TIP PROJECT: B-4196

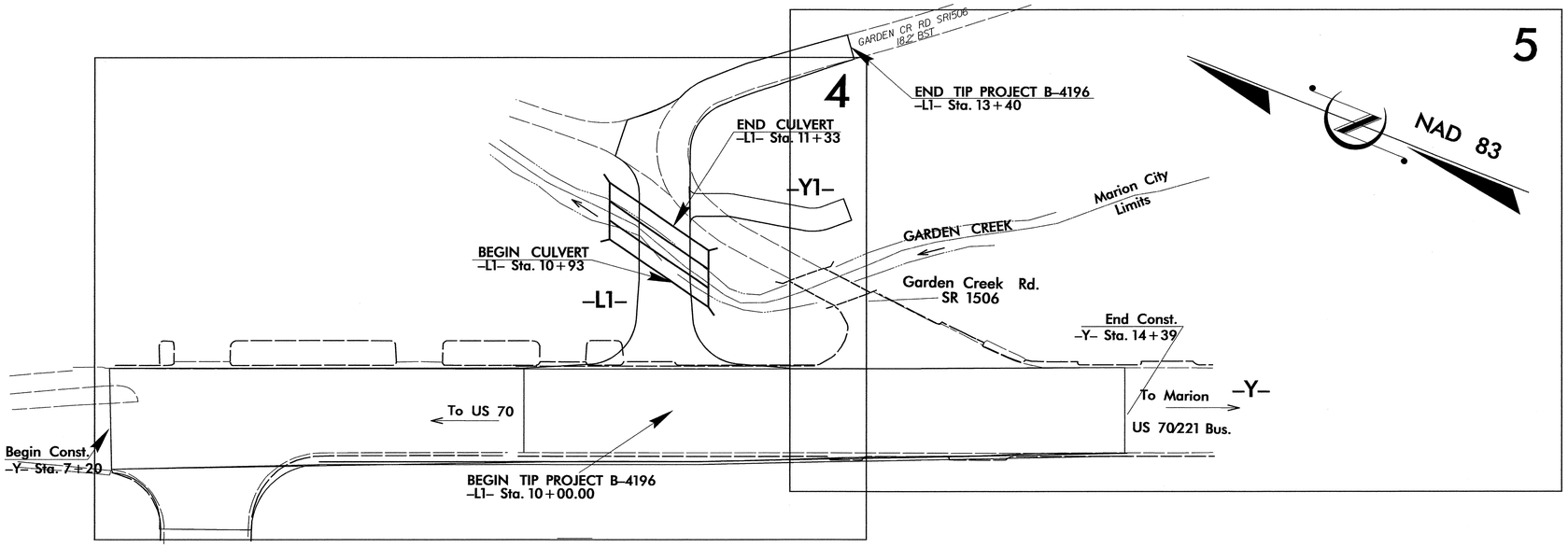
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

McDOWELL COUNTY

***LOCATION:** Bridge No. 238 over Garden Creek on SR 1506, Garden Creek Road*

***TYPE OF WORK:** Grading, Paving, Drainage, Guardrail Curb and Gutter and Culvert*



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4196	EC-1	

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

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	
1630.01	Riser Basin	
	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-B	
	Wattle	
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

Prepared In the Office of:

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

2006 STANDARD SPECIFICATIONS

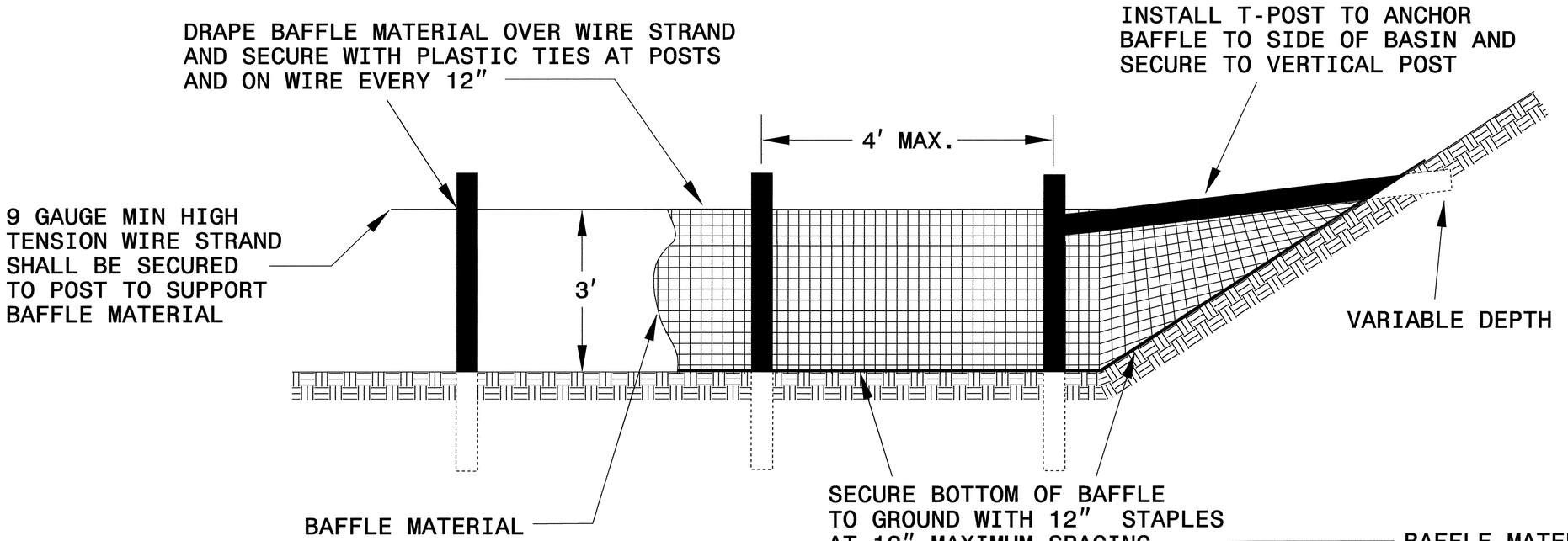
Roadway Standard Drawings

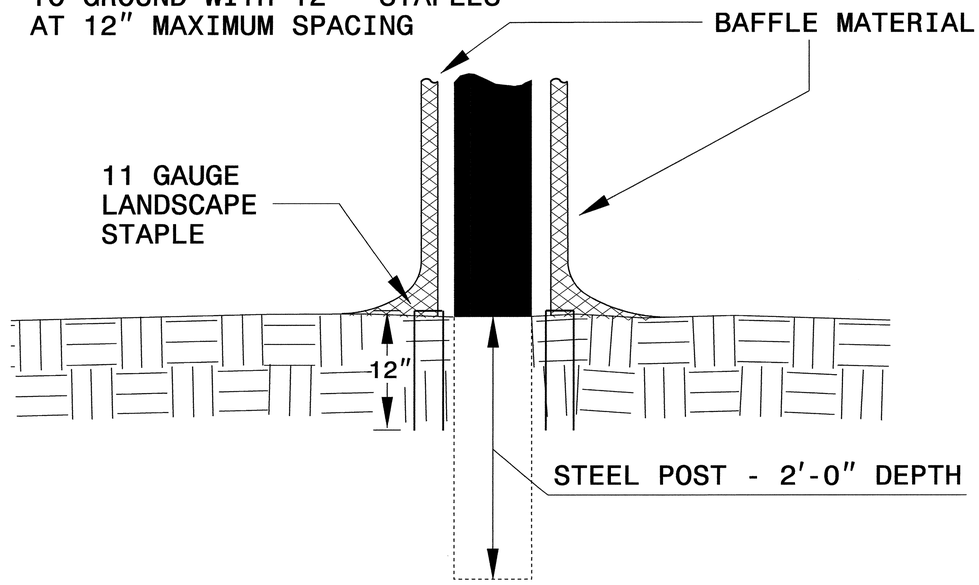
The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated July 18, 2006 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

