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PROJECT: R-2413CA

TIP P

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2413CA	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

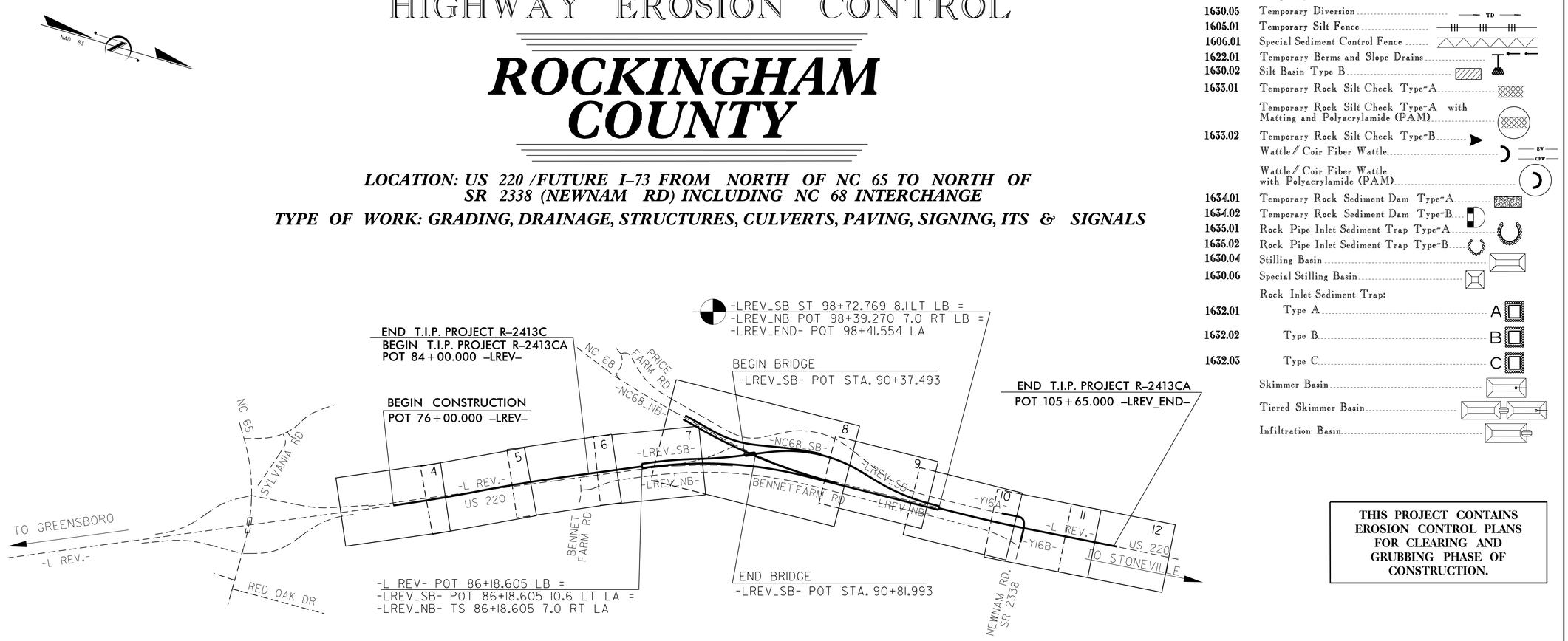
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ROCKINGHAM COUNTY

LOCATION: US 220 /FUTURE I–73 FROM NORTH OF NC 65 TO NORTH OF SR 2338 (NEWNAM RD) INCLUDING NC 68 INTERCHANGE

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



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	

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

GRAPHIC SCALE

0
PLANS
0
PROFILE (HORIZONTAL)
0
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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

Prepared in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Designed by:

Jennifer Parish ***3451***
NAME *LEVEL III CERTIFICATION NO.*

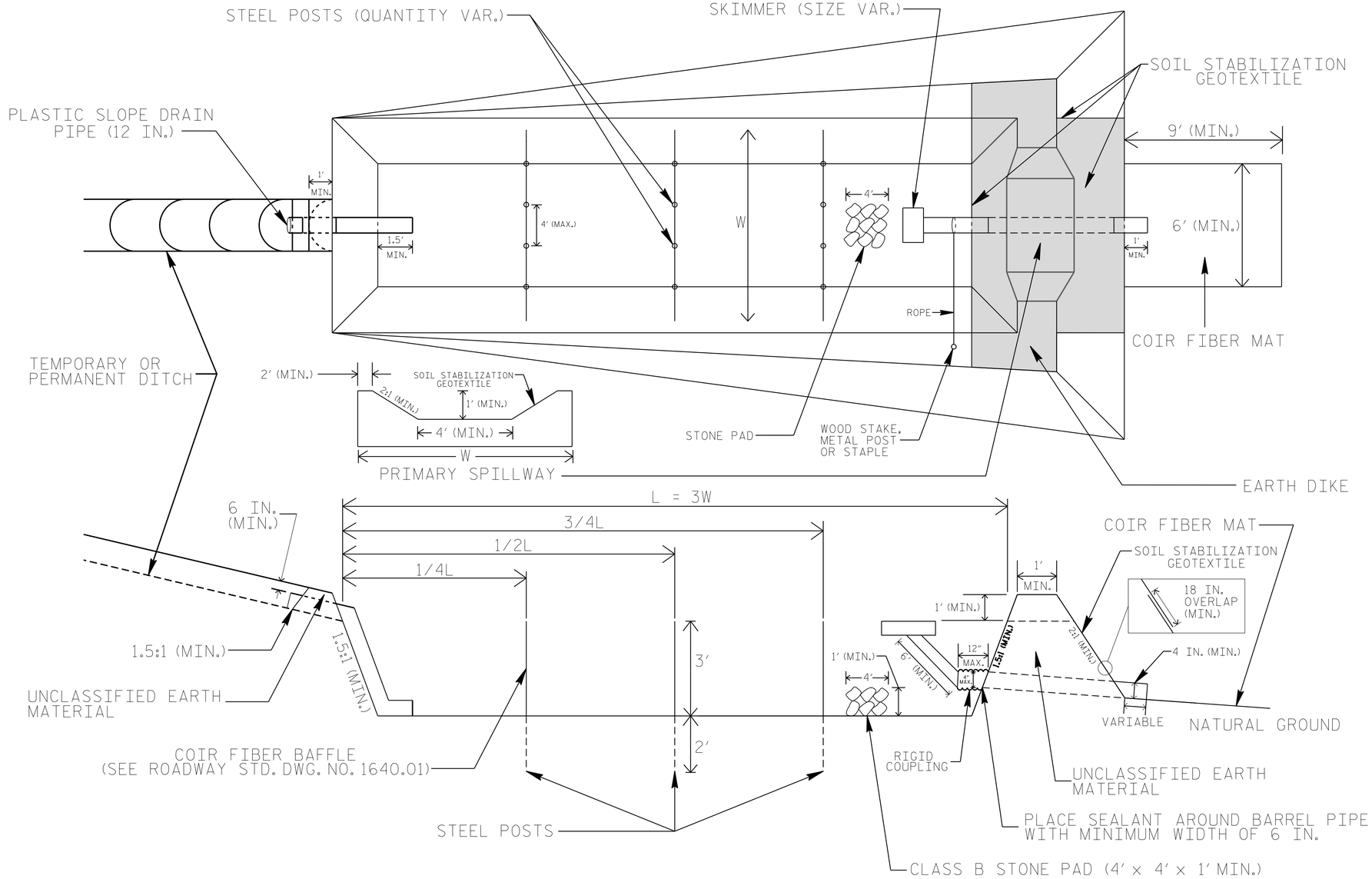
Roadway Standard Drawings

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.

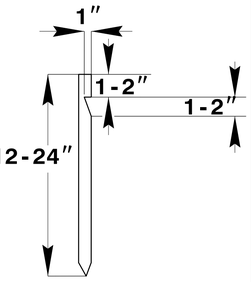
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type 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-2413CA	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

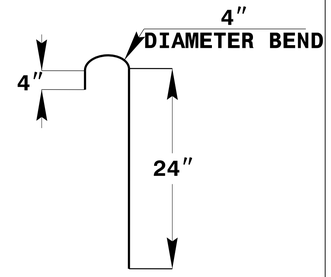
SKIMMER BASIN WITH BAFFLES DETAIL



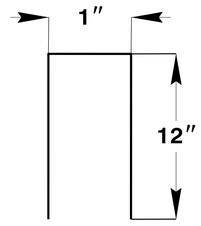
2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1" (nominal) STAPLE



COIR FIBER MAT ANCHOR OPTIONS

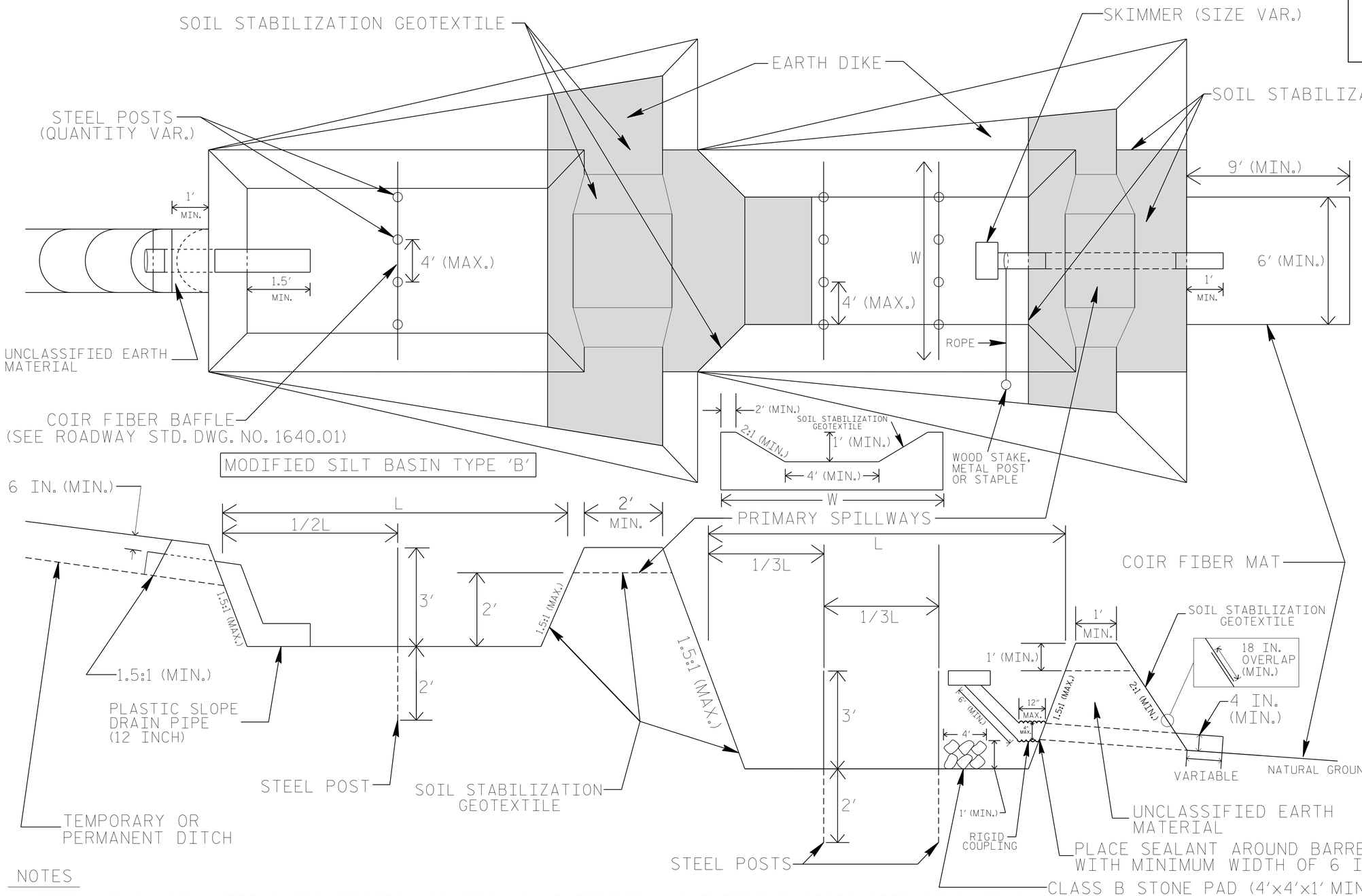
NOTES

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/0.4, 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.).

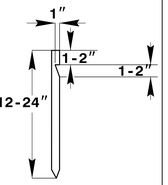
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

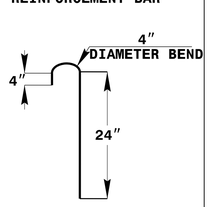
TIERED SKIMMER BASIN DETAIL



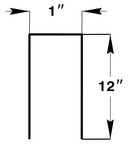
2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1" (nominal) STAPLE



COIR FIBER MAT ANCHOR OPTIONS

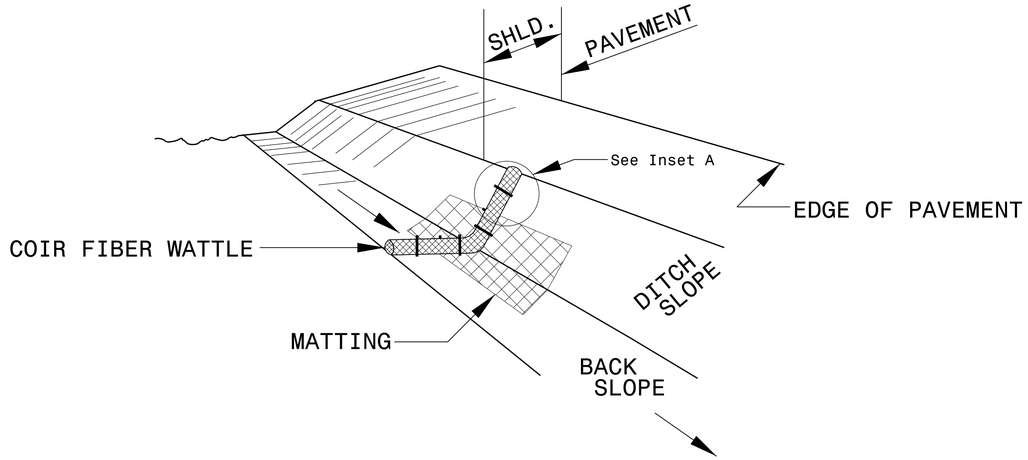
NOTES

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/0.4, 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.).

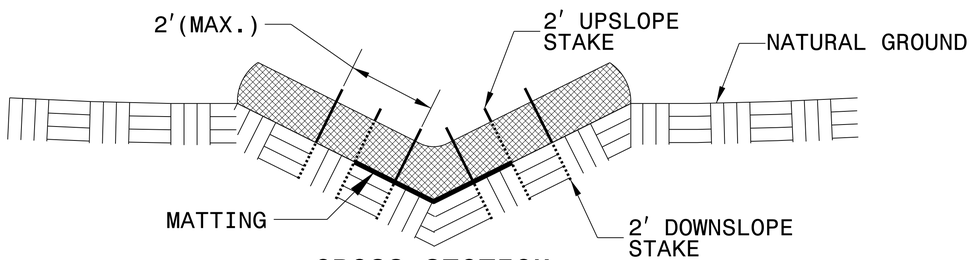
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

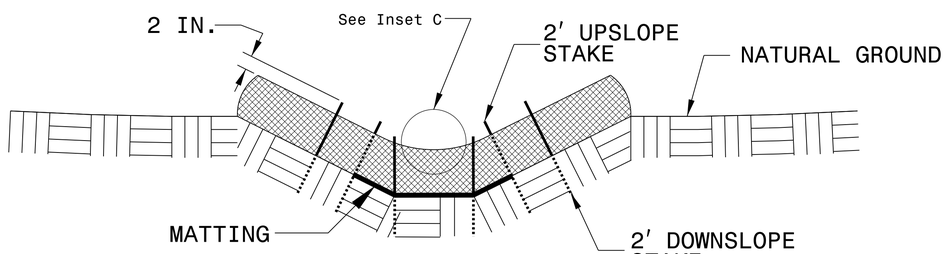
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) 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.

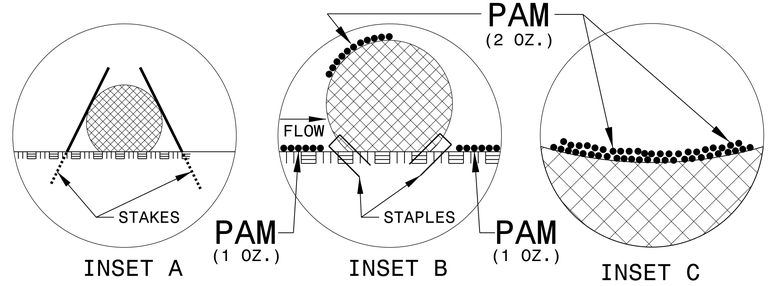
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

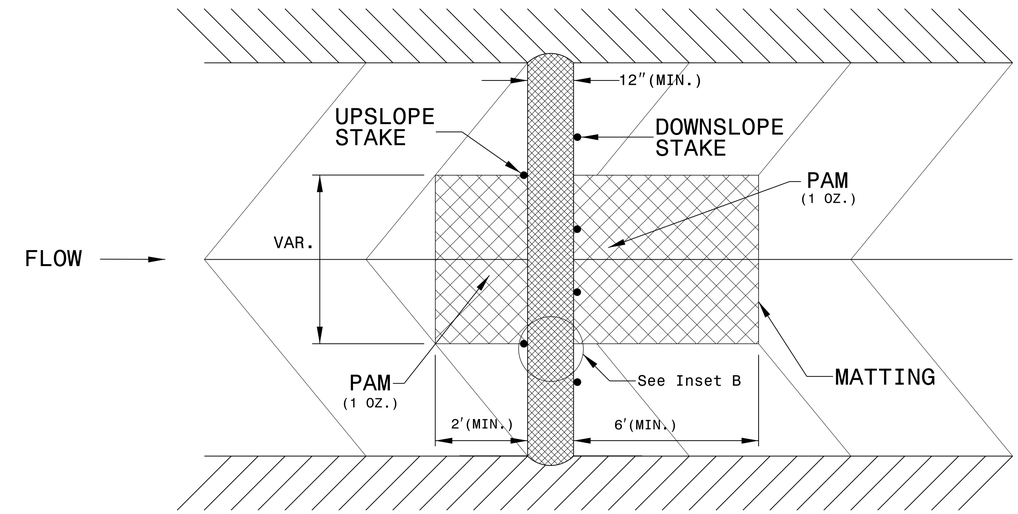
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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.

