TIP: R-3421B

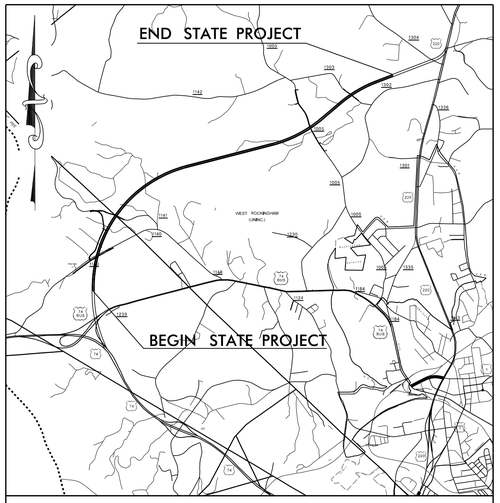
CONTRACT:

$TIME$

$DATE$

$FILE$

See Sheet 1–A For Index of Sheets
See Sheet 1–B For Conventional Symbols



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RICHMOND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R–3421B	EC-1	
WBS NO.	F. A. PROJ. NO.	DESCRIPTION	
34542.1.1	NHF–220(4)	P.E.	

LOCATION: US 220 BYPASS FROM 0.3 MILES SOUTH OF SR 1140 (OLD CHARLOTTE HIGHWAY) TO 0.2 MILES SOUTHWEST OF SR 1304 (HARRINGTON ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, FENCING,CULVERTS, STRUCTURES, SIGNING

NC GRID
NAD 83/95

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

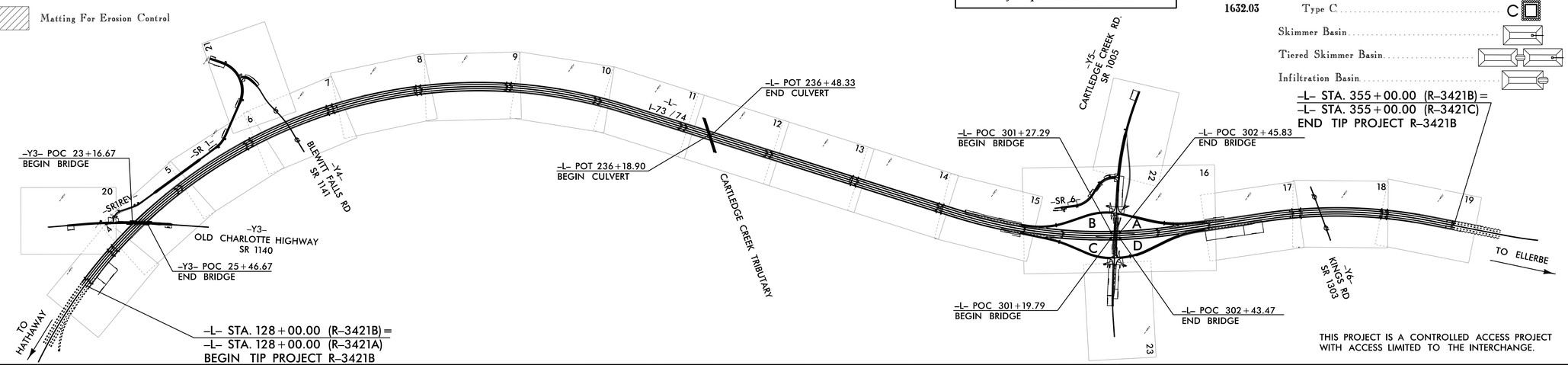
ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

Matting For Erosion Control



THIS PROJECT IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO THE INTERCHANGE.

GRAPHIC SCALE

25′ 0 50′
PLANS

25′ 0 50′
PROFILE (HORIZONTAL)

5′ 0 10′
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R–3421B = 4.270 MILES

LENGTH STRUCTURES TIP PROJECT R–3421B = 0.029 MILES

TOTAL LENGTH TIP PROJECT R–3421B = 4.299 MILES

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

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

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 23, 2009

LETTING DATE:
FEBRUARY 16, 2016
(PRODUCTION)

NCDOT CONTACT:

JOHNNY BANKS
MULKEY E & C
PROJECT MANAGER

STEVE BROWDE, PE
MULKEY E & C
PROJECT DESIGN ENGINEER

AUDREY BURNETTE, PE
RK&K EROSION CONTROL
DESIGN ENGINEER
LEVEL III CERTIFICATION NO.3081

REHKA PATEL, P.E.
PROJECT ENGINEER – ENGR. COORD.

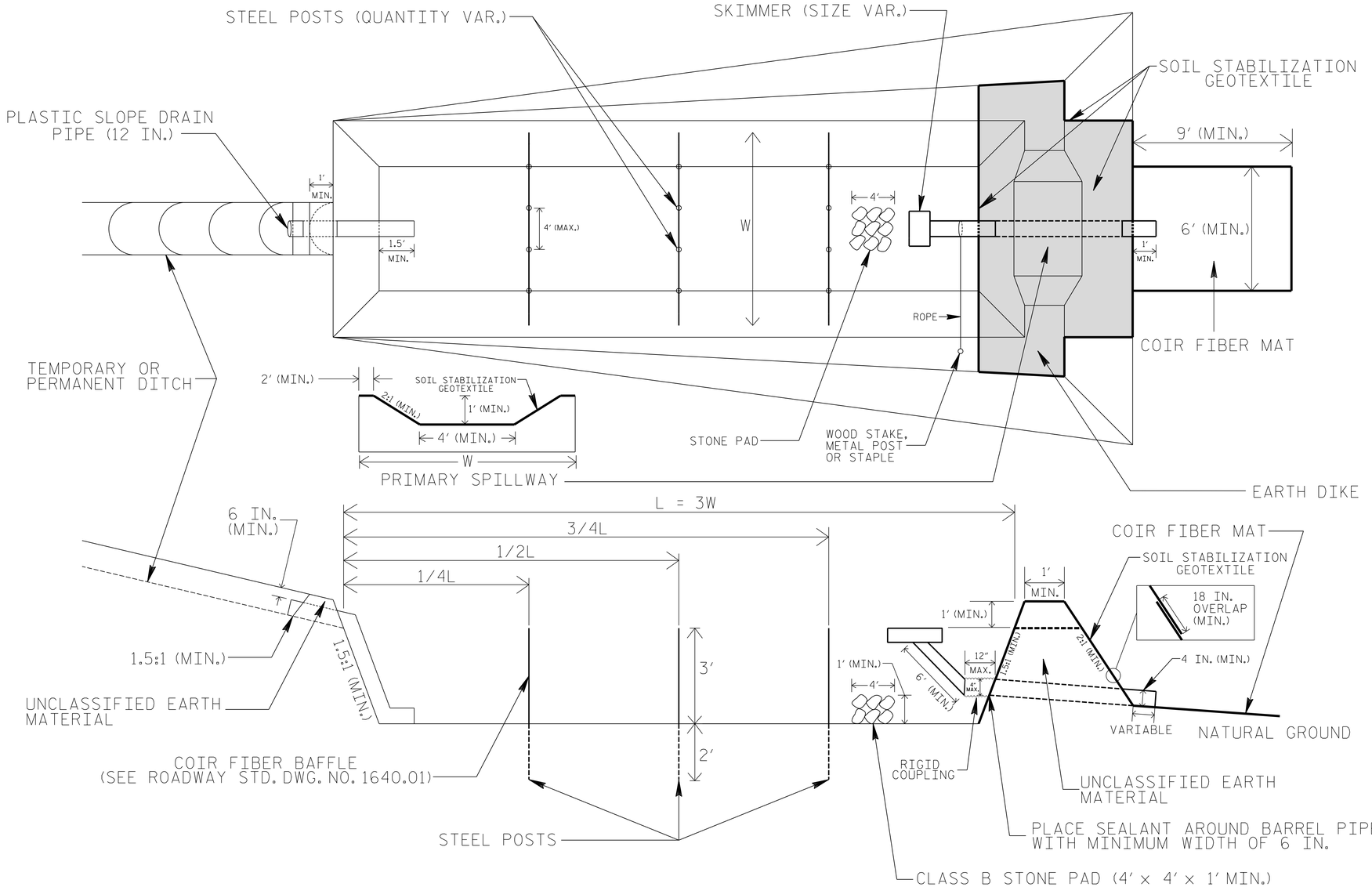
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

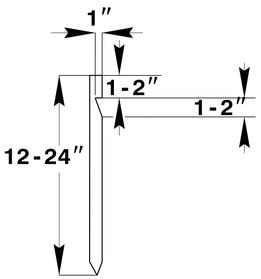
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

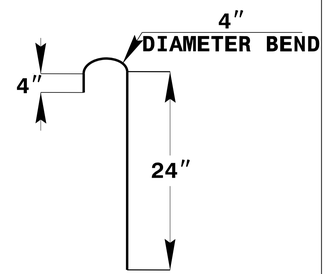
SKIMMER BASIN WITH BAFFLES DETAIL



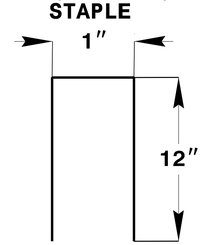
2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1" (nominal) STAPLE



COIR FIBER MAT ANCHOR OPTIONS

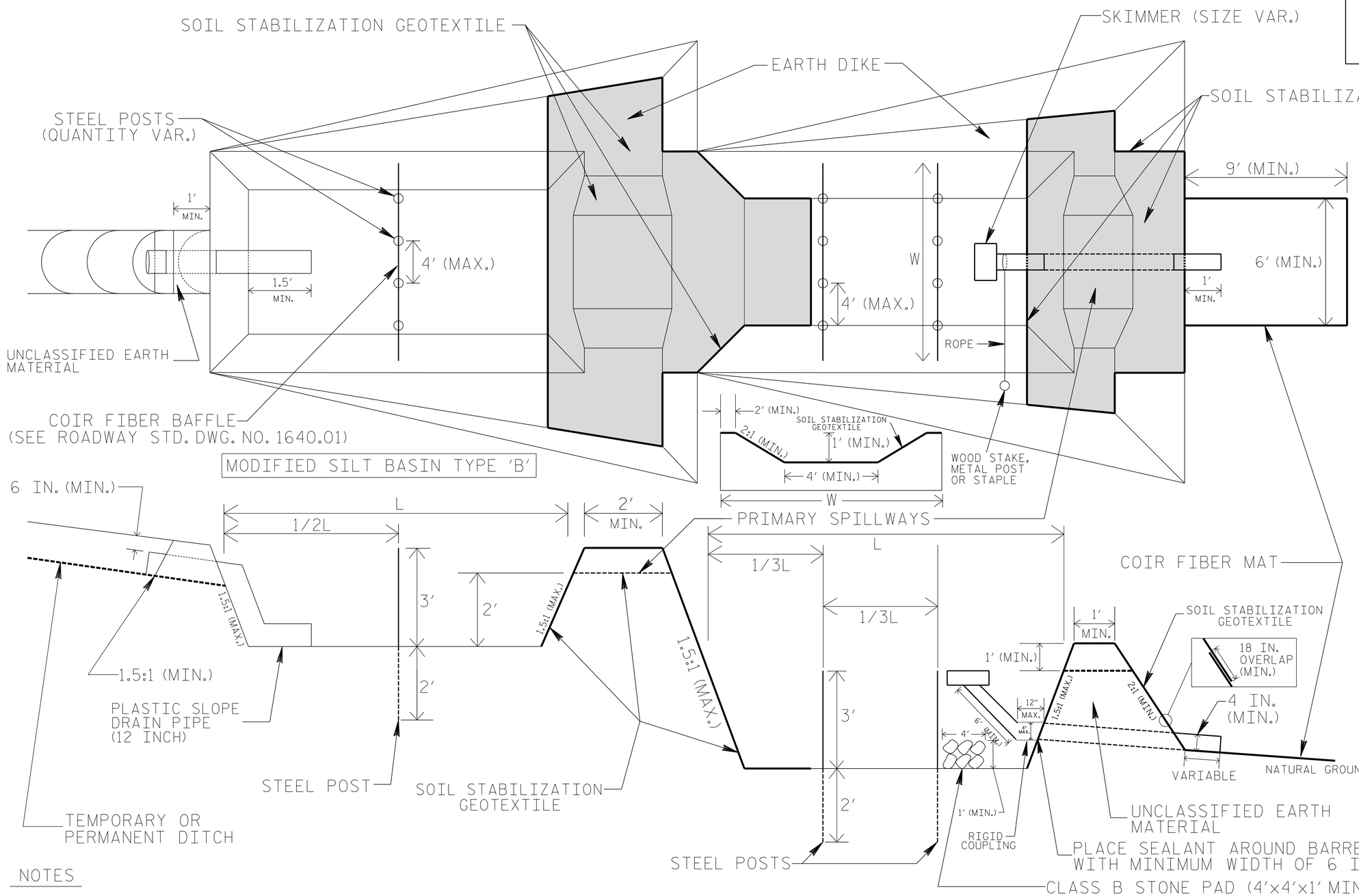
NOTES

1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.
3. FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.
4. DETERMINE PRIMARY SPILLWAY WEIR LENGTH (FT.) USING Q/0.8, WHERE Q IS FLOW RATE (CFS) INTO BASIN.
5. PLASTIC SLOPE DRAIN PIPE AT INLET OF BASIN MAY BE REPLACED BY FILTRATION GEOTEXTILE OR TARP AS DIRECTED.
6. SOIL STABILIZATION GEOTEXTILE FOR PRIMARY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

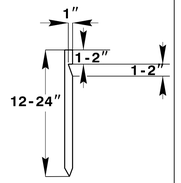
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

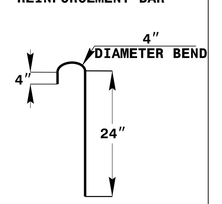
TIERED SKIMMER BASIN DETAIL



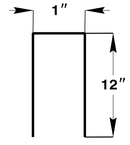
2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1" (nominal) STAPLE



COIR FIBER MAT ANCHOR OPTIONS

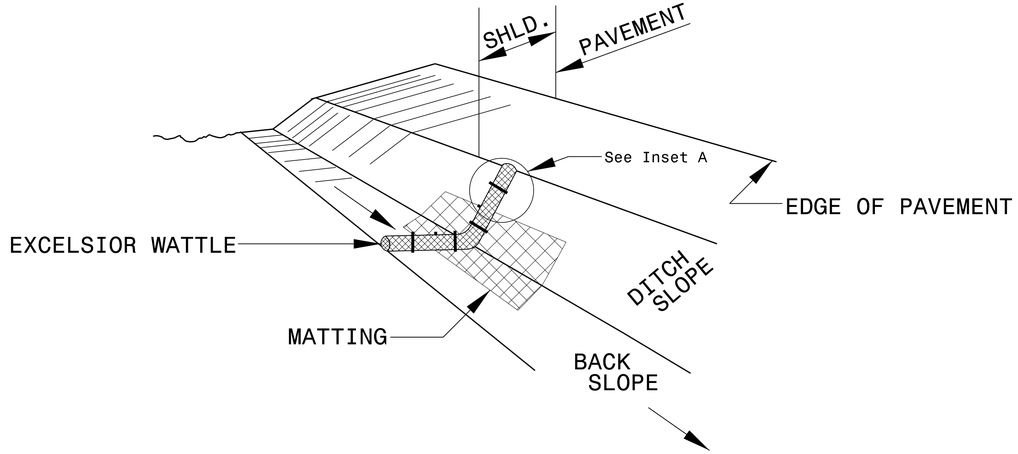
NOTES

1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES OF BASINS.
2. LIMIT HEIGHT OF EARTH DIKES TO 5 FT.
3. ADDITIONAL MODIFIED SILT BASINS TYPE 'B' MAY BE NEEDED DEPENDING ON SLOPE.
4. FOR BASIN DEPTHS OF 3FT., THE MINIMUM BASIN WIDTHS SHALL BE 9 FT.
5. DETERMINE PRIMARY SPILLWAY WEIR LENGTHS (FT.) USING Q/0.8, WHERE Q IS FLOW RATE (CFS) INTO UPPER BASIN.
6. SOIL STABILIZATION GEOTEXTILE FOR PRIMARY SPILLWAYS SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

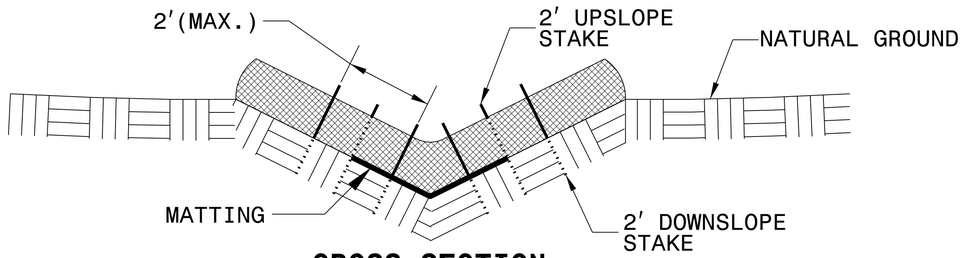
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

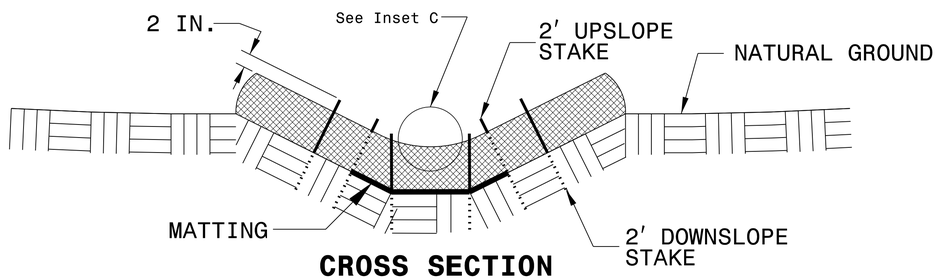
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

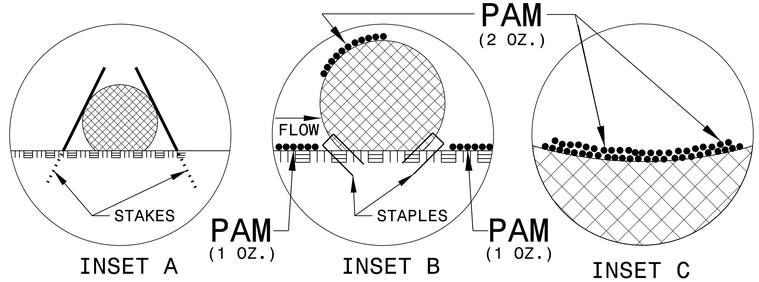
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

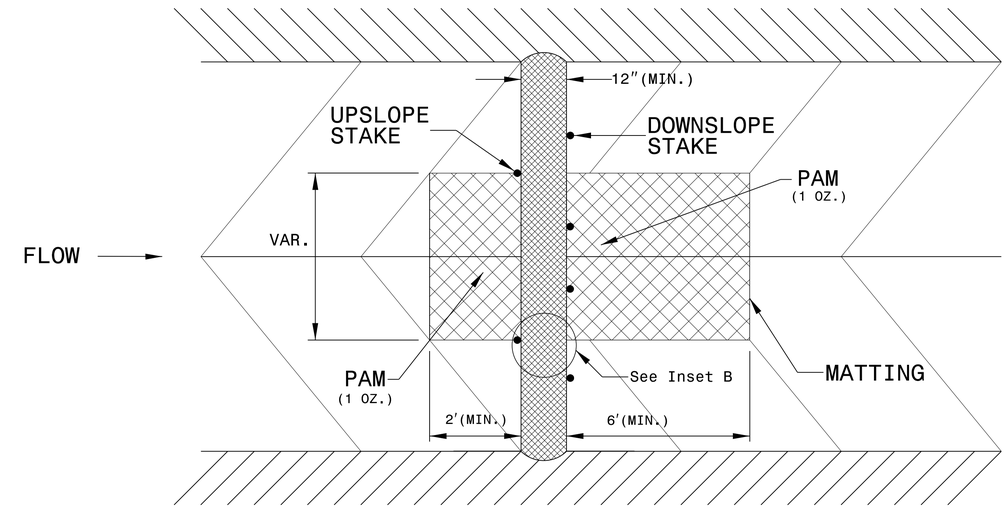
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

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 WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

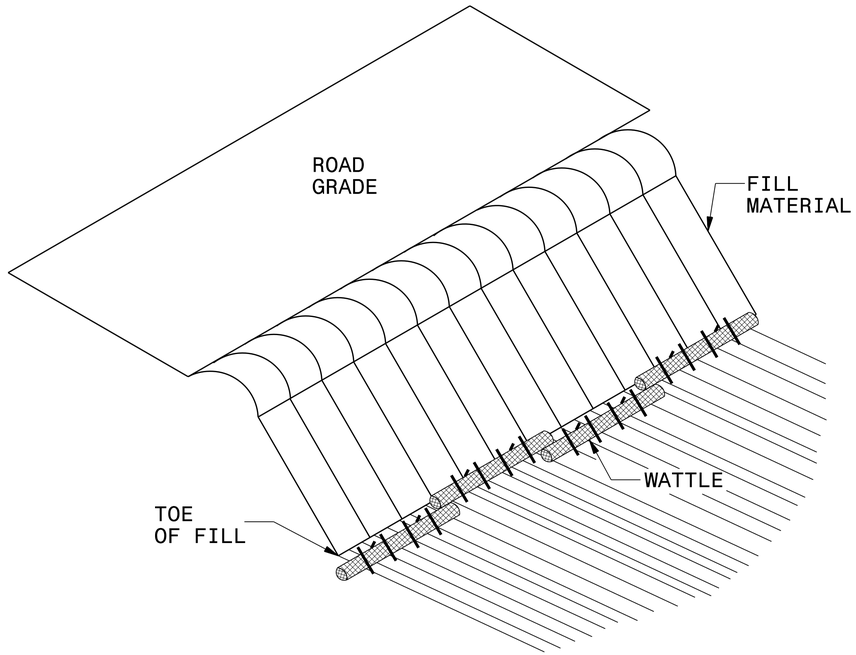




TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

WATTLE BARRIER DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 18 IN. NOMINAL DIAMETER EXCELSIOR WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

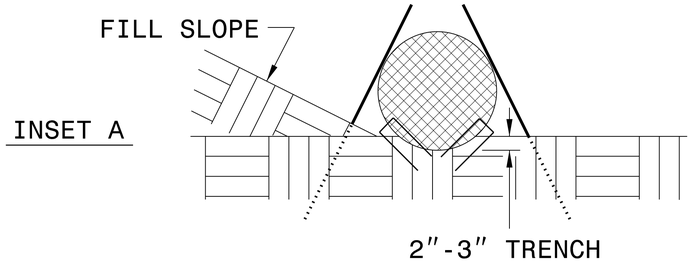
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

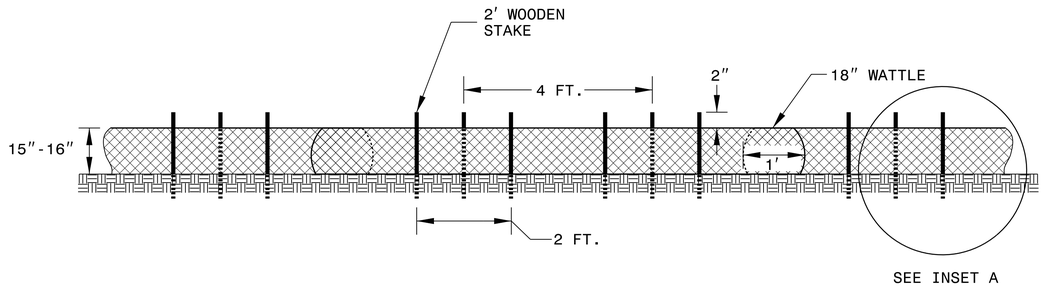
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

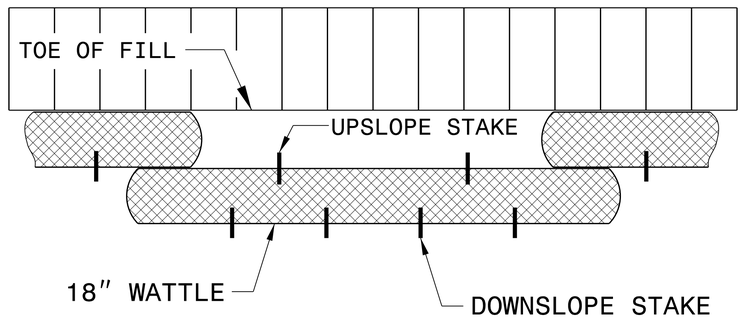
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.





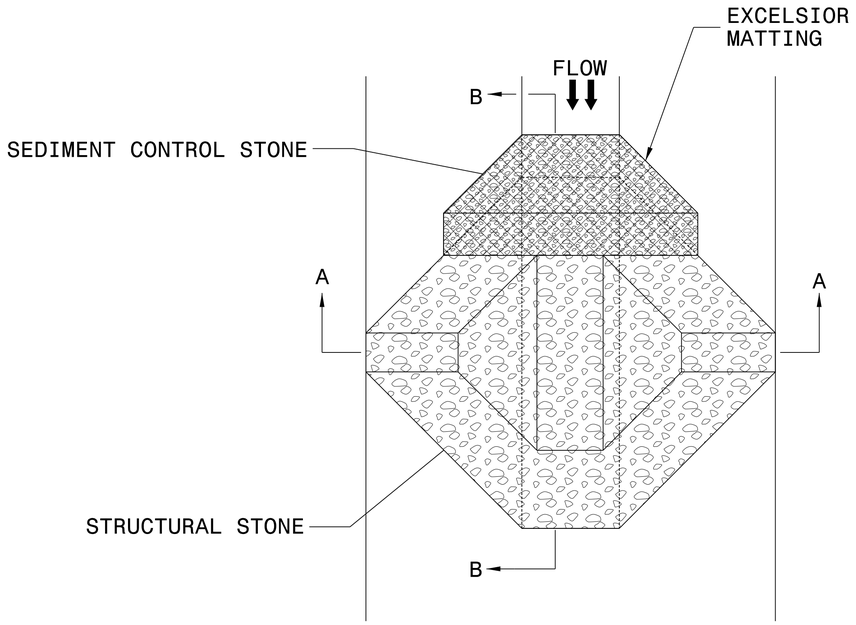
FRONT VIEW



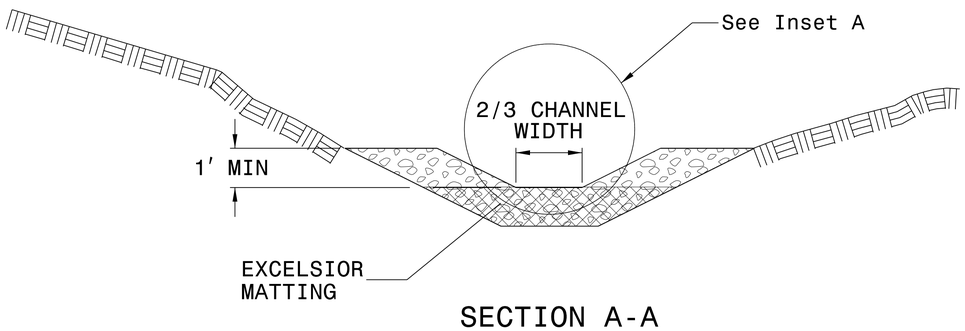
TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-2D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

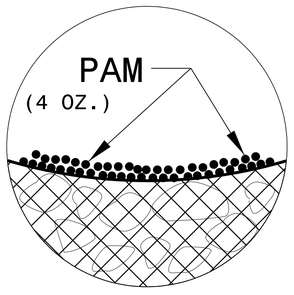
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

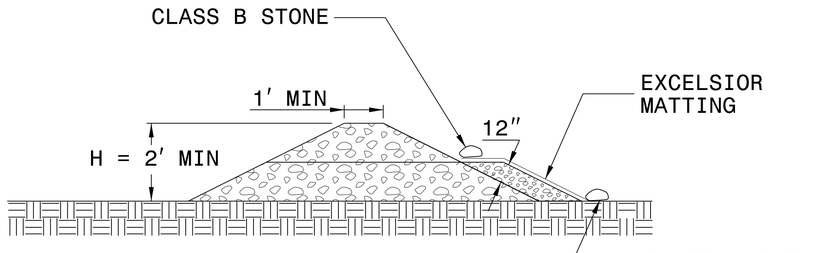
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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



INSET A

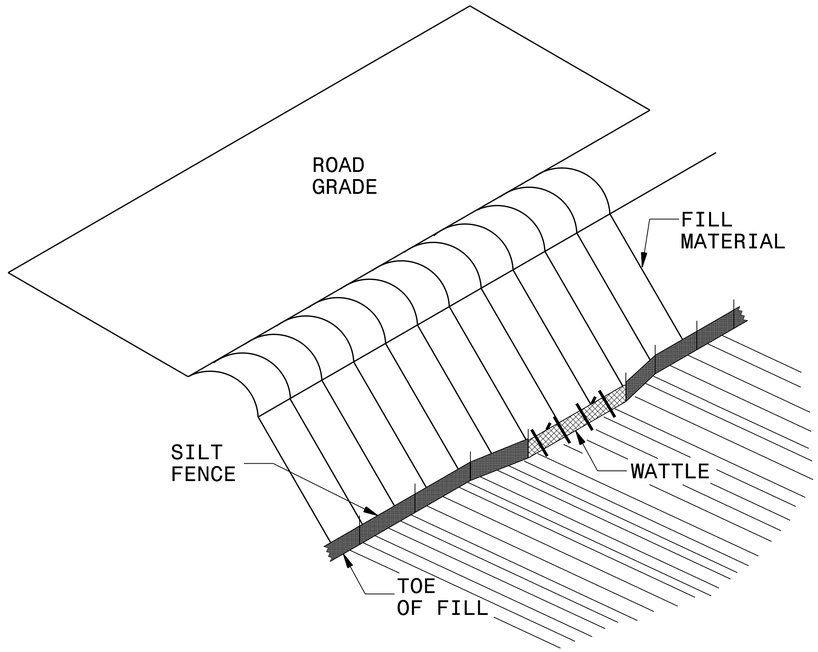


SECTION B-B

NOT TO SCALE

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-2E
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

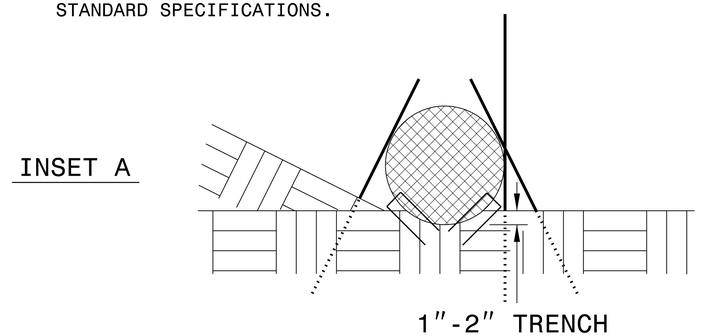
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

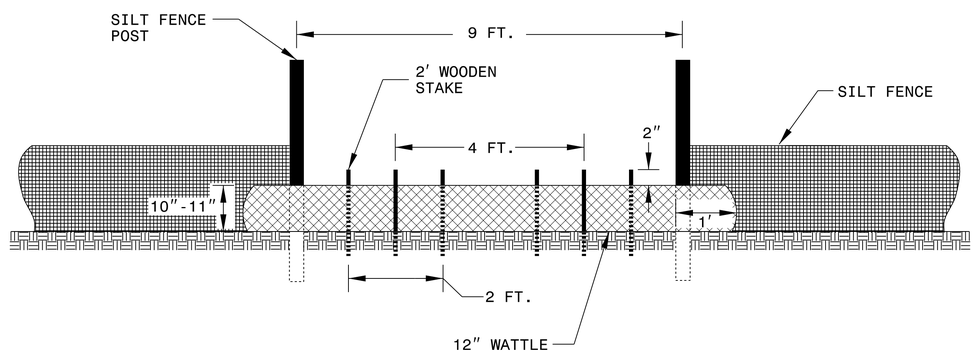
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

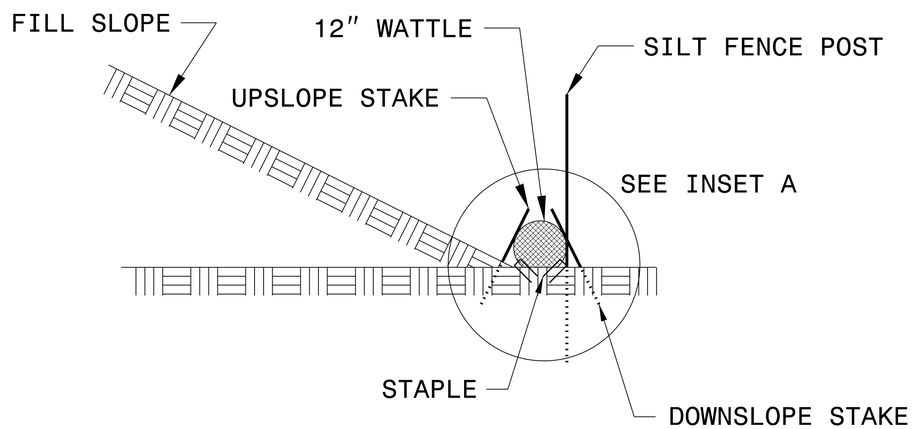
WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.





VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

EROSION CONTROL MATTING IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	135+50	128+50	LT	940
4	-L-	135+50	128+50	RT	940
4	-L-	135+50	128+00	MED	1335
5	-L-	139+50	136+00	LT	1050
5	-L-	140+00	136+00	RT	1200
5	-L-	146+50	143+00	LT	1050
5	-L-	146+00	143+00	RT	150
5	-SRIREV-	12+00	10+50	RT	170
5	-SRIREV-	17+54	15+00	RT	180
5	-SRI-	21+18	18+57	LT	185
5	-SRI-	21+18	18+57	RT	185
5	-L-	151+50	146+50	MED	890
6	-L-	163+00	153+00	RT	1340
6	Btwn -L-&-SRI-	149+50	148+00	LT	75
6	Btwn -L-&-SRI-	151+50	149+50	LT	100
7-8	-L-	178+00	173+00	RT	670
8	-L-	199+50	180+50	LT	2545
8	-L-	198+50	182+00	RT	2210
9	-L-	205+00	199+50	LT	740
9	-L-	205+00	200+00	RT	670
9	-L-	199+50	151+50	MED	8515
10	-L-	211+50	208+00	LT	470
10	-L-	212+50	210+00	RT	335
10	-L-	213+50	199+50	MED	2485
11	-L-	226+00	213+50	MED	2220
12	-L-	237+00	226+00	MED	1955
12-16	-L-	297+50	242+00	MED	9845
13-14	-L-	274+00	247+00	LT	3615
13-14	-L-	273+00	260+00	RT	1740
15	-L-	287+00	276+50	LT	1410
			SUBTOTAL		49,215

EROSION CONTROL MATTING IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
16	-L-	290+00	287+00	LT	340
16	-L-	287+00	278+50	RT	1140
16	-L-	292+00	287+00	RT	565
16	-Rmp B-	08+35	03+06	LT	605
16	-Rmp B-	14+67	08+35	LT	720
16	-L- & Rmp B	294+50	292+50	LT	270
16	-L- & Rmp C	295+00	292+50	RT	335
16	-L- & Rmp A	311+00	309+00	LT	225
16	Rmp A	13+32	12+32	RT	115
16	Rmp A	13+32	11+82	LT	140
16	-L-	328+50	325+00	LT	470
16	-L-	328+50	325+00	RT	470
16	-L-	338+50	328+50	LT	1340
16	-L-	338+50	328+50	RT	1340
16	-L-	343+50	338+50	LT	670
16	-L-	343+50	338+50	RT	670
16	-L-	346+50	343+50	LT	405
16	-L-	349+50	343+50	RT	805
16	-SR6-	11+50	10+00	LT	105
16	-SR6-	16+50	15+50	LT	70
16	-Y5-	28+50	25+50	LT	340
16	-Y5-	28+50	25+50	RT	340
16	-Y5-	31+00	30+00	LT	70
16	-L-	300+50	297+50	MED	535
16	-L-	309+50	300+50	MED	1600
16	-L-	313+50	309+50	MED	710
16,23	-Y5-	39+50	37+00	LT	335
16-17	-L-	328+50	313+50	MED	2665
17	-L-	338+50	328+50	MED	1775
19	-L-	355+00	343+50	MED	2040
			SUBTOTAL		21,210

7/1/2019
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dpiper

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-3A

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

EROSION CONTROL MATTING IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
20	-Y3-	19+50	18+00	LT	105
20	-Y3-	18+50	17+00	RT	105
20	-Y3-	22+00	18+50	RT	245
21	-SR1-	47+50	44+00	RT	320
21	-Y4-	12+50	10+50	LT	140
22	-Y5-	11+00	10+50	LT	35
22	-Y5-	13+00	11+00	LT	155
22	-Y5-	16+00	13+00	LT	255
23	-Y5-	43+00	39+50	LT	520

SUBTOTAL 1,880

EROSION CONTROL MATTING IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
		PROJECT TOTAL			72,305
			SAY		73,000

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cpiper

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-3B

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

PERMANENT SOIL REINFORCEMENT MAT IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
6	-SR1-	35+00	26+81	LT	575
6	-SR1-	35+00	26+81	RT	575
16	Rmp C	14+60	11+60	LT	405
16	Rmp C	12+80	11+60	RT	165
16	-L- & Rmp D	311+00	309+00	RT	270
16	-L- & Rmp A	309+00	305+50	LT	320
16	-SR6-	15+50	11+50	LT	280
16	-SR6-	20+00	16+00	RT	410
20	-Y3-	18+00	17+50	LT	35
21	-SR1-	40+50	35+00	LT	385
21	-SR1-	41+00	35+00	RT	420

SUBTOTAL 3,840

PERMANENT SOIL REINFORCEMENT MAT IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
		PROJECT TOTAL			3,840
		SAY			4,000

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cpiper

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-3C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
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.

7/1/2019
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PROJECT REFERENCE NO.
R-3421B
SHEET NO.
EC-4/CONST.4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DETAIL AL
FALSE SUMP
DETAIL AN
FALSE SUMP
DETAIL AM
FALSE SUMP
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4
NC GRID NAD 83/95
NOTE: ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
34 x 22 x 3 1.5 inch Skimmer with 0.875 inch Orifice Diameter 6 ft. weir (See Tiered Skimmer Basin Detail) ID B–100
Modified Silt Basin Type 'B' 34 x 22 x 3 6 ft. weir (See Tiered Skimmer Basin Detail) ID B–100
33 x 22 x 3 1.5 inch Skimmer with 0.875 inch Orifice Diameter 6 ft. weir (See Tiered Skimmer Basin Detail) ID B–102
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
PROP. WW FENCE
CONSTRUCTION BY OTHERS
I-73/74
-L-
PROP. DOUBLE FACE CABLE GUIDERAIL
MATCHLINE TO SHEET EC-5 -L- STATION 135+00
CL I RIP RAP PAD TO WETLAND BOUNDARY EST 7 TONS EST 12 SY GEOTEXTILE
30" HDPE
30" RCP-IV
15" RCP-IV
600' ACCELERATION LANE
300' UNIFORM TRANSITION
I-73/74 POC STA. 128+00.00 (R-3421A) -L- POC STA. 128+00.00 (R-3421B) BEGIN STATE PROJECT R-3421B BEGIN CONSTRUCTION
52 x 34 x 3 1.5 inch Skimmer with 1.5 inch Orifice Diameter 13 ft. weir (See Tiered Skimmer Basin Detail) ID B–101
Modified Silt Basin Type 'B' 52 x 34 x 3 13 ft. weir (See Tiered Skimmer Basin Detail) ID B–101
LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
Se = 0.03
D.S. = 70 mph
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-5/CONST.5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NC GRID NAD 83/95

MATCHLINE TO SHEET EC-4 -L- STATION 135+00

MATCHLINE TO SHEET EC-6 -L- STATION 149+00

CONSTRUCT LATERAL DITCH DURING C&G. DITCH TO BE USED AS TSD.

106 x 52 x 3
2.5 inch Skimmer
with 2.125 inch
Orifice Diameter
21 ft. weir
ID B-105

LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

Modified Silt Basin
Type 'B'
33 x 22 x 3
6 ft. weir
(See Tiered Skimmer
Basin Detail)
ID B-102

LINE TD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

63 x 27 x 3
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
6 ft. weir
ID B-103

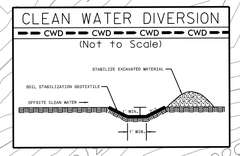
Modified Silt Basin
Type 'B'
41 x 27 x 3
8 ft. weir
(See Tiered Skimmer
Basin Detail)
ID B-106

41 x 27 x 3
1.5 inch Skimmer
with 1.125 inch
Orifice Diameter
8 ft. weir
(See Tiered Skimmer
Basin Detail)
ID B-106

CLEAN WATER DIVERSION

CWD — CWD — CWD — CWD

(Not to Scale)



NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

-SRIREV- PC Sta. 10+41.77

-SRIREV- PT Sta. 12+34.33

-SRIREV- POT Sta. 10+00.00 = -Y3- POC 20+15.00

-SRIREV- PC Sta. 14+32.06

-SRIREV- PT Sta. 15+66.52

-SRIREV- POT Sta. 17+00.38 (BK) = -SRI- PT Sta. 18+56.51 (AH)

-L- POC 140+97.00 = -Y3- POC 24+31.67

-Y3- POC 23+03.39 BEGIN APPROACH SLAB

-Y3- POC 23+16.67 BEGIN BRIDGE

-Y3- POC 25+46.67 END BRIDGE

-Y3- POC 25+60.29 END APPROACH SLAB

-Y3- POT 29+30.00 END CONSTRUCTION

-Y3- PT 27+01.85

-SRIREV-

PI Sta 11+49.10
Δ = 63° 02' 40.8" (RT)
D = 32° 44' 25.6"
L = 192.56'
T = 107.33'
R = 175.00'
Se = 0.06
Runoff = 102.00'
D.S. = 25 mph

PI Sta 14+99.81
Δ = 17° 21' 01.2" (LT)
D = 12° 54' 16.0"
L = 134.45'
T = 67.74'
R = 444.00'
Se = 0.06
Runoff = 117.00'
D.S. = 40 mph

-Y3-

PI Sta 21+23.43
Δ = 8° 41' 34.9" (RT)
D = 0° 45' 00.0"
L = 1,159.07
T = 580.65
R = 7,639.44
Se = 0.03
Runoff = 81.00'
D.S. = 60 mph

-L-

PI Sta 180+84.12
Δ = 104° 01' 52.6" (RT)
D = 0° 45' 00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
Se = 0.03
D.S. = 70 mph

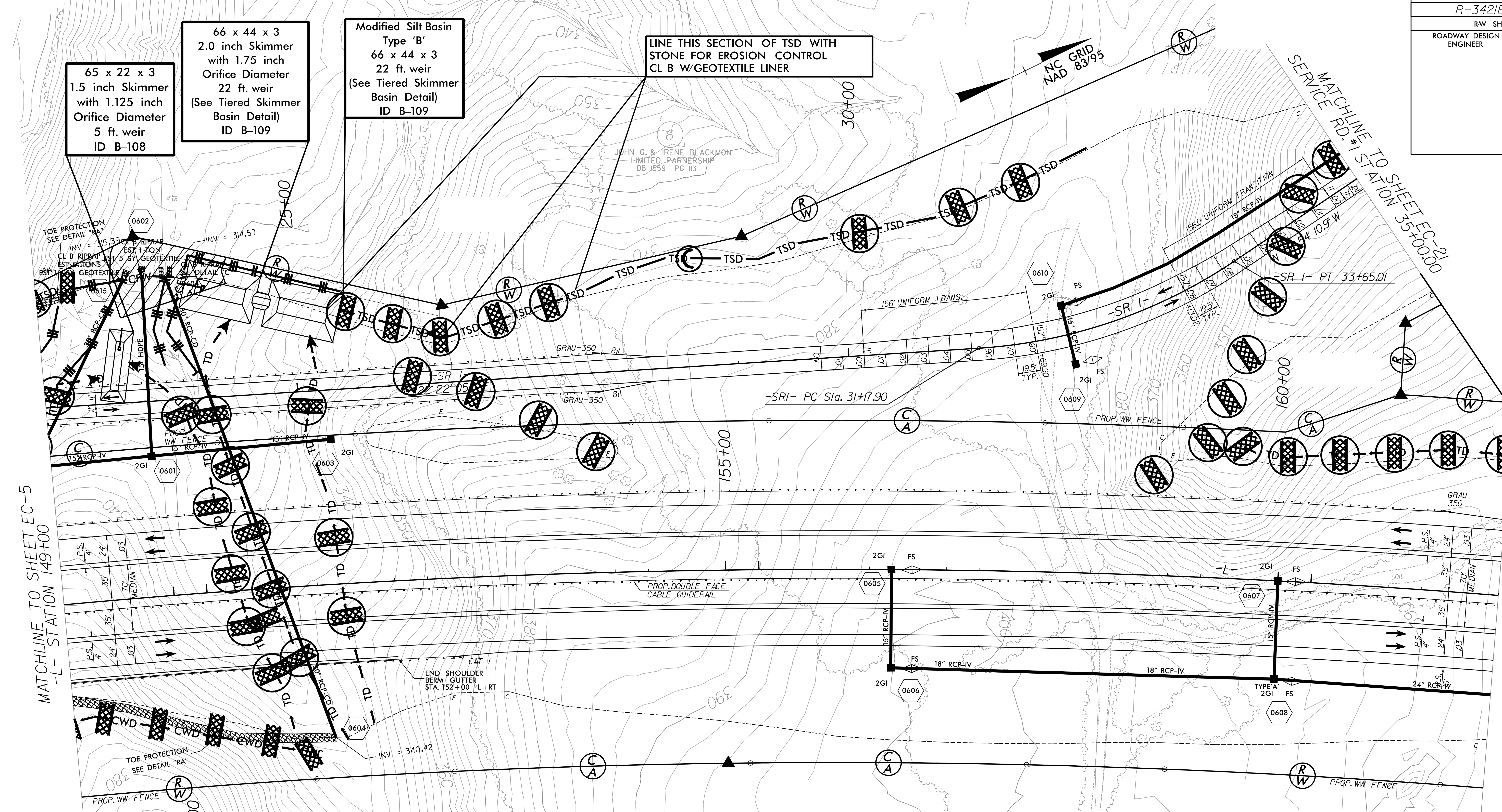
PLANS PREPARED BY :

RK&K

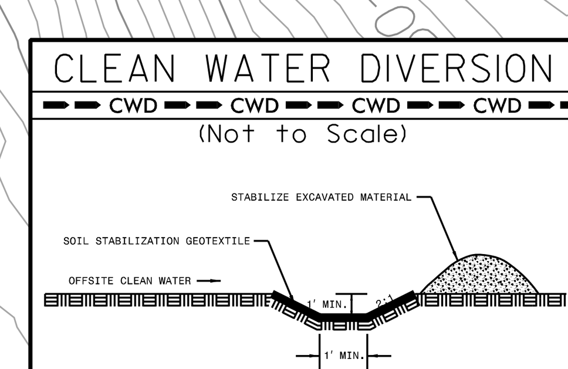
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

$DATE$ $TIME$ $FILE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-6/CONST.6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



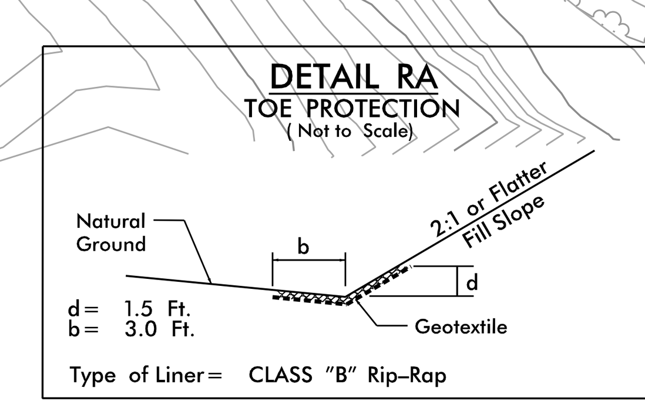
65 x 22 x 3
1.5 inch Skimmer
with 1.125 inch
Orifice Diameter
5 ft. weir
ID B-108
66 x 44 x 3
2.0 inch Skimmer
with 1.75 inch
Orifice Diameter
22 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-109
Modified Silt Basin
Type 'B'
66 x 44 x 3
22 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-109
LINE THIS SECTION OF TSD WITH
STONE FOR EROSION CONTROL
CL B W/GEOTEXTILE LINER
NC GRID
NAD 83/95
MATCHLINE TO SHEET EC-21
SERVICE RD. #1 STATION 35+00.00
MATCHLINE TO SHEET EC-5
-L- STATION 149+00
MATCHLINE TO SHEET EC-7
-L- STATION 162+00
JOHN G. & IRENE BLACKMON
LIMITED PARNERSHIP
DB 1559 PG 113
TOE PROTECTION
SEE DETAIL "RA"
-SRI- PC Sta. 31+17.90
-SR 1- PT 33+65.01
156' UNIFORM TRANS.
156.0' UNIFORM TRANSITION
PROP. WW FENCE
PROP. DOUBLE FACE
CABLE GUIDERAIL
END SHOULDER
BERM GUTTER
STA. 152+00 -L- RT
INV = 340.42
INV = 314.57
150+00
155+00
160+00
25+00
30+00



NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

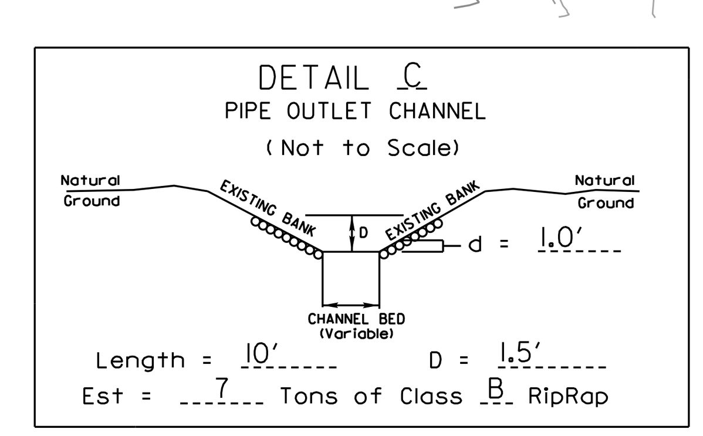
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 6

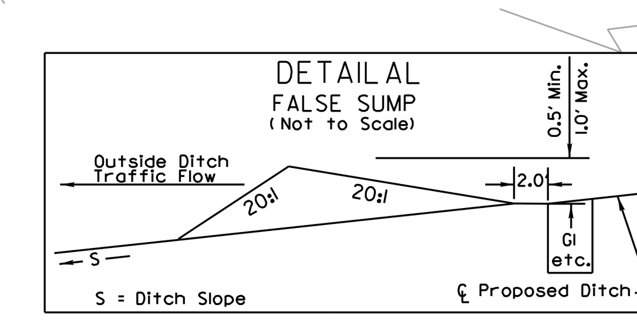


FROM STA. 149+00 -L- TO STA. 151+35 -L- RT.
(Est.Qty. 70 Tons; 161 SY GEOTEXTILE)
FROM STA. 22+71 -SR1- TO STA. 23+05 -SR1- LT.
(Est.Qty. 41 Tons; 24 SY GEOTEXTILE)

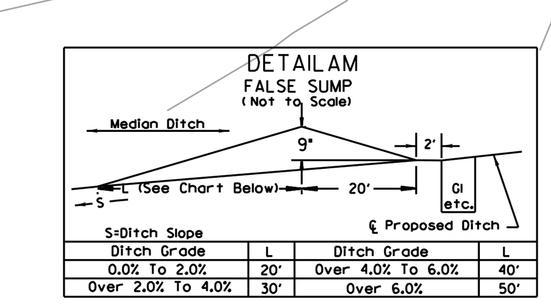
LAWRENCE C. GREENE
DB 1172 PG 177



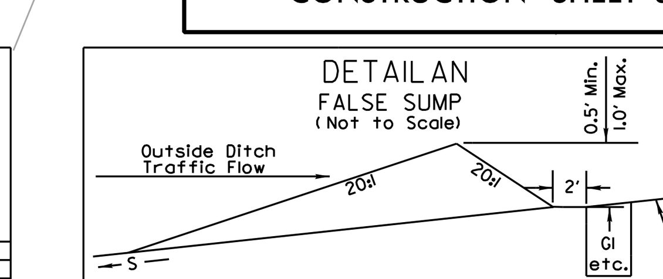
STA. 150+95.58 -L- (LT)



STA. 156+50 -L- (RT)
STA. 160+00 -L- (RT)
STA. 32+00 -SRI- (RT)



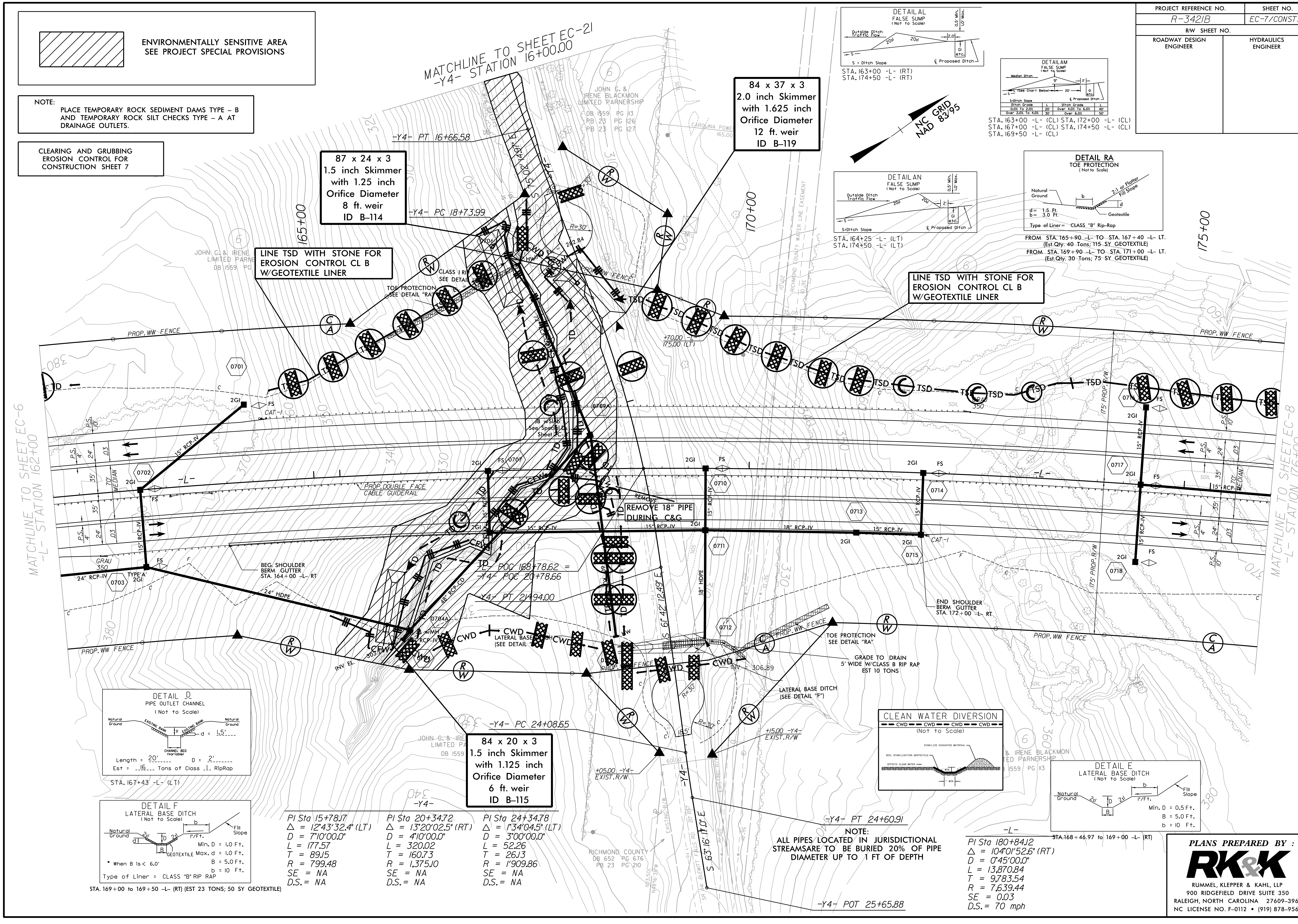
STA. 156+50 -L- (CL)
STA. 160+00 -L- (CL)



STA. 32+00 -SRI- (LT)

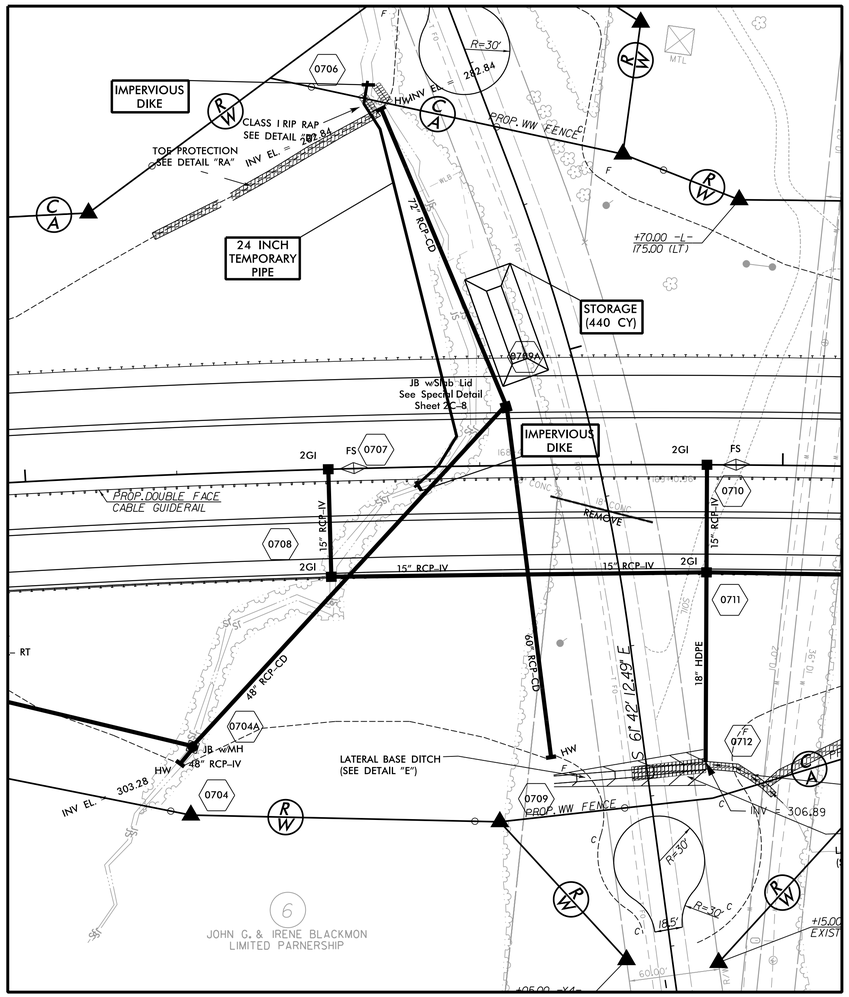
ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

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



PROJECT REFERENCE NO.
R-3421B
SHEET NO.
EC-7/CONST.7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 7
MATCHLINE TO SHEET EC-21 -Y4- STATION 16+00.00
MATCHLINE TO SHEET EC-6 -L- STATION 162+00
MATCHLINE TO SHEET EC-8 -L- STATION 176+00
NC GRID NAD 83/95
87 x 24 x 3 1.5 inch Skimmer with 1.25 inch Orifice Diameter 8 ft. weir ID B-114
84 x 37 x 3 2.0 inch Skimmer with 1.625 inch Orifice Diameter 12 ft. weir ID B-119
84 x 20 x 3 1.5 inch Skimmer with 1.125 inch Orifice Diameter 6 ft. weir ID B-115
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
REMOVE 18" PIPE DURING C&G
JOHN G. & IRENE BLACKMON LIMITED PARNERSHIP DB 1559 PG 113 PB 23 PG 126 PB 23 PG 127
RICHMOND COUNTY DB 652 PG 676 PB 23 PG 210
RICHMOND COUNTY WATER LINE EASEMENT
-Y4- PT 16+66.58
-Y4- PC 18+73.99
-Y4- PC 24+08.65
-Y4- PT 24+60.91
-Y4- POT 25+65.88
-Y4- POC 20+78.66
-Y4- PT 21+94.00
POC 168+78.62
PROP. WW FENCE
PROP. DOUBLE FACE CABLE GUIDERAIL
BEG. SHOULDER BERM GUTTER STA. 164+00 -L- RT
END SHOULDER BERM GUTTER STA. 172+00 -L- RT
TOE PROTECTION SEE DETAIL "RA"
GRADE TO DRAIN 5' WIDE W/CLASS B RIP RAP EST 10 TONS
LATERAL BASE DITCH (SEE DETAIL "F")
INV - 306.89
165+00
170+00
175+00
DETAIL AL FALSE SUMP (Not to Scale)
STA. 163+00 -L- (RT) STA. 174+50 -L- (RT)
DETAIL AM FALSE SUMP (Not to Scale)
STA. 163+00 -L- (CL) STA. 172+00 -L- (CL) STA. 167+00 -L- (CL) STA. 174+50 -L- (CL) STA. 169+50 -L- (CL)
DETAIL AN FALSE SUMP (Not to Scale)
STA. 164+25 -L- (LT) STA. 174+50 -L- (LT)
DETAIL RA TOE PROTECTION (Not to Scale)
d = 1.5 Ft. b = 3.0 Ft.
Type of Liner = CLASS "B" Rip-Rap
FROM STA. 165+90 -L- TO STA. 167+40 -L- LT. (Est.Qty. 40 Tons; 115 SY GEOTEXTILE)
FROM STA. 169+90 -L- TO STA. 171+00 -L- LT. (Est.Qty. 30 Tons; 75 SY GEOTEXTILE)
DETAIL D PIPE OUTLET CHANNEL (Not to Scale)
Length = 20' D = 2' d = 1.5'
Est = 16 Tons of Class I RipRap
STA. 167+43 -L- (LT)
DETAIL F LATERAL BASE DITCH (Not to Scale)
Min. D = 1.0 Ft. Max. d = 1.0 Ft. B = 5.0 Ft. b = 10 Ft.
* When B is < 6.0'
Type of Liner = CLASS "B" RIP RAP
STA. 169+00 to 169+50 -L- (RT) (EST 23 TONS; 50 SY GEOTEXTILE)
CLEAN WATER DIVERSION (Not to Scale)
DETAIL E LATERAL BASE DITCH (Not to Scale)
Min. D = 0.5 Ft. B = 5.0 Ft. b = 10 Ft.
STA. 168+46.97 to 169+00 -L- (RT)
PI Sta 15+78.17 △ = 12°43'32.4" (LT) D = 7°10'00.0" L = 177.57 T = 89.15 R = 799.48 SE = NA D.S.= NA
PI Sta 20+34.72 △ = 13°20'02.5" (RT) D = 4°10'00.0" L = 320.02 T = 160.73 R = 1,375.10 SE = NA D.S.= NA
PI Sta 24+34.78 △ = 1°34'04.5" (LT) D = 3°00'00.0" L = 52.26 T = 26.13 R = 1,909.86 SE = NA D.S.= NA
NOTE: ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
-L- PI Sta 180+84.12 △ = 104°01'52.6" (RT) D = 0°45'00.0" L = 13,870.84 T = 9,783.54 R = 7,639.44 SE = 0.03 D.S.= 70 mph
PLANS PREPARED BY: RK&K RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-7A/CONST.7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



CULVERT CONSTRUCTION SEQUENCE –L– 168+00

1. CONSTRUCT STILLING BASIN (440 CY).
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
3. INSTALL 24" TEMPORARY PIPE AT A MINIMUM SLOPE OF 1%. DIVERT STREAM THROUGH TEMPORARY PIPE.
4. INSTALL PROPOSED 60" REINFORCED CONCRETE PIPE INCLUDING HEADWALL AND OUTLET IMPROVEMENTS AS SHOWN IN DETAIL 'D'.
5. REMOVE IMPERVIOUS DIKES AND TEMPORARY PIPE AND DIVERT STREAM THROUGH NEW PIPE.
6. REMOVE STILLING BASIN.
7. CONSTRUCT ROADWAY FILL.

PLANS PREPARED BY :

RK&K

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

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-8/CONST.8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

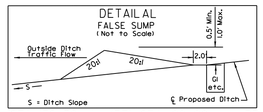
ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 8

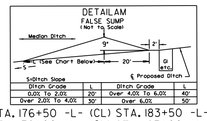
NC GRID
NAD 83/95

DETAIL AL
FALSE SUMP
(Not to Scale)



STA. 176+50 -L- (RT) STA. 190+00 -L- (RT)
STA. 183+50 -L- (RT)
STA. 187+00 -L- (RT)

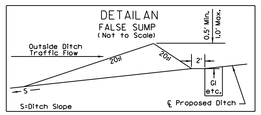
DETAIL AM
FALSE SUMP
(Not To Scale)



S=Ditch Slope			
Ditch Grade	L	Ditch Grade	L
0.00 To 2.00	20'	Over 4.00 To 6.00	40'
Over 2.00 To 4.00	30'	Over 6.00	50'

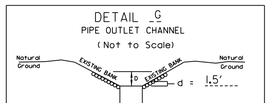
STA. 176+50 -L- (CL) STA. 183+50 -L- (CL)
STA. 179+00 -L- (CL) STA. 187+00 -L- (CL)
STA. 181+00 -L- (CL) STA. 190+00 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)



STA. 176+50 -L- (LT) STA. 190+00 -L- (LT)
STA. 183+50 -L- (LT)
STA. 187+00 -L- (LT)

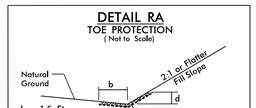
DETAIL C
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 12' D = 2.0'
Est = 11 Tons of Class I RipRap

STA. 178+71.06 -L- (LT)
STA. 179+59 -L- (RT) -(25' long)

DETAIL RA
TOE PROTECTION
(Not to Scale)



d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "B" Rip-Rap

FROM STA. 178+00 -L- TO STA. 180+00 -L- LT.
(Est.Qty. 70 Tons; 147 SY GEOTEXTILE)
FROM STA. 178+25 -L- TO STA. 179+45 -L- RT.
(Est.Qty. 30 Tons; 84 SY GEOTEXTILE)

70 x 35 x 3
1.5 inch Skimmer
with 1.375 inch
Orifice Diameter
9 ft. weir
ID B–122

42 x 20 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
4 ft. weir
ID B–121

90 x 44 x 3
2.0 inch Skimmer
with 1.75 inch
Orifice Diameter
15 ft. weir
ID B–128

LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

60 x 29 x 3
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
7 ft. weir
ID B–120

88 x 32 x 3
1.5 inch Skimmer
with 1.5 inch
Orifice Diameter
11 ft. weir
ID B–123

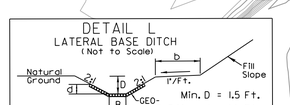
LINE THIS SECTION OF TSD WITH STONE FOR EROSIN CONTROL CL B W/GEOTEXTILE LINER

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

INSTALL PIPE(S) IN JURISDICTIONAL AREAS WITHOUT IMPACTING STREAM UNTIL AREA STABILIZED AND ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph

DETAIL L
LATERAL BASE DITCH
(Not to Scale)



* When B is < 6.0'
Type of Liner = CLASS "I"

STA. 179+55 TO 181+00-L-(RT)
EST 74 TONS; EST 156 SY GEOTEXTILE; 68 CY DDE

MATCHLINE TO SHEET EC-7 -L- STATION 176+00

MATCHLINE TO SHEET EC-9 -L- STATION 189+90

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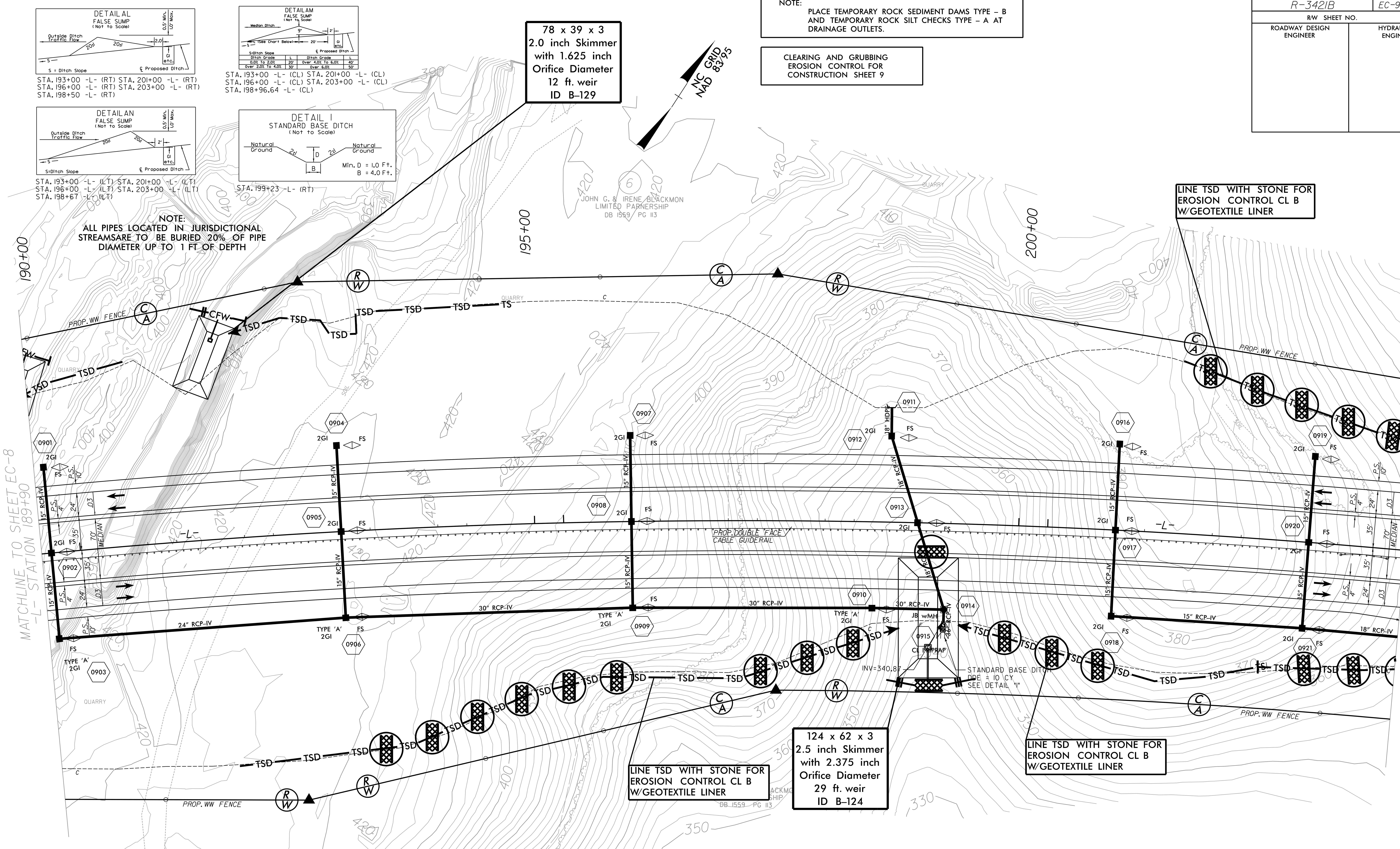
$DATE$ $TIME$ $FILE$

RIGHT OF WAY REVISION: SEPT. 11, 2014 - PROPERTY OWNER NAME CHANGED ON PARCEL 6.

