0660DEL_P21o

TIP PROJECT: P-4405K

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-4405K	EC-1	

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

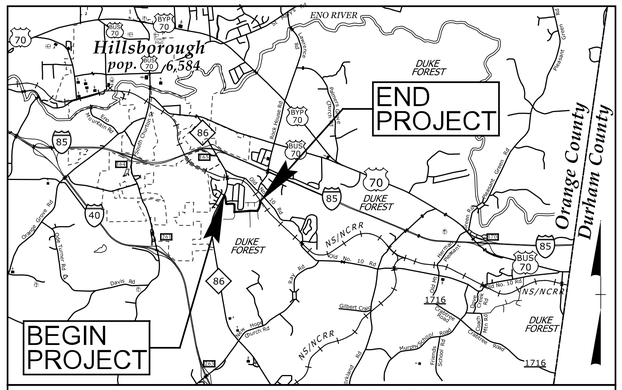
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

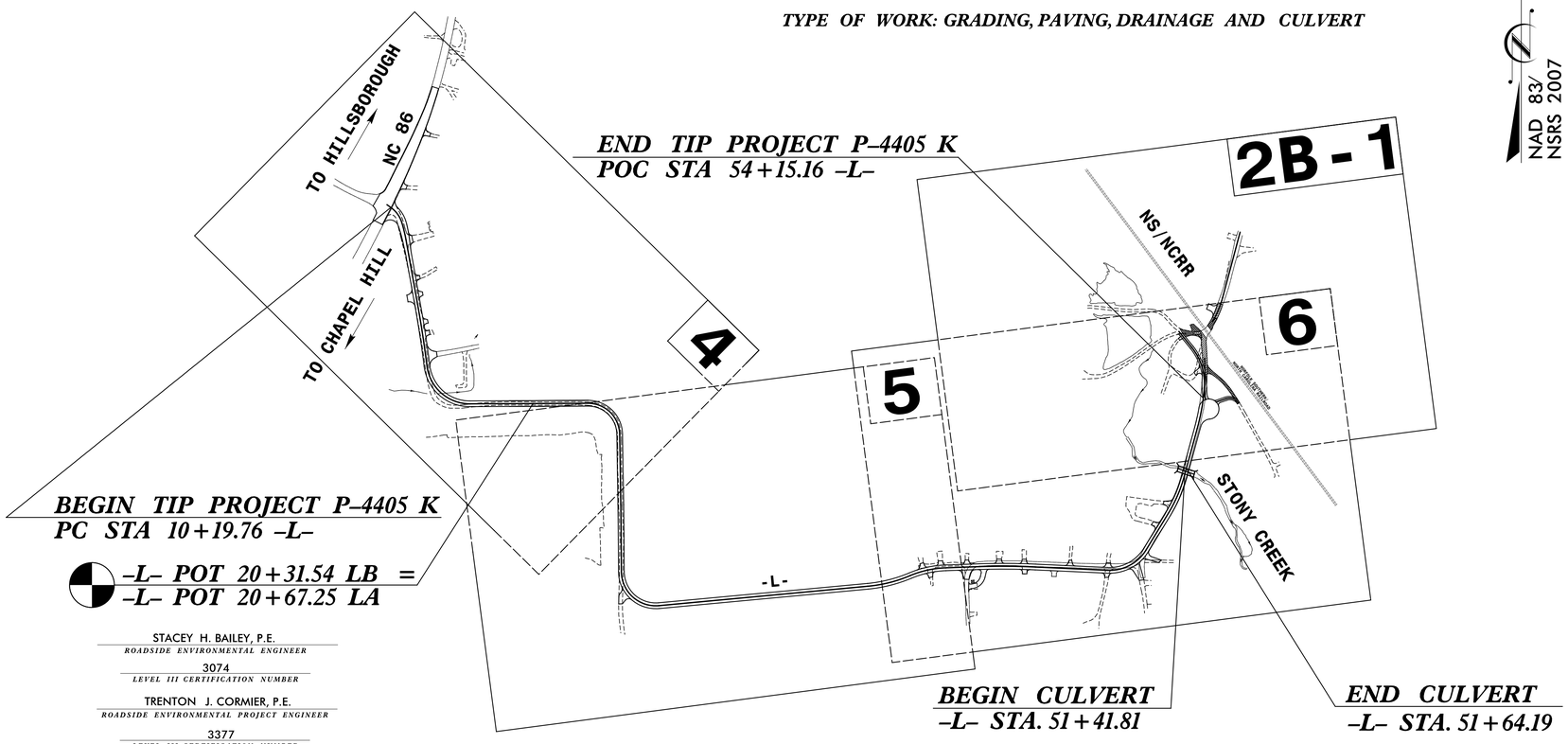
ORANGE COUNTY

LOCATION: BYRDSVILLE ROAD – EXTENSION FROM NS/NCRR TO NC 86 AND CROSSING CLOSURE

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



VICINITY MAP



END TIP PROJECT P-4405 K
POC STA 54+15.16 -L-

BEGIN TIP PROJECT P-4405 K
PC STA 10+19.76 -L-

-L- POT 20+31.54 LB =
-L- POT 20+67.25 LA

BEGIN CULVERT
-L- STA. 51+41.81

END CULVERT
-L- STA. 51+64.19

NAD 83/
NSRS 2007

STACEY H. BAILEY, P.E.
ROADSIDE ENVIRONMENTAL ENGINEER

3074
LEVEL III CERTIFICATION NUMBER

TRENTON J. CORMIER, P.E.
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

3377
LEVEL III CERTIFICATION NUMBER

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.

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.

GRAPHIC SCALE

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

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

Prepared In the Office of:

ICA ENGINEERING, INC.
5121 KINGDOM WAY, SUITE 100
RALEIGH NC 27607
NC LICENSE NO: F-0258

2012 STANDARD SPECIFICATIONS

Designed by:

STACEY H BAILEY, P.E. 3074
NAME *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Reviewed by:

JENNIFER PARISH

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.

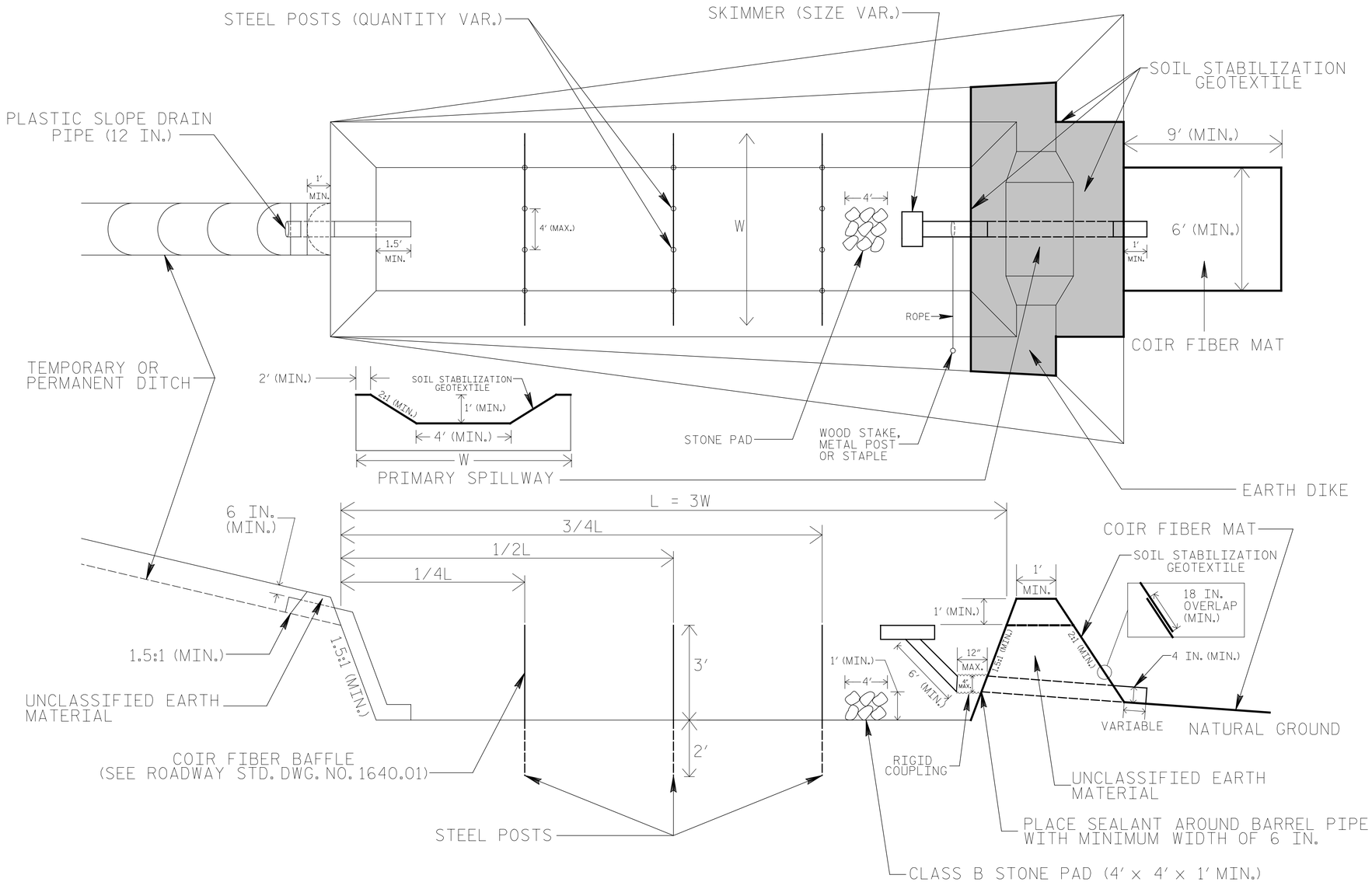
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type 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		

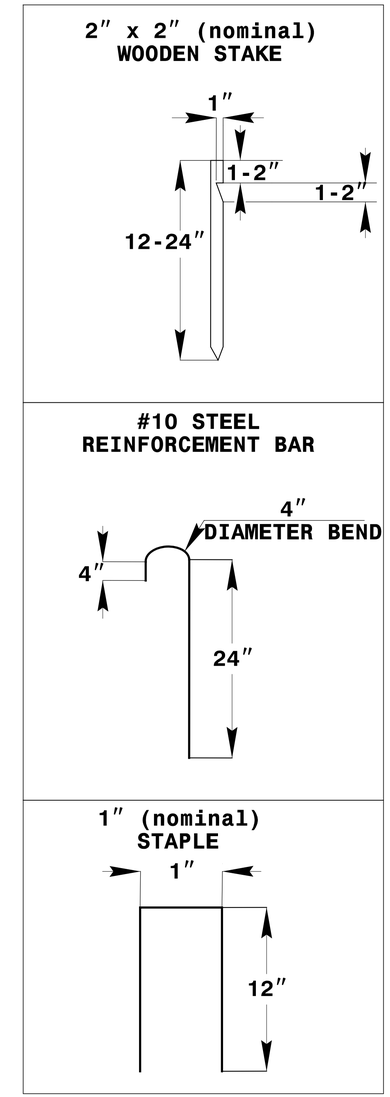
PROPRIETARY INFORMATION
ICA ENGINEERING, INC.

0660DEL_P21o

PROJECT REFERENCE NO.	SHEET NO.
P-4405K	EC-2
R/W SHEET NO.	

