

L:\Harford County Department of Public Works\Restoration\Working\CAD\01-P000-BennettPlace.dwg Oct 16, 2025 8:36am pboalzer

# BENNETT PLACE STREAM RESTORATION

## BID NO. TBD

### OFFICE OF WATERSHED PROTECTION AND RESTORATION

### HARFORD COUNTY, MARYLAND

### 60% DESIGN PLANS – NOT FOR CONSTRUCTION

**PROJECT OVERVIEW:**  
THE SCOPE OF THIS PROJECT IS THE RESTORATION OF TWO STREAMS, AN UNNAMED TRIBUTARY (UNT) TO BYNUM RUN & AN ADDITIONAL TRIBUTARY (TRIBUTARY 1) TOTALING APPROXIMATELY 2,819 LINEAR FEET, WITH AN ADDITIONAL 442 LINEAR FEET OF BANK STABILIZATION. THE PRIMARY GOAL OF THIS PROJECT IS TO REDUCE STREAM BED AND BANK EROSION AND ASSOCIATED NITROGEN AND PHOSPHORUS INPUTS TO ASSIST THE COUNTY IN MEETING MS4/TMDL REQUIREMENTS. A SECONDARY GOAL FOCUSES ON CREATING OPPORTUNITIES FOR ECOLOGICAL UPLIFT VIA FLOODPLAIN RECONNECTION AND HYPORHEIC EXCHANGE. THE PROJECT CONSISTS OF TWO STREAM SEGMENTS AND WILL EMPLOY A COMBINATION OF NATURAL CHANNEL DESIGN AND FLOODPLAIN/VALLEY RESTORATION TECHNIQUES TO REDUCE STREAM BANK EROSION, NUTRIENT INPUTS, AND IMPROVING ECOLOGICAL AND GEOMORPHIC FUNCTION. THE UNT TO BYNUM RUN BEGINS AT AN ENDWALL CONSISTING OF A 30" RCP & A 18" RCP WHILE TRIBUTARY 1 ORIGINATES DOWNSTREAM OF AN ENDWALL CONSISTING OF A 27" RCP. BOTH STREAMS ARE ALMOST ENTIRELY LOCATED ON PRIVATE PROPERTIES OWNED BY THE FOXBOROUGH FARMS HOMEOWNERS ASSOCIATION AND THE WOODLAND GREENS HOMEOWNERS ASSOCIATION.

#### PROJECT SUMMARY

TOTAL LENGTH OF STREAM RESTORED: 2,409 LF  
TOTAL LENGTH OF OUTFALL CHANNEL STABILIZED: 410 LF  
TOTAL LENGTH OF BANK STABILIZATION ONLY: 442 LF  
STREAM USE CLASS: USE III  
STREAM CLOSURE PERIOD: OCTOBER 1 – APRIL 30  
LOAD REDUCTIONS:

STREAM	TSS REDUCTION	TN REDUCTION	TP REDUCTION
UNT TO BYNUM RUN	303 TONS/YR	356 LBS/YR	104 LBS/YR
TRIBUTARY 1	91 TONS/YR	81 LBS/YR	31 LBS/YR
TOTAL	394 TONS/YR	437 LBS/YR	135 LBS/YR

CREDIT TOTALS CALCULATED USING PROTOCOLS 1, 2, 3, AND 5 METHODOLOGIES

#### IA CREDIT SUMMARY:

STREAM	DA	IA	PE REQ.	PE PROV.	IA CREDIT
UNT TO BYNUM RUN	119.52 AC	36.47 AC	N/A IN	N/A IN	47.27 AC
TRIBUTARY 1	14.90 AC	3.37 AC	N/A IN	N/A IN	13.70 AC

IMPERVIOUS ADORE CREDITS CALCULATED USING EQUIVALENT IMPERVIOUS ADORE METHODOLOGY

#### CUT / FILL SUMMARY:

CUT – 4,064 CY  
FILL – 900 CY

NET – 3,164 CY CUT

INDEX OF SHEETS		
SHEET NO.	DESCRIPTION	TITLE
1	GN-01	TITLE SHEET
2	OV-01	OVERVIEW SHEET
3-4	DA-01 - DA-02	DRAINAGE AREA MAP
5-6	GE-01 - GE-02	GEOMETRY SHEETS
7-11	SR-01 - SR-05	GRADING PLAN
12-14	PR-01 - PR-03	PROFILE SHEETS
15-21	DE-01 - DE-06	DETAIL SHEETS
22-29	CS-01 - CS-08	CROSS-SECTION SHEETS
30-34	ES-01 - ES-05	EROSION AND SEDIMENT CONTROL PLAN
35	EN-01	EROSION AND SEDIMENT CONTROL NOTES
36-37	ED-01 - ED-02	EROSION AND SEDIMENT CONTROL DETAILS
38-42	LS-01 - LS-05	LANDSCAPE PLAN
43	LD-01	LANDSCAPE NOTES AND DETAILS
44	MT-01 - MT-02	MAINTENANCE OF TRAFFIC PLAN

#### STANDARD SYMBOLS

	EX. TRAVERSE POINT
	EX. FENCE
	EX. PROPERTY BOUNDARY
	EX. EASEMENT
	EX. TREELINE
	EX. TREE (12" - 29.9" DBH)
	EX. SPECIMEN TREE (>30" DBH)
	EX. WATERS OF THE U.S.
	EX. STRUCTURE
	EX. RIPRAP
	EX. EDGE OF PAVEMENT
	EX. 5' MAJOR CONTOUR
	EX. 1' MAJOR CONTOUR
	EX. WETLAND
	EX. WETLAND BUFFER
	EX. 100-YR FLOODPLAIN
	EX. SANITARY SEWER LINE
	EX. SANITARY CLEAN OUT
	EX. STORM DRAIN LINE
	TOPOGRAPHIC SURVEY BOUNDARY
	BOUNDARY
SEE PLAN SHEETS FOR PROPOSED FEATURES LEGEND	

#### LOCATION MAP

SCALE 1" = 1,000'



#### PROPERTY OWNERS:

FOXBOROUGH FARMS HOMEOWNERS ASSOCIATION  
L:1489 F:67 ; MAP 49, GRID 2F, PARCEL 289  
L:1489 F:67 ; MAP 49, GRID 2F, PARCEL 291

WOODLAND GREENS HOMEOWNERS ASSOCIATION  
L:1715 F:121 ; MAP 49, GRID 3F, PARCEL 324  
L:1715 F:121 ; MAP 49, GRID 3F, PARCEL 309

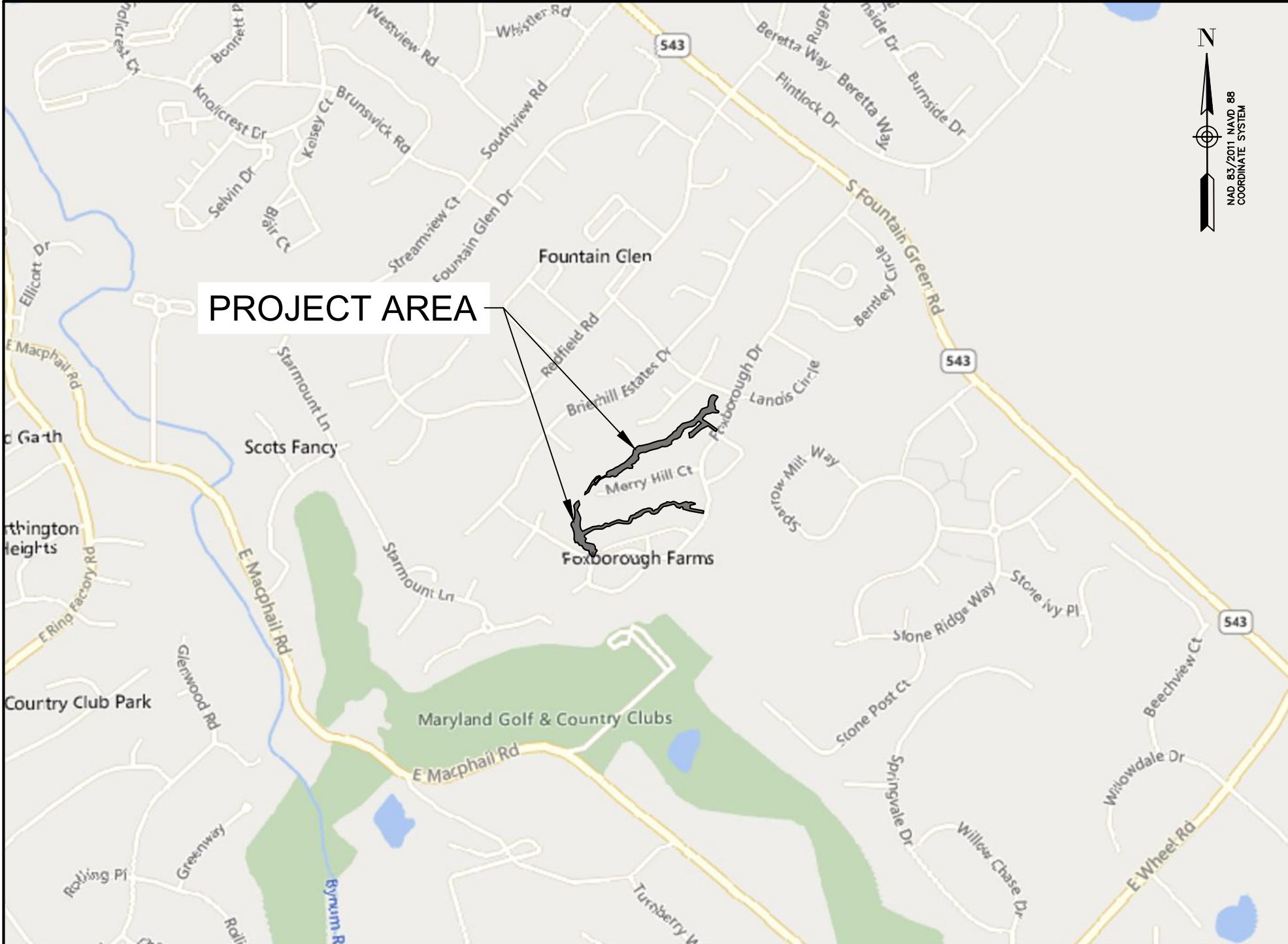
DYLAN T. CULLEN & ALLYSA A. STABILE  
L:15415 F:001; MAP 49, GRID 3F, PARCEL 309, LOT 278

APRIL DAWN BONNEY  
L: 12978 F:48; MAP 49, GRID 3F, PARCEL 309, LOT 279

ZACHARY A. BROWN & SERENA C. DI COCCO  
L:15691 F:483; MAP 49, GRID 3F, PARCEL 309, LOT 280

BILLING NO. XXXXXX
EG-SWMENG- XXXXXX-XXXX #XXXX
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.

OVERALL LIMIT OF DISTURBANCE:  
150,110 SQ. FT // 3.45 AC.



#### DEVELOPER'S/LANDOWNER'S CERTIFICATION

I/WE HEREBY CERTIFY THAT ALL PROPOSED WORK SHOWN ON THESE CONSTRUCTION DRAWING(S) WILL BE I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO ACCOMPLISH PURSUANT TO THESE PLANS. THE CONSTRUCTION SUPERVISED AND CERTIFIED, INCLUDING THE SUBMITTAL OF "AS-BUILT" PLANS WITHIN 30 DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL ENGINEER.

SIGNED \_\_\_\_\_  
PRINTED NAME \_\_\_\_\_  
DATE \_\_\_\_\_

#### ENGINEER'S CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME, OR UNDER MY SUPERVISION, AND MEETS THE MINIMUM STANDARDS OF THE HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS AND/OR THE UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, AND/OR THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION.

SIGNED   
PRINTED NAME CRAIG A. LYNCH  
DATE 10/9/2025  
P.E. NO. 28731

#### EROSION AND SEDIMENT CONTROL PLAN #:

#### TECHNICAL REVIEW BY:

#### HARFORD SOIL CONSERVATION DISTRICT

#### APPROVED BY:

#### HARFORD SOIL CONSERVATION DISTRICT

#### FIELD VERIFICATION CERTIFICATION

I HEREBY CERTIFY THAT I COMPLETED A FIELD VERIFICATION TO THE SITE AND THAT THE INFORMATION SHOWN ON THE PLANS ON INFORMATION SHOWN ON THE PLANS IS IN AGREEMENT WITH THE ACTUAL FIELD CONDITIONS.

Ian P. Turner

PRINTED NAME \_\_\_\_\_  
SIGNED   
DATE 10/9/25

#### AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

SIGNED \_\_\_\_\_  
PRINTED NAME \_\_\_\_\_  
DATE \_\_\_\_\_  
P.E. NO. \_\_\_\_\_

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

#### OWNER / DEVELOPER:

HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS  
OFFICE OF WATERSHED PROTECTION AND RESTORATION  
212 S BOND ST. 1ST FLOOR, BEL AIR, MD 21014

CONTACT: LINDSEY SNYDER  
EMAIL: LOSNYDER@HARFORDCOUNTYMD.GOV

#### PREPARED BY :

CENTURY ENGINEERING  
A Kleinfelder Company

CONTRACTOR SHALL NOTIFY MISS UTILITY AT LEAST 48 HOURS BEFORE STARTING WORK SHOWN ON THESE DRAWINGS: MISS UTILITY - (800) 257-7777

S/C PLAN # TBD  
GP # TBD



10/9/2025

## HARFORD COUNTY, MARYLAND

### BENNETT PLACE STREAM RESTORATION

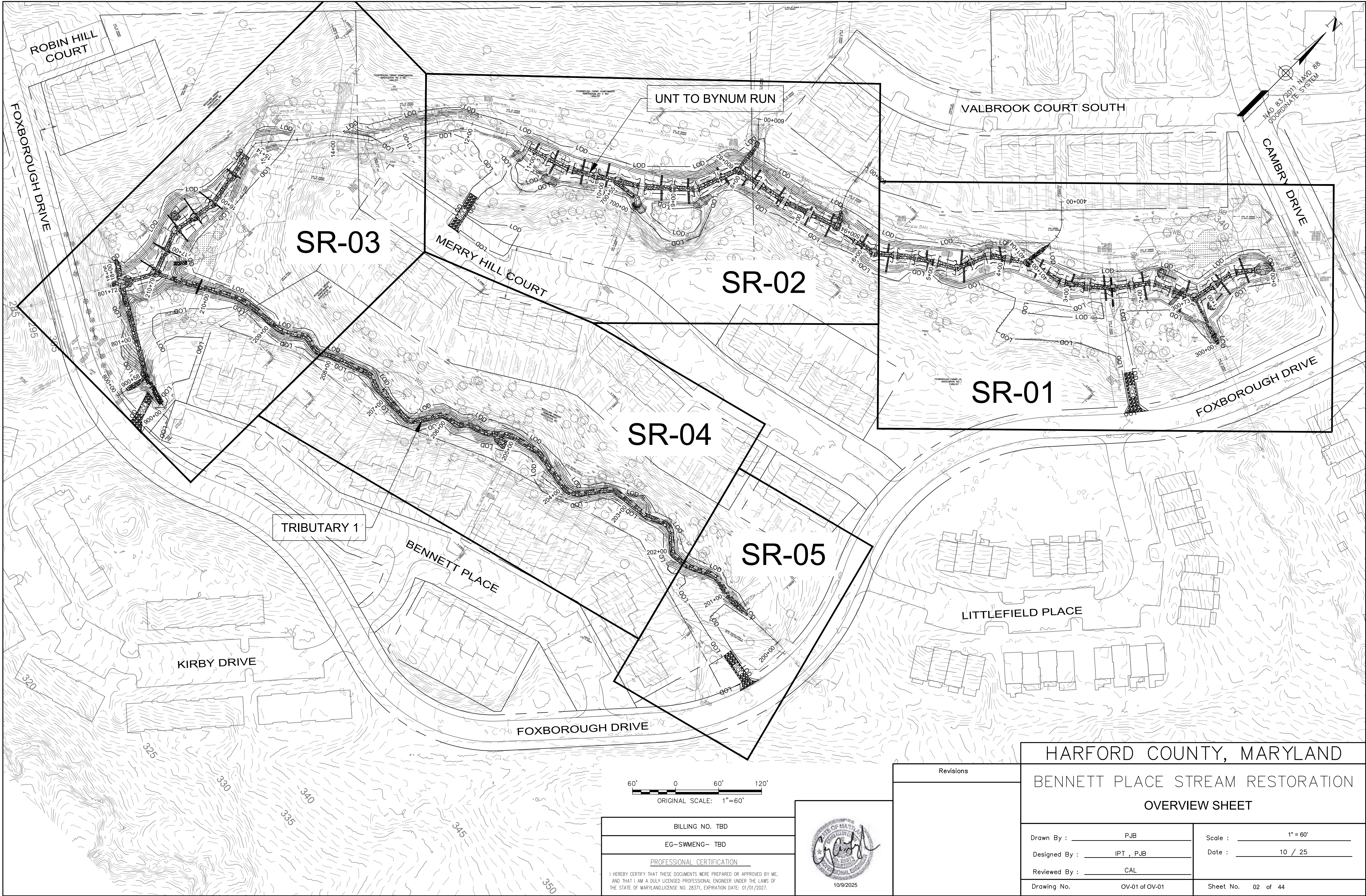
Drawn By : _____	PJB	Scale : _____
Designed By : _____	IPT , PJB	Date : _____ 10 / 25
Reviewed By : _____	CAL	
Drawing No.	GN-01 of GN-01	Sheet No. 01 of 44

BID No.:

HCG DWG ID No.: STATE: T TBD



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60' 0 60' 120'  
ORIGINAL SCALE: 1"=60'

BILLING NO. TBD  
EG-SWMENG- TBD  
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AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF  
THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.

