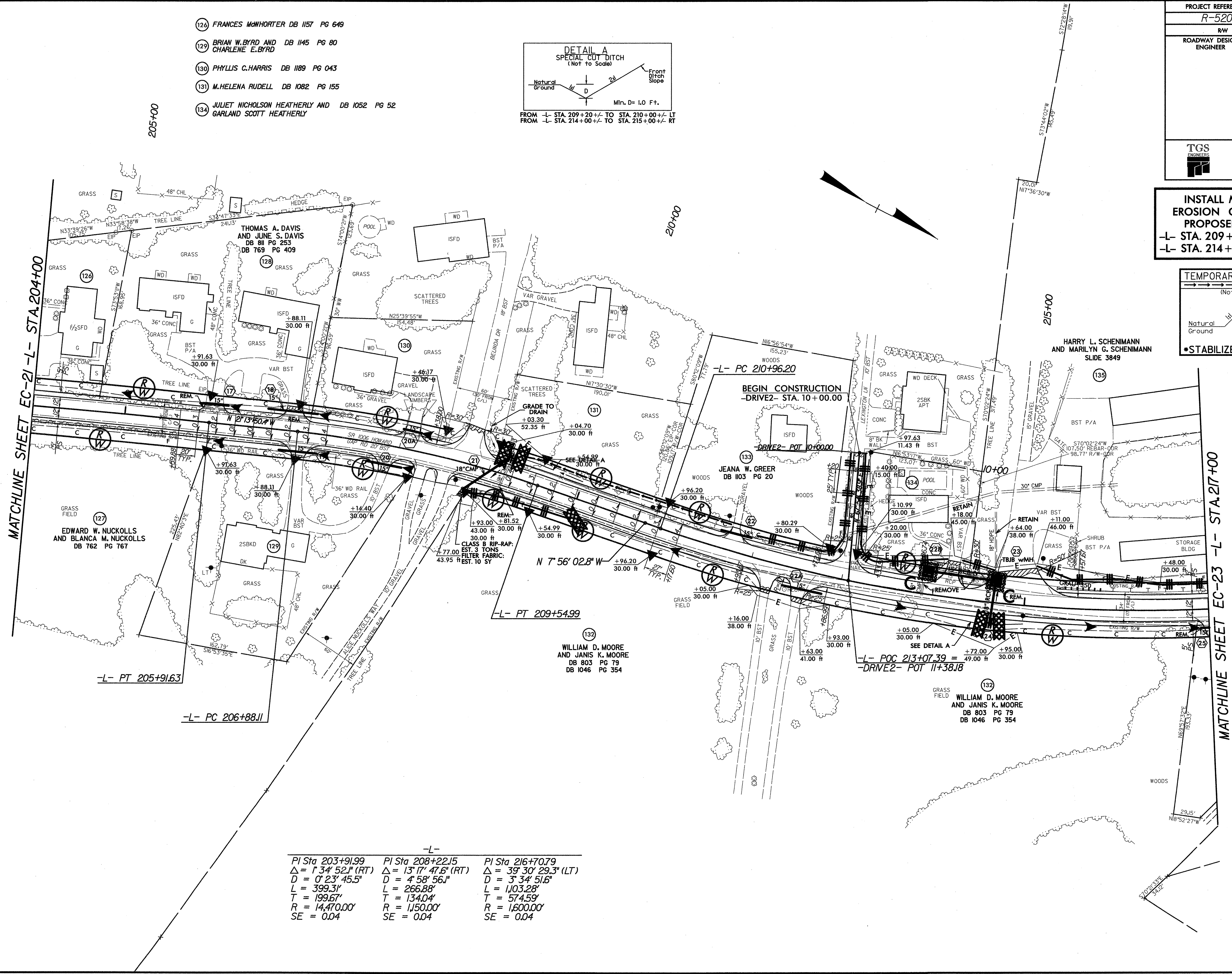
PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-22/CONST.6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
 -L- STA. 209+20 TO 210+00 LT
 -L- STA. 214+00 TO 214+70 RT



FROM -L- STA. 209+20+/- TO STA. 210+00+/- LT
 FROM -L- STA. 214+00+/- TO STA. 215+00+/- RT

- (126) FRANCES MATHORTER DB 1157 PG 649
- (129) BRIAN W. BYRD AND CHARLENE E. BYRD DB 1145 PG 80
- (130) PHYLLIS C. HARRIS DB 1189 PG 043
- (131) M. HELENA RUDELL DB 1082 PG 155
- (134) JULIET NICHOLSON HEATHERLY AND GARLAND SCOTT HEATHERLY DB 1052 PG 52



MATCHLINE SHEET EC-21 -L- STA. 204+00


MATCHLINE SHEET EC-23 -L- STA. 217+00

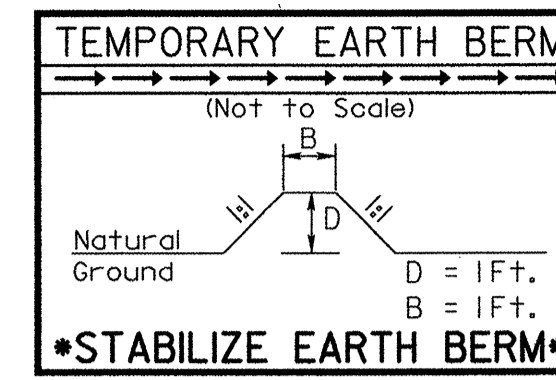
-L-		
PI Sta 203+91.99	PI Sta 208+22.15	PI Sta 216+70.79
$\Delta = 1' 34" 52.1" (RT)$	$\Delta = 13' 17" 47.6" (RT)$	$\Delta = 39' 30" 29.3" (LT)$
$D = 0' 23' 45.5"$	$D = 4' 58' 56.1"$	$D = 3' 34' 51.6"$
$L = 399.31'$	$L = 266.88'$	$L = 1,103.28'$
$T = 199.67'$	$T = 134.04'$	$T = 574.59'$
$R = 14,470.00'$	$R = 1,150.00'$	$R = 1,600.00'$
$SE = 0.04$	$SE = 0.04$	$SE = 0.04$

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8/17/99

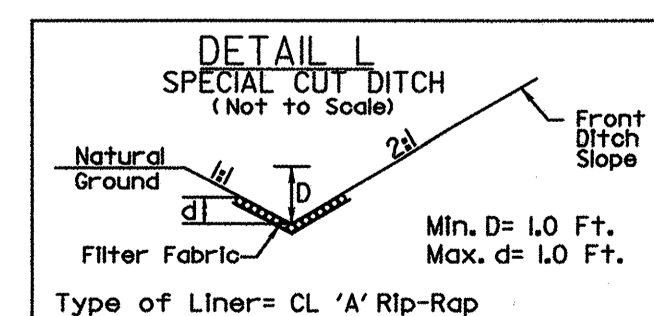
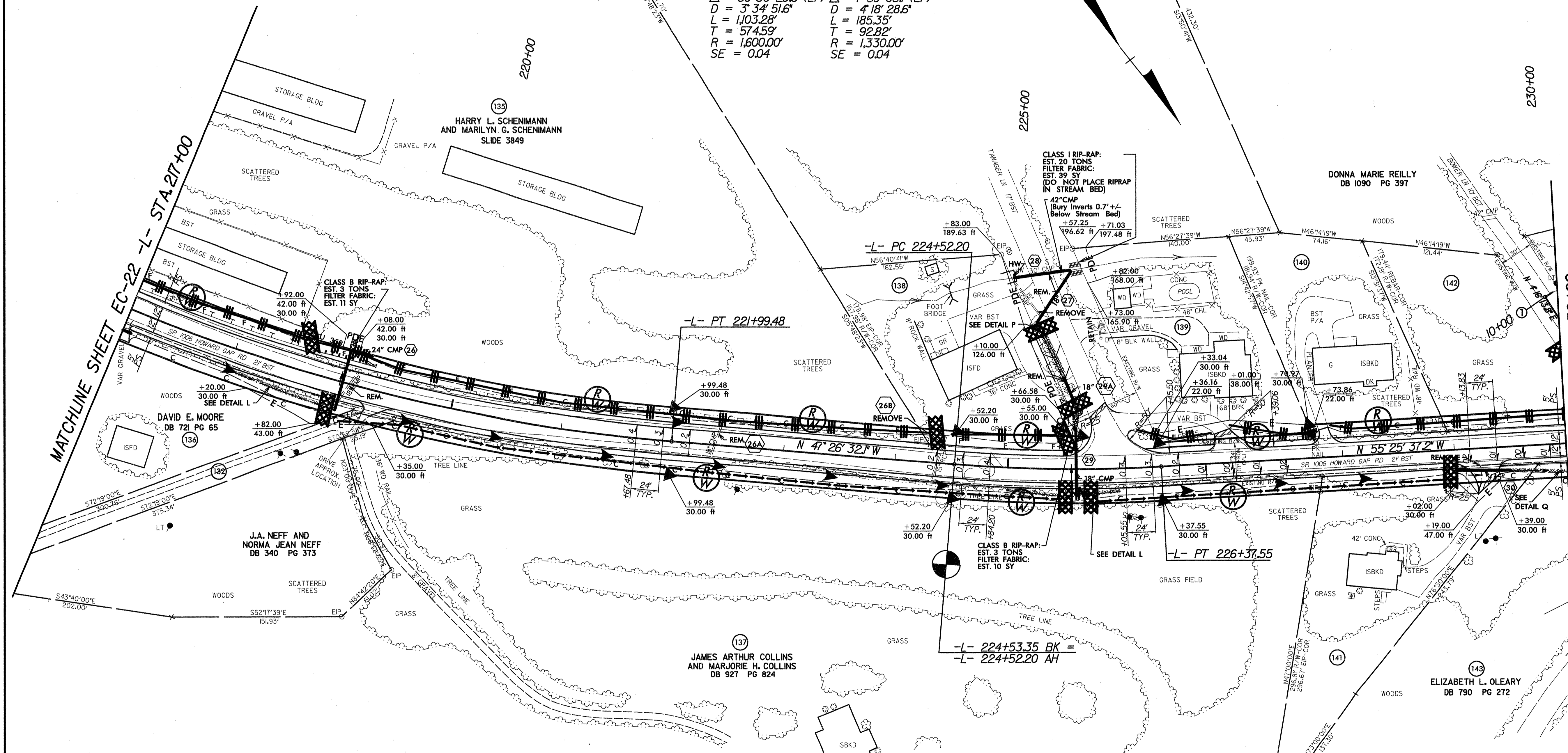
- 138 ROBERT H. JOHNSON DB 495 PG 157 AND NILDA L. JOHNSON
- 139 ROBERT P. POND AND BARBARA L. POND DB 962 PG 174
- 140 JOSEPH H. KELLEY DB CT02 PG 541
- 141 JOHN L. REESE, JR. DB 818 PG 137
- 142 RONALD W. KAROLYI AND JOYCE A. DAVIS DB 842 PG 455

PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-23/CONST.7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	



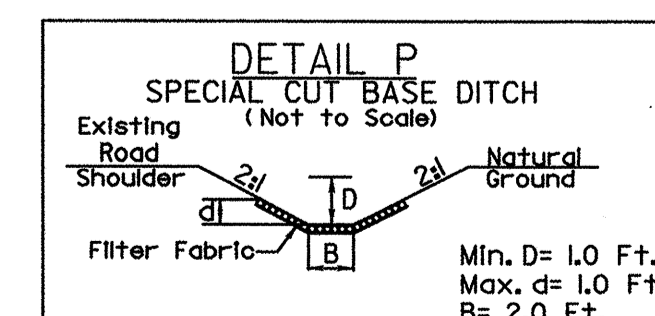
-L-

PI Sta 216+70.79	PI Sta 225+45.02
$\Delta = 39^{\circ} 30' 29.3"$ (LT)	$\Delta = 7^{\circ} 59' 05.1"$ (LT)
$D = 3' 34' 51.6"$	$D = 4' 18' 28.6"$
$L = 1,103.28'$	$L = 185.35'$
$T = 574.59'$	$T = 92.82'$
$R = 1,600.00'$	$R = 1,330.00'$
$SE = 0.04$	$SE = 0.04$

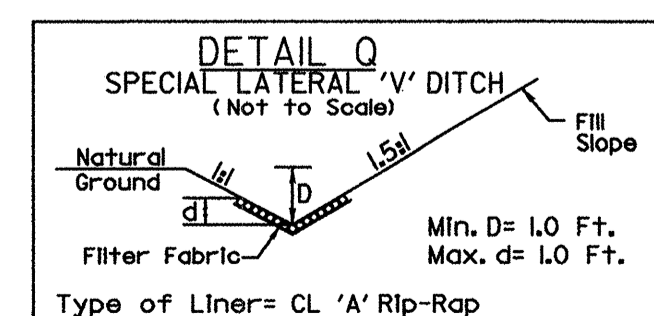


FROM -L- STA. 218+00+/- TO STA. 219+00+/- RT
CL 'A' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 78 SY

FROM -L- STA. 225+00+/- TO STA. 226+00+/- RT
CL 'A' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 78 SY



TANAGER LANE - RT
CL 'A' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 78 SY
D.D.E.: EST. 12CY

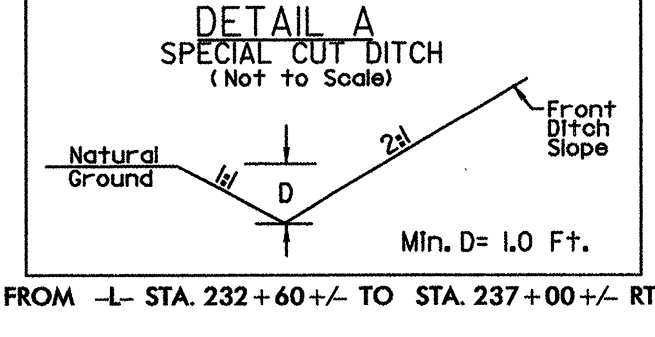
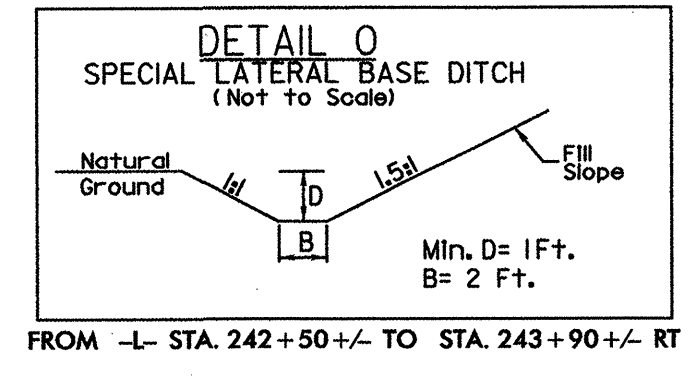
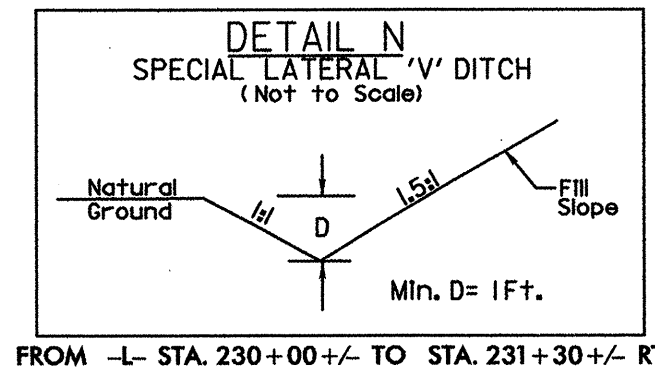
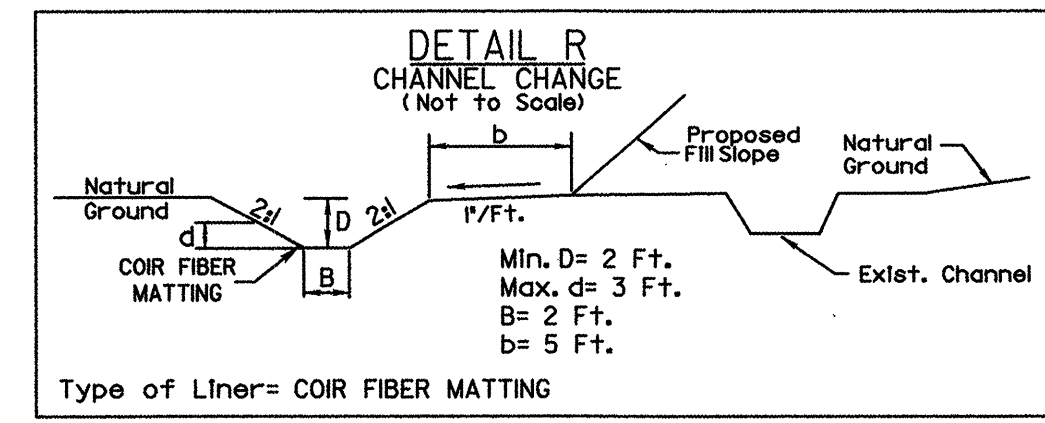