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-9/CONST.9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 9



-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S.= 70 mph

PLANS PREPARED BY :
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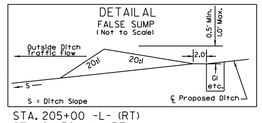
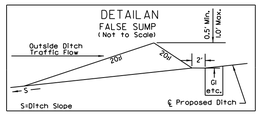
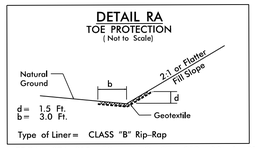
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-10/CONST.10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



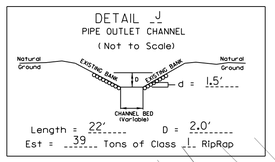
STA. 205+00 -L- (RT)
STA. 211+50 -L- (RT)



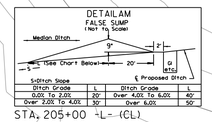
STA. 205+00-L- (LT)
STA. 211+50 -L- (LT)



FROM STA. 215+50 -L- TO STA. 218+00 -L- RT.
(Est.Qty. 70 Tons; 170 SY GEOTEXTILE)



STA. 216+69.17 -L- (LT)



STA. 205+00 -L- (CL)
STA. 209+00 -L- (CL)
STA. 211+50 -L- (CL)
STA. 215+50 -L- (CL)

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 10

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

NC GRID NAD 83'95

Modified Silt Basin Type 'B' 42 x 26 x 3 8 ft. weir (See Tiered Skimmer Basin Detail) ID B–126

42 x 26 x 3 1.5 inch Skimmer with 1.125 inch Orifice Diameter 8 ft. weir (See Tiered Skimmer Basin Detail) ID B–126

52 x 16 x 3 1.5 inch Skimmer with 0.75 inch Orifice Diameter 4 ft. weir ID B–131

205+00

210+00

215+00

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

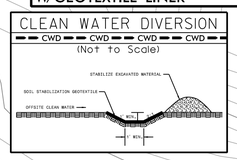
75 x 70 x 3 2.0 inch Skimmer with 2.0 inch Orifice Diameter 20 ft. weir ID B–125

Modified Silt Basin Type 'B' 48 x 16 x 3 6 ft. weir (See Tiered Skimmer Basin Detail) ID B–127

48 x 16 x 3 1.5 inch Skimmer with 0.875 inch Orifice Diameter 6 ft. weir (See Tiered Skimmer Basin Detail) ID B–127

37 x 15 x 3 1.5 inch Skimmer with 0.75 inch Orifice Diameter 4 ft. weir (See Tiered Skimmer Basin Detail) ID B–130

Modified Silt Basin Type 'B' 37 x 15 x 3 4 ft. weir (See Tiered Skimmer Basin Detail) ID B–130



MATCHLINE TO SHEET EC-9 -L- STATION 204+00

MATCHLINE TO SHEET EC-11 -L- STATION 218+00

PROP. WW FENCE

PROP. DOUBLE FACE CABLE GUIDERAIL

JOHN C. & IRENE BLACKMON LIMITED PARNERSHIP DB 1559 PG 113

B. V. HEDRICK GRAVEL AND SAND COMPANY DB 1035 PG 260

RAILROAD IRON

-L-
PI Sta 180+84.12
△ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

PLANS PREPARED BY :
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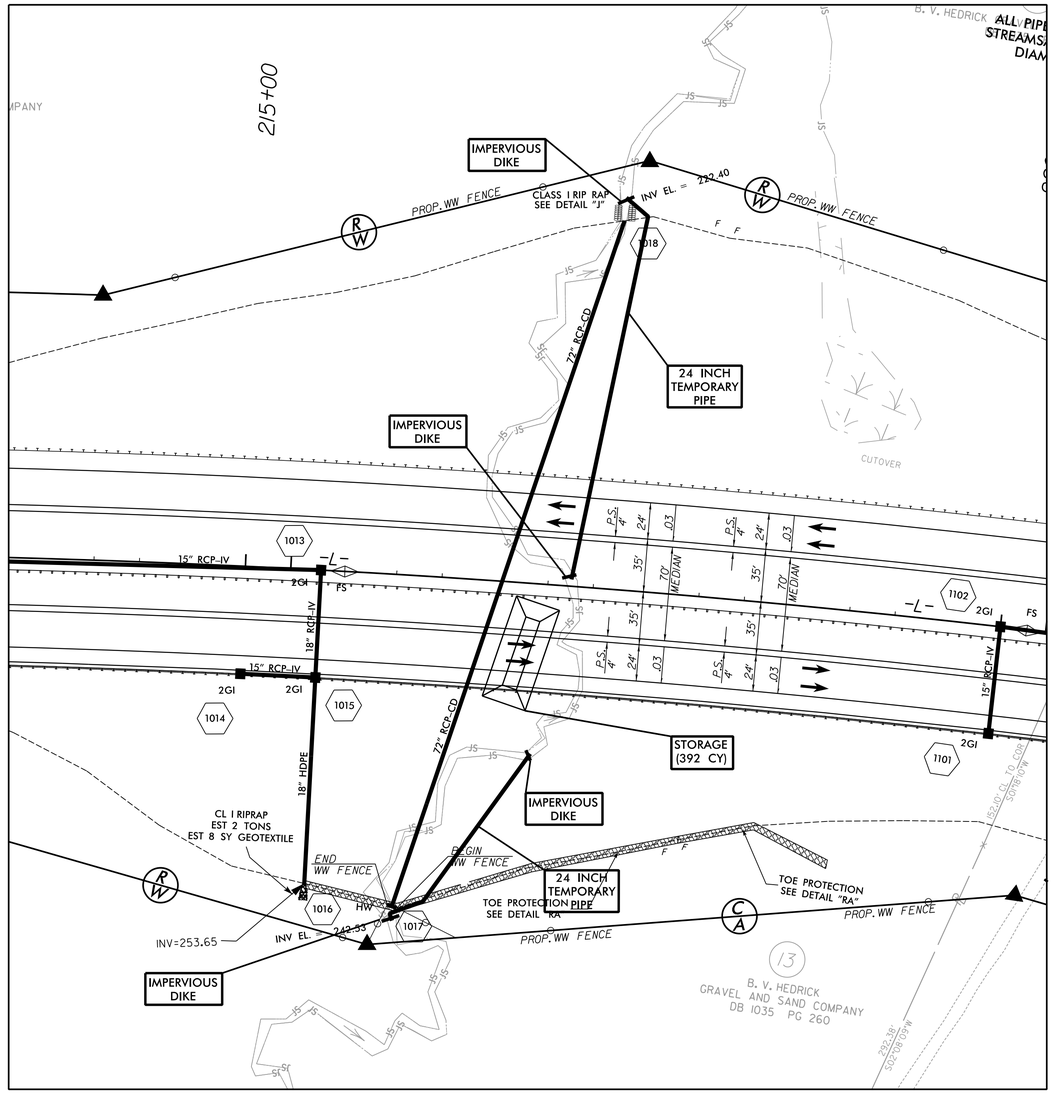
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-10A/CONST. 10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

CULVERT CONSTRUCTION SEQUENCE –L– 216+70

1. CONSTRUCT STILLING BASIN (392 CY).
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
3. INSTALL 24" TEMPORARY PIPES AT A MINIMUM SLOPE OF 1%. DIVERT STREAM THROUGH TEMPORARY PIPES AND EXISTING STREAM AS SHOWN ON PLANS.
4. INSTALL PROPOSED 72" REINFORCED CONCRETE PIPE INCLUDING HEADWALL AND OUTLET IMPROVEMENTS SHOWN IN DETAIL 'J'.
5. REMOVE IMPERVIOUS DIKES AND TEMPORARY PIPES AND DIVERT STREAM THROUGH NEW PIPE.
6. REMOVE STILLING BASIN.
7. CONSTRUCT ROADWAY FILL.



PLANS PREPARED BY :

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900 RIDGEFIELD DRIVE SUITE 350
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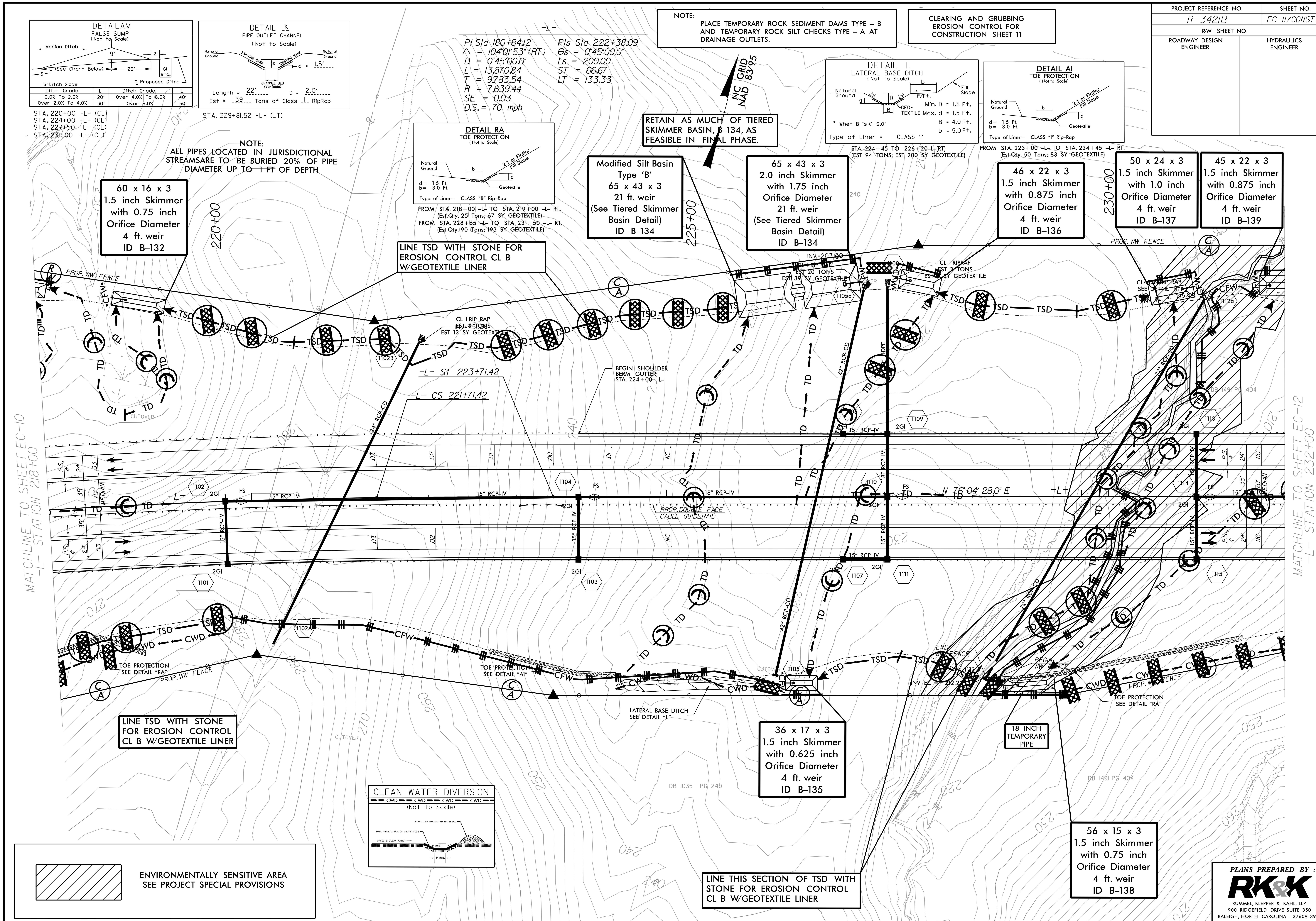
FOR THE NORTH CAROLINA TURNPIKE AUTHORITY



PROJECT REFERENCE NO.
SHEET NO.
R-3421B
EC-11/CONST.11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 11
DETAIL AM
FALSE SUMP
(Not to Scale)
S=Ditch Slope
Ditch Grade
Ditch Grade
0.0% To 2.0%
Over 4.0% To 6.0%
Over 2.0% To 4.0%
Over 6.0%
STA. 220+00 -L- (CL)
STA. 224+00 -L- (CL)
STA. 227+50 -L- (CL)
STA. 231+00 -L- (CL)
DETAIL K
PIPE OUTLET CHANNEL
(Not to Scale)
Length = 22'
D = 2.0'
Est = 39 Tons of Class I RipRap
STA. 229+81.52 -L- (LT)
-L-
PI Sta 180+84.12
Δ = 104°01'53" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph
PIs Sta 222+38.09
Θs = 0°45'00.0"
Ls = 200.00
ST = 66.67
LT = 133.33
NC GRID NAD 83/95
DETAIL RA
TOE PROTECTION
(Not to Scale)
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "B" Rip-Rap
FROM STA. 218+00 -L- TO STA. 219+00 -L- RT. (Est.Qty. 25 Tons; 67 SY GEOTEXTILE)
FROM STA. 228+65 -L- TO STA. 231+50 -L- RT. (Est.Qty. 90 Tons; 193 SY GEOTEXTILE)
RETAIN AS MUCH OF TIERED SKIMMER BASIN, B-134, AS FEASIBLE IN FINAL PHASE.
DETAIL L
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.
* When B is < 6.0'
Type of Liner = CLASS "I"
STA. 224+45 TO 226+20 -L- (RT)
(EST 94 TONS; EST 200 SY GEOTEXTILE)
DETAIL AI
TOE PROTECTION
(Not to Scale)
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "I" Rip-Rap
FROM STA. 223+00 -L- TO STA. 224+45 -L- RT.
(Est.Qty. 50 Tons; 83 SY GEOTEXTILE)
NOTE: ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
60 x 16 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
4 ft. weir
ID B-132
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
Modified Silt Basin
Type 'B'
65 x 43 x 3
21 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-134
65 x 43 x 3
2.0 inch Skimmer
with 1.75 inch
Orifice Diameter
21 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-134
46 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-136
50 x 24 x 3
1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
4 ft. weir
ID B-137
45 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-139
220+00
225+00
230+00
-L- ST 223+71.42
-L- CS 221+71.42
BEGIN SHOULDER BERM GUTTER STA. 224+00 -L-
PROP. WW FENCE
PROP. DOUBLE FACE CABLE GUIDERAIL
N 76°04'28.0" E
MATCHLINE TO SHEET EC-10 -L- STATION 218+00
MATCHLINE TO SHEET EC-12 -L- STATION 232+00
TOE PROTECTION SEE DETAIL "RA"
TOE PROTECTION SEE DETAIL "AI"
LATERAL BASE DITCH SEE DETAIL "L"
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
36 x 17 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
4 ft. weir
ID B-135
18 INCH TEMPORARY PIPE
TOE PROTECTION SEE DETAIL "RA"
DB 1035 PG 240
DB 1491 PG 404
CLEAN WATER DIVERSION
(Not to Scale)
LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
56 x 15 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
4 ft. weir
ID B-138
ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS
PLANS PREPARED BY:
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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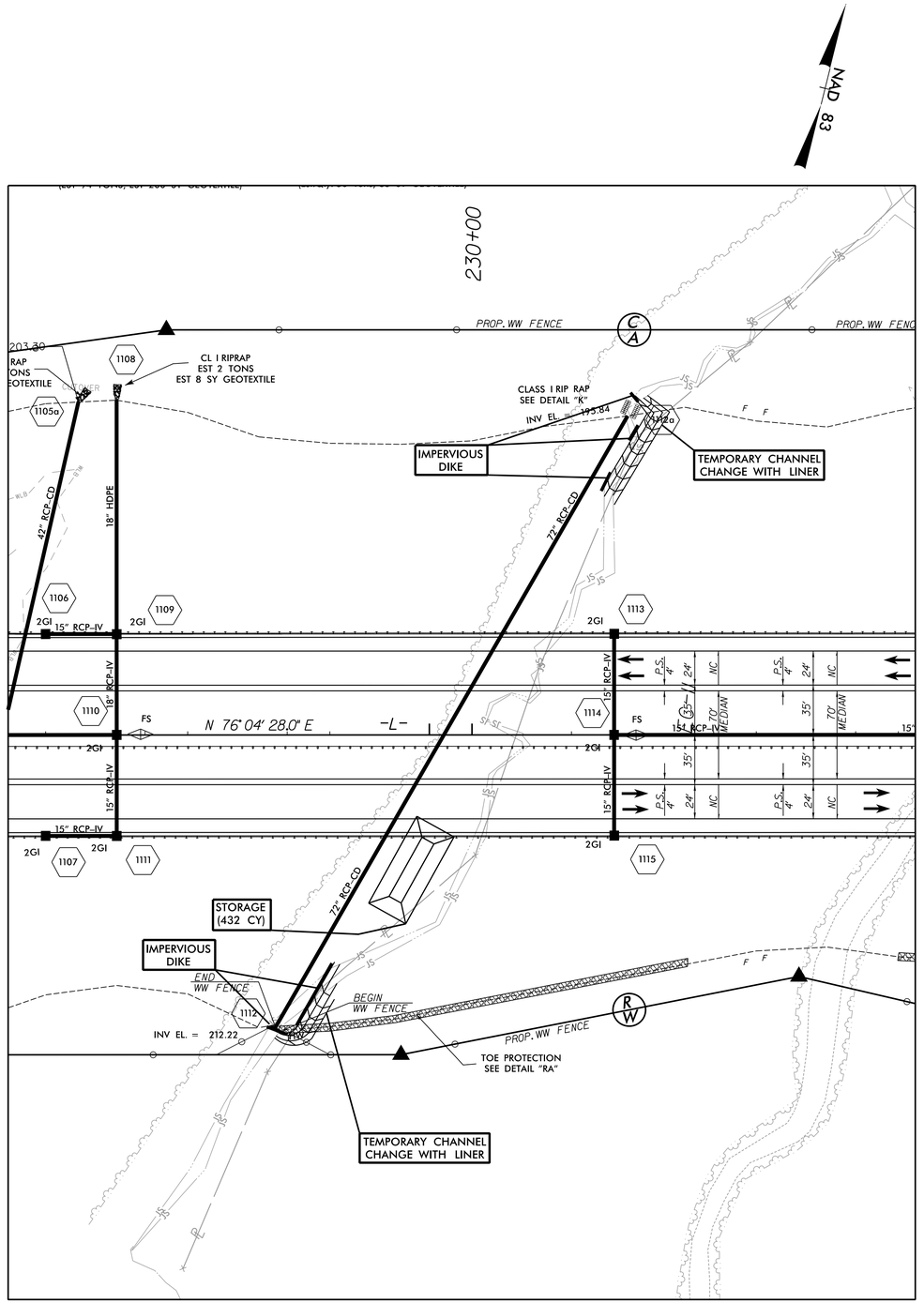
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-11A/CONST. 11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CULVERT CONSTRUCTION SEQUENCE –L– 229+80

1. CONSTRUCT STILLING BASIN (432 CY).
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
3. INSTALL TEMPORARY CHANNEL CHANGES WITH TYPE IV GEOTEXTILE LINER (5 FT BASE, 2 FT DEEP, 2:1 SIDE SLOPES). DIVERT STREAM THROUGH TEMPORARY CHANNEL CHANGES AND EXISTING CHANNEL AS SHOWN ON PLANS.
4. INSTALL PROPOSED 72" REINFORCED CONCRETE PIPE INCLUDING HEADWALL AND OUTLET IMPROVEMENTS SHOWN IN DETAIL 'K'.
5. REMOVE IMPERVIOUS DIKES AND TEMPORARY CHANNEL CHANGES AND DIVERT STREAM THROUGH NEW PIPE.
6. REMOVE STILLING BASIN.
7. CONSTRUCT ROADWAY FILL.



PLANS PREPARED BY :

RK&K

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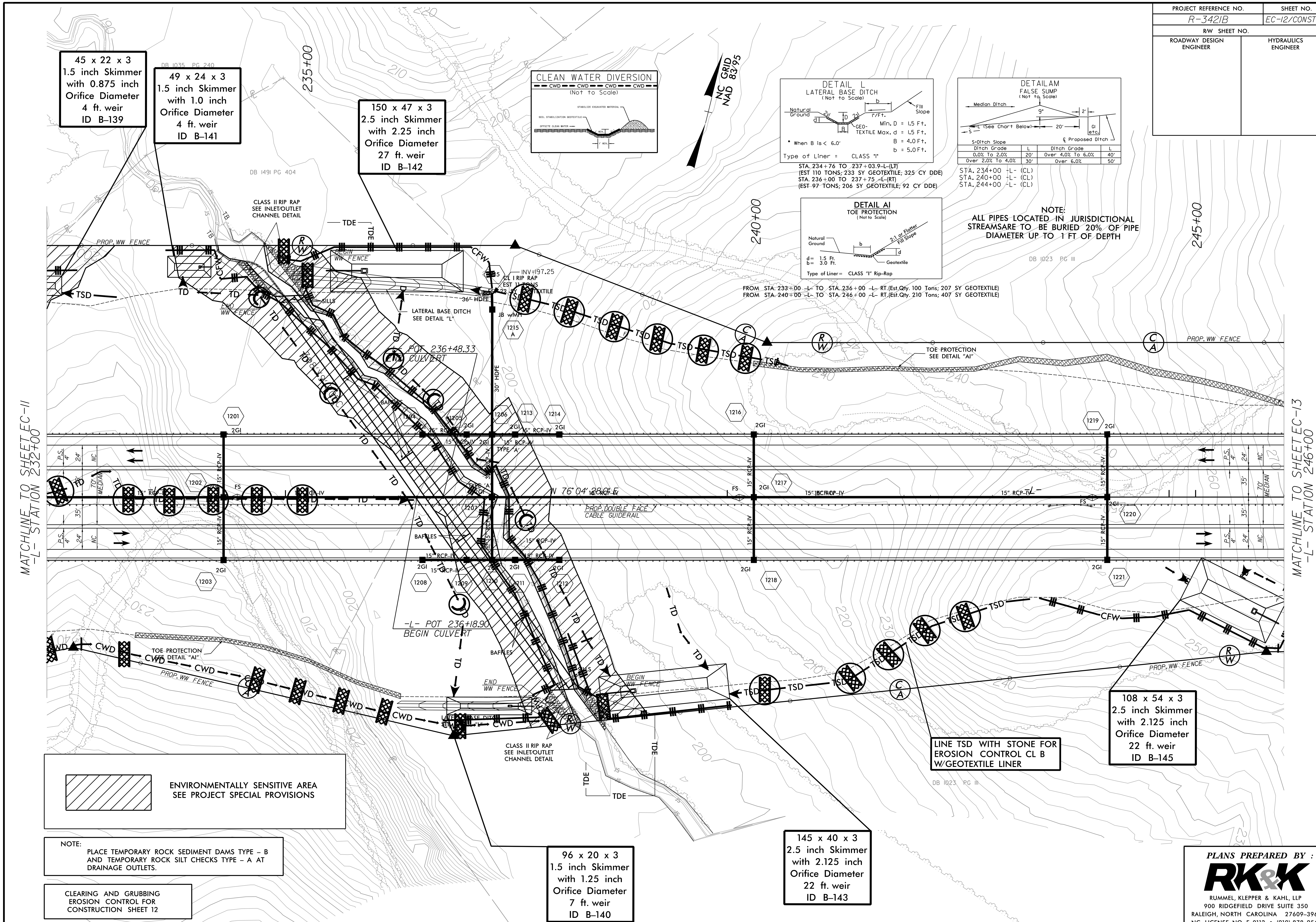
FOR
THE NORTH CAROLINA TURNPIKE AUTHORITY



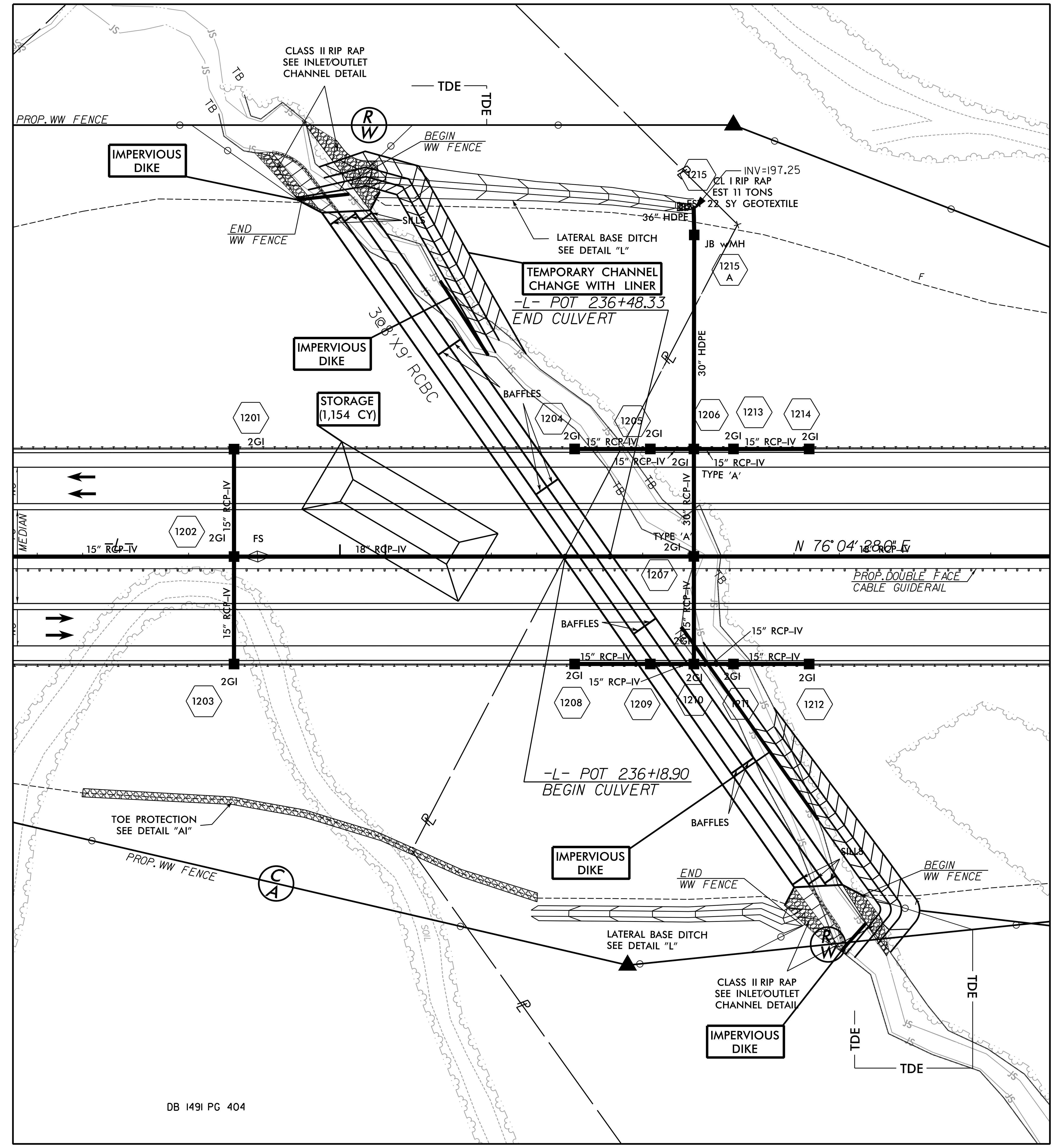
PROJECT REFERENCE NO.
SHEET NO.
R-3421B
EC-12/CONST.12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
45 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-139
49 x 24 x 3
1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
4 ft. weir
ID B-141
150 x 47 x 3
2.5 inch Skimmer
with 2.25 inch
Orifice Diameter
27 ft. weir
ID B-142
CLEAN WATER DIVERSION
(Not to Scale)
NC GRID NAD 83/95
DETAIL L
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
GEO-TEXTILE
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.
* When B is < 6.0'
Type of Liner = CLASS "I"
STA. 234+76 TO 237+03.9 -L- (LT)
(EST 110 TONS; 233 SY GEOTEXTILE; 325 CY DDE)
STA. 236+00 TO 237+75 -L- (RT)
(EST 97 TONS; 206 SY GEOTEXTILE; 92 CY DDE)
DETAIL AM
FALSE SUMP
(Not to Scale)
Median Ditch
(See Chart Below)
S=Ditch Slope
℄ Proposed Ditch
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'
STA. 234+00 -L- (CL)
STA. 240+00 -L- (CL)
STA. 244+00 -L- (CL)
DETAIL AI
TOE PROTECTION
(Not to Scale)
Natural Ground
2:1 or Flatter Fill Slope
Geotextile
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner = CLASS "I" Rip-Rap
FROM STA. 233+00 -L- TO STA. 236+00 -L- RT. (Est. Qty. 100 Tons; 207 SY GEOTEXTILE)
FROM STA. 240+00 -L- TO STA. 246+00 -L- RT. (Est. Qty. 210 Tons; 407 SY GEOTEXTILE)
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
235+00
240+00
245+00
DB 1035 PG 240
DB 1491 PG 404
DB 1023 PG III
CLASS II RIP RAP
SEE INLET/OUTLET
CHANNEL DETAIL
PROP. WW FENCE
BEGIN WW FENCE
END WW FENCE
INV=197.25
CL I RIP RAP
36" HDPE
30" HDPE
LATERAL BASE DITCH
SEE DETAIL "L"
POT 236+48.33
CULVERT
-L- POT 236+18.90
BEGIN CULVERT
BAFFLES
SILLS
TOE PROTECTION
SEE DETAIL "AI"
N 76° 04' 28.0" E
PROP. DOUBLE FACE CABLE GUIDERAIL
15" RCP-IV
2GI
MATCHLINE TO SHEET EC-11
-L- STATION 232+00
MATCHLINE TO SHEET EC-13
-L- STATION 246+00
LINE TSD WITH STONE FOR
EROSION CONTROL CL B
W/GEOTEXTILE LINER
108 x 54 x 3
2.5 inch Skimmer
with 2.125 inch
Orifice Diameter
22 ft. weir
ID B-145
96 x 20 x 3
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
7 ft. weir
ID B-140
145 x 40 x 3
2.5 inch Skimmer
with 2.125 inch
Orifice Diameter
22 ft. weir
ID B-143
ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 12
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-12A/CONST. 12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

CULVERT CONSTRUCTION SEQUENCE -L- 236+36

1. CONSTRUCT STILLING BASIN (1,154 CY).
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
3. INSTALL TEMPORARY CHANNEL CHANGES WITH TYPE IV GEOTEXTILE LINER (6 FT BASE, 3 FT DEEP, 2:1 SIDE SLOPES). DIVERT STREAM THROUGH TEMPORARY CHANNEL CHANGES AND EXISTING CHANNEL AS SHOWN ON PLANS.
4. INSTALL (3)-9'x9' REINFORCED CONCRETE BOX CULVERT, INCLUDING WINGWALLS AT BOTH ENDS AND INLET IMPROVEMENTS.
5. REMOVE IMPERVIOUS DIKES AND TEMPORARY CHANNEL CHANGES AND DIVERT STREAM THROUGH NEW CULVERT.
6. USING PUMP AROUND OPERATIONS, CONSTRUCT OUTLET CHANNEL IMPROVEMENTS.
7. REMOVE STILLING BASIN.
8. CONSTRUCT ROADWAY FILL.