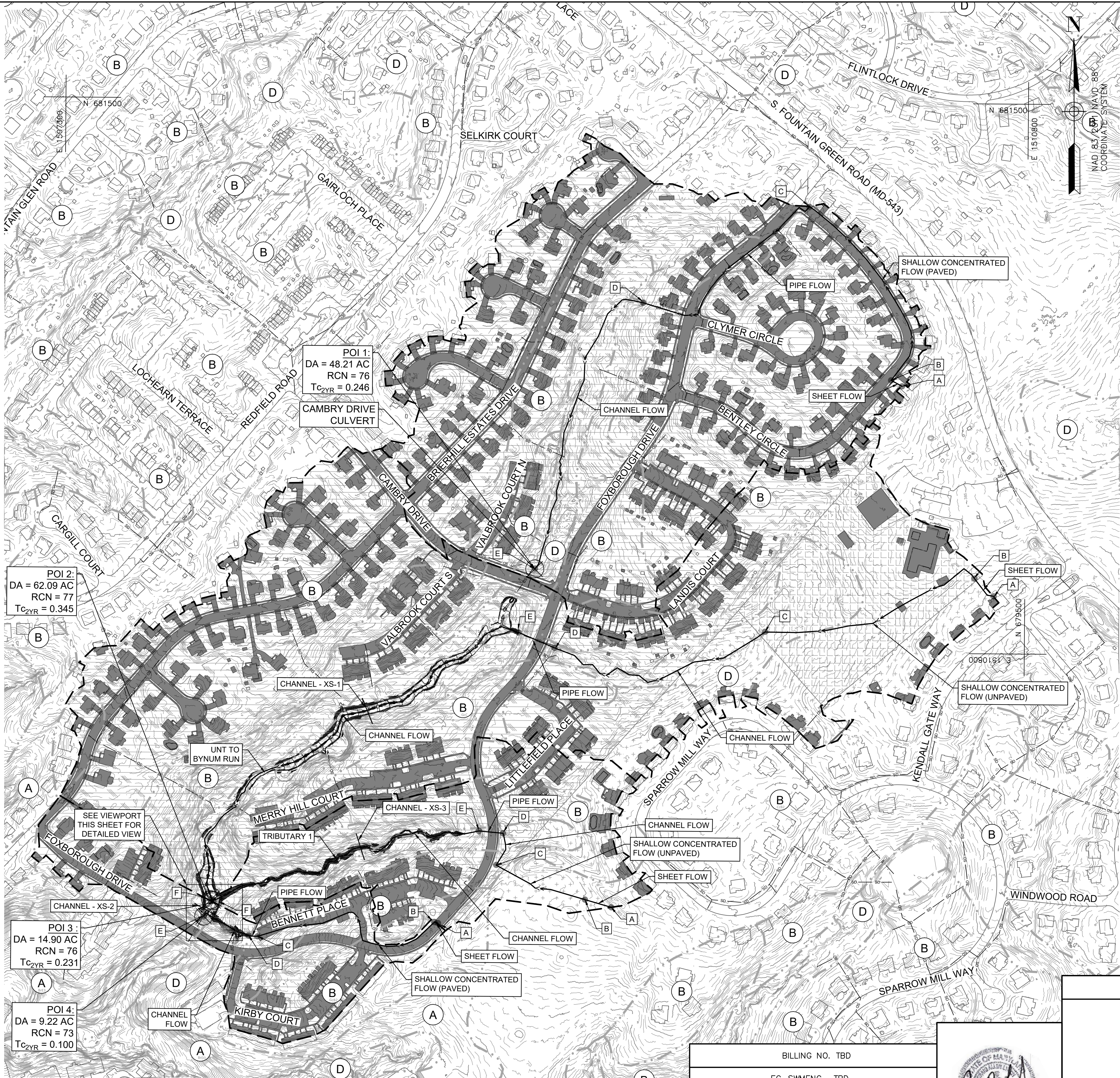


Revisions	

HARFORD COUNTY, MARYLAND			
BENNETT PLACE STREAM RESTORATION			
OVERVIEW SHEET			
Drawn By :	PJB	Scale :	1" = 60'
Designed By :	IPT , PJB	Date :	10 / 25
Reviewed By :	CAL		
Drawing No.	OV-01 of OV-01	Sheet No.	02 of 44



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LEGEND

1' LIDAR CONTOUR

5' LIDAR CONTOUR

ROADWAY/BUILDING OUTLINE

SOIL BOUNDARY

STORM DRAIN

TREE LINE

DRAINAGE DIVIDE

148

150

(B)

(C)

80

80

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DRAINAGE STUDY POINT

FLOW PATH/SEGMENT

R2 - RES. DISTRICTS 1/4 AC

R1 - RES. DISTRICTS 1/2 AC

AG - AGRICULTURAL

1' PROPOSED CONTOUR

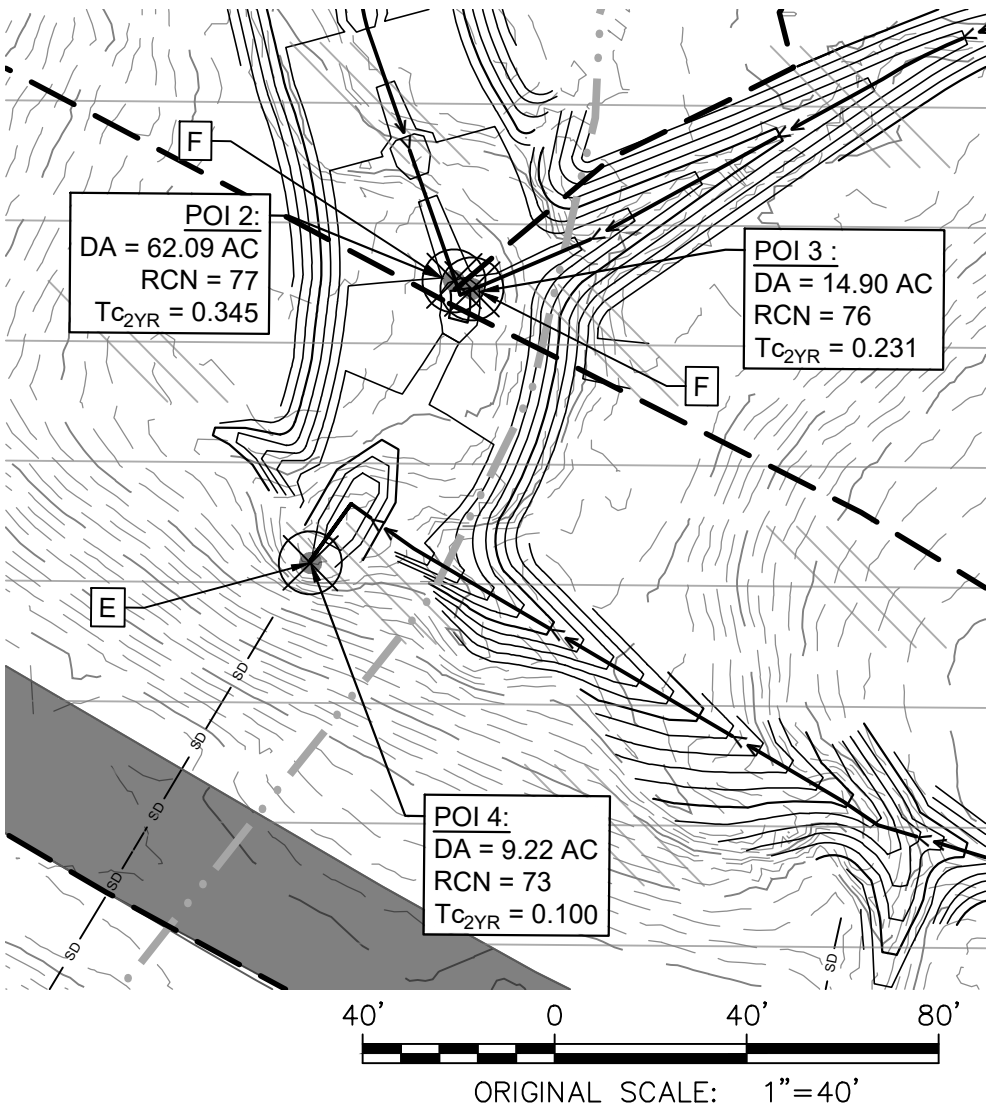
NOTES:

1. DRAINAGE PATTERNS REMAIN CONSISTENT FROM EXISTING TO PROPOSED CONDITIONS. ULTIMATE ZONING CONDITIONS GOVERN OVER EXISTING LAND USE CONDITIONS.

2. ASSUMED AVERAGE PIPE VELOCITY OF 7 FT/S FOR NON-SURVEYED STORM DRAIN SYSTEMS PER SECTION II.D. OF THE HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS ROADWAY & STORMDRAIN DESIGN STANDARDS, DECEMBER 2, 2008.

3. OUTLET DRAINAGE AREA = 134.43 AC  
IMPERVIOUS = 46.48 AC (34.6%)

SOIL	SYMBOL	% SLOPE	K <sub>t</sub> VALUE	HYDRIC (YN)	HYDRIC COMPONENT	COMPONENT %	LANDFORM
Brandywine Gravelly Loam	BrD3	15 - 25	0.17	N			
Brandywine Gravelly Loam	BrE3	25 - 40	0.17	N			
Chester Silt Loam	CcB2	3 - 8	0.43	N			
Glenelg Loam	GcC	8 - 15	0.43	N			
Glenelg Loam	GcC3	8 - 15	0.37	N			
Genville Silt Loam	GnB	3 - 8	0.55	Y	Baile	10	Drainageway s
Manor Loam	MbD	15 - 25	0.32	N			



HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

DRAINAGE AREA MAP - ULTIMATE CONDITIONS

Revisions

Drawn By : PJB

Designed By : IPT, PJB

Reviewed By : CAL

Drawing No. DA-01 of DA-02

Scale : 1" = 200'

Date : 10 / 25

Sheet No. 03 of 44

BILLING NO. TBD

EG-SWMENG- TBD

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10/9/2025



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POI-1 (DA-1) ULTIMATE ZONING LAND USE DETAILS			
LAND USE	HSG	AREA (AC)	RCN
RESIDENTIAL DISTRICTS (¼ AC)	B	44.59	75
RESIDENTIAL DISTRICTS (¼ AC)	D	3.62	87
TOTAL	N/A	48.21	76

POI-2 (DA-2) ULTIMATE ZONING LAND USE DETAILS			
LAND USE	HSG	AREA (AC)	RCN
ROW CROP, STRAIGHT ROW (SR) (GOOD)	B	6.51	78
ROW CROP, STRAIGHT ROW (SR) (GOOD)	D	2.22	89
RESIDENTIAL DISTRICTS (¼ AC)	A	1.48	61
RESIDENTIAL DISTRICTS (¼ AC)	B	39.03	75
RESIDENTIAL DISTRICTS (¼ AC)	D	7.09	87
RESIDENTIAL DISTRICTS (½ AC)	B	4.41	70
RESIDENTIAL DISTRICTS (½ AC)	D	1.35	85
TOTAL	N/A	62.09	77

POI-3 (DA-3) ULTIMATE ZONING LAND USE DETAILS			
LAND USE	HSG	AREA (AC)	RCN
RESIDENTIAL DISTRICTS (¼ AC)	A	0.01	61
RESIDENTIAL DISTRICTS (¼ AC)	B	8.63	75
RESIDENTIAL DISTRICTS (¼ AC)	D	2.24	87
RESIDENTIAL DISTRICTS (½ AC)	B	3.68	70
RESIDENTIAL DISTRICTS (½ AC)	D	0.34	85
TOTAL	N/A	14.90	76

POI-1 (DA-1) TIME OF CONCENTRATION - 2-YR 24HR STORM EVENT						
SEGMENT	FLOW TYPE	LENGTH (LF)	SLOPE (FT/FT)	MANNING'S N	VELOCITY (FPS)	TIME (HRS)
A-B	SHEET	45	0.018	0.150	-	0.088
B-C	SHALLOW CONC.	793	0.021	-	2.90	0.076
C-D	PIPE	800	-	-	7.00	0.032
D-E	CHANNEL	1136	0.028	0.040	6.23	0.051
TIME OF CONCENTRATION =						0.246

POI-2 (DA-2) TIME OF CONCENTRATION - 2-YR 24HR STORM EVENT						
SEGMENT	FLOW TYPE	LENGTH (LF)	SLOPE (FT/FT)	MANNING'S N	VELOCITY (FPS)	TIME (HRS)
A-B	SHEET	100	0.044	0.150	-	0.117
B-C	SHALLOW CONC.	838	0.038	-	3.20	0.073
C-D	CHANNEL	869	0.026	0.040	5.57	0.043
D-E	PIPE	145	-	-	7.00	0.006
E-F	CHANNEL	1708	0.028	0.040	4.48	0.106
TIME OF CONCENTRATION =						0.345

POI-3 (DA-3) TIME OF CONCENTRATION - 2-YR 24HR STORM EVENT						
SEGMENT	FLOW TYPE	LENGTH (LF)	SLOPE (FT/FT)	MANNING'S N	VELOCITY (FPS)	TIME (HRS)
A-B	SHEET	100	0.036	0.150	-	0.127
B-C	SHALLOW CONC.	351	0.035	-	3.05	0.032
C-D	CHANNEL	125	0.066	0.040	4.04	0.009
D-E	PIPE	88	-	-	7.00	0.003
E-F	CHANNEL	1098	0.050	0.040	5.11	0.060
TIME OF CONCENTRATION =						0.231

POI-4 (DA-4) ULTIMATE ZONING LAND USE DETAILS			
LAND USE	HSG	AREA (AC)	RCN
RESIDENTIAL DISTRICTS (¼ AC)	A	1.90	61
RESIDENTIAL DISTRICTS (¼ AC)	B	6.64	75
RESIDENTIAL DISTRICTS (¼ AC)	D	0.68	87
TOTAL	N/A	9.22	73

POI-4 (DA-4) TIME OF CONCENTRATION - 2-YR 24HR STORM EVENT						
SEGMENT	FLOW TYPE	LENGTH (LF)	SLOPE (FT/FT)	MANNING'S N	VELOCITY (FPS)	TIME (HRS)
A-B	SHEET	12	0.001	0.011	-	0.012
B-C	SHALLOW CONC.	764	0.056	-	4.80	0.044
C-D	PIPE	33	-	-	7.00	0.001
D-E	CHANNEL	199	0.114	0.040	2.71	0.020
TIME OF CONCENTRATION =						0.100