FROM STA. 229+50+/- TO STA. 230+00+/- RT
CL 'A' RIP RAP: EST. 9 TONS
FILTER FABRIC: EST. 36 SY

8/17/99

1	-DRIVE3- POT 10+00.00
2	-DRIVE3- PC 10+94.51
3	-DRIVE3- PT 11+39.99
3 to 4	N 34°34'21.7" E
4	-L- POT 230+48.24 = -DRIVE3- POT 11+45.76
5	-L- PC 230+73.82
6	-L- POC 231+86.63 = -Y14- POT 10+00.00
6 to 7	N 29°56'03.2" E
7	-Y14- PC 10+08.31
8	-Y14- PT 10+46.20
9	-Y14- POT 11+30.67
10	-Y15- PT 12+31.81

- 144 PHILIP M. CHAVEZ AND CAROLYN M. CHAVEZ DB 930 PG 456
- 148 COLONIAL VILLAGE HOMEOWNERS ASSOCIATION DB IA PG 1055
- 149 GARY AND RUTH BIENVENU DB 1260 PG 257
- 150 PINE VILLA HOMEOWNERS ASSOCIATION DB 477 PG 575
- 151 RICHARD J. SILTZER AND KELLY M. SILTZER DB 1229 PG 762
- 152 AMELIA ANN HOUCK DB 1079 PG 665
- 153 DAVID F. BOONE AND LORENA C. BOONE DB 950 PG 735



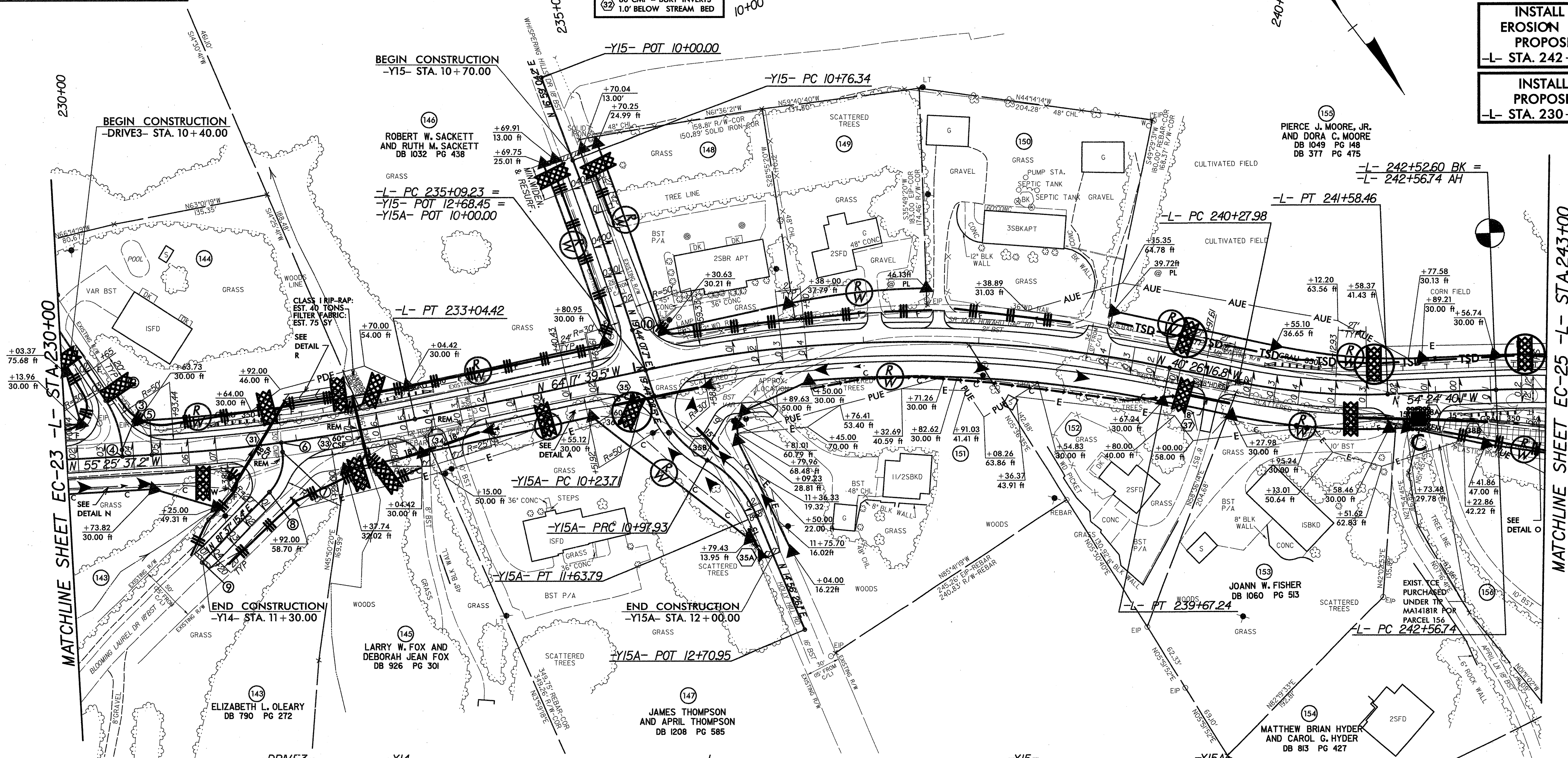
- 31 48" CMP - BURY INVERTS 0.8' BELOW STREAM BED
- 32 60" CMP - BURY INVERTS 1.0' BELOW STREAM BED

FROM -L- STA. 231+95+/- TO STA. 232+50+/- LT
COIR FIBER MATTING: EST. 150 SY
D.D.E.: EST. 50 CY

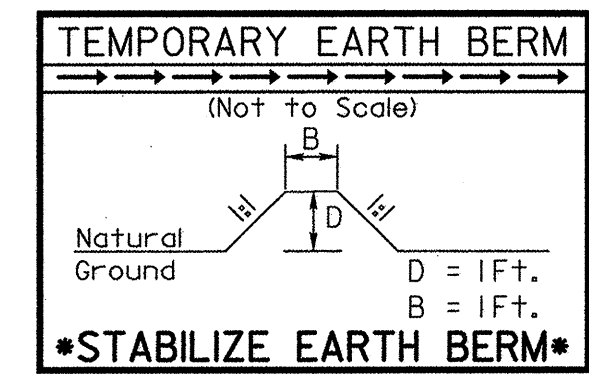
PROJECT REFERENCE NO.	R-5207B	SHEET NO.	EC-24/CONST. 8
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS		TGS ENGINEERS	
SUITE 141		SUITE 141	
975 WALNUT STREET		975 WALNUT STREET	
CARY, NC 27511		CARY, NC 27511	
PH (919) 319-8850		PH (919) 319-8850	

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
-L- STA. 242+50 TO 243+90 RT

INSTALL PRSM IN THE PROPOSED DITCH LINE.
-L- STA. 230+00 TO 231+30 RT



Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands as Work Allows.

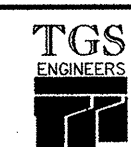


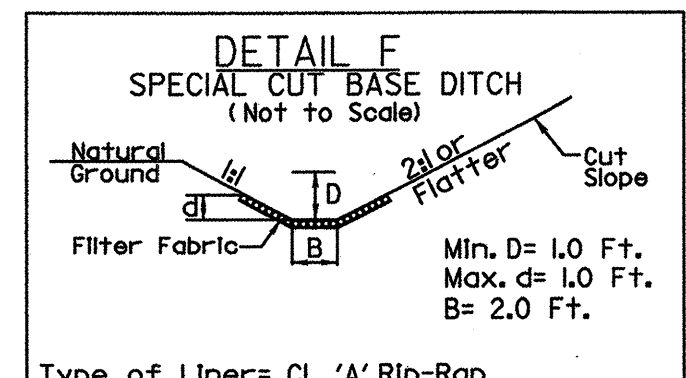
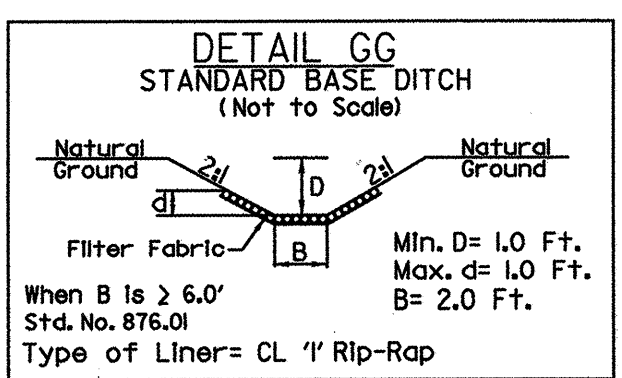
-DRIVE3-	-Y14-	-L-			-Y15-	-Y15A-	
PI Sta 11+71.79	PI Sta 10+28.66	PI Sta 231+89.35	PI Sta 237+41.60	PI Sta 240+93.55	PI Sta 244+82.18	PI Sta 10+62.62	PI Sta 11+32.11
$\Delta = 30' 18" 07.9" (RT)$	$\Delta = 5' 4' 12.2" (RT)$	$\Delta = 8' 52' 02.3" (LT)$	$\Delta = 23' 5' 22.7" (RT)$	$\Delta = 13' 58' 23.3" (LT)$	$\Delta = 3' 28' 34.0" (RT)$	$\Delta = 42' 3' 43.8" (LT)$	$\Delta = 37' 44' 01.5" (RT)$
D = 66' 37" 22.8"	D = 136' 25" 06.7"	D = 3' 50' 43.3"	D = 5' 12' 31.3"	D = 10' 42' 34.2"	D = 7' 09' 43.1"	D = 57' 17" 44.8"	D = 57' 17" 44.8"
L = 45.48'	L = 37.89'	L = 230.60'	L = 458.01'	L = 130.47'	L = 439.49'	L = 74.23'	L = 65.86'
T = 23.29'	T = 20.34'	T = 115.53'	T = 232.37'	T = 65.56'	T = 225.44'	T = 38.92'	T = 34.17'
R = 86.00'	R = 42.00'	R = 1,490.00'	R = 1,000.00'	R = 535.00'	R = 800.00'	R = 100.00'	R = 100.00'
		SE = 0.07	SE = 0.04	SE = 0.04	SE = 0.04		

MATCHLINE SHEET EC-23 -L- STA. 230+00

MATCHLINE SHEET EC-25 -L- STA. 243+00

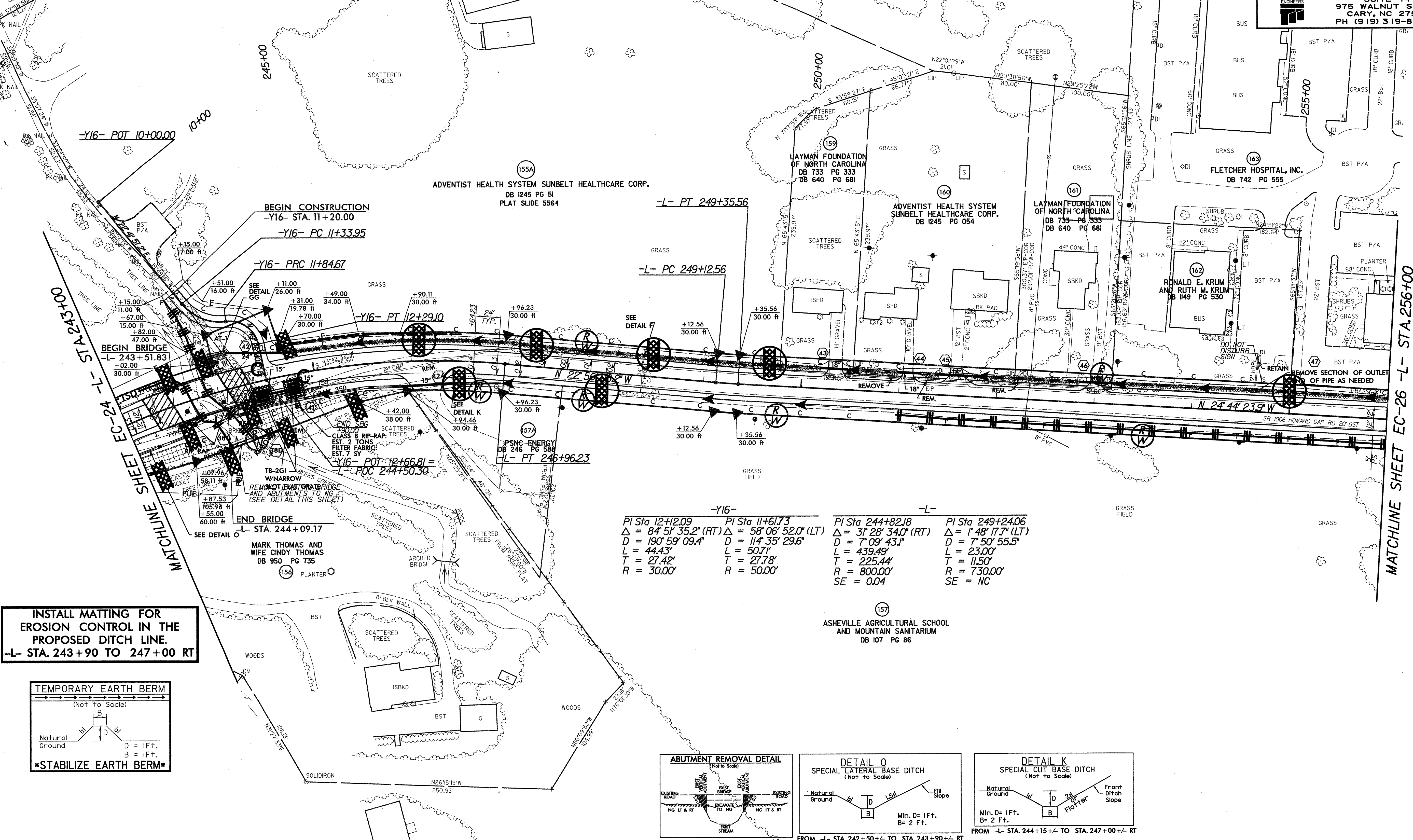
8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-25/CONST.9	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			

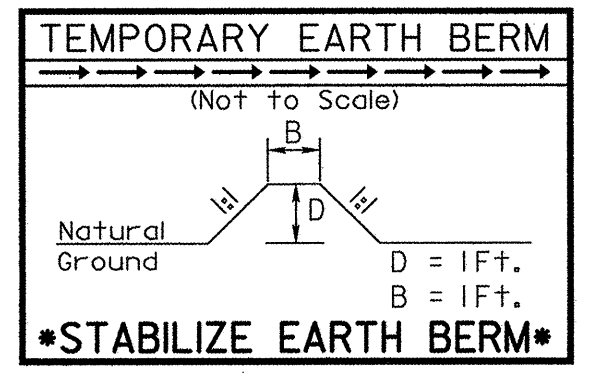


FROM -L- STA. 243+90+/- TO STA. 244+15+/- LT
(SEE -L- PROFILE FOR DITCH GRADE)
CL '1' RIP RAP: EST. 20 TONS
FILTER FABRIC: EST. 40 SY
D.D.E.: EST. 5 CY