SKIMMER BASIN WITH BAFFLES DETAIL





COIR FIBER MAT ANCHOR OPTIONS

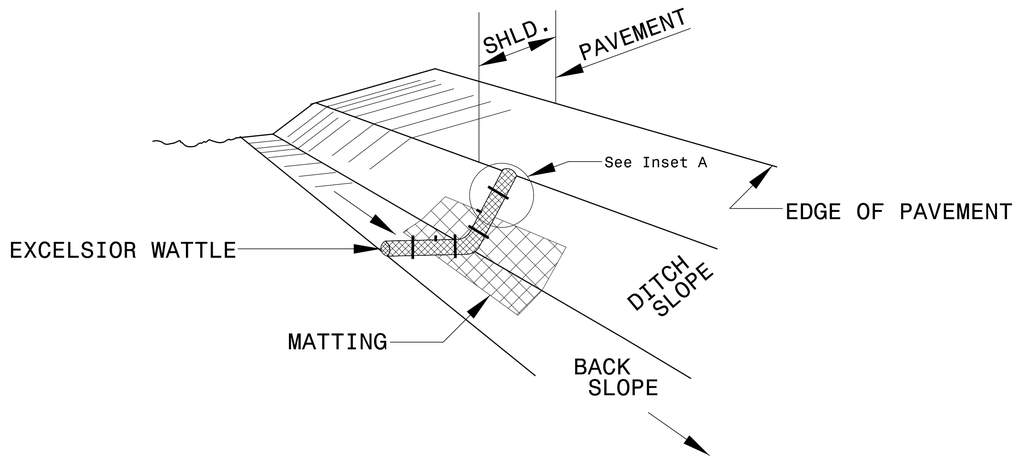
NOTES

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.).

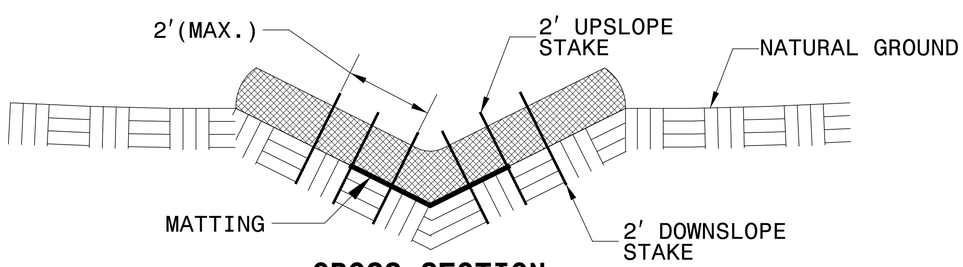
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
P-4405K	EC-2A

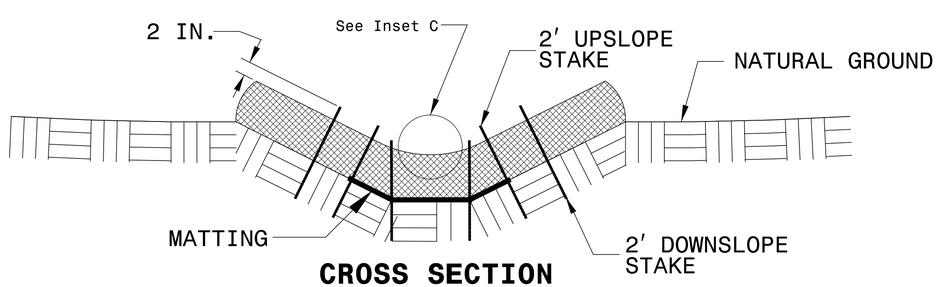
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



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.

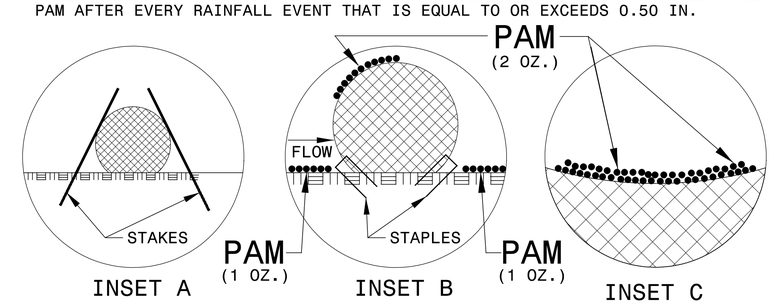
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

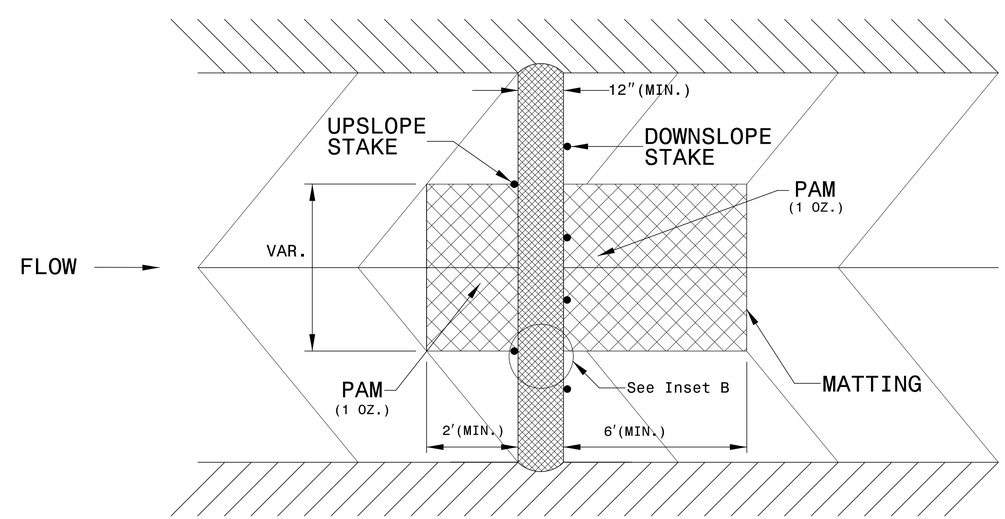
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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.

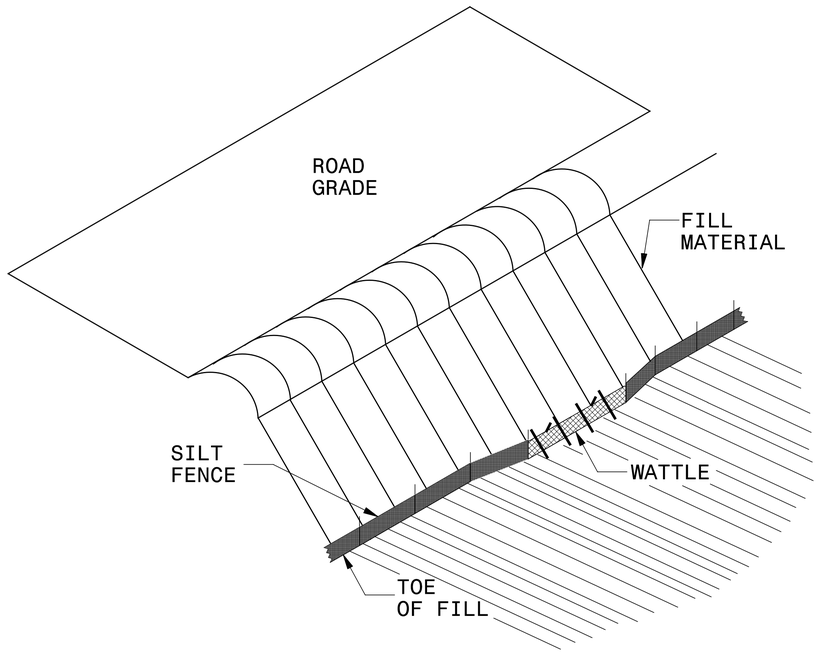




TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
P-4405K	EC-2B

SILT FENCE WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR 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.

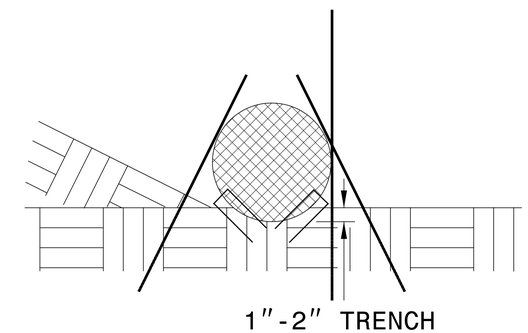
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

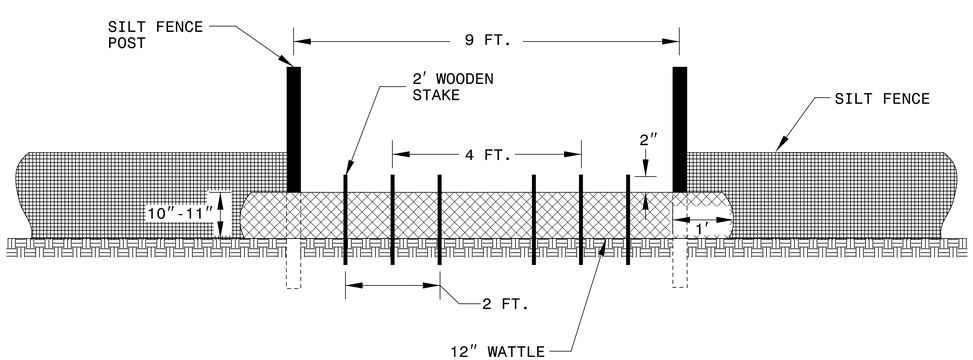
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

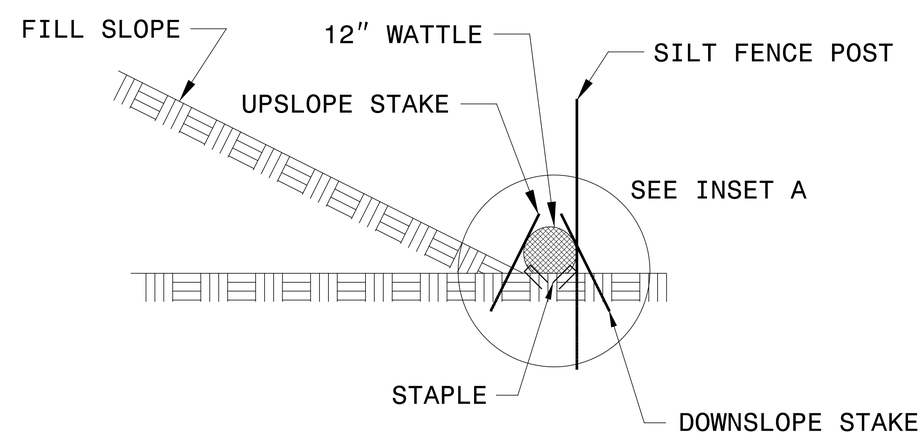
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