BILLING NO. TBD
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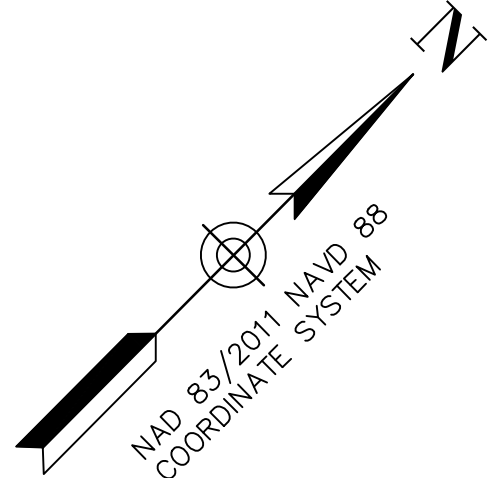
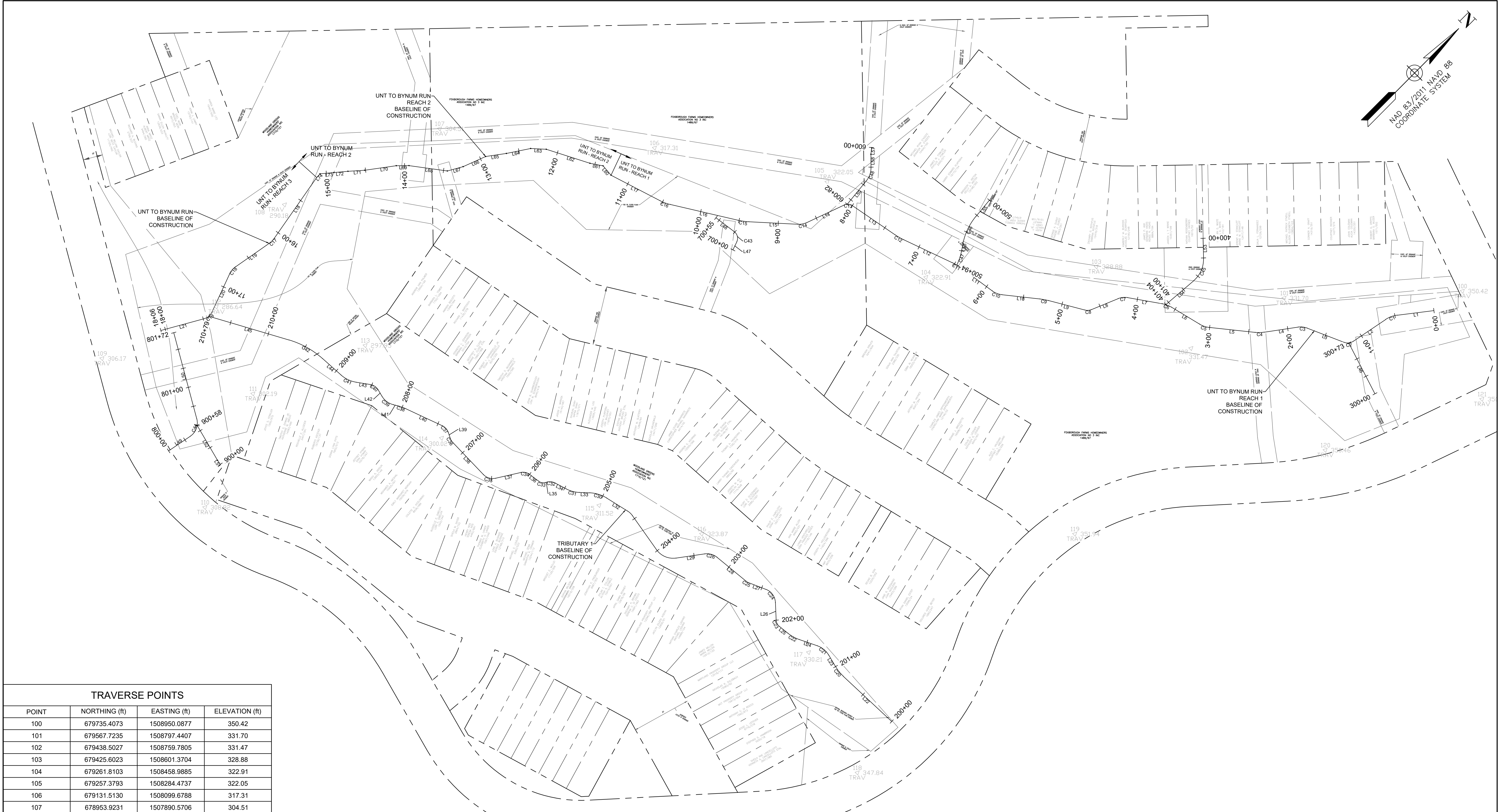


Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
DRAINAGE AREA MAP - ULTIMATE CONDITIONS	
Drawn By : PJB	Scale : N/A
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. DA-02 of DA-02	Sheet No. 04 of 44



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TRAVERSE POINTS			
POINT	NORTHING (ft)	EASTING (ft)	ELEVATION (ft)
100	679735.4073	1508950.0877	350.42
101	679567.7235	1508797.4407	331.70
102	679438.5027	1508759.7805	331.47
103	679425.6023	1508601.3704	328.88
104	679261.8103	1508458.9885	322.91
105	679257.3793	1508284.4737	322.05
106	679131.5130	1508099.6788	317.31
107	678953.9231	1507890.5706	304.51
108	678745.6732	1507821.0802	290.18
109	678443.1352	1507797.5944	306.17
110	678403.4763	1508024.2993	308.82
111	678548.3469	1507964.1942	302.19
112	678592.8340	1507852.6919	286.64
113	678693.0984	1508020.5659	297.95
114	678679.6555	1508172.6430	300.02
115	678762.2167	1508374.1284	311.52
116	678829.6857	1508491.5635	323.87
117	678820.7896	1508694.2868	330.21
118	678757.3775	1508846.7000	347.84
119	679167.5134	1508824.4369	351.94
120	679469.1800	1508971.8771	350.46
121	679656.6392	1509065.4266	350.35

60'0 60'120'ORIGINAL SCALE: 1"=60'

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THE STATE OF MARYLAND

DEPARTMENT OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER

10/9/2025

Revisions

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

GEOMETRY SHEET

Drawn By : PJB

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. GE-01 of GE-03

Scale : 1" = 60'

Date : 10 / 25

Sheet No. 05 of 44

SHEET 05 OF 44

HCG DWG ID No.: BID No.:



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UNT to Bynum Run - Reach 1																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L1			0+00.00	0+46.97	46.966		S37° 24' 19.72"W	679691.9262,1508942.2828	679654.6182,1508913.7531							
C1	679648.1730,1508908.8244	0+55.08			15.931	34.105	S24° 01' 24.55"W	679654.6182,1508913.7531	679640.1989,1508907.3261	026° 45' 50.35"	167° 59' 50.84"	679633.90	1508940.8447	8.11	15.79	0.95
L2			0+62.90	1+12.35	49.455		S10° 38' 29.37"W	679640.1989,1508907.3261	679591.5946,1508898.1936							
C2	679584.9341,1508896.9422	1+19.13			12.494	13.000	S38° 10' 30.17"W	679591.5946,1508898.1936	679582.1462,1508890.7651	055° 04' 01.60"	440° 44' 12.36"	679594.00	1508885.4172	6.78	12.02	1.66
L3			1+24.85	1+74.96	50.118		S65° 42' 30.97"W	679582.1462,1508890.7651	679561.5287,1508845.0843							
C3	679559.0743,1508839.6460	1+80.93			11.666	22.551	S50° 53' 20.91"W	679561.5287,1508845.0843	679554.2515,1508836.1332	029° 38' 20.13"	254° 04' 10.25"	679540.97	1508854.3613	5.97	11.54	0.78
L4			1+86.63	2+30.33	43.700		S36° 04' 10.84"W	679554.2515,1508836.1332	679518.9284,1508810.4037							
C4	679514.2525,1508806.9978	2+36.12			11.507	45.066	S43° 23' 03.73"W	679518.9284,1508810.4037	679510.5885,1508802.5213	014° 37' 45.77"	127° 08' 15.37"	679545.46	1508773.9768	5.78	11.48	0.37
L5			2+41.84	3+00.40	58.559		S50° 41' 56.62"W	679510.5885,1508802.5213	679473.4973,1508757.2063							
C5	679469.3223,1508752.1056	3+06.99			12.973	29.749	S63° 11' 32.28"W	679473.4973,1508757.2063	679467.6926,1508745.7188	024° 59' 11.33"	192° 35' 53.19"	679496.52	1508738.3636	6.59	12.87	0.72
L6			3+13.37	3+55.19	41.820		S75° 41' 07.95"W	679467.6926,1508745.7188	679457.3530,1508705.1974							
C6	679455.7748,1508699.0126	3+61.57			12.622	34.297	S65° 08' 34.79"W	679457.3530,1508705.1974	679452.0773,1508693.8096	021° 05' 06.32"	167° 03' 20.08"	679424.12	1508713.6772	6.38	12.55	0.59
L7			3+67.81	4+12.51	44.695		S54° 36' 01.63"W	679452.0773,1508693.8096	679426.1867,1508657.3774							
C7	679422.5220,1508652.2205	4+18.83			12.316	21.866	S38° 27' 51.45"W	679426.1867,1508657.3774	679416.6699,1508649.8171	032° 16' 20.37"	262° 01' 34.03"	679408.36	1508670.0440	6.33	12.15	0.90
L8			4+24.82	4+61.71	36.886		S22° 19' 41.26"W	679416.6699,1508649.8171	679382.5498,1508635.8038							
C8	679378.5927,1508634.1786	4+65.99			8.259	12.855	S40° 44' 02.80"W	679382.5498,1508635.8038	679376.3984,1508630.5064	036° 48' 43.09"	445° 42' 07.97"	679387.43	1508623.9125	4.28	8.12	0.69
L9			4+69.97	5+17.83	47.863		S59° 08' 24.35"W	679376.3984,1508630.5064	679351.8474,1508589.4193							
C9	679348.9739,1508584.6105	5+23.43			11.185	78.989	S55° 05' 00.22"W	679351.8474,1508589.4193	679345.4505,1508580.2553	008° 06' 48.25"	072° 32' 12.63"	679284.04	1508629.9357	5.60	11.18	0.20
L10			5+29.02	5+77.51	48.491		S51° 01' 36.10"W	679345.4505,1508580.2553	679314.9516,1508542.5564							
C10	679310.6188,1508537.2007	5+84.40			13.464	25.812	S65° 58' 10.77"W	679314.9516,1508542.5564	679309.5308,1508530.3983	029° 53' 09.35"	221° 58' 11.28"	679335.02	1508526.3215	6.89	13.31	0.90
L11			5+90.97	6+39.95	48.974		S80° 54' 45.45"W	679309.5308,1508530.3983	679301.7958,1508482.0390							
C11	679300.7308,1508475.3805	6+46.69			13.445	69.859	S75° 23' 57.08"W	679301.7958,1508482.0390	679298.4118,1508469.0486	011° 01' 36.74"	082° 01' 00.63"	679232.81	1508493.0725	6.74	13.42	0.32
L12			6+53.39	7+21.62	68.233		S69° 53' 08.71"W	679298.4118,1508469.0486	679274.9470,1508404.9772							
C12	679272.7876,1508399.0811	7+27.90			12.532	79.572	S74° 23' 51.54"W	679274.9470,1508404.9772	679271.5798,1508392.9193	009° 01' 25.66"	072° 00' 17.98"	679349.67	1508377.6130	6.28	12.52	0.25
L13			7+34.16	7+99.73	65.576		S78° 54' 34.37"W	679271.5798,1508392.9193	679258.9658,1508328.5684							
C13	679257.7866,1508322.5524	8+05.86			11.138	10.723	S49° 09' 12.35"W	679258.9658,1508328.5684	679252.0041,1508320.5164	059° 30' 44.04"	534° 18' 19.23"	679248.44	1508330.6311	6.13	10.64	1.63
L14			8+10.87	8+63.39	52.518		S19° 23' 50.33"W	679252.0041,1508320.5164	679202.4669,1508303.0742							
C14	679196.9956,1508301.1477	8+69.19			11.367	23.166	S33° 27' 16.98"W	679202.4669,1508303.0742	679193.0776,1508296.8703	028° 06' 53.30"	247° 19' 39.01"	679210.16	1508281.2232	5.80	11.25	0.72
L15			8+74.75	9+37.31	62.550		S47° 30' 43.63"W	679193.0776,1508296.8703	679150.8291,1508250.7445							
C15	679146.0015,1508245.4739	9+44.45			14.257	80.419	S52° 35' 27.59"W	679150.8291,1508250.7445	679142.1791,1508239.4345	010° 09' 27.93"	071° 14' 46.82"	679210.13	1508196.4265	7.15	14.24	0.32
L16			9+51.56	10+39.68	88.117		S57° 40' 11.56"W	679142.1791,1508239.4345	679095.0544,1508164.9772							
C16	679091.2808,1508159.0149	10+46.74			14.038	55.932	S64° 51' 36.41"W	679095.0544,1508164.9772	679089.1062,1508152.3022	014° 22' 49.71"	102° 26' 20.56"	679142.32	1508135.0652	7.06	14.00	0.44
L17			10+53.72	11+23.90	70.178		S72° 03' 01.27"W	679089.1062,1508152.3022	679067.4786,1508085.5397							

UNT to Bynum Run - Reach 2																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L60			11+23.90	11+39.53	15.639		N85° 47' 01.83"W	679067.4786,1508085.5397	679068.6284,1508069.9435							
L61			11+39.53	11+56.57	17.036		S55° 41' 16.00"W	679068.6284,1508069.9435	679059.0249,1508055.8718							
L62			11+56.57	12+14.86	58.290		S62° 21' 40.50"W	679059.0249,1508055.8718	679031.9843,1508004.2329							
L63			12+14.86	12+34.65	19.792		S47° 28' 48.98"W	679031.9843,1508004.2329	679018.6079,1507989.6453							
L64			12+34.65	12+66.22	31.564		S32° 55' 22.54"W	679018.6079,1507989.6453	678992.1132,1507972.4900							
L65			12+66.22	12+92.89	26.670		S36° 18' 19.00"W	678992.1132,1507972.4900	678970.6208,1507956.6993							
L66			12+92.89	13+24.32	31.433		S20° 14' 24.05"W	678970.6208,1507956.6993	678941.1291,1507945.8250							
L67			13+24.32	13+45.14	20.817		S29° 10' 45.64"W	678941.1291,1507945.8250	678922.9537,1507935.6758							
L68			13+45.14	13+94.29	49.155		S52° 32' 01.32"W	678922.9537,1507935.6758	678893.0530,1507896.6608							
L69			13+94.29	14+10.45	16.159		S44° 08' 09.95"W	678893.0530,1507896.6608	678881.4555,1507885.4079							
L70			14+10.45	14+51.05	40.600		S36° 28' 07.39"W	678881.4555,1507885.4079	678848.8057,1507861.2759							
L71			14+51.05	14+72.37	21.315		S41° 02' 45.95"W	678848.8057,1507861.2759	678832.7305,1507847.2792							
L72			14+72.37	14+90.27	17.904		S39° 26' 37.49"W	678832.7305,1507847.2792	678818.9043,1507835.9046							
L73			14+90.27	15+07.98	17.710		S39° 05' 47.20"W	678818.9043,1507835.9046	678805.1600,1507824.7363							
L74			15+07.98	15+14.34	6.362		S02° 15' 25.75"E	678805.1600,1507824.7363	678798.8027,1507824.9869							

UNT to Bynum Run - Reach 3																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L18			15+14.34	16+08.58	94.237		S10° 33' 29.87"E	678798.8027,1507824.9869	678706.1614,1507842.2545							
C17	678701.5879,1507843.1069	16+13.23			9.208	26.122	S00° 27' 35.95"E	678706.1614,1507842.2545	678697.0013,1507842.3280	020° 11' 47.83"	219° 20' 22.25"	678701.37	1507816.5748	4.65	9.16	0.41
L19			16+17.78	16+69.83	52.043		S09° 38' 17.96"W	678697.0013,1507842.3280	678645.6932,1507833.6146							
C18	678639.5086,1507832.5643	16+76.10			12.251	23.109	S05° 32' 55.46"E	678645.6932,1507833.6146	678633.6419,1507834.7853	030° 22' 26.83"	247° 55' 56.53"	678641.82	1507856.3978	6.27	12.11	0.84
L20			16+82.08	17+35.27	53.192		S20° 44' 08.87"E	678633.6419,1507834.7853	678583.8956,1507853.6184							
C19	678577.1847,1507856.1590	17+42.45			13.426	15.363	S04° 18' 02.32"W	678583.8956,1507853.6184	678570.9293,1507852.6434	050° 04' 22.37"	372° 57' 12.50"	678578.46	1507839.2509	7.18	13.00	1.59
L21			17+48.70	18+05.81	57.111		S29° 20' 13.50"W	678570.9293,1507852.6434	678521.1430,1507824.6622							