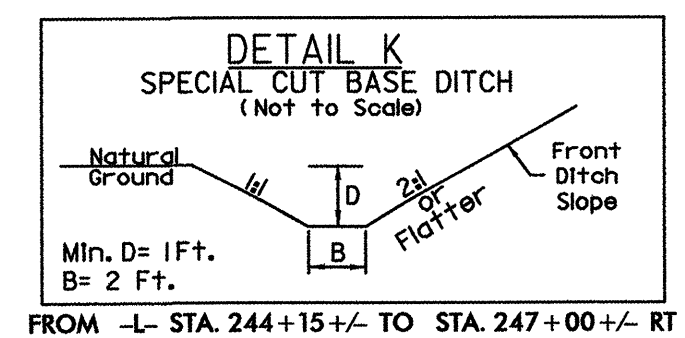
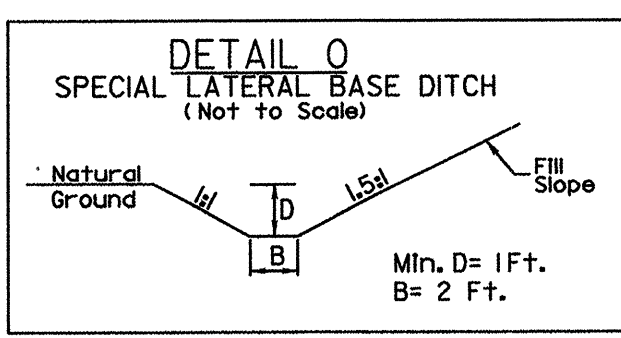
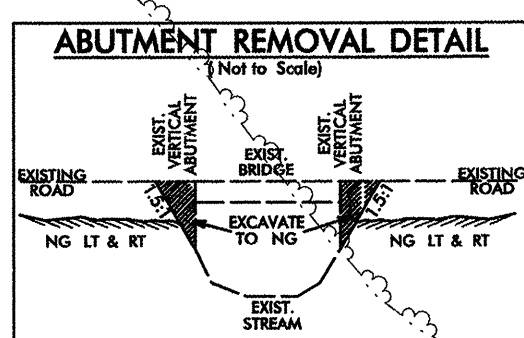
FROM -L- STA. 244+70+/- TO STA. 256+00+/- LT
(USE -L- GRADE FROM STA. 247+50 TO 253+20+/-)
CL 'A' RIP RAP: EST. 260 TONS
FILTER FABRIC: EST. 1025 SY



INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
-L- STA. 243+90 TO 247+00 RT



-Y16-		-L-	
PI Sta 12+12.09	PI Sta 11+61.73	PI Sta 244+82.18	PI Sta 249+24.06
$\Delta = 84^{\circ} 51' 35.2''$ (RT)	$\Delta = 58^{\circ} 06' 52.0''$ (LT)	$\Delta = 31^{\circ} 28' 34.0''$ (RT)	$\Delta = 1^{\circ} 48' 17.7''$ (LT)
D = 190' 59' 09.4"	D = 114' 35' 29.6"	D = 7' 09' 43.1"	D = 7' 50' 55.5"
L = 44.43'	L = 50.71'	L = 439.49'	L = 23.00'
T = 27.42'	T = 27.78'	T = 225.44'	T = 11.50'
R = 30.00'	R = 50.00'	R = 800.00'	R = 730.00'
		SE = 0.04	SE = NC

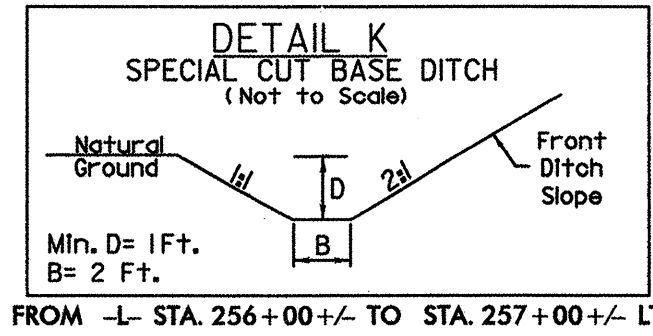


FROM -L- STA. 242+50+/- TO STA. 243+90+/- RT

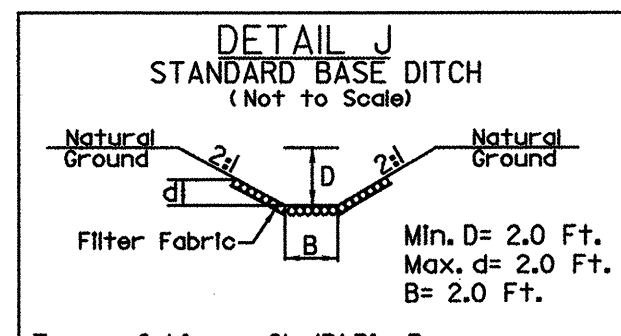
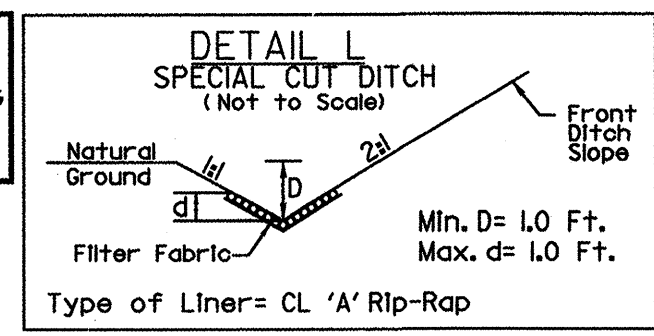
FROM -L- STA. 244+15+/- TO STA. 247+00+/- RT

MATCHLINE SHEET EC-26 -L- STA. 256+00

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE. -L- STA. 256+00 TO 257+00 LT



NOTE: REMOVE SECTION OF EXISTING 15" PIPE AS NEEDED (APPROX. 30'+/-). TIE EXISTING 15" PIPE INTO CB USING TWO HDPE ELBOWS AND APPROX. 16' NEW HDPE 15" PIPE.

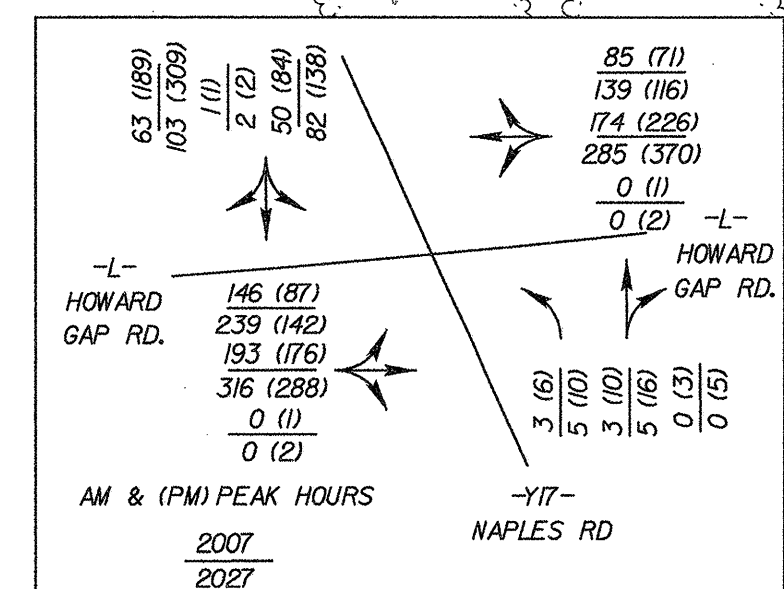


FROM -L- STA. 267+22+/- TO STA.268+50+/- LT CL 'A' RIP RAP: EST. 24 TONS FILTER FABRIC: EST. 100 SY

-L- STA. 267+25+/- RT CL 'B' RIP RAP: EST. 38 TONS FILTER FABRIC: EST. 98 SY D.D.E.: EST. 45 CY

MATCHLINE SHEET EC-25 -L- STA.256+00

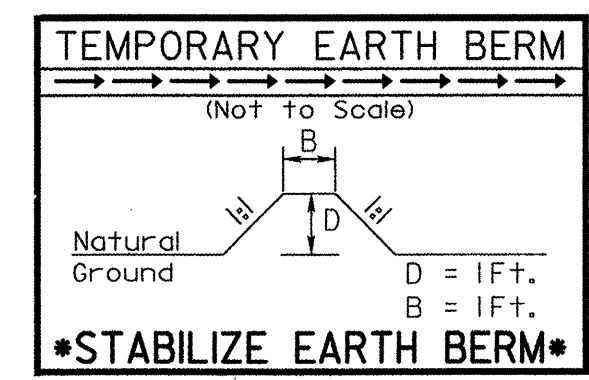
MATCHLINE SHEET EC-27 -L- STA.269+00



PEAK HOUR TRAFFIC VOLUMES (vehicles per hour)

Table with 2 rows of traffic volume data for different approaches: 1) -L- POC 261+11.06 = -Y17- POC 12+76.15; 2) -DRIVE3A- POT 10+00.00 = -L- POC 264+84.85

Table of curve data for various stations: -L- PI Sta 260+35.35, -L- PI Sta 264+83.07, -L- PI Sta 268+83.38, -Y17- PI Sta 12+61.28, -DRIVE3A- PI Sta 10+19.97



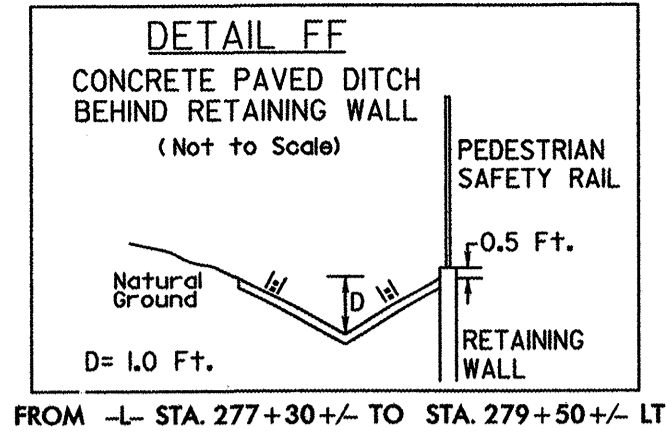
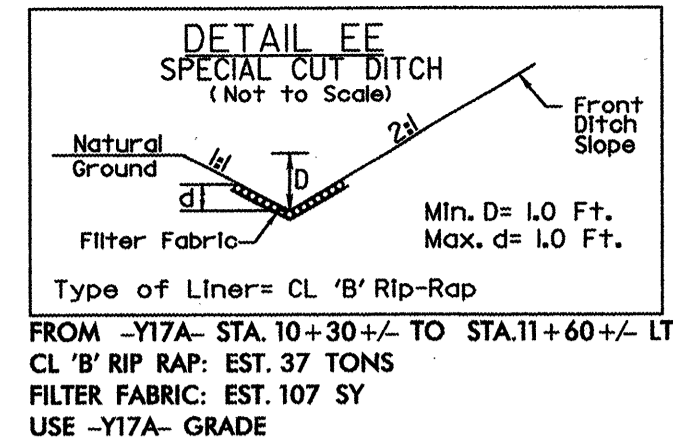
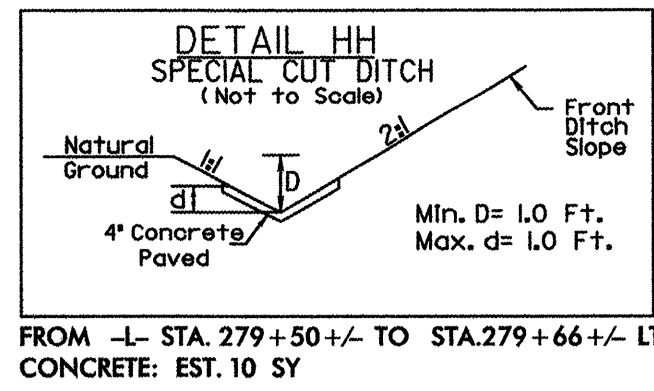
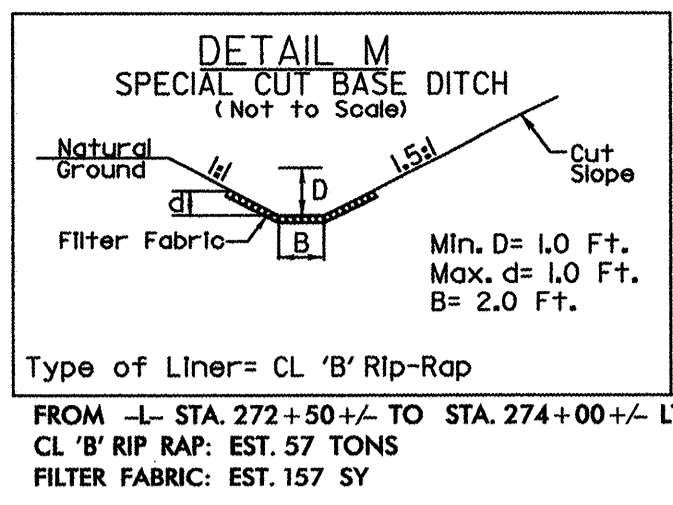
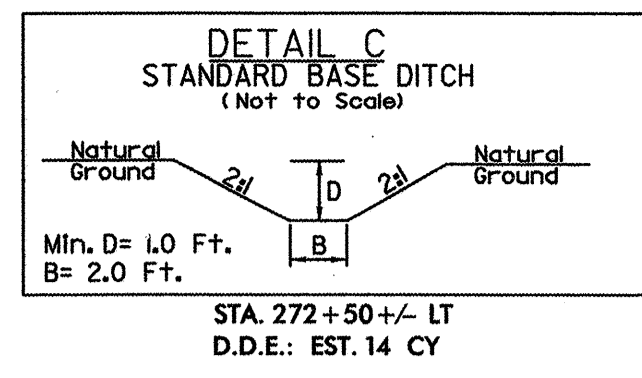
STABILIZE EARTH BERM