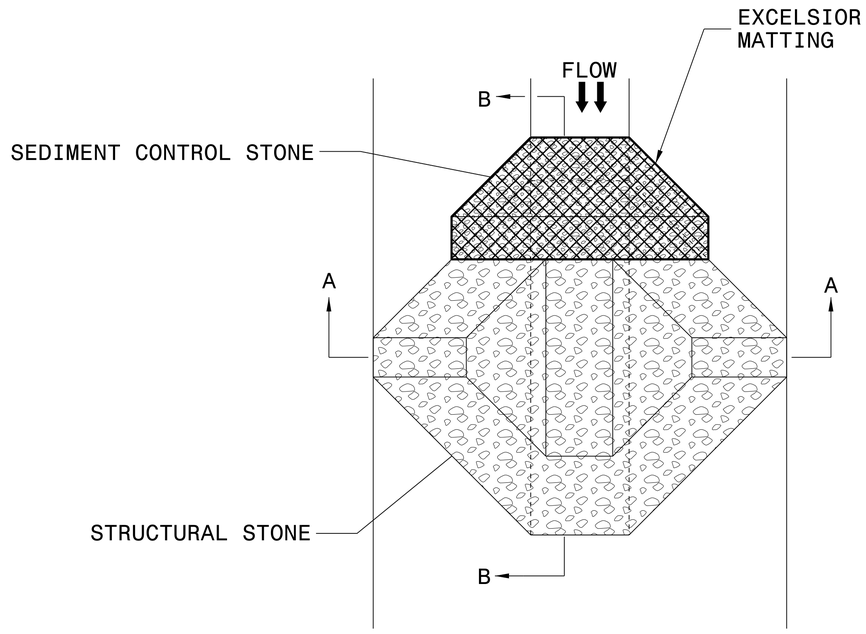




TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN

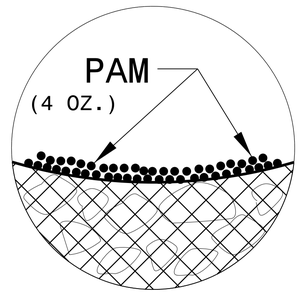
NOTES:

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

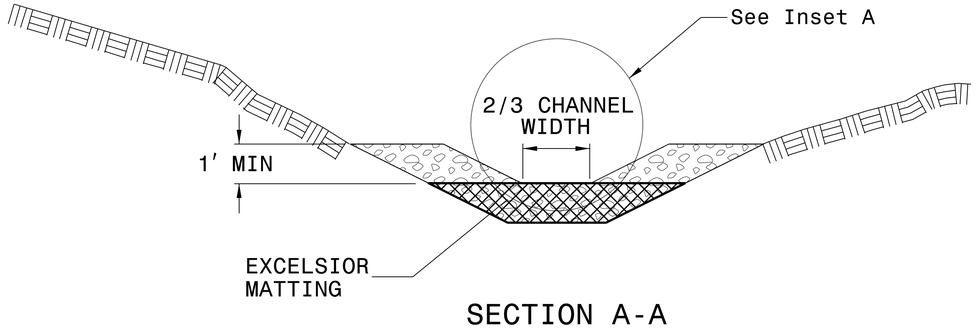
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.

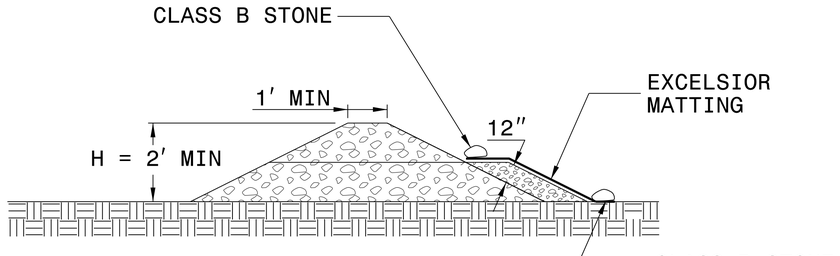
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
6	-LREV-	83+00	83+20	LT	90
6	-LREV-	83+00	85+00	MED	875
6	-LREV-	83+20	83+80	RT	265
7	-LREV-	85+00	88+60	MED	950
7	-LREV-	85+40	86+00	LT	265
7	-LREV-	85+60	86+00	LT	375
7	-LREV-	85+60	86+00	RT	180
7	-LREV*SB-	86+00	88+21	LT	970
7	-LREV*NB-	86+00	88+60	RT	1140
8	-LREV*NB-	88+60	91+00	RT	1055
8	-NC68*NB-	13+81	14+21	LT	180
8	-LREV*NB-	93+40	97+80	LT	1925
8	-LREV*NB-	93+80	97+80	RT	1195
8	-NC68*NB-	10+00	12+79	LT	545
8	-NC68*NB-	12+08	12+47	RT	150
				SUBTOTAL	10,160
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					19,000
				TOTAL	29,160
				SAY	30,000

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
6	-LREV-	83+60	84+20	LT	235
				SUBTOTAL	235
		ADDITIONAL PSRM TO BE INSTALLED			230
				TOTAL	465
				SAY	500

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-3A
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.

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-4/CONST.4
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R /W REV.	

METRIC

5m 0 10m

Erosion Control devices on this sheet have been installed on R-2413C and are shown for reference only

NAD 83

RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C

75+00 76+00 77+00

MATCH LINE STA. 78+00 -L REV.- SHEET 5

EDWARD A. FRIDDLE FAMILY TRUST
DB 1229 PG 1585
(FORMERLY E. AUSTIN FRIDDLE)

BEGIN CONSTRUCTION (NB LANES)
POC 76+00.000 -LREV-

PROP 1.2m WW

+58.641 -L REV- 53.500 (175.52 FT.)

N 23°39'10" W 859.852

EXIST R/W

TOE PROTECTION
STA 76+30 TO
STA 77+13 -LREV- LT
W78.2 MTN CL "B" RIP RAP
EST. 345.8 SMFF
SEE DETAIL #8

BEGIN PROP. CABLE GUIDERAIL TIE TO EXISTING

1350 CLASS IV RCP

JB w/Slab Lid

1350 CONC

900 CLASS IV RCP

COLLAR AND EXTEND

900 CONC

US 220 SB (BY OTHERS)

PROPOSED CABLE GUIDERAIL

REMOVE

RETAIN

US 220 7.3 BST

2GI-A FS

600

-L REV-

750

450 RCP

375 RCP

2GI W/FG

2GI FS

450 CONC

REMOVE +/-12.5m REMOVE EXISTING GUARDRAIL

INSTALL DURING XOVRI CONSTRUCTION

COLLAR AND EXTEND

450 CLASS IV

900 CLASS IV

450 W/ELBOWS

+37 -L REV- END SHLDR BERM GUTTER RT.

US 220 NB (BY OTHERS)

EXIST. R/W

N 23°39'10" W 73.324

G.R.A.U. TYPE 350

-L REV- STA. 76+85.000 BEGIN 90 TAPER

+50 -L REV- BEGIN SHLDR BERM GUTTER RT.

-L REV- STA. 77+05.000 END 90 TAPER

BERM DITCH
STA 73+40 TO
STA 74+50 -LREV- RT
SEE PROFILE FOR GRADE
SEE DETAIL #6

BDO

450 W/ELBOWS

CLASS 'A' RIP RAP ON BANKS ONLY EST 26.9 MTONS EST 31.7 SM FF (INSTALL DURING XOVRI CONSTRUCTION)

CLASS 'I' RIP RAP ON BANKS ONLY EST 26.9 MTONS EST 31.7 SM FF (INSTALL DURING XOVRI CONSTRUCTION)

EDWARD A. FRIDDLE FAMILY TRUST
DB 1229 PG 1585
(FORMERLY E. AUSTIN FRIDDLE)

EDWARD A. FRIDDLE FAMILY TRUST
DB 1229 PG 1585
(FORMERLY E. AUSTIN FRIDDLE)

S 66°52'55" W 70.274

S 23°28'18" E 73.313

N 66°53'28" E 70.506 (BACK EIP TO R/W)
N 66°53'28" E 70.086 (BACK EIP TO EIP)

17.000

+9.516

EIP

24 x 8 x 1
38 mm Skimmer
with 33 mm
Orifice Diameter
5.5 m weir
ID 19.3 CG

14 x 4 x 1
38 mm Skimmer
with 15 mm
Orifice Diameter
1.5 m weir
ID 19.7 F

20 x 5 x 1
38 mm Skimmer
with 24 mm
Orifice Diameter
2.5 m weir
ID 19.4 CG

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

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

-L REV-
PI Sta 77+51.191
△ = 3°09' 20.9" (LT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC

SEE SHEET 13 FOR -L REV- PROFILE

06-FEB-2015 14:23
N:\Projects\R2413CA\Design\R2413CA_EC_ps#04.dgn
ATP NEW\2841103

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-5/CONST.5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5m 0 10m

CONST.REV.

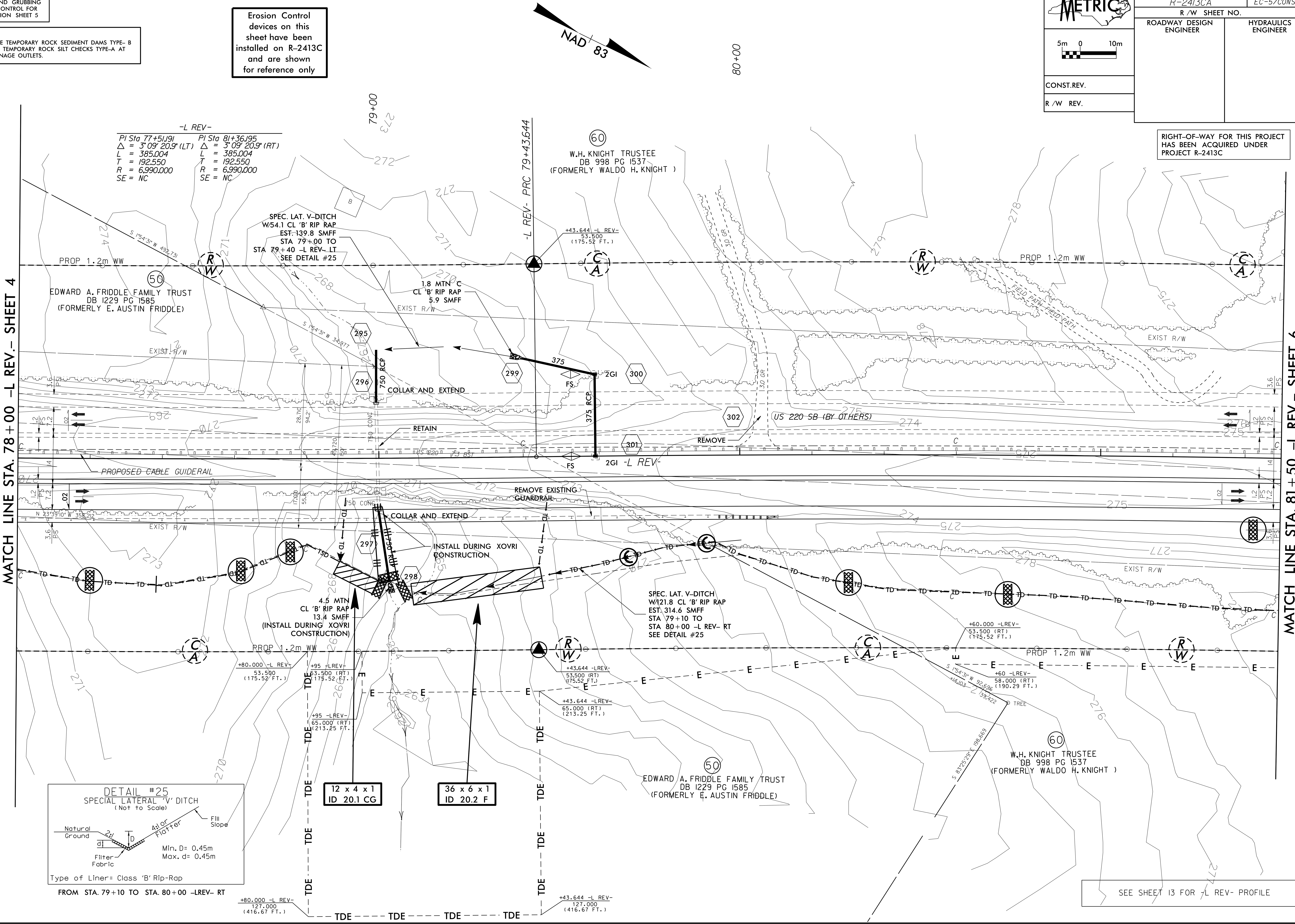
R/W REV.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

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

Erosion Control devices on this sheet have been installed on R-2413C and are shown for reference only

RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C



DETAIL #25
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground — Filter Fabric — 4:1 or Flatter — Fill Slope