PLANS PREPARED BY :

RK&K

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

FOR
THE NORTH CAROLINA TURNPIKE AUTHORITY

8/17/99

$$$$$$TIME$$$$$
R:\Hydraulics\CADD\PSH\Erosion Control\r-3421b_EC_psh12a.dgn

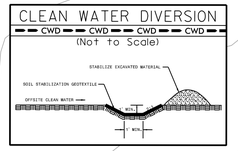
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-13/CONST.13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 13

NC GRID NAD 83/95

CLEAN WATER DIVERSION
(Not to Scale)



COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

250+00
255+00
MATCHLINE TO SHEET EC-12 -L- STATION 246+00
MATCHLINE TO SHEET EC-14 -L- STATION 259+90

PROP. WW FENCE
STD BERM DITCH 240.01 WBDO
FROM STA 250+00 – 252+50 -L- LT
BERM BASE DITCH SEE DETAIL "M"
STANDARD BASE DITCH SEE DETAIL "N"
END SHOULDER BERM GUTTER STA. 246+25 -L- LT
END SHOULDER BERM GUTTER STA. 248+50 -L-
GRAU 350
PROP. DOUBLE FACE CABLE GUIDERAIL
N 76° 04' 28.0" E
INV=253.50
CL I RIP RAP
EST 17 TONS
EST 38 SY GEOTEXTILE
CL I RIP RAP
EST 10 TONS
EST 20 SY GEOTEXTILE

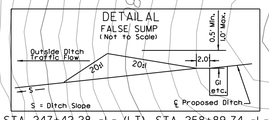
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

66 x 33 x 3
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
8 ft. weir
ID B–146

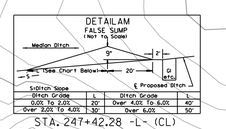
95 x 35 x 3
2.0 inch Skimmer
with 1.625 inch
Orifice Diameter
13 ft. weir
ID B–147

DETAIL AL
FALSE SUMP
(Not to Scale)



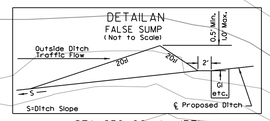
STA. 247+42.28 -L- (LT)
STA. 250+00 -L- (LT)
STA. 253+00 -L- (LT)
STA. 258+89.74 -L- (LT)
STA. 260+00 -L- (LT)

DETAIL AM
FALSE SUMP
(Not to Scale)



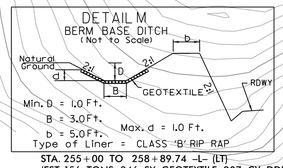
STA. 247+42.28 -L- (CL)
STA. 250+00 -L- (CL)
STA. 253+00 -L- (CL)
STA. 258+58.81 -L- (CL)
STA. 260+00 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)



STA. 250+00 -L- (RT)
STA. 253+00 -L- (RT)
STA. 260+00 -L- (RT)

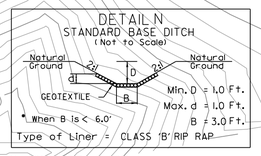
DETAIL M
BERM BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 3.0 Ft.
b = 5.0 Ft. Max. d = 1.0 Ft.
Type of Liner = CLASS "B" RIP RAP

STA. 255+00 TO 258+89.74 -L- (LT)
(EST 156 TONS; 346 SY GEOTEXTILE; 207 CY DDE)
STA. 258+89.74 TO 260+00 -L- (LT)
(EST 39 TONS; 86 SY GEOTEXTILE)

DETAIL N
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner = CLASS "B" RIP RAP

STA. 258+89.74 -L- (LT)
DDE = 53 CY
EST 16 TONS
EST 31 SY GEOTEXTILE

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

$DATE$ $TIME$ $FILE$

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609–3960
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PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-14/CONST.14
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR CONSTRUCTION SHEET 14

NC GRID NAD 83 95

260+00 265+00 270+00

COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

PROP. WW FENCE

BERM BASE DITCH SEE DETAIL "M"

MATCHLINE TO SHEET EC-13 -L- STATION 259+90

MATCHLINE TO SHEET EC-15 -L- STATION 274+00

1401 1402 1403 1404 1405 1406 1407 1408 1409

2GI TYPE 'A' 2GI

18" RCP-IV 24" RCP-IV 15" RCP-IV

-L-

N 76° 04' 28.0" E

PROP. DOUBLE FACE CABLE GUIDERAIL

TSD

LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

122 x 40 x 3
2.0 inch Skimmer
with 1.875 inch
Orifice Diameter
19 ft. weir
ID B-148

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

78 x 39 x 3
2.0 inch Skimmer
with 1.625 inch
Orifice Diameter
12 ft. weir
ID B-149

COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

DETAIL AL
FALSE SUMP
(Not to Scale)

STA. 264+00 -L- (LT)
STA. 269+00 -L- (LT)
STA. 274+00 -L- (LT)

DETAIL AM
FALSE SUMP
(Not to Scale)

S=Ditch Slope	L
Ditch Grade	
0.00% To 2.00%	20'
Over 2.00% To 4.00%	30'
Over 4.00% To 6.00%	40'
Over 6.00%	50'

STA. 264+00 -L- (CL)
STA. 269+00 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)

STA. 264+00 -L- (RT)
STA. 269+00 -L- (RT)

DETAIL M
BERM BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft.
B = 3.0Ft.
b = 5.0Ft.
Max. d = 1.0 Ft.
Type of Liner = CLASS 'B' RIP RAP

STA. 255+00 TO 258+89.74 -L- (LT)
(EST 156 TONS; 346 SY GEOTEXTILE)
STA. 258+89.74 TO 260+00 -L- (LT)
(EST 39 TONS; 86 SY GEOTEXTILE)

PLANS PREPARED BY :
RK&K
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RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

$DATE$ $TIME$ $FILE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-15/CONST.15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 15

DETAIL AL
FALSE SUMP
(Not to Scale)

STA. 277+00 -L- (LT)
STA. 281+50 -L- (LT)
STA. 287+50 -L- (LT)

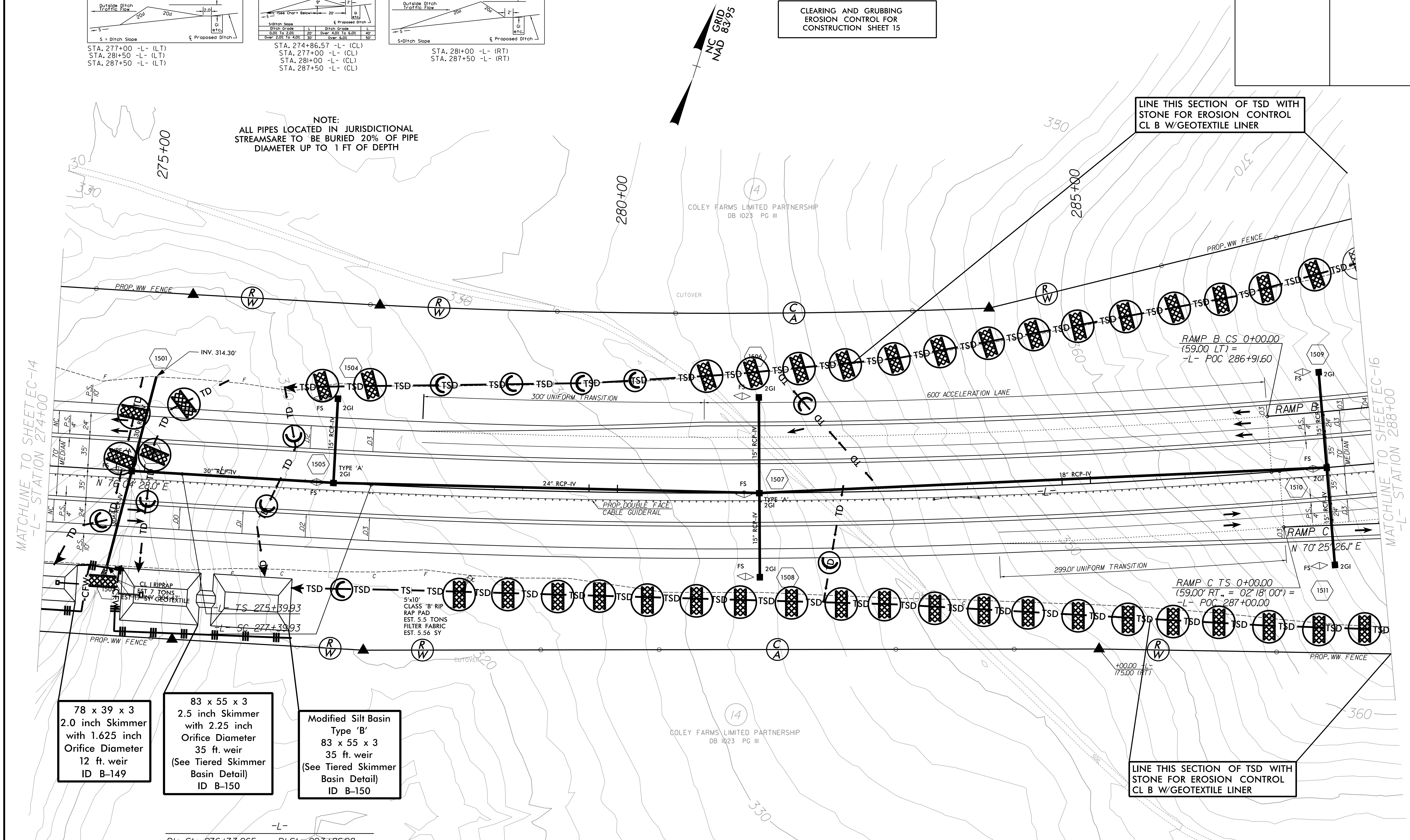
DETAIL AM
FALSE SUMP
(Not to Scale)

STA. 274+86.57 -L- (CL)
STA. 277+00 -L- (CL)
STA. 281+00 -L- (CL)
STA. 287+50 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)

STA. 281+00 -L- (RT)
STA. 287+50 -L- (RT)

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH



-L-

PIs Sta 276+73.265	PI Sta 293+86.98
Θs = 0°45'00"	Δ = 24°20'00.0" (LT)
Ls = 200.000	D = 0°45'00.0"
ST = 66.67	L = 3,244.44
LT = 133.33	T = 1,647.05
	R = 7,639.44
	Se = 0.03
	D.S.= 70 mph

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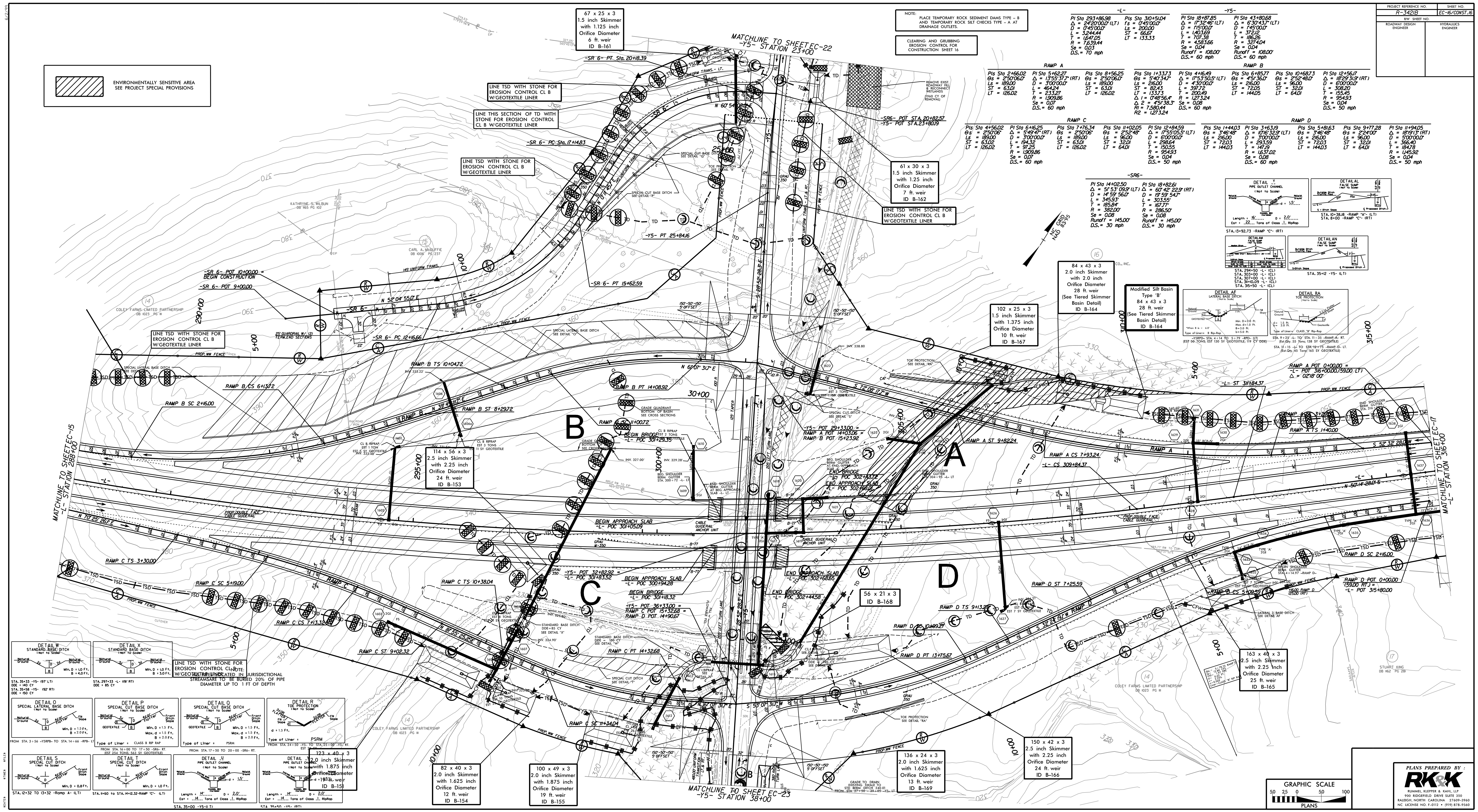
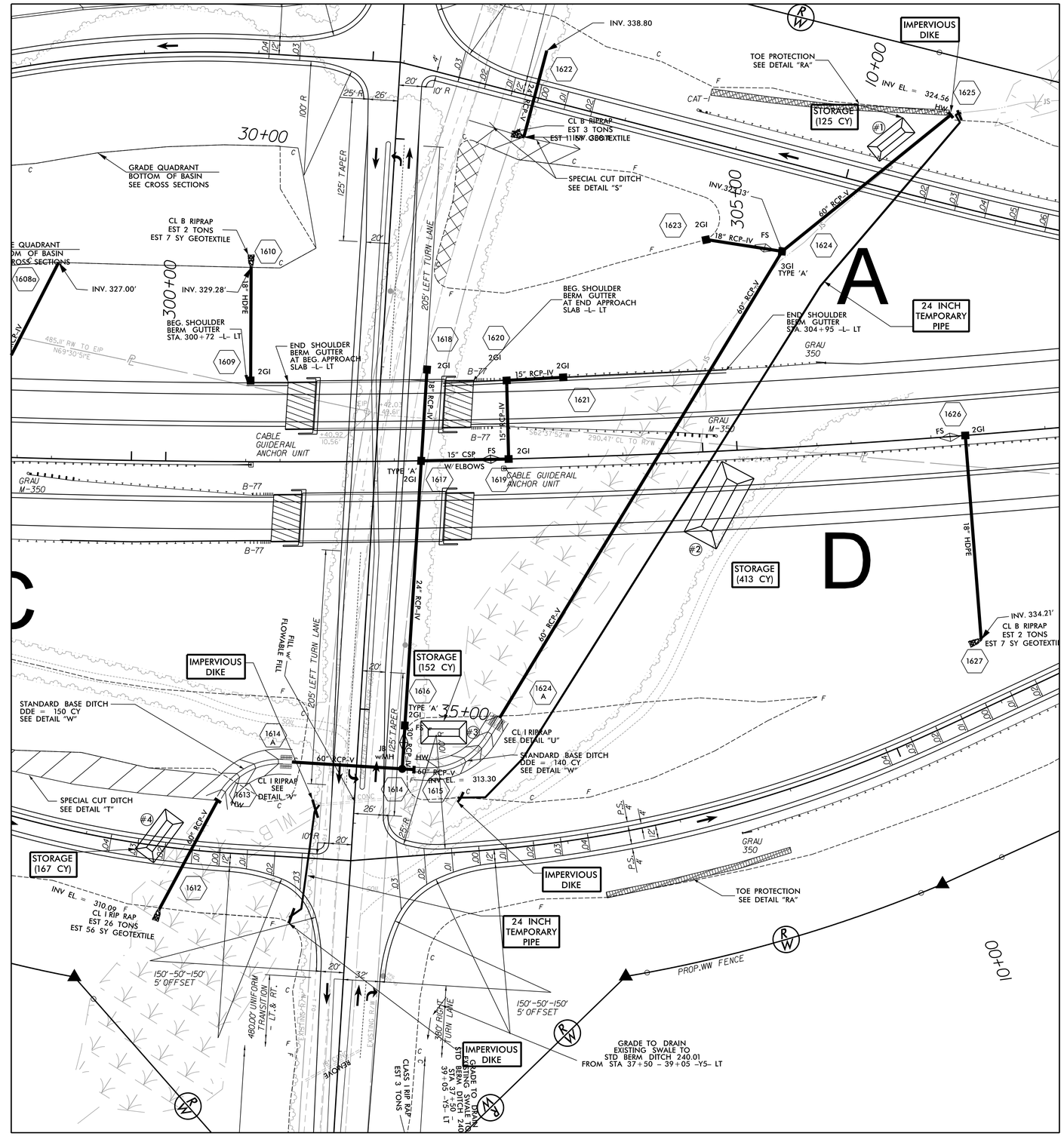
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

$DATE$ $TIME$ $FILE$


PROJECT REFERENCE NO.
R-3421B
SHEET NO.
EC-16/CONST.16
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 16
-L-
PI Sta 293+86.98 Δ = 24°20'00.0" (LT) D = 0°45'00.0" L = 3,244.44 T = 1,647.05 R = 7,639.44 Se = 0.03 D.S.= 70 mph
PIs Sta 310+51.04 fs = 0°45'00.0" Ls = 200.00 ST = 66.67 LT = 133.33
-Y5-
PI Sta 18+87.85 Δ = 17°32'46" (LT) D = 1°15'00.0" L = 1,403.69 T = 707.38 R = 4,583.66 Se = 0.04 Runoff = 108.00' D.S.= 60 mph
PI Sta 43+80.68 Δ = 6°30'43.7" (LT) D = 1°45'00.0" L = 372.12 T = 186.26 R = 3274.04 Se = 0.04 Runoff = 108.00' D.S.= 60 mph
RAMP A
PIs Sta 2+66.02 θs = 2°50'06.0" Ls = 189.00 ST = 63.01 LT = 126.02
PI Sta 5+62.27 Δ = 13°55'37.7" (RT) D = 3°00'00.0" L = 464.24 T = 233.27 R = 1,909.86 Se = 0.07 D.S.= 60 mph
PIs Sta 8+56.25 θs = 2°50'06.0" Ls = 189.00 ST = 63.01 LT = 126.02
RAMP B
PIs Sta 1+33.73 θs = 5°40'34.7" Ls = 216.00 ST = 82.43 LT = 133.73 Δ 1 = 0°48'56.4" Δ 2 = 4°51'38.3" R1 = 7,580.44 R2 = 1,273.24
PI Sta 4+16.49 Δ = 17°53'50.5" (LT) D = 4°30'00.0" L = 397.72 T = 200.49 R = 1,273.24 Se = 0.08 D.S.= 60 mph
PIs Sta 6+85.77 θs = 4°51'36.0" Ls = 216.00 ST = 72.05 LT = 144.05
PIs Sta 10+68.73 θs = 2°52'48.0" Ls = 96.00 ST = 32.01 LT = 64.01
PI Sta 12+56.17 Δ = 18°29'31.9" (RT) D = 6°00'00.0" L = 308.20 T = 155.45 R = 954.93 Se = 0.04 D.S.= 50 mph
RAMP C
RAMP D
REMOVE EXIST. ROADWAY FILL & RECONNECT WETLANDS (1960 CY OF REMOVAL)
-SR6- POT STA. 20+82.57
-Y5- POT STA. 23+80.19
ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS
MATCHLINE TO SHEET EC-22 -Y5- STATION 23+00
MATCHLINE TO SHEET EC-23 -Y5- STATION 38+00
MATCHLINE TO SHEET EC-15 -L- STATION 288+00
MATCHLINE TO SHEET EC-17 -L- STATION 316+00
67 x 25 x 3 1.5 inch Skimmer with 1.125 inch Orifice Diameter 6 ft. weir ID B-161
61 x 30 x 3 1.5 inch Skimmer with 1.25 inch Orifice Diameter 7 ft. weir ID B-162
84 x 43 x 3 2.0 inch Skimmer with 2.0 inch Orifice Diameter 28 ft. weir (See Tiered Skimmer Basin Detail) ID B-164
Modified Silt Basin Type 'B' 84 x 43 x 3 28 ft. weir (See Tiered Skimmer Basin Detail) ID B-164
102 x 25 x 3 1.5 inch Skimmer with 1.375 inch Orifice Diameter 10 ft. weir ID B-167
114 x 56 x 3 2.5 inch Skimmer with 2.25 inch Orifice Diameter 24 ft. weir ID B-153
56 x 21 x 3 ID B-168
163 x 40 x 3 2.5 inch Skimmer with 2.25 inch Orifice Diameter 25 ft. weir ID B-165
150 x 42 x 3 2.5 inch Skimmer with 2.25 inch Orifice Diameter 24 ft. weir ID B-166
136 x 24 x 3 2.0 inch Skimmer with 1.625 inch Orifice Diameter 13 ft. weir ID B-169
100 x 49 x 3 2.0 inch Skimmer with 1.875 inch Orifice Diameter 19 ft. weir ID B-155
82 x 40 x 3 2.0 inch Skimmer with 1.625 inch Orifice Diameter 12 ft. weir ID B-154
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
LINE THIS SECTION OF TD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
A
B
C
D
GRAPHIC SCALE
50 25 0 50 100
PLANS
PLANS PREPARED BY
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-16A/CONST.16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



CULVERT CONSTRUCTION SEQUENCE
–Y5RPA– 9+80 & –L– 304+32

1. CONSTRUCT STILLING BASIN #1 (125 CY).
2. CONSTRUCT STILLING BASIN #2 (413 CY).
3. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
4. INSTALL 24" TEMPORARY PIPE AT A MINIMUM SLOPE OF 1%. DIVERT STREAM THROUGH TEMPORARY PIPES AS SHOWN ON PLANS.
5. INSTALL PROPOSED 60" RCP AT –Y5RPA– STA. 9+80 INCLUDING HEADWALL AND 3GI AS SHOWN ON PLANS. INSTALL PROPOSED 60" RCP AT –L– 304+32 AND OUTLET IMPROVEMENTS AS SHOWN IN DETAIL 'U'.

CULVERT CONSTRUCTION SEQUENCE
–Y5– 35+50 & –Y5RPC– 13+85

1. CONSTRUCT STILLING BASIN #3 (152 CY).
2. CONSTRUCT STILLING BASIN #4 (167 CY).
3. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
4. INSTALL 24" TEMPORARY PIPE AT A MINIMUM SLOPE OF 1%, ALONG –Y5– FROM STA. 35+85 TO STA. 36+80 RT. MAINTAIN EXISTING 18" RCP. DIVERT STREAM THROUGH TEMPORARY PIPES.
5. INSTALL PROPOSED 60" RCP AT –Y5– STA. 35+50 INCLUDING HEADWALL, JB AND OUTLET IMPROVEMENTS AS SHOWN IN DETAIL 'V'.
6. INSTALL PROPOSED 60" RCP AT –Y5RPC– STA. 13+85 INCLUDING HEADWALL AND OUTLET IMPROVEMENTS AS SHOWN IN DETAIL 'Y'.
7. REMOVE IMPERVIOUS DIKES AND TEMPORARY PIPES AND DIVERT STREAM THROUGH NEW PIPE SYSTEM.
8. REMOVE STILLING BASINS.
9. CONSTRUCT ROADWAY FILL.

PLANS PREPARED BY :

RK&K

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PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-17/CONST.17
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 17

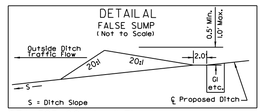
-L-

PIs Sta 325+85.19
Θs = 0°45'00"
Ls = 200.00
ST = 66.67
LT = 133.33

PI Sta 338+47.89
Δ = 17°47'45.9" (RT)
D = 0°45'00.0"
L = 2,372.81
T = 1,196.04
R = 7,639.44
SE = 0.03
D.S. = 70 mph

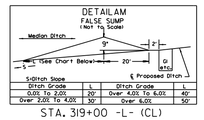
NC GRID
NAD 83/95

DETAIL AL
FALSE SUMP
(Not to Scale)



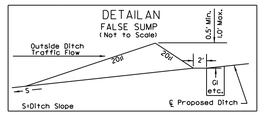
STA. 325+00 -L- (LT)
STA. 329+50 -L- (LT)

DETAIL AM
FALSE SUMP
(Not to Scale)

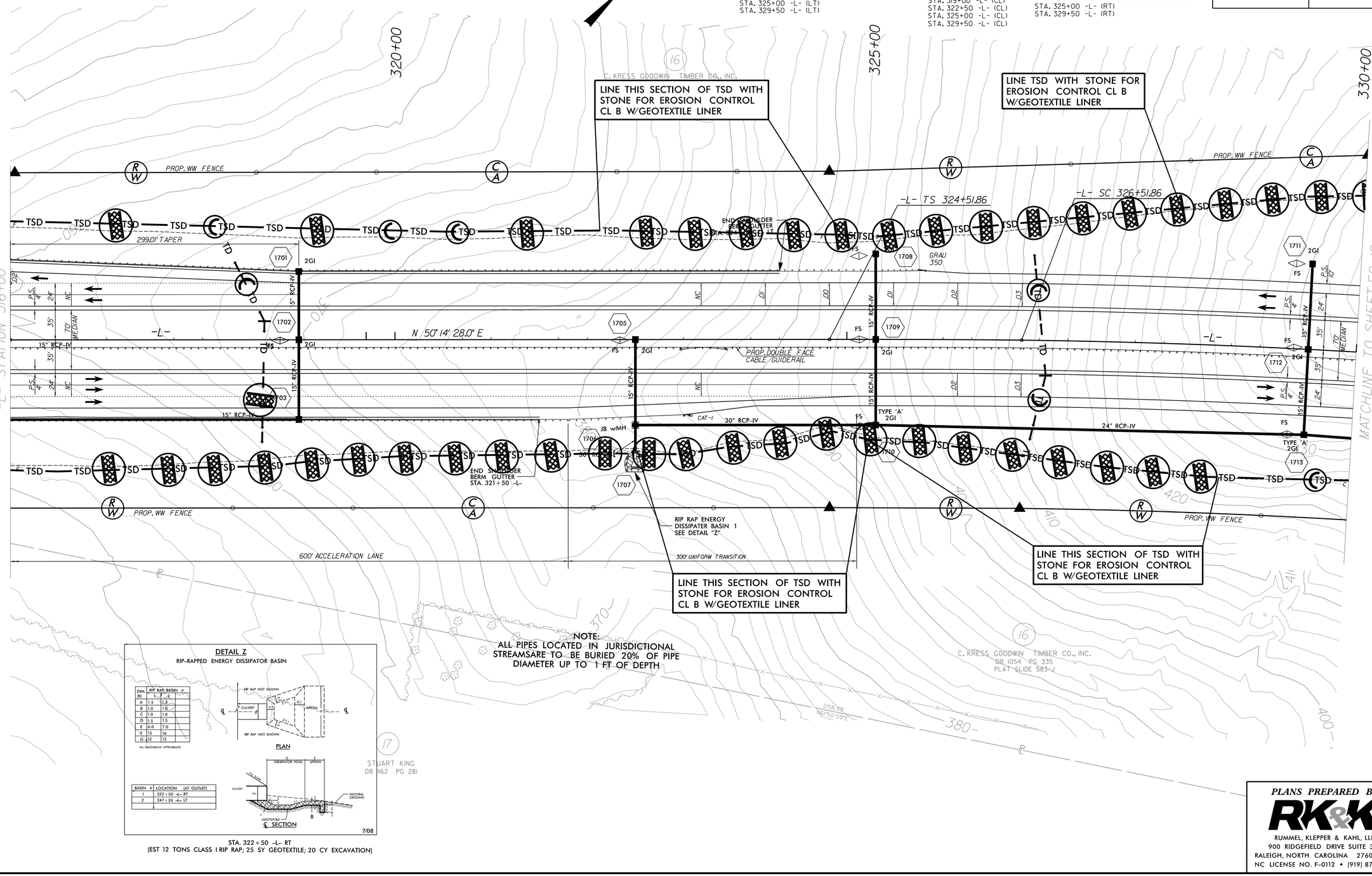


STA. 319+00 -L- (CL)
STA. 322+50 -L- (CL)
STA. 325+00 -L- (CL)
STA. 329+50 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)



STA. 325+00 -L- (RT)
STA. 329+50 -L- (RT)



NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

DETAIL Z
RIP-RAPPED ENERGY DISSIPATOR BASIN

DIM (ft)	RIP RAP BASIN # 1	2
A	1.5	1.5
B	1.0	1.0
C	1.0	1.0
D	1.5	1.5
E	6.0	7.0
F	15	16
G	12	13

ALL DIMENSIONS APPROXIMATE

PLAN

℄ SECTION

BASIN #	LOCATION (AT OUTLET)
1	322+50 –L– RT
2	347+26 –L– LT

7-08

STA. 322+50 –L– RT
(EST 12 TONS CLASS I RIP RAP; 25 SY GEOTEXTILE; 20 CY EXCAVATION)

$DATE$ $TIME$ $FILE$

PLANS PREPARED BY :

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RUMMEL, KLEPPER & KAHL, LLP
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RALEIGH, NORTH CAROLINA 27609-3960
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PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-18/CONST.18

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

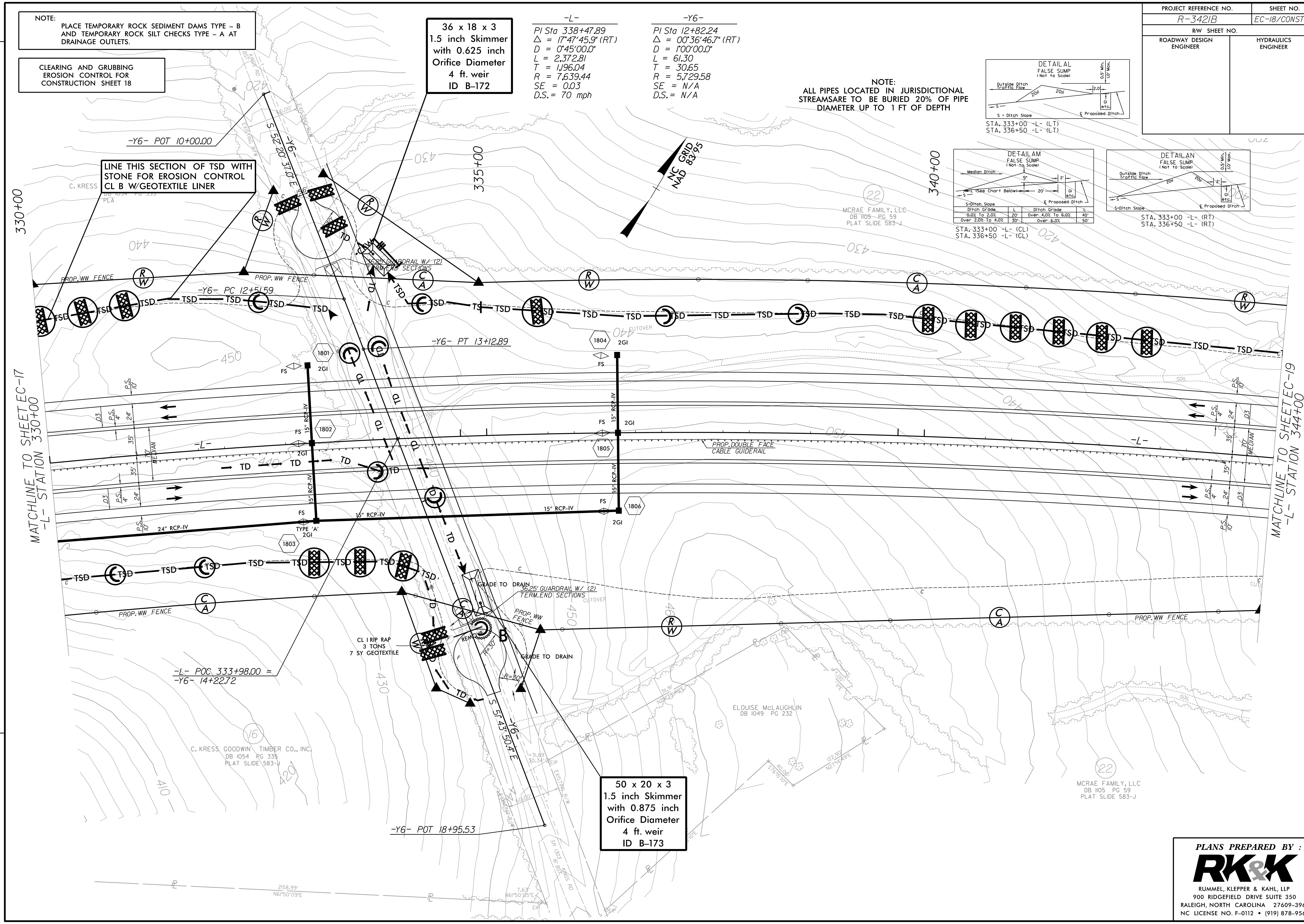
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 18

36 x 18 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
4 ft. weir
ID B-172

-L-
PI Sta 338+47.89
Δ = 17°47'45.9" (RT)
D = 0°45'00.0"
L = 2,372.81
T = 1,196.04
R = 7,639.44
SE = 0.03
D.S.= 70 mph

-Y6-
PI Sta 12+82.24
Δ = 00°36'46.7" (RT)
D = 1°00'00.0"
L = 61.30
T = 30.65
R = 5,729.58
SE = N/A
D.S.= N/A

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH



50 x 20 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-173

REVISIONS

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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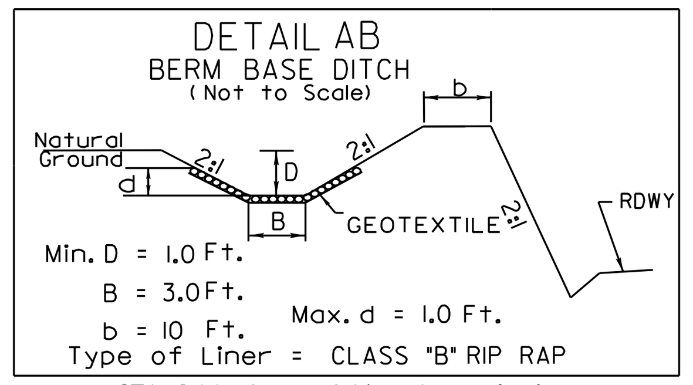
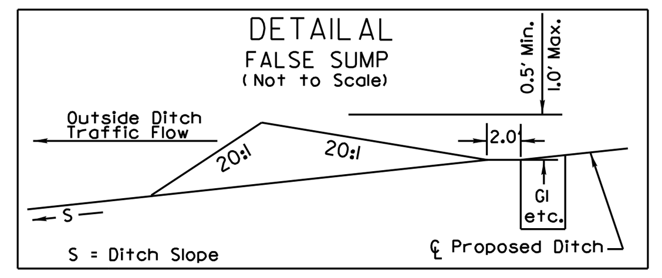
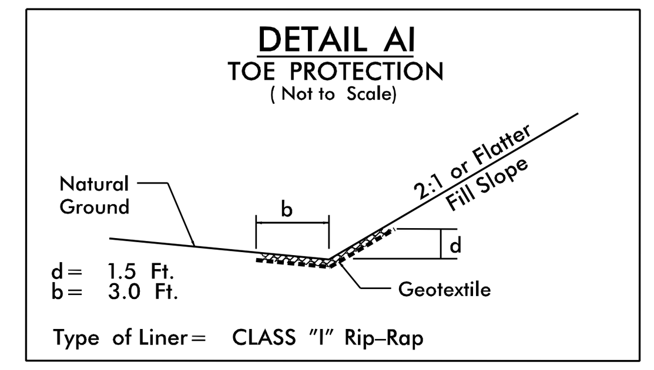
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-19/CONST.19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



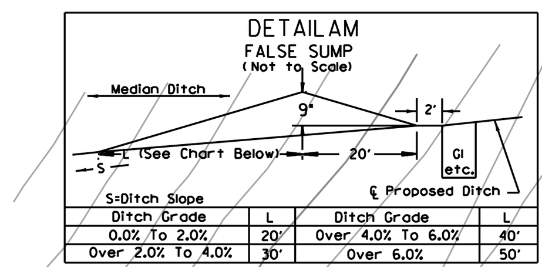
STA. 344+25 to 346+50 -L- (RT.)
(EST 77 TONS; 172 SY GEOTEXTILE)



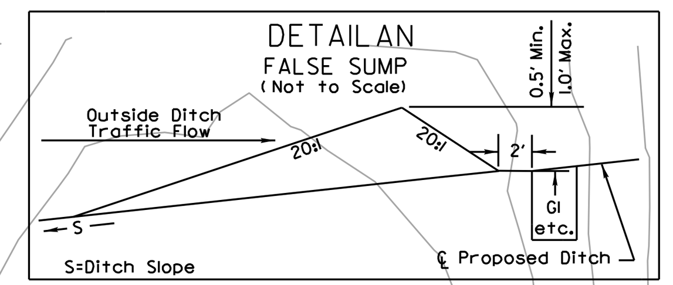
STA. 346+50 -L- (RT)
STA. 349+50 -L- (RT)



FROM STA. 350+68 -L- TO STA. 354+65 -L- RT.(Est.Qty. 130 Tons; 267 SY GEOTEXTILE)
FROM STA. 352+30 -L- TO STA. 355+90 -L- LT.(Est.Qty. 125 Tons; 245 SY GEOTEXTILE)