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
1630.05	Temporary Diversion	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.06	Special Stilling Basin		

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER BAFFLE DETAIL



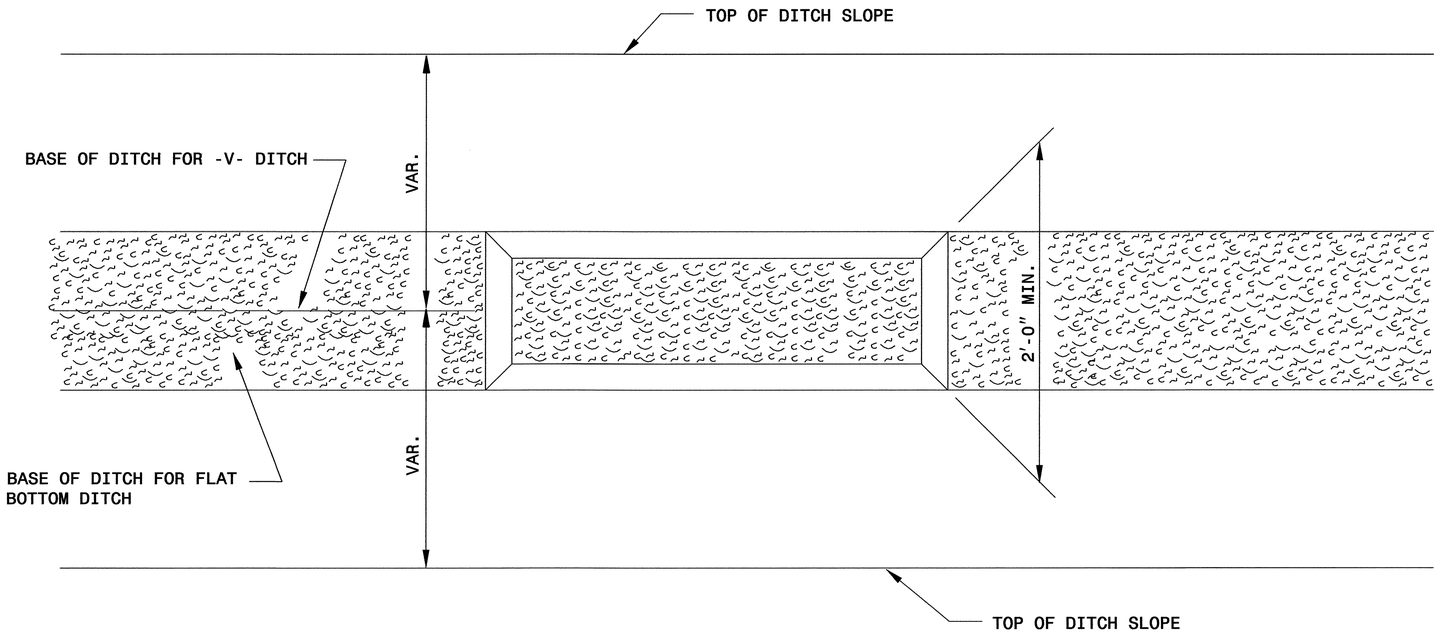


BAFFLE MATERIAL SHALL BE SECURED TO THE BOTTOM AND SIDES OF BASIN USING 12″ LANDSCAPE STAPLES

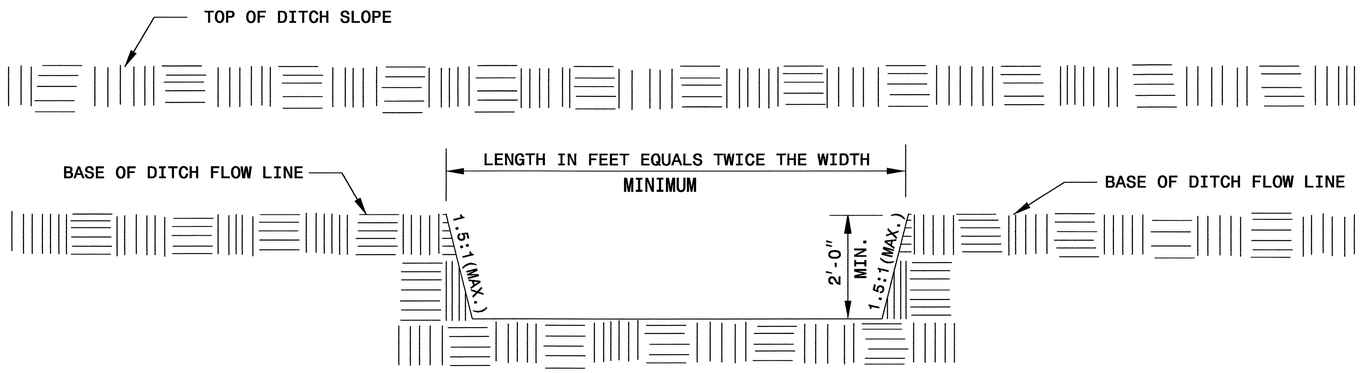
NOTE: INSTALL THREE(3) COIR FIBER BAFFLES IN SILT BASINS AND SEDIMENT DAMS AT DRAINAGE OUTLETS WITH A SPACING OF ¼ THE BASIN LENGTH. TWO(2) COIR FIBER BAFFLES CAN BE INSTALLED IN SILT BASINS AND DAMS LESS THAN 20 FT. IN LENGTH WITH A SPACING OF 1/3 THE BASIN LENGTH.