SEE SHEET 2-C FOR INTERSECTION DETAILS AND GRADING PLANS

DO NOT DISTURB SIGN

EXISTING ROW TO BE ABANDONED AND REVERT BACK TO PRESENT PROPERTY OWNER

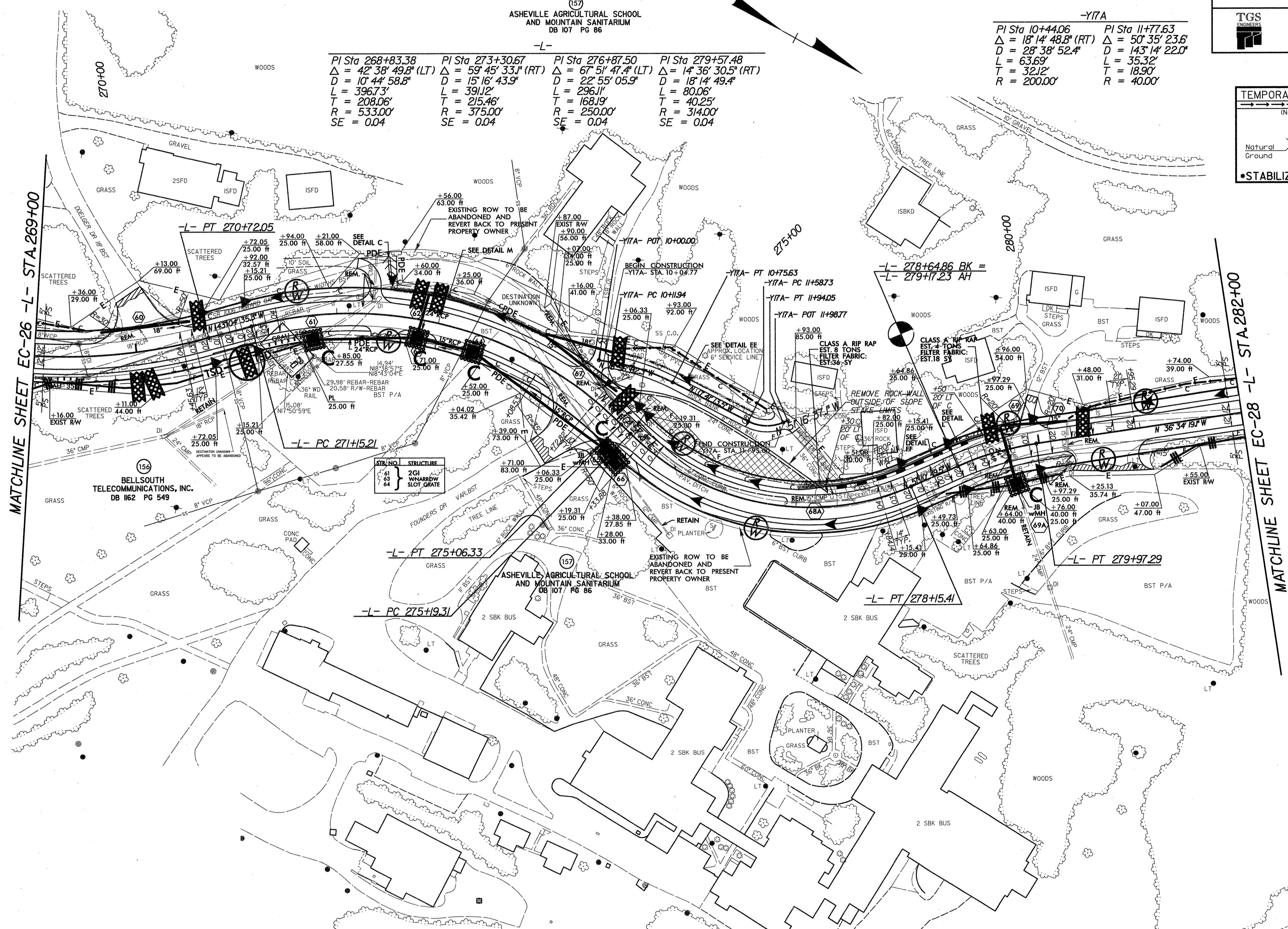
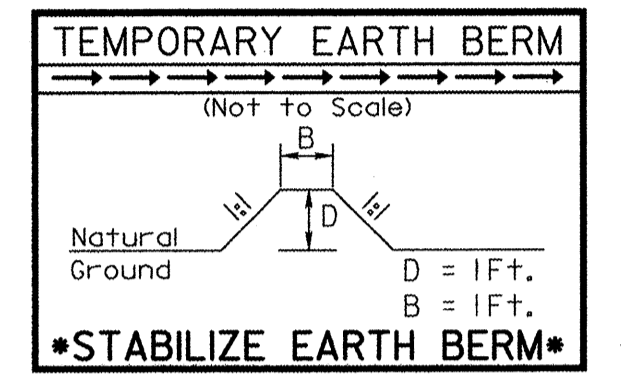
8/17/99



PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-27/CONST. II
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

-L-			
PI Sta 268+83.38 $\Delta = 42' 38'' 49.8''$ (LT) $D = 10' 44'' 58.8''$ $L = 396.73'$ $T = 208.06'$ $R = 533.00'$ $SE = 0.04$	PI Sta 273+30.67 $\Delta = 59' 45'' 33.1''$ (RT) $D = 15' 16'' 43.9''$ $L = 391.12'$ $T = 215.46'$ $R = 375.00'$ $SE = 0.04$	PI Sta 276+87.50 $\Delta = 67' 51'' 47.4''$ (LT) $D = 22' 55'' 05.9''$ $L = 296.11'$ $T = 168.19'$ $R = 250.00'$ $SE = 0.04$	PI Sta 279+57.48 $\Delta = 14' 36'' 30.5''$ (RT) $D = 18' 14'' 49.4''$ $L = 80.06'$ $T = 40.25'$ $R = 314.00'$ $SE = 0.04$

-Y17A	
PI Sta 10+44.06 $\Delta = 18' 14'' 48.8''$ (RT) $D = 28' 38'' 52.4''$ $L = 63.69'$ $T = 32.12'$ $R = 200.00'$	PI Sta 11+77.63 $\Delta = 50' 35'' 23.6''$ $D = 143' 14'' 22.0''$ $L = 35.32'$ $T = 18.90'$ $R = 40.00'$

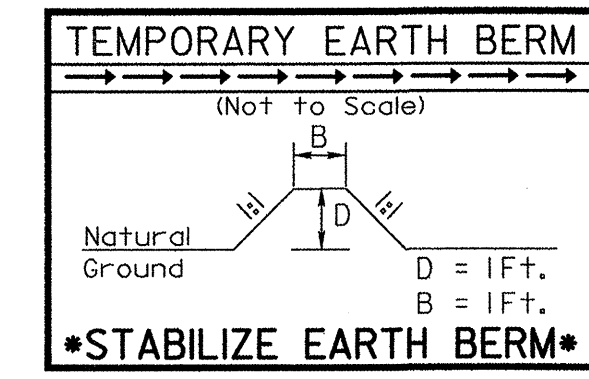
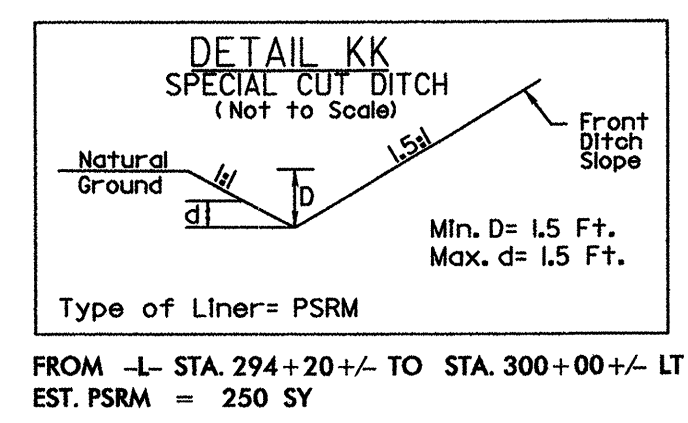
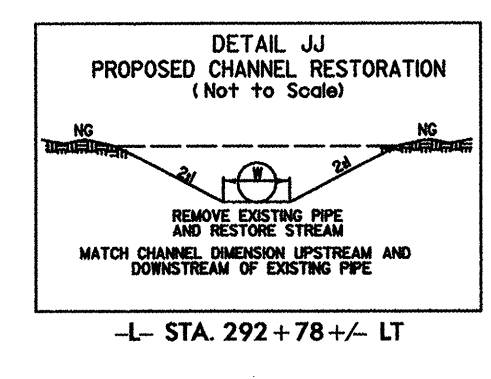
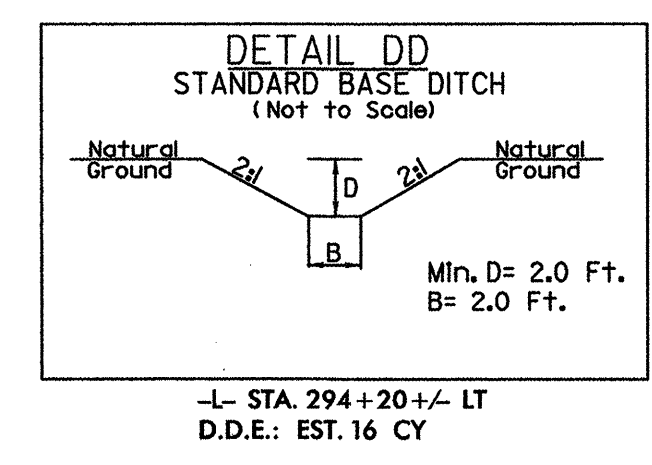
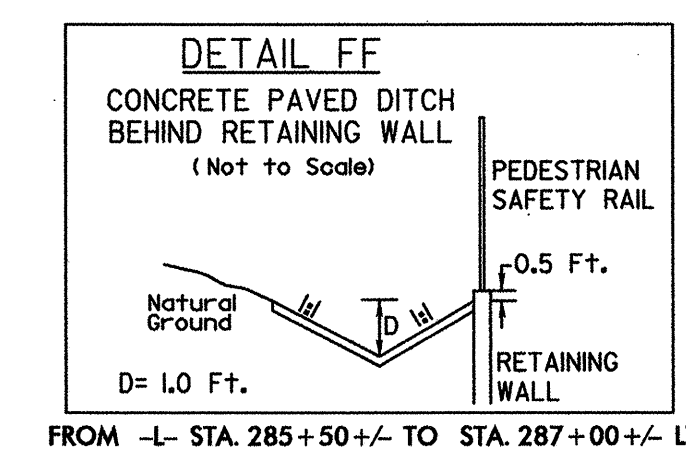
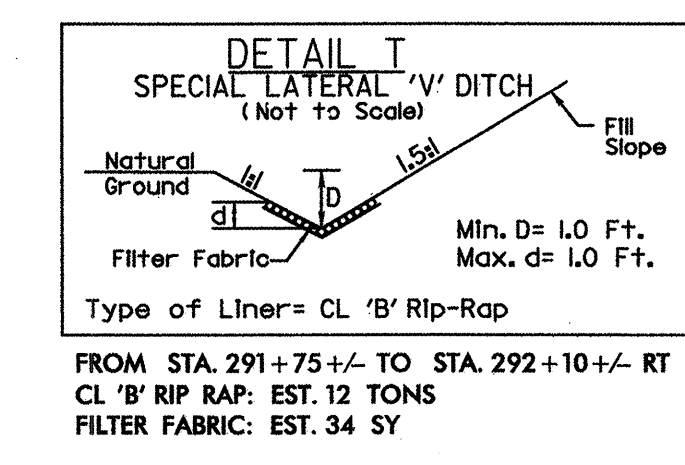
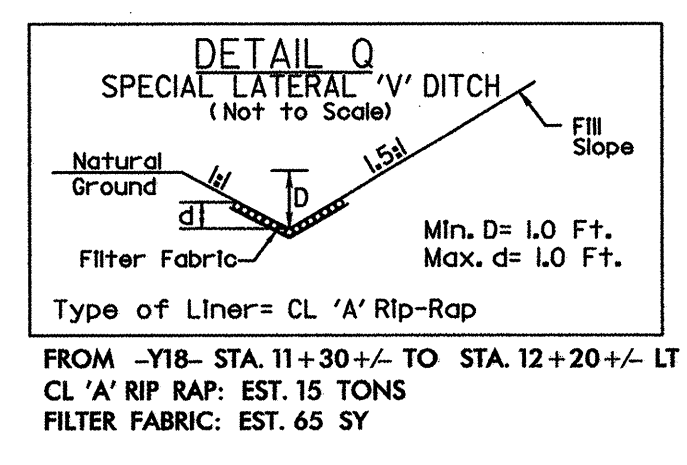


SECTION CUTS: CONCRETE, RIP RAP, FILTER FABRIC, GRASS, WOODS, ISFD, 2SFD, 1SFD, 2SBK BUS, 36\"/>

8/17/99

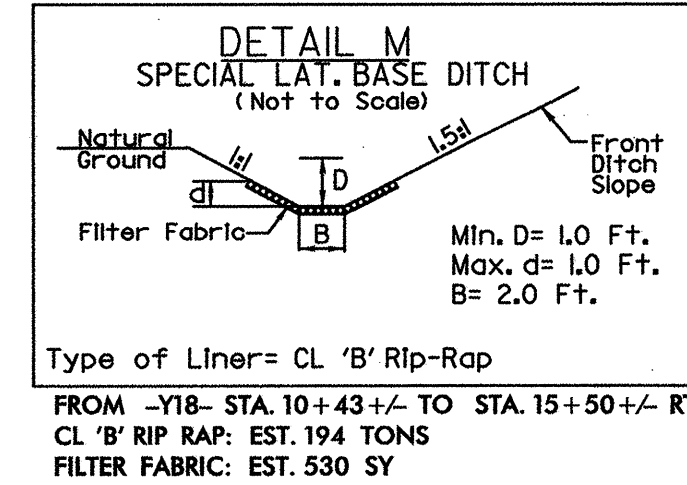
PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-28/CONST.12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

QUANTITIES FOR EACH OF 5 TEMP. SLOPE DRAINS: CL 'B' RIP RAP: EST. 1 TON FILTER FABRIC: EST. 4 SY

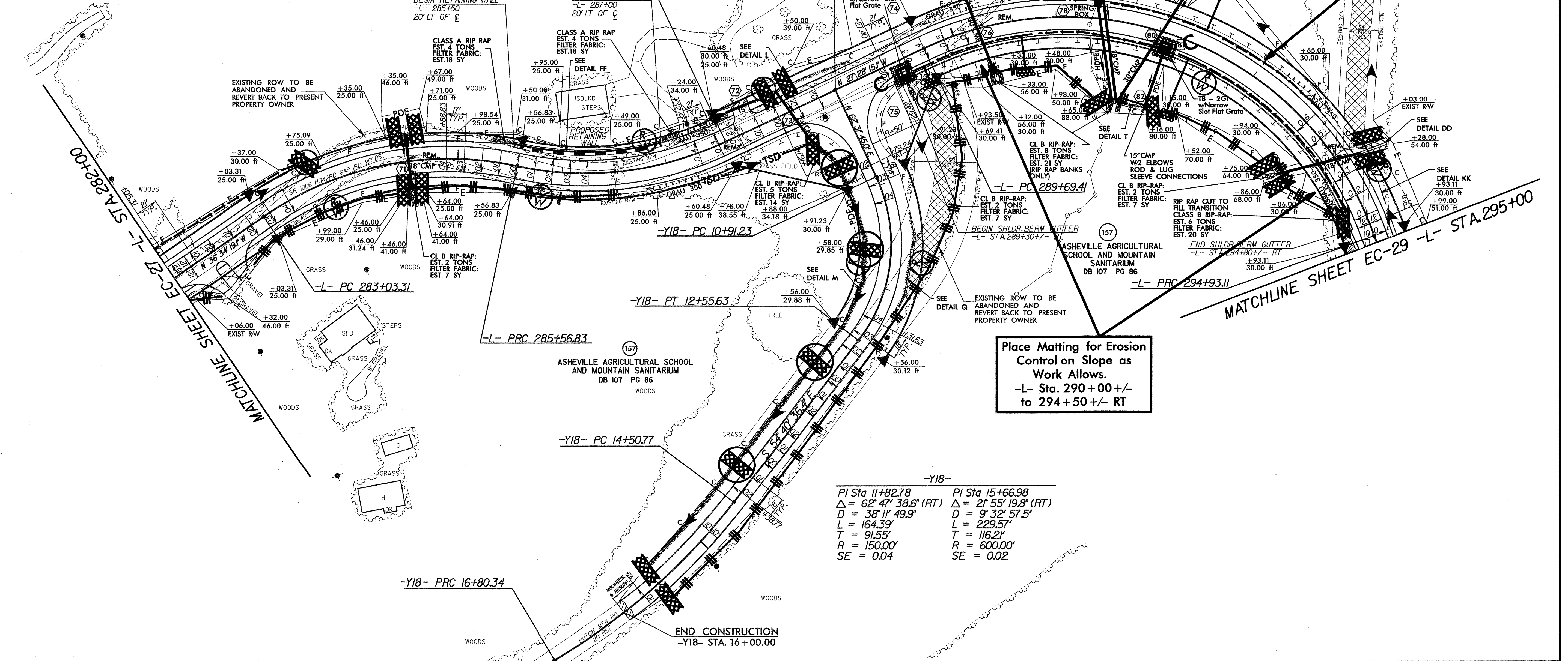
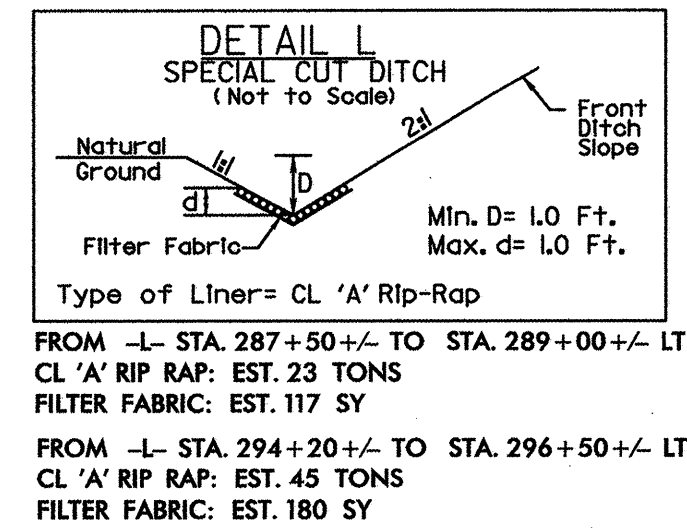


- 76 30"CMP - BURY INVERTS 0.5' BELOW STREAM BED
- 77 18"CMP - BURY INVERTS 0.3' BELOW STREAM BED 0.064" WALL THICKNESS CLASS III SELECT BACKFILL MATERIAL REQUIRED
- 80 30"CMP - BURY INVERTS 0.5' BELOW STREAM BED 0.138 WALL THICKNESS CLASS III SELECT BACKFILL MATERIAL REQUIRED

Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands as Work Allows.