Min. D= 0.45m
Max. d= 0.45m

Type of Liner= Class 'B' Rip-Rap

FROM STA. 79+10 TO STA. 80+00 -LREV- RT

SEE SHEET 13 FOR -L REV- PROFILE

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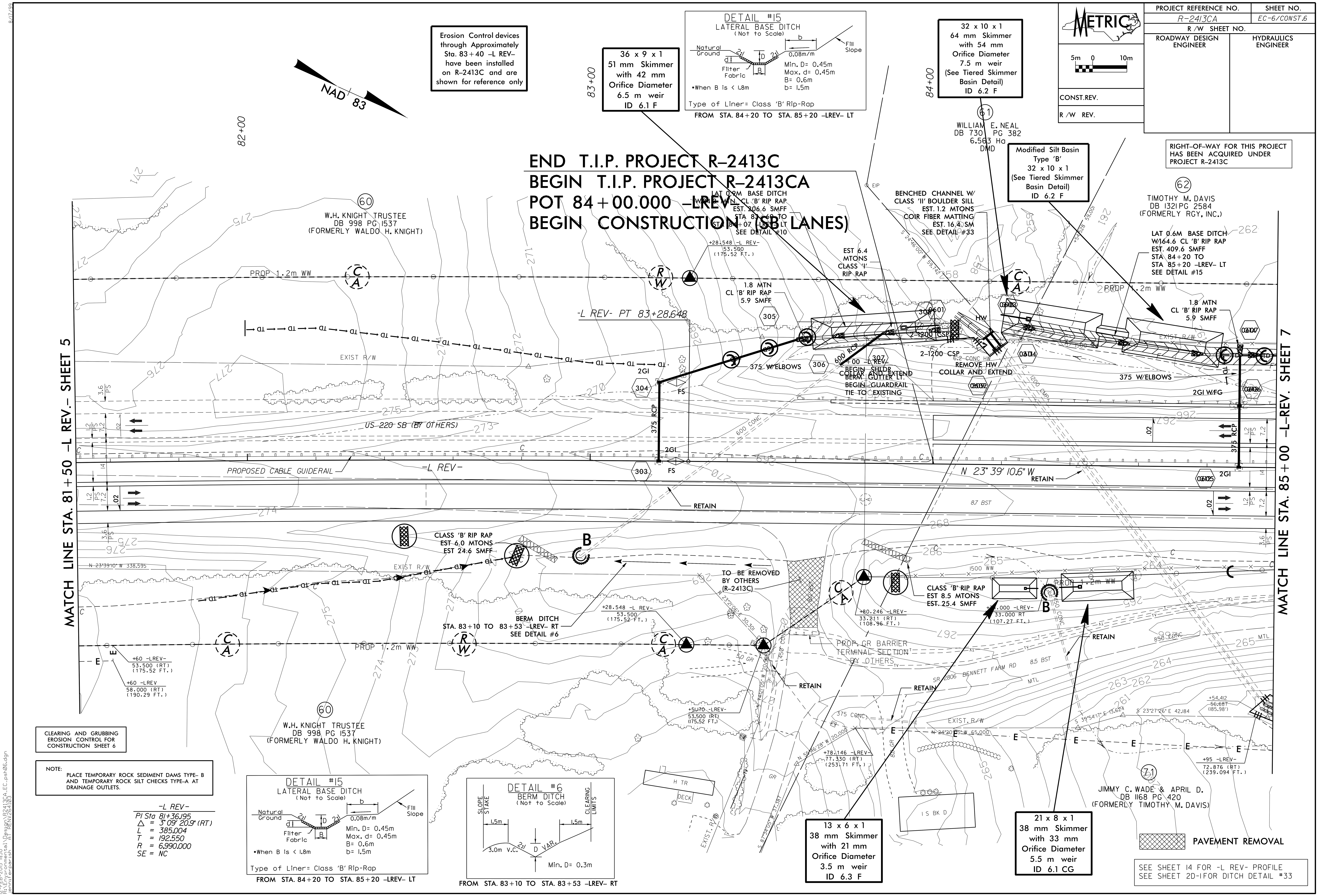
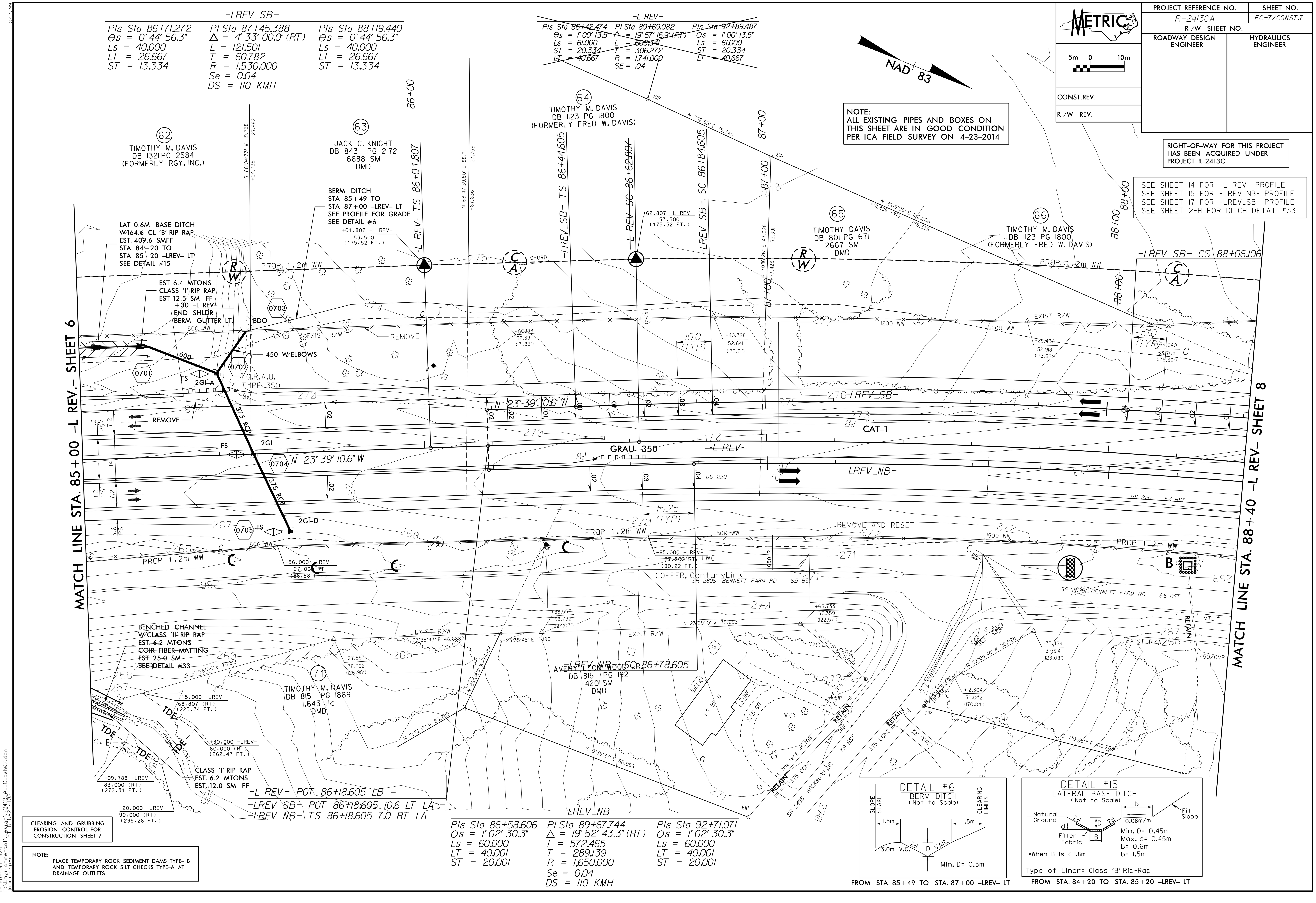
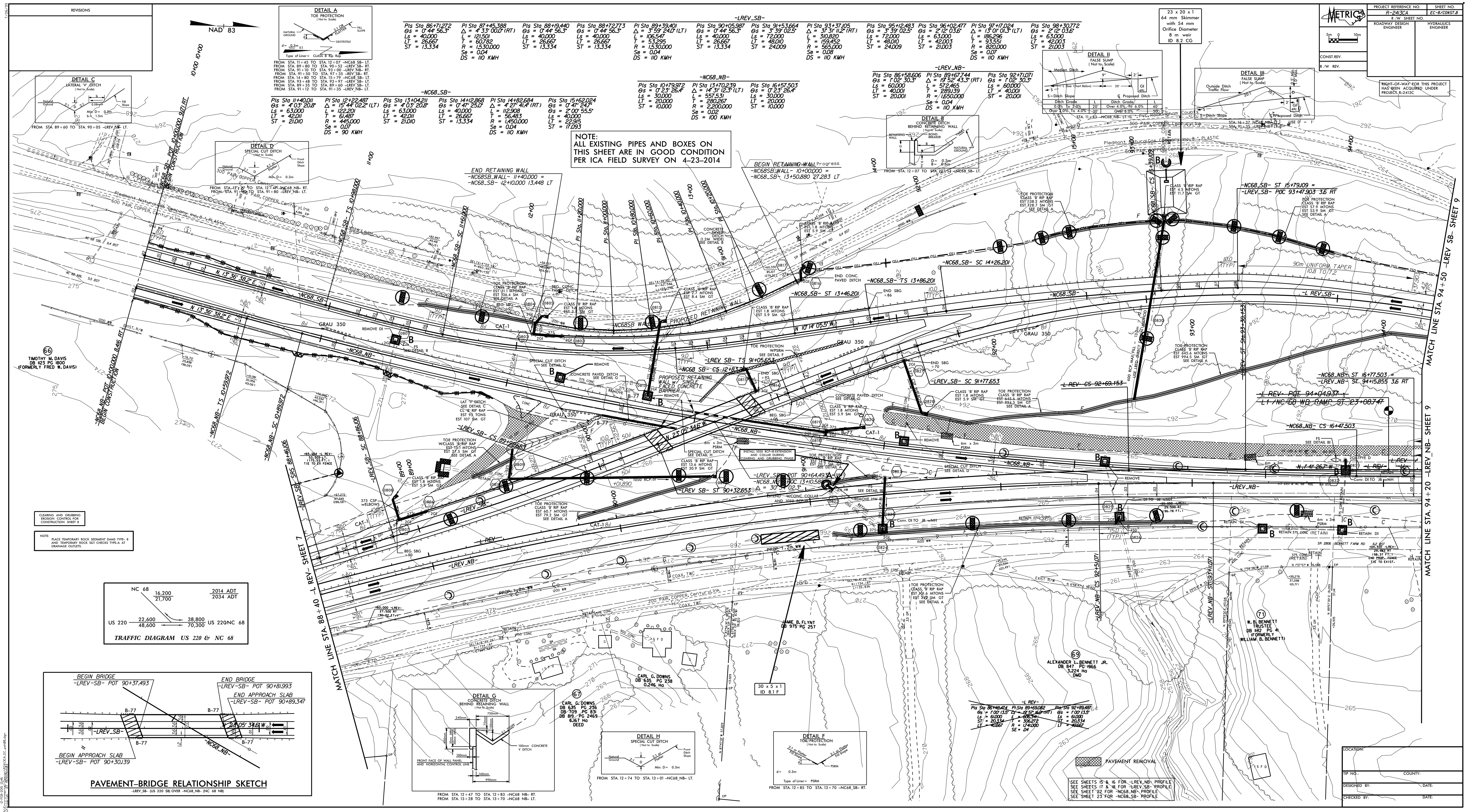
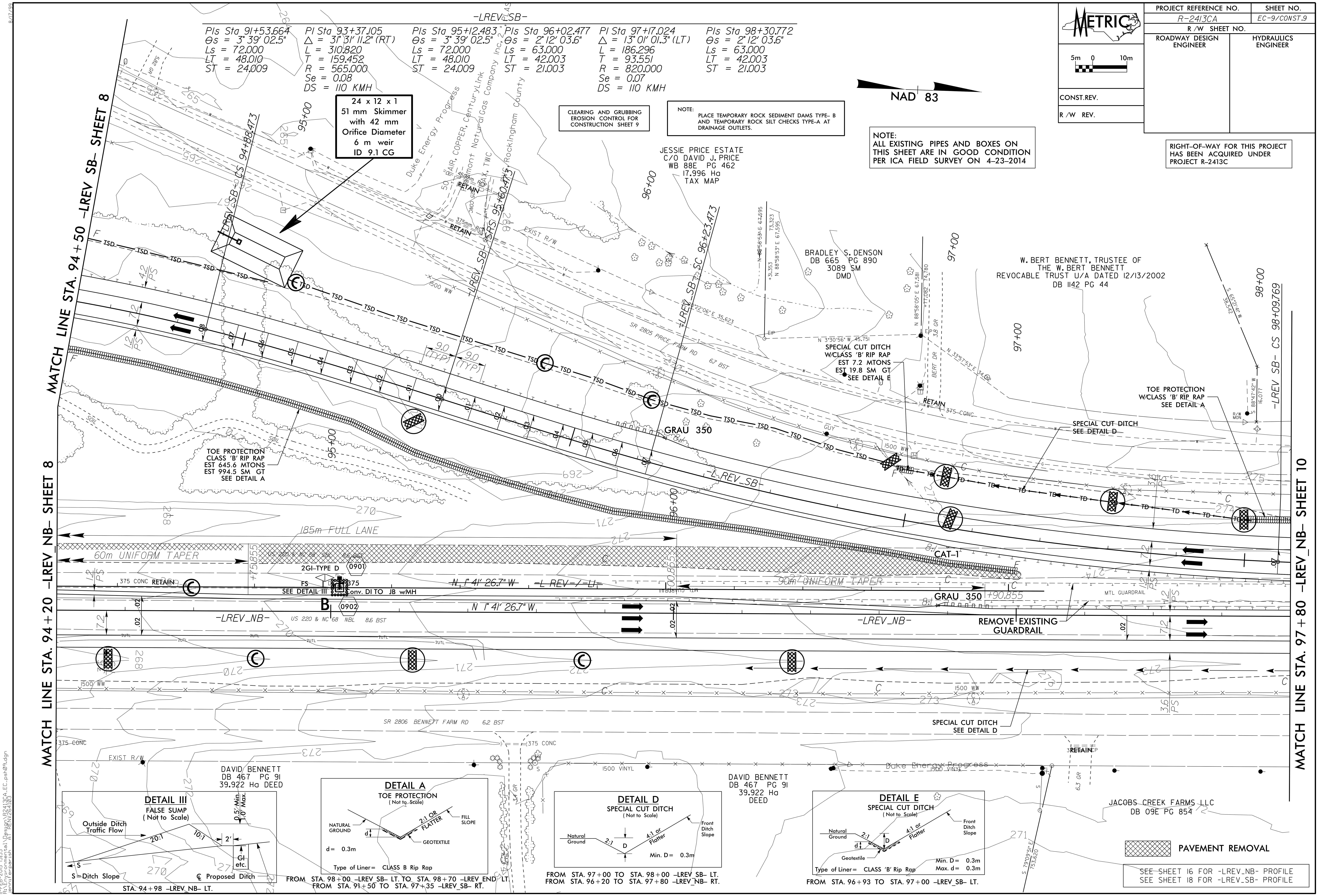
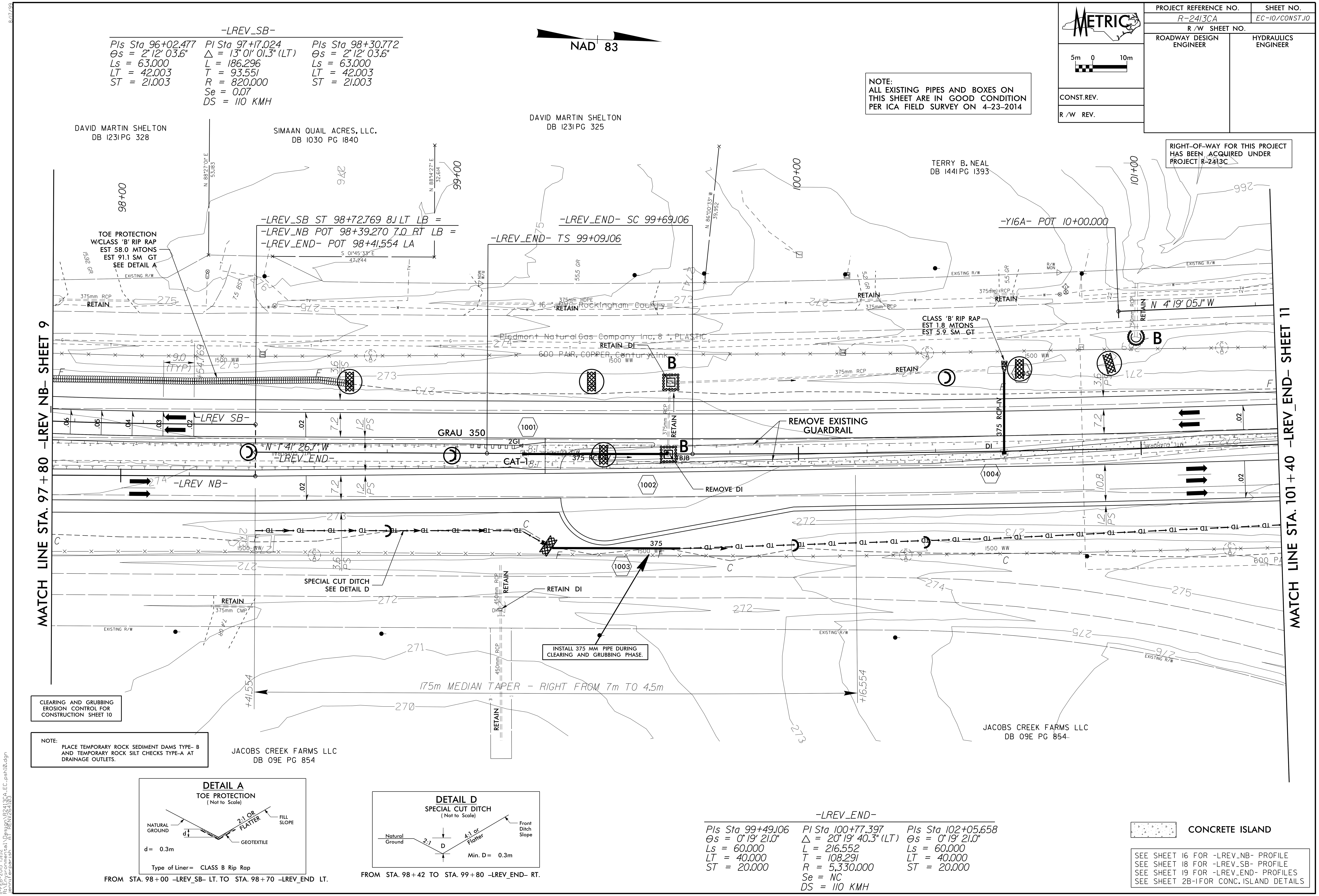

PROJECT REFERENCE NO.
R-2413CA
SHEET NO.
EC-6/CONST.6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
Erosion Control devices through Approximately Sta. 83+40 -L REV- have been installed on R-2413C and are shown for reference only
NAD 83
DETAIL #15
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Fill Slope
0.08m/m
Min. D= 0.45m
Max. d= 0.45m
B= 0.6m
b= 1.5m
•When B is < 1.8m
Type of Liner= Class 'B' Rip-Rap
FROM STA. 84+20 TO STA. 85+20 -LREV- LT
36 x 9 x 1
51 mm Skimmer
with 42 mm
Orifice Diameter
6.5 m weir
ID 6.1 F
32 x 10 x 1
64 mm Skimmer
with 54 mm
Orifice Diameter
7.5 m weir
(See Tiered Skimmer Basin Detail)
ID 6.2 F
Modified Silt Basin
Type 'B'
32 x 10 x 1
(See Tiered Skimmer Basin Detail)
ID 6.2 F
END T.I.P. PROJECT R-2413C
BEGIN T.I.P. PROJECT R-2413CA
POT 84+00.000 -LREV-
BEGIN CONSTRUCTION (SB LANES)
W.H. KNIGHT TRUSTEE
DB 998 PG 1537
(FORMERLY WALDO H. KNIGHT)
WILLIAM E. NEAL
DB 730 PG 382
6.563 Ha
DMD
TIMOTHY M. DAVIS
DB 1321 PG 2584
(FORMERLY RGY, INC.)
JIMMY C. WADE & APRIL D.
DB 1168 PG 420
(FORMERLY TIMOTHY M. DAVIS)
LAT 0.9M BASE DITCH
EST. 206.6 SMFF
SEE DETAIL #10
BENCHED CHANNEL W/ CLASS 'II' BOULDER SILL
EST. 1.2 MTONS
COIR FIBER MATTING
EST. 16.4 SM
SEE DETAIL #33
LAT 0.6M BASE DITCH
W/164.6 CL 'B' RIP RAP
EST. 409.6 SMFF
STA 84+20 TO
STA 85+20 -LREV- LT
SEE DETAIL #15
EST 6.4 MTONS CLASS 'I' RIP RAP
1.8 MTN
CL 'B' RIP RAP
5.9 SMFF
-L REV- PT 83+28.648
PROP 1.2m WW
EXIST R/W
375 W/ELBOWS
2-1200 CSP
REMOVE HW
COLLAR AND EXTEND
BEGIN SHLDR BERM GUTTER LT.
BEGIN GUARDRAIL TIE TO EXISTING
2GI W/FG
US-220 SB (BY OTHERS)
PROPOSED CABLE GUIDERAIL
-L REV-
N 23° 39' 10.6" W
RETAIN
375 RCP
2GI
FS
CLASS 'B' RIP RAP
EST 6.0 MTONS
EST 24.6 SMFF
TO BE REMOVED BY OTHERS (R-2413C)
CLASS 'B' RIP RAP
EST 8.5 MTONS
EST. 25.4 SMFF
BERM DITCH
STA. 83+10 TO 83+53 -LREV- RT
SEE DETAIL #6
PROP. GR BARRIER TERMINAL SECTION BY OTHERS
SR 2806 BENNETT FARM RD
MATCH LINE STA. 81+50 -L REV.- SHEET 5
MATCH LINE STA. 85+00 -L-REV. SHEET 7
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 6
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE- B AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.
-L REV-
PI Sta 81+36.195
Δ = 3°09' 20.9" (RT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC
DETAIL #6
BERM DITCH
(Not to Scale)
SLOPE STAKE
CLEARING LIMITS
Min. D= 0.3m
FROM STA. 83+10 TO STA. 83+53 -LREV- RT
13 x 6 x 1
38 mm Skimmer
with 21 mm
Orifice Diameter
3.5 m weir
ID 6.3 F
21 x 8 x 1
38 mm Skimmer
with 33 mm
Orifice Diameter
5.5 m weir
ID 6.1 CG
PAVEMENT REMOVAL
SEE SHEET 14 FOR -L REV- PROFILE
SEE SHEET 2D-1 FOR DITCH DETAIL #33


PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-7/CONST.7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
5m 0 10m
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
SEE SHEET 14 FOR -L REV- PROFILE
SEE SHEET 15 FOR -LREV_NB- PROFILE
SEE SHEET 17 FOR -LREV_SB- PROFILE
SEE SHEET 2-H FOR DITCH DETAIL #33
NOTE: ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
NAD 83
-LREV_SB-
PIs Sta 86+71.272 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 87+45.388 Δ = 4° 33' 00.0" (RT) L = 121.501 T = 60.782 R = 1,530.000 Se = 0.04 DS = 110 KMH
PIs Sta 88+19.440 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
-L REV-
PIs Sta 86+42.474 Θs = 1° 00' 13.5" Ls = 61.000 ST = 20.334 LT = 40.667
PI Sta 89+69.082 Δ = 19° 57' 16.9" (RT) L = 606.341 T = 306.272 R = 1,741.000 SE = .04
PIs Sta 92+89.487 Θs = 1° 00' 13.5" Ls = 61.000 ST = 20.334 LT = 40.667
62 TIMOTHY M. DAVIS DB 1321 PG 2584 (FORMERLY RGY, INC.)
63 JACK C. KNIGHT DB 843 PG 2172 6688 SM DMD
64 TIMOTHY M. DAVIS DB 1123 PG 1800 (FORMERLY FRED W. DAVIS)
65 TIMOTHY DAVIS DB 801 PG 671 2667 SM DMD
66 TIMOTHY M. DAVIS DB 1123 PG 1800 (FORMERLY FRED W. DAVIS)
71 TIMOTHY M. DAVIS DB 815 PG 1869 1.643 Ha DMD
AVERY LEON WOOD JR. DB 815 PG 192 4201 SM DMD
BERM DITCH STA 85+49 TO STA 87+00 -LREV- LT SEE PROFILE FOR GRADE SEE DETAIL #6
LAT 0.6M BASE DITCH W/164.6 CL 'B' RIP RAP EST. 409.6 SMFF STA 84+20 TO STA 85+20 -LREV- LT SEE DETAIL #15
EST 6.4 MTONS CLASS 'I' RIP RAP EST 12.5 SM FF +30 -L REV- END SHLDR BERM GUTTER LT.
BENCHED CHANNEL W/CLASS 'II' RIP RAP EST. 6.2 MTONS COIR FIBER MATTING EST. 25.0 SM SEE DETAIL #33
CLASS 'I' RIP RAP EST. 6.2 MTONS EST. 12.0 SM FF
MATCH LINE STA. 85+00 -L REV.- SHEET 6
MATCH LINE STA. 88+40 -L REV- SHEET 8
-L REV- TS 86+01.807
-LREV_SB- TS 86+44.605
-L REV- SC 86+62.807
-LREV_SB- SC 86+84.605
-LREV_SB- CS 88+06.106
-LREV_NB- SC 86+78.605
-L REV- POT 86+18.605 LB = -LREV_SB- POT 86+18.605 10.6 LT LA = -LREV_NB- TS 86+18.605 7.0 RT LA
N 23° 39' 10.6" W
GRAU 350
CAT-1
-L REV-
-LREV_SB-
-LREV_NB-
PROP 1.2m WW
EXIST R/W
REMOVE
REMOVE AND RESET
450 W/ELBOWS
375 RCP
2GI-A
2GI
2GI-D
BDO
0701 0702 0703 0704 0705
COPPER, CenturyLink
SR 2806 BENNETT FARM RD 6.5 BST
SR 2495 ROCKWOOD DR 7.9 BST
US 220
RETAIN
TDE
-LREV_NB-
PIs Sta 86+58.606 Θs = 1° 02' 30.3" Ls = 60.000 LT = 40.001 ST = 20.001
PI Sta 89+67.744 Δ = 19° 52' 43.3" (RT) L = 572.465 T = 289.139 R = 1,650.000 Se = 0.04 DS = 110 KMH
PIs Sta 92+71.071 Θs = 1° 02' 30.3" Ls = 60.000 LT = 40.001 ST = 20.001
DETAIL #6 BERM DITCH (Not to Scale)
FROM STA. 85+49 TO STA. 87+00 -LREV- LT
Min. D= 0.3m
DETAIL #15 LATERAL BASE DITCH (Not to Scale)
Min. D= 0.45m Max. d= 0.45m B= 0.6m b= 1.5m
•When B is < 1.8m
Type of Liner= Class 'B' Rip-Rap
FROM STA. 84+20 TO STA. 85+20 -LREV- LT
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 7
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE-B AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.