Tributary 1																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L22			200+00.00	200+84.27	84.267		S87° 35' 53.30"W	678834.1738,1508830.9078	678830.6423,1508746.7148							
C20	678830.3135,1508738.8739	200+92.11			15.589	54.591	N84° 13' 16.37"W	678830.6423,1508746.7148	678832.2066,1508731.2578	016° 21' 40.66"	104° 57' 16.61"	678885.19	1508744.4270	7.85	15.54	0.56
L23		200+99.86	201+16.96	17.109			N76° 02' 26.04"W	678832.2066,1508731.2578	678836.3339,1508714.6541							
C21	678838.7543,1508704.9170	201+27.00		19.230	27.297		S83° 46' 40.10"W	678836.3339,1508714.6541	678834.2925,1508695.9303	040° 21' 47.73"	209° 53' 52.34"	678809.84	1508708.0691	10.03	18.83	1.79
L24		201+36.19	201+60.33	24.135			S63° 35' 46.23"W	678834.2925,1508695.9303	678823.5596,1508674.3126							
C22	678819.8351,1508666.8109	201+68.71		16.583	47.872		S73° 31' 11.21"W	678823.5596,1508674.3126	678818.8788,1508658.4903	019° 50' 49.98"	119° 41' 04.41"	678866.44	1508653.0240	8.38	16.50	0.73
L25		201+76.91	201+90.67	13.757			S83° 26' 36.19"W	678818.8788,1508658.4903	678817.3080,1508644.8235							
C23	678816.7137,1508639.6531	201+95.87		9.776	11.513		N72° 13' 50.81"W	678817.3080,1508644.8235	678820.2025,1508635.7913	048° 39' 06.00"	497° 40' 31.05"	678828.75	1508643.5089	5.20	9.48	1.12
L26		202+00.45	202+22.42	21.971			N47° 54' 17.81"W	678820.2025,1508635.7913	678834.9312,1508619.4880							
C24	678843.2340,1508610.2975	202+34.80		21.935	18.927		N81° 06' 19.10"W	678834.9312,1508619.4880	678838.1360,1508599.0097	066° 24' 02.59"	302° 43' 19.97"	678820.89	1508606.8001	12.39	20.73	3.69
L27		202+44.35	202+68.06	23.704			S65° 41' 39.60"W	678838.1360,1508599.0097	678828.3793,1508577.4068							
C25	678827.7083,1508575.9211	202+69.69		3.233	10.128		S74° 50' 17.83"W	678828.3793,1508577.4068	678827.5374,1508574.2999	018° 17' 16.46"	565° 43' 07.89"	678837.61	1508573.2381	1.63	3.22	0.13
L28		202+71.29	203+19.49	48.202			S83° 58' 56.06"W	678827.5374,1508574.2999	678822.4841,1508526.3640							
C26	678821.5558,1508517.5577	203+28.34		16.671	19.985		S60° 05' 06.56"W	678822.4841,1508526.3640	678814.4090,1508512.3293	047° 47' 38.99"	286° 41' 18.23"	678802.61	1508528.4592	8.86	16.19	1.87
L29		203+36.16	203+73.06	36.903			S36° 11' 17.07"W	678814.4090,1508512.3293	678784.6254,1508490.5405							
L32		204+63.10	204+94.30	31.193			S76° 32' 05.14"W	678782.6886,1508404.6795	678775.4252,1508374.3442							
C30	678772.7057,1508362.9864	205+05.97		22.837	44.251		S61° 45' 01.18"W	678775.4252,1508374.3442	678764.7358,1508354.4499	029° 34' 07.13"	129° 28' 44.19"	678732.39	1508384.6483	11.68	22.58	1.52
L33		205+17.13	205+30.44	13.310			S46° 57' 57.21"W	678764.7358,1508354.4499	678755.6529,1508344.7213							
C31	678749.5988,1508338.2369	205+39.31		17.449	39.204		S59° 42' 58.33"W	678755.6529,1508344.7213	678746.9262,1508329.7777	025° 30' 02.24"	146° 08' 46.89"	678784.31	1508317.9669	8.87	17.31	0.99
L34		205+47.89	205+63.83	15.941			S72° 27' 59.45"W	678746.9262,1508329.7777	678742.1238,1508314.5772							
C32	678740.5227,1508309.5095	205+69.15		10.159	14.003		S51° 40' 58.57"W	678742.1238,1508314.5772	678735.9623,1508306.7803	041° 34' 01.76"	409° 10' 04.39"	678728.77	1508318.7958	5.31	9.94	0.97
L35		205+73.99	205+76.98	2.985			S30° 53' 57.69"W	678735.9623,1508306.7803	678733.4010,1508305.2474							
C33	678729.5208,1508302.9252	205+81.50		8.444	9.522		S56° 18' 10.66"W	678733.4010,1508305.2474	678728.8685,1508298.5454	050° 48' 25.94"	601° 43' 26.96"	678738.29	1508297.0769	4.52	8.17	1.02
L36		205+85.42	206+00.01	14.595			S81° 42' 23.63"W	678728.8685,1508298.5454	678726.7632,1508284.0076							
C34	678725.8542,1508277.7719	206+06.32		11.789	13.480		S56° 39' 03.12"W	678726.7632,1508284.0076	678720.4867,1508274.4704	050° 06' 41.42"	425° 03' 23.44"	678713.42	1508285.9519	6.30	11.42	1.50
L37		206+11.80	206+44.58	32.773			S31° 35' 42.61"W	678720.4867,1508274.4704	678692.5714,1508257.3000							
C35	678684.5962,1508252.3946	206+53.94		17.021	16.433		S61° 16' 05.93"W	678692.5714,1508257.3000	678684.7500,1508243.0328	059° 20' 46.64"	348° 39' 38.34"	678701.18	1508243.3028	9.36	16.27	2.48
L38		206+61.60	207+17.12	55.525			N89° 03' 30.75"W	678684.7500,1508243.0328	678685.6623,1508187.5155							
C36	678685.7316,1508183.3010	207+21.34		8.299	19.211		N76° 40' 59.57"W	678685.6623,1508187.5155	678687.5590,1508179.5027	024° 45' 02.36"	298° 15' 02.01"	678704.87	1508187.8312	4.22	8.23	0.46
L39		207+25.42	207+32.25	6.832			N64° 18' 28.39"W	678687.5590,1508179.5027	678690.5211,1508173.3458							
C37	678693.2149,1508167.7465	207+38.47		11.746	14.568		N87° 24' 25.82"W	678690.5211,1508173.3458	678691.0382,1508161.9267	046° 11' 54.87"	393° 17' 56.88"	678677.39	1508167.0300	6.21	11.43	1.27
L40		207+44.00	207+95.34	51.335			S69° 29' 36.74"W	678691.0382,1508161.9267	678673.0548,1508113.8444							
C38	678671.0194,1508108.4026	208+01.15		11.584	60.533		S64° 00' 39.88"W	678673.0548,1508113.8444	678667.9862,1508103.4472	010° 57' 53.72"	094° 39' 06.62"	678616.36	1508135.0499	5.81	11.57	0.28
L41		208+06.92	208+11.79	4.869			S58° 31' 43.03"W	678667.9862,1508103.4472	678665.4442,1508099.2943							
C39	678660.3991,1508091.0522	208+21.45		18.312	23.183		S81° 09' 26.28"W	678665.4442,1508099.2943	678662.7019,1508081.6670	045° 15' 26.52"	247° 09' 01.45"	678685.22	1508087.1913	9.66	17.84	1.93
L42		208+30.10	208+39.54	9.439			N76° 12' 50.46"W	678662.7019,1508081.6670	678664.9511,1508072.5002							
C40	678666.5614,1508065.9371	208+46.30		12.654	14.565		S78° 53' 47.35"W	678664.9511,1508072.5002	678662.5900,1508060.4694	049° 46' 44.39"	393° 22' 15.29"	678650.81	1508069.0293	6.76	12.26	1.49
L43		208+52.19	208+70.34	18.149			S54° 00' 25.15"W	678662.5900,1508060.4694	678651.9243,1508045.7856							
C41	678645.3910,1508036.7910	208+81.46		21.649	38.620		S70° 03' 56.10"W	678651.9243,1508045.7856	678644.6395,1508025.6994	032° 07' 01.89"	148° 21' 23.07"	678683.17	1508023.0889	11.12	21.37	1.57
L44		208+91.99	209+23.54	31.544			S86° 07' 27.04"W	678644.6395,1508025.6994	678642.5073,1507994.2274							
C42	678640.8239,1507969.3794	209+48.44		49.012	111.977		S73° 35' 06.02"W	678642.5073,1507994.2274	678628.7672,1507947.5874	025° 04' 42.04"	051° 10' 03.16"	678530.79	1508001.7964	24.90	48.62	2.74
L45		209+72.55	210+78.85	106.304			S61° 02' 45.00"W	678628.7672,1507947.5874	678577.3042,1507854.5703							



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OUTFALL #1																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L46			300+00.00	300+72.70	72.701		N72° 40' 58.76"W	679564.3203,1508965.0426	679585.9604,1508895.6369							

OUTFALL #2																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L53			400+00.00	400+26.09	26.091		S46° 57' 54.41"E	679547.3675,1508670.7752	679529.5616,1508689.8464							
C45	679518.0667,1508702.1581	400+42.94			31.435	35.332	S21° 28' 36.81"E	679529.5616,1508689.8464	679501.2644,1508700.9798	050° 58' 35.20"	162° 09' 47.91"	679503.74	1508665.7343	16.84	30.41	3.81
L54			400+57.53	401+04.25	46.727		S04° 00' 40.80"W	679501.2644,1508700.9798	679454.6517,1508697.7111							

OUTFALL #3																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L55			500+00.00	500+27.02	27.023		S05° 48' 17.84"E	679387.8951,1508445.7088	679361.0103,1508448.4420							
C46	679341.2772,1508450.4481	500+46.86			38.837	77.545	S20° 09' 09.61"E	679361.0103,1508448.4420	679324.9308,1508461.6828	028° 41' 43.53"	073° 53' 12.25"	679368.85	1508525.5898	19.83	38.43	2.50
L56			500+65.86	500+74.00	8.135		S34° 30' 01.37"E	679324.9308,1508461.6828	679318.2265,1508466.2907							
C47	679309.9438,1508471.9833	500+84.05			19.995	79.615	S27° 18' 20.52"E	679318.2265,1508466.2907	679300.5063,1508475.4389	014° 23' 21.71"	071° 57' 56.54"	679273.13	1508400.6778	10.05	19.94	0.63

OUTFALL #4																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L57			600+00.00	600+08.65	8.650		S40° 22' 30.96"E	679328.1588,1508292.8145	679321.5690,1508298.4180							
L58			600+08.65	600+25.81	17.160		S45° 37' 49.79"E	679321.5690,1508298.4180	679309.5690,1508310.6850							
C48	679303.0301,1508317.3695	600+35.16			17.958	26.106	S25° 55' 25.34"E	679309.5690,1508310.6850	679293.7341,1508318.3821	039° 24' 48.90"	219° 28' 13.96"	679290.91	1508292.4293	9.35	17.61	1.62
L59			600+43.77	600+82.24	38.471		S06° 13' 00.89"E	679293.7341,1508318.3821	679255.4896,1508322.5483							

OUTFALL #5																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L47			700+00.00	700+11.33	11.333		N19° 25' 04.92"W	679111.2099,1508261.9003	679121.8986,1508258.1324							
C43	679129.9043,1508255.3103	700+19.82			14.225	10.366	N58° 43' 50.62"W	679121.8986,1508258.1324	679128.7166,1508246.9053	078° 37' 31.42"	552° 42' 51.95"	679118.45	1508248.3558	8.49	13.14	3.03
L48			700+25.56	700+55.08	29.518		S81° 57' 23.67"W	679128.7166,1508246.9053	679124.5863,1508217.6781							

OUTFALL #6																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L49			800+00.00	800+33.27	33.270		N10° 39' 42.78"E	678420.7521,1507940.6493	678453.4482,1507946.8048							
C44	678467.6512,1507949.4787	800+47.72			25.098	20.228	N24° 52' 58.06"W	678453.4482,1507946.8048	678474.7839,1507936.9089	071° 05' 21.68"	283° 14' 41.37"	678457.19	1507926.9257	14.45	23.52	4.63
L50			800+58.37	801+71.92	113.548		N60° 25' 38.90"W	678474.7839,1507936.9089	678530.8229,1507838.1522							

OUTFALL #7																
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	CENTER NORTHING	CENTER EASTING	EXTERNAL TANGENT	CHORD LENGTH	EXTERNAL DISTANCE
L51			900+00.00	900+06.23	6.226		N81° 05' 13.06"W	678455.5840,1507999.1122	678456.5486,1507992.9618							
L52			900+06.23	900+57.65	51.425		N75° 39' 31.76"W	678456.5486,1507992.9618	678469.2863,1507943.1393							

BILLING NO. TBD

EG--SWMENG-- TBD

PROFESSIONAL CERTIFICATION

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Revisions

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

GEOMETRY SHEET

Drawn By : PJB

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. GE-03 of GE-03

Scale : N/A

Date : 10 / 25

Sheet No. 07 of 44

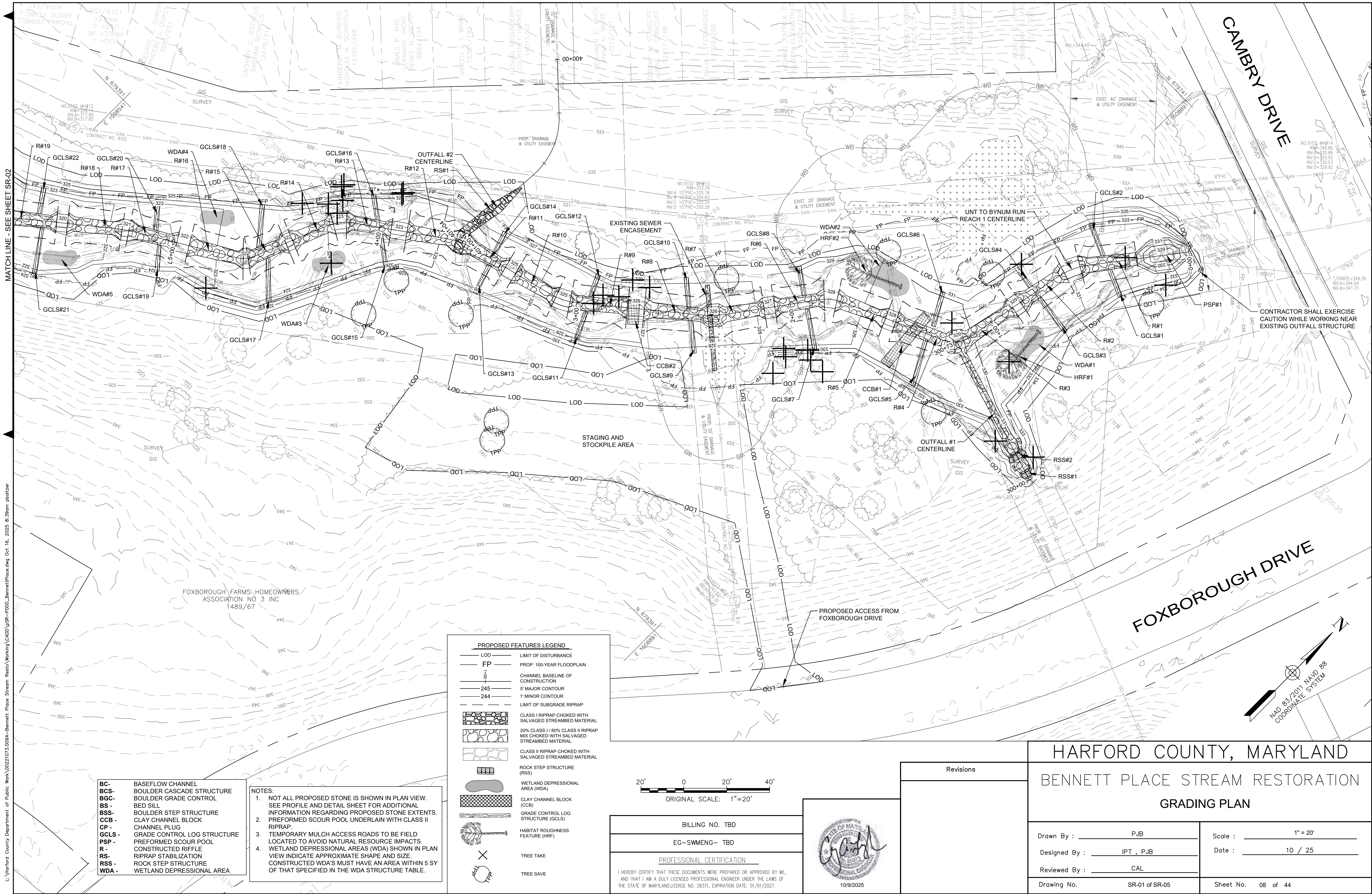
SHEET 07

BID No.:

H-CG DWG ID No.:

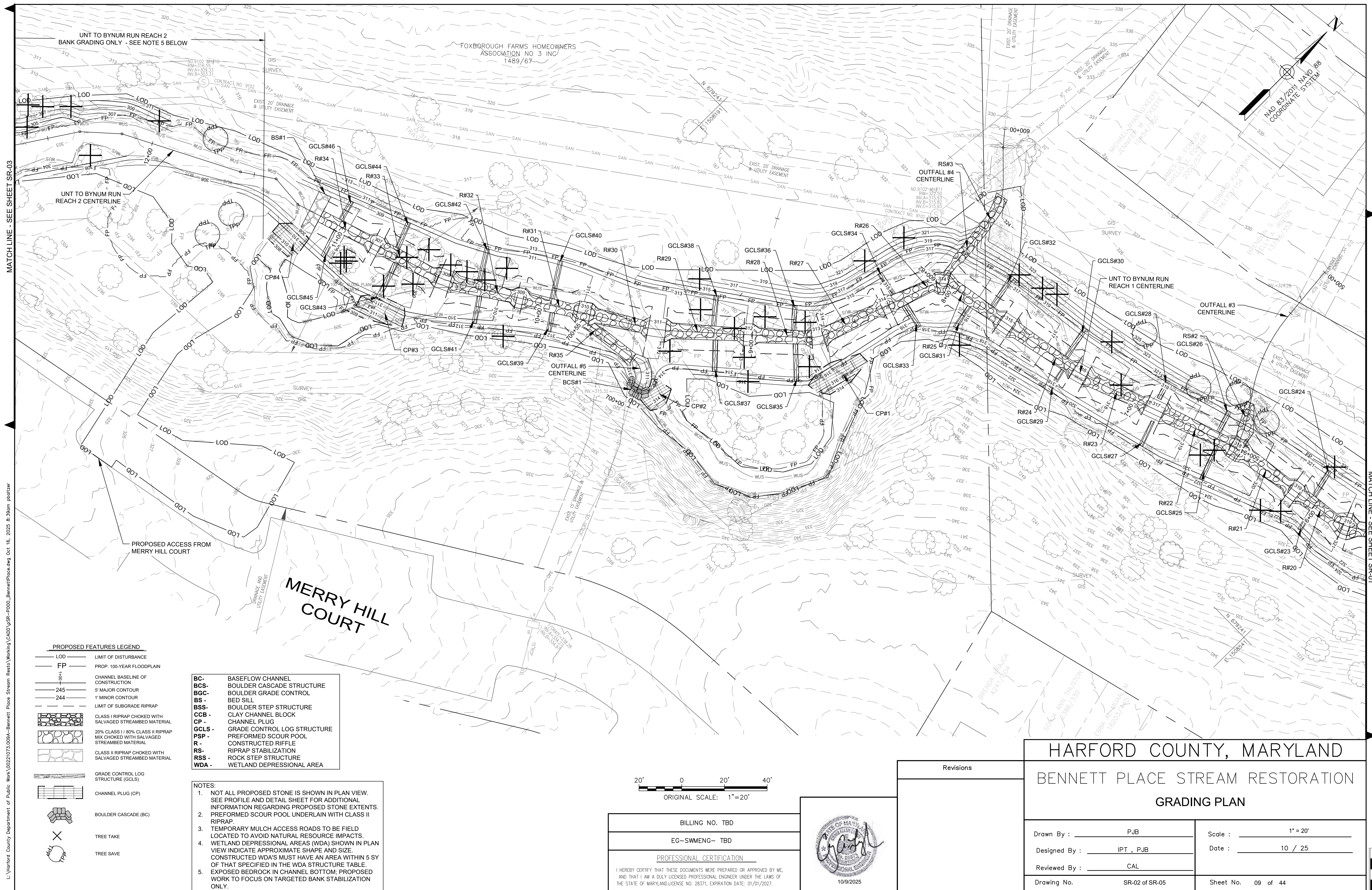


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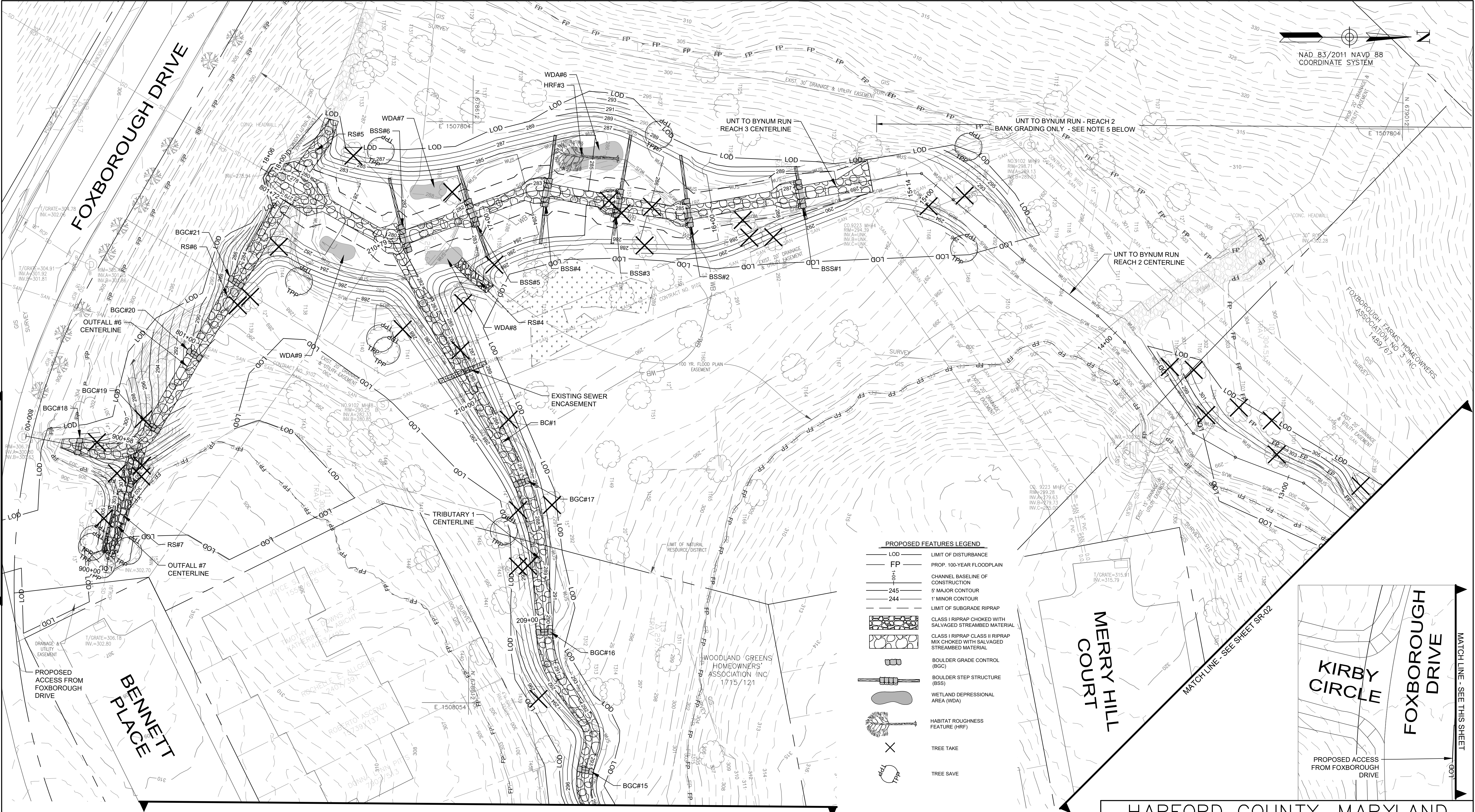


BID No.: HCG DWG ID No.: 10/9/2025









- NOTES:
- NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
  - PREFORMED SCOUR POOL UNDERLAIN WITH CLASS II RIPRAP.
  - TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
  - WETLAND DEPRESSIONAL AREAS (WDA) SHOWN IN PLAN VIEW INDICATE APPROXIMATE SHAPE AND SIZE. CONSTRUCTED WDA'S MUST HAVE AN AREA WITHIN 5 SY OF THAT SPECIFIED IN THE WDA STRUCTURE TABLE.
  - EXPPOSED BEDROCK IN CHANNEL BOTTOM; PROPOSED WORK TO FOCUS ON TARGETED BANK STABILIZATION ONLY.

BC-	BASEFLOW CHANNEL
BGS-	BOULDER CASCADE STRUCTURE
BGC-	BOULDER GRADE CONTROL
BS-	BED SILL
BSS-	BOULDER STEP STRUCTURE
CCB-	CLAY CHANNEL BLOCK
CP-	CHANNEL PLUG
GCLS-	GRADE CONTROL LOG STRUCTURE
PSP-	PREFORMED SCOUR POOL
R-	CONSTRUCTED RIFFLE
RS-	RIPRAP STABILIZATION
RSS-	ROCK STEP STRUCTURE
WDA-	WETLAND DEPRESSIONAL AREA



BILLING NO. TBD
EG-SWMENG- TBD
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Revisions

HARFORD COUNTY, MARYLAND			
BENNETT PLACE STREAM RESTORATION			
GRADING PLAN			
Drawn By :	PJB	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	10 / 25
Reviewed By :	CAL		
Drawing No.	SR-03 of SR-05	Sheet No.	10 of 44

MATCH LINE - SEE SHEET INSET

MATCH LINE - SEE SHEET SR-04

MERRY HILL COURT

MATCHLINE - SEE SHEET SR-02

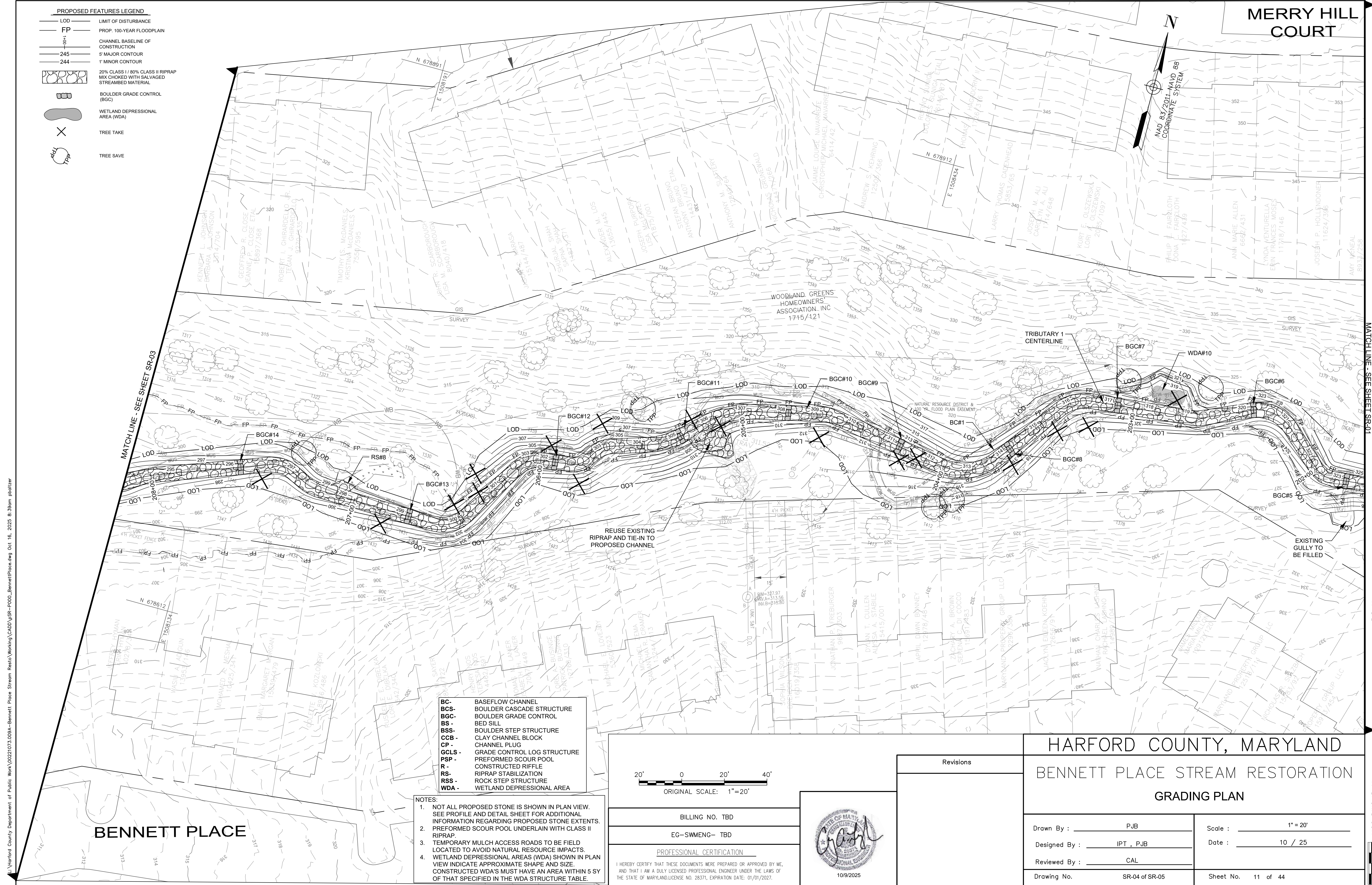
KIRBY CIRCLE

FOXBOROUGH DRIVE

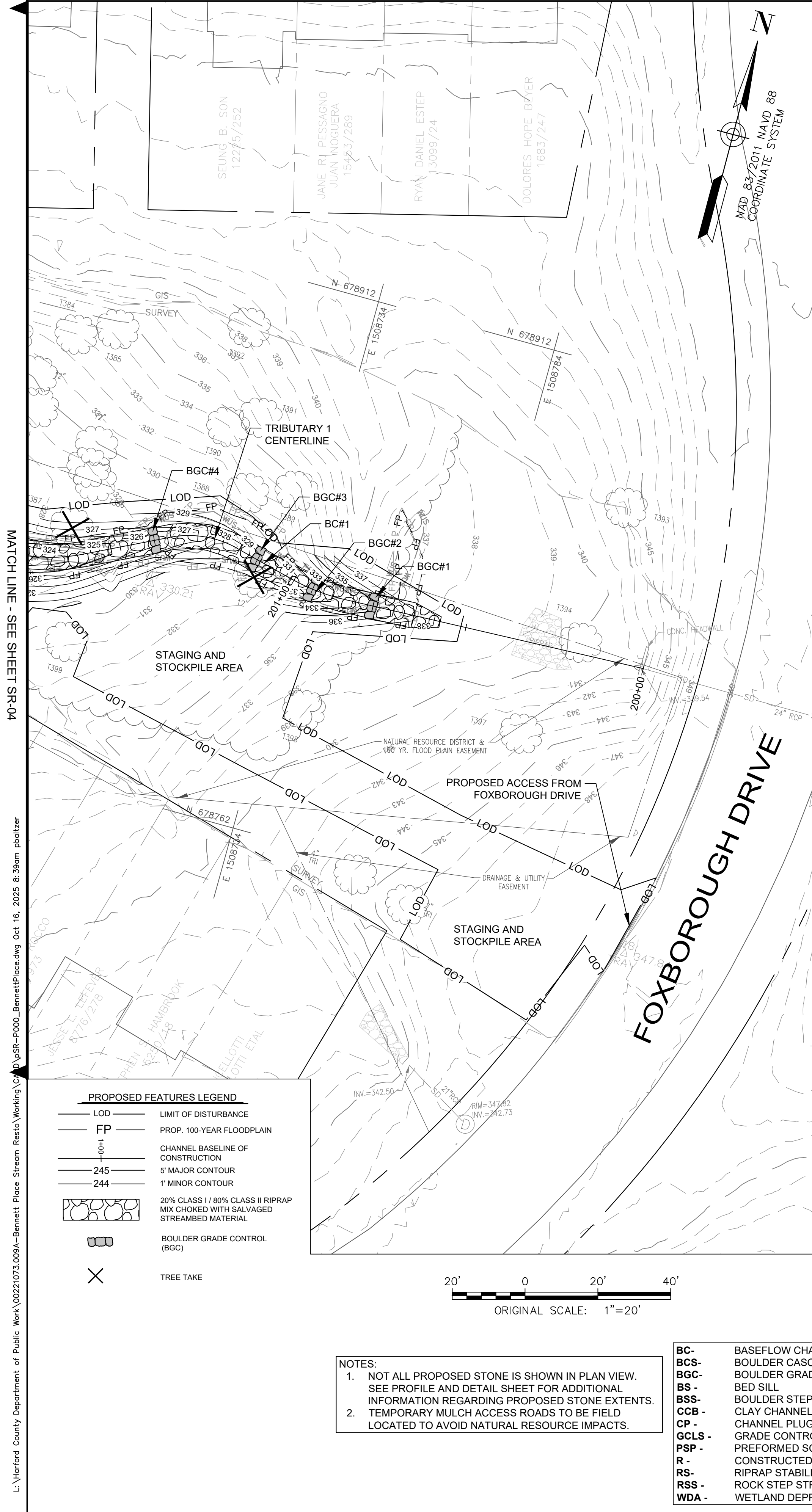
BID No.:

HCG DWG ID No.:









CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
1	N/A	0+24.44	0+46.97	0+50.97
2	0+58.90	0+62.90	0+78.74	0+82.74
3	0+88.53	0+91.53	1+12.35	1+15.35
4	1+21.85	1+24.85	1+44.86	1+48.86
5	1+53.86	1+57.86	1+76.96	1+77.96
6	1+83.63	1+86.63	2+04.01	2+07.01
7	2+11.98	2+14.98	2+30.33	2+33.33
8	2+38.86	2+41.86	2+64.56	2+68.56
9	2+76.37	2+80.37	3+00.40	3+03.40
10	3+10.37	3+13.37	3+29.12	3+32.12
11	3+37.62	3+40.62	3+55.19	3+59.19
12	3+63.81	3+67.81	3+84.02	3+87.02
13	3+94.51	3+97.51	4+12.51	4+15.51
14	4+21.82	4+24.82	4+39.39	4+42.39
15	4+45.71	4+48.71	4+61.71	4+64.71
16	4+66.97	4+69.97	4+88.91	4+92.91
17	4+98.83	5+02.83	5+17.83	5+21.83
18	5+25.02	5+29.02	5+47.70	5+50.70

HABITAT ROUGHNESS FEATURE (HRF)				
HRF#	STA FROM	OFFSET	STA TO	OFFSET
1	0+83.96	15.9 L	1+08.08	22.0 L
2	1+52.11	16.4 R	1+76.11	17.1 R

WETLAND DEPRESSIONAL AREA (WDA)	
WDA #	AREA (SY)
1	18
2	23
3	10
4	10
5	10

PREFORMED SCOUR POOL (PSP)		
PSP #	STA FROM	STA TO
1	0+00.70	0+24.44

RIPRAP STABILIZATION (RS)			
RS#	STA FROM	STA TO	
1	400+66.18	400+98.37	

CLAY CHANNEL BLOCK (CCB)					
CCB#	STA FROM	OFFSET	STA TO	OFFSET	LENGTH
1	1+46.51	20.2 L	1+36.13	8.0 R	36
2	2+73.11	7.5 R	2+73.63	3.8 R	16