PI Sta 284+37.44 Δ = 46' 15" 36.1" (RT) D = 18' 14" 49.4" L = 253.52' T = 134.13' R = 314.00' SE = 0.04	PI Sta 286+62.38 Δ = 37' 09" 32.1" (LT) D = 18' 14" 49.4" L = 203.64' T = 105.55' R = 314.00' SE = 0.04	PI Sta 293+15.46 Δ = 95' 33" 38.5" (RT) D = 18' 14" 49.4" L = 523.70' T = 346.06' R = 314.00' SE = 0.06	PI Sta 298+69.84 Δ = 100' 22" 40.7" (LT) D = 18' 14" 49.4" L = 550.10' T = 376.73' R = 314.00' SE = 0.06
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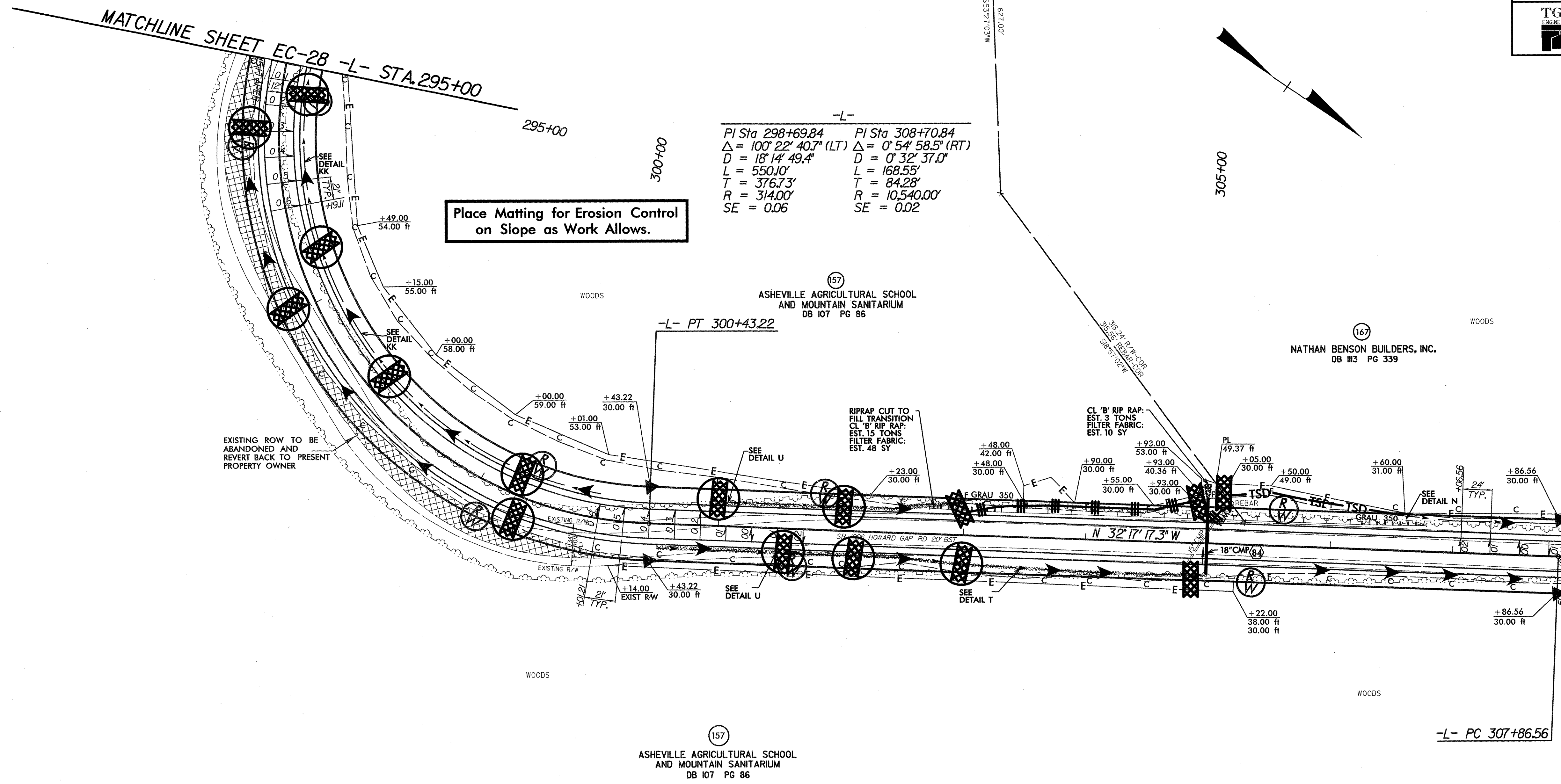
Place Matting for Erosion Control on Slopes as Work Allows. -L- Sta. 291+25+/- to 293+00+/- LT

Place Matting for Erosion Control on Slopes as Work Allows. -L- Sta. 290+00+/- to 294+50+/- RT

PI Sta 11+82.78 Δ = 62' 47" 38.6" (RT) D = 38' 11" 49.9" L = 164.39' T = 91.55' R = 150.00' SE = 0.04	PI Sta 15+66.98 Δ = 21' 55" 19.8" (RT) D = 9' 32" 57.5" L = 229.57' T = 116.21' R = 600.00' SE = 0.02
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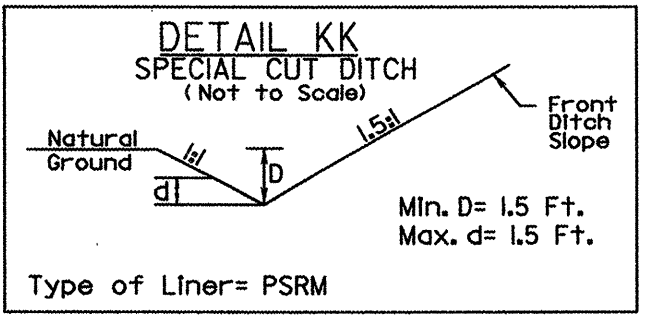


Place Matting for Erosion Control on Slope as Work Allows.

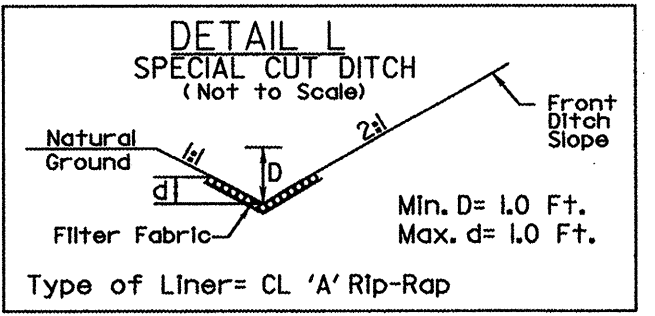
-L-

PI Sta 298+69.84 Δ = 100° 22' 40.7" (LT) D = 18' 14" 49.4" L = 550.10' T = 376.73' R = 314.00' SE = 0.06	PI Sta 308+70.84 Δ = 0° 54' 58.5" (RT) D = 0' 32' 37.0" L = 168.55' T = 84.28' R = 10,540.00' SE = 0.02
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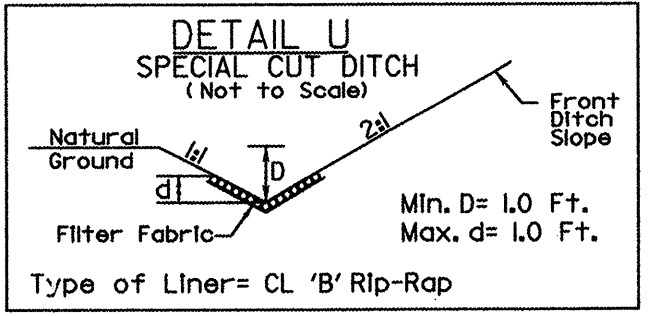
EXISTING ROW TO BE ABANDONED AND REVERT BACK TO PRESENT PROPERTY OWNER



FROM -L- STA. 294+20+/- TO STA. 300+00+/- LT
EST. PSRM = 250 SY



FROM -L- STA. 294+20+/- TO STA. 296+50+/- LT
CL 'A' RIP RAP: EST. 45 TONS
FILTER FABRIC: EST. 180 SY

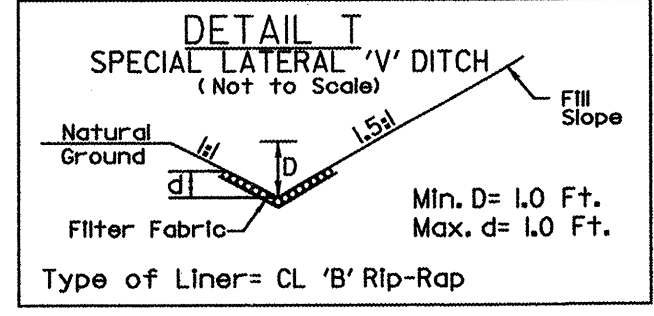


FROM -L- STA. 296+50+/- TO STA. 298+00+/- LT
CL 'B' RIP RAP: EST. 71 TONS
FILTER FABRIC: EST. 205 SY

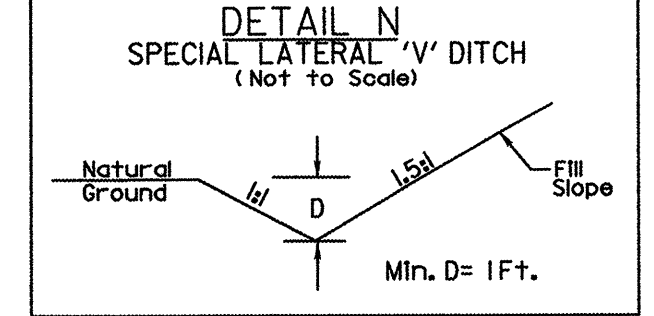
FROM -L- STA. 300+50+/- TO STA. 302+50+/- RT
CL 'B' RIP RAP: EST. 57 TONS
FILTER FABRIC: EST. 164 SY

FROM -L- STA. 301+00+/- TO STA. 302+50+/- LT
CL 'B' RIP RAP: EST. 43 TONS
FILTER FABRIC: EST. 123 SY

USE -L- GRADE FOR DETAIL 'U'



FROM -L- STA. 302+50+/- TO STA. 305+00+/- RT
CL 'B' RIP RAP: EST. 72 TONS
FILTER FABRIC: EST. 206 SY

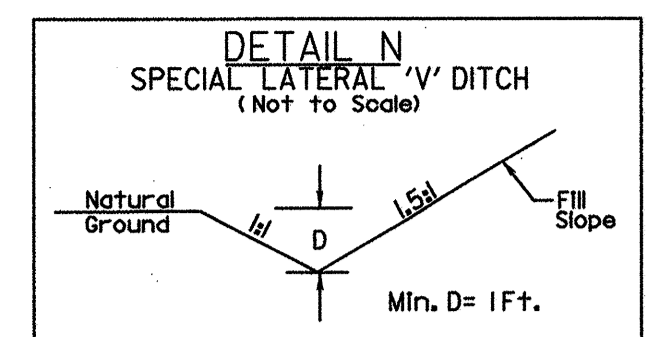


FROM -L- STA. 306+50+/- TO STA. 310+00+/- LT

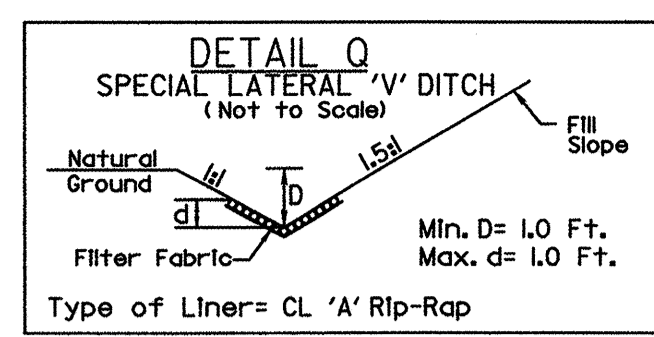
PLotted on 11/1/00

8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-30/CONST.14	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS		TGS ENGINEERS	
SUITE 141		SUITE 141	
975 WALNUT STREET		975 WALNUT STREET	
CARY, NC 27511		CARY, NC 27511	
PH (919) 319-8850		PH (919) 319-8850	



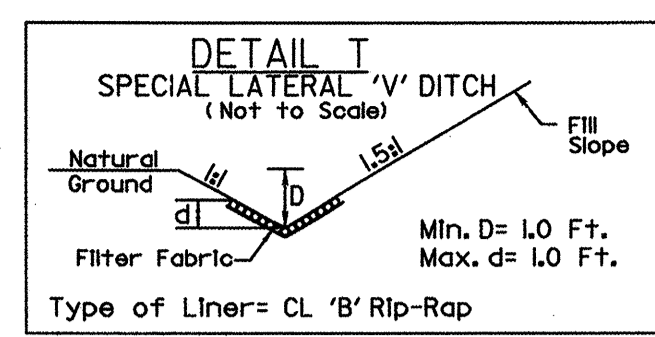
FROM -L- STA. 306+50+/- TO STA. 310+00+/- LT
Min. D = 1 Ft.