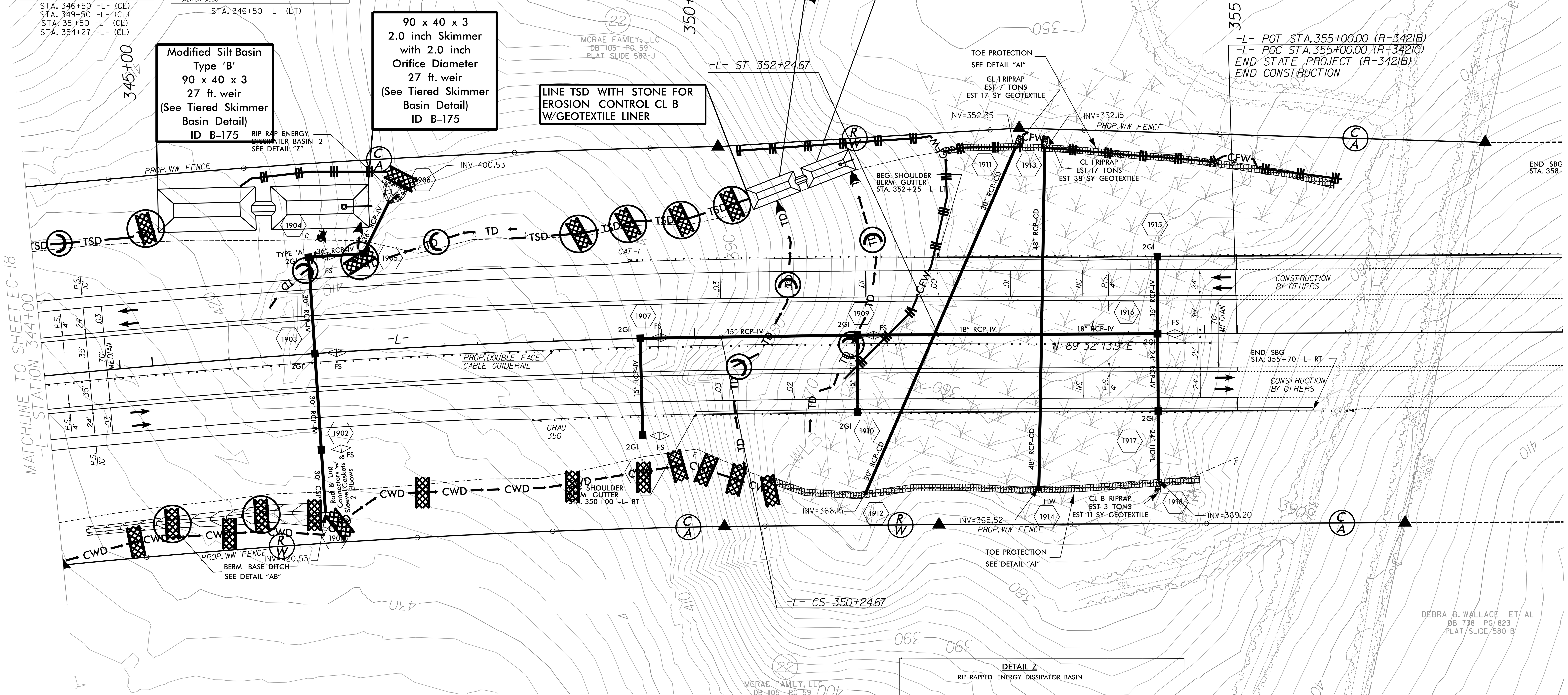


STA. 346+50 -L- (CL)
STA. 349+50 -L- (CL)
STA. 351+50 -L- (CL)
STA. 354+27 -L- (CL)



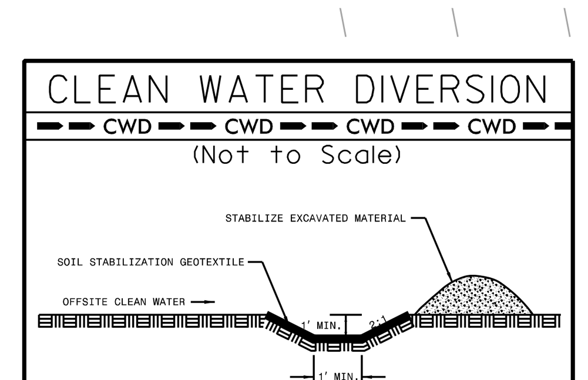
STA. 346+50 -L- (LT)

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH



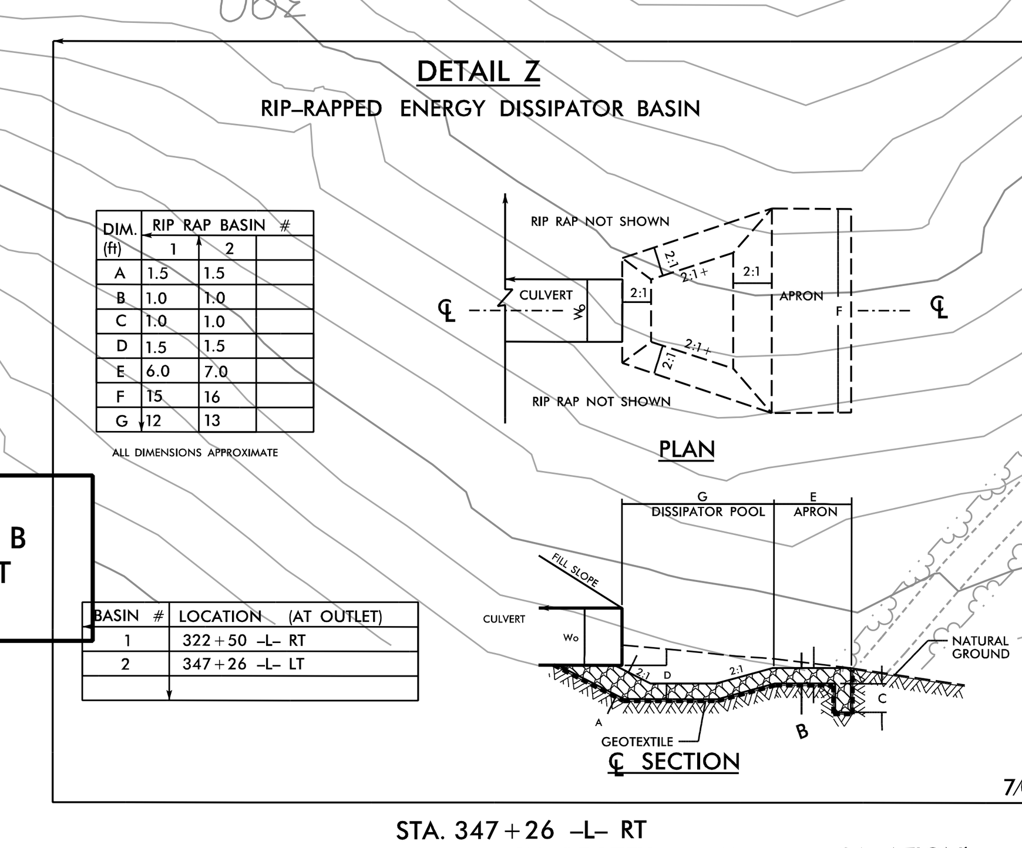
-L-

PI Sta 338+47.89	PIs Sta 350+91.34
Δ = 17°47'46" (RT)	Θs = 0°45'00"
D = 0°45'00.0"	Ls = 200.00
L = 2,372.81	ST = 66.67
T = 1,196.04	LT = 133.33
R = 7,639.44	
SE = 0.03	
D.S.= 70 mph	



NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 19



STA. 347+26 -L- RT
(EST 15 TONS CLASS I RIP RAP; 27 SY GEOTEXTILE; 23 CY EXCAVATION)

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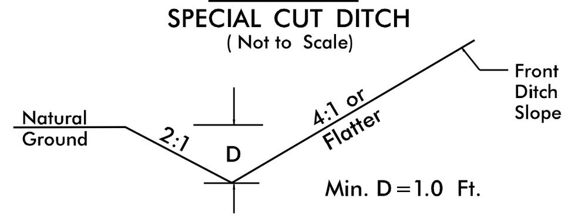
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-20/CONST.20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DETAIL A

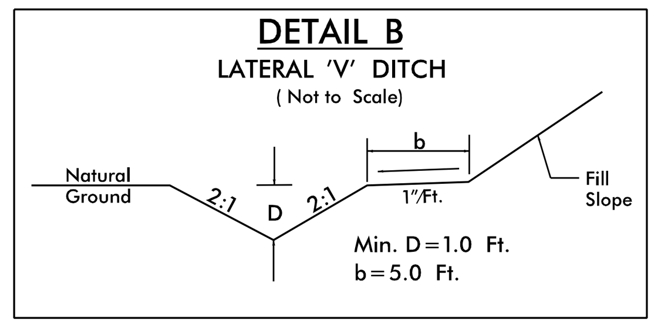
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. TO STA.
STA. 19+00 to 19+50 –Y3– (RT)
STA. 16+50 to 18+00 –Y3– (LT)
STA. 28+00 to 28+72 –Y3– (LT)

DETAIL B

LATERAL 'V' DITCH
(Not to Scale)

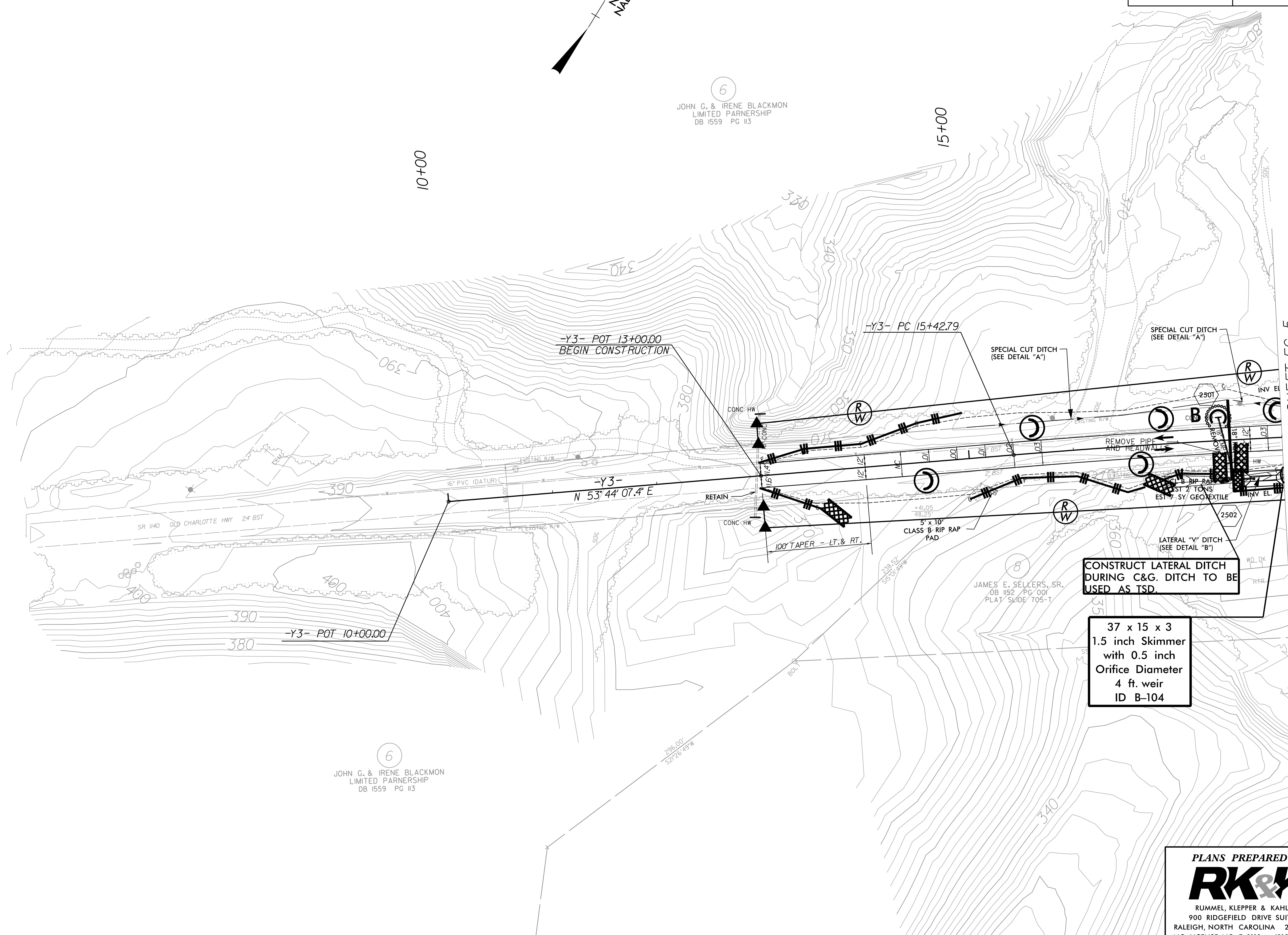


FROM STA. TO STA.
STA. 16+84.60 to 19+00 –Y3– (RT)

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 20

–Y3–
PI Sta 21+23.43
Δ = 8°41'34.9" (RT)
D = 0°45'00.0"
L = 1,159.07
T = 580.65
R = 7,639.44
Se = 0.03
Runoff = 81.00'
D.S.= 60 mph



PLANS PREPARED BY :

RK&K

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$DATE$ $TIME$ $FILE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-21/CONST.21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

RIGHT OF WAY REVISION: SEPT. 11, 2014 – CHANGED PARCEL NUMBER 7 TO PARCEL 6; PROPERTY OWNER NAME CHANGED ON PARCEL 6.

DETAIL AF
LATERAL BASE DITCH
(Not to Scale)
Natural Ground; 2:1; D; 2:1; b; 1"/Ft.; Fill Slope; d; GEOTEXTILE; B
*When B is < 6.0'
Min. D=2.0 Ft.
Max. d=1.7 Ft.
B=3.0 Ft.
b=5.0 Ft.
Type of Liner= Class "B" Rip-Rap
STA. 40+50 TO 43+70.78–SRI– (LT)
(EST 162 TONS; 360 SY GEOTEXTILE)

DETAIL AG
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground; MIN. 2:1 TO TIE EXISTING BANK; CHANNEL BED (Variable); d
Length=18 Ft.
d=2.0 Ft.
Est.= 24 Tons of Class 1 Rip-Rap
STA. 42+60.29 –SRI– (LT)

DETAIL AH
STANDARD BASE DITCH
(Not to Scale)
Natural Ground; 2:1; D; 2:1; d; Geotextile; B
*When B is < 6.0'
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
Type of Liner= Class "B" Rip-Rap
STA. 12+58.46 –Y4– (RT)
DDE=12 CY
(EST CLASS B 12 TONS; EST 9 SY GEOTEXTILE)

DETAIL AI
TOE PROTECTION
(Not to Scale)
Natural Ground; b; 2:1 or Flatter Fill Slope; d; Geotextile
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "I" Rip-Rap
FROM STA. 11+50 –L– TO STA. 13+22 –Y4– LT.
(Est.Qty. 50 Tons; EST 53 SY GEOTEXTILE)

DETAIL AJ
CUT DITCH
(Not to Scale)
Natural Ground; 2:1; D; 4:1 or Flatter; Front Ditch Slope
Min. D=1.0 Ft.
STA. 44+00 TO 48+00 –SRI– (RT)
STA. 12+00 TO 12+50 –Y4– (LT)

DETAIL AK
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground; 2:1; D; var. 2:1 to 4:1; Front Ditch Slope; d; Geotextile
Min. D=1.0 Ft.
Max. d=1.0 Ft.
Type of Liner= Class B Rip-Rap
STA. 11+00 TO 10+32.14 –Y4– (LT)
(EST 22 TONS; EST 49 SY GEOTEXTILE)

DETAIL AL
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow; 10:1; 20:1; 2.0'; 0.5' Min. 1.0' Max; GI etc.; S
S=Ditch Slope
℄ Proposed Ditch
STA. 35+50 –SRI– (RT)
STA. 38+00 –SRI– (RT)
STA.40+12.29 –SRI– (RT)

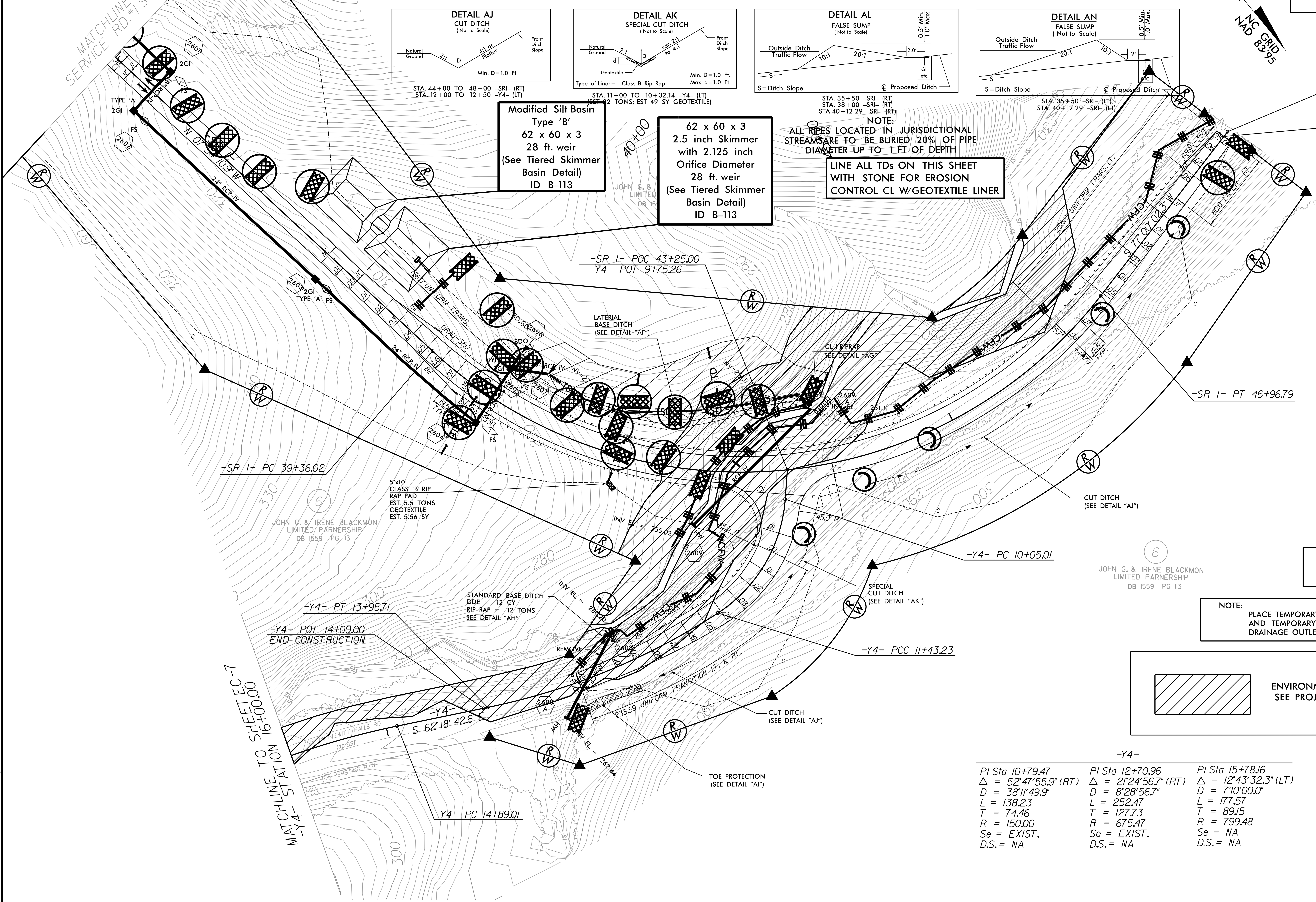
DETAIL AN
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow; 20:1; 10:1; 2'; 0.5' Min. 1.0' Max.; etc.; S
S=Ditch Slope
℄ Proposed Ditch
STA. 35+50 –SRI– (LT)
STA. 40+12.29 –SRI– (LT)

Modified Silt Basin
Type 'B'
62 x 60 x 3
28 ft. weir
(See Tiered Skimmer Basin Detail)
ID B–113

62 x 60 x 3
2.5 inch Skimmer
with 2.125 inch
Orifice Diameter
28 ft. weir
(See Tiered Skimmer Basin Detail)
ID B–113

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

LINE ALL TDs ON THIS SHEET WITH STONE FOR EROSION CONTROL CL W/GEOTEXTILE LINER



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 21

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

-Y4-

PI Sta 10+79.47	PI Sta 12+70.96	PI Sta 15+78.16
Δ = 52°47'55.9" (RT)	Δ = 21°24'56.7" (RT)	Δ = 12°43'32.3" (LT)
D = 38°11'49.9"	D = 8°28'56.7"	D = 7°10'00.0"
L = 138.23	L = 252.47	L = 177.57
T = 74.46	T = 127.73	T = 89.15
R = 150.00	R = 675.47	R = 799.48
Se = EXIST.	Se = EXIST.	Se = NA
D.S.= NA	D.S.= NA	D.S.= NA

PLANS PREPARED BY :
RK&K
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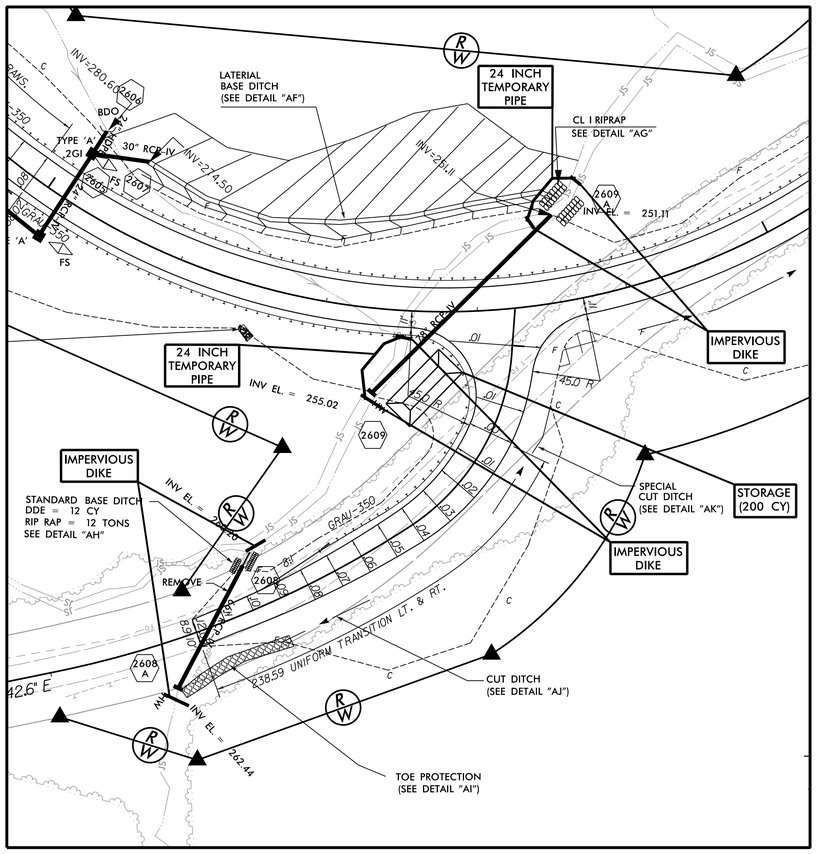
$FILE$ $TIME$ $DATE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-21A/CONST.21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

RIGHT OF WAY REVISION: SEPT. 11, 2014 – CHANGED PARCEL NUMBER 7 TO PARCEL 6; PROPERTY OWNER NAME CHANGED ON PARCEL 6.



CULVERT CONSTRUCTION SEQUENCE –Y4– 12+90

1. INSTALL SPECIAL STILLING BASIN WITH A MINIMUM CAPACITY OF 76 CY.
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN TO BLOCK STREAM DURING DRY SEASON.
3. UTILIZE TEMPORARY PUMPING OPERATIONS TO DIVERT STREAM AROUND EXISTING/PROPOSED PIPE.
4. REMOVE EXISTING 30" CMP AND INSTALL PROPOSED 66" REINFORCED CONCRETE PIPE WITHIN A 24–HR PERIOD. CONSTRUCT HEADWALL AND OUTLET IMPROVEMENTS AS SHOWN IN DETAIL 'AH'.
5. REMOVE TEMPORARY PUMPING OPERATIONS AND DIVERT STREAM THROUGH PROPOSED 66" RCP.
6. REMOVE SPECIAL STILLING BASIN.
7. CONSTRUCT ROADWAY FILL.

CULVERT CONSTRUCTION SEQUENCE –SR1– 42+86

1. CONSTRUCT STILLING BASIN (200 CY).
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN.
3. INSTALL 24" TEMPORARY PIPES AT A MINIMUM SLOPE OF 1%. DIVERT STREAM THROUGH TEMPORARY PIPES AND EXISTING STREAM AS SHOWN ON PLANS.
4. INSTALL PROPOSED 78" REINFORCED CONCRETE PIPE INCLUDING HEADWALL AND OUTLET IMPROVEMENTS AS SHOWN IN DETAIL 'AG'.
5. REMOVE IMPERVIOUS DIKES AND TEMPORARY PIPES AND DIVERT STREAM THROUGH NEW PIPE.
6. REMOVE STILLING BASIN.
7. CONSTRUCT ROADWAY FILL.

PLANS PREPARED BY :

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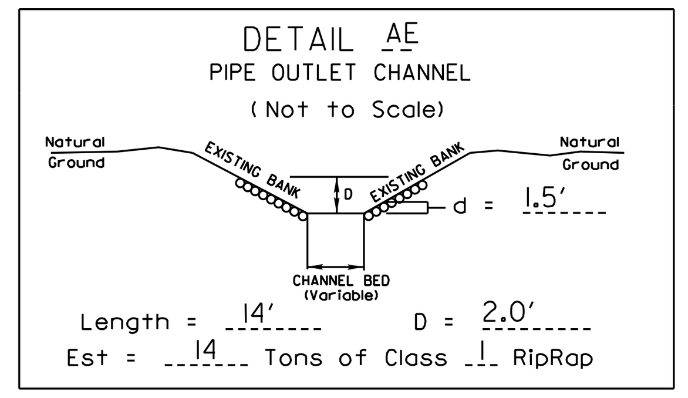
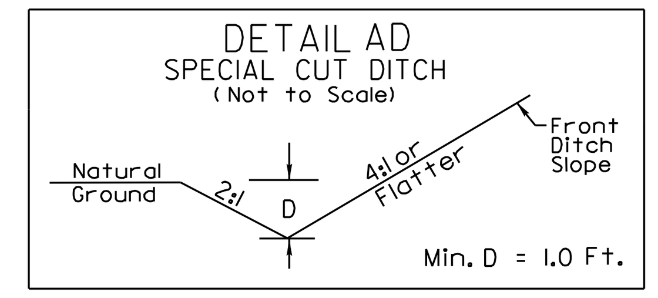
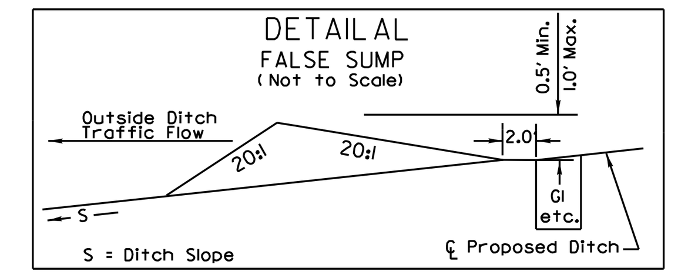
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-22/CONST.22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



STA. 22+77.50 -Y5- (RT)



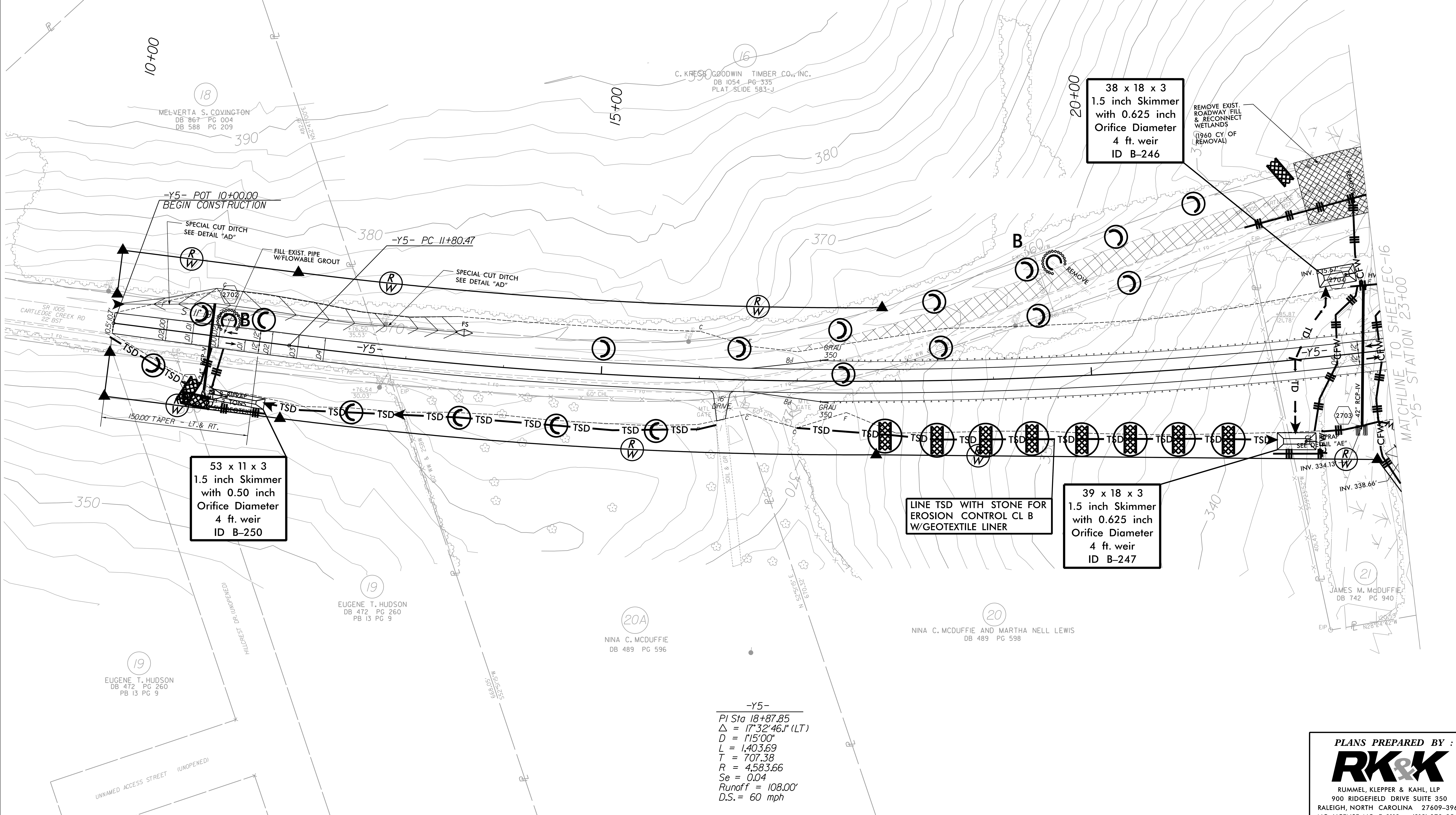
Sta. 10+00 to 13+50 -Y5-



STA. 13+56.65 -Y5- (LT)

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 22



NC GRID
NAD 83/95
10+00
15+00
20+00
MELVERTA S. COVINGTON
DB 867 PG 004
DB 588 PG 209
C. KRESS GOODWIN TIMBER CO., INC.
DB 1054 PG 335
PLAT SLIDE 583-J
-Y5- POT 10+00.00
BEGIN CONSTRUCTION
SPECIAL CUT DITCH
SEE DETAIL "AD"
FILL EXIST. PIPE
W/FLOWABLE GROUT
-Y5- PC 11+80.47
SPECIAL CUT DITCH
SEE DETAIL "AD"
38 x 18 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
4 ft. weir
ID B-246
REMOVE EXIST. ROADWAY FILL & RECONNECT WETLANDS
(1960 CY OF REMOVAL)
REMOVE
-Y5-
150.00' TAPER - LT. & RT.
53 x 11 x 3
1.5 inch Skimmer
with 0.50 inch
Orifice Diameter
4 ft. weir
ID B-250
LINE TSD WITH STONE FOR
EROSION CONTROL CL B
W/GEOTEXTILE LINER
39 x 18 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
4 ft. weir
ID B-247
MATCHLINE TO SHEET EC-16
-Y5- STATION 23+00
SEE DETAIL "AE"
INV. 334.13
INV. 338.66'
42" RCP-IV
EUGENE T. HUDSON
DB 472 PG 260
PB 13 PG 9
NINA C. MCDUFFIE
DB 489 PG 596
NINA C. MCDUFFIE AND MARTHA NELL LEWIS
DB 489 PG 598
JAMES M. MCDUFFIE
DB 742 PG 940
EUGENE T. HUDSON
DB 472 PG 260
PB 13 PG 9
UNNAMED ACCESS STREET (UNOPENED)
-Y5-
PI Sta 18+87.85
Δ = 17°32'46.1" (LT)
D = 1°15'00"
L = 1,403.69
T = 707.38
R = 4,583.66
Se = 0.04
Runoff = 108.00'
D.S. = 60 mph

PLANS PREPARED BY :
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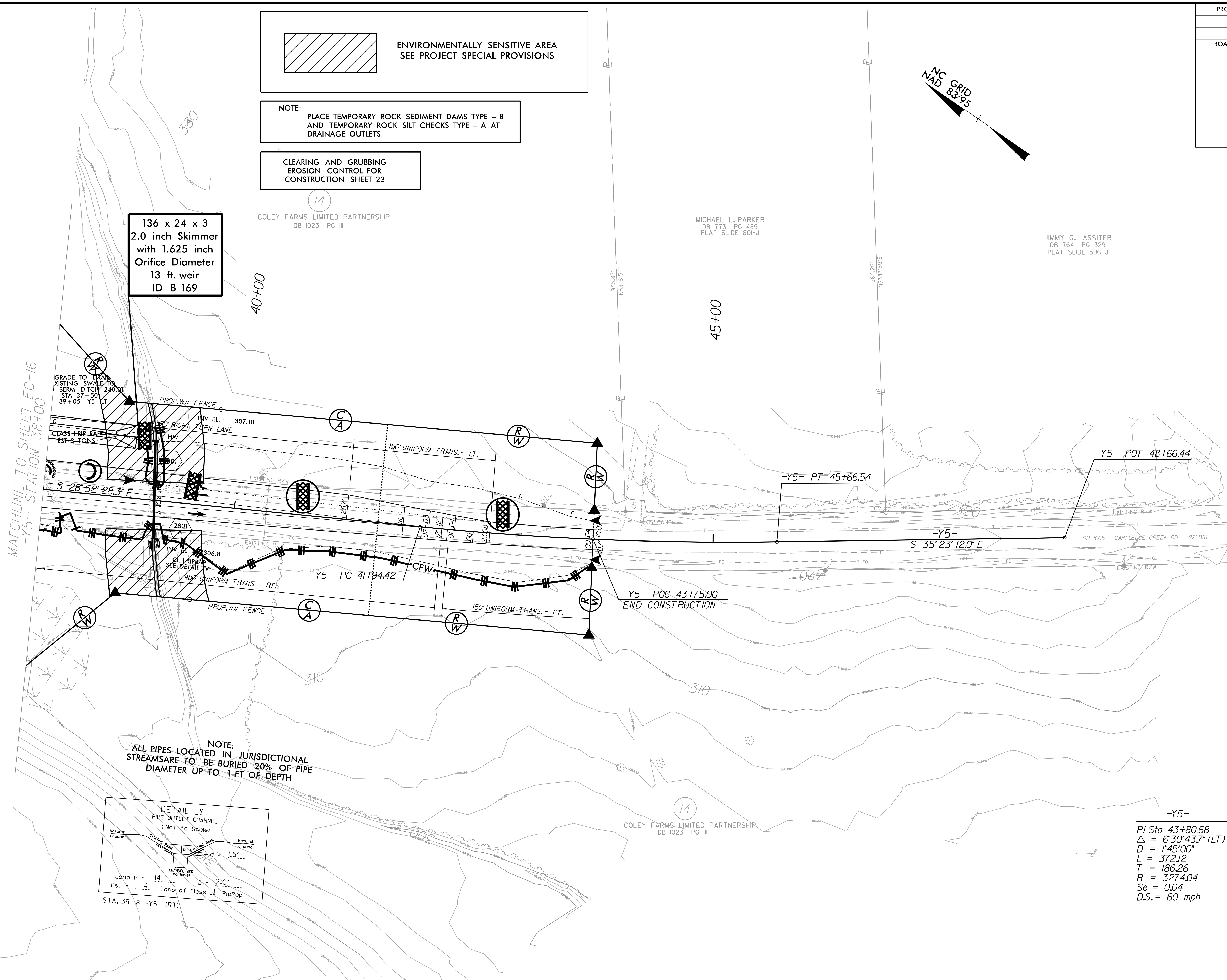
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-23/CONST.23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 23