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT BASIN 'B' DETAIL



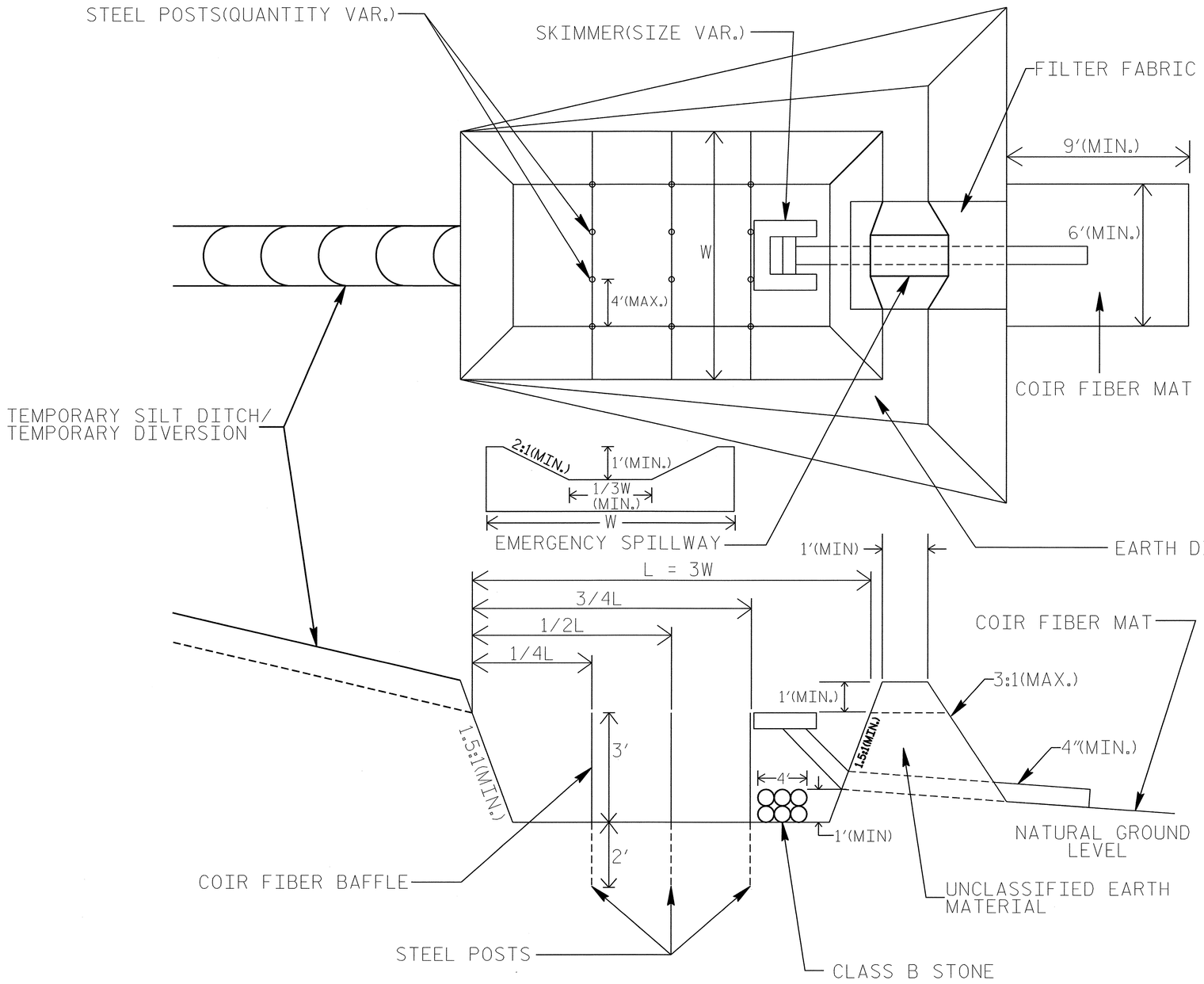
PLAN



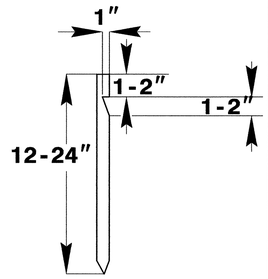
ELEVATION

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

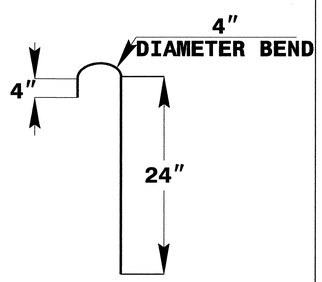
SKIMMER BASIN WITH BAFFLES DETAIL



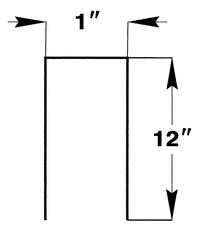
2" x 2" (nominal)
WOODEN STAKE



#10 STEEL
REINFORCEMENT BAR



1" (nominal)
STAPLE

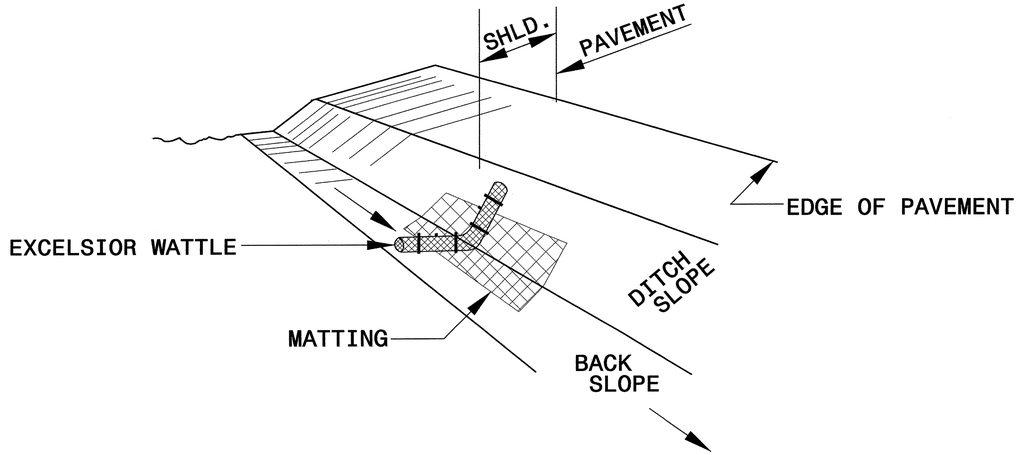


COIR FIBER MAT ANCHOR OPTIONS

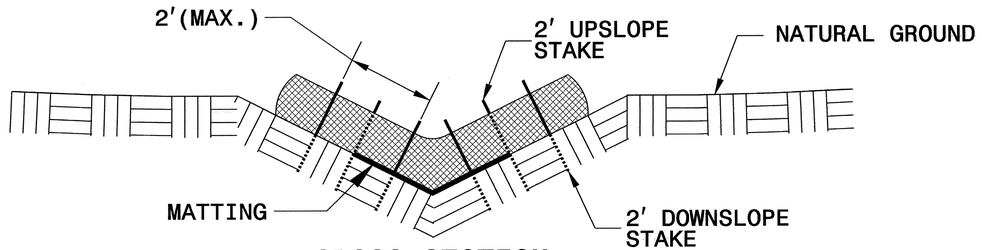
NOTES:
1. SEED AND PLACE MATTING FOR EROSION CONTROL ON SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

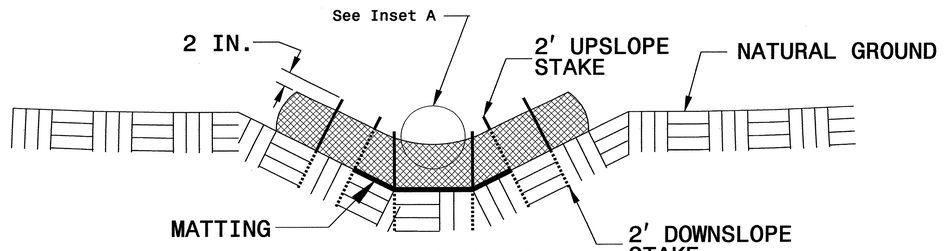
WATTLE WITH POLYACRYLAMIDE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

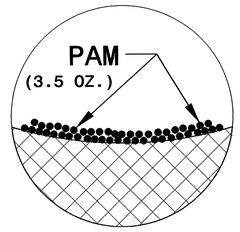
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. CROSS SECTION.