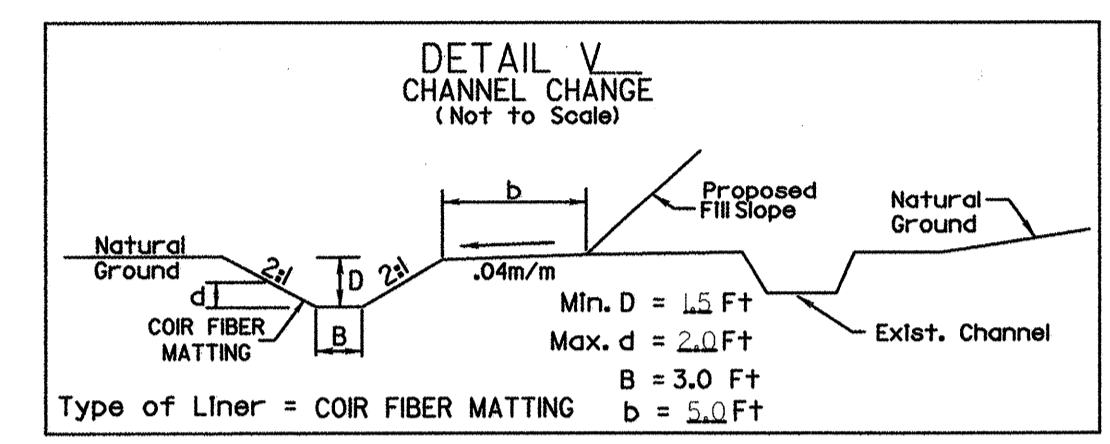
FROM STA. 308+50+/- TO STA. 310+50+/- RT
CL 'A' RIP RAP: EST. 34 TONS
FILTER FABRIC: EST. 144 SY

FROM STA. 314+00+/- TO STA. 315+80+/- LT
CL 'A' RIP RAP: EST. 31 TONS
FILTER FABRIC: EST. 130 SY

FROM STA. 317+85+/- TO STA. 319+50+/- LT
CL 'A' RIP RAP: EST. 30 TONS
FILTER FABRIC: EST. 120 SY



FROM STA. 316+75+/- TO STA. 318+00+/- LT
CL 'B' RIP RAP: EST. 7 TONS
FILTER FABRIC: EST. 21 SY



FROM STA. 315+80+/- TO STA. 316+75+/- LT
COR FIBER MATTING: EST. 180 SY
D.D.E. EST. 105 CY

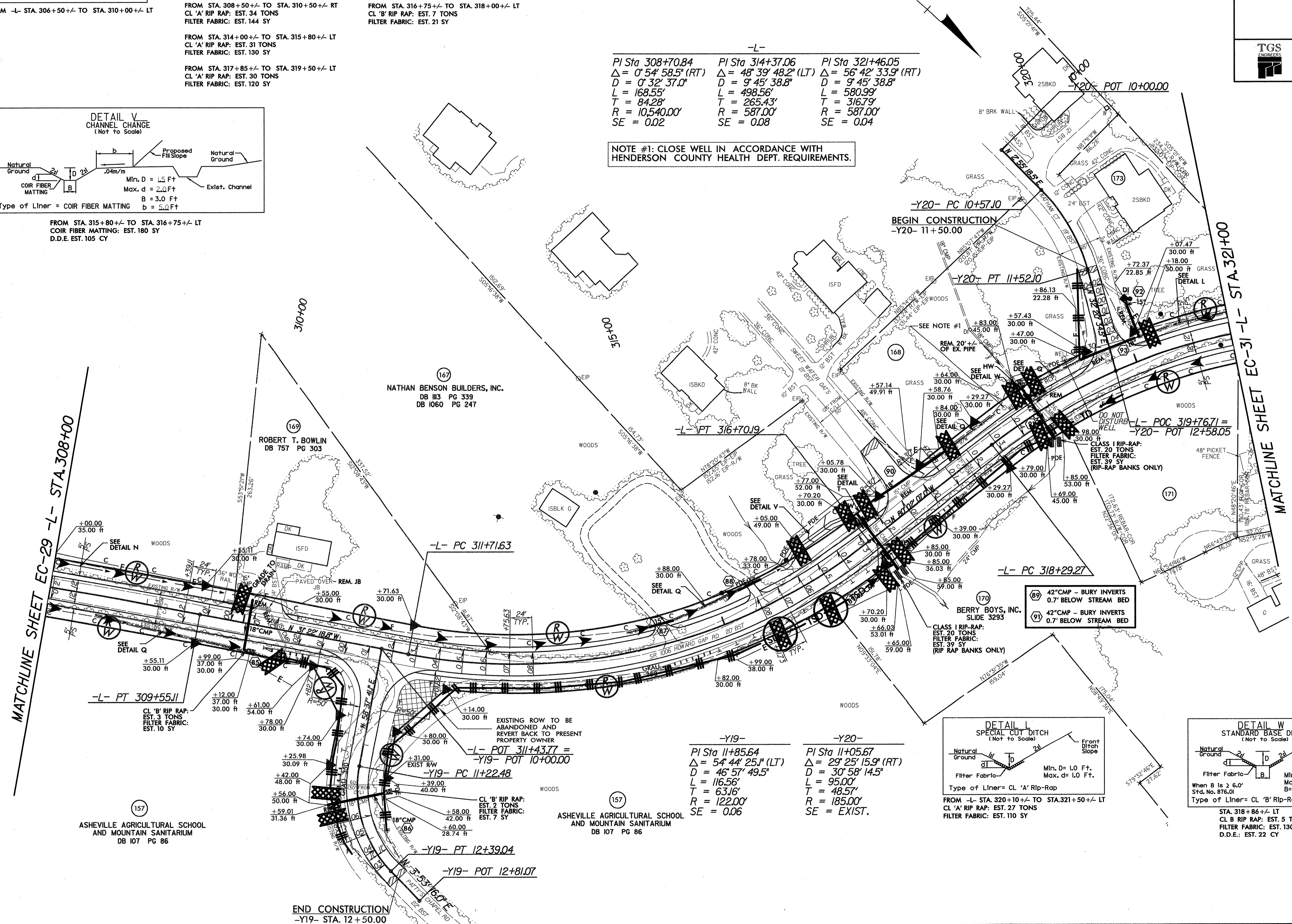
- (168) NATHAN BENSON BUILDERS, INC. DB 1113 PG 339 DB 1080 PG 247
- (171) REBECCA S. CHRISTENSEN DB 1260 PG 94
- (173) LESLIE L. MILLAR DB 1065 PG 430

-L- PI Sta 308+70.84 $\Delta = 0^\circ 54' 58.5''$ (RT) $D = 0^\circ 32' 37.0''$ $L = 168.55'$ $T = 84.28'$ $R = 10,540.00'$ $SE = 0.02$	-L- PI Sta 314+37.06 $\Delta = 48^\circ 39' 48.2''$ (LT) $D = 9^\circ 45' 38.8''$ $L = 498.56'$ $T = 265.43'$ $R = 587.00'$ $SE = 0.08$	-L- PI Sta 321+46.05 $\Delta = 56^\circ 42' 33.9''$ (RT) $D = 9^\circ 45' 38.8''$ $L = 580.99'$ $T = 316.79'$ $R = 587.00'$ $SE = 0.04$
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NOTE #1: CLOSE WELL IN ACCORDANCE WITH HENDERSON COUNTY HEALTH DEPT. REQUIREMENTS.

Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands as Work Allows.

INSTALL PSRM IN THE PROPOSED DITCH LINE.
-L- STA. 306+50 TO 310+00 LT



MATCHLINE SHEET EC-29 -L- STA. 308+00

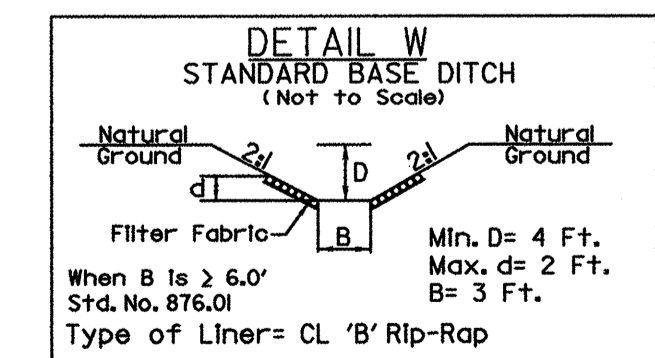
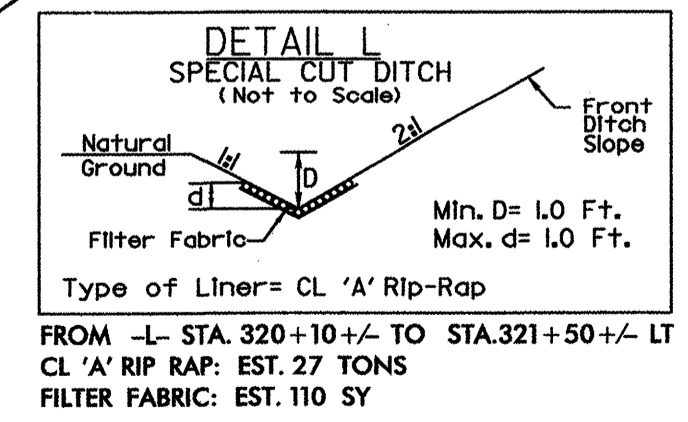
MATCHLINE SHEET EC-31 -L- STA. 321+00

(157) ASHEVILLE AGRICULTURAL SCHOOL AND MOUNTAIN SANITARIUM DB 107 PG 86

(157) ASHEVILLE AGRICULTURAL SCHOOL AND MOUNTAIN SANITARIUM DB 107 PG 86


(170) BERRY BOYS, INC. SLIDE 3293
CLASS I RIP-RAP: EST. 20 TONS FILTER FABRIC: EST. 39 SY (RIP-RAP BANKS ONLY)

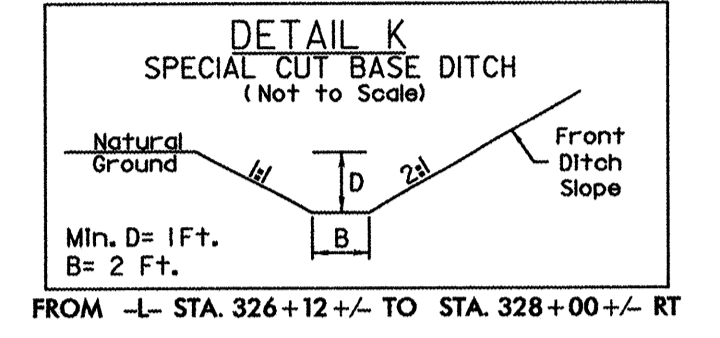
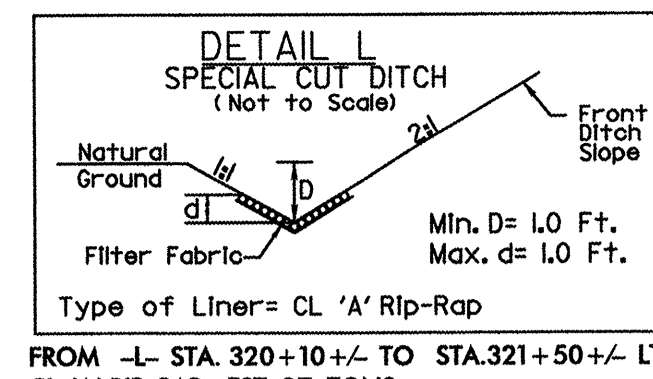
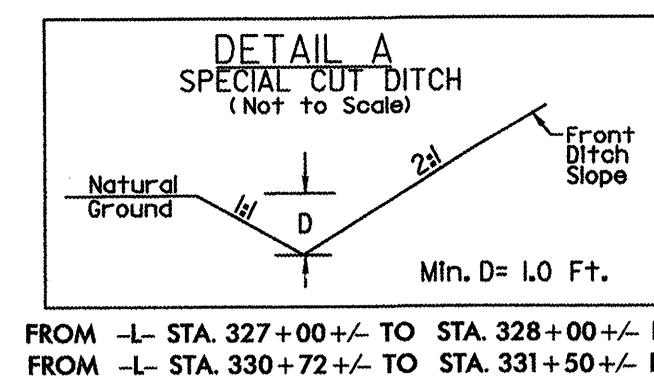
-Y19- PI Sta 11+85.64 $\Delta = 54^\circ 44' 25.1''$ (LT) $D = 46^\circ 57' 49.5''$ $L = 116.56'$ $T = 63.16'$ $R = 122.00'$ $SE = 0.06$	-Y20- PI Sta 11+05.67 $\Delta = 29^\circ 25' 15.9''$ (RT) $D = 30^\circ 58' 14.5''$ $L = 95.00'$ $T = 48.57'$ $R = 185.00'$ $SE = EXIST.$
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END CONSTRUCTION
-Y19- STA. 12+50.00

8/17/99

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-31/CONST.15	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			



-DRIVE4-

PI Sta 11+95.39	PI Sta 10+76.30
$\Delta = 3^\circ 33' 02.8''$ (LT)	$\Delta = 2^\circ 45' 34.4''$ (RT)
D = 114' 35" 29.6"	D = 24' 54" 40.4"
L = 30.15'	L = 87.35'
T = 15.55'	T = 44.21'
R = 50.00'	R = 230.00'

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.

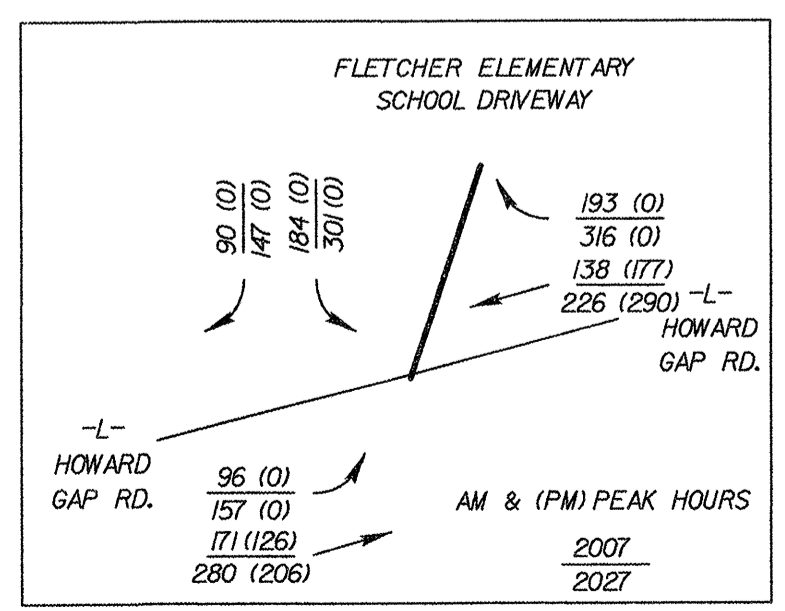
-L- STA. 330+72 TO 331+50 LT
-L- STA. 326+12 TO 328+00 RT

INSTALL PSRM IN THE PROPOSED DITCH LINE.