ROCK STEP STRUCTURE (RSS)		
RSS#	WEIR STA	WEIR ELEV.
1	300+00.95	331.52
2	300+10.84	330.52

CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
19	5+55.69	5+58.69	5+77.51	5+82.01
20	5+84.97	5+90.97	6+07.43	6+10.43
21	6+14.92	6+17.92	6+39.95	6+43.95
22	6+49.39	6+53.39	6+81.77	6+84.77
23	6+93.62	6+96.62	7+21.62	7+24.62
24	7+31.16	7+34.16	7+63.25	7+66.25
25	7+72.47	7+75.47	7+99.73	8+02.73
26	8+07.87	8+10.87	8+29.56	8+32.56
27	8+35.82	8+38.82	8+63.39	8+66.39
28	8+71.75	8+74.75	8+96.62	8+99.62
29	9+03.62	9+06.62	9+37.31	9+40.31
30	9+48.56	9+51.56	9+73.50	9+76.50
31	9+82.56	9+85.56	10+05.64	10+08.64
32	10+11.72	10+14.72	10+39.68	10+43.68
33	10+49.72	10+53.72	10+77.63	10+80.63
34	10+84.31	10+87.31	11+14.90	N/A

RIPRAP STABILIZATION (RS)		
RS#	STA FROM	STA TO
2	500+71.60	500+88.71
3	600+32.98	600+76.98

BOULDER CASCADE STRUCTURE (BCS)				
BCS#	WEIR STA.	WEIR ELEV.	DROP HEIGHT	POOL LENGTH
1	700+05.50	315.32	5.0	15.5

BED SILL (BS)					
BS#	STA FROM	OFFSET	STA TO	OFFSET	STA TO
1	11+11.83	11.8 L	10.3 R	11+17.70	8.7 L

CHANNEL PLUG (CP)												
CP #	STA OFFSET A	OFFSET	ELEV.	STA OFFSET B	OFFSET	ELEV.	STA OFFSET C	OFFSET	ELEV.	STA OFFSET D	OFFSET	ELEV.
1	8+68.58	14.1 L	314.0'	8+67.82	17.5 L	316.0'	8+66.90	22.2 L	316.0'	8+66.29	26.0 L	314.0'
2	9+38.28	35.8 L	312.0'	9+41.23	32.7 L	314.0'	9+43.65	28.9 L	314.0'	9+44.52	27.5 L	312.0'
3	10+64.66	19.8 L	309.0'	10+68.27	23.9 L	311.0'	10+72.80	29.1 L	311.0'	10+76.45	33.3 L	309.0'
4	11+22.74	22.4 L	308.0'	11+20.88	18.7 L	310.0'	11+18.80	14.1 L	310.0'	11+17.09	10.5 L	308.0'

BASEFLOW CHANNEL (BC)		
BC#	STA FROM	STA TO
1	200+00.00	210+78.85

RIPRAP STABILIZATION (RS)				
RS#	STA FROM	OFFSET	STA TO	OFFSET
4	17+09.56	33.53 L	17+18.18	17.91 L
5	17+88.70	24.84 R	17+90.18	3.5 R

BOULDER GRADE CONTROL (BGC)		
BGC#	WEIR STA.	WEIR ELEV.
5	201+84.30	323
6	202+43.02	320
7	203+07.77	317
8	203+65.63	314
9	204+22.67	311
10	204+77.93	308
11	205+30.92	305
12	205+93.16	302
13	206+73.38	299
14	207+57.65	296

BASEFLOW CHANNEL (BC)		
BC#	STA FROM	STA TO
1	200+00.00	210+78.85

BOULDER GRADE CONTROL (BGC)		
BGC#	WEIR STA.	WEIR ELEV.
1	200+76.16	335
2	200+93.42	332
3	201+10.61	329
4	201+40.45	326

# HARFORD COUNTY, MARYLAND

## BENNETT PLACE STREAM RESTORATION

### GRADING PLAN

Drawn By : PJB

Designed By : IPT, PJB

Reviewed By : CAL

Drawing No. SR-05 of SR-05

Scale : 1" = 20'

Date : 10 / 25

Sheet No. 12 of 44

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

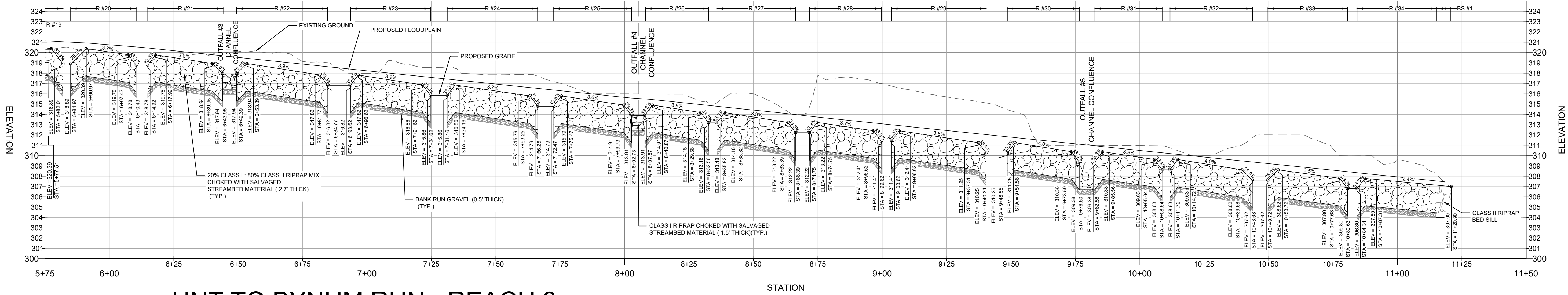
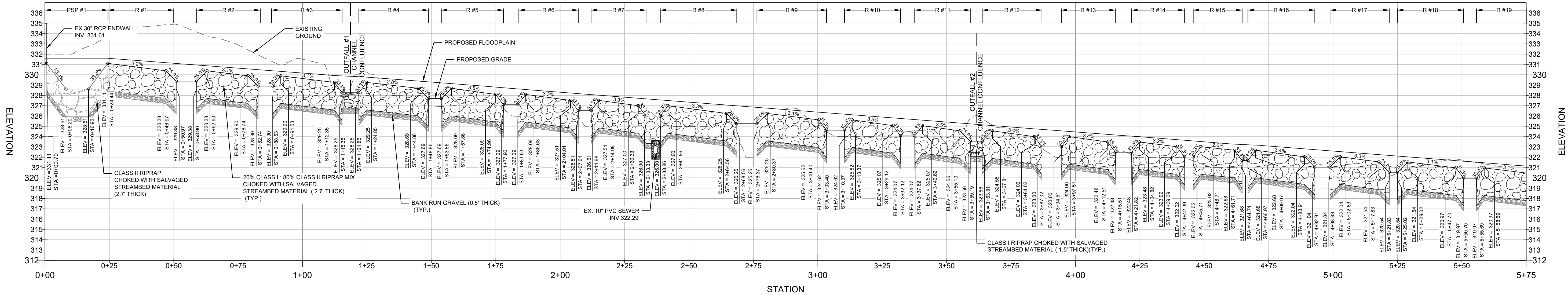
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



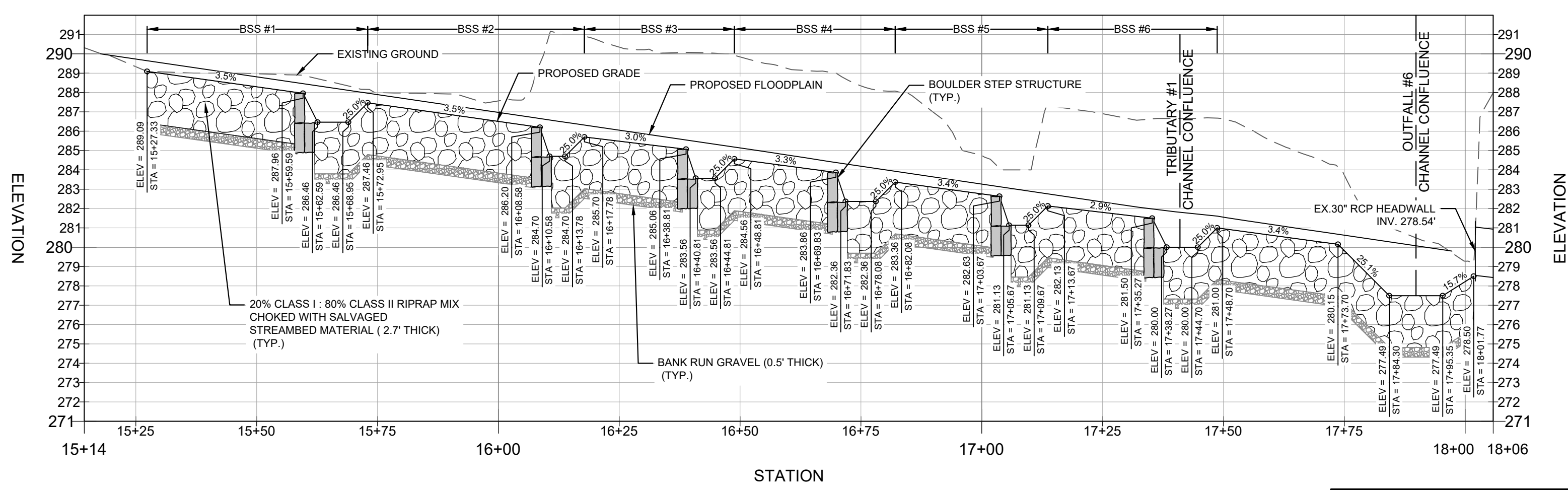
Revisions	



UNT TO BYNUM RUN - REACH 1



UNT TO BYNUM RUN - REACH 3



NOTE: BANK GRADING ONLY IN UNT TO BYNUM RUN REACH 2: NO PROPOSED PROFILE FOR THIS REACH INCLUDED IN PLANS.

BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION
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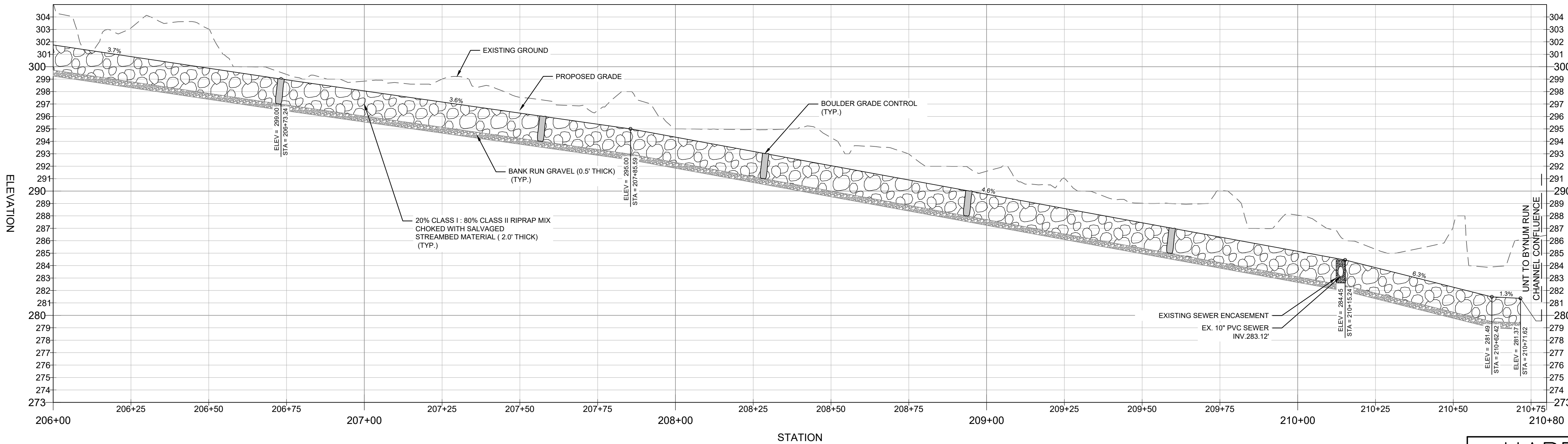
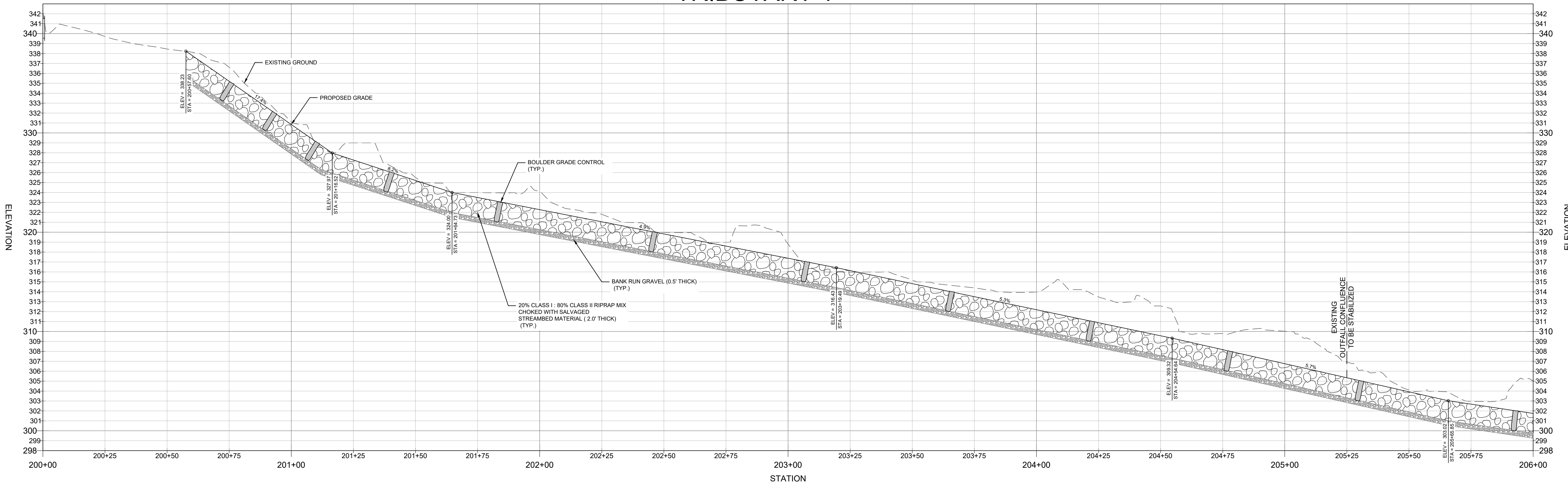


Revisions	

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
PROFILE SHEET	
Drawn By : PJB	Scale : AS SHOWN
Designed By : IPT, PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. PR-01 of PR-03	Sheet No. 13 of 44



TRIBUTARY 1



HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION  
PROFILE SHEET

Drawn By : PJB  
Designed By : IPT, PJB  
Reviewed By : CAL

Scale : AS SHOWN  
Date : 10 / 25

Drawing No. PR-02 of PR-03 Sheet No. 14 of 44

BILLING NO. TBD  
EG-SWMENG- TBD  
PROFESSIONAL CERTIFICATION  
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AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF  
THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.