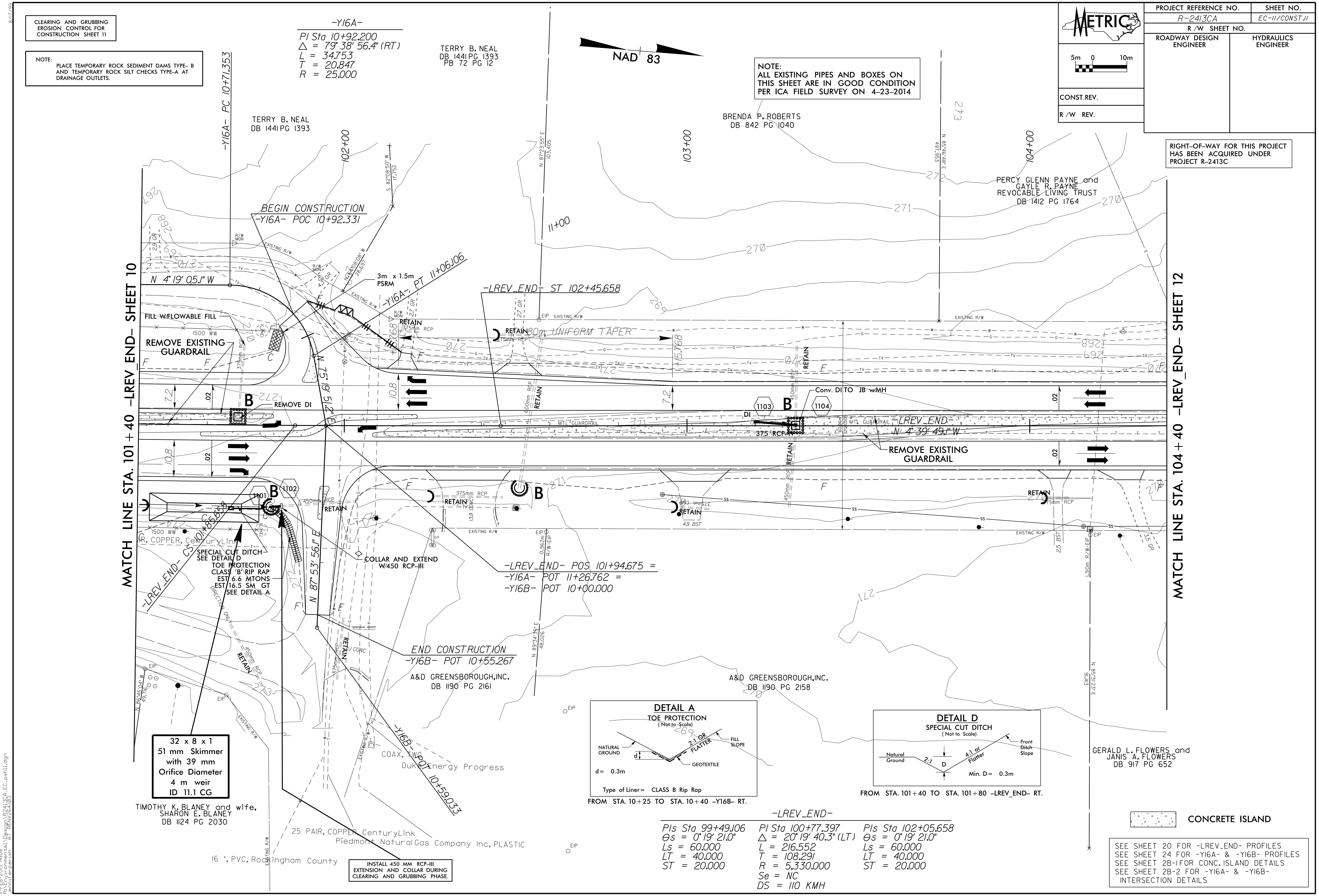

REVISIONS
NAD 83
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d= 0.3m
Type of Liner= CLASS B Rip Rap
FROM STA. 11+45 TO STA. 12+07 -NC68_SB- LT.
FROM STA. 89+80 TO STA. 90+52 -LREV_SB- RT.
FROM STA. 91+10 TO STA. 93+00 -LREV_NB- RT.
FROM STA. 91+50 TO STA. 97+35 -REV_SB- RT.
FROM STA. 14+80 TO STA. 15+79 -NC68_SB- LT.
FROM STA. 93+48 TO STA. 93+97 -LREV_SB- LT.
FROM STA. 89+35 TO STA. 89+60 -LREV_SB- LT.
FROM STA. 91+12 TO STA. 91+35 -LREV_NB- LT.
-LREV_SB-
PIs Sta 86+71.272 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 87+45.388 Δ = 4° 33' 00.0" (RT) L = 121.501 T = 60.782 R = 1,530.000 Se = 0.04 DS = 110 KMH
PIs Sta 88+19.440 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PIs Sta 88+72.773 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 89+39.401 Δ = 3° 59' 24.0" (LT) L = 106.547 T = 53.295 R = 1,530.000 Se = 0.04 DS = 110 KMH
PIs Sta 90+05.987 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PIs Sta 91+53.664 Θs = 3° 39' 02.5" Ls = 72.000 LT = 48.010 ST = 24.009
PI Sta 93+37.105 Δ = 31° 31' 11.2" (RT) L = 310.820 T = 159.452 R = 565.000 Se = 0.08 DS = 110 KMH
PIs Sta 95+12.483 Θs = 3° 39' 02.5" Ls = 72.000 LT = 48.010 ST = 24.009
PIs Sta 96+02.477 Θs = 2° 12' 03.6" Ls = 63.000 LT = 42.003 ST = 21.003
PI Sta 97+17.024 Δ = 13° 01' 01.3" (LT) L = 186.296 T = 93.551 R = 820.000 Se = 0.07 DS = 110 KMH
PIs Sta 98+30.772 Θs = 2° 12' 03.6" Ls = 63.000 LT = 42.003 ST = 21.003
-NC68_SB-
PIs Sta 11+40.011 Θs = 4° 03' 20.8" Ls = 63.000 LT = 42.011 ST = 21.010
PI Sta 12+22.487 Δ = 15° 44' 02.2" (LT) L = 122.201 T = 61.487 R = 445.000 Se = 0.07 DS = 90 KMH
PIs Sta 13+04.211 Θs = 4° 03' 20.8" Ls = 63.000 LT = 42.011 ST = 21.010
PIs Sta 14+12.868 Θs = 0° 47' 25.0" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 14+82.684 Δ = 4° 27' 41.4" (RT) L = 112.908 T = 56.483 R = 1,450.000 Se = 0.04 DS = 110 KMH
PIs Sta 15+62.024 Θs = 0° 47' 24.7" Θs = 2° 00' 55.5" Ls = 40.000 LT = 22.915 ST = 17.093
-NC68_NB-
PIs Sta 10+79.972 Θs = 0° 23' 26.4" Ls = 30.000 LT = 20.000 ST = 10.000
PI Sta 13+70.239 Δ = 14° 31' 12.3" (LT) L = 557.531 T = 280.267 R = 2,200.000 Se = 0.02 DS = 100 KMH
PIs Sta 16+57.503 Θs = 0° 23' 26.4" Ls = 30.000 LT = 20.000 ST = 10.000
-LREV_NB-
PIs Sta 86+58.606 Θs = 1° 02' 30.3" Ls = 60.000 LT = 40.001 ST = 20.001
PI Sta 89+67.744 Δ = 19° 52' 43.3" (RT) L = 572.465 T = 289.139 R = 1,650.000 Se = 0.04 DS = 110 KMH
PIs Sta 92+71.071 Θs = 1° 02' 30.3" Ls = 60.000 LT = 40.001 ST = 20.001
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
DETAIL C
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D= 0.3m
b= 1.5m
FROM STA. 89+60 TO STA. 90+05 -LREV_SB- LT.
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
4:1 or Flatter
Front Ditch Slope
Min. D= 0.3m
FROM STA. 12+27 TO STA. 12+47 -NC68_NB- RT.
FROM STA. 91+40 TO STA. 91+80 -LREV_NB- LT.
DETAIL B
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
RETAINING WALL
BOND BREAKER
NATURAL GROUND
D= 0.3m
B= 0.6m
FROM STA. 12+07 TO STA. 13+54 -NC68_SB- LT.
DETAIL II
FALSE SUMP
(Not to Scale)
Median Ditch
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. 11+43 -NC68_NB- LT.
DETAIL III
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S=Ditch Slope
Proposed Ditch
STA. 16+37 -NC68_NB- LT.
STA. 91+35 -LREV_NB- LT.
USE D' = 1'
23 x 20 x 1
64 mm Skimmer with 54 mm Orifice Diameter
8 m weir
ID 8.2 CG
PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-8/CONST.8
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
END RETAINING WALL
-NC68SB_WALL- 11+40.000 =
-NC68_SB- 12+10.000 13.448 LT
BEGIN RETAINING WALL
-NC68SB_WALL- 10+00.000 =
-NC68_SB- 13+50.880 27.283 LT
-NC68_SB- POT 10+00.000 9.171 RT
BEGIN CONSTRUCTION
-NC68_NB- POT 10+00.000 8.416 RT
BEGIN CONSTRUCTION
-NC68_SB- TS 10+98.000
-NC68_SB- SC 11+61.000
-NC68_SB- ST 13+46.201
-NC68_SB- TS 13+86.201
-NC68_SB- SC 14+26.201
-NC68_SB- CS 15+39.09
-NC68_SB- ST 15+79.109 =
-LREV_SB- POC 93+47.903 3.6 RT
-NC68_NB- TS 10+59.972
-NC68_NB- SC 10+89.972
-LREV_SB- TS 91+05.653
-NC68 SB- CS 12+83.3
-LREV_SB- SC 91+77.653
-L REV- CS 92+69.153
-LREV_SB- CS 89+92.653
-LREV_SB- ST 90+32.653
-LREV_SB- POT 90+64.493 =
-NC68_NB- POC 13+10.58
Δ = 30° 54' 02.3"
-LREV-ST Sta. 93+30.153
-NC68_NB- ST 16+77.503 =
-LREV_NB- ST 94+15.855 3.6 RT
-L REV- POT 94+04.937 =
L1 /NC 68 WB RAMP ST 23+08.747
-NC68_NB- CS 16+47.503
-LREV_NB- CS 92+51.071
-LREV_NB- ST 93+11.071
N 13° 36' 38.2" E
N 10° 14' 05.5" W
N 23° 05' 34.6" W
N 1° 41' 26.7" W
90m UNIFORM TAPER 10.8 TO 7.2
PROPOSED RETAINING WALL
PROPOSED RETAINING WALL w/ SINGLE FACED CONCRETE BARRIER
INSTALL 1050 RCP-III EXTENSION AND COLLAR DURING CLEARING AND GRUBBING PHASE
600 RCP, MAX FILL = 13.2m USE LRFD DIRECT DESIGN METHOD
TOE PROTECTION CLASS 'B' RIP RAP EST 31.1 MTONS EST 136.4 SM GT SEE DETAIL A
TOE PROTECTION CLASS 'B' RIP RAP EST 138.2 MTONS EST 128.7 SM GT SEE DETAIL A
TOE PROTECTION CLASS 'B' RIP RAP EST 57.9 MTONS EST 53.9 SM GT SEE DETAIL A
TOE PROTECTION CLASS 'B' RIP RAP EST 645.6 MTONS EST 994.5 SM GT SEE DETAIL A
TOE PROTECTION W/CLASS 'B' RIP RAP EST 15.1 MTONS EST 27.5 SM GT SEE DETAIL A
TOE PROTECTION CLASS 'B' RIP RAP EST 60.7 MTONS EST 79.2 SM GT SEE DETAIL A
TOE PROTECTION W/CLASS 'B' RIP RAP EST 14.8 MTONS EST 20.7 SM GT SEE DETAIL A
TOE PROTECTION CLASS 'B' RIP RAP EST 101.6 MTONS EST 342 SM GT SEE DETAIL A
TOE PROTECTION W/PSRM SEE DETAIL F
CLASS 'B' RIP RAP EST 4.5 MTONS EST 11.7 SM GT
CLASS 'B' RIP RAP EST 13.6 MTONS EST 30.9 SM GT
LAT 'V' DITCH SEE DETAIL C CL 'B' RIP RAP EST 93 TONS EST 107 SM GT
TIMOTHY M. DAVIS DB 1123 PG 1800 (FORMERLY FRED W. DAVIS)
CARL G. DOWNS DB 635 PG 238 0.246 Ha
CARL G. DOWNS DB 635 PG 236 DB 709 PG 831 DB 819 PG 2469 6.167 Ha DEED
JAMIE B. FLYNT DB 975 PG 257
ALEXANDER L. BENNETT JR. DB 847 PG 1966 3.224 Ha DMD
W. B. BENNETT TRUSTEE DB 1142 PG 41 (FORMERLY WILLIAM B. BENNETT)
30 x 5 x 1
ID 8.1 F
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 8
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE- B AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.
NC 68 16,200 / 21,700
2014 ADT / 2034 ADT
US 220 22,600 / 48,600
38,800 / 70,300 US 220/NC 68
TRAFFIC DIAGRAM US 220 & NC 68
BEGIN BRIDGE -LREV-SB- POT 90+37.493
END BRIDGE -LREV-SB- POT 90+81.993
END APPROACH SLAB -LREV-SB- POT 90+89.347
BEGIN APPROACH SLAB -LREV-SB- POT 90+30.139
PAVEMENT-BRIDGE RELATIONSHIP SKETCH
-LREV_SB- (US 220 SB) OVER -NC68_NB- (NC 68 NB)
DETAIL G
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
100mm CONCRETE V DITCH
FRONT FACE OF WALL PANEL AND HORIZONTAL CONTROL LINE
FROM STA. 12+47 TO STA. 12+83 -NC68_NB- RT.
FROM STA. 13+28 TO STA. 13+70 -NC68_NB- LT.
DETAIL H
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 0.3m
FROM STA. 12+74 TO STA. 13+01 -NC68_NB- LT.
DETAIL F
TOE PROTECTION
(Not to Scale)
2:1 or Flatter Fill Slope
PSRM
d= 0.3m
Type of Liner= PSRM
FROM STA. 12+85 TO STA. 13+70 -NC68_SB- RT.
-L REV-
PIs Sta 86+42.474 Θs = 1° 00' 13.5" Ls = 61.000 ST = 20.334 LT = 40.667
PI Sta 89+69.082 Δ = 19° 57' 16.8" (RT) L = 606.341 T = 306.272 R = 1,741.000 SE = .04
PIs Sta 92+89.487 Θs = 1° 00' 13.5" Ls = 61.000 ST = 20.334 LT = 40.667
PAVEMENT REMOVAL
SEE SHEETS 15 & 16 FOR -LREV_NB- PROFILE
SEE SHEETS 17 & 18 FOR -LREV_SB- PROFILE
SEE SHEET 22 FOR -NC68_NB- PROFILE
SEE SHEET 23 FOR -NC68_SB- PROFILE
MATCH LINE STA. 88+40 -L REV- SHEET 7
MATCH LINE STA. 94+50 -LREV SB- SHEET 9
MATCH LINE STA. 94+20 -LREV_NB- SHEET 9
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
DATE:
CHECKED BY:
DATE:
12-FEB-2015 12:46



METRIC
PROJECT REFERENCE NO.
R-2413CA
SHEET NO.
EC-9/CONST.9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
5m 0 10m
CONST. REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
-LREV_SB-
PIs Sta 91+53.664
θs = 3° 39' 02.5"
Ls = 72.000
LT = 48.010
ST = 24.009
PI Sta 93+37.105
△ = 31° 31' 11.2" (RT)
L = 310.820
T = 159.452
R = 565.000
Se = 0.08
DS = 110 KMH
PIs Sta 95+12.483
θs = 3° 39' 02.5"
Ls = 72.000
LT = 48.010
ST = 24.009
PIs Sta 96+02.477
θs = 2° 12' 03.6"
Ls = 63.000
LT = 42.003
ST = 21.003
PI Sta 97+17.024
△ = 13° 01' 01.3" (LT)
L = 186.296
T = 93.551
R = 820.000
Se = 0.07
DS = 110 KMH
PIs Sta 98+30.772
θs = 2° 12' 03.6"
Ls = 63.000
LT = 42.003
ST = 21.003
NAD 83
24 x 12 x 1
51 mm Skimmer
with 42 mm
Orifice Diameter
6 m weir
ID 9.1 CG
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 9
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE-B AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
JESSIE PRICE ESTATE
C/O DAVID J. PRICE
WB 88E PG 462
17.996 Ha
TAX MAP
BRADLEY S. DENSON
DB 665 PG 890
3089 SM
DMD
W. BERT BENNETT, TRUSTEE OF THE W. BERT BENNETT REVOCABLE TRUST U/A DATED 12/13/2002
DB 1142 PG 44
MATCH LINE STA. 94+50 -LREV_SB- SHEET 8
MATCH LINE STA. 94+20 -LREV_NB- SHEET 8
MATCH LINE STA. 97+80 -LREV_NB- SHEET 10
-LREV SB- CS 94+88.473
-LREV_SB- SPS 95+60.473
-LREV_SB- SC 96+23.473
-LREV_SB- CS 98+09.769
Duke Energy Progress
AIR, COPPER, CenturyLink
Piedmont Natural Gas Company Inc.
Rockingham County
RETAIN
EXIST R/W
SPECIAL CUT DITCH W/CLASS 'B' RIP RAP EST 7.2 MTONS EST 19.8 SM GT SEE DETAIL E
TOE PROTECTION W/CLASS 'B' RIP RAP SEE DETAIL A
SPECIAL CUT DITCH SEE DETAIL D
TOE PROTECTION CLASS 'B' RIP RAP EST 645.6 MTONS EST 994.5 SM GT SEE DETAIL A
GRAU 350
SR 2805 PRICE FARM RD 6.7 BST
-L REV_SB-
185m FULL LANE
60m UNIFORM TAPER
90m UNIFORM TAPER
CAT-1
2GI-TYPE D
0901
0902
SEE DETAIL III
375 Conv. DI TO JB wMH
N 1° 41' 26.7" W
-L REV-/ LI-
-LREV_NB-
US 220 & NC 68 NBL 8.6 BST
REMOVE EXISTING GUARDRAIL
MTL GUARDRAIL
SR 2806 BENNETT FARM RD 6.2 BST
SPECIAL CUT DITCH SEE DETAIL D
Duke Energy Progress
DAVID BENNETT
DB 467 PG 91
39.922 Ha DEED
DAVID BENNETT
DB 467 PG 91
39.922 Ha
DEED
JACOBS CREEK FARMS LLC
DB 09E PG 854
DETAIL III
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
20:1
10:1
2'
0.5' Min. 1.0' Max.
GI etc.
S=Ditch Slope
℄ Proposed Ditch
STA. 94+98 -LREV_NB- LT.
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d= 0.3m
Type of Liner= CLASS B Rip Rap
FROM STA. 98+00 -LREV SB- LT. TO STA. 98+70 -LREV END LT.
FROM STA. 91+50 TO STA. 97+35 -LREV_SB- RT.
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1
4:1 or Flatter
Front Ditch Slope
Min. D= 0.3m
FROM STA. 97+00 TO STA. 98+00 -LREV_SB- LT.
FROM STA. 96+20 TO STA. 97+80 -LREV_NB- RT.
DETAIL E
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Geotextile
4:1 or Flatter
Front Ditch Slope
Type of Liner= CLASS 'B' Rip Rap
Min. D= 0.3m
Max. d= 0.3m
FROM STA. 96+93 TO STA. 97+00 -LREV_SB- LT.
PAVEMENT REMOVAL
SEE SHEET 16 FOR -LREV_NB- PROFILE
SEE SHEET 18 FOR -LREV_SB- PROFILE