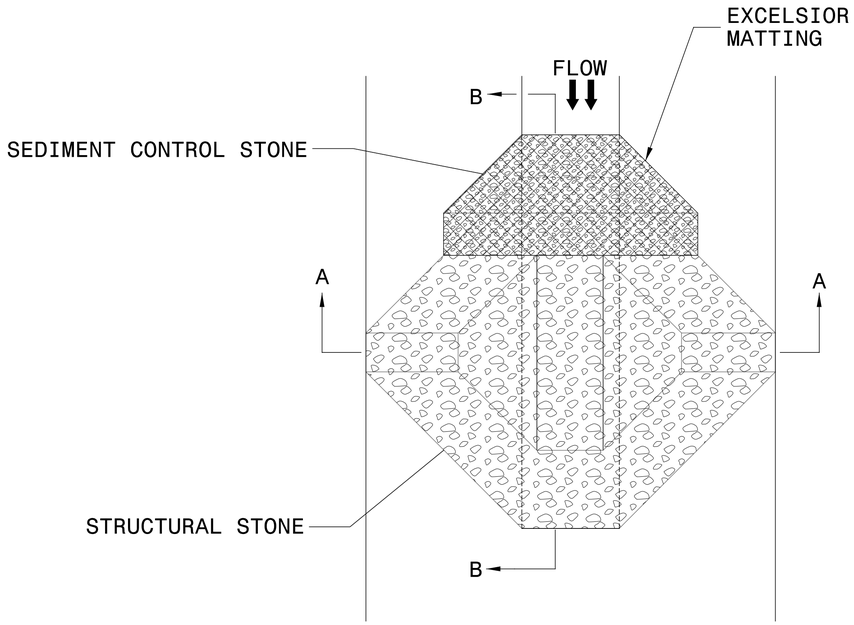
VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
P-4405K	EC-2C

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



PLAN

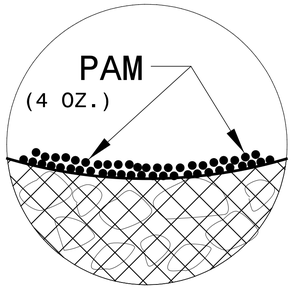
NOTES:

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

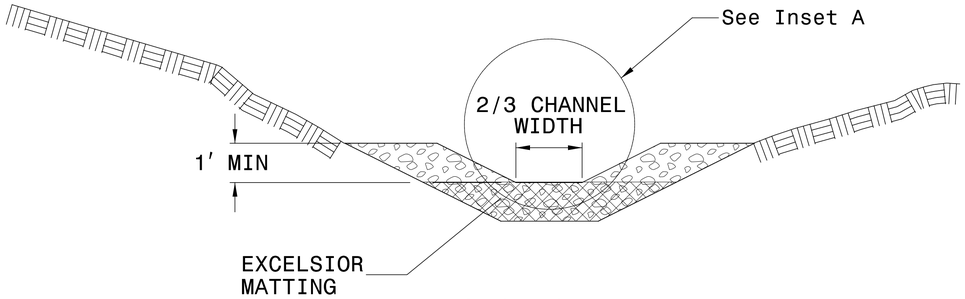
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.

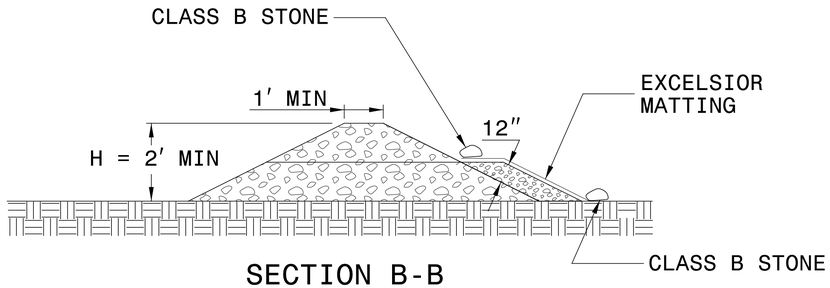
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

0660DEL_P21o

PROJECT REFERENCE NO.	SHEET NO.
P-4405K	EC-3

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

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)
4	-L-	11+00	14+50	RT	250
4	-L-	16+00	16+73	RT	55
4	-L-	19+00	20+31	RT	95
4	-L-	21+00	22+50	RT	105
4	-L-	19+00	20+00	LT	70
4	-L-	21+50	23+50	LT	140
4	-L-	22+50	23+50	RT	70
5	-L-	28+00	29+50	RT	105
5	-L-	31+00	34+00	LT	210
5	-L-	31+50	33+50	RT	140
6	-L-	41+00	42+17	LT	85
6	-L-	42+50	43+50	LT	70
6	-DR1-	10+35	11+22	LT	65
6	-DR1-	10+00	11+46	RT	105
				SUBTOTAL	1565
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					6755
				TOTAL	8320
				SAY	8320

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	23+50	24+36	RT	65
4	-L-	25+00	26+00	RT	70
4	-L-	25+50	27+00	LT	105
5	-L-	35+50	36+00	LT	35
5	-L-	40+00	41+00	LT	70
6	-L-	42+17	42+50	LT	25
6	-L-	48+50	49+00	RT	35
6	-L-	53+00	54+00	LT	70
				SUBTOTAL	475
		ADDITIONAL PSRM TO BE INSTALLED			2090
				TOTAL	2565
				SAY	2565

PROJECT REFERENCE NO.	SHEET NO.
P-4405K	EC-3A

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.

0660DEL_P21o

DGN

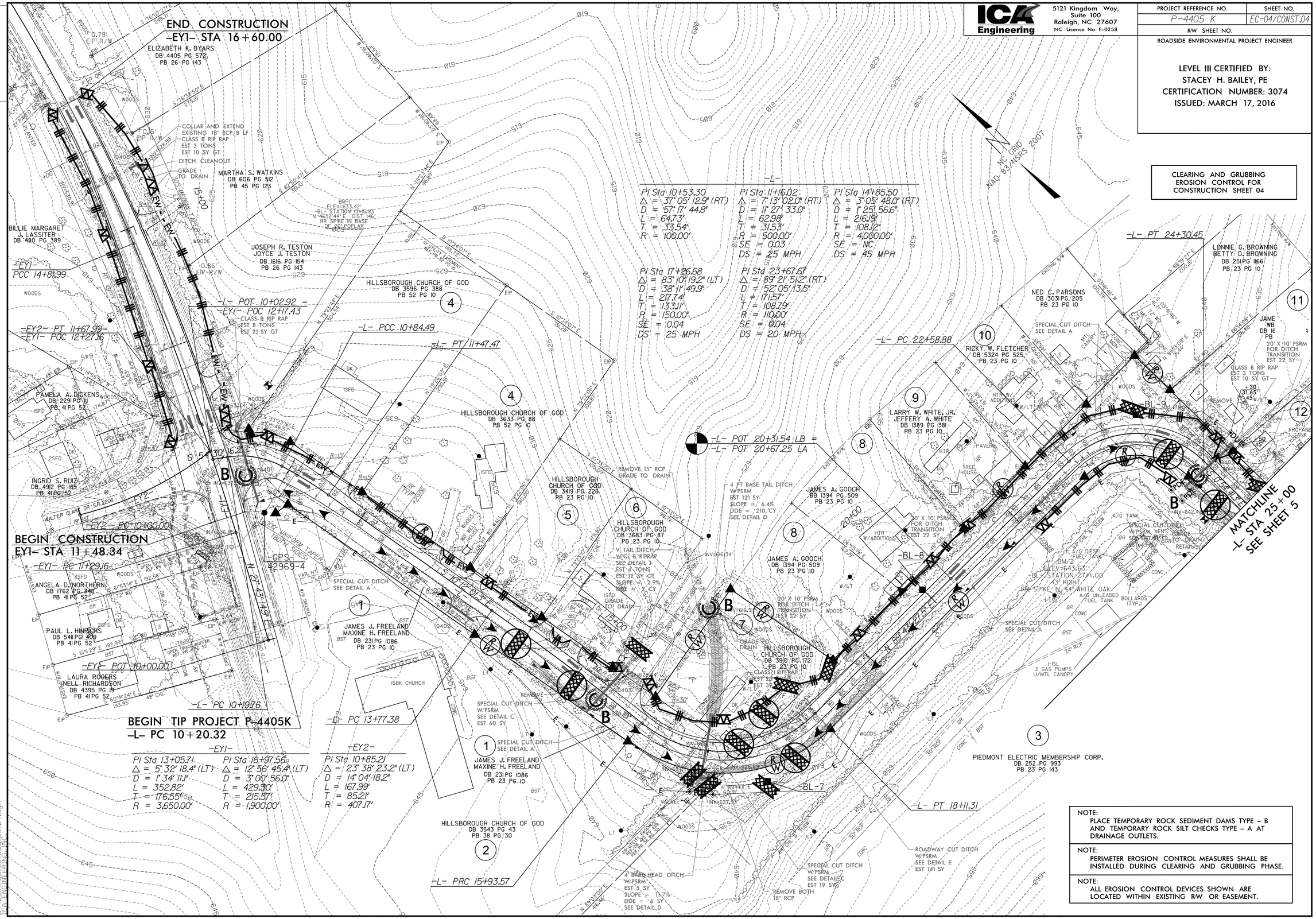
ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-04/CONST.04
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



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

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

3/17/2016
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ICA ENGINEERING, INC.

0660DEL_P21o

DGN

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

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

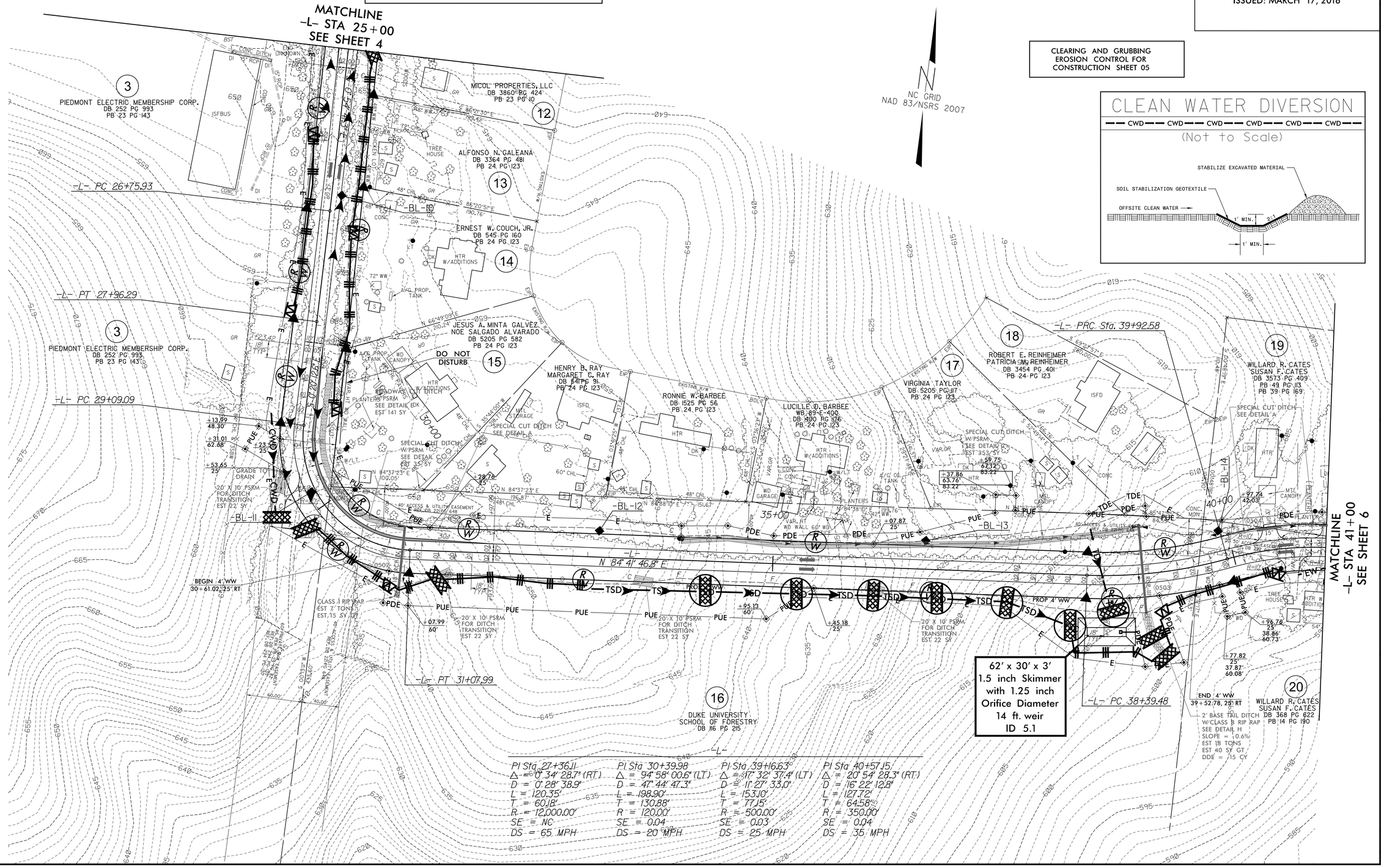
ICA Engineering
5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-05/CONST.05
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 05