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

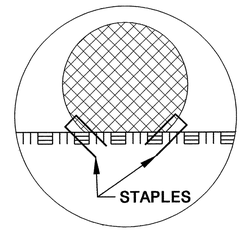
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

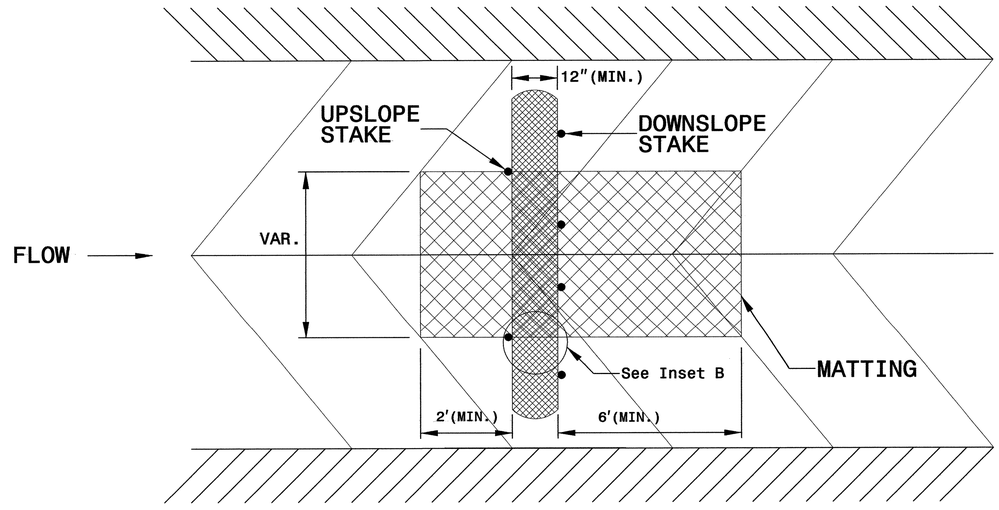
APPLY 3.5 OUNCES OF ANIONIC OR NEUTRALLY CHARGED POLYACRYLAMIDE (PAM) OVER WATTLE WHERE WATER WILL FLOW.



INSET A



INSET B



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-4196	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)
4	-L1-	12+25	13+00	RT	85
4	-Y1-	10+30	10+60	RT	20
			SUBTOTAL		105
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					245
				TOTAL	350
				SAY	350

MATTING FOR EROSION CONTROL

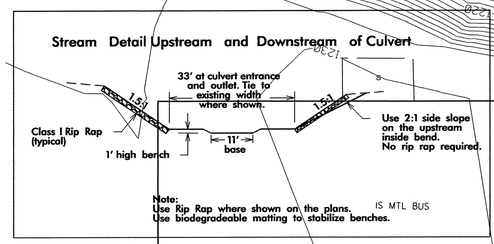
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

Stream Detail Upstream and Downstream of Culvert



Note:
Use Rip Rap where shown on the plans.
Use biodegradeable matting to stabilize benches.

FROM 12+00 TO 13+00 -Y1- Rt.

-LI-
PI Sta 12+14.65
Δ = 66° 30' 53.3" (RT)
D = 119° 59' 59.8"
L = 55.43'
T = 31.31'
R = 47.75'
SE = 0.04
RO = SEE PLANS

PI Sta 12+61.73
Δ = 7° 47' 44.2" (RT)
D = 16° 59' 59.8"
L = 45.86'
T = 22.96'
R = 337.04'
SE = 0.04
RO = SEE PLANS

PI Sta 13+92.85
Δ = 2° 19' 01.2" (LT)
D = 12° 00' 00.0"
L = 115.85'
T = 57.93'
R = 2,864.79'
SE = EXIST

-Y1-
PI Sta 11+12.11
Δ = 3° 21' 46.6" (LT)
D = 190° 59' 09.4"
L = 16.42'
T = 8.42'
R = 30.00'
SE = NC

-LI- PCSta. 13+34.91
+34.91 -LI- Exist.R/W
-LI- PTSta. 12+84.63
+84.63 -LI- Exist.R/W
+38.77 -LI- Exist.R/W
END TIP PROJECT B-4196
-LI- POCSta. 13+40.00

INVERT OF EXISTING SEWER LINE CALCULATED AT DESIRED POINT UTILIZING MANHOLE INVERTS AS SHOWN
INVERT = 1213.67

BL- 3 PINC 9+81.67
POC STA. 12+21.43 -LI- 13.60' Lt.

WILLIAM RAY MILOVITZ
DB 651PG 637

RESURFACE TURNOUT
+95.00 -LI- 75.00' Lt.

-LI- PCSta. 11+83.34
+83.34 -LI- Prop.R/W 87.00' Lt.

NAD 83

GARDEN CR RD SR1506
18.2 BST

DO NOT DISTURB SIDEWALK

S 37° 25' 59.4" E

50' TAPER Retain Exist.R/W

+34.91 -LI- Exist.R/W

+84.63 -LI- 54"CONC Exist.R/W

FRANCES CUTHRELL & KENNETH HALL
DB 462 PG 856

Special Ditch See Detail

20 x 7 x 3
ID 4.3C

-Y1- PCSta. 11+03.69

-Y1- PINC Sta. 10+50.70

20 x 6 x 3
ID 4.2C

+32.00 -Y1- 12.00' Lt.

-Y1- POTSta. 11+55.49

+68.00 -Y1 14.00' Lt.

18"CONC

S 21° 46' 11.3" E

End Culvert Sta.11+33 -LI-

S 13° 04' 59.5" E

S 42° 26' 46.1" E 167' GR

END CONST. PTSta. 11+25.72

-Y1- PTSta. 11+20.11 13.00' Rt.

+30.00 -Y1- +15.00 -LI- Exist.R/W

N35-54-29"W 24.33'

GARDEN CR

MCDOWELL CO MARION CORP LIMIT N35°54'29"W

Remove

Class I Rip Rap Est. 30 tons

+42.00 -LI- 94.00' Lt.

3@ 11'x8' RCBC

-Y1- POTSta. 10+00.00
-LI- POT Sta.11+45.60

Conc Pad

Class I Rip Rap Est. 60 tons

+00.00 -LI- 40.00', 43.00', 70.00', 87.00' Lt.

TDE

Pavement Removal

CARTERS UNLIMITED DBA SONNY'S FOOTHILLS
DB 658 PG 76

Begin Culvert Sta.10+93 -LI- +65.00 -LI- 40.00' Lt.

+09.00 -Y- Exist.R/W

+60.00 -LI- Prop.R/W

+58.00 -Y- Exist.R/W

Prop. 8"x18" Curb

6' CONC C

S W PLANTER

50' TAPER

35'R

36'

12" DIP

2" GAV

Tie To Exist C&G

Culvert Excavation

Low Flow Channel Excavation

-BY- 7 POT 12+39.05
POT STA 10+36.93 -LI- 223.1584' LT.