METRIC
PROJECT REFERENCE NO.
SHEET NO.
R-2413CA
EC-10/CONST.10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
5m 0 10m
CONST.REV.
R/W REV.
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
NAD 83
-LREV_SB-
PIs Sta 96+02.477
Θs = 2° 12' 03.6"
Ls = 63.000
LT = 42.003
ST = 21.003
PI Sta 97+17.024
Δ = 13° 01' 01.3" (LT)
L = 186.296
T = 93.551
R = 820.000
Se = 0.07
DS = 110 KMH
PIs Sta 98+30.772
Θs = 2° 12' 03.6"
Ls = 63.000
LT = 42.003
ST = 21.003
DAVID MARTIN SHELTON
DB 1231 PG 328
SIMAAN QUAIL ACRES, LLC.
DB 1030 PG 1840
DAVID MARTIN SHELTON
DB 1231 PG 325
TERRY B. NEAL
DB 1441 PG 1393
JACOBS CREEK FARMS LLC
DB 09E PG 854
JACOBS CREEK FARMS LLC
DB 09E PG 854
-LREV_SB ST 98+72.769 8.1 LT LB =
-LREV_NB POT 98+39.270 7.0 RT LB =
-LREV_END- POT 98+41.554 LA
-LREV_END- SC 99+69.106
-LREV_END- TS 99+09.106
-Y16A- POT 10+00.000
TOE PROTECTION W/CLASS 'B' RIP RAP
EST 58.0 MTONS
EST 91.1 SM GT
SEE DETAIL A
CLASS 'B' RIP RAP
EST 1.8 MTONS
EST 5.9 SM GT
REMOVE EXISTING GUARDRAIL
REMOVE DI
RETAIN DI
RETAIN
SPECIAL CUT DITCH SEE DETAIL D
INSTALL 375 MM PIPE DURING CLEARING AND GRUBBING PHASE.
Piedmont Natural Gas Company Inc. 8" PLASTIC
600 PAIR, COPPER, CenturyLink
Rockingham County
GRAU 350
1001
1002
1003
1004
-LREV SB-
-LREV_END-
-LREV NB-
N 1° 41' 26.7" W
N 4° 19' 05.1" W
175m MEDIAN TAPER - RIGHT FROM 7m TO 4.5m
MATCH LINE STA. 97+80 -LREV_NB- SHEET 9
MATCH LINE STA. 101+40 -LREV_END- SHEET 11
98+00
99+00
100+00
101+00
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 10
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE-B AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d = 0.3m
Type of Liner = CLASS B Rip Rap
FROM STA. 98+00 -LREV_SB- LT. TO STA. 98+70 -LREV_END LT.
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1
4:1 or Flatter
Front Ditch Slope
Min. D = 0.3m
FROM STA. 98+42 TO STA. 99+80 -LREV_END- RT.
-LREV_END-
PIs Sta 99+49.106
Θs = 0° 19' 21.0"
Ls = 60.000
LT = 40.000
ST = 20.000
PI Sta 100+77.397
Δ = 20° 19' 40.3" (LT)
L = 216.552
T = 108.291
R = 5,330.000
Se = NC
DS = 110 KMH
PIs Sta 102+05.658
Θs = 0° 19' 21.0"
Ls = 60.000
LT = 40.000
ST = 20.000
CONCRETE ISLAND
SEE SHEET 16 FOR -LREV_NB- PROFILE
SEE SHEET 18 FOR -LREV_SB- PROFILE
SEE SHEET 19 FOR -LREV_END- PROFILES
SEE SHEET 2B-1 FOR CONC. ISLAND DETAILS



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 11
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE- B AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.
-Y16A-
PI Sta 10+92.200
Δ = 79° 38' 56.4" (RT)
L = 34.753
T = 20.847
R = 25.000
TERRY B. NEAL
DB 1441 PG 1393
PB 72 PG 12
NAD 83
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
METRIC
5m 0 10m
CONST. REV.
R/W REV.
PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-11/CONST11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
TERRY B. NEAL
DB 1441 PG 1393
BRENDA P. ROBERTS
DB 842 PG 1040
PERCY GLENN PAYNE and GAYLE R. PAYNE REVOCABLE LIVING TRUST
DB 1412 PG 1764
-Y16A- PC 10+71.353
102+00
103+00
104+00
11+00
BEGIN CONSTRUCTION
-Y16A- POC 10+92.331
3m x 1.5m PSRM
-Y16A- PT 11+06.106
-LREV_END- ST 102+45.658
N 4° 19' 05.1" W
FILL W/FLOWABLE FILL
REMOVE EXISTING GUARDRAIL
RETAIN 375mm RCP
30m UNIFORM TAPER
N 75° 19' 51.2" E
REMOVE DI
Conv. DI TO JB w/MH
1103
1104
375 RCP
-LREV_END-
N 4° 39' 49.1" W
REMOVE EXISTING GUARDRAIL
MATCH LINE STA. 101+40 -LREV_END- SHEET 10
MATCH LINE STA. 104+40 -LREV_END- SHEET 12
1101
1102
450mm RCP
RETAIN
-LREV_END- CS 101+85.658
SPECIAL CUT DITCH SEE DETAIL D
TOE PROTECTION CLASS 'B' RIP RAP EST 6.6 MTONS EST 16.5 SM GT SEE DETAIL A
COLLAR AND EXTEND W/450 RCP-III
-LREV_END- POS 101+94.675 =
-Y16A- POT 11+26.762 =
-Y16B- POT 10+00.000
N 87° 53' 56.1" E
END CONSTRUCTION
-Y16B- POT 10+55.267
A&D GREENSBOROUGH, INC.
DB 1190 PG 2161
A&D GREENSBOROUGH, INC.
DB 1190 PG 2158
-Y16B- POT 10+59.033
32 x 8 x 1
51 mm Skimmer
with 39 mm
Orifice Diameter
4 m weir
ID 11.1 CG
TIMOTHY K. BLANEY and wife, SHARON E. BLANEY
DB 1124 PG 2030
COAX, TWC
Duke Energy Progress
25 PAIR, COPPER, CenturyLink
Piedmont Natural Gas Company Inc, PLASTIC
16", PVC, Rockingham County
INSTALL 450 MM RCP-III EXTENSION AND COLLAR DURING CLEARING AND GRUBBING PHASE.
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d = 0.3m
Type of Liner = CLASS B Rip Rap
FROM STA. 10+25 TO STA. 10+40 -Y16B- RT.
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1
4:1 or Flatter
Front Ditch Slope
Min. D = 0.3m
FROM STA. 101+40 TO STA. 101+80 -LREV_END- RT.
GERALD L. FLOWERS and JANIS A. FLOWERS
DB 917 PG 652
-LREV_END-
PIs Sta 99+49.106
Θs = 0° 19' 21.0"
Ls = 60.000
LT = 40.000
ST = 20.000
PI Sta 100+77.397
Δ = 20° 19' 40.3" (LT)
L = 216.552
T = 108.291
R = 5,330.000
Se = NC
DS = 110 KMH
PIs Sta 102+05.658
Θs = 0° 19' 21.0"
Ls = 60.000
LT = 40.000
ST = 20.000
CONCRETE ISLAND
SEE SHEET 20 FOR -LREV_END- PROFILES
SEE SHEET 24 FOR -Y16A- & -Y16B- PROFILES
SEE SHEET 2B-1 FOR CONC. ISLAND DETAILS
SEE SHEET 2B-2 FOR -Y16A- & -Y16B- INTERSECTION DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-12/CONSTJ2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

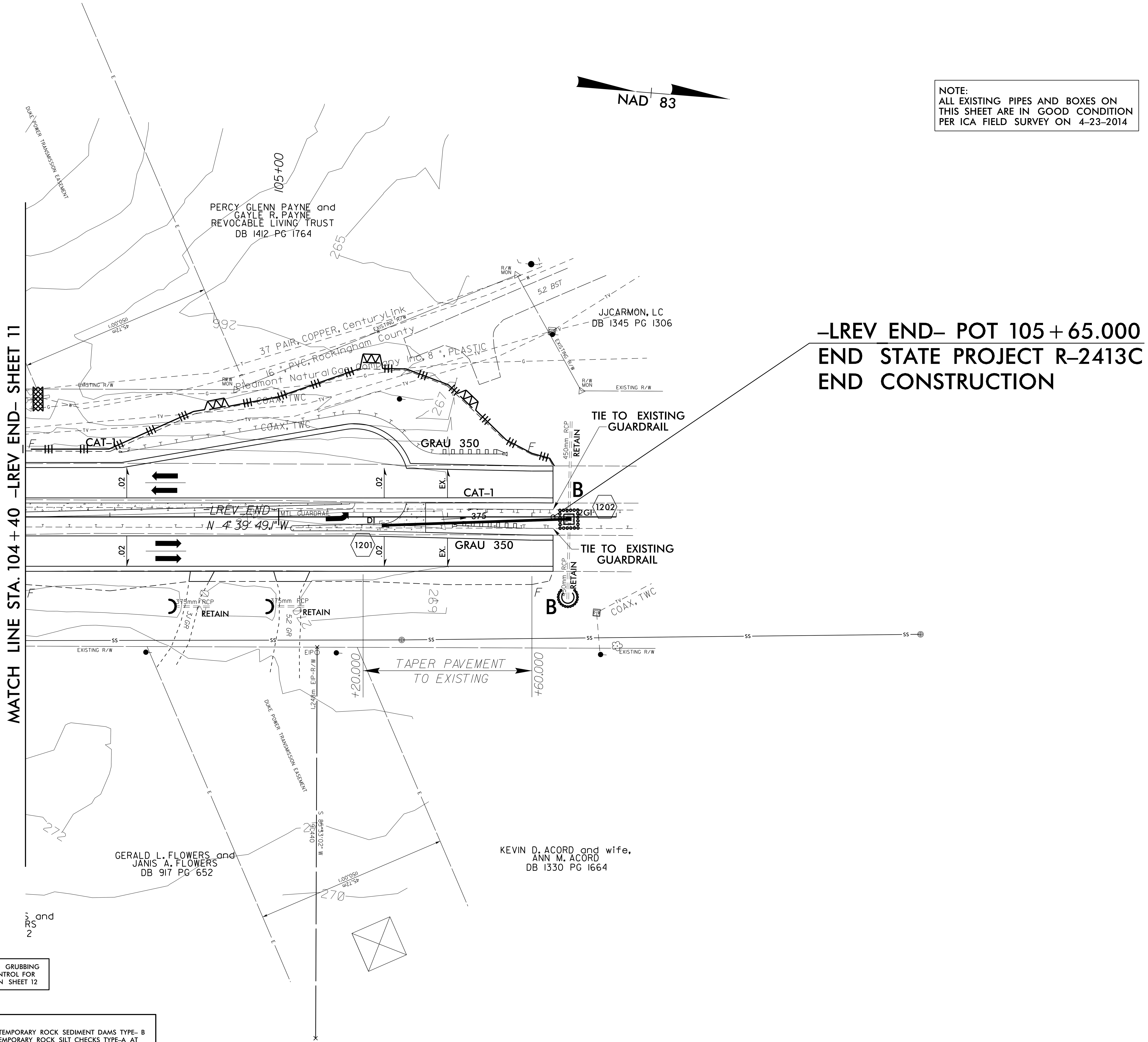
5m 0 10m

CONST. REV.

R/W REV.

RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C

NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014



CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 12

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

CONCRETE ISLAND

SEE SHEETS 20 & 21 FOR -LREV_END- PROFILES
SEE SHEET 2B-1 FOR CONC. ISLAND DETAILS

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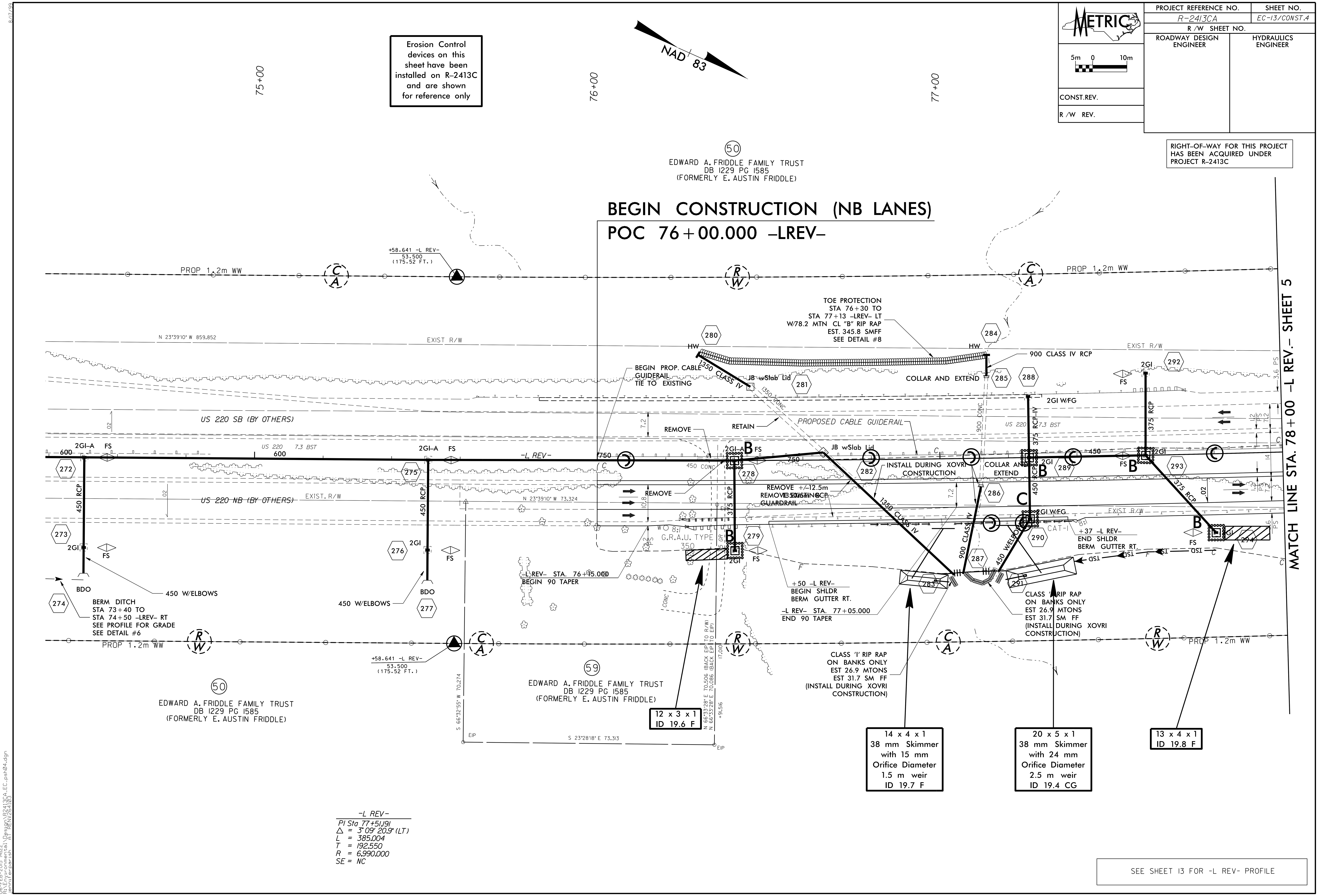
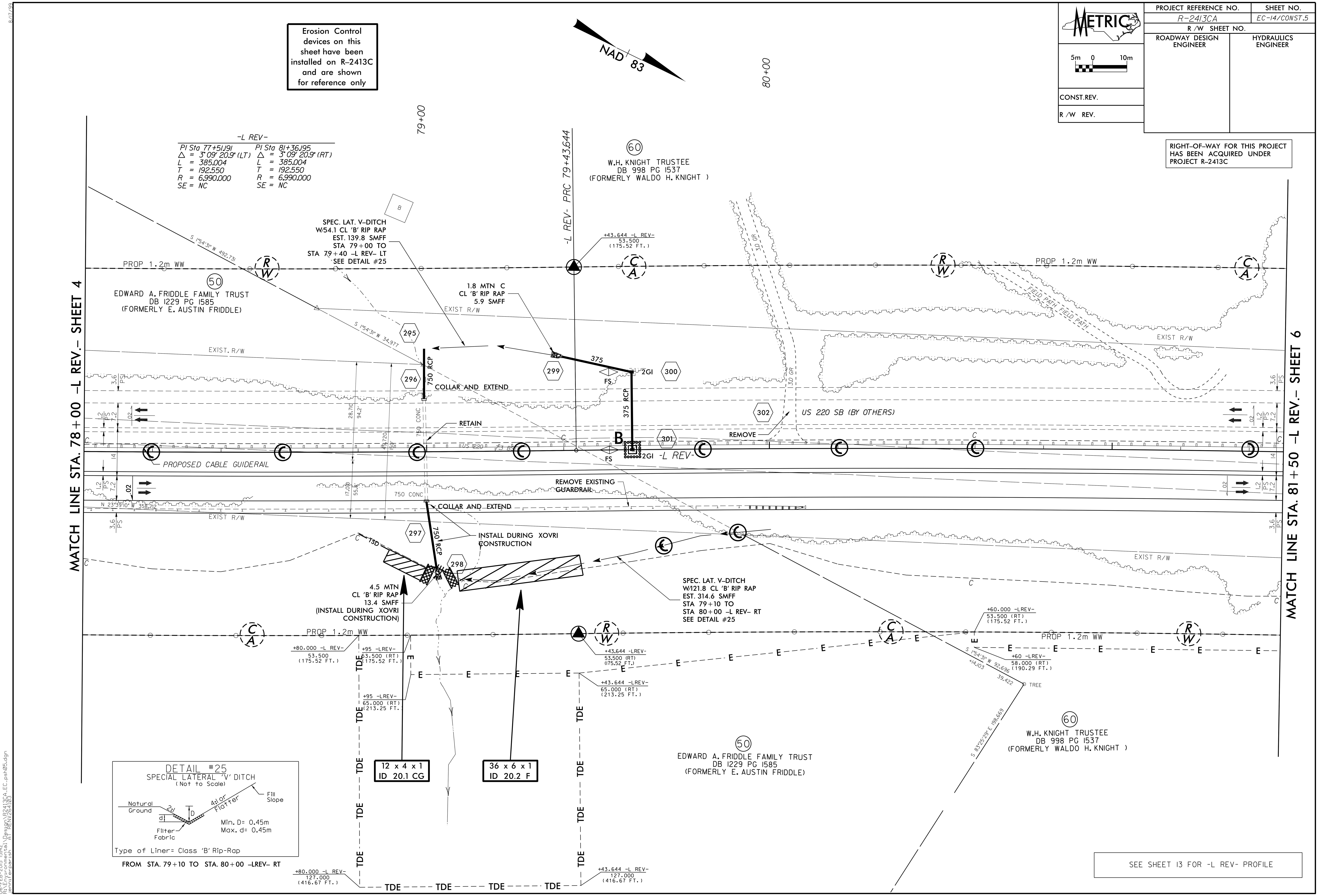
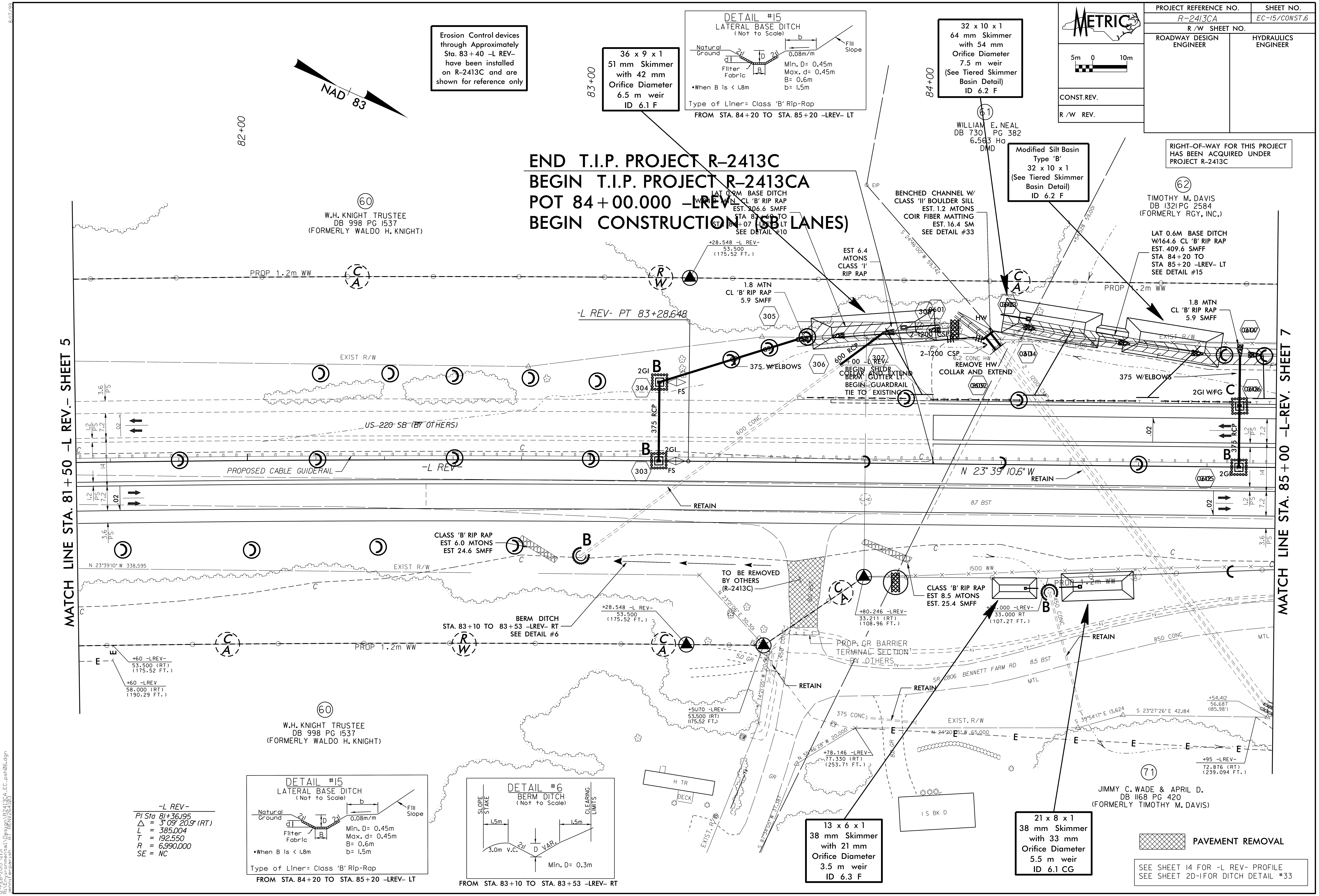