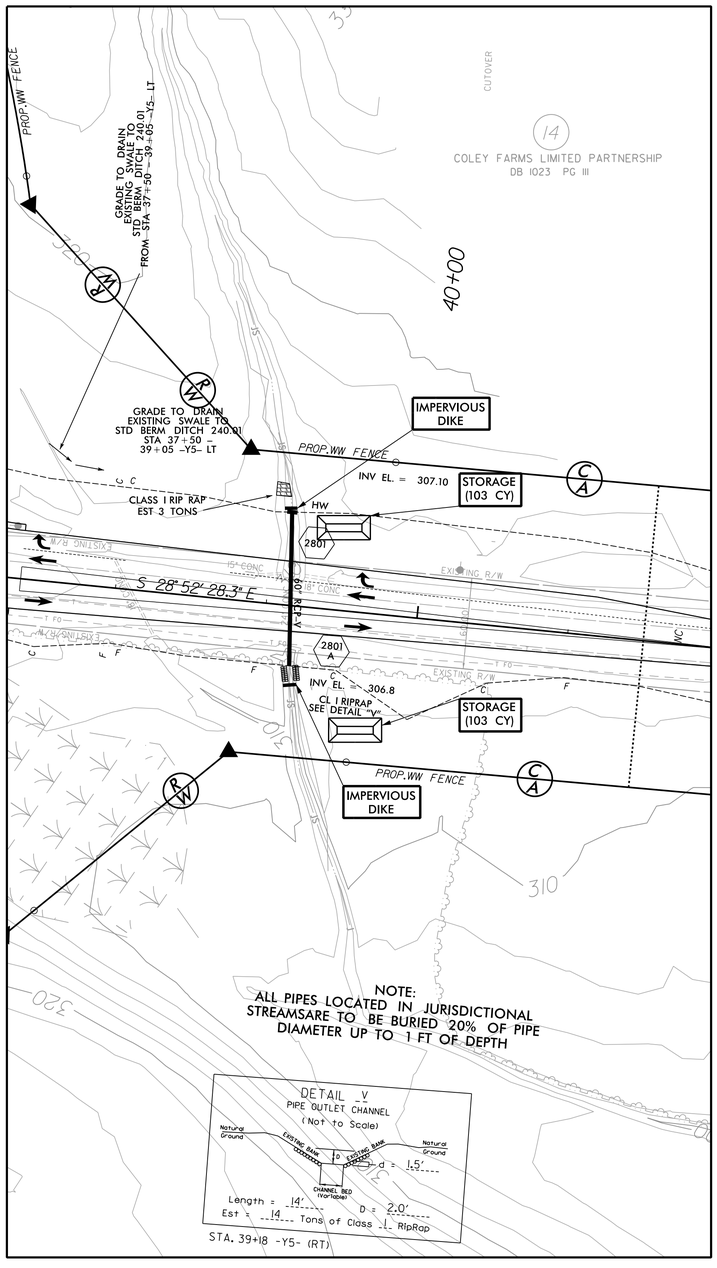


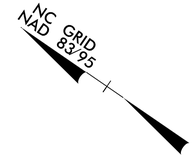
-Y5-

PI Sta 43+80.68
Δ = 6°30'43.7" (LT)
D = 1°45'00"
L = 372.12
T = 186.26
R = 3274.04
Se = 0.04
D.S. = 60 mph

SEE SHEET 41 FOR -Y5- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-23A/CONST.23
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER





CULVERT CONSTRUCTION SEQUENCE
–Y5– 39+15

1. CONSTRUCT STILLING BASIN (103 CY) ON BOTH THE NORTH AND SOUTH SIDE OF –Y5–.
2. INSTALL IMPERVIOUS DIKES AS SHOWN ON PLAN TO BLOCK STREAM DURING DRY SEASON.
3. REMOVE EXISTING 24" RCP. INSTALL PROPOSED 60" RCP. INSTALLATION TO BE COMPLETED WITHIN A 24–HR PERIOD. CONSTRUCT HEADWALL AND OUTLET CHANNEL IMPROVEMENTS AS SHOWN IN DETAIL 'V'.
4. REMOVE IMPERVIOUS DIKES AND DIVERT STREAM THROUGH NEW PIPE.
5. REMOVE STILLING BASINS.
6. CONSTRUCT ROADWAY FILL AS SHOWN ON PLANS.

PLANS PREPARED BY :

RK&K

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RALEIGH, NORTH CAROLINA 27609–3960
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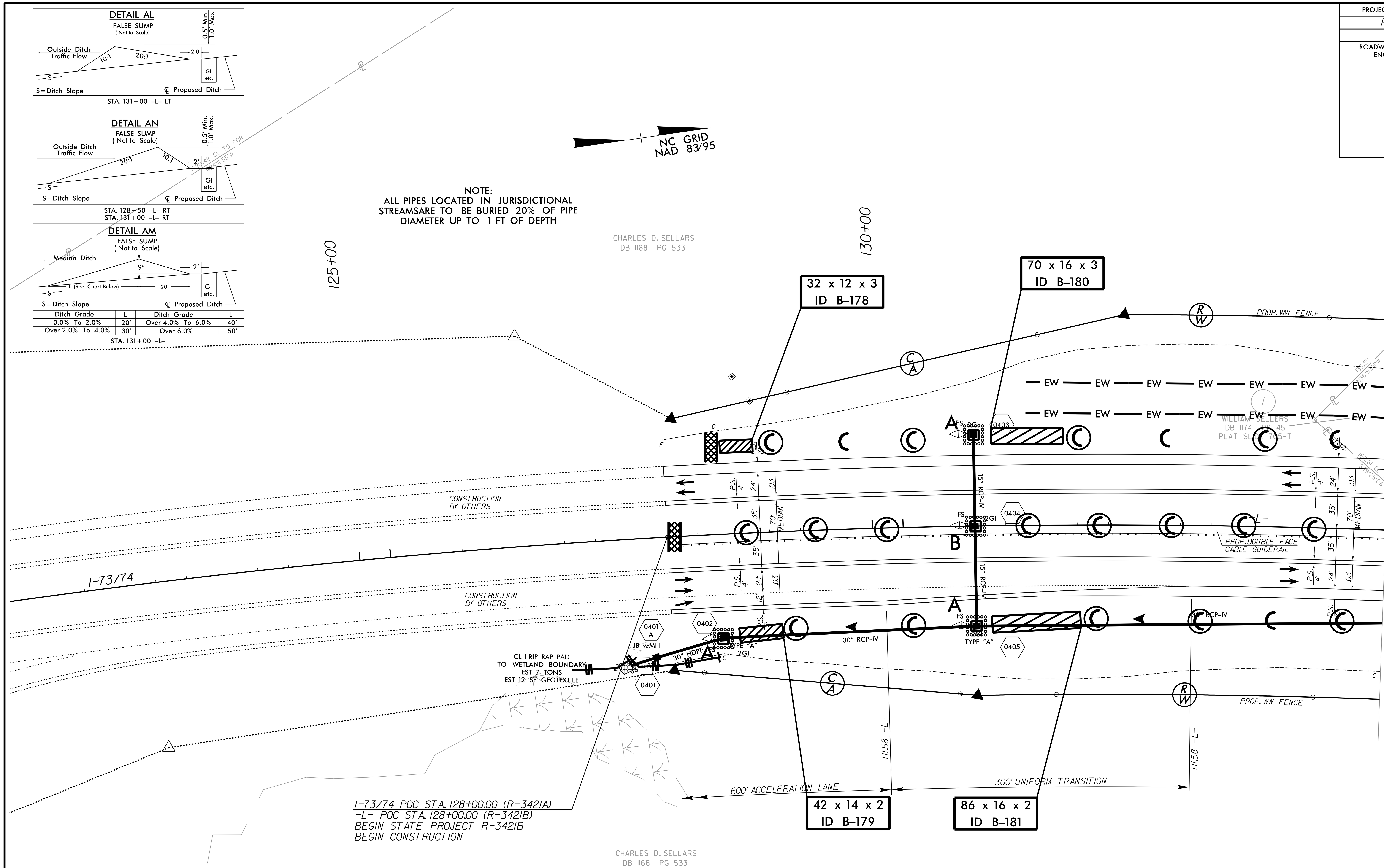
$DATE$ $TIME$ $FILE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-24/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
Se = 0.03
D.S.= 70 mph

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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$DATE$ $TIME$ $FILE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-25/CONST.5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NC GRID NAD 83/95

MATCHLINE TO SHEET EC-40 -Y3- STATION 18+00.00

MATCHLINE TO SHEET EC-24 -L- STATION 135+00

MATCHLINE TO SHEET EC-26 -L- STATION 149+00

135+00 | 140+00 | 145+00 | 15+00 | 20+00 | 25+00

-SRIREV- PC Sta. 10+41.77

-SRIREV- PT Sta. 12+34.33

-SRIREV- POT Sta. 10+00.00 = -Y3- POC 20+15.00

-SRIREV- PC Sta. 14+32.06

-SRIREV- PT Sta. 15+68.52

-L- POC 140+97.00 = -Y3- POC 24+31.67

-SRIREV- POT Sta. 17+53.73 (BK) = -SRI- PT Sta. 18+56.51 (AH)

-Y3- POC 23+40.09 BEGIN APPROACH SLAB

-Y3- POC 23+16.67 BEGIN BRIDGE

-Y3- POC 25+46.67 END BRIDGE

-Y3- POC 25+60.29 END APPROACH SLAB

-Y3- POT 29+30.00 END CONSTRUCTION

-Y3- PT 27+01.85

41 x 16 x 3 ID B-182

54 x 16 x 2 ID B-183

50 x 16 x 2 ID B-184

36 x 12 x 3 ID B-192

36 x 18 x 3 ID B-191

43 x 20 x 3 ID B-190

36 x 16 x 3 ID B-186

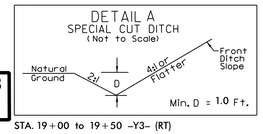
34 x 14 x 2 ID B-187

44 x 21 x 3 ID B-112

53 x 16 x 3 ID B-266

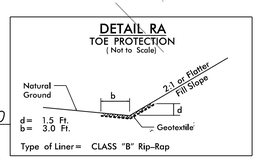
38 x 18 x 2 ID B-188

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



STA. 19+00 to 19+50 -Y3- (RT)
STA. 15+00 to 18+00 -Y3- (LT)

DETAIL RA
TOE PROTECTION
(Not to Scale)



d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner = CLASS "B" Rip-Rap

FROM STA. 12+50 -SR1REV- TO STA. 13+00 -SR1REV- LT.(Est.Qty. 27 Tons; 43 SY GEOTEXTILE)
FROM STA. 14+00 -SR1REV- TO STA. 14+50 -SR1REV- LT. (Est.Qty. 28 Tons; 47 SY GEOTEXTILE)
FROM STA. 147+43 -L- TO STA. 149+00 -L- RT. (Est.Qty. 45 Tons; 109 SY GEOTEXTILE)
FROM STA. 21+67 -SR1- TO STA. 22+71 -SR1- LT. (Est.Qty. 41 Tons; 71 SY GEOTEXTILE)

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

-SRIREV-

PI Sta 11+49.10
Δ = 63°02'40.8" (RT)
D = 32°44'25.6"
L = 192.56'
T = 107.33'
R = 175.00'
Se = 0.06
Runoff = 102.00'
D.S. = 25 mph

PI Sta 14+99.81
Δ = 17°21'01.2" (LT)
D = 12°54'16.0"
L = 134.45'
T = 67.74'
R = 444.00'
Se = 0.06
Runoff = 117.00'
D.S. = 40 mph

-Y3-

PI Sta 21+23.43
Δ = 8°41'34.9" (RT)
D = 0°45'00.0"
L = 1,159.07
T = 580.65
R = 7,639.44
Se = 0.03
Runoff = 81.00'
D.S. = 60 mph

-L-

PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
Se = 0.03
D.S. = 70 mph

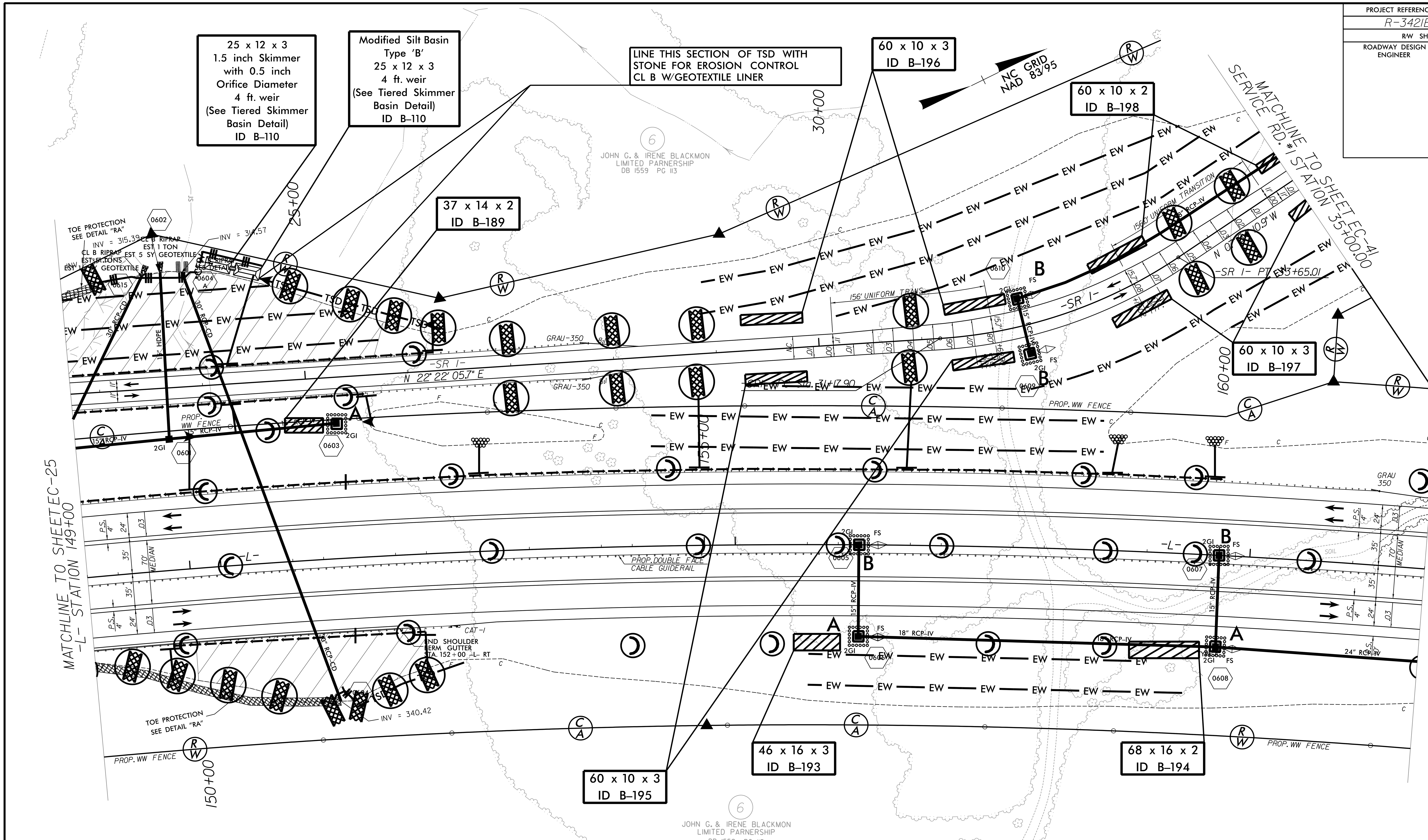
PLANS PREPARED BY :

RK&K

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

$DATE$ $TIME$ $FILE$

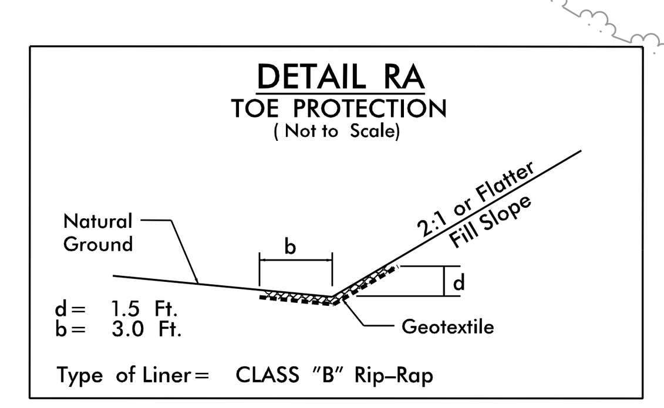
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-26/CONST.6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



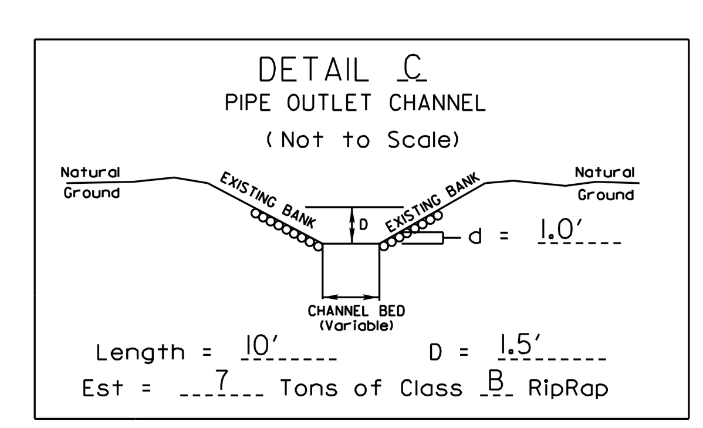
25 x 12 x 3
1.5 inch Skimmer
with 0.5 inch
Orifice Diameter
4 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-110
Modified Silt Basin
Type 'B'
25 x 12 x 3
4 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-110
LINE THIS SECTION OF TSD WITH
STONE FOR EROSION CONTROL
CL B W/GEOTEXTILE LINER
60 x 10 x 3
ID B-196
NC GRID
NAD 83/95
60 x 10 x 2
ID B-198
MATCHLINE TO SHEET EC-41
SERVICE RD. #1 STATION 35+00.00
JOHN G. & IRENE BLACKMON
LIMITED PARNERSHIP
DB 1559 PG 113
37 x 14 x 2
ID B-189
TOE PROTECTION
SEE DETAIL "RA"
INV = 315.39
INV = 314.57
CL B RIPRAP EST 1 TON
CL B RIPRAP EST 5 SY GEOTEXTILE
-SR 1-
N 22°22'05.7" E
GRAU-350
156' UNIFORM TRANS.
156' UNIFORM TRANSITION
-SR 1- PT 33+65.01
60 x 10 x 3
ID B-197
PROP. WW FENCE
MATCHLINE TO SHEET EC-25
-L- STATION 149+00
MATCHLINE TO SHEET EC-27
-L- STATION 162+00
-L-
PROP. DOUBLE FACE
CABLE GUIDERAIL
MEDIAN
18" RCP-IV
24" RCP-IV
15" RCP-IV
END SHOULDER
BERM GUTTER
STA. 152+00 -L- RT
CAT-I
TOE PROTECTION
SEE DETAIL "RA"
INV = 340.42
PROP. WW FENCE
46 x 16 x 3
ID B-193
68 x 16 x 2
ID B-194
60 x 10 x 3
ID B-195
25+00
30+00
150+00
155+00
160+00

JOHN G. & IRENE BLACKMON
LIMITED PARNERSHIP
DB 1559 PG 113

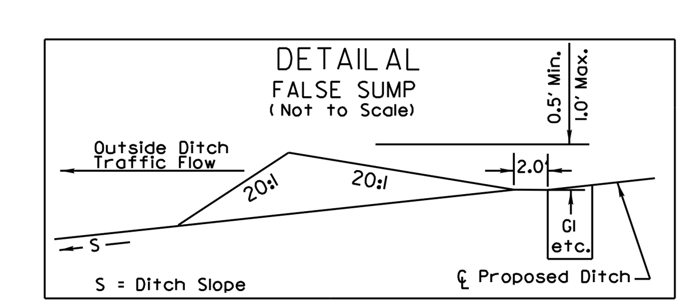
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH



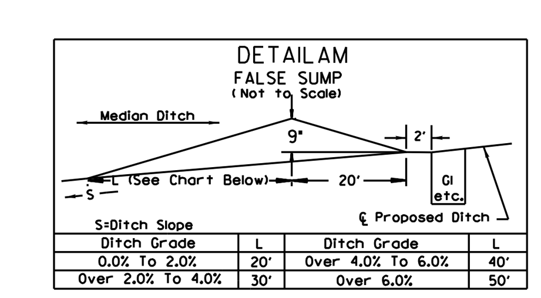
FROM STA. 149+00 -L- TO STA. 151+35 -L- RT.
(Est.Qty. 70 Tons; 161 SY GEOTEXTILE)
FROM STA. 22+71 -SR1- TO STA. 23+05 -SR1- LT.
(Est.Qty. 41 Tons; 24 SY GEOTEXTILE)



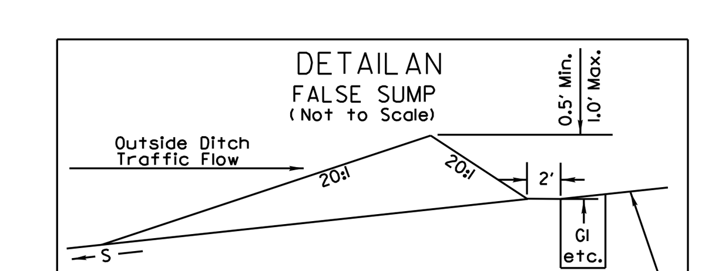
STA. 150+95.58 -L- (LT)



STA. 156+50 -L- (RT)
STA. 160+00 -L- (RT)
STA. 32+00 -SRI- (RT)



STA. 156+50 -L- (CL)
STA. 160+00 -L- (CL)



STA. 32+00 -SRI- (LT)

-L-	-SR 1-
PI Sta 180+84.12	PI Sta 32+44.41
Δ = 104°01'52.6" (RT)	Δ = 30°16'16.6" (LT)
D = 0°45'00.0"	D = 12°15'00.0"
L = 13,870.84	L = 247.11
T = 9,783.54	T = 126.51
R = 7,639.44	R = 467.72
Se = 0.03	Se = 0.08
D.S. = 70 mph	D.S. = 40 mph

LAWRENCE C. GREENE
DB 1172 PG 177

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

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-27/CONST.7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATCHLINE TO SHEET EC-41
-Y4- STATION 16+00.00

MATCHLINE TO SHEET EC-26
-L- STATION 162+00

MATCHLINE TO SHEET EC-28
-L- STATION 176+00

-Y4- PT 16+66.58

-Y4- PC 18+73.99

50 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B–116

52 x 14 x 3
ID B–204

34 x 15 x 3
ID B–203

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER

49 x 16 x 2
ID B–202

Modified Silt Basin
Type 'B'
28 x 17 x 3
4 ft. weir
(See Tiered Skimmer
Basin Detail)
ID B–117

28 x 17 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
4 ft. weir
ID B–117

73 x 23 x 3
ID B–264

32 x 12 x 3
ID B–205

-Y4- PC 24+08.65

-Y4- PT 24+60.91

-Y4- POT 25+65.88

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

-Y4- POC 168+78.62 =
-Y4- POC 20+78.66

-Y4- PT 21+94.00

BEG. SHOULDER BERM GUTTER STA. 164+00 -L- RT

END SHOULDER BERM GUTTER STA. 172+00 -L- RT

LATERAL BASE DITCH (SEE DETAIL "E")

LATERAL BASE DITCH (SEE DETAIL "F")

TOE PROTECTION (SEE DETAIL "RA")

CLASS I RIPRAP (SEE DETAIL "RA")

JB w/Slab 'L' See Special Detail Sheet 2C-8

PROP. DOUBLE FACE CABLE GUIDERAIL

PROP. WW FENCE

JOHN G. & IRENE BLACKMON LIMITED PARNERSHIP
DB 1559 PG 113
PB 23 PG 126
PB 23 PG 127

RICHMOND COUNTY
DB 652 PG 676
PB 23 PG 210

CAROLINA POWER & LIGHT CO.

RICHMOND COUNTY WATER LINE EASEMENT

SR 1411 BLEWITT FALLS RD

NC GRID
NAD 83/95

DETAIL AL
FALSE SUMP
(Not to Scale)

STA. 163+00 -L- (RT)
STA. 174+50 -L- (RT)

DETAIL AM
FALSE SUMP
(Not To Scale)

S=Ditch Slope	L
Ditch Grade 0.00% To 2.00%	20'
Over 2.00% To 4.00%	30'
Ditch Grade Over 4.00% To 6.00%	40'
Over 6.00%	50'

STA. 163+00 -L- (CL) STA. 172+00 -L- (CL)
STA. 167+00 -L- (CL) STA. 174+50 -L- (CL)
STA. 169+50 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)

STA. 164+25 -L- (LT)
STA. 174+50 -L- (LT)

DETAIL RA
TOE PROTECTION
(Not to Scale)

d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "B" Rip-Rap

FROM STA. 165+90 -L- TO STA. 167+40 -L- LT.
(Est.Qty. 40 Tons; 115 SY GEOTEXTILE)
FROM STA. 169+90 -L- TO STA. 171+00 -L- LT.
(Est.Qty. 30 Tons; 75 SY GEOTEXTILE)

DETAIL D
PIPE OUTLET CHANNEL
(Not to Scale)

Length = 20'
D = 2'
Est = 16 Tons of Class I RipRap

STA. 167+43 -L- (LT)

DETAIL E
LATERAL BASE DITCH
(Not to Scale)

Min. D = 0.5 Ft.
B = 5.0 Ft.
b = 10 Ft.

STA. 168+46.97 to 169+00 -L- (RT)

DETAIL F
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 5.0 Ft.
b = 10 Ft.
* When B is < 6.0'
Type of Liner = CLASS "B" RIP RAP

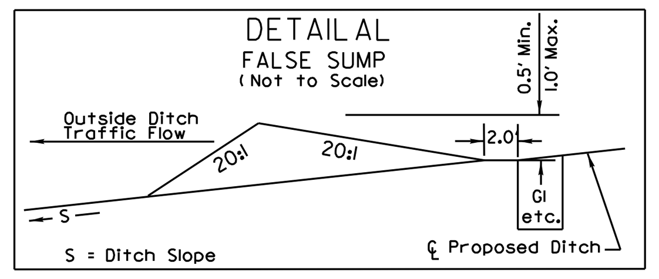
STA. 169+00 to 169+50 -L- (RT) (EST 23 TONS; 50 SY GEOTEXTILE)

-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph

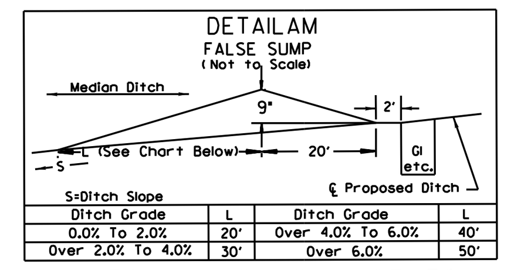
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

$DATE$ $TIME$ $FILE$

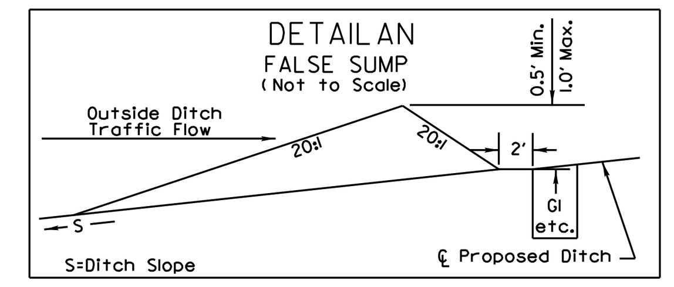
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-28/CONST.8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



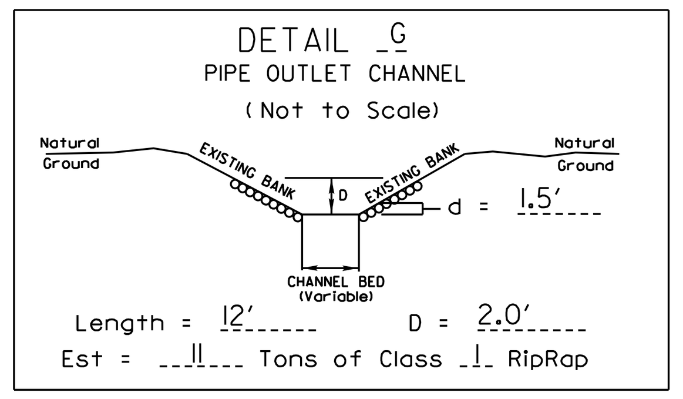
STA. 176+50 -L- (RT) STA. 190+00 -L- (RT)
STA. 183+50 -L- (RT)
STA. 187+00 -L- (RT)



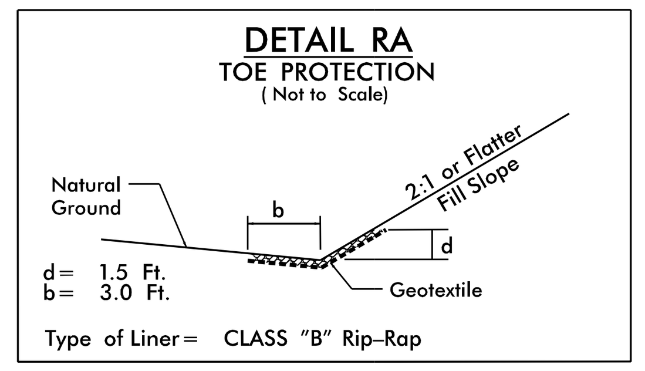
STA. 176+50 -L- (CL) STA. 183+50 -L- (CL)
STA. 179+00 -L- (CL) STA. 187+00 -L- (CL)
STA. 181+00 -L- (CL) STA. 190+00 -L- (CL)



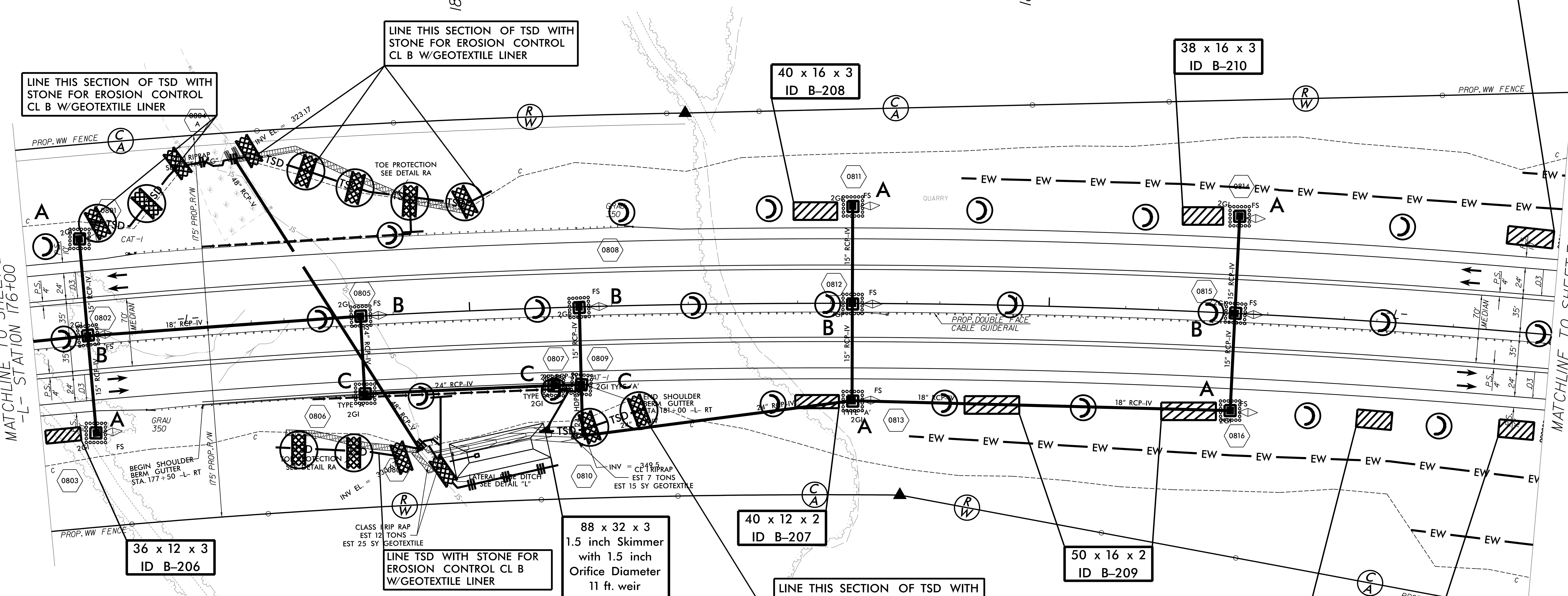
STA. 176+50 -L- (LT) STA. 190+00 -L- (LT)
STA. 183+50 -L- (LT)
STA. 187+00 -L- (LT)



STA. 178+71.06 -L- (LT)
STA. 179+59 -L- (RT) -(25' long)

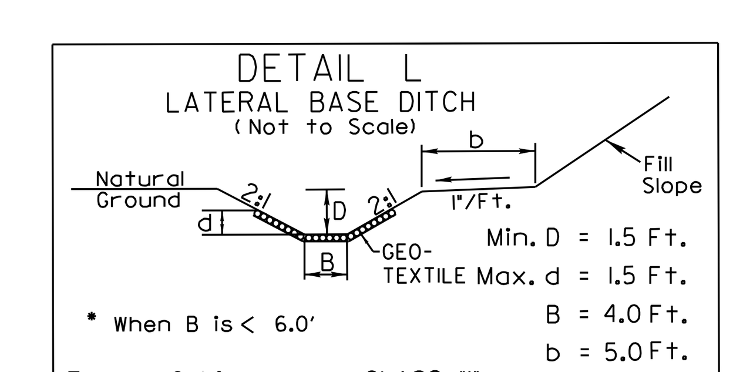


FROM STA. 178+00 -L- TO STA. 180+00 -L- LT.
(Est.Qty. 70 Tons; 147 SY GEOTEXTILE)
FROM STA. 178+25 -L- TO STA. 179+45 -L- RT.
(Est.Qty. 30 Tons; 84 SY GEOTEXTILE)