Adjust CB

Remove and Replace with Traffic Bearing JB w/MHC

Retain

COLLAR

15"

15" CSP

CB

66' (6-11' LANES)

30'

36'

33'

BEGIN CONST. -Y- Sta.7+20.00

Prop.2'-6" C&G

+40.00 -Y- 53.00' Rt.

+04.00 -Y- Exist.R/W

+18.94 50.13'

+89.27 50.05'

+00.00 -Y- 54.00' Rt.

+60.00 -Y- 53.00' Rt.

300' Epoxy

BM#1
-LI- STATION 10+00
S 20° 21' 57.0" W DIST 69.21'
NAIL IN BASE OF 20 IN. SYCAMORE
AS PER AS-BUILT INFO ONLY

BEGIN TIP PROJECT B-4196
-LI- POTSta. 10+00.00
-Y- POT Sta.11+17.97

END SUE INFO

8" STEEL

10" AC

24'

GR/DIRT

ALVIN RAY BERRYHILL SR.
DB 567 PG 707

MCDOWELL COUNTY BOARD OF EDUCATION
DB 606 PG 889

JANET L. LOVE
DB 414 PG 820

MCDOWELL COUNTY MARION CORP LIMIT

Exist.R

50' R

EXISTING R/W

GR/GRASS

WD COVER

-54" BK

CONC

BST

SIG LT

LT

GRAU 350

44' F-F

Prop. Guardrail

Retain

18"CMP

15"CMP

15"CONC

Class I Rip Rap Est. 4 tons Filter Fabric Est 12 SY

See Detail for Stream Realignment

BRIDGE

-LA- 10+36.93 BL-2 PINC 9+86.67

Class I Rip Rap Est. 26 tons

12.23' Rt.

30 x 10 x 2
1.5 inch Skimmer with 0.75 inch Orifice Diameter
4 ft. weir
ID 4.1C

SEE SHEET 6 FOR L1 AND Y1 PROFILE
SEE SHEET 7 FOR Y PROFILE
SEE C-1 THRU C-4 FOR CULVERT PLANS

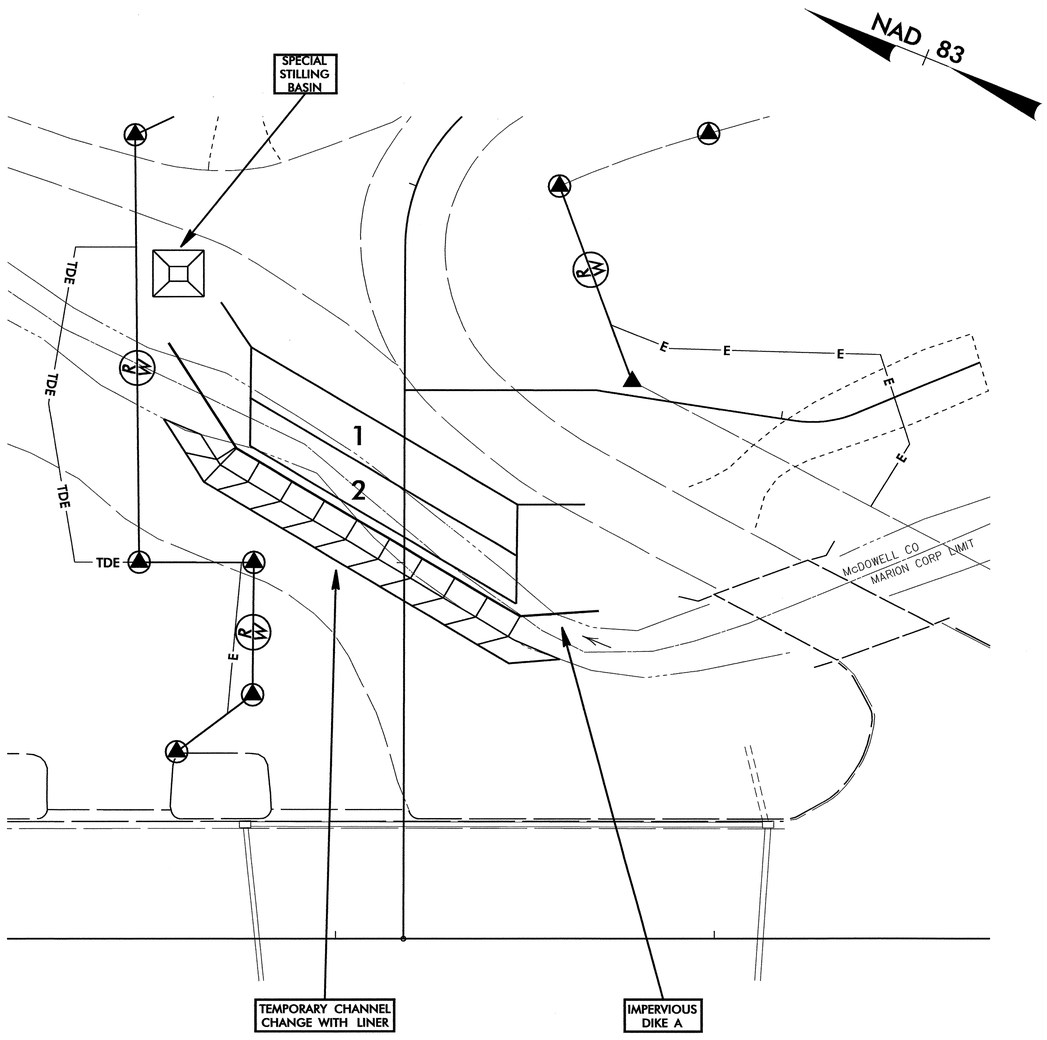
Match Line to Sheet 5

CULVERT CONSTRUCTION SEQUENCE STA. 11+13 –L1–
(PAGE 1 OF 2)