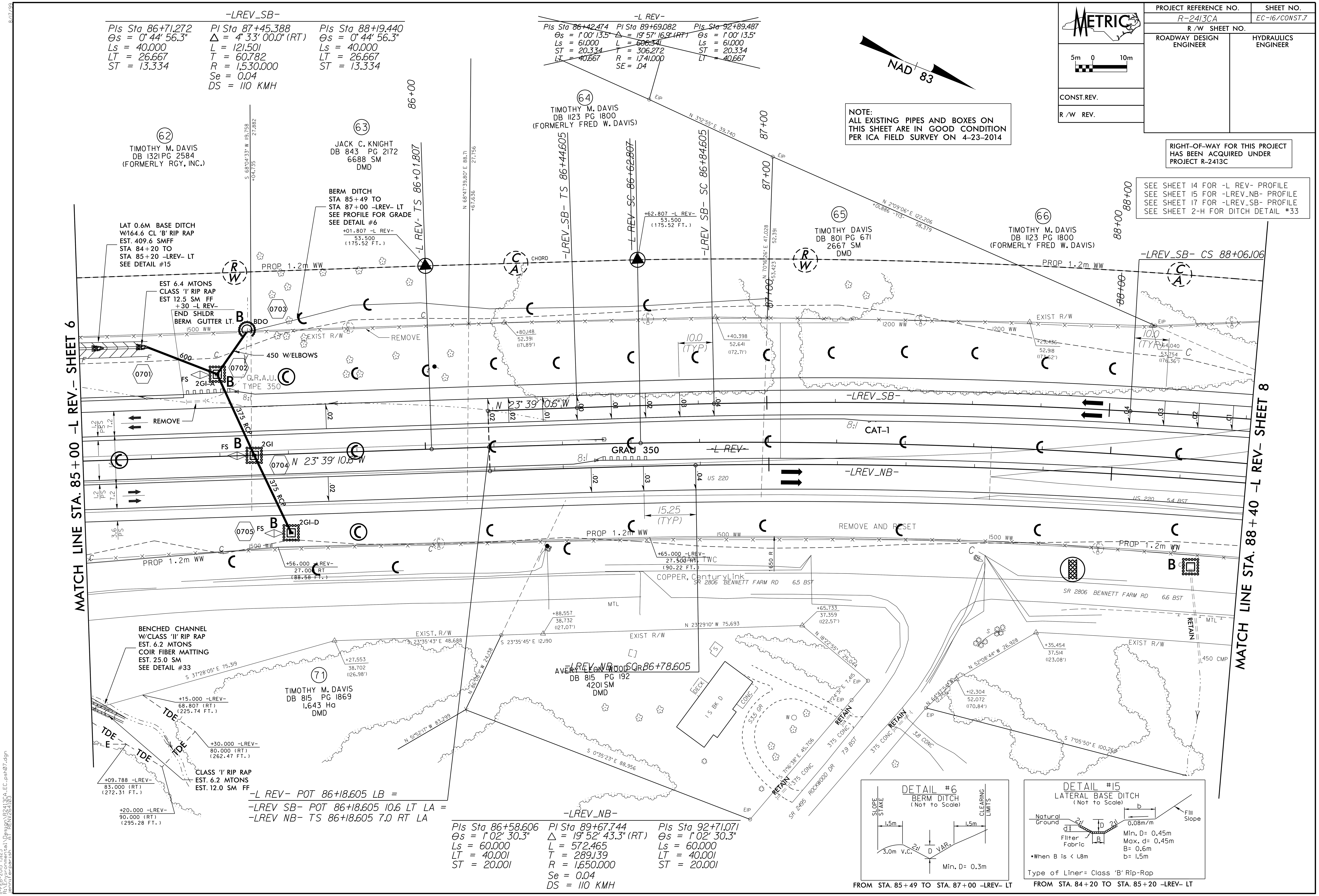
METRIC
PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-13/CONST.4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
5m 0 10m
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
Erosion Control devices on this sheet have been installed on R-2413C and are shown for reference only
NAD 83
75+00
76+00
77+00
EDWARD A. FRIDDLE FAMILY TRUST DB 1229 PG 1585 (FORMERLY E. AUSTIN FRIDDLE)
BEGIN CONSTRUCTION (NB LANES)
POC 76+00.000 -LREV-
PROP 1.2m WW
EXIST R/W
US 220 SB (BY OTHERS)
US 220 NB (BY OTHERS)
-L REV-
TOE PROTECTION STA 76+30 TO STA 77+13 -LREV- LT W/78.2 MTN CL "B" RIP RAP EST. 345.8 SMFF SEE DETAIL #8
900 CLASS IV RCP
COLLAR AND EXTEND
BEGIN PROP. CABLE GUIDERAIL TIE TO EXISTING
JB wSlab Lid
PROPOSED CABLE GUIDERAIL
RETAIN
REMOVE
INSTALL DURING XOVRI CONSTRUCTION
REMOVE +/-12.5m EXISTING GUARDRAIL
BERM DITCH STA 73+40 TO STA 74+50 -LREV- RT SEE PROFILE FOR GRADE SEE DETAIL #6
450 W/ELBOWS
-L REV- STA. 76+15.000 BEGIN 90 TAPER
+50 -L REV- BEGIN SHLDR BERM GUTTER RT.
-L REV- STA. 77+05.000 END 90 TAPER
+37 -L REV- END SHLDR BERM GUTTER RT.
CLASS 'I' RIP RAP ON BANKS ONLY EST 26.9 MTONS EST 31.7 SM FF (INSTALL DURING XOVRI CONSTRUCTION)
12 x 3 x 1 ID 19.6 F
14 x 4 x 1 38 mm Skimmer with 15 mm Orifice Diameter 1.5 m weir ID 19.7 F
20 x 5 x 1 38 mm Skimmer with 24 mm Orifice Diameter 2.5 m weir ID 19.4 CG
13 x 4 x 1 ID 19.8 F
+58.641 -L REV- 53.500 (175.52 FT.)
MATCH LINE STA. 78+00 -L REV.- SHEET 5
-L REV-
PI Sta 77+51.191
Δ = 3°09' 20.9" (LT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC
SEE SHEET 13 FOR -L REV- PROFILE



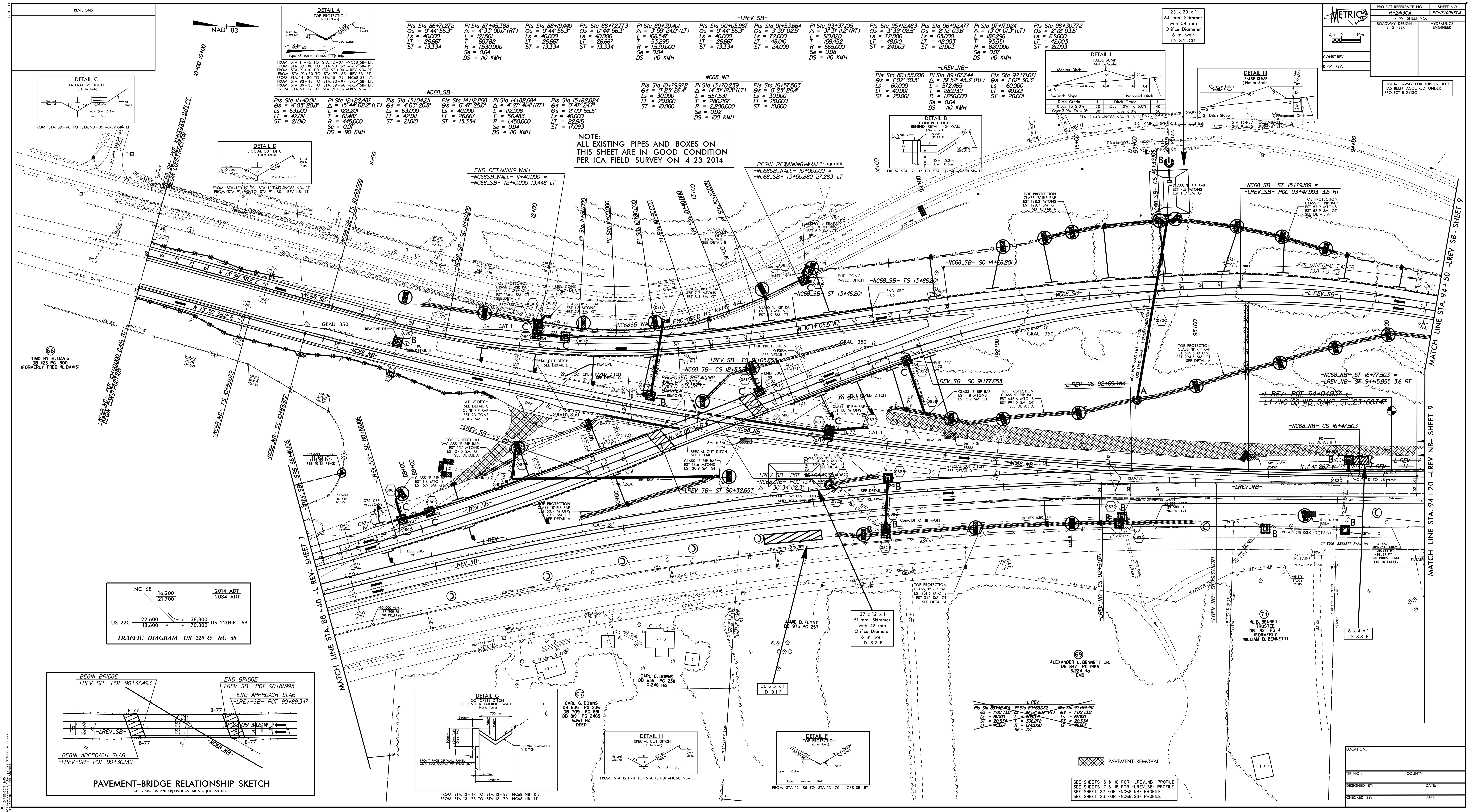
METRIC
PROJECT REFERENCE NO.
R-2413CA
SHEET NO.
EC-14/CONST.5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
5m 0 10m
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
Erosion Control devices on this sheet have been installed on R-2413C and are shown for reference only
NAD 83
79+00
80+00
-L REV-
PI Sta 77+51.191
△ = 3°09' 20.9" (LT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC
PI Sta 81+36.195
△ = 3°09' 20.9" (RT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC
-L REV- PRC 79+43.644
60
W.H. KNIGHT TRUSTEE
DB 998 PG 1537
(FORMERLY WALDO H. KNIGHT)
50
EDWARD A. FRIDDLE FAMILY TRUST
DB 1229 PG 1585
(FORMERLY E. AUSTIN FRIDDLE)
SPEC. LAT. V-DITCH
W/54.1 CL 'B' RIP RAP
EST. 139.8 SMFF
STA 79+00 TO
STA 79+40 -L REV- LT
SEE DETAIL #25
1.8 MTN C
CL 'B' RIP RAP
5.9 SMFF
PROP 1.2m WW
EXIST R/W
COLLAR AND EXTEND
RETAIN
750 RCP
375 RCP
2GI
FS
US 220 SB (BY OTHERS)
REMOVE
PROPOSED CABLE GUIDERAIL
-L REV-
REMOVE EXISTING GUARDRAIL
750 CONC
INSTALL DURING XOVRI CONSTRUCTION
4.5 MTN
CL 'B' RIP RAP
13.4 SMFF
(INSTALL DURING XOVRI CONSTRUCTION)
SPEC. LAT. V-DITCH
W/121.8 CL 'B' RIP RAP
EST. 314.6 SMFF
STA 79+10 TO
STA 80+00 -L REV- RT
SEE DETAIL #25
FIELD PATH
TDE
12 x 4 x 1
ID 20.1 CG
36 x 6 x 1
ID 20.2 F
DETAIL #25
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
4:1 or Flatter
Filter Fabric
Min. D= 0.45m
Max. d= 0.45m
Type of Liner= Class 'B' Rip-Rap
FROM STA. 79+10 TO STA. 80+00 -LREV- RT
MATCH LINE STA. 78+00 -L REV.- SHEET 4
MATCH LINE STA. 81+50 -L REV.- SHEET 6
SEE SHEET 13 FOR -L REV- PROFILE

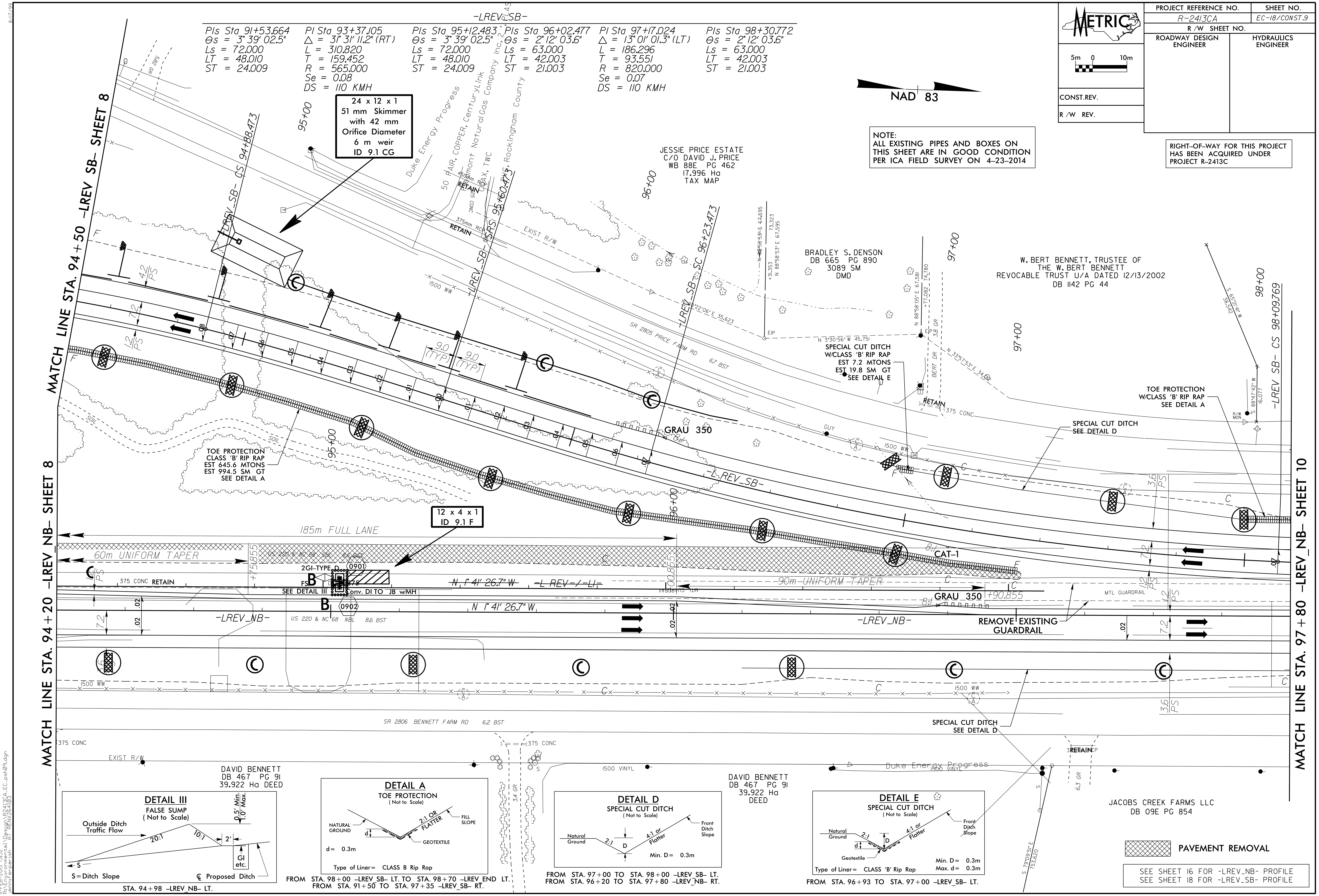


PROJECT REFERENCE NO.
R-2413CA
SHEET NO.
EC-15/CONST.6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
5m 0 10m
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
Erosion Control devices through Approximately Sta. 83+40 -L REV- have been installed on R-2413C and are shown for reference only
NAD 83
DETAIL #15
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Fill Slope
0.08m/m
Min. D= 0.45m
Max. d= 0.45m
B= 0.6m
b= 1.5m
•When B is < 1.8m
Type of Liner= Class 'B' Rip-Rap
FROM STA. 84+20 TO STA. 85+20 -LREV- LT
36 x 9 x 1
51 mm Skimmer
with 42 mm
Orifice Diameter
6.5 m weir
ID 6.1 F
32 x 10 x 1
64 mm Skimmer
with 54 mm
Orifice Diameter
7.5 m weir
(See Tiered Skimmer Basin Detail)
ID 6.2 F
WILLIAM E. NEAL
DB 730 PG 382
6.563 Ha
DMD
Modified Silt Basin
Type 'B'
32 x 10 x 1
(See Tiered Skimmer Basin Detail)
ID 6.2 F
END T.I.P. PROJECT R-2413C
BEGIN T.I.P. PROJECT R-2413CA
POT 84+00.000 -LREV-
BEGIN CONSTRUCTION (SB LANES)
LAT 0.9M BASE DITCH
W/ CL 'B' RIP RAP
EST. 206.6 SMFF
SEE DETAIL #10
BENCHED CHANNEL W/ CLASS 'II' BOULDER SILL
EST. 1.2 MTONS
COIR FIBER MATTING
EST. 16.4 SM
SEE DETAIL #33
TIMOTHY M. DAVIS
DB 1321 PG 2584
(FORMERLY RGY, INC.)
LAT 0.6M BASE DITCH
W/164.6 CL 'B' RIP RAP
EST. 409.6 SMFF
STA 84+20 TO
STA 85+20 -LREV- LT
SEE DETAIL #15
W.H. KNIGHT TRUSTEE
DB 998 PG 1537
(FORMERLY WALDO H. KNIGHT)
EST 6.4 MTONS CLASS 'I' RIP RAP
1.8 MTN
CL 'B' RIP RAP
5.9 SMFF
PROP 1.2m WW
-L REV- PT 83+28.648
375 W/ELBOWS
2-1200 CSP
2-1200 CSP
REMOVE HW, COLLAR AND EXTEND
BEGIN SHLDR BERM GUTTER LT.
BEGIN GUARDRAIL TIE TO EXISTING
375 RCP
US-220 SB (BY OTHERS)
PROPOSED CABLE GUIDERAIL
-L REV-
N 23°39'10.6" W
RETAIN
87 BST
2GI W/FG
MATCH LINE STA. 81+50 -L REV.- SHEET 5
MATCH LINE STA. 85+00 -L REV. SHEET 7
CLASS 'B' RIP RAP
EST 6.0 MTONS
EST 24.6 SMFF
EXIST R/W
TO BE REMOVED BY OTHERS (R-2413C)
CLASS 'B' RIP RAP
EST 8.5 MTONS
EST. 25.4 SMFF
BERM DITCH
STA. 83+10 TO 83+53 -LREV- RT
SEE DETAIL #6
PROP. GR BARRIER TERMINAL SECTION BY OTHERS
SR 2806 BENNETT FARM RD
850 CONC
W.H. KNIGHT TRUSTEE
DB 998 PG 1537
(FORMERLY WALDO H. KNIGHT)
JIMMY C. WADE & APRIL D.
DB 1168 PG 420
(FORMERLY TIMOTHY M. DAVIS)
-L REV-
PI Sta 81+36.195
Δ = 3°09' 20.9" (RT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC
DETAIL #6
BERM DITCH
(Not to Scale)
SLOPE STAKE
CLEARING LIMITS
Min. D= 0.3m
FROM STA. 83+10 TO STA. 83+53 -LREV- RT
13 x 6 x 1
38 mm Skimmer
with 21 mm
Orifice Diameter
3.5 m weir
ID 6.3 F
21 x 8 x 1
38 mm Skimmer
with 33 mm
Orifice Diameter
5.5 m weir
ID 6.1 CG
PAVEMENT REMOVAL
SEE SHEET 14 FOR -L REV- PROFILE
SEE SHEET 2D-1 FOR DITCH DETAIL #33