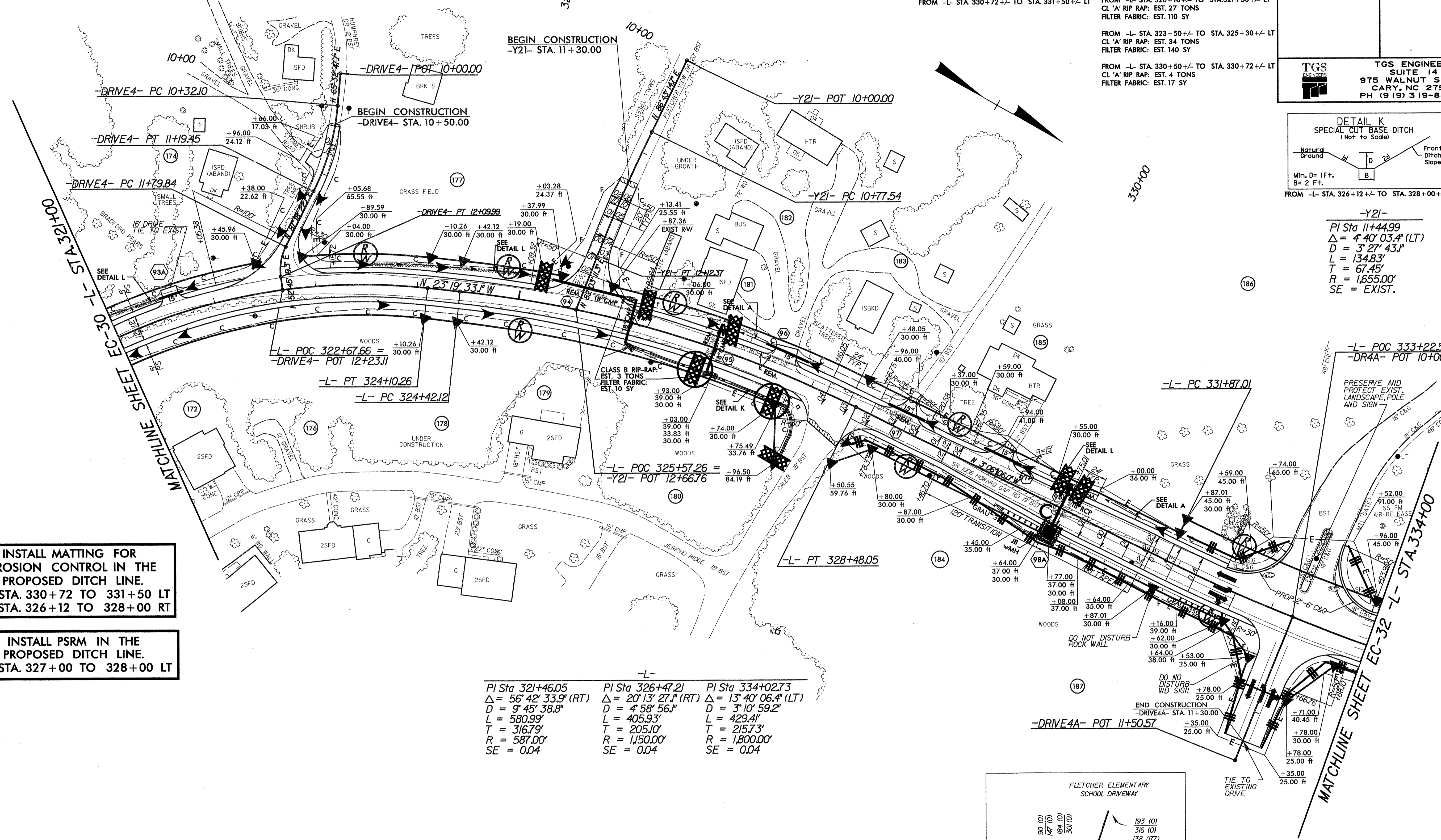
-L- STA. 327+00 TO 328+00 LT

-L-

PI Sta 321+46.05	PI Sta 326+47.21	PI Sta 334+02.73
$\Delta = 56^\circ 42' 33.9''$ (RT)	$\Delta = 20^\circ 13' 27.1''$ (RT)	$\Delta = 13^\circ 40' 06.4''$ (LT)
D = 9' 45" 38.8"	D = 4' 58" 56.1"	D = 3' 10" 59.2"
L = 580.99'	L = 405.93'	L = 429.41'
T = 316.79'	T = 205.10'	T = 215.73'
R = 587.00'	R = 1,150.00'	R = 1,800.00'
SE = 0.04	SE = 0.04	SE = 0.04



PEAK HOUR TRAFFIC VOLUMES (vehicles per hour)

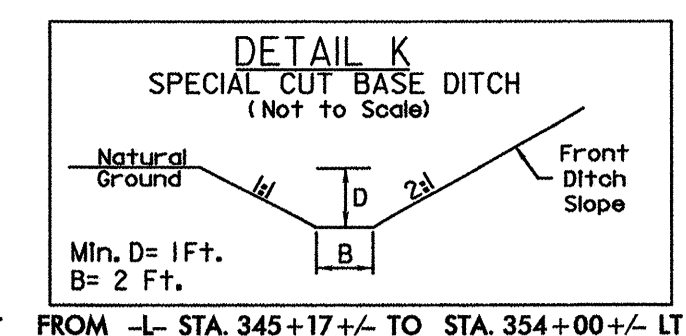
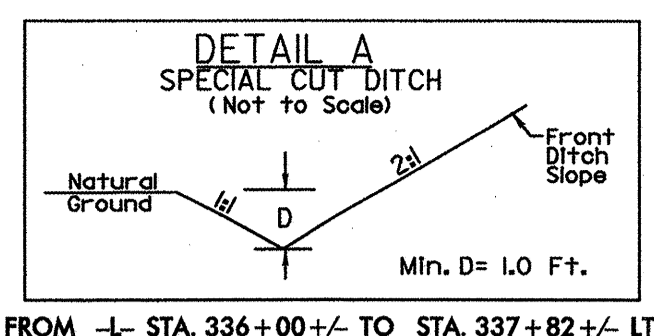


8/17/99

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INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.

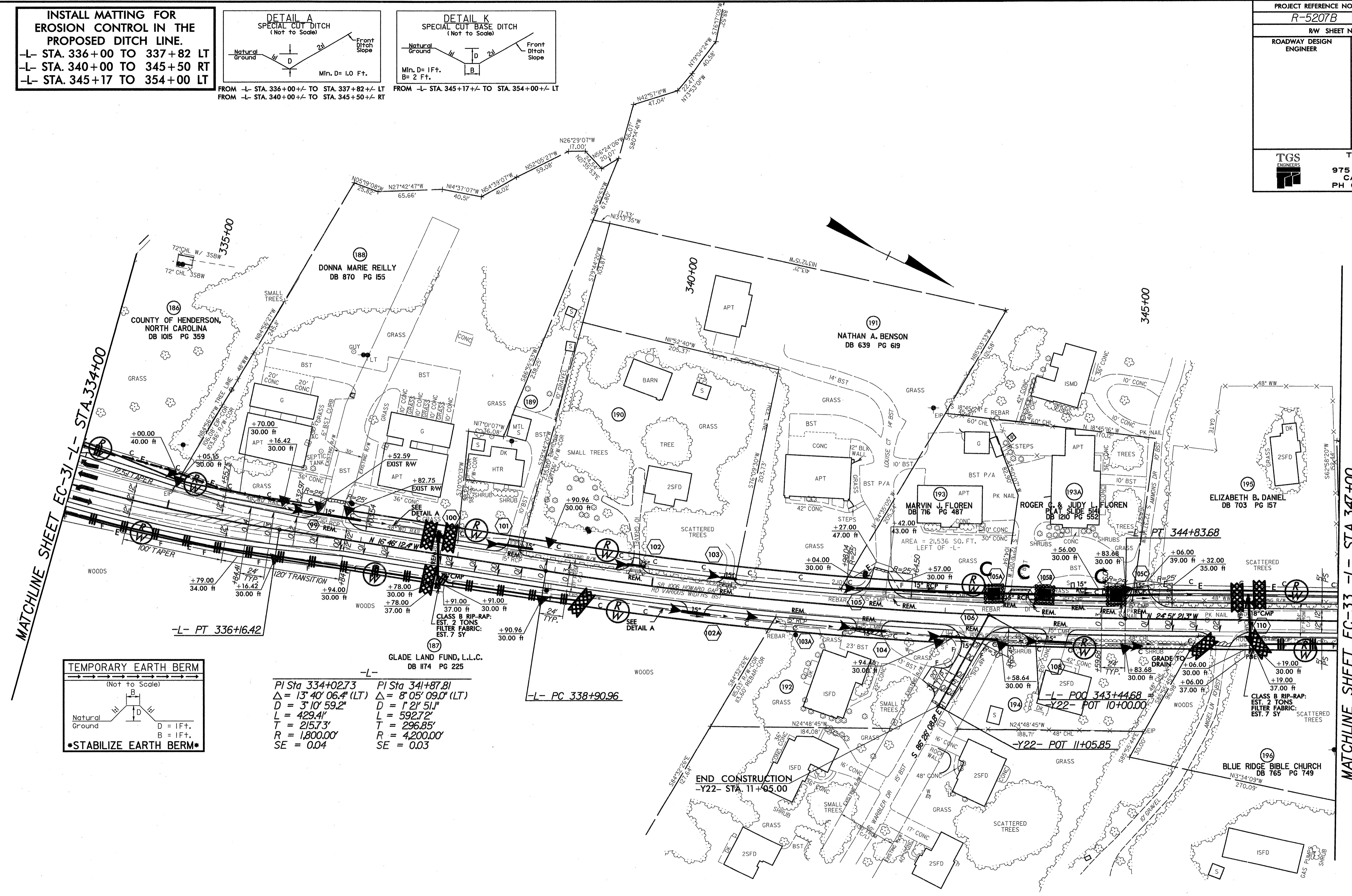
-L- STA. 336+00 TO 337+82 LT
 -L- STA. 340+00 TO 345+50 RT
 -L- STA. 345+17 TO 354+00 LT



FROM -L- STA. 336+00+/- TO STA. 337+82+/- LT
 FROM -L- STA. 340+00+/- TO STA. 345+50+/- RT

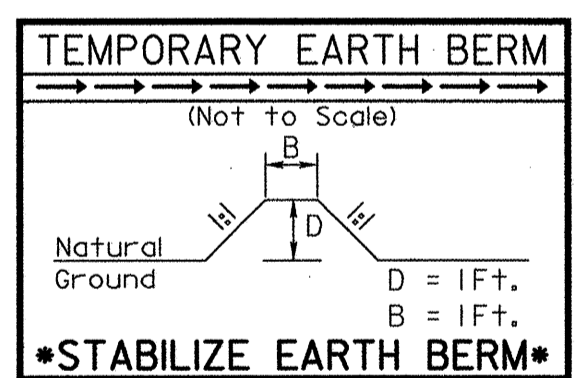
FROM -L- STA. 345+17+/- TO STA. 354+00+/- LT

PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-32/CONST.16	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			



MATCHLINE SHEET EC-31 -L- STA. 334+00

MATCHLINE SHEET EC-33 -L- STA. 347+00



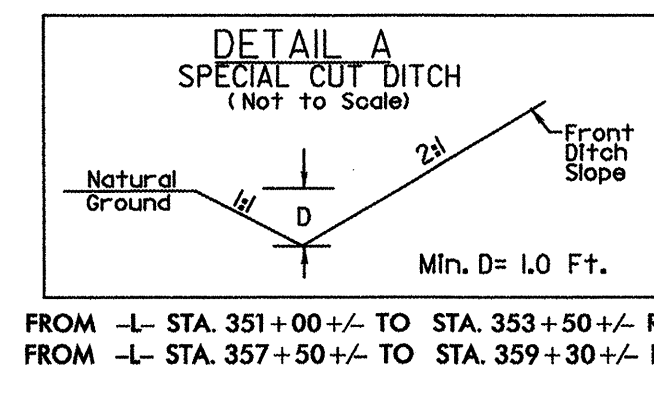
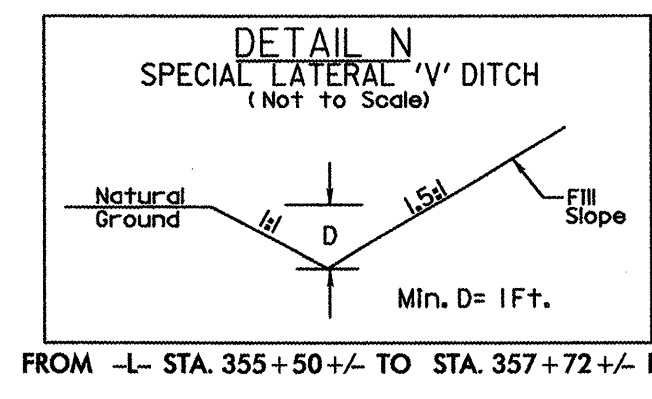
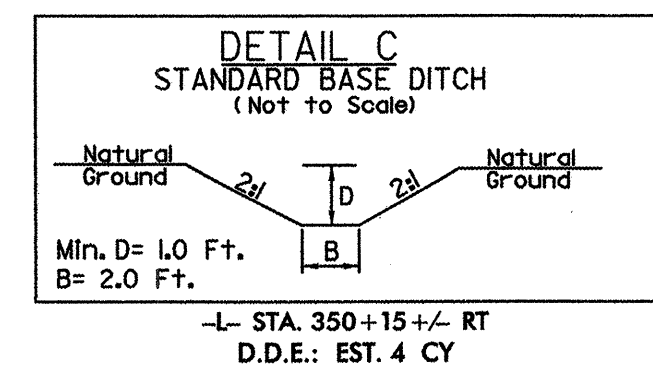
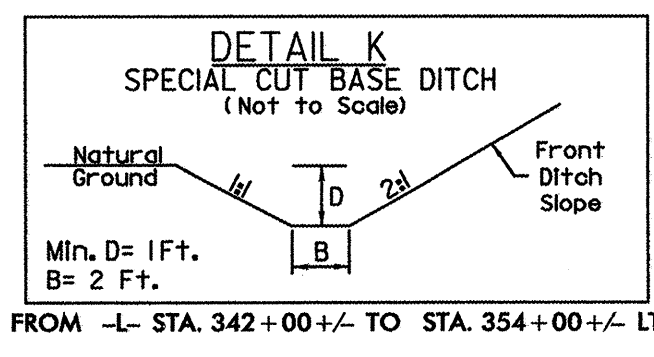
GLADE LAND FUND, L.L.C.
 DB 1174 PG 225

-L- PI Sta 334+02.73	-L- PI Sta 341+87.81
$\Delta = 13^{\circ} 40' 06.4''$ (LT)	$\Delta = 8^{\circ} 05' 09.0''$ (LT)
D = 3' 10' 59.2"	D = 1' 21' 51.1"
L = 429.4'	L = 592.72'
T = 215.73'	T = 296.85'
R = 1,800.00'	R = 4,200.00'
SE = 0.04	SE = 0.03

- (189) JOSEPH C. KUYKENDALL DB 597 PG 511 AND EDITH KUYKENDALL
- (190) LARRY WAYNE WALKER DB 533 PG 245
- (192) BRUCE A. JONES AND DARLENE P. JONES DB 1034 PG 297
- (194) CARRIE M. WALKER DB 1180 PG 625

SYSTEMS DESIGN CONSULTANTS

8/17/99



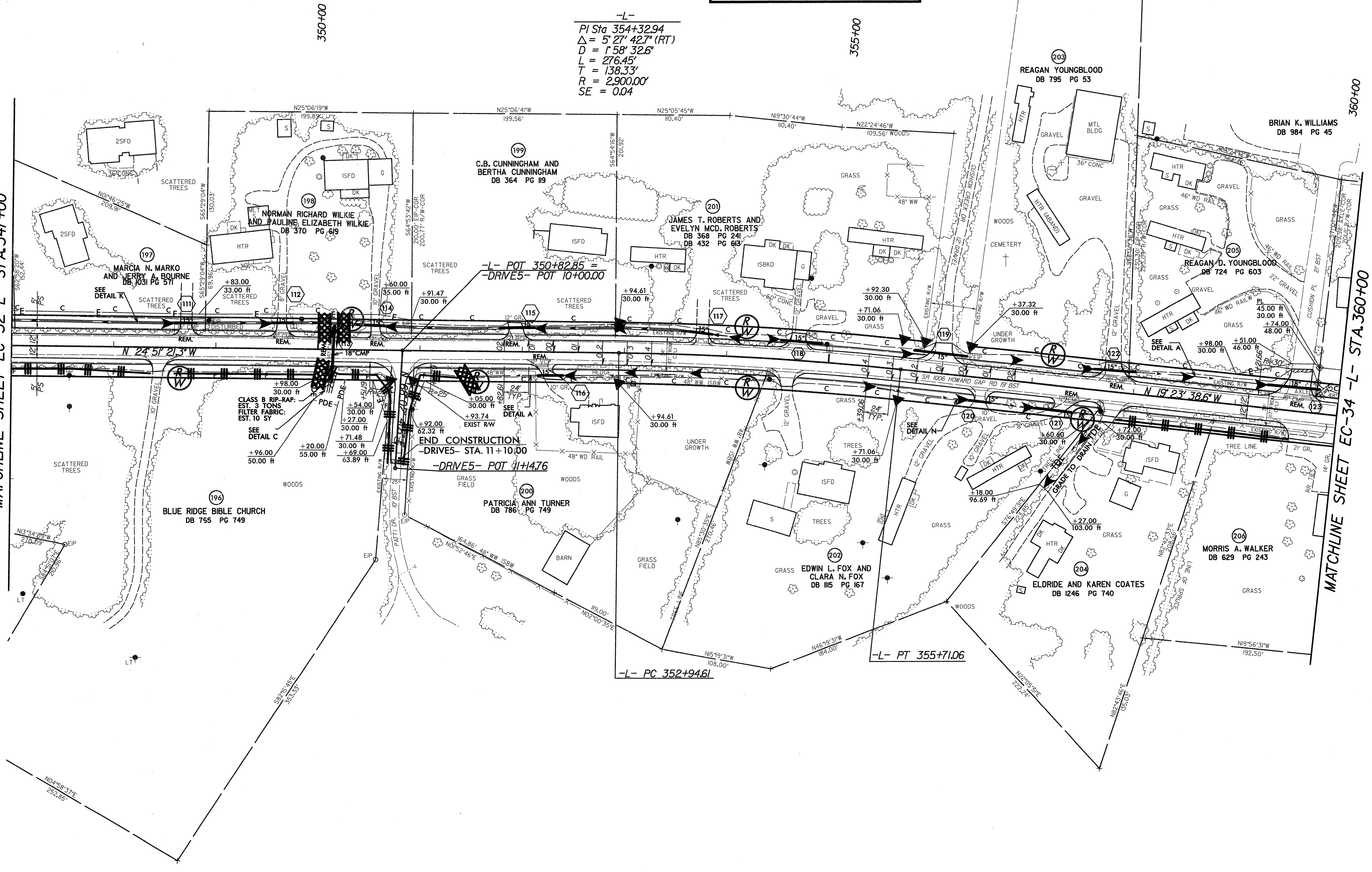
PROJECT REFERENCE NO. R-5207B	SHEET NO. EC-33/CONST.17
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