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

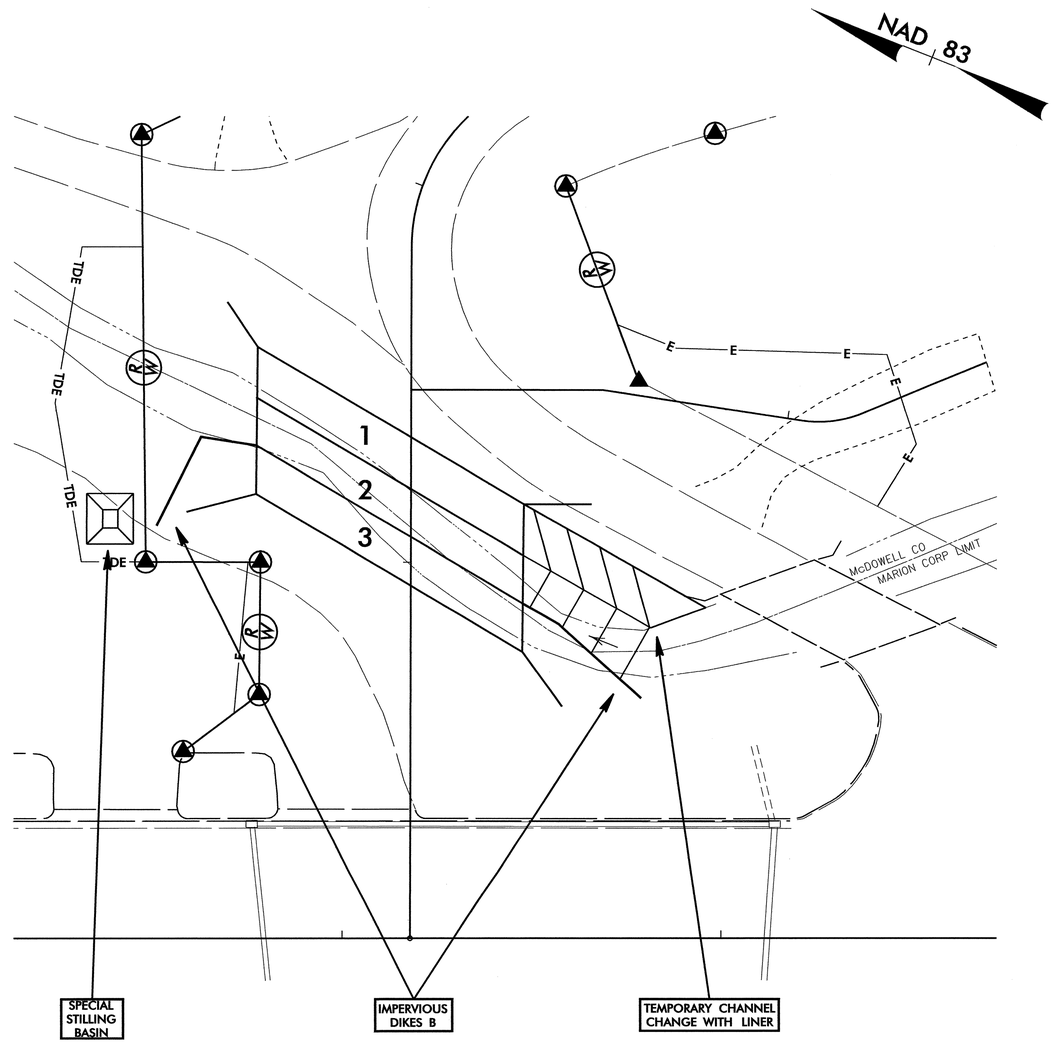
PHASE I

1. UTILIZE SPECIAL STILLING BASIN(S) THROUGHOUT CULVERT CONSTRUCTION AS NEEDED.
2. CONSTRUCT TEMPORARY CHANNEL CHANGE WITH LINER (6 FT. BASE, 3 FT. DEEP, 2:1 SIDE SLOPES), UTILIZING IMPERVIOUS DIKE A AS ONE SIDE OF CHANNEL, DIVERTING FLOW.
3. CONSTRUCT BARRELS 1 AND 2, AND PORTION OF THE WING WALLS.
4. REMOVE TEMPORARY CHANNEL CHANGE AND IMPERVIOUS DIKE A.



PHASE II

5. CONSTRUCT TEMPORARY CHANNEL CHANGE WITH LINER, ALIGNED WITH BARREL 2.
6. CONSTRUCT IMPERVIOUS DIKES B AND DIVERT FLOW THROUGH BARREL 2.
7. CONSTRUCT BARREL 3 AND REMAINDER OF THE WING WALLS.
8. REMOVE TEMPORARY CHANNEL CHANGE AND IMPERVIOUS DIKES B.

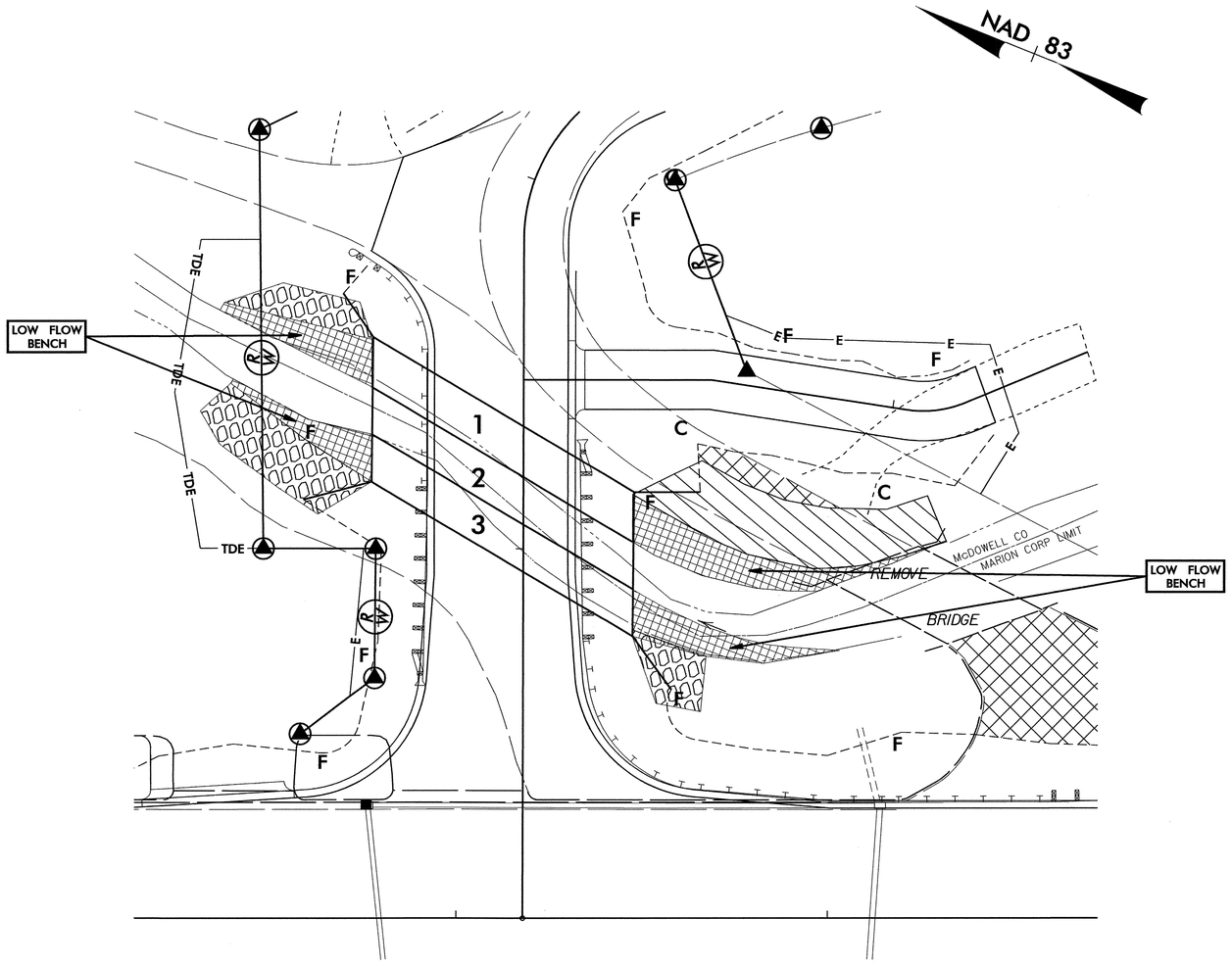


CULVERT CONSTRUCTION SEQUENCE STA. 11+13 –L1– (PAGE 2 OF 2)

PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-6/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PHASE III

9. CONSTRUCT UPSTREAM AND DOWNSTREAM CHANNEL IMPROVEMENTS, UTILIZING COIR FIBER MAT TO STABILIZE LOW FLOW BENCHES.
10. CONSTRUCT PROPOSED ROADWAY OVER CULVERT.
11. REMOVE EXISTING BRIDGE AND REGRADE STREAM BANK(S) AS NEEDED.
12. REMOVE ANY REMAINING SPECIAL STILLING BASINS, AND COMPLETE ROADWAY.



PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-7/CONST.5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

-LI- PI Sta. 14+50.76

-BL- 4 POT 12+48.12
POT-STA 13+75.87 -Y-
311.95' LT.

PI Sta 13+92.85
Δ = 2° 19' 01.2" (LT)
D = 2° 00' 00.0"
L = 115.85'
T = 57.93'
R = 2,864.79'
SE = EXIST

JAMES H. GRANT
DB 394 PG 185
4

FRANCES CUTHRELL &
KENNETH HALL
DB 462 PG 856
3

FRANK MICHEAL WHITE JR.
DB 356 984
5

ALVIN RAY BERRYHILL SR.
DB 567 PG 707
8

MARION CORP LIMIT
McDOWELL COUNTY

NAD 83

Pavement Removal

-BL- 1 POT 5+00.00=
-BY- PINC 7+16.97
-LI- POC 14+13.99
329.11' Rt.
-Y- POT 14+11.68
36.30' Rt.

-BY- 5 POT 5+00.00

SEE SHEET 6 FOR L1 AND Y1 PROFILE
SEE SHEET 7 FOR Y PROFILE

Match Line to Sheet 4

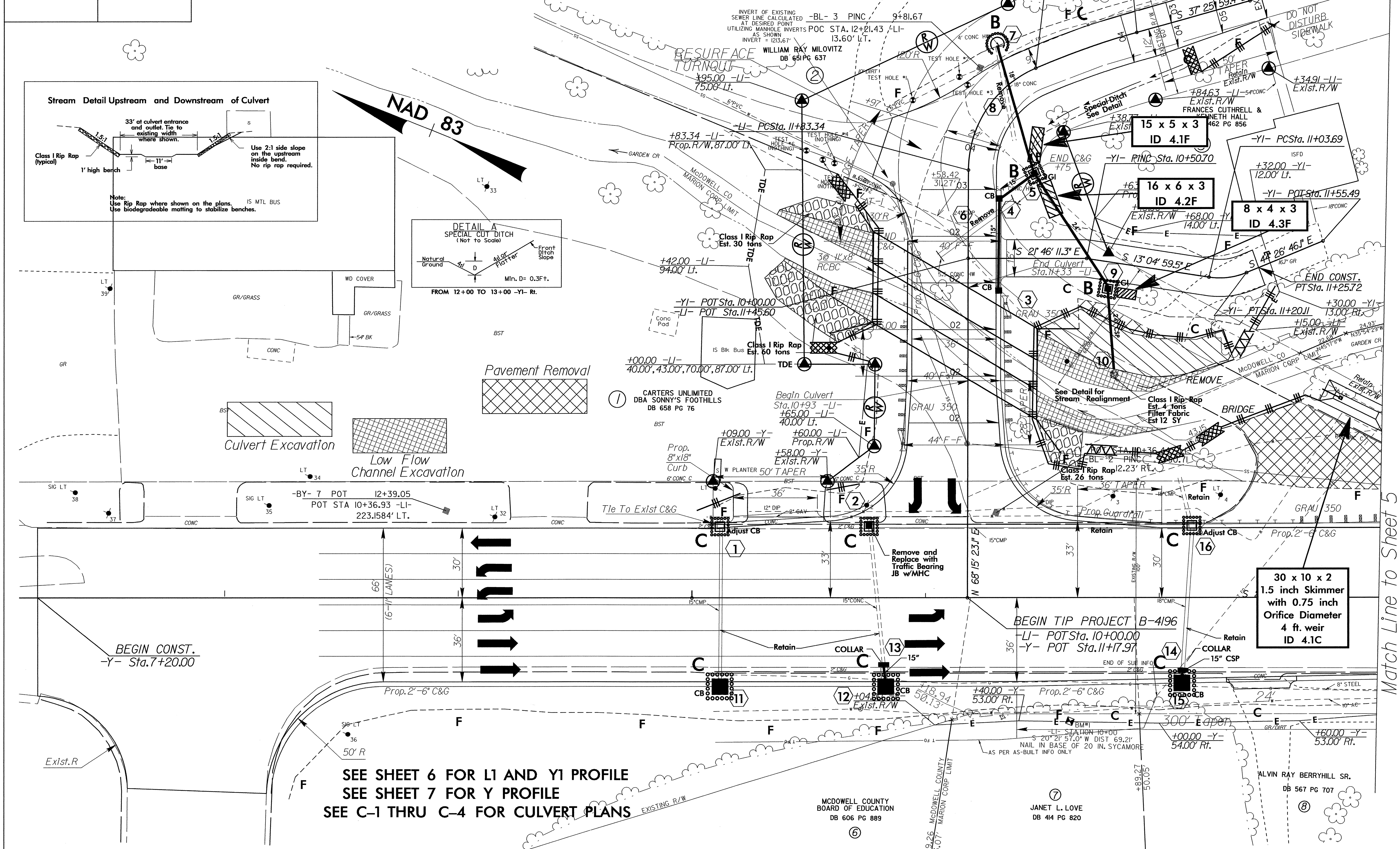
PROJECT REFERENCE NO.	SHEET NO.
B-4196	EC-8/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L1-