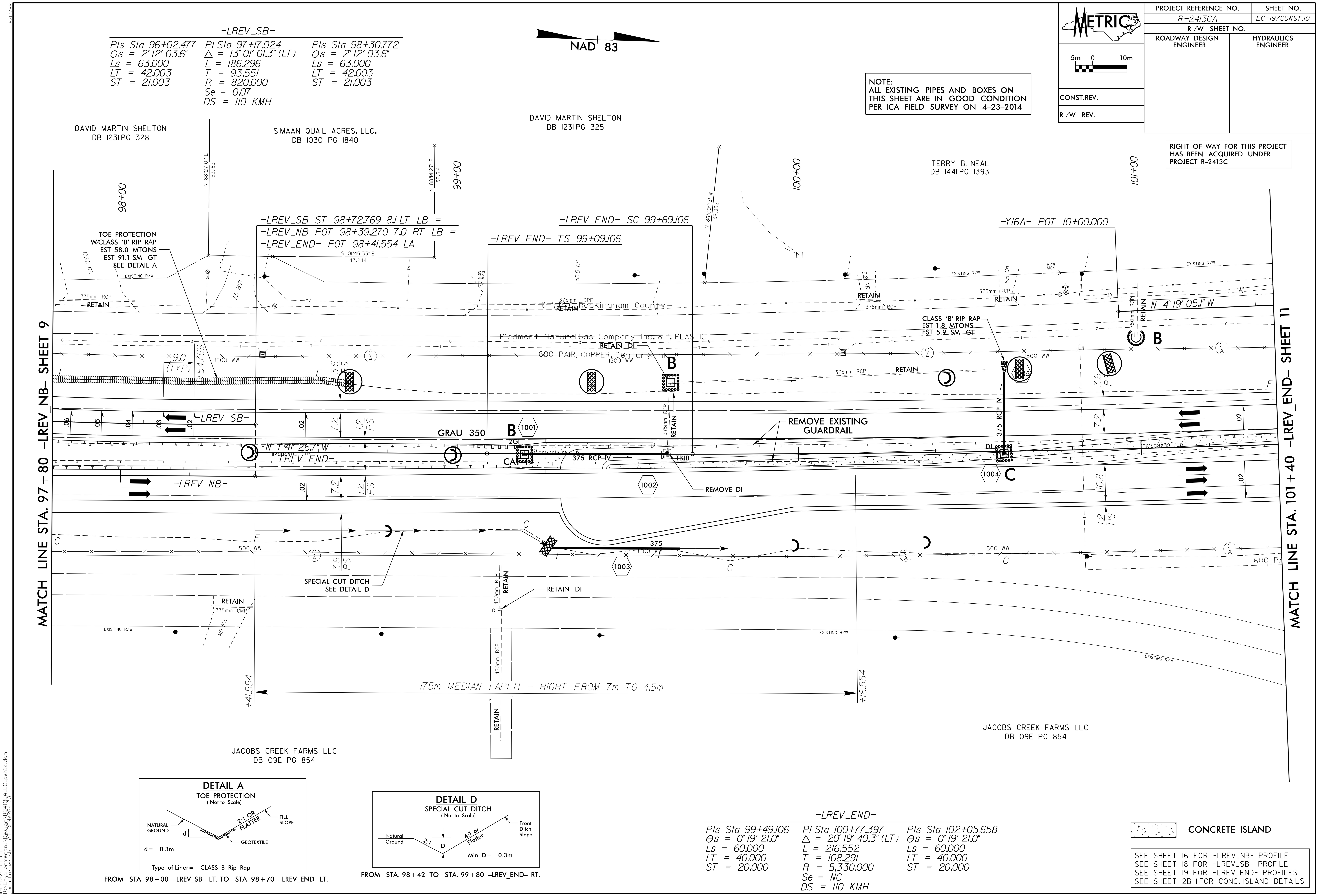


PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-16/CONST.7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
5m 0 10m
CONST.REV.
R/W REV.
NAD 83
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
SEE SHEET 14 FOR -L REV- PROFILE
SEE SHEET 15 FOR -LREV_NB- PROFILE
SEE SHEET 17 FOR -LREV_SB- PROFILE
SEE SHEET 2-H FOR DITCH DETAIL #33
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
-LREV_SB-
PIs Sta 86+71.272
Θs = 0° 44' 56.3"
Ls = 40.000
LT = 26.667
ST = 13.334
PI Sta 87+45.388
Δ = 4° 33' 00.0" (RT)
L = 121.501
T = 60.782
R = 1,530.000
Se = 0.04
DS = 110 KMH
PIs Sta 88+19.440
Θs = 0° 44' 56.3"
Ls = 40.000
LT = 26.667
ST = 13.334
-L REV-
PIs Sta 86+42.474
Θs = 1° 00' 13.5"
Ls = 61.000
ST = 20.334
LT = 40.667
PI Sta 89+69.082
Δ = 19° 57' 16.9" (RT)
L = 606.341
T = 306.272
R = 1,741.000
SE = .04
PIs Sta 92+89.487
Θs = 1° 00' 13.5"
Ls = 61.000
ST = 20.334
LT = 40.667
-LREV_NB-
PIs Sta 86+58.606
Θs = 1° 02' 30.3"
Ls = 60.000
LT = 40.001
ST = 20.001
PI Sta 89+67.744
Δ = 19° 52' 43.3" (RT)
L = 572.465
T = 289.139
R = 1,650.000
Se = 0.04
DS = 110 KMH
PIs Sta 92+71.071
Θs = 1° 02' 30.3"
Ls = 60.000
LT = 40.001
ST = 20.001
-L REV- POT 86+18.605 LB =
-LREV SB- POT 86+18.605 10.6 LT LA =
-LREV NB- TS 86+18.605 7.0 RT LA
62 TIMOTHY M. DAVIS DB 1321 PG 2584 (FORMERLY RGY, INC.)
63 JACK C. KNIGHT DB 843 PG 2172 6688 SM DMD
64 TIMOTHY M. DAVIS DB 1123 PG 1800 (FORMERLY FRED W. DAVIS)
65 TIMOTHY DAVIS DB 801 PG 671 2667 SM DMD
66 TIMOTHY M. DAVIS DB 1123 PG 1800 (FORMERLY FRED W. DAVIS)
71 TIMOTHY M. DAVIS DB 815 PG 1869 1.643 Ha DMD
AVERY LEON WOOD, JR. DB 815 PG 192 4201 SM DMD
LAT 0.6M BASE DITCH W/164.6 CL 'B' RIP RAP EST. 409.6 SMFF STA 84+20 TO STA 85+20 -LREV- LT SEE DETAIL #15
EST 6.4 MTONS CLASS 'I' RIP RAP EST 12.5 SM FF
+30 -L REV- END SHLDR BERM GUTTER LT.
BERM DITCH STA 85+49 TO STA 87+00 -LREV- LT SEE PROFILE FOR GRADE SEE DETAIL #6
BENCHED CHANNEL W/CLASS 'II' RIP RAP EST. 6.2 MTONS COIR FIBER MATTING EST. 25.0 SM SEE DETAIL #33
CLASS 'I' RIP RAP EST. 6.2 MTONS EST. 12.0 SM FF
450 W/ELBOWS
375 RCP
BDO
2GI-A
2GI
2GI-D
G.R.A.U. TYPE 350
GRAU 350
CAT-1
REMOVE
REMOVE AND RESET
PROP 1.2m WW
EXIST R/W
US 220
SR 2806 BENNETT FARM RD
SR 2495 ROCKWOOD DR
COPPER, CenturyLink
RETAIN
450 CMP
-L REV- TS 86+01.807
-LREV_SB- TS 86+44.605
-L REV- SC 86+62.807
-LREV SB- SC 86+84.605
-LREV_SB- CS 88+06.106
-LREV_NB- SC 86+78.605
N 23° 39' 10.6" W
MATCH LINE STA. 85+00 -L REV.- SHEET 6
MATCH LINE STA. 88+40 -L REV- SHEET 8
DETAIL #6
BERM DITCH
(Not to Scale)
SLOPE STAKE
CLEARING LIMITS
1.5m
3.0m V.C.
D VAR.
Min. D= 0.3m
FROM STA. 85+49 TO STA. 87+00 -LREV- LT
DETAIL #15
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
Filter Fabric
0.08m/m
Min. D= 0.45m
Max. d= 0.45m
B= 0.6m
b= 1.5m
•When B is < 1.8m
Type of Liner= Class 'B' Rip-Rap
FROM STA. 84+20 TO STA. 85+20 -LREV- LT

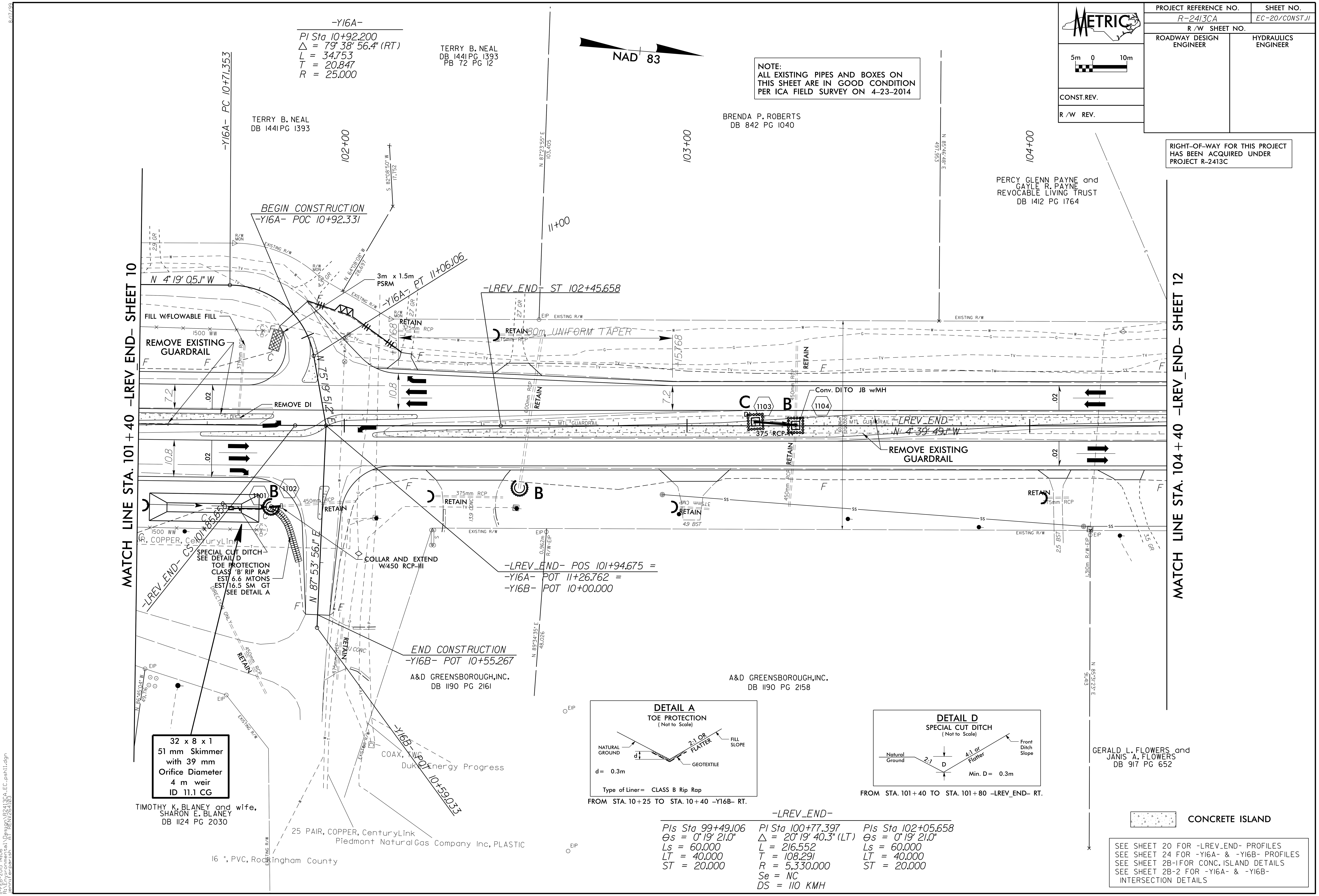

REVISIONS
NAD 83
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d= 0.3m
Type of Liner= CLASS B Rip Rap
FROM STA. 11+45 TO STA. 12+07 -NC68_SB- LT.
FROM STA. 89+80 TO STA. 90+52 -LREV_SB- RT.
FROM STA. 91+10 TO STA. 93+00 -LREV_NB- RT.
FROM STA. 91+50 TO STA. 97+35 -REV_SB- RT.
FROM STA. 14+80 TO STA. 15+79 -NC68_SB- LT.
FROM STA. 93+48 TO STA. 93+97 -LREV_SB- LT.
FROM STA. 89+35 TO STA. 89+60 -LREV_SB- LT.
FROM STA. 91+12 TO STA. 91+35 -LREV_NB- LT.
DETAIL C
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D= 0.3m
b= 1.5m
FROM STA. 89+60 TO STA. 90+05 -LREV_SB- LT.
-LREV_SB-
Pls Sta 86+71.272 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 87+45.388 Δ = 4° 33' 00.0" (RT) L = 121.501 T = 60.782 R = 1,530.000 Se = 0.04 DS = 110 KMH
Pls Sta 88+19.440 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
Pls Sta 88+72.773 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 89+39.401 Δ = 3° 59' 24.0" (LT) L = 106.547 T = 53.295 R = 1,530.000 Se = 0.04 DS = 110 KMH
Pls Sta 90+05.987 Θs = 0° 44' 56.3" Ls = 40.000 LT = 26.667 ST = 13.334
Pls Sta 91+53.664 Θs = 3° 39' 02.5" Ls = 72.000 LT = 48.010 ST = 24.009
PI Sta 93+37.105 Δ = 31° 31' 11.2" (RT) L = 310.820 T = 159.452 R = 565.000 Se = 0.08 DS = 110 KMH
Pls Sta 95+12.483 Θs = 3° 39' 02.5" Ls = 72.000 LT = 48.010 ST = 24.009
Pls Sta 96+02.477 Θs = 2° 12' 03.6" Ls = 63.000 LT = 42.003 ST = 21.003
PI Sta 97+17.024 Δ = 13° 01' 01.3" (LT) L = 186.296 T = 93.551 R = 820.000 Se = 0.07 DS = 110 KMH
Pls Sta 98+30.772 Θs = 2° 12' 03.6" Ls = 63.000 LT = 42.003 ST = 21.003
-NC68_SB-
Pls Sta 11+40.011 Θs = 4° 03' 20.8" Ls = 63.000 LT = 42.011 ST = 21.010
PI Sta 12+22.487 Δ = 15° 44' 02.2" (LT) L = 122.201 T = 61.487 R = 445.000 Se = 0.07 DS = 90 KMH
Pls Sta 13+04.211 Θs = 4° 03' 20.8" Ls = 63.000 LT = 42.011 ST = 21.010
Pls Sta 14+12.868 Θs = 0° 47' 25.0" Ls = 40.000 LT = 26.667 ST = 13.334
PI Sta 14+82.684 Δ = 4° 27' 41.4" (RT) L = 112.908 T = 56.483 R = 1,450.000 Se = 0.04 DS = 110 KMH
Pls Sta 15+62.024 Θs = 0° 47' 24.7" Θs = 2° 00' 55.5" Ls = 40.000 LT = 22.915 ST = 17.093
-NC68_NB-
Pls Sta 10+79.972 Θs = 0° 23' 26.4" Ls = 30.000 LT = 20.000 ST = 10.000
PI Sta 13+70.239 Δ = 14° 31' 12.3" (LT) L = 557.531 T = 280.267 R = 2,200.000 Se = 0.02 DS = 100 KMH
Pls Sta 16+57.503 Θs = 0° 23' 26.4" Ls = 30.000 LT = 20.000 ST = 10.000
-LREV_NB-
Pls Sta 86+58.606 Θs = 1° 02' 30.3" Ls = 60.000 LT = 40.001 ST = 20.001
PI Sta 89+67.744 Δ = 19° 52' 43.3" (RT) L = 572.465 T = 289.139 R = 1,650.000 Se = 0.04 DS = 110 KMH
Pls Sta 92+71.071 Θs = 1° 02' 30.3" Ls = 60.000 LT = 40.001 ST = 20.001
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 0.3m
FROM STA. 12+27 TO STA. 12+47 -NC68_NB- RT.
FROM STA. 91+40 TO STA. 91+80 -LREV_NB- LT.
DETAIL B
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
D= 0.3m
B= 0.6m
FROM STA. 12+07 TO STA. 13+54 -NC68_SB- LT.
DETAIL II
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. 11+43 -NC68_NB- LT.
DETAIL III
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S=Ditch Slope
STA. 16+37 -NC68_NB- LT. USE D = 1'
STA. 91+35 -LREV_NB- LT.
23 x 20 x 1
64 mm Skimmer with 54 mm Orifice Diameter
8 m weir
ID 8.2 CG
END RETAINING WALL
-NC68SB_WALL- 11+40.000 =
-NC68_SB- 12+10.000 13.448 LT
BEGIN RETAINING WALL
-NC68SB_WALL- 10+00.000 =
-NC68_SB- 13+50.880 27.283 LT
PROPOSED RETAINING WALL
PROPOSED RETAINING WALL w/ SINGLE FACED CONCRETE BARRIER
-NC68_SB- ST 15+79.109 =
-LREV_SB- POC 93+47.903 3.6 RT
-NC68_NB- ST 16+77.503 =
-LREV_NB- ST 94+15.855 3.6 RT
-NC68_NB- CS 16+47.503
-LREV_SB- POT 90+64.493 =
-NC68_NB- POC 13+10.588
Δ = 30° 34' 02.3"
-LREV SB- ST 90+32.653
-LREV_SB- SC 91+77.653
-NC68_SB- TS 13+86.201
-NC68_SB- ST 13+46.201
-NC68_SB- SC 14+26.201
600 RCP, MAX FILL = 13.3m > 12.2m USE LRFD DIRECT DESIGN METHOD
90m UNIFORM TAPER 10.8 TO 7.2
MATCH LINE STA. 94+50 -LREV SB- SHEET 9
MATCH LINE STA. 94+20 -LREV_NB- SHEET 9
MATCH LINE STA. 88+40 -L REV- SHEET 7
66
TIMOTHY M. DAVIS
DB 1123 PG 1800
(FORMERLY FRED W. DAVIS)
67
CARL G. DOWNS
DB 635 PG 236
DB 709 PG 831
DB 819 PG 2469
6.167 Ha
DEED
CARL G. DOWNS
DB 635 PG 238
0.246 Ha
JAMIE B. FLYNT
DB 975 PG 257
69
ALEXANDER L. BENNETT JR.
DB 847 PG 1966
3.224 Ha
DMD
71
W. B. BENNETT
TRUSTEE
DB 1142 PG 41
(FORMERLY WILLIAM B. BENNETT)
27 x 12 x 1
51 mm Skimmer with 42 mm Orifice Diameter
6 m weir
ID 8.2 F
30 x 5 x 1
ID 8.1 F
8 x 4 x 1
ID 8.3 F
NC 68
16,200
21,700
2014 ADT
2034 ADT
US 220
22,600
48,600
38,800
70,300
US 220/NC 68
TRAFFIC DIAGRAM US 220 & NC 68
BEGIN BRIDGE
-LREV-SB- POT 90+37.493
END BRIDGE
-LREV-SB- POT 90+81.993
END APPROACH SLAB
-LREV-SB- POT 90+89.347
BEGIN APPROACH SLAB
-LREV-SB- POT 90+30.139
PAVEMENT-BRIDGE RELATIONSHIP SKETCH
-LREV_SB- (US 220 SB) OVER -NC68_NB- (NC 68 NB)
DETAIL G
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
100mm CONCRETE V DITCH
FRONT FACE OF WALL PANEL AND HORIZONTAL CONTROL LINE
FROM STA. 12+47 TO STA. 12+83 -NC68 NB- RT.
FROM STA. 13+28 TO STA. 13+70 -NC68 NB- LT.
DETAIL H
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 0.3m
FROM STA. 12+74 TO STA. 13+01 -NC68_NB- LT.
DETAIL F
TOE PROTECTION
(Not to Scale)
d= 0.3m
Type of Liner= PSRM
FROM STA. 12+85 TO STA. 13+70 -NC68_SB- RT.
PAVEMENT REMOVAL
SEE SHEETS 15 & 16 FOR -LREV_NB- PROFILE
SEE SHEETS 17 & 18 FOR -LREV_SB- PROFILE
SEE SHEET 22 FOR -NC68_NB- PROFILE
SEE SHEET 23 FOR -NC68_SB- PROFILE
PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-17/CONST.8
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
DATE:
CHECKED BY:
DATE:
12-FEB-2015 12:45