NC GRID NAD 83/95
6
JOHN G. & IRENE BLACKMON LIMITED PARNERSHIP
DB 1559 PG 113
180+00
185+00
190+00
LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
TOE PROTECTION SEE DETAIL RA
INV EL = 323.17
MATCHLINE TO SHEET EC-27 -L- STATION 176+00
MATCHLINE TO SHEET EC-29 -L- STATION 189+90
PROP. WW FENCE
40 x 16 x 3
ID B-208
38 x 16 x 3
ID B-210
42 x 16 x 3
ID B-212
36 x 12 x 3
ID B-206
40 x 12 x 2
ID B-207
50 x 16 x 2
ID B-209
32 x 16 x 3
ID B-211
88 x 32 x 3
1.5 inch Skimmer
with 1.5 inch
Orifice Diameter
11 ft. weir
ID B-123
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
LINE THIS SECTION OF TSD WITH STONE FOR EROSIN CONTROL CL B W/GEOTEXTILE LINER
CLASS I RIP RAP
EST 12 TONS
EST 25 SY GEOTEXTILE
BEGIN SHOULDER BERM GUTTER STA. 177+50 -L- RT
END SHOULDER BERM GUTTER STA. 181+00 -L- RT
INV = 349.5
CL I RIPRAP
EST 7 TONS
EST 15 SY GEOTEXTILE
LATERAL BASE DITCH SEE DETAIL "L"
18" RCP-IV
24" RCP-IV
15" RCP-IV
PROP. DOUBLE FACE CABLE GUIDERAIL
QUARRY
DB 1559 PG 113

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

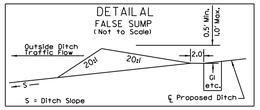


STA. 179+55 TO 181+00-L-(RT)
EST 74 TONS; EST 156 SY GEOTEXTILE; 68 CY DDE

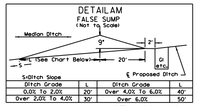
-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph

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

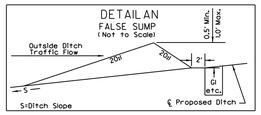
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-29/CONST.9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



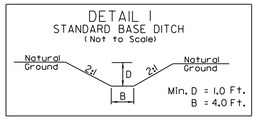
STA. 193+00 -L- (RT) STA. 201+00 -L- (RT)
STA. 196+00 -L- (RT) STA. 203+00 -L- (RT)
STA. 198+50 -L- (RT)



STA. 193+00 -L- (CL) STA. 201+00 -L- (CL)
STA. 196+00 -L- (CL) STA. 203+00 -L- (CL)
STA. 198+96.64 -L- (CL)



STA. 193+00 -L- (LT) STA. 201+00 -L- (LT)
STA. 196+00 -L- (LT) STA. 203+00 -L- (LT)
STA. 198+67 -L- (LT)



STA. 199+23 -L- (RT)

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

NC GRID NAD 83/95

6
JOHN G. & IRENE BLACKMON LIMITED PARNERSHIP
DB 1559 PG 113

ACKMO SHIP
DB 1559 PG 113

190+00
195+00
200+00

52 x 16 x 3
ID B–214

66 x 16 x 3
ID B–216

58 x 16 x 3
ID B–218

32 x 16 x 3
ID B–220

38 x 16 x 3
ID B–221

50 x 16 x 2
ID B–213

78 x 16 x 2
ID B–215

46 x 16 x 2
ID B–217

38 x 16 x 2
ID B–219

PROP. WW FENCE
QUARRY
EW
-L-
PROP. DOUBLE FACE CABLE GUIDERAIL
STANDARD BASE DITCH
DDE = 10 CY
SEE DETAIL "I"
CL RIPRAP
INV=340.87
JB w/MH
TYPE 2GI
TYPE 'A' 2GI
15" RCP-IV
18" RCP-IV
24" RCP-IV
30" RCP-IV
P.S. 4
P.S. 10
24'
03
35'
70' MEDIAN
+50.00 -L- 275.00 (RT)

MATCHLINE TO SHEET EC-28 -L- STATION 189+90

MATCHLINE TO SHEET EC-30 -L- STATION 204+00

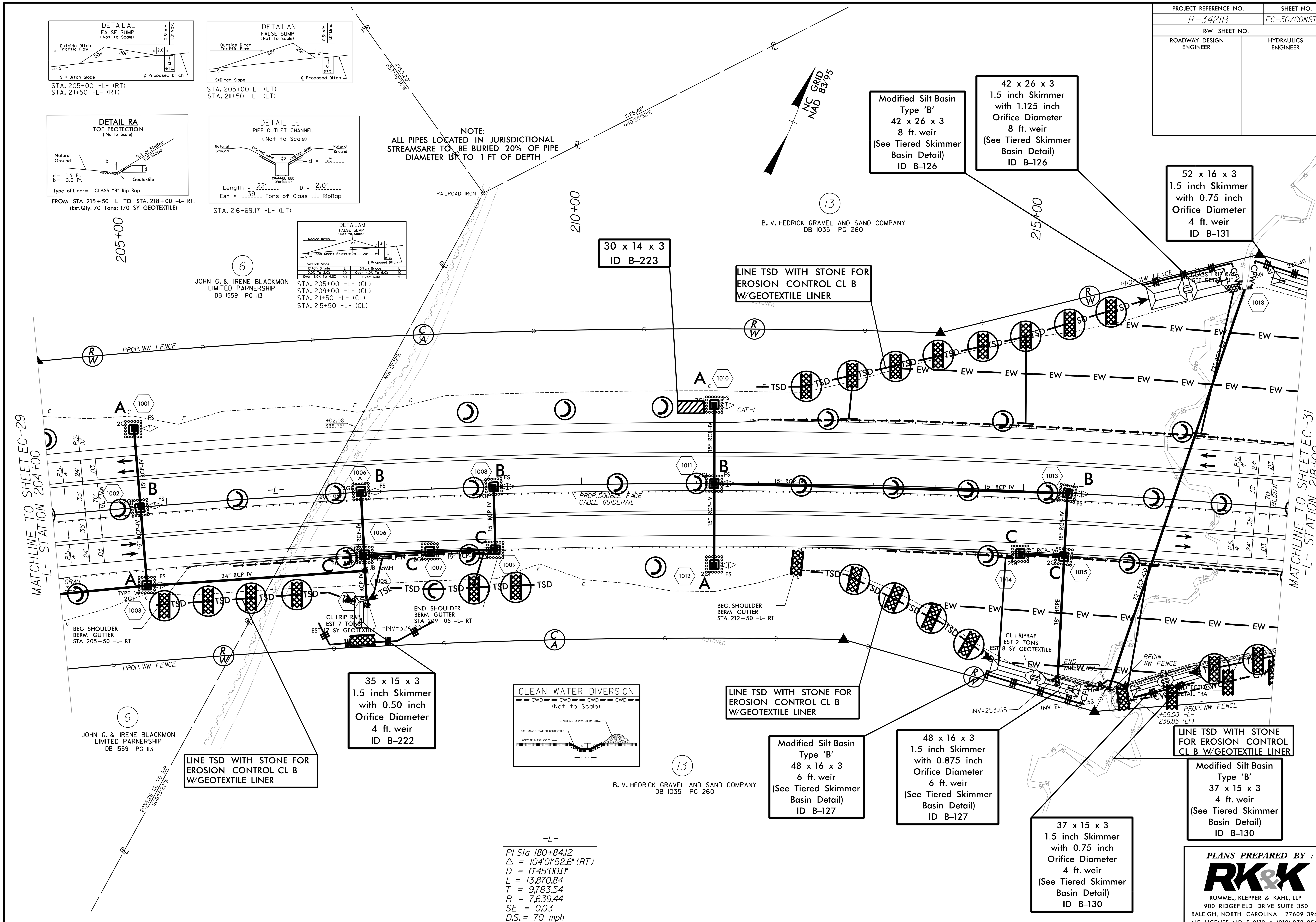
-L-
PI Sta 180+84.12
△ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph

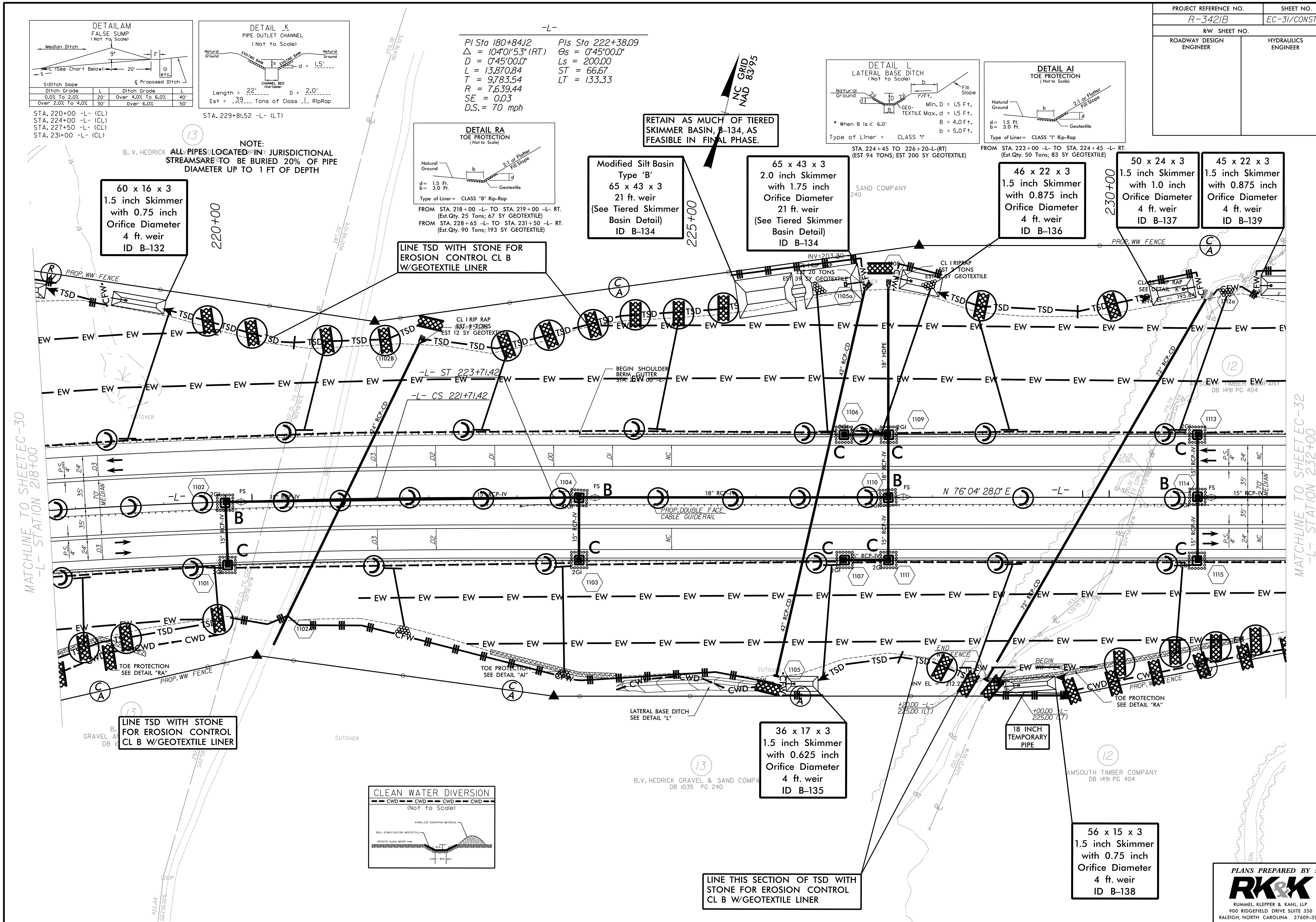
RIGHT OF WAY REVISION: SEPT. 11, 2014 – PROPERTY OWNER NAME CHANGED ON PARCEL 6.

$DATE$ $TIME$ $FILE$

PLANS PREPARED BY :

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


PROJECT REFERENCE NO. R-3421B
SHEET NO. EC-30/CONST.10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DETAIL AL
FALSE SUMP
(Not to Scale)
STA. 205+00 -L- (RT)
STA. 211+50 -L- (RT)
DETAIL AN
FALSE SUMP
(Not to Scale)
STA. 205+00-L- (LT)
STA. 211+50 -L- (LT)
DETAIL RA
TOE PROTECTION
(Not to Scale)
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "B" Rip-Rap
FROM STA. 215+50 -L- TO STA. 218+00 -L- RT.
(Est.Qty. 70 Tons; 170 SY GEOTEXTILE)
DETAIL J
PIPE OUTLET CHANNEL
(Not to Scale)
Length = 22'
D = 2.0'
d = 1.5'
Est = 39 Tons of Class I RipRap
STA. 216+69.17 -L- (LT)
DETAIL AM
FALSE SUMP
(Not to Scale)
STA. 205+00 -L- (CL)
STA. 209+00 -L- (CL)
STA. 211+50 -L- (CL)
STA. 215+50 -L- (CL)
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
RAILROAD IRON
NC GRID NAD 83/95
JOHN G. & IRENE BLACKMON LIMITED PARNERSHIP DB 1559 PG 113
B. V. HEDRICK GRAVEL AND SAND COMPANY DB 1035 PG 260
30 x 14 x 3
ID B-223
Modified Silt Basin Type 'B' 42 x 26 x 3 8 ft. weir (See Tiered Skimmer Basin Detail) ID B-126
42 x 26 x 3 1.5 inch Skimmer with 1.125 inch Orifice Diameter 8 ft. weir (See Tiered Skimmer Basin Detail) ID B-126
52 x 16 x 3 1.5 inch Skimmer with 0.75 inch Orifice Diameter 4 ft. weir ID B-131
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
PROP. WW FENCE
PROP. DOUBLE FACE CABLE GUIDERAIL
MATCHLINE TO SHEET EC-29 -L- STATION 204+00
MATCHLINE TO SHEET EC-31 -L- STATION 218+00
BEG. SHOULDER BERM GUTTER STA. 205+50 -L- RT
END SHOULDER BERM GUTTER STA. 209+05 -L- RT
BEG. SHOULDER BERM GUTTER STA. 212+50 -L- RT
CL I RIP RAP EST 7 TONS EST 17 SY GEOTEXTILE
CL I RIPRAP EST 2 TONS EST 8 SY GEOTEXTILE
35 x 15 x 3 1.5 inch Skimmer with 0.50 inch Orifice Diameter 4 ft. weir ID B-222
CLEAN WATER DIVERSION (Not to Scale)
Modified Silt Basin Type 'B' 48 x 16 x 3 6 ft. weir (See Tiered Skimmer Basin Detail) ID B-127
48 x 16 x 3 1.5 inch Skimmer with 0.875 inch Orifice Diameter 6 ft. weir (See Tiered Skimmer Basin Detail) ID B-127
37 x 15 x 3 1.5 inch Skimmer with 0.75 inch Orifice Diameter 4 ft. weir (See Tiered Skimmer Basin Detail) ID B-130
Modified Silt Basin Type 'B' 37 x 15 x 3 4 ft. weir (See Tiered Skimmer Basin Detail) ID B-130
BEGIN WW FENCE
INV=253.65
-L-
PI Sta 180+84.12
Δ = 104°01'52.6" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S.= 70 mph
PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560


PROJECT REFERENCE NO. | SHEET NO.
R-3421B | EC-31/CONST.11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DETAIL AM
FALSE SUMP
(Not to Scale)
Median Ditch
9"
2'
L (See Chart Below)
20'
GI etc.
S=Ditch Slope
℄ Proposed Ditch
Ditch Grade | L | Ditch Grade | L
0.0% To 2.0% | 20' | Over 4.0% To 6.0% | 40'
Over 2.0% To 4.0% | 30' | Over 6.0% | 50'
STA. 220+00 -L- (CL)
STA. 224+00 -L- (CL)
STA. 227+50 -L- (CL)
STA. 231+00 -L- (CL)
DETAIL K
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground
EXISTING BANK
CHANNEL BED (Variable)
d = 1.5'
Length = 22'
D = 2.0'
Est = 39 Tons of Class I RipRap
STA. 229+81.52 -L- (LT)
-L-
PI Sta 180+84.12
Δ = 104°01'53" (RT)
D = 0°45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph
PIs Sta 222+38.09
θs = 0°45'00.0"
Ls = 200.00
ST = 66.67
LT = 133.33
NC GRID NAD 83/95
DETAIL RA
TOE PROTECTION
(Not to Scale)
2:1 or Flatter Fill Slope
Natural Ground
Geotextile
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "B" Rip-Rap
FROM STA. 218+00 -L- TO STA. 219+00 -L- RT.
(Est.Qty. 25 Tons; 67 SY GEOTEXTILE)
FROM STA. 228+65 -L- TO STA. 231+50 -L- RT.
(Est.Qty. 90 Tons; 193 SY GEOTEXTILE)
RETAIN AS MUCH OF TIERED SKIMMER BASIN, B-134, AS FEASIBLE IN FINAL PHASE.
DETAIL L
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
1"/Ft.
GEO-TEXTILE
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.
* When B is < 6.0'
Type of Liner = CLASS "I"
STA. 224+45 TO 226+20-L-(RT)
(EST 94 TONS; EST 200 SY GEOTEXTILE)
DETAIL AI
TOE PROTECTION
(Not to Scale)
2:1 or Flatter Fill Slope
Natural Ground
Geotextile
d= 1.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS "I" Rip-Rap
FROM STA. 223+00 -L- TO STA. 224+45 -L- RT.
(Est.Qty. 50 Tons; 83 SY GEOTEXTILE)
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
60 x 16 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
4 ft. weir
ID B-132
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
Modified Silt Basin
Type 'B'
65 x 43 x 3
21 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-134
65 x 43 x 3
2.0 inch Skimmer
with 1.75 inch
Orifice Diameter
21 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-134
46 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-136
50 x 24 x 3
1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
4 ft. weir
ID B-137
45 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-139
220+00
225+00
230+00
PROP. WW FENCE
INV=203.30
CL I RIP RAP
EST 20 TONS
EST 39 SY GEOTEXTILE
CL I RIP RAP
EST 4 TONS
EST 12 SY GEOTEXTILE
CL I RIPRAP
EST 2 TONS
EST 7 SY GEOTEXTILE
CLASS I RIP RAP
SEE DETAIL "K"
INV EL. = 195.84
-L- ST 223+71.42
-L- CS 221+71.42
BEGIN SHOULDER BERM GUTTER STA. 224+00 -L-
24" RCP-CD
42" RCP-CD
18" HDPE
72" RCP-CD
15" RCP-IV
18" RCP-IV
N 76° 04' 28.0" E
PROP. DOUBLE FACE CABLE GUIDERAIL
B. V. HEDRICK GRAVEL AND SAND COMPANY
AMSOUTH TIMBER COMPANY
DB 1491 PG 404
CUTOVER
MATCHLINE TO SHEET EC-30
-L- STATION 218+00
MATCHLINE TO SHEET EC-32
-L- STATION 232+00
1101
1102
1102A
1102B
1103
1104
1105
1105a
1106
1107
1108
1109
1110
1111
1112a
1113
1114
1115
TOE PROTECTION SEE DETAIL "RA"
TOE PROTECTION SEE DETAIL "AI"
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
LATERAL BASE DITCH SEE DETAIL "L"
36 x 17 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
4 ft. weir
ID B-135
END WW FENCE
BEGIN WW FENCE
INV EL. = 212.22
+20.00 -L-
225.00 (LT)
+00.00 -L-
225.00 (LT)
18 INCH TEMPORARY PIPE
B.V. HEDRICK GRAVEL & SAND COMPANY
DB 1035 PG 240
CLEAN WATER DIVERSION
(Not to Scale)
STABILIZE EXCAVATED MATERIAL
SOIL STABILIZATION GEOTEXTILE
OFFSITE CLEAN WATER
1' MIN.
LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
56 x 15 x 3
1.5 inch Skimmer
with 0.75 inch
Orifice Diameter
4 ft. weir
ID B-138
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
$DATE$
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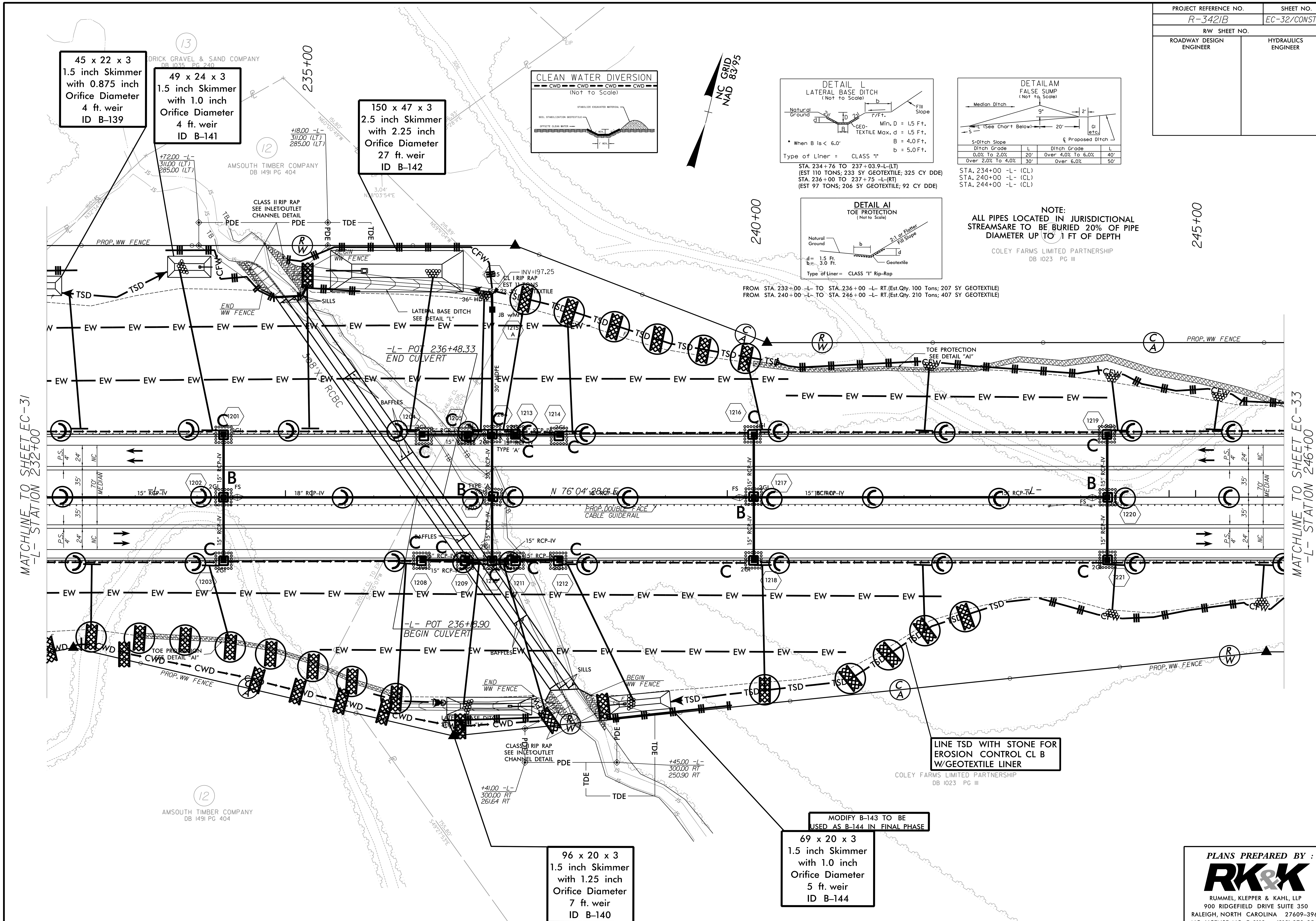


PROJECT REFERENCE NO.
SHEET NO.
R-3421B
EC-32/CONST.12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NC GRID NAD 83/95
CLEAN WATER DIVERSION
(Not to Scale)
DETAIL L
LATERAL BASE DITCH
(Not to Scale)
Type of Liner = CLASS "I"
STA. 234+76 TO 237+03.9-L-(LT)
(EST 110 TONS; 233 SY GEOTEXTILE; 325 CY DDE)
STA. 236+00 TO 237+75 -L-(RT)
(EST 97 TONS; 206 SY GEOTEXTILE; 92 CY DDE)
DETAIL AM
FALSE SUMP
(Not to Scale)
STA. 234+00 -L- (CL)
STA. 240+00 -L- (CL)
STA. 244+00 -L- (CL)
DETAIL AI
TOE PROTECTION
(Not to Scale)
Type of Liner = CLASS "I" Rip-Rap
FROM STA. 233+00 -L- TO STA. 236+00 -L- RT.(Est.Qty. 100 Tons; 207 SY GEOTEXTILE)
FROM STA. 240+00 -L- TO STA. 246+00 -L- RT.(Est.Qty. 210 Tons; 407 SY GEOTEXTILE)
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
45 x 22 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
4 ft. weir
ID B-139
49 x 24 x 3
1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
4 ft. weir
ID B-141
150 x 47 x 3
2.5 inch Skimmer
with 2.25 inch
Orifice Diameter
27 ft. weir
ID B-142
96 x 20 x 3
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
7 ft. weir
ID B-140
MODIFY B-143 TO BE USED AS B-144 IN FINAL PHASE
69 x 20 x 3
1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
5 ft. weir
ID B-144
LINE TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
MATCHLINE TO SHEET EC-31 -L- STATION 232+00
MATCHLINE TO SHEET EC-33 -L- STATION 246+00
235+00
240+00
245+00
AMSOUTH TIMBER COMPANY DB 1491 PG 404
COLEY FARMS LIMITED PARTNERSHIP DB 1023 PG III
-L- POT 236+48.33 END CULVERT
-L- POT 236+18.90 BEGIN CULVERT
N 76°04'28.0" E
PROP. DOUBLE FACE CABLE GUIDERAIL
CLASS II RIP RAP SEE INLET/OUTLET CHANNEL DETAIL
PROP. WW FENCE
PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-33/CONST.13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NC GRID
NAD 83'95

14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

250+00

255+00

38 x 16 x 3
ID B-224

52 x 16 x 3
ID B-225

52 x 16 x 3
ID B-228

40 x 16 x 3
ID B-226

50 x 16 x 3
ID B-227

+50.00 -L-
175.00 (LT)

+40.00 -L-
230.00 (LT)

STD BERM DITCH 240.01 WBDO
FROM STA 250+00 - 252+50 -L- LT

STANDARD BASE DITCH
SEE DETAIL "N"

BERM BASE DITCH
SEE DETAIL "M"

PROP. WW FENCE

END SHOULDER
BERM GUTTER
STA. 246+25 -L- LT

END SHOULDER
BERM GUTTER
STA. 248+50 -L-

CL I RIP RAP
EST 17 TONS
EST 38 SY GEOTEXTILE

CL I RIP RAP
EST 10 TONS
EST 23 SY GEOTEXTILE

INV=253.50

-L-

N 76°04'28.0" E

PROP. DOUBLE FACE
CABLE GUIDERAIL

CUTOVER

MATCHLINE TO SHEET EC-32
-L- STATION 246+00

MATCHLINE TO SHEET EC-34
-L- STATION 259+90

DETAIL AL
FALSE SUMP
(Not to Scale)

S = Ditch Slope

STA. 247+42.28 -L- (LT)
STA. 250+00 -L- (LT)
STA. 253+00 -L- (LT)
STA. 258+89.74 -L- (LT)
STA. 260+00 -L- (LT)

DETAIL AM
FALSE SUMP
(Not to Scale)

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

STA. 247+42.28 -L- (CL)
STA. 250+00 -L- (CL)
STA. 253+00 -L- (CL)
STA. 258+58.81 -L- (CL)
STA. 260+00 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)

STA. 250+00 -L- (RT)
STA. 253+00 -L- (RT)
STA. 260+00 -L- (RT)

DETAIL M
BERM BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft.
B = 3.0 Ft.
b = 5.0 Ft.
Max. d = 1.0 Ft.
Type of Liner = CLASS 'B' RIP RAP

STA. 255+00 TO 258+89.74 -L- (LT)
(EST 156 TONS; 346 SY GEOTEXTILE; 207 CY DDE)
STA. 258+89.74 TO 260+00 -L- (LT)
(EST 39 TONS; 86 SY GEOTEXTILE)

DETAIL N
STANDARD BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 3.0 Ft.
* When B is < 6.0'
Type of Liner = CLASS 'B' RIP RAP

STA. 258+89.74 -L- (LT)
DDE = 53 CY
EST 16 TONS
EST 31 SY GEOTEXTILE

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

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

$DATE$ $TIME$ $FILE$

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-34/CONST.14
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NC GRID NAD 83/95

260+00

265+00

270+00

14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

56 x 16 x 3
ID B-231

72 x 16 x 3
ID B-232

68 x 16 x 3
ID B-233

PROP. WW FENCE

BERM BASE DITCH
SEE DETAIL "M"

EW — EW — EW — EW — EW — EW — EW — EW — EW — EW — EW — EW — EW

-L-

24" RCP-IV

18" RCP-IV

15" RCP-IV

TYPE 'A'

1402 1403 1405 1406 1408 1409

N 76° 04' 28.0" E

PROP. DOUBLE FACE CABLE GUIDERAIL

P.S. 4" 24" NC 35' 70' MEDIAN

P.S. 10"

47 x 16 x 3
ID B-229

65 x 16 x 3
ID B-230

49 x 16 x 3
ID B-234

78 x 39 x 3
2.0 inch Skimmer
with 1.625 inch
Orifice Diameter
12 ft. weir
ID B-149

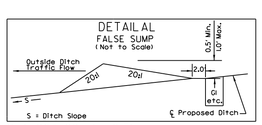
MATCHLINE TO SHEET EC-33
-L- STATION 259+90

MATCHLINE TO SHEET EC-35
-L- STATION 274+00

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

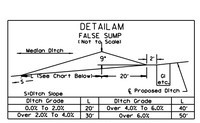
14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

DETAIL AL
FALSE SUMP
(Not to Scale)



STA. 264+00 -L- (LT)
STA. 269+00 -L- (LT)
STA. 274+00 -L- (LT)

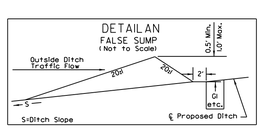
DETAIL AM
FALSE SUMP
(Not to Scale)



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

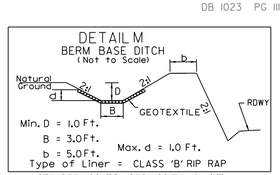
STA. 264+00 -L- (CL)
STA. 269+00 -L- (CL)

DETAIL AN
FALSE SUMP
(Not to Scale)



STA. 264+00 -L- (RT)
STA. 269+00 -L- (RT)

DETAIL M
BERM BASE DITCH
(Not to Scale)



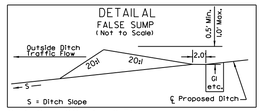
Min. D = 1.0 Ft.
B = 3.0Ft.
b = 5.0Ft.
Max. d = 1.0 Ft.
Type of Liner = CLASS 'B' RIP RAP

STA. 255+00 TO 258+89.74 -L- (LT)
(EST 156 TONS; 346 SY GEOTEXTILE)
STA. 258+89.74 TO 260+00 -L- (LT)
(EST 39 TONS; 86 SY GEOTEXTILE)

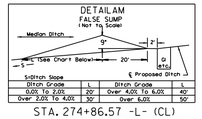
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

$DATE$ $TIME$ $FILE$

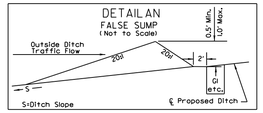
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-35/CONST.15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



STA. 277+00 -L- (LT)
STA. 281+50 -L- (LT)
STA. 287+50 -L- (LT)



STA. 274+86.57 -L- (CL)
STA. 277+00 -L- (CL)
STA. 281+00 -L- (CL)
STA. 287+50 -L- (CL)



STA. 281+00 -L- (RT)
STA. 287+50 -L- (RT)

NC GRID NAD 83/95

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

275+00

280+00

285+00

67 x 16 x 3
ID B-235

50 x 16 x 3
ID B-236

70 x 16 x 3
ID B-237

14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG 111

PROP. WW FENCE

CUTOVER

INV. 314.30'

1501 1502 1504 1505 1506 1507 1509 1510 1511

TYPE '2GI'

30" RCP

15" RCP-IV

24" RCP-IV

18" RCP-IV

300' UNIFORM TRANSITION

300' ACCELERATION LANE

RAMP B CS 0+00.00
(59.00' LT) =
-L- POC 286+91.60

RAMP B

RAMP C

N 76° 04' 28.0" E

N 70° 25' 26.1" E

299.01' UNIFORM TRANSITION

RAMP C TS 0+00.00
(59.00' RT) = 02° 18' 00") =
-L- POC 287+00.00

+00.00 -L-
175.00 (RT)

CL I RIPRAP
EST 7 TONS
70 EST SY GEOTEXTILE

-L- TS 275+39.93

-L- SC 277+39.93

5'x10'
CLASS 'B' RIP RAP PAD
EST. 5.5 TONS
FILTER FABRIC
EST. 5.56 SY

PROP. DOUBLE FACE CABLE GUIDERAIL

78 x 39 x 3
2.0 inch Skimmer
with 1.625 inch
Orifice Diameter
12 ft. weir
ID B-149

83 x 55 x 3
2.5 inch Skimmer
with 2.25 inch
Orifice Diameter
35 ft. weir
(See Tiered Skimmer
Basin Detail)
ID B-150

Modified Silt Basin
Type 'B'
83 x 55 x 3
35 ft. weir
(See Tiered Skimmer
Basin Detail)
ID B-150

52 x 16 x 3
ID B-238

56 x 16 x 3
ID B-239

MATCHLINE TO -L- STATION 274+00 SEE SHEET EC-34

MATCHLINE TO -L- STATION 288+00 SEE SHEET EC-36

-L-

PIs Sta 276+73.265	PI Sta 293+86.98
Θs = 0°45'00"	△ = 24°20'00.0" (LT)
Ls = 200.000	D = 0°45'00.0"
ST = 66.67	L = 3,244.44
LT = 133.33	T = 1,647.05
	R = 7,639.44
	Se = 0.03
	D.S. = 70 mph

$DATE$ $TIME$ $FILE$

PLANS PREPARED BY :

RK&K

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

PROJECT REFERENCE NO.	SHEET NO.
R-3601B	EC-36/CONST.16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-

PI Sta 293+86.98	PI Sta 301+51.04
Δ = 24°20'00.0" (LT)	Ts = 0°45'00.0"
D = 1°45'00.0"	Ls = 200.00
L = 3,244.44	ST = 66.67
T = 1,647.05	LT = 133.33
R = 1,639.44	
Se = 0.03	
Runoff = 108.00'	
D.S.= 70 mph	

-Y5-

PI Sta 18+87.85	PI Sta 43+80.68
Δ = 17°35'46" (LT)	Δ = 6°50'43.7" (LT)
D = 1°15'00.0"	D = 1°45'00.0"
L = 1,403.69	L = 372.12
T = 707.38	T = 186.26
R = 4,583.66	R = 3,274.04
Se = 0.04	Se = 0.04
Runoff = 108.00'	Runoff = 108.00'
D.S.= 60 mph	D.S.= 60 mph

RAMP A

PI Sta 2+66.02	PI Sta 5+62.27	PI Sta 8+56.25
Gs = 2°50'06.0"	Δ = 13°55'37.2" (RT)	Gs = 2°50'06.0"
Ls = 189.00	D = 3°00'00.0"	Ls = 189.00
ST = 63.01	L = 464.24	ST = 63.01
LT = 126.02	T = 233.27	LT = 126.02
	R = 1,909.86	
	Se = 0.07	
	D.S.= 60 mph	