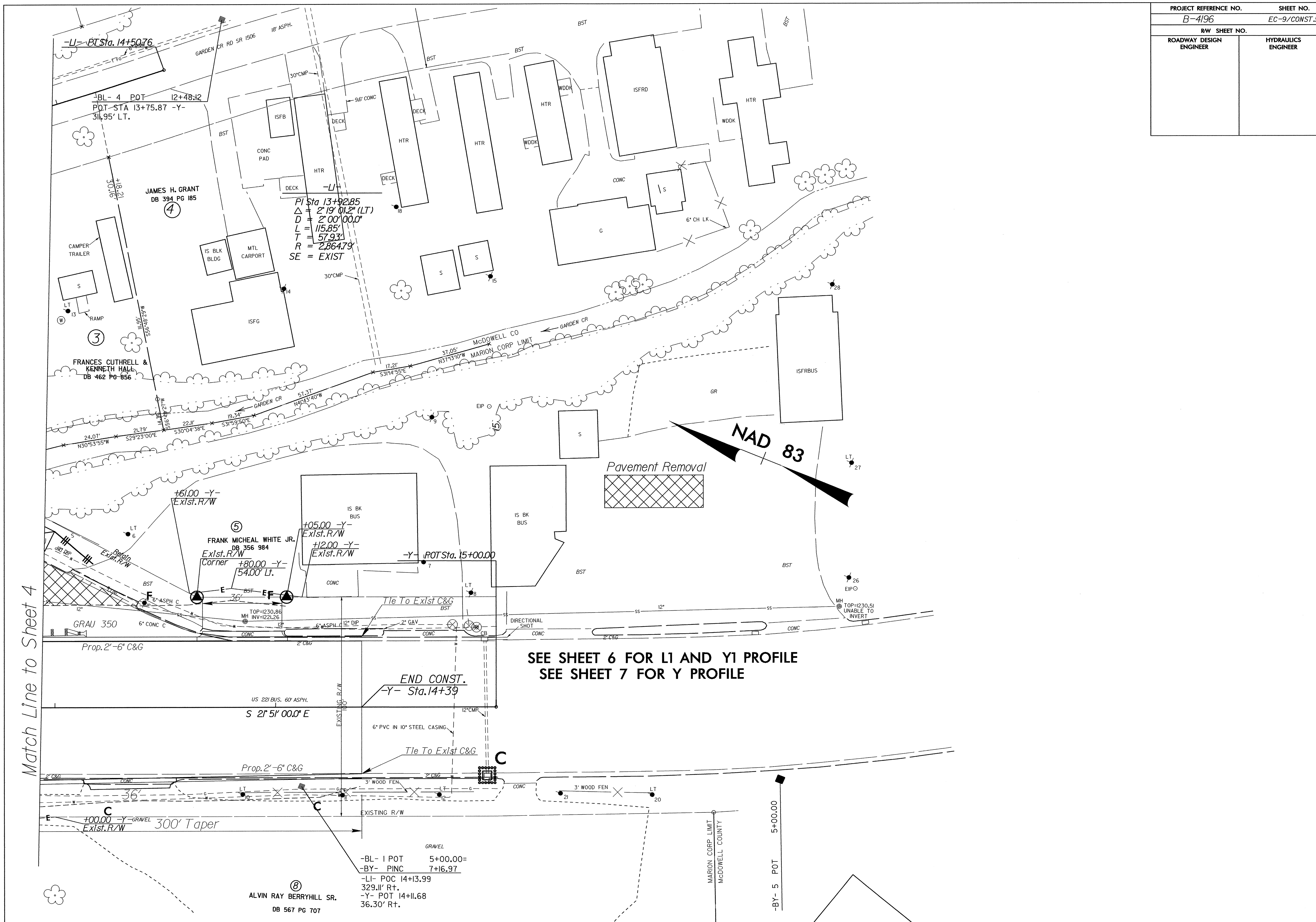
PI Sta 12+14.65	PI Sta 12+61.73	PI Sta 13+92.85
△ = 66° 30' 53.3" (RT)	△ = 7° 47' 44.2" (RT)	△ = 2° 19' 01.2" (LT)
D = 119° 59' 59.8"	D = 16° 59' 59.8"	D = 2° 00' 00.0"
L = 55.43'	L = 45.86'	L = 115.85'
T = 31.31'	T = 22.96'	T = 57.93'
R = 47.75'	R = 337.04'	R = 2,864.79'
SE = 0.04	SE = 0.04	SE = EXIST
RO = SEE PLANS	RO = SEE PLANS	

-Y1-

PI Sta 11+12.11
△ = 31° 21' 46.6" (LT)
D = 190° 59' 09.4"
L = 16.42'
T = 8.42'
R = 30.00'
SE = NC



Stream Detail Upstream and Downstream of Culvert
33' at culvert entrance and outlet. Tie to existing width where shown.
Class I Rip Rap (typical)
1' high bench
11' base
Use 2:1 side slope on the upstream inside bend. No rip rap required.
Note:
Use Rip Rap where shown on the plans.
Use biodegradeable matting to stabilize benches.
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D= 0.3Ft.
FROM 12+00 TO 13+00 -Y1- Rt.
NAD 83
Pavement Removal
Culvert Excavation
Low Flow Channel Excavation
CARTERS UNLIMITED DBA SONNY'S FOOTHILLS DB 658 PG 76
WILLIAM RAY MILOVITZ DB 651 PG 637
FRANCES CUTHRELL & KENNETH HALL
15 x 5 x 3 ID 4.1F
16 x 6 x 3 ID 4.2F
8 x 4 x 3 ID 4.3F
30 x 10 x 2 1.5 inch Skimmer with 0.75 inch Orifice Diameter 4 ft. weir ID 4.1C
END TIP PROJECT B-4196 -L1- POCSta. 13+40.00
BEGIN TIP PROJECT B-4196 -L1- POT Sta. 10+00.00 -Y- POT Sta. 11+17.97
BEGIN CONST. -Y- Sta. 7+20.00
END CONST. PT Sta. 11+25.72
Begin Culvert Sta. 10+93 -L1-
End Culvert Sta. 11+33 -L1-
3 @ 11'x8' RCBC
Class I Rip Rap Est. 30 tons
Class I Rip Rap Est. 60 tons
Class I Rip Rap Est. 26 tons
Class I Rip Rap Est. 4 tons Filter Fabric Est 12 SY
See Detail for Stream Realignment
Remove and Replace with Traffic Bearing JB w/MHC
MCDOWELL COUNTY BOARD OF EDUCATION DB 606 PG 889
JANET L. LOVE DB 414 PG 820
ALVIN RAY BERRYHILL SR. DB 567 PG 707
Match Line to Sheet 5
SEE SHEET 6 FOR L1 AND Y1 PROFILE
SEE SHEET 7 FOR Y PROFILE
SEE C-1 THRU C-4 FOR CULVERT PLANS



PROJECT REFERENCE NO.
SHEET NO.
B-4196
EC-9/CONST.5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-L1- PT Sta. 14+50.76
GARDEN CR RD SR 1506
18' ASPH.
-BL- 4 POT 12+48.12
POT STA 13+75.87 -Y-
31.95' LT.
JAMES H. GRANT
DB 394 PG 185
PI Sta 13+92.85
Δ = 2°19' 01.2" (LT)
D = 2°00' 00.0"
L = 115.85'
T = 57.93'
R = 2,864.79'
SE = EXIST
FRANCES CUTHRELL & KENNETH HALL
DB 462 PG 856
McDOWELL CO
MARION CORP LIMIT
NAD 83
Pavement Removal
FRANK MICHEAL WHITE JR.
DB 356 984
-Y- POT Sta. 15+00.00
Tie To Exist C&G
GRAU 350
Prop. 2'-6" C&G
SEE SHEET 6 FOR L1 AND Y1 PROFILE
SEE SHEET 7 FOR Y PROFILE
END CONST.
-Y- Sta. 14+39
US 221 BUS. 60' ASPH.
S 21° 51' 00.0" E
EXISTING R/W
6" PVC IN 10" STEEL CASING
300' Taper
-BL- 1 POT 5+00.00=
-BY- PINC 7+16.97
-L1- POC 14+13.99
329.11' Rt.
-Y- POT 14+11.68
36.30' Rt.
ALVIN RAY BERRYHILL SR.
DB 567 PG 707
MARION CORP LIMIT
McDOWELL COUNTY
-BY- 5 POT 5+00.00
Match Line to Sheet 4