INSTALL PSRM IN THE PROPOSED DITCH LINE.
 -L- STA. 355+50 TO 357+72 RT
 -L- STA. 351+00 TO 353+50 RT
 -L- STA. 357+50 TO 359+30 LT


-L-
 PI Sta 354+32.94
 $\Delta = 5^{\circ} 27' 42.7''$ (RT)
 $D = 1^{\circ} 58' 32.6''$
 $L = 276.45'$
 $T = 138.33'$
 $R = 2,900.00'$
 $SE = 0.04$

MATCHLINE SHEET EC-32-L- STA. 347+00

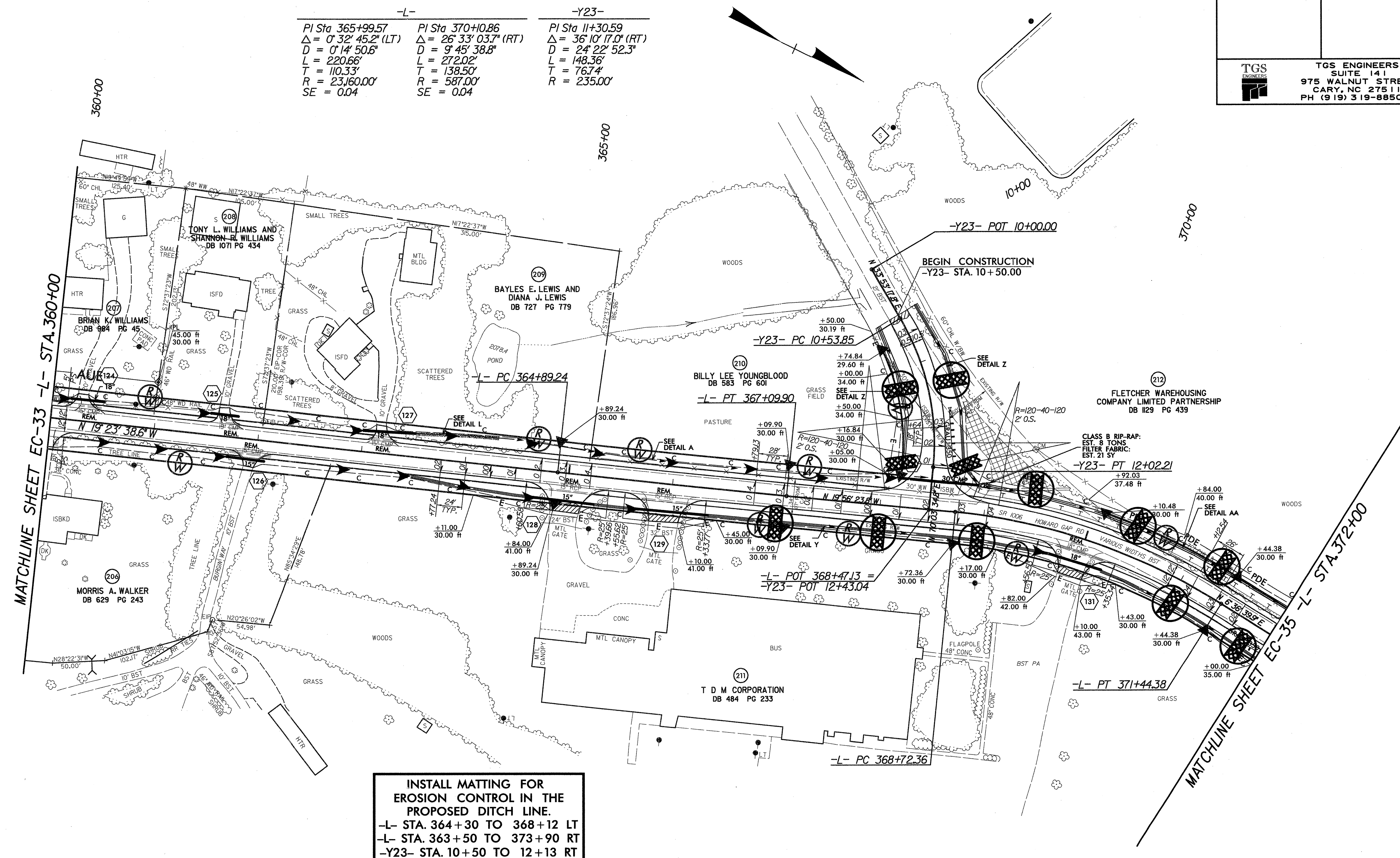
MATCHLINE SHEET EC-34 -L- STA. 360+00



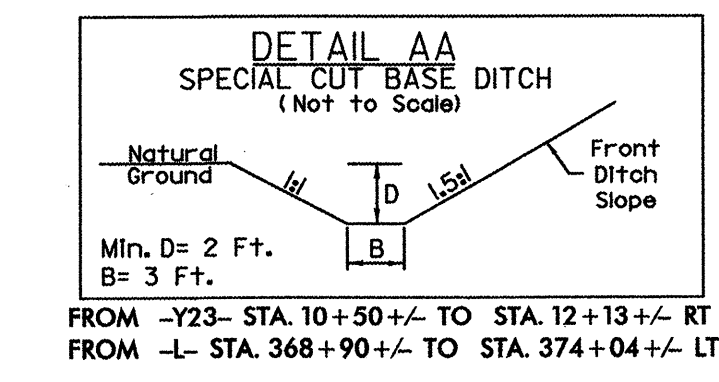
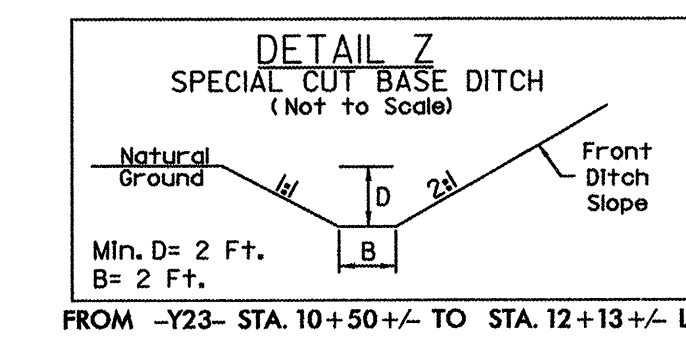
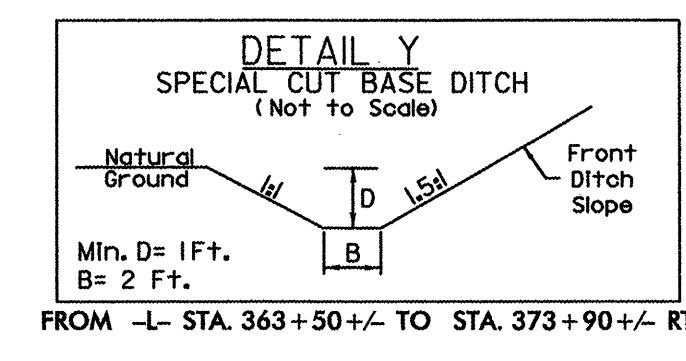
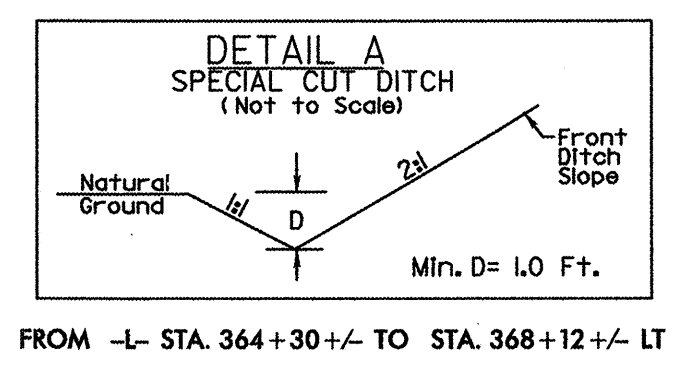
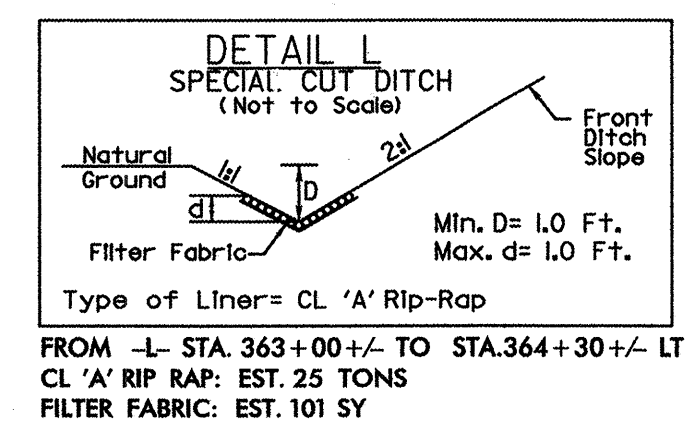
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PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-34/CONST.18	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850			


-L-	-Y23-
PI Sta 365+99.57 Δ = 0° 32' 45.2" (LT) D = 0' 14' 50.6" L = 220.66' T = 110.33' R = 23160.00' SE = 0.04	PI Sta 370+10.86 Δ = 26° 33' 03.7" (RT) D = 9' 45' 38.8" L = 272.02' T = 138.50' R = 587.00' SE = 0.04
	PI Sta 11+30.59 Δ = 36° 10' 17.0" (RT) D = 24' 22' 52.3" L = 148.36' T = 76.74' R = 235.00'



INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
 -L- STA. 364+30 TO 368+12 LT
 -L- STA. 363+50 TO 373+90 RT
 -Y23- STA. 10+50 TO 12+13 RT

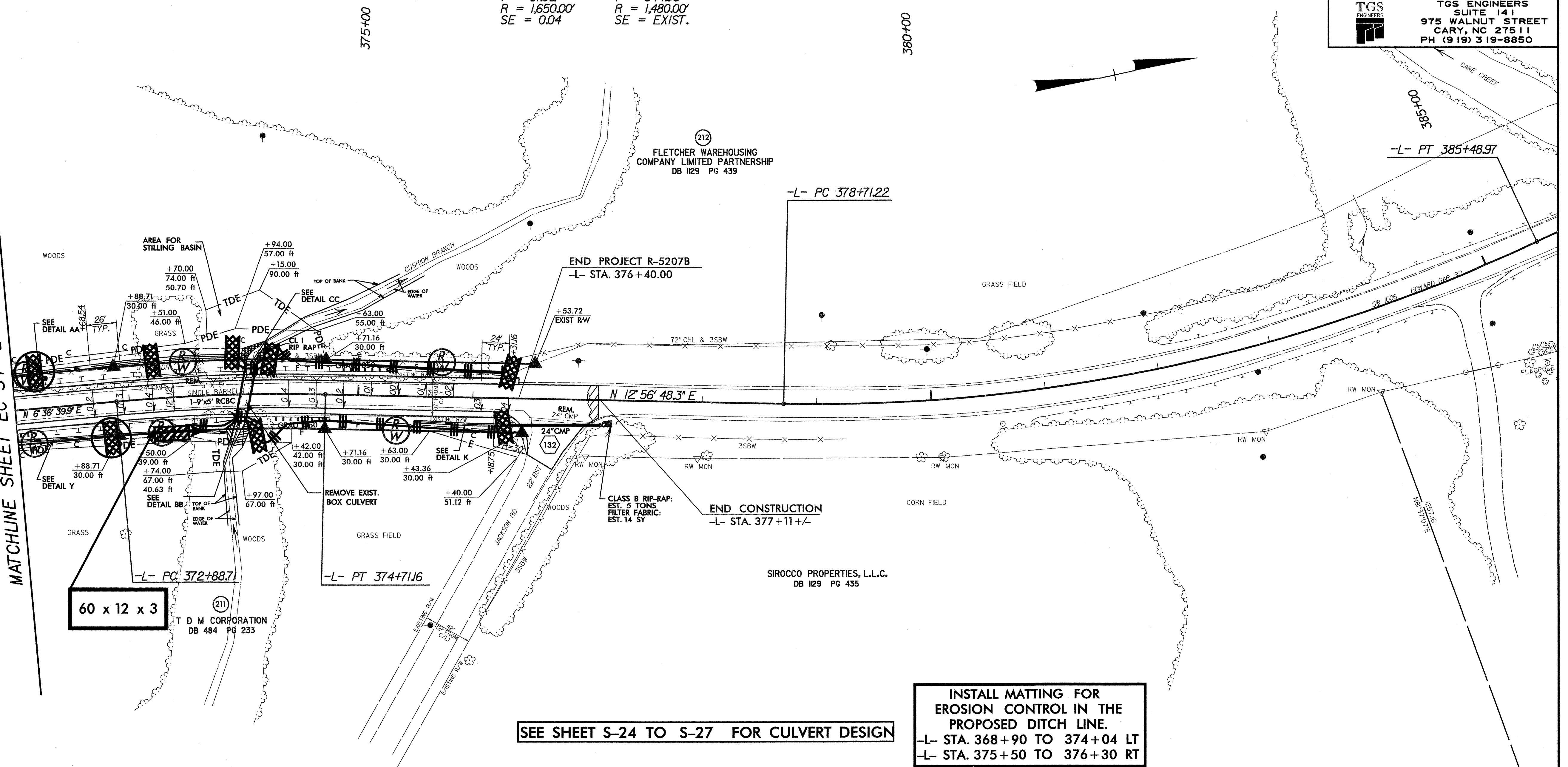


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PROJECT REFERENCE NO. R-5207B		SHEET NO. EC-35/CONST.19	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
		TGS ENGINEERS SUITE 141 975 WALNUT STREET CARY, NC 27511 PH (919) 319-8850	

-L-
 PI Sta 373+80.03 PI Sta 382+16.14
 $\Delta = 6^{\circ} 20' 08.4" (RT)$ $\Delta = 26^{\circ} 14' 17.0" (LT)$
 $D = 3^{\circ} 28' 20.9"$ $D = 3^{\circ} 52' 16.8"$
 $L = 182.45'$ $L = 677.75'$
 $T = 91.32'$ $T = 344.93'$
 $R = 1,650.00'$ $R = 1,480.00'$
 $SE = 0.04$ $SE = EXIST.$

MATCHLINE SHEET EC-34 -L- STA. 372+00



SEE SHEET S-24 TO S-27 FOR CULVERT DESIGN

INSTALL MATTING FOR EROSION CONTROL IN THE PROPOSED DITCH LINE.
 -L- STA. 368+90 TO 374+04 LT
 -L- STA. 375+50 TO 376+30 RT