PI Sta 27+36.11	PI Sta 30+39.98	PI Sta 39+16.63	PI Sta 40+57.15
Δ = 0° 34' 28.7" (RT)	Δ = 94° 58' 00.6" (LT)	Δ = 91° 32' 37.4" (LT)	Δ = 20° 54' 28.3" (RT)
D = 0° 28' 38.9"	D = 47° 44' 47.3"	D = 11° 27' 33.0"	D = 16° 22' 12.8"
L = 120.35'	L = 198.90'	L = 153.10'	L = 127.72'
T = 60.18'	T = 130.88'	T = 77.15'	T = 64.58'
R = 12,000.00'	R = 120.00'	R = 500.00'	R = 350.00'
SE = NC	SE = 0.04	SE = 0.03	SE = 0.04
DS = 65 MPH	DS = 20 MPH	DS = 25 MPH	DS = 35 MPH

3/17/2016
34405_mid_ec_c&g_psh05.dgn
FCA ENGINEERING, INC.

0660DEL_P21o

DGN

ICA Engineering
5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No: F-0258

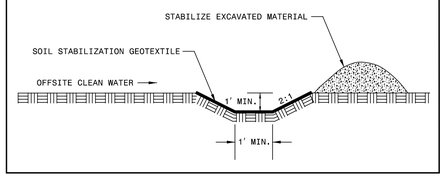
PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-06/CONST.06
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

CLEAN WATER DIVERSION

CWD — CWD — CWD — CWD — CWD — CWD

(Not to Scale)



OBLITERATE

PAVEMENT REMOVAL

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.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

END CONSTRUCTION
–DR1– POT 12+22.46

END TIP PROJECT P-4405K
–L– POC 54+15.16

END CONSTRUCTION
–Y– STA 13+11.75
–Y– PT 13+26.34

EARTHEN BERM

NORFOLK SOUTHERN/ NORTH CAROLINA RAILROAD

FOR CROSSING CLOSURE DETAIL
SEE SHEET 2B-1

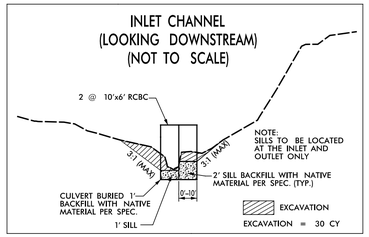
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 06

MATCHLINE –L– STA 41+00.00 SEE SHEET 5

56' x 28' x 3'
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
12 ft. weir
ID 6.1

RELOCATE
MAIL KIOSK

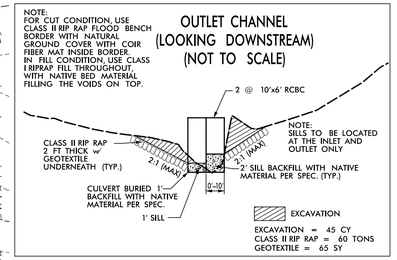
INLET CHANNEL (LOOKING DOWNSTREAM) (NOT TO SCALE)



NOTE:
SILLS TO BE LOCATED AT THE INLET AND OUTLET ONLY

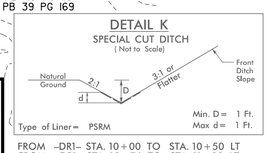
OUTLET CHANNEL (LOOKING DOWNSTREAM) (NOT TO SCALE)

NOTE:
FOR CUT CONDITION USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVER WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION USE CLASS I RIPRAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



NOTE:
SILLS TO BE LOCATED AT THE INLET AND OUTLET ONLY

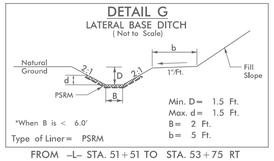
DETAIL K
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max d= 1 Ft.
Type of Liner= PSRM

FROM –DR1– STA. 10+00 TO STA. 10+50 LT
FROM –DR1– STA. 10+76 TO STA. 11+00 LT
FROM –DR1– STA. 10+35 TO STA. 11+00 RT

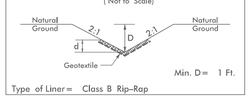
DETAIL G
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
b= 5 Ft.
Type of Liner= PSRM

FROM –L– STA. 51+51 TO STA. 53+75 RT

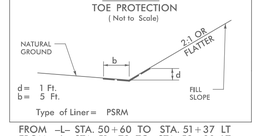
DETAIL J
STANDARD "V" DITCH
(Not to Scale)



Min. D= 1 Ft.
Type of Liner= Class B Rip-Rap

–L– STA. 50+00 RT

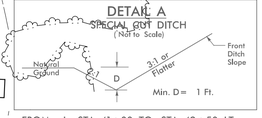
DETAIL F
TOE PROTECTION
(Not to Scale)



d= 1 Ft.
b= 5 Ft.
Type of Liner= PSRM

FROM –L– STA. 50+60 TO STA. 51+37 LT
FROM –L– STA. 51+73 TO STA. 52+90 LT

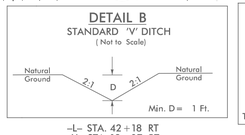
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.

FROM –L– STA. 41+00 TO STA. 42+50 LT
FROM –L– STA. 48+20 TO STA. 49+25 RT
FROM –DR1– STA. 11+00 TO STA. 11+90 LT
FROM –DR1– STA. 11+00 TO STA. 11+85 RT

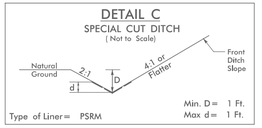
DETAIL B
STANDARD "V" DITCH
(Not to Scale)



Min. D= 1 Ft.

–L– STA. 42+18 RT
–Y– STA. 13+07 RT

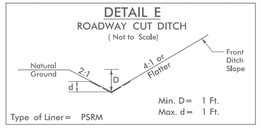
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max d= 1 Ft.
Type of Liner= PSRM

FROM –L– STA. 46+00 TO STA. 47+50 LT
FROM –L– STA. 48+00 TO STA. 48+20 RT
FROM –L– STA. 49+50 TO STA. 50+00 LT

DETAIL E
ROADWAY CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max. d= 1 Ft.
Type of Liner= PSRM

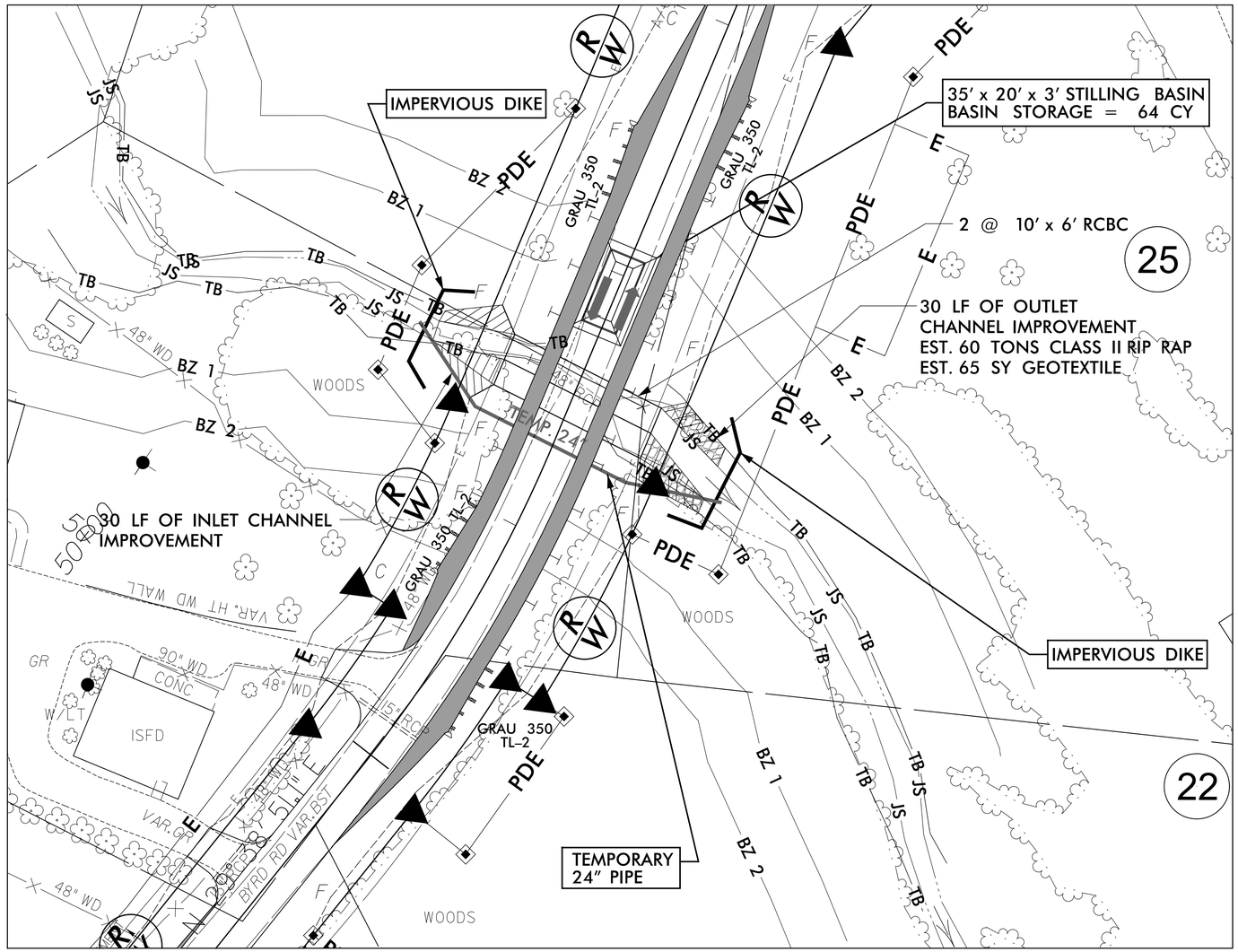
FROM –L– STA. 44+20 TO STA. 46+00 LT
FROM –L– STA. 47+50 TO STA. 49+50 LT
FROM –L– STA. 52+90 TO STA. 54+50 LT

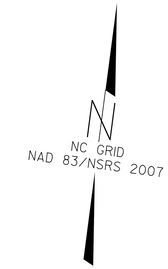
3/17/2016
c:\pwworking\ica\d0660del\ica_ec&g_psh06.dgn
ICA ENGINEERING, INC.