PROJECT REFERENCE NO.
R-2413CA
SHEET NO.
EC-18/CONST.9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
5m 0 10m
CONST. REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
NAD 83
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
-LREV_SB-
PIs Sta 91+53.664
Θs = 3° 39' 02.5"
Ls = 72.000
LT = 48.010
ST = 24.009
PI Sta 93+37.105
Δ = 31° 31' 11.2" (RT)
L = 310.820
T = 159.452
R = 565.000
Se = 0.08
DS = 110 KMH
PIs Sta 95+12.483
Θs = 3° 39' 02.5"
Ls = 72.000
LT = 48.010
ST = 24.009
PIs Sta 96+02.477
Θs = 2° 12' 03.6"
Ls = 63.000
LT = 42.003
ST = 21.003
PI Sta 97+17.024
Δ = 13° 01' 01.3" (LT)
L = 186.296
T = 93.551
R = 820.000
Se = 0.07
DS = 110 KMH
PIs Sta 98+30.772
Θs = 2° 12' 03.6"
Ls = 63.000
LT = 42.003
ST = 21.003
24 x 12 x 1
51 mm Skimmer
with 42 mm
Orifice Diameter
6 m weir
ID 9.1 CG
MATCH LINE STA. 94+50 -LREV SB- SHEET 8
MATCH LINE STA. 94+20 -LREV_NB- SHEET 8
MATCH LINE STA. 97+80 -LREV_NB- SHEET 10
-LREV SB- CS 94+88.473
-LREV_SB- SC 96+23.473
-LREV SB- CS 98+09.769
Duke Energy Progress
AIR, COPPER, CenturyLink
Piedmont NaturalGas Company Inc.
Rockingham County
JESSIE PRICE ESTATE
C/O DAVID J. PRICE
WB 88E PG 462
17.996 Ha
TAX MAP
BRADLEY S. DENSON
DB 665 PG 890
3089 SM
DMD
W. BERT BENNETT, TRUSTEE OF
THE W. BERT BENNETT
REVOCABLE TRUST U/A DATED 12/13/2002
DB 1142 PG 44
SR 2805 PRICE FARM RD 6.7 BST
EXIST R/W
RETAIN
375 CONC
1500 WW
SPECIAL CUT DITCH
W/CLASS 'B' RIP RAP
EST 7.2 MTONS
EST 19.8 SM GT
SEE DETAIL E
TOE PROTECTION
W/CLASS 'B' RIP RAP
SEE DETAIL A
SPECIAL CUT DITCH
SEE DETAIL D
TOE PROTECTION
CLASS 'B' RIP RAP
EST 645.6 MTONS
EST 994.5 SM GT
SEE DETAIL A
GRAU 350
-L REV_SB-
CAT-1
12 x 4 x 1
ID 9.1 F
185m FULL LANE
60m UNIFORM TAPER
90m UNIFORM TAPER
2GI-TYPE D
0901
0902
SEE DETAIL III
Conv. DI TO JB w/MH
N 1° 41' 26.7" W
-L REV-/-LI-
-LREV_NB-
US 220 & NC 68 SBL 8.6 BST
US 220 & NC 68 NBL 8.6 BST
+75.855
+90.855
REMOVE EXISTING GUARDRAIL
MTL GUARDRAIL
SR 2806 BENNETT FARM RD 6.2 BST
SPECIAL CUT DITCH
SEE DETAIL D
1500 VINYL
Duke Energy Progress
DAVID BENNETT
DB 467 PG 91
39.922 Ha DEED
DAVID BENNETT
DB 467 PG 91
39.922 Ha
DEED
JACOBS CREEK FARMS LLC
DB 09E PG 854
DETAIL III
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
20:1
10:1
2'
0.5' Min. 1.0' Max.
GI etc.
S=Ditch Slope
℄ Proposed Ditch
STA. 94+98 -LREV_NB- LT.
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d= 0.3m
Type of Liner= CLASS B Rip Rap
FROM STA. 98+00 -LREV_SB- LT. TO STA. 98+70 -LREV_END LT.
FROM STA. 91+50 TO STA. 97+35 -LREV_SB- RT.
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1
D
4:1 or Flatter
Front Ditch Slope
Min. D= 0.3m
FROM STA. 97+00 TO STA. 98+00 -LREV_SB- LT.
FROM STA. 96+20 TO STA. 97+80 -LREV_NB- RT.
DETAIL E
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1
D
d
4:1 or Flatter
Front Ditch Slope
Geotextile
Type of Liner= CLASS 'B' Rip Rap
Min. D= 0.3m
Max. d= 0.3m
FROM STA. 96+93 TO STA. 97+00 -LREV_SB- LT.
PAVEMENT REMOVAL
SEE SHEET 16 FOR -LREV_NB- PROFILE
SEE SHEET 18 FOR -LREV_SB- PROFILE



METRIC
PROJECT REFERENCE NO. R-2413CA
SHEET NO. EC-19/CONST.10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
5m 0 10m
CONST.REV.
R/W REV.
NAD 83
NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
-LREV_SB-
PIs Sta 96+02.477 θs = 2° 12' 03.6" Ls = 63.000 LT = 42.003 ST = 21.003
PI Sta 97+17.024 Δ = 13° 01' 01.3" (LT) L = 186.296 T = 93.551 R = 820.000 Se = 0.07 DS = 110 KMH
PIs Sta 98+30.772 θs = 2° 12' 03.6" Ls = 63.000 LT = 42.003 ST = 21.003
DAVID MARTIN SHELTON DB 1231 PG 328
SIMAAN QUAIL ACRES, LLC. DB 1030 PG 1840
DAVID MARTIN SHELTON DB 1231 PG 325
TERRY B. NEAL DB 1441 PG 1393
JACOBS CREEK FARMS LLC DB 09E PG 854
JACOBS CREEK FARMS LLC DB 09E PG 854
98+00
99+00
100+00
101+00
-LREV_SB ST 98+72.769 8.1 LT LB =
-LREV_NB POT 98+39.270 7.0 RT LB =
-LREV_END- POT 98+41.554 LA
-LREV_END- TS 99+09.106
-LREV_END- SC 99+69.106
-Y16A- POT 10+00.000
TOE PROTECTION W/CLASS 'B' RIP RAP EST 58.0 MTONS EST 91.1 SM GT SEE DETAIL A
CLASS 'B' RIP RAP EST 1.8 MTONS EST 5.9 SM GT
Piedmont Natural Gas Company Inc. 8" PLASTIC
600 PAIR, COPPER, CenturyLink
16" PVC Rockingham County
RETAIN DI
RETAIN
375mm RCP
375mm HDPE
1500 WW
GRAU 350
2GI
CA
375 RCP-IV
TBJB
REMOVE DI
REMOVE EXISTING GUARDRAIL
N 1° 41' 26.7" W
N 4° 19' 05.1" W
-LREV SB-
-LREV_END-
-LREV NB-
1001
1002
1003
1004
B
C
DI
SPECIAL CUT DITCH SEE DETAIL D
375mm CMP
450mm RCP
EXISTING R/W
175m MEDIAN TAPER - RIGHT FROM 7m TO 4.5m
+41.554
+16.554
MATCH LINE STA. 97+80 -LREV_NB- SHEET 9
MATCH LINE STA. 101+40 -LREV_END- SHEET 11
DETAIL A
TOE PROTECTION (Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d= 0.3m
Type of Liner= CLASS B Rip Rap
FROM STA. 98+00 -LREV_SB- LT. TO STA. 98+70 -LREV_END LT.
DETAIL D
SPECIAL CUT DITCH (Not to Scale)
Natural Ground
2:1
4:1 or Flatter
Front Ditch Slope
Min. D= 0.3m
FROM STA. 98+42 TO STA. 99+80 -LREV_END- RT.
-LREV_END-
PIs Sta 99+49.106 θs = 0° 19' 21.0" Ls = 60.000 LT = 40.000 ST = 20.000
PI Sta 100+77.397 Δ = 20° 19' 40.3" (LT) L = 216.552 T = 108.291 R = 5,330.000 Se = NC DS = 110 KMH
PIs Sta 102+05.658 θs = 0° 19' 21.0" Ls = 60.000 LT = 40.000 ST = 20.000
CONCRETE ISLAND
SEE SHEET 16 FOR -LREV_NB- PROFILE
SEE SHEET 18 FOR -LREV_SB- PROFILE
SEE SHEET 19 FOR -LREV_END- PROFILES
SEE SHEET 2B-1 FOR CONC. ISLAND DETAILS


PROJECT REFERENCE NO.
R-2413CA
SHEET NO.
EC-20/CONSTJI
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
5m 0 10m
CONST.REV.
R/W REV.
RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C
NOTE: ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014
NAD 83
-Y16A-
PI Sta 10+92.200
△ = 79° 38' 56.4" (RT)
L = 34.753
T = 20.847
R = 25.000
TERRY B. NEAL
DB 1441 PG 1393
PB 72 PG 12
TERRY B. NEAL
DB 1441 PG 1393
BRENDA P. ROBERTS
DB 842 PG 1040
PERCY GLENN PAYNE and GAYLE R. PAYNE REVOCABLE LIVING TRUST
DB 1412 PG 1764
-Y16A- PC 10+71.353
BEGIN CONSTRUCTION
-Y16A- POC 10+92.331
-Y16A- PT 11+06.106
3m x 1.5m PSRM
-LREV_END- ST 102+45.658
80m UNIFORM TAPER
MATCH LINE STA. 101+40 -LREV_END- SHEET 10
MATCH LINE STA. 104+40 -LREV_END- SHEET 12
FILL W/FLOWABLE FILL
REMOVE EXISTING GUARDRAIL
REMOVE DI
RETAIN
Conv. DI TO JB w/MH
-LREV_END-
N 4° 39' 49.1" W
N 4° 19' 05.1" W
REMOVE EXISTING GUARDRAIL
-LREV_END- CS 101+85.658
SPECIAL CUT DITCH SEE DETAIL D
TOE PROTECTION CLASS 'B' RIP RAP EST 6.6 MTONS EST 16.5 SM GT SEE DETAIL A
COLLAR AND EXTEND W/450 RCP-III
-LREV_END- POS 101+94.675 = -Y16A- POT 11+26.762 = -Y16B- POT 10+00.000
END CONSTRUCTION
-Y16B- POT 10+55.267
-Y16B- POT 10+59.033
A&D GREENSBOROUGH, INC.
DB 1190 PG 2161
A&D GREENSBOROUGH, INC.
DB 1190 PG 2158
32 x 8 x 1
51 mm Skimmer with 39 mm Orifice Diameter
4 m weir
ID 11.1 CG
TIMOTHY K. BLANEY and wife, SHARON E. BLANEY
DB 1124 PG 2030
GERALD L. FLOWERS and JANIS A. FLOWERS
DB 917 PG 652
25 PAIR, COPPER, CenturyLink
Piedmont Natural Gas Company Inc, PLASTIC
16", PVC, Rockingham County
COAX, TWC
Duke Energy Progress
DETAIL A
TOE PROTECTION
(Not to Scale)
NATURAL GROUND
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE
d = 0.3m
Type of Liner = CLASS B Rip Rap
FROM STA. 10+25 TO STA. 10+40 -Y16B- RT.
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
2:1
4:1 or Flatter
Front Ditch Slope
Min. D = 0.3m
FROM STA. 101+40 TO STA. 101+80 -LREV_END- RT.
-LREV_END-
PIs Sta 99+49.106
θs = 0° 19' 21.0"
Ls = 60.000
LT = 40.000
ST = 20.000
PI Sta 100+77.397
△ = 20° 19' 40.3" (LT)
L = 216.552
T = 108.291
R = 5,330.000
Se = NC
DS = 110 KMH
PIs Sta 102+05.658
θs = 0° 19' 21.0"
Ls = 60.000
LT = 40.000
ST = 20.000
CONCRETE ISLAND
SEE SHEET 20 FOR -LREV_END- PROFILES
SEE SHEET 24 FOR -Y16A- & -Y16B- PROFILES
SEE SHEET 2B-1 FOR CONC. ISLAND DETAILS
SEE SHEET 2B-2 FOR -Y16A- & -Y16B- INTERSECTION DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-2413CA	EC-21/CONST.12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

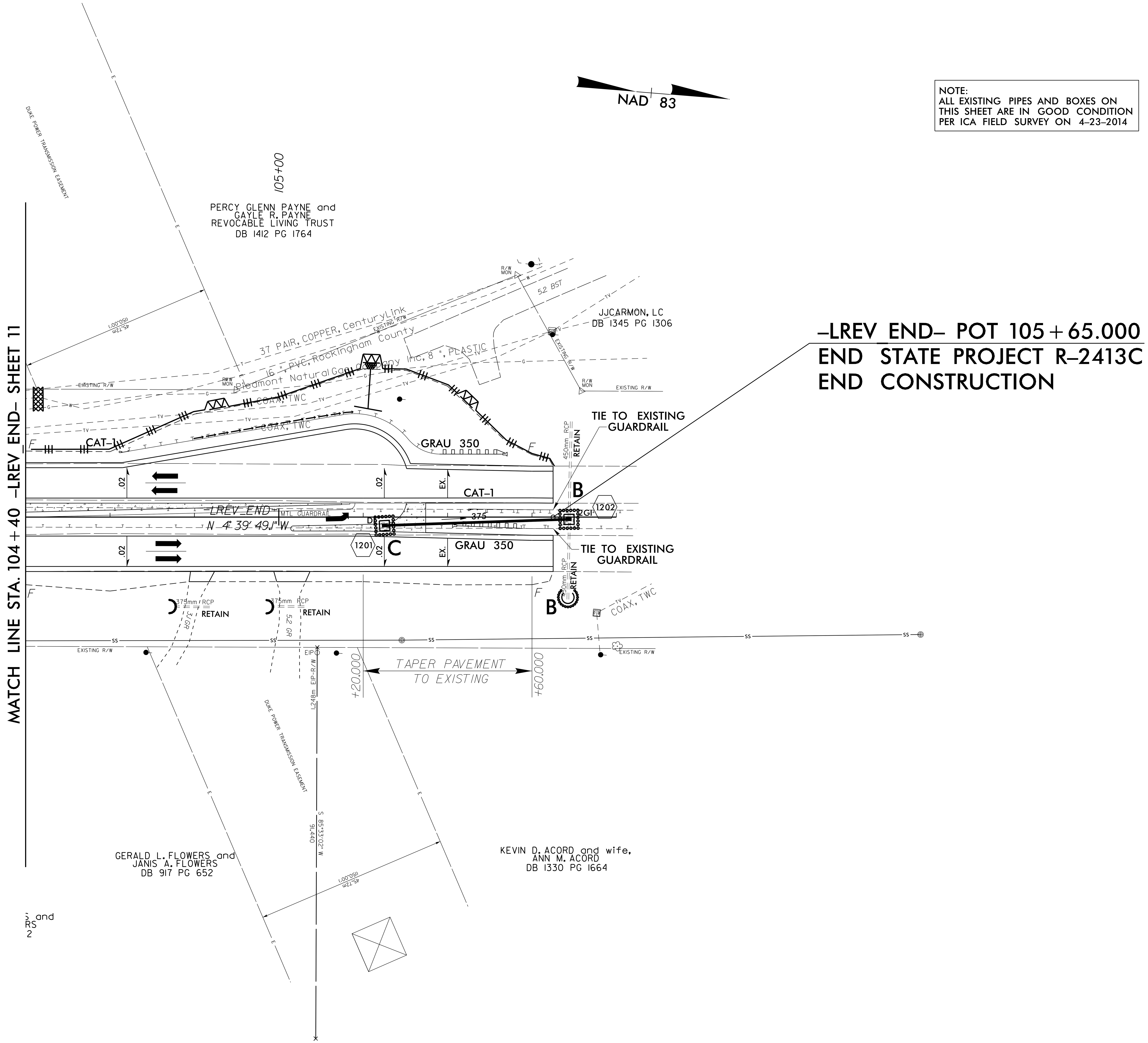
5m 0 10m

CONST. REV.

R/W REV.

NOTE:
ALL EXISTING PIPES AND BOXES ON THIS SHEET ARE IN GOOD CONDITION PER ICA FIELD SURVEY ON 4-23-2014

RIGHT-OF-WAY FOR THIS PROJECT HAS BEEN ACQUIRED UNDER PROJECT R-2413C



CONCRETE ISLAND

SEE SHEETS 20 & 21 FOR -LREV_END- PROFILES
SEE SHEET 2B-1 FOR CONC. ISLAND DETAILS

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