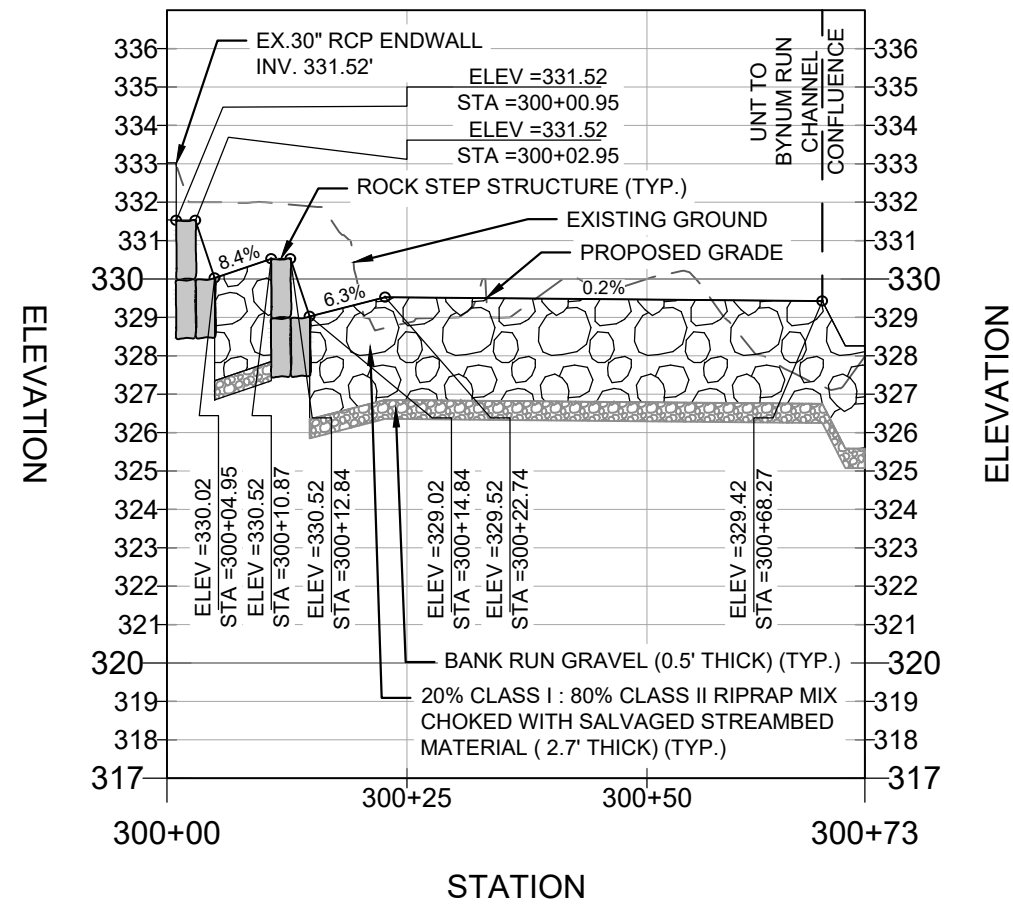


Revisions	

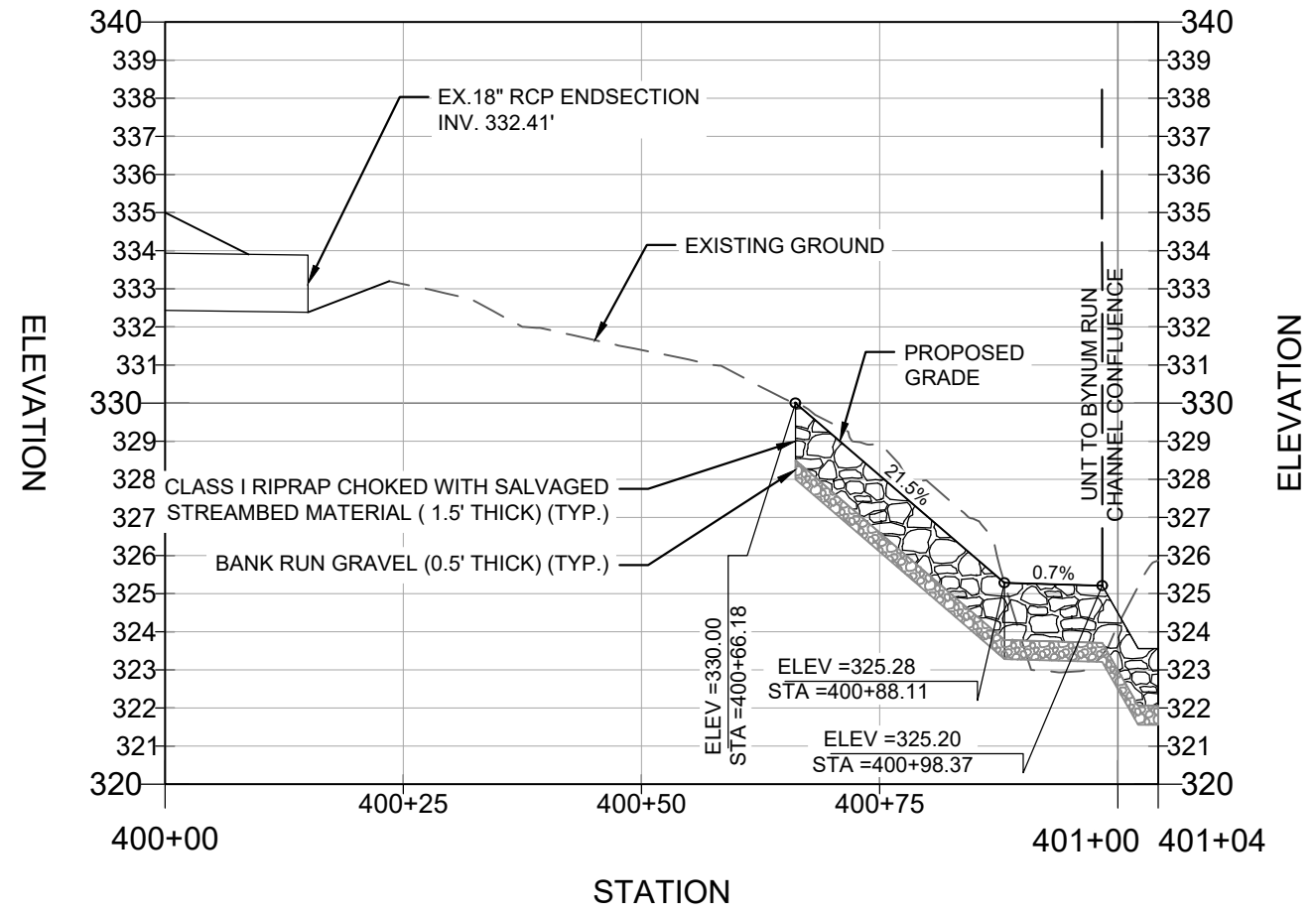


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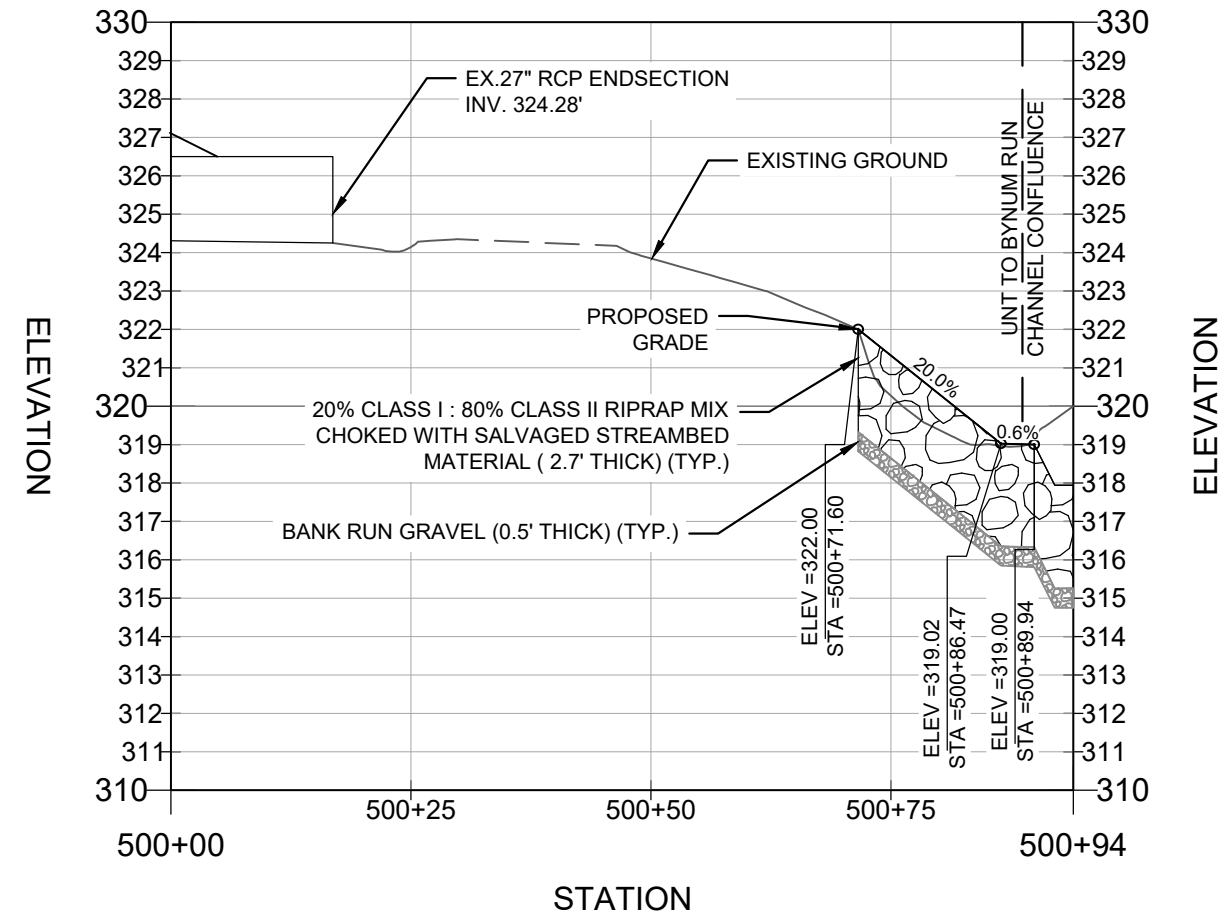
## OUTFALL #1



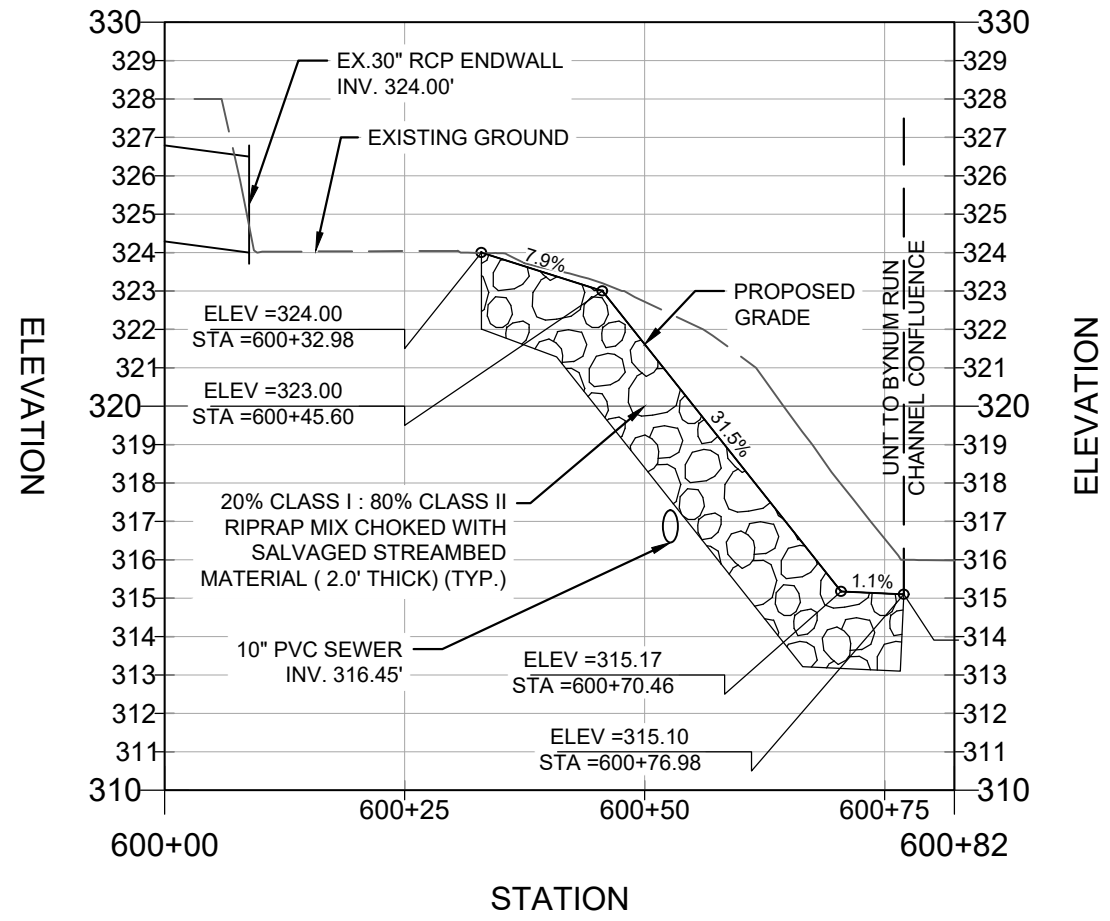
## OUTFALL #2



## OUTFALL #3

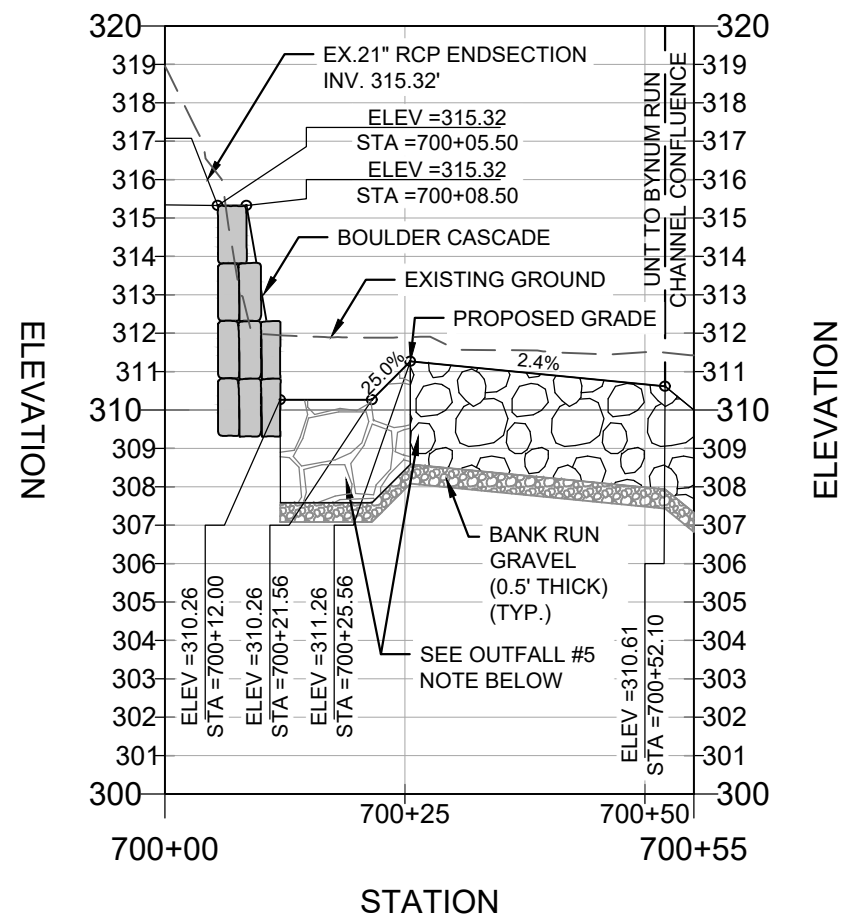


## OUTFALL #4



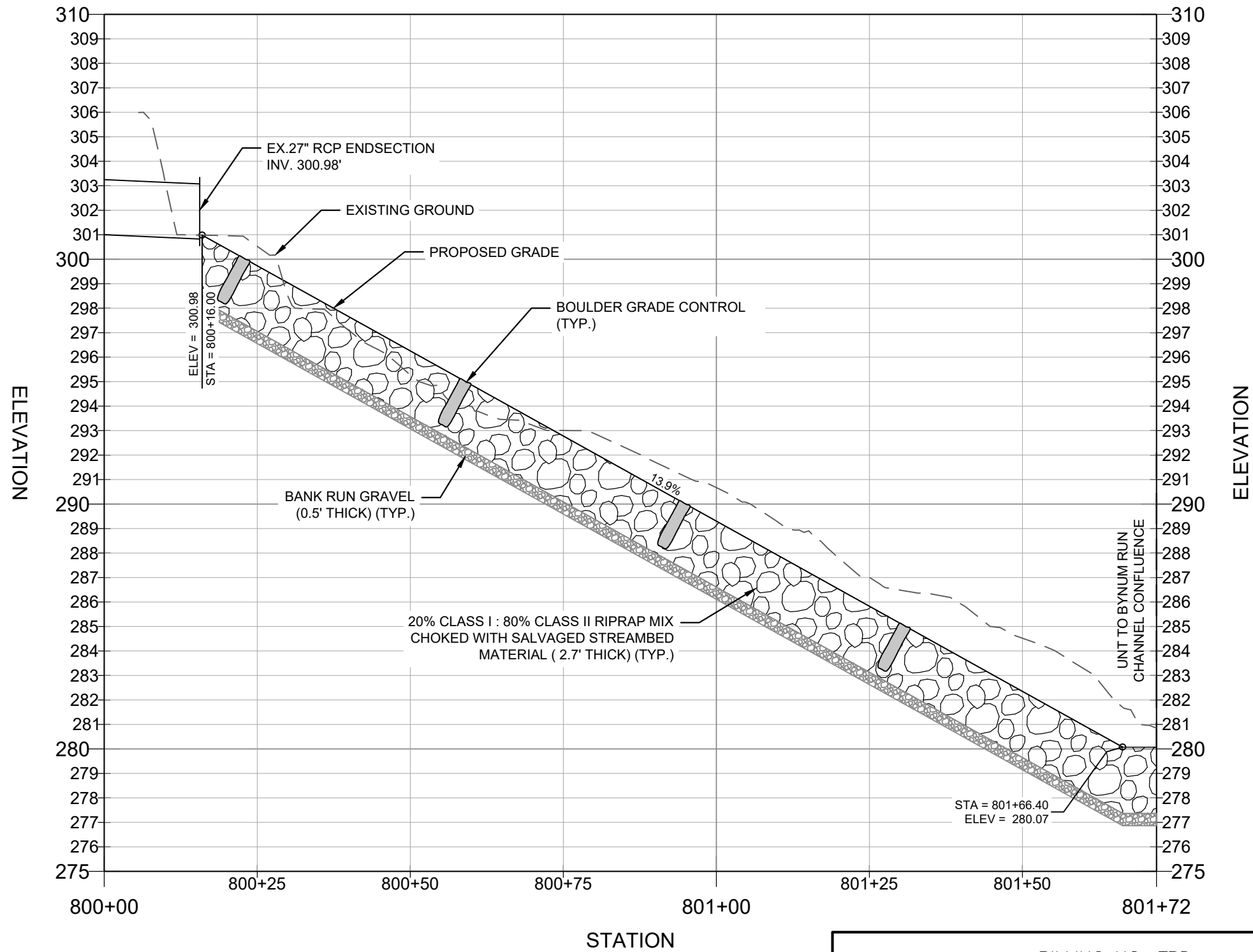
OUTFALL #4 NOTE:  
GEOTEXTILE CLASS SE NONWOVEN IS TO  
BE USED IN PLACE OF BANK RUN GRAVEL  
ALONG OUTFALL #4 DUE TO PROXIMITY TO  
THE SEWER LINE.