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-06A/CONST.06
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

CULVERT CONSTRUCTION SEQUENCE STA. 51+52.7 –L–





NOTES

1. CULVERT CONSTRUCTION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW AS NECESSARY.
3. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
5. PUMPS AND HOSES SHALL BE SUFFICIENT SIZE TO DEWATER THE WORK AREA.
6. THE CONTRACTOR SHALL NOT PUMP SEDIMENT-LADEN WATER DIRECTLY INTO STREAM. FOR DEWATERING OF CULVERT SITES, THE CONTRACTOR SHALL FILTER SEDIMENT-LADEN WATER THROUGH STILLING BASIN AND/OR SPECIAL STILLING BASIN.

CONSTRUCTION SEQUENCE

1. CONSTRUCT STILLING BASIN TO SIZE SPECIFIED AT LOCATION SHOWN.
2. INSTALL 24" TEMPORARY PIPE (134 LF) AND IMPERVIOUS DIKES (110 LF) AS SHOWN, DIVERT CHANNEL FLOW THROUGH TEMPORARY PIPE.
3. CONSTRUCT 2 @ 10' x 6' RCBC w/SILLS AND BEVELED INLET AND CHANNEL IMPROVEMENTS.
4. REMOVE IMPERVIOUS DIKES, STILLING BASIN, AND TEMPORARY PIPE. DIRECT FLOW THOUGH NEWLY CONSTRUCTED CULVERTS.
5. CONSTRUCT PROPOSED ROADWAY.

DGN 0660DEL_P21o
3/17/2016
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RPA ENGINEERING, INC.

0660DEL_P21o

DGN

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

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

CROSSING CLOSURE DETAIL

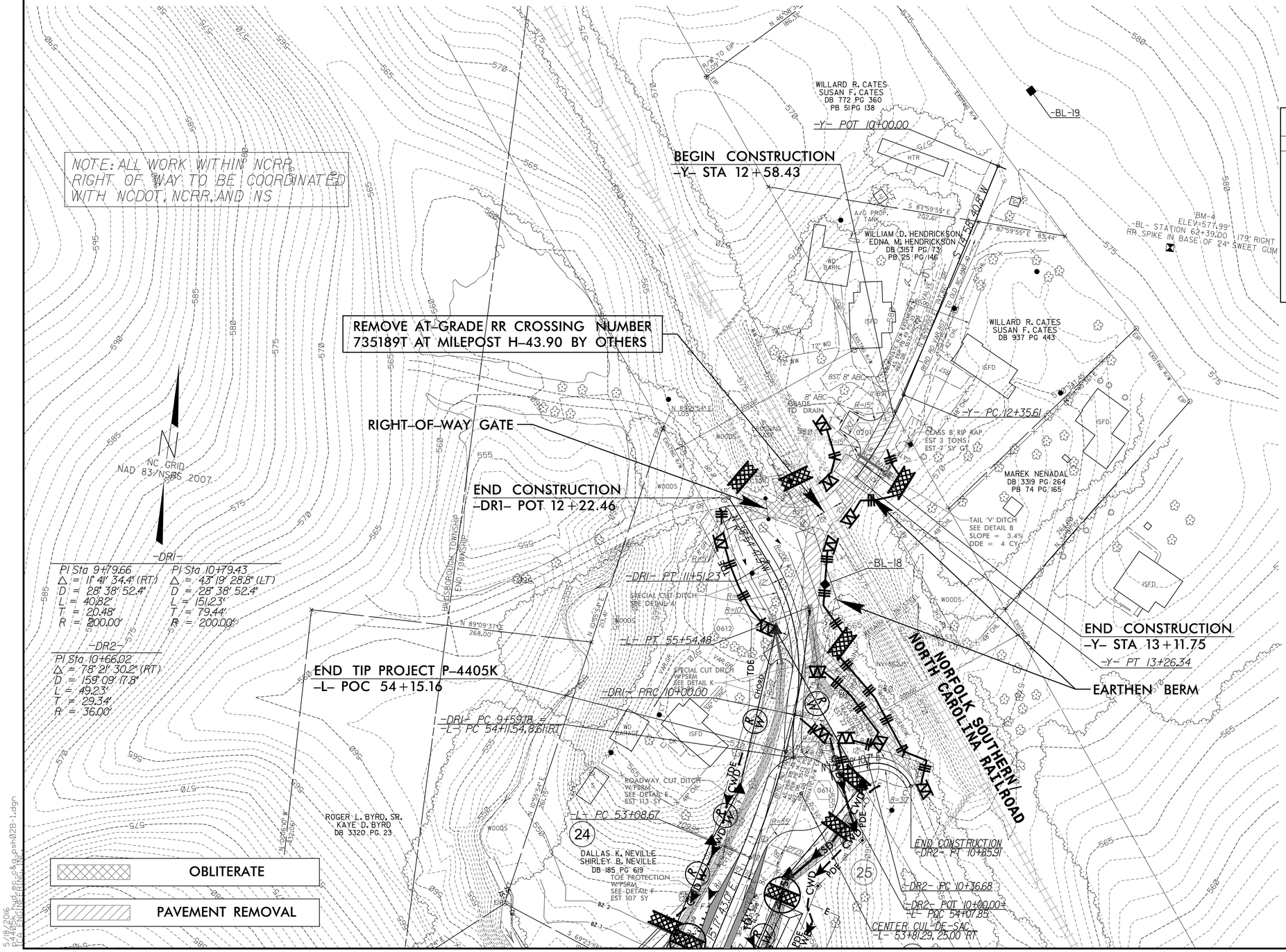
BYRD RD

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-07/CONST.02B-1
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MAY 18, 2016

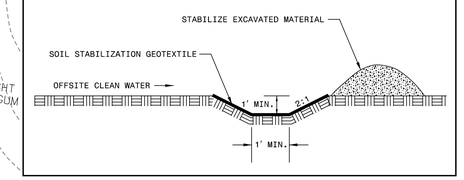


CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 2B-1

CLEAN WATER DIVERSION

CWD CWD CWD CWD CWD CWD

(Not to Scale)



-Y-
PI Sta 12+81.23
Δ = 14° 51' 11.7" (RT)
D = 16° 22' 12.8"
L = 90.73'
T = 45.62'
R = 350.00'

-DR1-

PI Sta 9+79.66	PI Sta 10+79.43
Δ = 11° 41' 34.4" (RT)	Δ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-
PI Sta 10+66.02
Δ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-L-
PI Sta 54+32.69
Δ = 18° 46' 43.1" (LT)
D = 7° 38' 22.0"
L = 245.81'
T = 124.02'
R = 750.00'
SE = 0.03
DS = 30 MPH

5/18/2016
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ICA ENGINEERING, INC.

0660DEL_P21o

DGN

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

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

CROSSING CLOSURE DETAIL

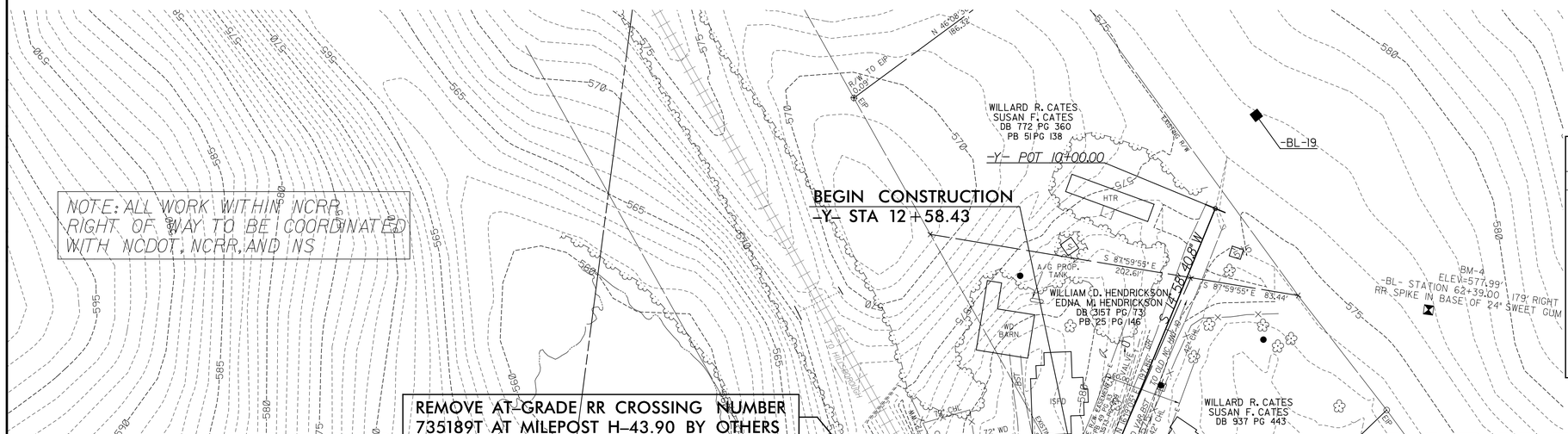
BYRD RD

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

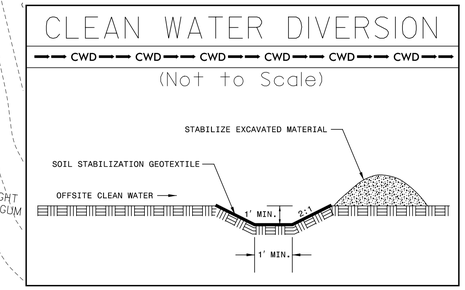
PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-07/CONST.02B-1
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

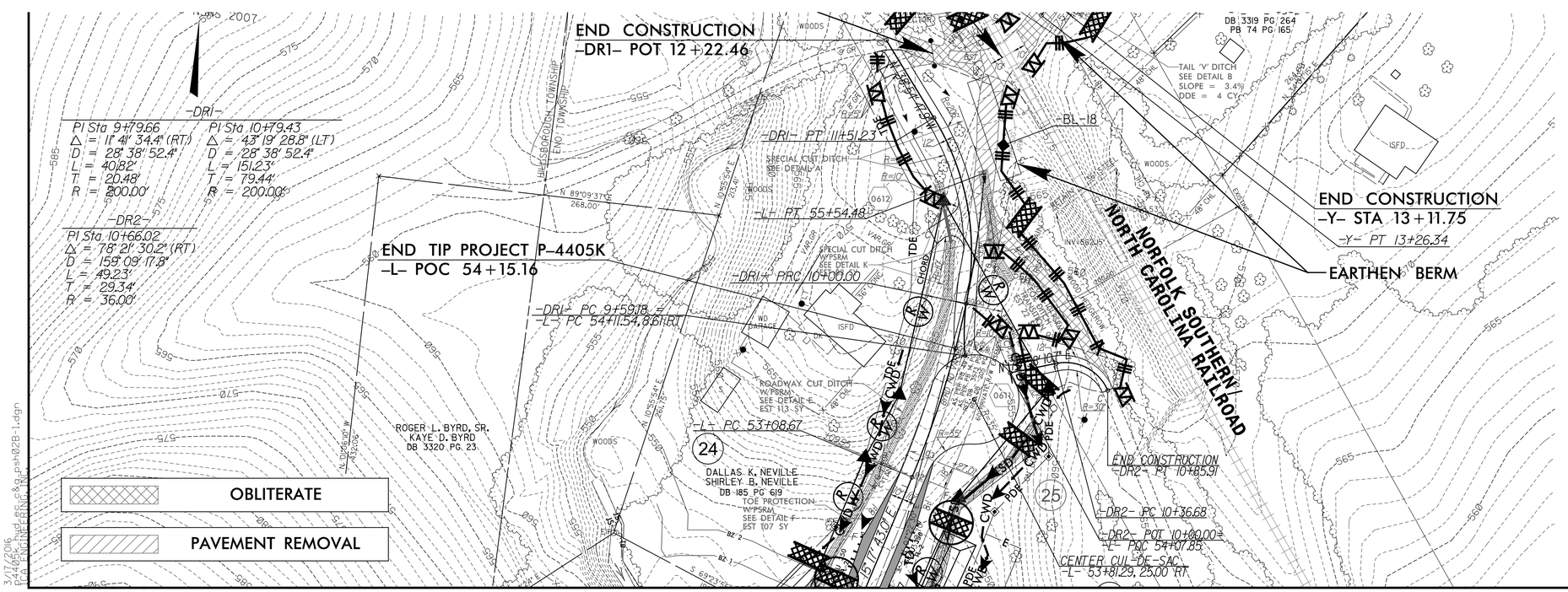
LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016



CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 2B-1



--VOID -----VOID -----VOID --



-DR1-

PI Sta 9+79.66	PI Sta 10+79.43
Δ = 11° 41' 34.4" (RT)	Δ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-

PI Sta 10+66.02
Δ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-Y-

PI Sta 12+83.28
Δ = 15° 30' 36.5" (RT)
D = 16° 22' 12.8"
L = 94.75'
T = 47.66'
R = 350.00'

-DR1-

PI Sta 9+79.66	PI Sta 10+79.43
Δ = 11° 41' 34.4" (RT)	Δ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-

PI Sta 10+66.02
Δ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-L-

PI Sta 54+32.69
Δ = 18° 46' 43.1" (LT)
D = 7° 38' 22.0"
L = 245.81'
T = 124.02'
R = 750.00'
SE = 0.03
DS = 30 MPH

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ICA ENGINEERING, INC.

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DGN

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

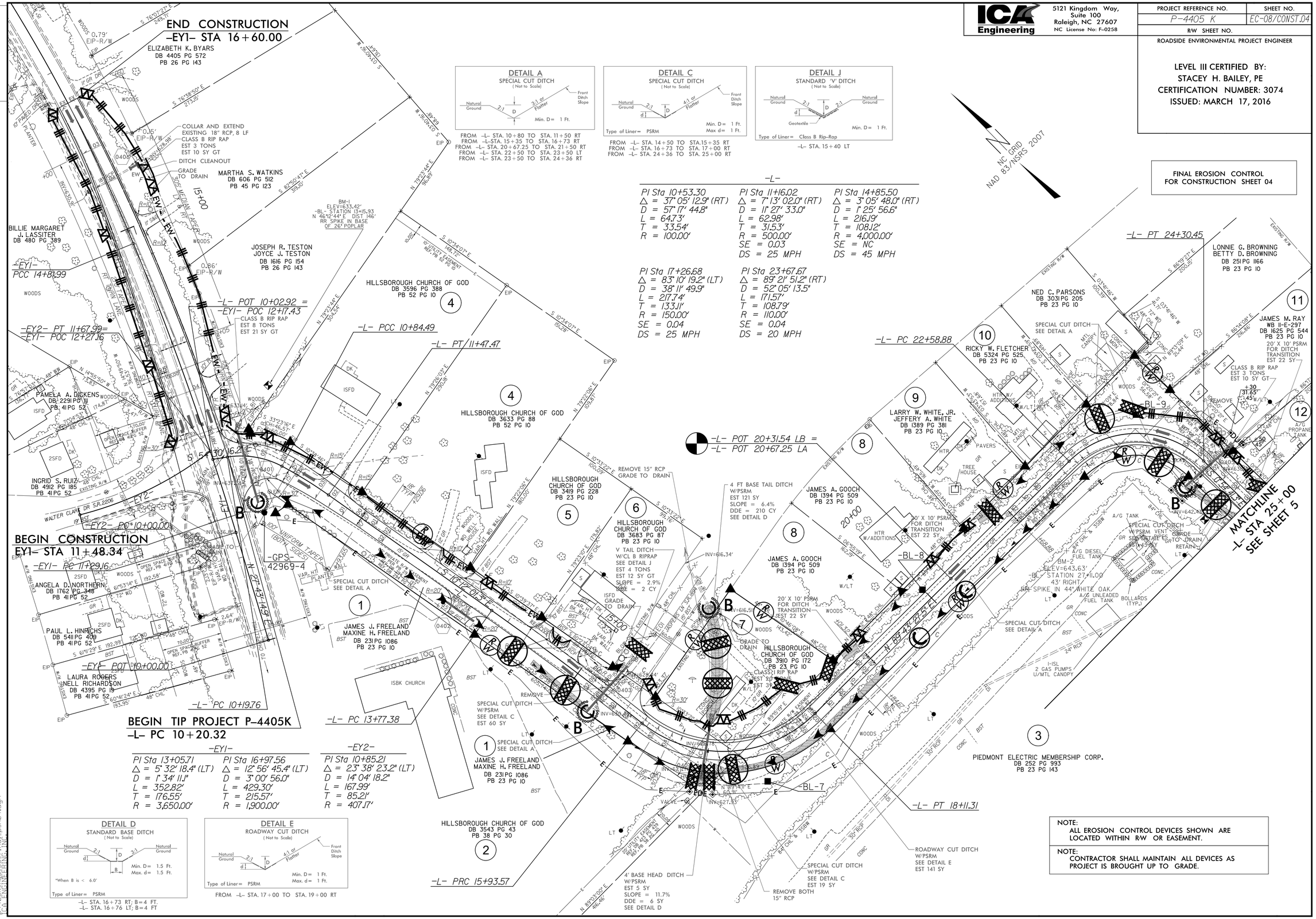
PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-08/CONST.04
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 04

NC GRID NAD 83/NSRS 2007



NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

NOTE:
CONTRACTOR SHALL MAINTAIN ALL DEVICES AS PROJECT IS BROUGHT UP TO GRADE.

3/17/2016
3440Sroad_ec_final_psh04.dgn
FCA ENGINEERING, INC.

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DGN

ICA Engineering
5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-09/CONST.05
R/W SHEET NO.	

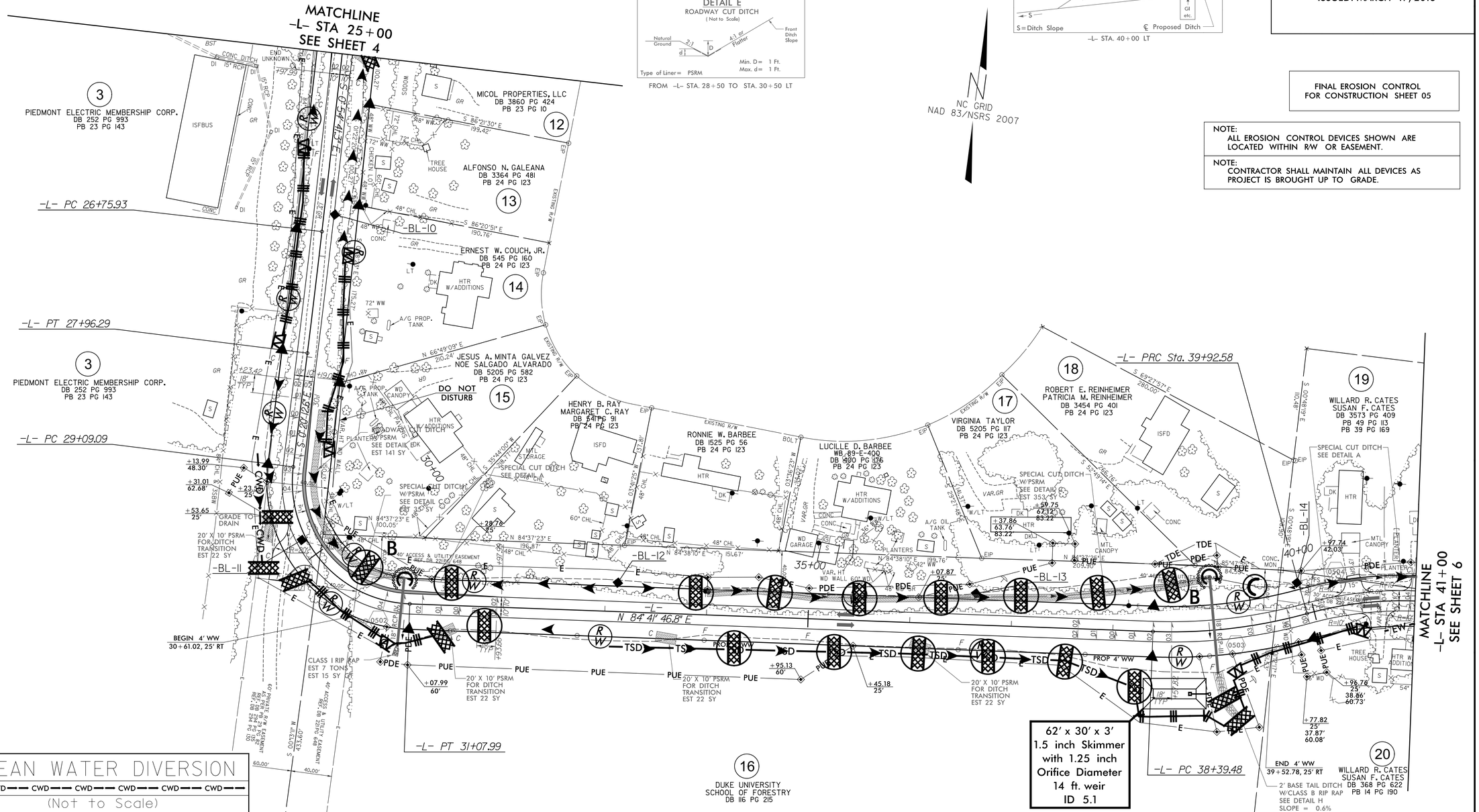
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

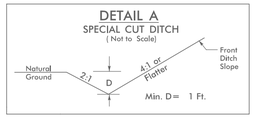
FINAL EROSION CONTROL
FOR CONSTRUCTION SHEET 05

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

NOTE:
CONTRACTOR SHALL MAINTAIN ALL DEVICES AS PROJECT IS BROUGHT UP TO GRADE.