RAMP B

PI Sta 1+33.73	PI Sta 4+16.49	PI Sta 6+85.77	PI Sta 10+67.73	PI Sta 12+56.17
Gs = 5°40'34.7"	Δ = 17°53'50.5" (LT)	Gs = 4°57'36.0"	Gs = 2°52'48.0"	Δ = 18°29'31.5" (RT)
Ls = 216.00	D = 4°30'00.0"	Ls = 216.00	Ls = 96.00	D = 6°00'00.0"
ST = 82.45	L = 397.72	ST = 72.05	ST = 32.01	L = 308.20
LT = 133.73	T = 200.49	LT = 144.05	LT = 64.01	T = 155.45
Δ 1 = 17°49'56.4"	R = 1,273.24			R = 954.93
Δ 2 = 4°52'58.3"	Se = 0.08			Se = 0.04
R1 = 7,580.44	D.S.= 60 mph			D.S.= 50 mph
R2 = 1,273.24				

RAMP C

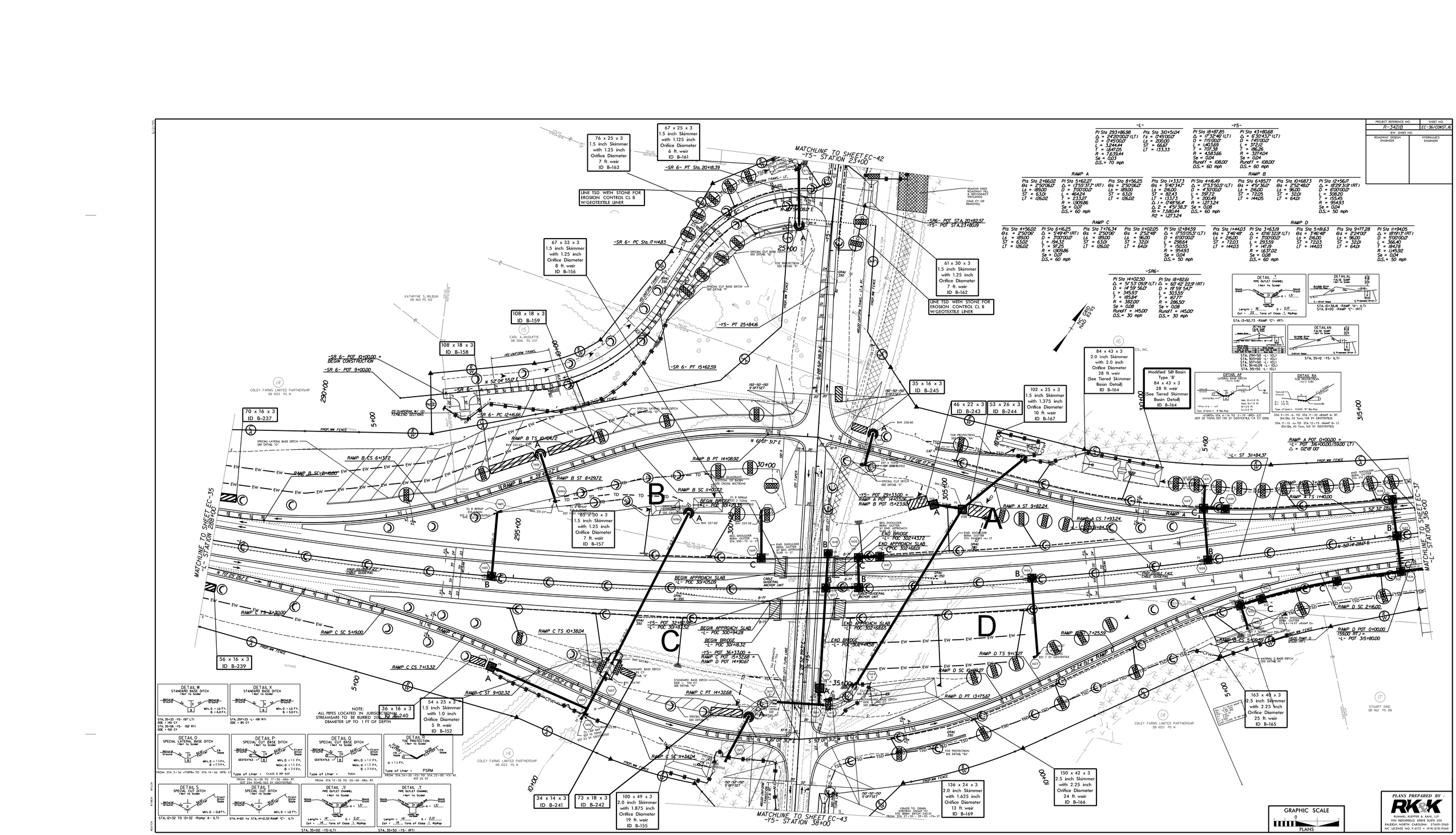
PI Sta 4+56.02	PI Sta 6+16.25	PI Sta 7+76.34	PI Sta 11+02.05	PI Sta 12+84.59
Gs = 2°50'06"	Δ = 5°49'47" (RT)	Gs = 2°50'06"	Gs = 2°52'48"	Δ = 17°55'05.5" (LT)
Ls = 189.00	D = 7°00'00.0"	Ls = 189.00	Ls = 96.00	D = 6°00'00.0"
ST = 63.02	L = 194.32	ST = 63.01	ST = 32.01	L = 298.64
LT = 126.02	T = 97.25	LT = 126.02	LT = 64.01	T = 150.55
	R = 1,909.86			R = 954.93
	Se = 0.07			Se = 0.04
	D.S.= 60 mph			D.S.= 50 mph

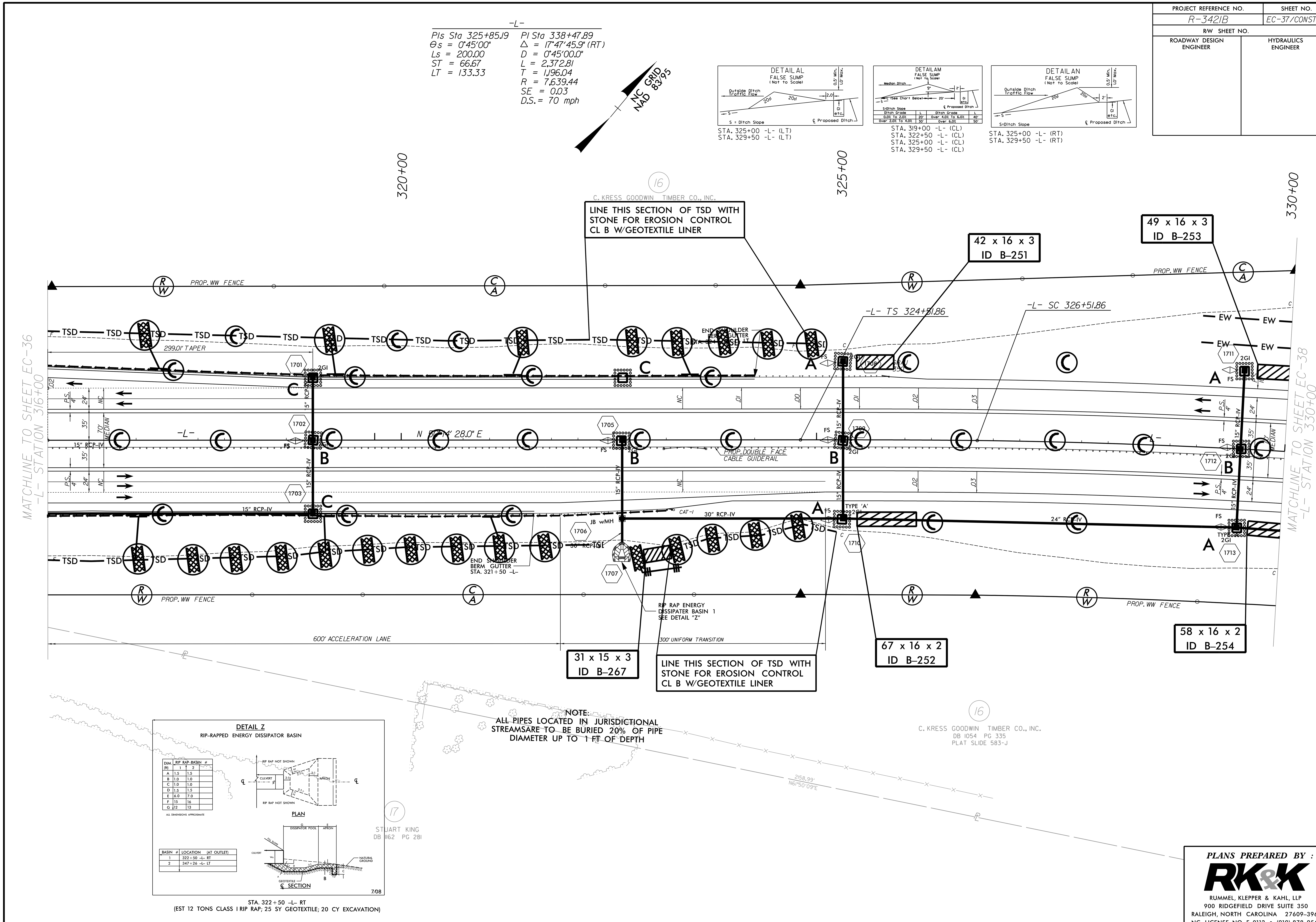
RAMP D

PI Sta 1+44.03	PI Sta 3+63.19	PI Sta 5+81.63	PI Sta 9+77.28	PI Sta 11+94.05
Gs = 3°46'48"	Δ = 16°16'32.5" (LT)	Gs = 3°46'48"	Gs = 2°24'00"	Δ = 18°19'13" (RT)
Ls = 216.00	D = 7°00'00.0"	Ls = 216.00	Ls = 96.00	D = 5°00'00.0"
ST = 72.03	L = 293.59	ST = 72.03	ST = 32.01	L = 366.40
LT = 144.03	T = 147.19	LT = 144.03	LT = 64.01	T = 184.78
	R = 1,637.02			R = 1,145.92
	Se = 0.08			Se = 0.04
	D.S.= 60 mph			D.S.= 50 mph

-SR6-

PI Sta 14+02.50	PI Sta 18+82.61
Δ = 51°53'09.5" (LT)	Δ = 60°42'22.9" (RT)
D = 14°59'56.0"	D = 19°59'54.7"
L = 345.33'	L = 303.55'
T = 185.84'	T = 167.77'
R = 382.00'	R = 286.50'
Se = 0.08	Se = 0.08
Runoff = 145.00'	Runoff = 145.00'
D.S.= 30 mph	D.S.= 30 mph




PROJECT REFERENCE NO.
SHEET NO.
R-3421B
EC-37/CONST.17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-L-
PIs Sta 325+85.19
θs = 0°45'00"
Ls = 200.00
ST = 66.67
LT = 133.33
PI Sta 338+47.89
Δ = 17°47'45.9" (RT)
D = 0°45'00.0"
L = 2,372.81
T = 1,196.04
R = 7,639.44
SE = 0.03
D.S. = 70 mph
NC GRID NAD 83/95
DETAIL AL
FALSE SUMP
(Not to Scale)
STA. 325+00 -L- (LT)
STA. 329+50 -L- (LT)
DETAIL AM
FALSE SUMP
(Not to Scale)
STA. 319+00 -L- (CL)
STA. 322+50 -L- (CL)
STA. 325+00 -L- (CL)
STA. 329+50 -L- (CL)
DETAIL AN
FALSE SUMP
(Not to Scale)
STA. 325+00 -L- (RT)
STA. 329+50 -L- (RT)
320+00
325+00
330+00
16
C. KRESS GOODWIN TIMBER CO., INC.
LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
42 x 16 x 3
ID B-251
49 x 16 x 3
ID B-253
PROP. WW FENCE
-L- TS 324+51.86
-L- SC 326+51.86
299.01' TAPER
MATCHLINE TO SHEET EC-36 -L- STATION 316+00
MATCHLINE TO SHEET EC-38 -L- STATION 330+00
1701
1702
1703
1705
1706
1707
1709
1710
1711
1712
1713
15" RCP-IV
30" RCP-IV
24" RCP-IV
-L-
N 51°14' 28.0" E
PROP. DOUBLE FACE CABLE GUIDERAIL
END SHOULDER BERM GUTTER STA. 321+50 -L-
JB w/MH
TYPE 'A'
2GI
RIP RAP ENERGY DISSIPATER BASIN 1
SEE DETAIL "Z"
600' ACCELERATION LANE
300' UNIFORM TRANSITION
31 x 15 x 3
ID B-267
LINE THIS SECTION OF TSD WITH STONE FOR EROSION CONTROL CL B W/GEOTEXTILE LINER
67 x 16 x 2
ID B-252
58 x 16 x 2
ID B-254
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
16
C. KRESS GOODWIN TIMBER CO., INC.
DB 1054 PG 335
PLAT SLIDE 583-J
17
STUART KING
DB 1162 PG 281
DETAIL Z
RIP-RAPPED ENERGY DISSIPATOR BASIN
PLAN
SECTION
STA. 322+50 -L- RT
(EST 12 TONS CLASS I RIP RAP; 25 SY GEOTEXTILE; 20 CY EXCAVATION)
PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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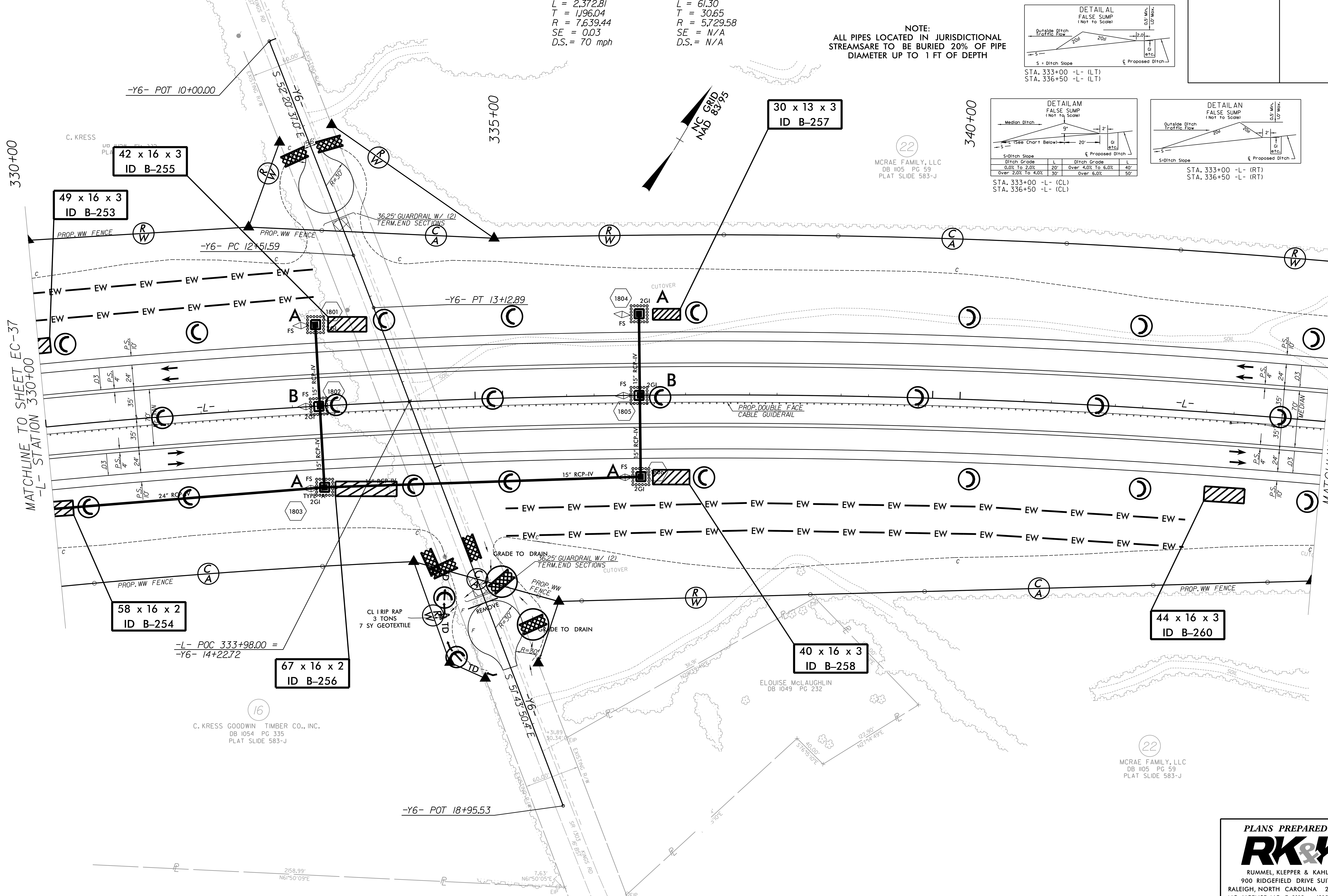
NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-38/CONST.18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-	-Y6-
PI Sta 338+47.89	PI Sta 12+82.24
Δ = 17°47'45.9" (RT)	Δ = 00°36'46.7" (RT)
D = 0°45'00.0"	D = 1°00'00.0"
L = 2,372.81	L = 61.30
T = 1,196.04	T = 30.65
R = 7,639.44	R = 5,729.58
SE = 0.03	SE = N/A
D.S. = 70 mph	D.S. = N/A

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH



DETAIL AL
FALSE SUMP
(Not to Scale)
STA. 333+00 -L- (LT)
STA. 336+50 -L- (LT)
DETAIL AM
FALSE SUMP
(Not to Scale)
STA. 333+00 -L- (CL)
STA. 336+50 -L- (CL)
DETAIL AN
FALSE SUMP
(Not to Scale)
STA. 333+00 -L- (RT)
STA. 336+50 -L- (RT)
-Y6- POT 10+00.00
-Y6- PC 12+51.59
-Y6- PT 13+12.89
-Y6- POT 18+95.53
-L- POC 333+98.00 = -Y6- 14+22.72
S 52°20'37.0" E
S 51°43'50.4" E
NC GRID NAD 83/95
330+00
335+00
340+00
MATCHLINE TO SHEET EC-37 -L- STATION 330+00
MATCHLINE TO SHEET EC-39 -L- STATION 344+00
30 x 13 x 3 ID B-257
42 x 16 x 3 ID B-255
49 x 16 x 3 ID B-253
58 x 16 x 2 ID B-254
67 x 16 x 2 ID B-256
40 x 16 x 3 ID B-258
44 x 16 x 3 ID B-260
C. KRESS
MCRAE FAMILY, LLC DB 1105 PG 59 PLAT SLIDE 583-J
C. KRESS GOODWIN TIMBER CO., INC. DB 1054 PG 335 PLAT SLIDE 583-J
ELOUISE McLAUGHLIN DB 1049 PG 232
36.25' GUARDRAIL W/ (2) TERM.END SECTIONS
PROP. WW FENCE
PROP. DOUBLE FACE CABLE GUIDERAIL
15" RCP-IV
24" RCP
GRADE TO DRAIN
CL I RIP RAP 3 TONS 7 SY GEOTEXTILE
REMOVE
CUTOVER
SR 1303 ST. KINGS RD
EXISTING R/W
1801
1802
1803
1804
1805
2GI
FS

PLANS PREPARED BY :
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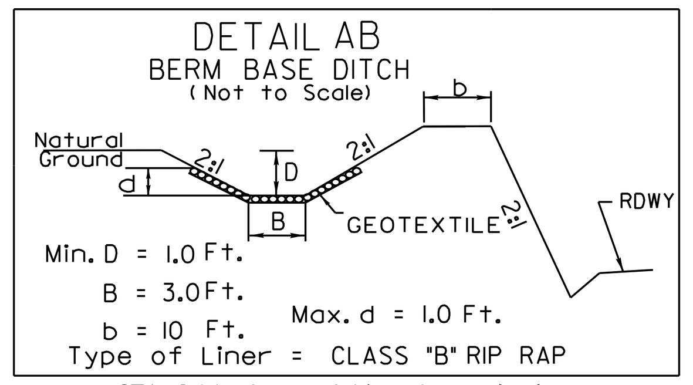
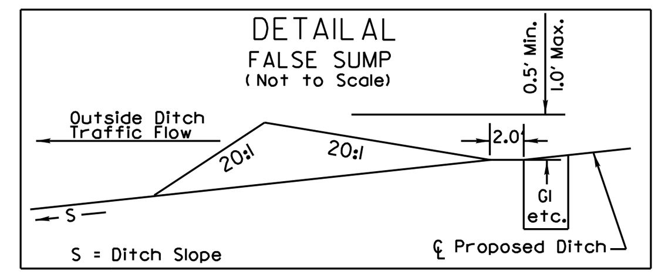
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-39/CONST.19

R/W SHEET NO.

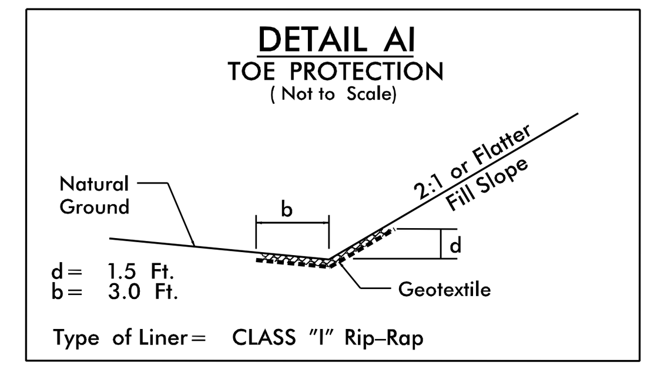
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



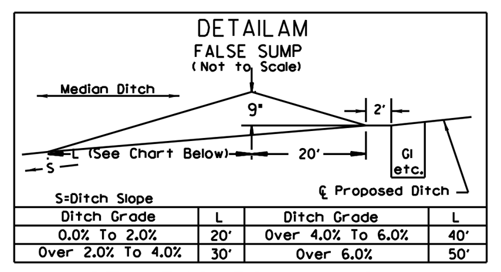
STA. 344+25 to 346+50 -L- (RT.)
(EST 77 TONS; 172 SY GEOTEXTILE)



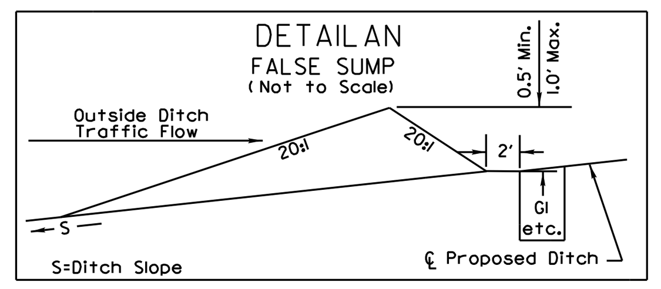
STA. 346+50 -L- (RT)
STA. 349+50 -L- (RT)



FROM STA. 350+68 -L- TO STA. 354+65 -L- RT.(Est.Qty. 130 Tons; 267 SY GEOTEXTILE)
FROM STA. 352+30 -L- TO STA. 355+90 -L- LT.(Est.Qty. 125 Tons; 245 SY GEOTEXTILE)

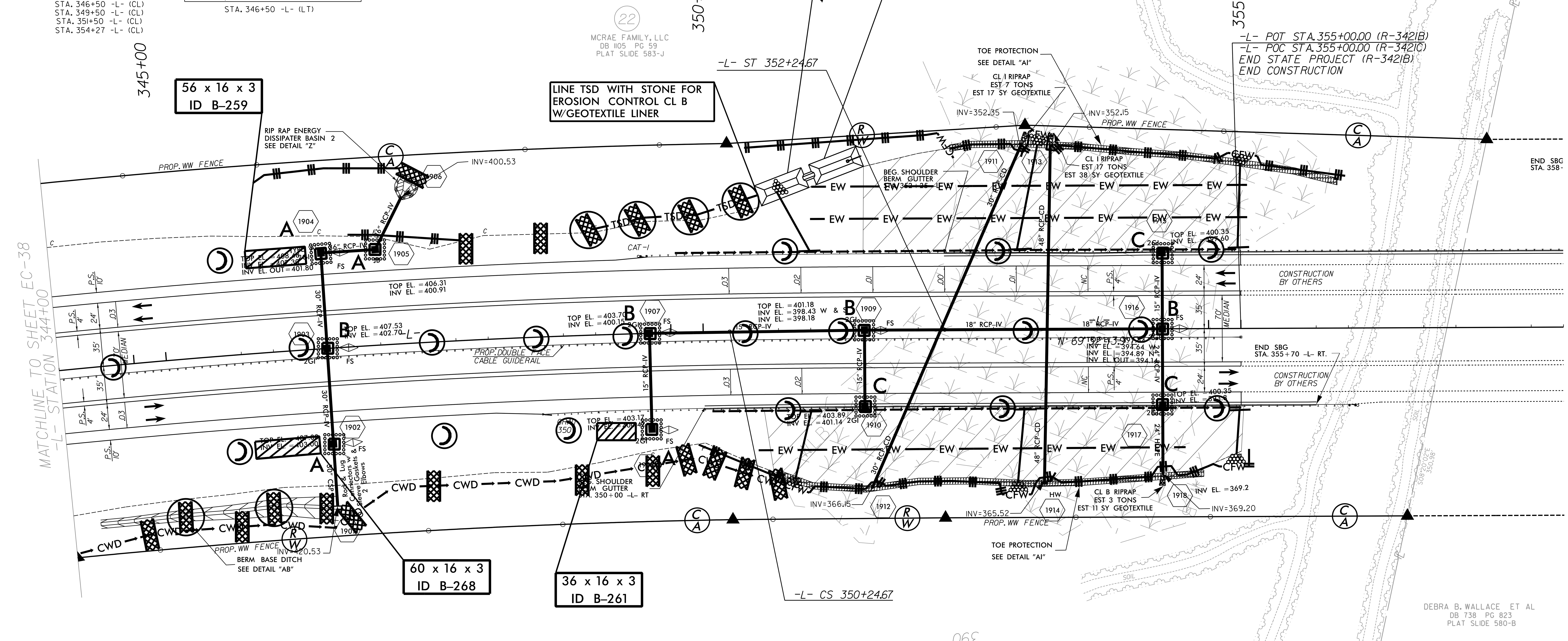


STA. 346+50 -L- (CL)
STA. 349+50 -L- (CL)
STA. 351+50 -L- (CL)
STA. 354+27 -L- (CL)



STA. 346+50 -L- (LT)

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMSARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH

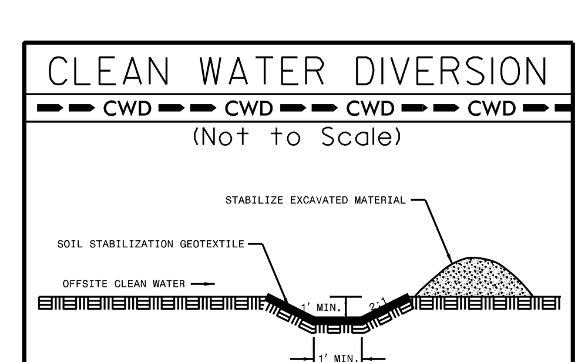


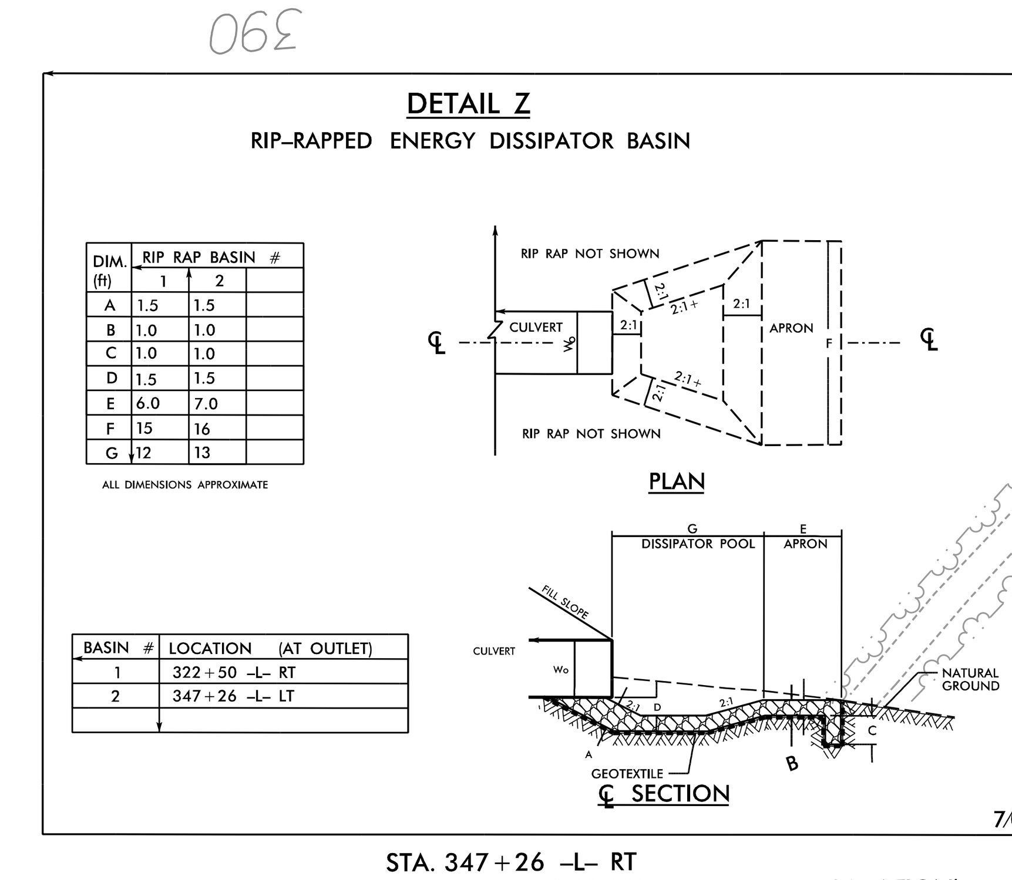
Modified Silt Basin
Type 'B'
47 x 20 x 3
7 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-177
47 x 20 x 3
1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
7 ft. weir
(See Tiered Skimmer Basin Detail)
ID B-177
NC GRID NAD 83/95
345+00
350+00
355+00
MCRAE FAMILY, LLC
DB 1105 PG 59
PLAT SLIDE 583-J
56 x 16 x 3
ID B-259
RIP RAP ENERGY DISSIPATER BASIN 2
SEE DETAIL "Z"
LINE TSD WITH STONE FOR
EROSION CONTROL CL B
W/GEOTEXTILE LINER
-L- ST 352+24.67
TOE PROTECTION
SEE DETAIL "AI"
CL I RIPRAP
EST 7 TONS
EST 17 SY GEOTEXTILE
INV=352.35
INV=352.15
PROP. WW FENCE
CL I RIPRAP
EST 17 TONS
EST 38 SY GEOTEXTILE
BEG. SHOULDER BERM GUTTER
-L- POT STA.355+00.00 (R-3421B)
-L- POC STA.355+00.00 (R-3421C)
END STATE PROJECT (R-3421B)
END CONSTRUCTION
END SBG
CONSTRUCTION BY OTHERS
END SBG
STA. 355+70 -L- RT.
CONSTRUCTION BY OTHERS
MATCHLINE TO SHEET EC-38
-L- STATION 344+00
INV=400.53
PROP. DOUBLE FACE CABLE GUIDERAIL
CAT-I
MEDIAN
TOP EL. =406.31
INV EL. =400.91
TOP EL. =407.53
INV EL. =402.70
TOP EL. =403.70
INV EL. =400.15
TOP EL. =401.18
INV EL. =398.43
INV EL. =398.18
TOP EL. =400.35
INV EL. =394.64
INV EL. =394.89
INV EL OUT=394.14
TOP EL. =403.89
INV EL. =401.14
TOP EL. =403.17
INV EL OUT=401.80
18" RCP-IV
30" RCP-IV
15" RCP-IV
30" RCP-CD
48" RCP-CD
24" HDPE
BEG. SHOULDER BERM GUTTER
STA. 350+00 -L- RT
INV=366.15
INV=365.52
PROP. WW FENCE
CL B RIPRAP
EST 3 TONS
EST 11 SY GEOTEXTILE
INV EL. =369.2
INV=369.20
TOE PROTECTION
SEE DETAIL "AI"
BERM BASE DITCH
SEE DETAIL "AB"
INV=420.53
60 x 16 x 3
ID B-268
36 x 16 x 3
ID B-261
-L- CS 350+24.67
DEBRA B. WALLACE ET AL
DB 738 PG 823
PLAT SLIDE 580-B
390
MCRAE FAMILY, LLC
DB 1105 PG 59
PLAT SLIDE 583-J

FURNISH THE LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY TO MAINTAIN AND REMOVE EROSION CONTROL DEVICES WITHIN PROJECT LIMITS OF R-3421B INSTALLED UNDER THE R-3421C PROJECT (STATION 355+00 to 460+00) AS DIRECTED

-L-

PI Sta 338+47.89	PIs Sta 350+91.34
Δ = 17°47'46" (RT)	Θs = 0°45'00"
D = 0°45'00.0"	Ls = 200.00
L = 2,372.81	ST = 66.67
T = 1,196.04	LT = 133.33
R = 7,639.44	
SE = 0.03	
D.S.= 70 mph	





STA. 347+26 -L- RT
(EST 15 TONS CLASS I RIP RAP; 27 SY GEOTEXTILE; 23 CY EXCAVATION)

PLANS PREPARED BY :
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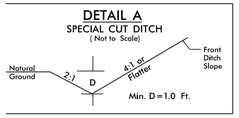
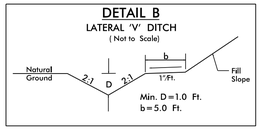
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	EC-40/CONST.20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. TO STA.
STA. 19+00 to 19+50 –Y3– (RT)
STA. 16+50 to 18+00 –Y3– (LT)
STA. 28+00 to 28+72 –Y3– (LT)

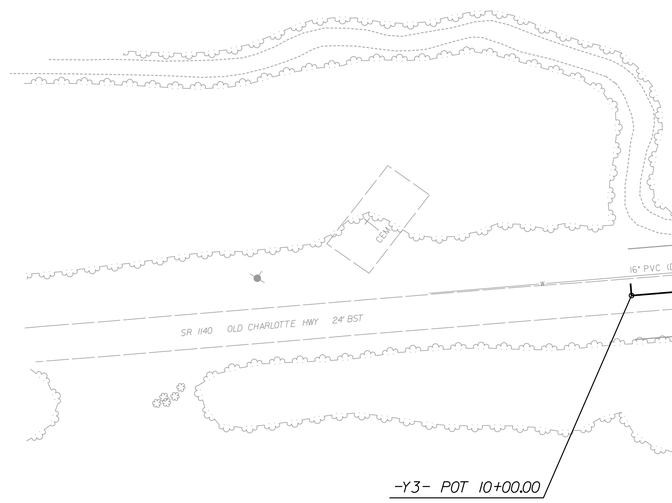
DETAIL B
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. TO STA.
STA. 16+84.60 to 19+00 –Y3– (RT)

–Y3–
PI Sta 21+23.43
Δ = 8°41'34.9" (RT)
D = 0°45'00.0"
L = 1,159.07
T = 580.65
R = 7,639.44
Se = 0.03
Runoff = 81.00'
D.S. = 60 mph

NC GRID
NAD 83/95



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$DATE$ $TIME$ $FILE$