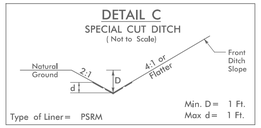


DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 31+00 TO STA. 31+50 LT
FROM -L- STA. 39+00 TO STA. 41+00 LT

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)

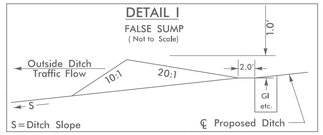


FROM -L- STA. 30+50 TO STA. 31+00 LT
FROM -L- STA. 34+00 TO STA. 39+00 LT

DETAIL E
ROADWAY CUT DITCH
(Not to Scale)

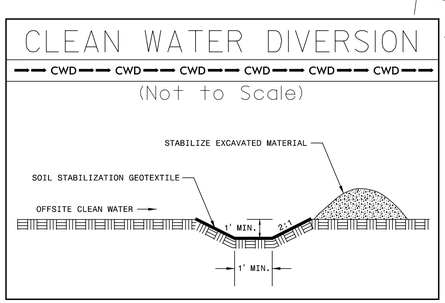
FROM -L- STA. 28+50 TO STA. 30+50 LT

DETAIL I
FALSE SUMP
(Not to Scale)



-L- STA. 40+00 LT

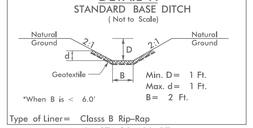
CLEAN WATER DIVERSION
(Not to Scale)



-L-

PI Sta 27+36.11	PI Sta 30+39.98	PI Sta 39+16.63	PI Sta 40+57.15
Δ = 0° 34' 28.7" (RT)	Δ = 94° 58' 00.6" (LT)	Δ = 17° 32' 37.4" (LT)	Δ = 20° 54' 28.3" (RT)
D = 0° 28' 38.9"	D = 47° 44' 47.3"	D = 11° 27' 33.0"	D = 16° 22' 12.8"
L = 120.35'	L = 198.90'	L = 153.10'	L = 127.72'
T = 60.18'	T = 130.88'	T = 77.15'	T = 64.58'
R = 12,000.00'	R = 120.00'	R = 500.00'	R = 350.00'
SE = NC	SE = 0.04	SE = 0.03	SE = 0.04
DS = 65 MPH	DS = 20 MPH	DS = 25 MPH	DS = 35 MPH

DETAIL H
STANDARD BASE DITCH
(Not to Scale)



-L- STA.39+00 RT

3/17/2016
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ICA ENGINEERING, INC.

0660DEL_P21o

DGN

ICA Engineering
5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-10/CONST.06
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

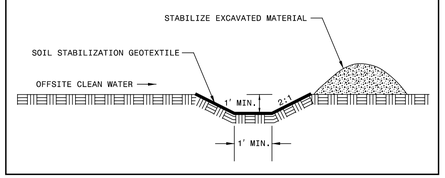
OBLITERATE

PAVEMENT REMOVAL

CLEAN WATER DIVERSION

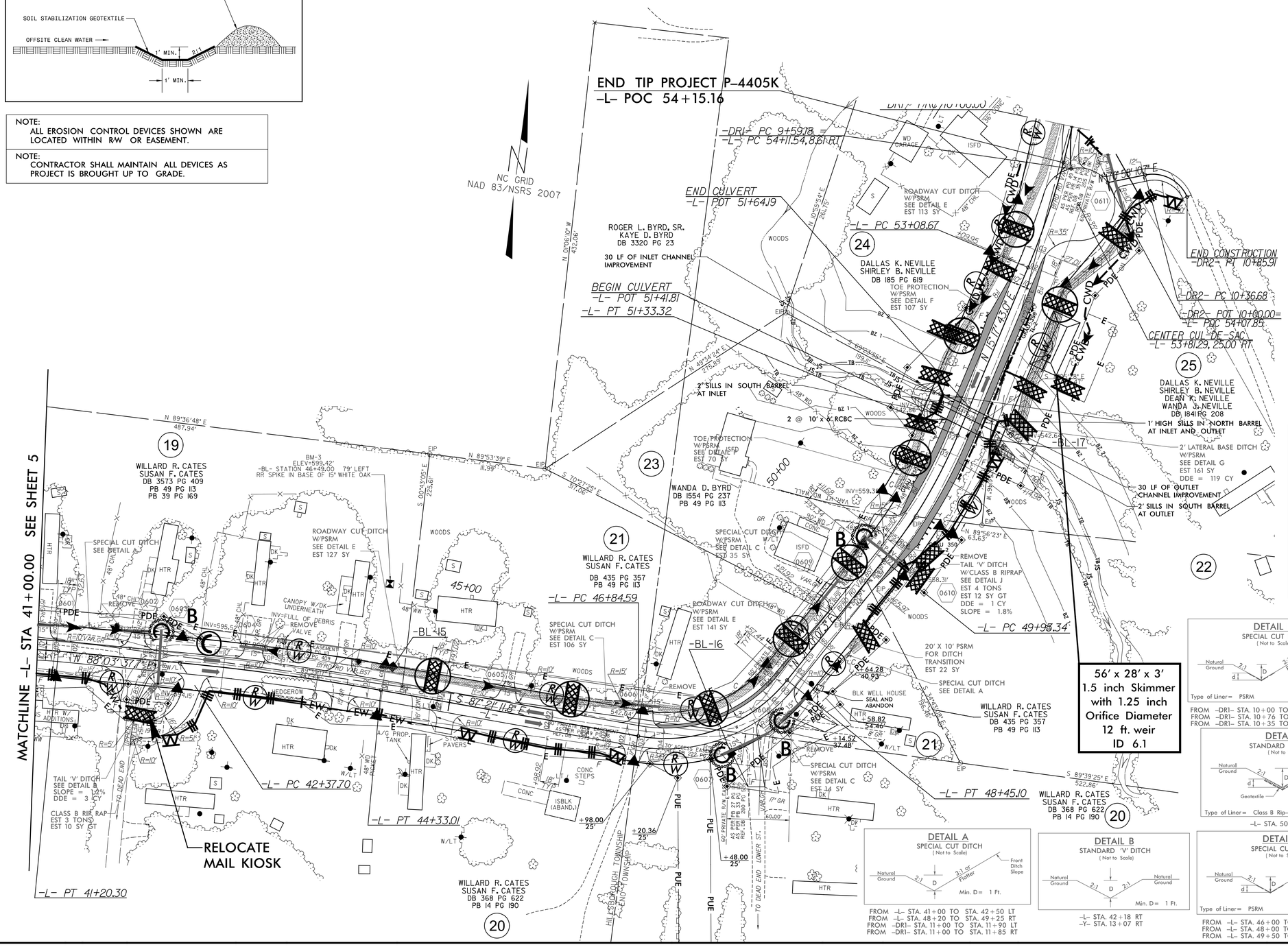
—— CWD —— CWD —— CWD —— CWD —— CWD —— CWD ——

(Not to Scale)



NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

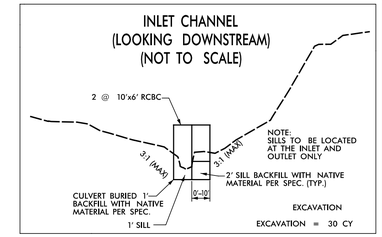
NOTE:
CONTRACTOR SHALL MAINTAIN ALL DEVICES AS PROJECT IS BROUGHT UP TO GRADE.



FOR CROSSING CLOSURE DETAIL SEE SHEET 2B-1

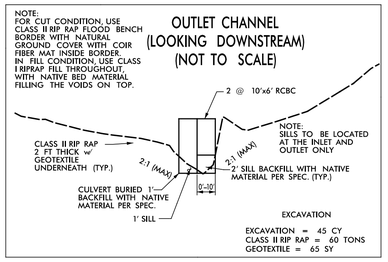
FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 06

INLET CHANNEL (LOOKING DOWNSTREAM) (NOT TO SCALE)

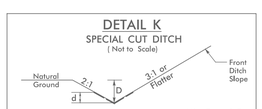


OUTLET CHANNEL (LOOKING DOWNSTREAM) (NOT TO SCALE)

NOTE:
FOR CUT CONDITION USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVER WITH COIR FIBER MAT INSIDE BORDER.
IN FILL CONDITION USE CLASS I RIPRAP FILL THROUGHOUT, WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



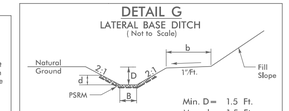
DETAIL K
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max d= 1 Ft.
Type of Liner= PSRM

FROM -DR1- STA. 10+00 TO STA. 10+50 LT
FROM -DR1- STA. 10+76 TO STA. 11+00 LT
FROM -DR1- STA. 10+35 TO STA. 11+00 RT

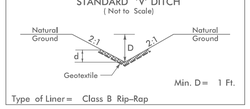
DETAIL G
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
b= 5 Ft.
Type of Liner= PSRM

FROM -L- STA. 51+51 TO STA. 53+75 RT

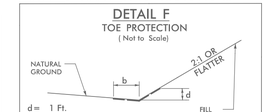
DETAIL J
STANDARD 'V' DITCH
(Not to Scale)



Min. D= 1 Ft.
Type of Liner= Class B Rip-Rap

-L- STA. 50+00 RT

DETAIL F
TOE PROTECTION
(Not to Scale)



d= 1 Ft.
b= 5 Ft.
Type of Liner= PSRM

FROM -L- STA. 50+60 TO STA. 51+37 LT
FROM -L- STA. 51+73 TO STA. 52+90 LT

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

Min. D= 1 Ft.

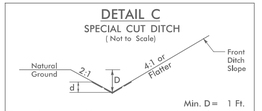
FROM -L- STA. 41+00 TO STA. 42+50 LT
FROM -L- STA. 48+20 TO STA. 49+25 RT
FROM -DR1- STA. 11+00 TO STA. 11+90 LT
FROM -DR1- STA. 11+00 TO STA. 11+85 RT

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

Min. D= 1 Ft.

-L- STA. 42+18 RT
-Y- STA. 13+07 RT

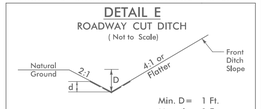
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max d= 1 Ft.
Type of Liner= PSRM

FROM -L- STA. 46+00 TO STA. 47+50 LT
FROM -L- STA. 48+00 TO STA. 48+20 RT
FROM -L- STA. 49+50 TO STA. 50+00 LT

DETAIL E
ROADWAY CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max. d= 1 Ft.
Type of Liner= PSRM

FROM -L- STA. 44+20 TO STA. 46+00 LT
FROM -L- STA. 47+50 TO STA. 49+50 LT
FROM -L- STA. 52+90 TO STA. 54+50 LT

3/17/2016
34406_ICA_proposed_es_final_psh06.dgn
ICA ENGINEERING INC.

0660DEL_P21o

DGN

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-11/CONST.02B-1
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MAY 18, 2016

CROSSING CLOSURE DETAIL

BYRD RD

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

NOTE:
CONTRACTOR SHALL MAINTAIN ALL DEVICES AS PROJECT IS BROUGHT UP TO GRADE.

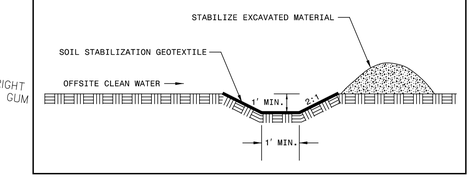
NOTE: ALL WORK WITHIN NCRR RIGHT OF WAY TO BE COORDINATED WITH NCDOT, NCRR, AND NS

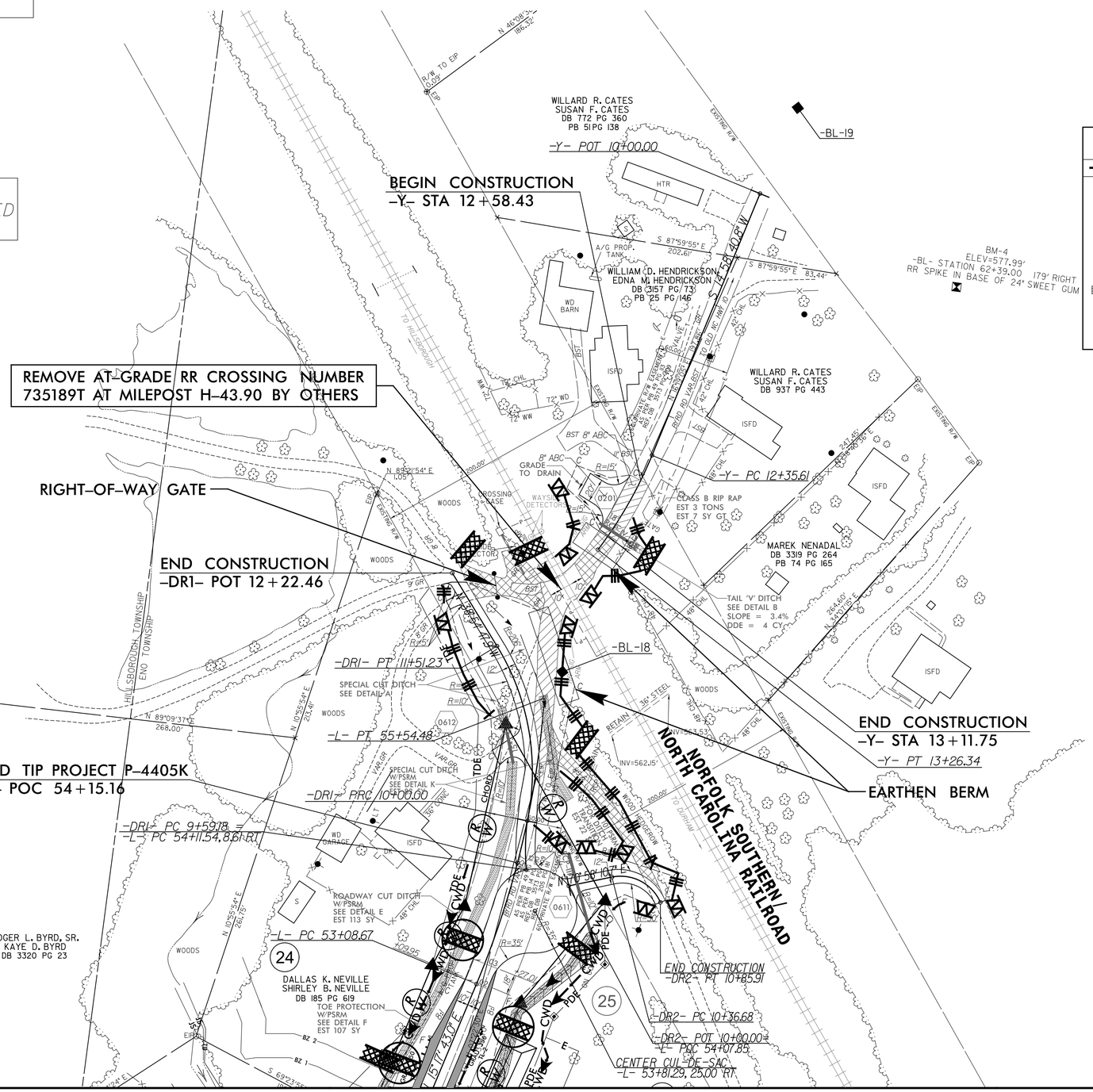
FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 2B-1

CLEAN WATER DIVERSION

CWD CWD CWD CWD CWD CWD

(Not to Scale)





-DRI-

PI Sta 9+79.66	PI Sta 10+79.43
Δ = 11° 41' 34.4" (RT)	Δ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-

PI Sta 10+66.02
Δ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-Y-

PI Sta 12+81.23
Δ = 14° 51' 11.7" (RT)
D = 16° 22' 12.8"
L = 90.73'
T = 45.62'
R = 350.00'

-DRI-

PI Sta 9+79.66	PI Sta 10+79.43
Δ = 11° 41' 34.4" (RT)	Δ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-

PI Sta 10+66.02
Δ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-L-

PI Sta 54+32.69
Δ = 18° 46' 43.1" (LT)
D = 7° 38' 22.0"
L = 245.81'
T = 124.02'
R = 750.00'
SE = 0.03
DS = 30 MPH

5/18/2016
04405K_rdwy_rd_sp_final_psh02B-1.dgn
ICA ENGINEERING, INC.

0660DEL_P21o

DGN

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	EC-11/CONST.02B-1
R/W SHEET NO.	

ROADSIDE ENVIRONMENTAL PROJECT ENGINEER

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MARCH 17, 2016

CROSSING CLOSURE DETAIL

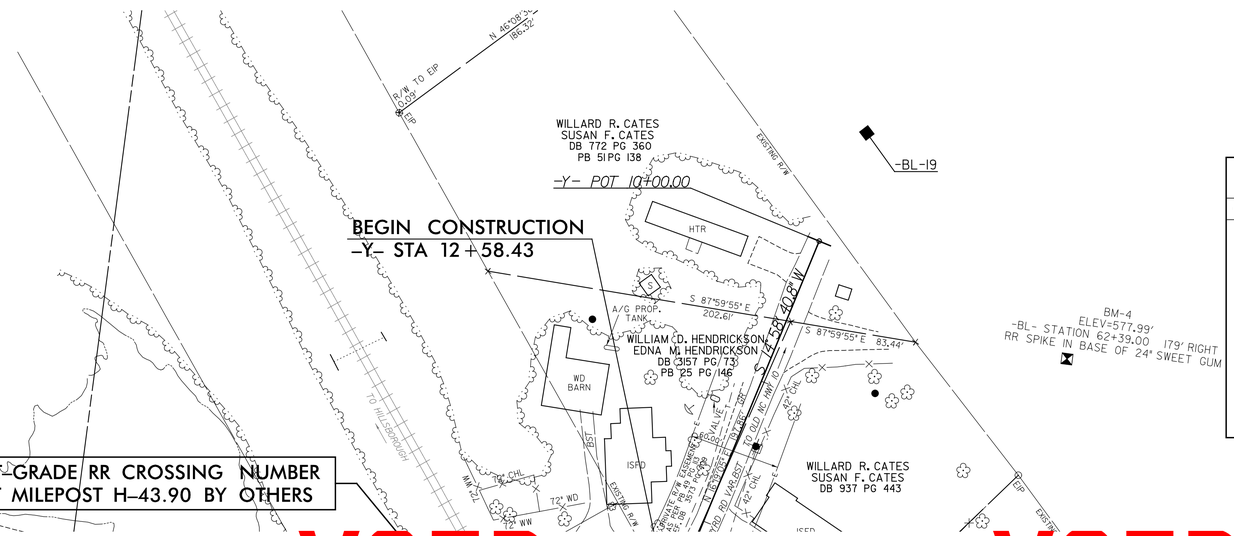
BYRD RD

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN R/W OR EASEMENT.

NOTE:
CONTRACTOR SHALL MAINTAIN ALL DEVICES AS PROJECT IS BROUGHT UP TO GRADE.

NOTE: ALL WORK WITHIN NCRR RIGHT OF WAY TO BE COORDINATED WITH NCDOT, NCRR, AND NS

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 2B-1

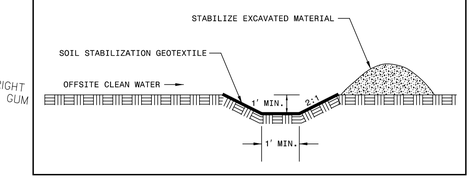


BM-4
ELEV=577.99'
-BL- STATION 62+39.00 179' RIGHT
RR SPIKE IN BASE OF 24" SWEET GUM

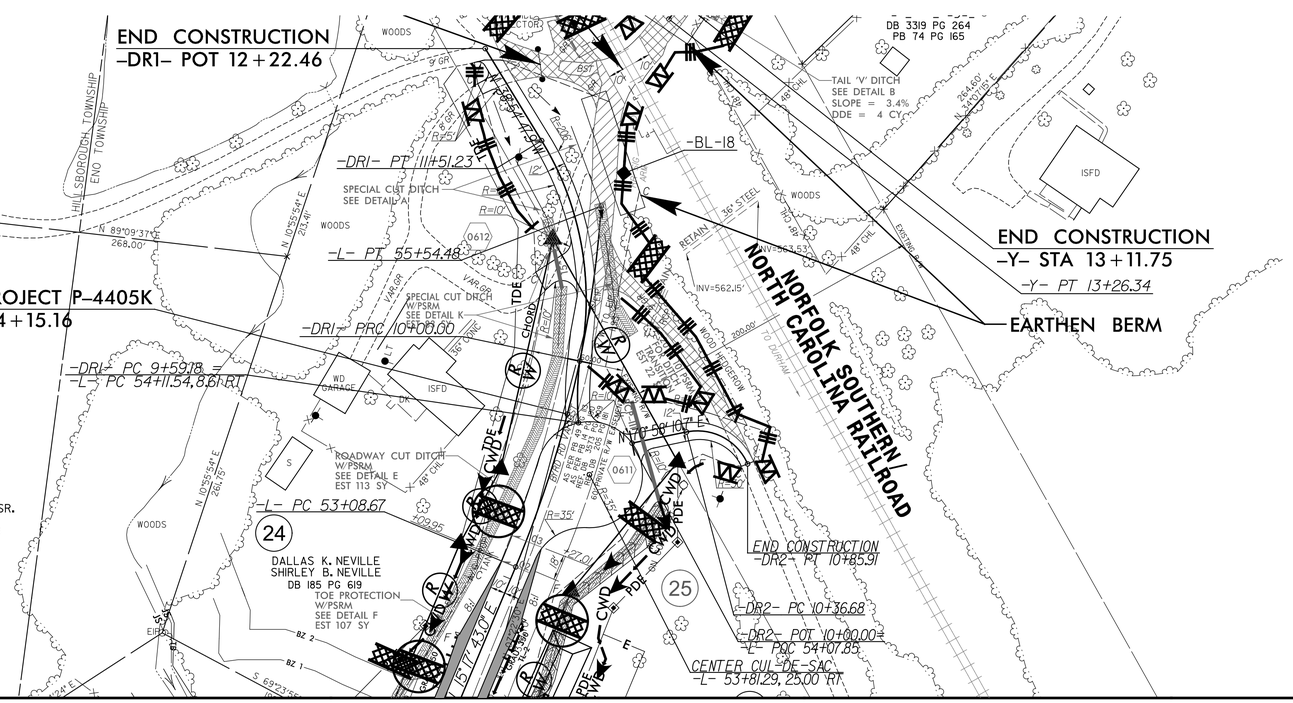
CLEAN WATER DIVERSION

CWD — CWD — CWD — CWD — CWD — CWD

(Not to Scale)



--VOID -----VOID -----VOID --



-DRI-

PI Sta 9+79.66	PI Sta 10+79.43
△ = 11° 41' 34.4" (RT)	△ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-

PI Sta 10+66.02
△ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-Y-

PI Sta 12+83.28
△ = 15° 30' 36.5" (RT)
D = 16° 22' 12.8"
L = 94.75'
T = 47.66'
R = 350.00'

-DRI-

PI Sta 9+79.66	PI Sta 10+79.43
△ = 11° 41' 34.4" (RT)	△ = 43° 19' 28.8" (LT)
D = 28° 38' 52.4"	D = 28° 38' 52.4"
L = 40.82'	L = 151.23'
T = 20.48'	T = 79.44'
R = 200.00'	R = 200.00'

-DR2-

PI Sta 10+66.02
△ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

-L-

PI Sta 54+32.69
△ = 18° 46' 43.1" (LT)
D = 7° 38' 22.0"
L = 245.81'
T = 124.02'
R = 750.00'
SE = 0.03
DS = 30 MPH

OBLITERATE

PAVEMENT REMOVAL

3/17/2016
34405K_PROD_ed_eg_final_psh02B-1.dgn
ICA ENGINEERING, INC.