## OUTFALL #5

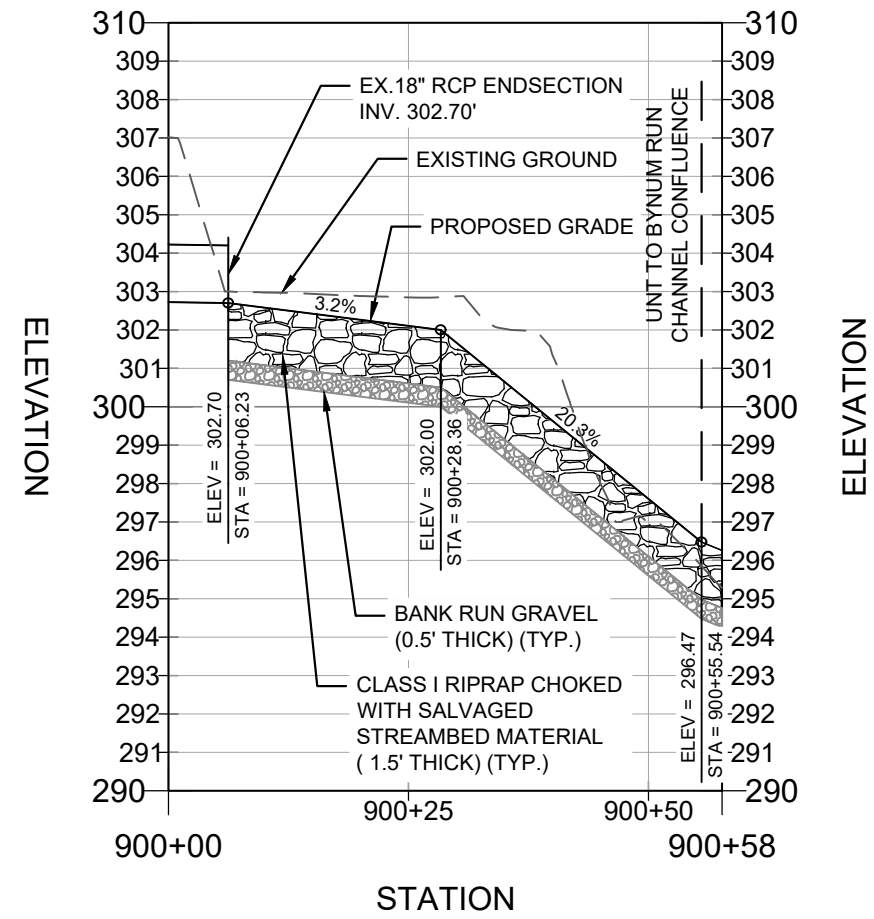


OUTFALL #5 NOTE:  
BED MATERIALS FOR OUTFALL #5  
CHANNEL ARE AS FOLLOWS:  
  
STA 700+12.00 - STA 700+25.56  
CLASS II RIPRAP CHOKED WITH SALVAGED  
STREAMBED MATERIAL (2.7' THICK)  
  
STA 700+25.56 - STA 700+52.10  
20% CLASS I RIPRAP - 80% CLASS II RIPRAP  
CHOKED WITH SALVAGED STREAMBED  
MATERIAL (2.7' THICK)

## OUTFALL #6



## OUTFALL #7



20' 0 20' 40'  
ORIGINAL SCALE: 1"=20'

10' 5' 0 5' 10'  
ORIGINAL SCALE: 1"=5'

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

PROFILE SHEET

Drawn By : PJB

Scale : AS SHOWN

Designed By : IPT, PJB

Date : 10 / 25

Reviewed By : CAL

Drawing No. PR-03 of PR-03

Sheet No. 15 of 44

BILLING NO. TBD

EG-SWMENG- TBD

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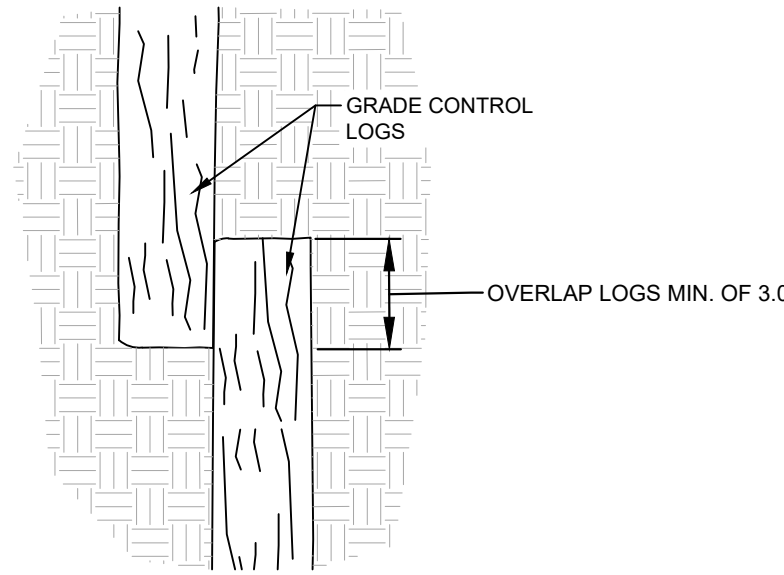
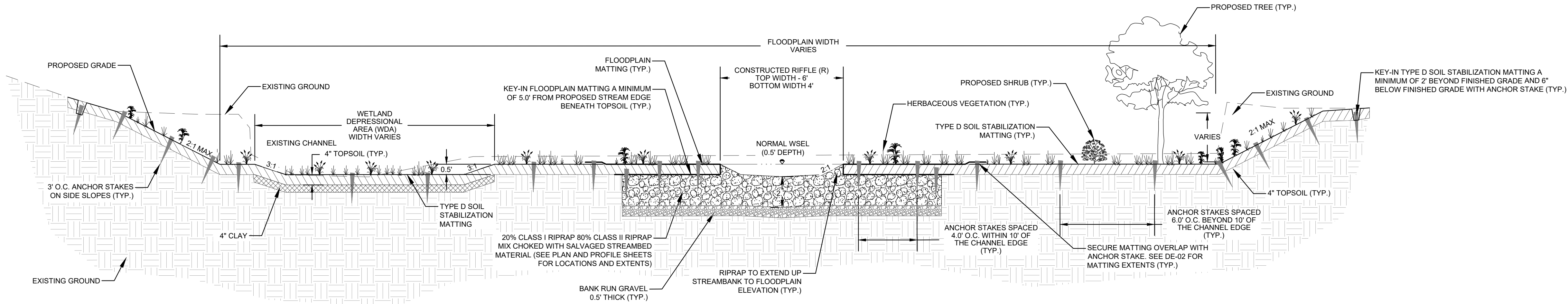
10/9/2025

BID No.:

HCG DWG ID No.:



FLOODPLAIN RESTORATION DETAILS - UNT TO BYNUM RUN (REACH 1)

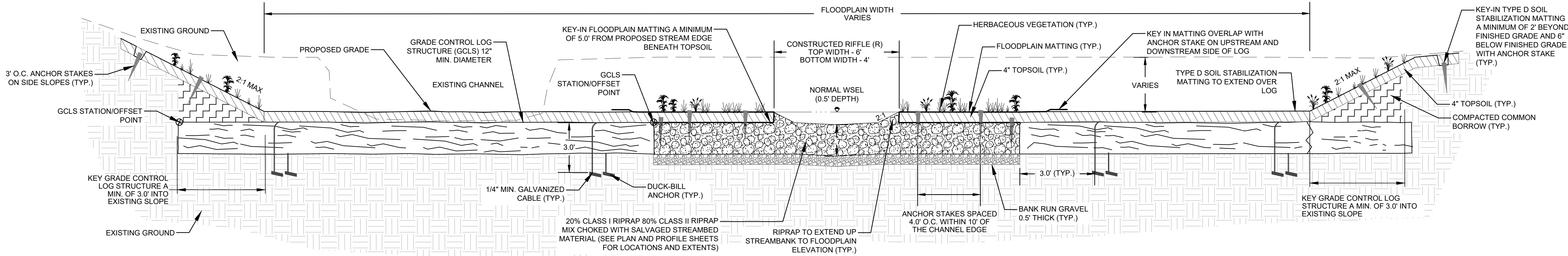


GRADE CONTROL LOG OVERLAP - PLAN VIEW

NOTE: SEE TYPICAL SECTION DE-01 FOR INFORMATION ON TOPSOIL AND FLOODPLAIN MATTING PLACEMENT.

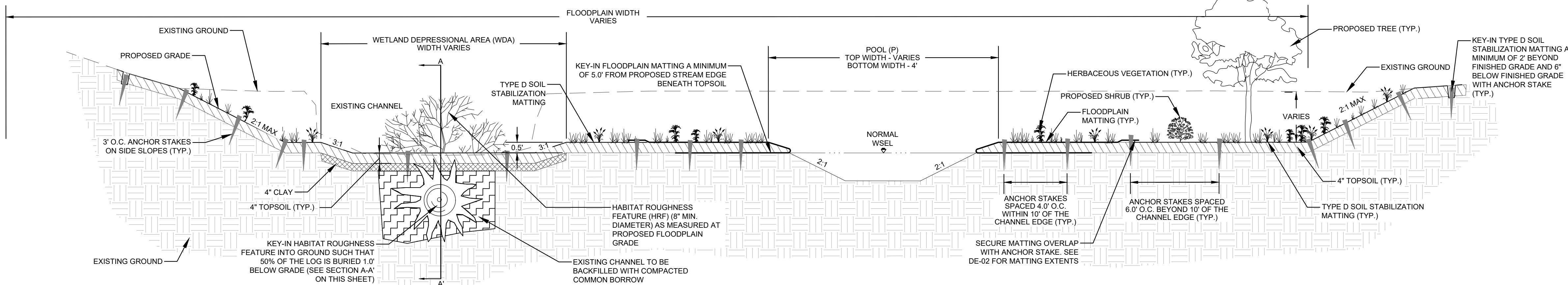
FLOODPLAIN RESTORATION WITH CONSTRUCTED RIFFLE (R) & WETLAND DEPRESSIONAL AREA (WDA) - UNT TO BYNUM RUN REACH 1 - TYPICAL SECTION VIEW

NOT TO SCALE



FLOODPLAIN RESTORATION WITH CONSTRUCTED RIFFLE (R) & GRADE CONTROL LOG STRUCTURE (GCLS) - UNT TO BYNUM RUN REACH 1 - TYPICAL SECTION VIEW

NOT TO SCALE

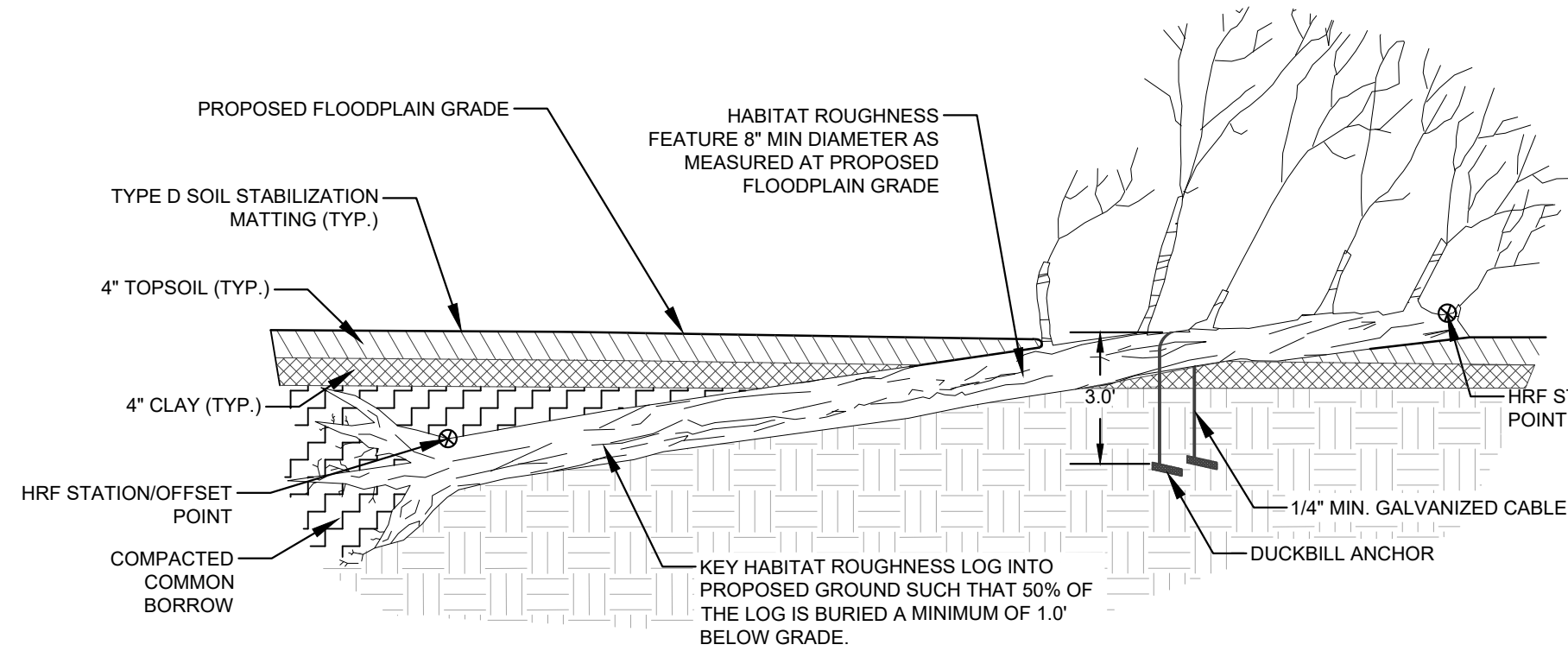


FLOODPLAIN RESTORATION WITH POOL AND WETLAND DEPRESSIONAL AREA (WDA) - UNT TO BYNUM RUN REACH 1 - TYPICAL SECTION VIEW

NOT TO SCALE

NOTES:

- ANCHOR STAKES SHALL BE SPACED 4.0' O.C. WITHIN 10' OF CHANNEL EDGE, OVER SUBGRADE RIPRAP, AND 2.0' O.C. ALONG ALL SEAMS. ANCHOR STAKES SHALL BE SPACED 6.0' O.C. THROUGHOUT THE REST OF THE FLOODPLAIN AND 3.0' O.C. ON SIDE SLOPES.
- WHERE MORE THAN ONE LOG IS NEEDED FOR GRADE CONTROL LOG STRUCTURES, OVERLAP LOGS A MINIMUM OF 3.0' AT OVERLAPPING JOINT.
- SEEDING MUST OCCUR PRIOR TO PLACEMENT OF TYPE D SOIL STABILIZATION MATTING AND/OR FLOODPLAIN MATTING.
- ALL MATTING SHALL OVERLAP IN A DOWN VALLEY OR DOWNSTREAM DIRECTION.
- GRADE CONTROL LOG STRUCTURES (GCLS) ARE TO BE PLACED
- PERPENDICULAR TO THE VALLEY AS SHOWN ON THE PLAN AND AT THE DIRECTION OF THE ENGINEER.
- WHEN PLACING RIPRAP MIX, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SALVAGED STREAMBED MATERIAL SHALL BE WASHED INTO THE RIPRAP MIX TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED.
- STATION/OFFSET POINTS REFER TO GRADE CONTROL LOG STRUCTURE AND HABITAT ROUGHNESS FEATURE.



HABITAT ROUGHNESS FEATURE (HRF) KEY-IN SECTION A-A'

HABITAT ROUGHNESS FEATURE NOTE: ORIENT HABITAT ROUGHNESS FEATURES SUCH THAT THE BRANCHING IS DOWN VALLEY OF THE ROOTWAD. SEE PLAN SHEETS FOR HRF LOCATIONS.

NOT TO SCALE

BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.

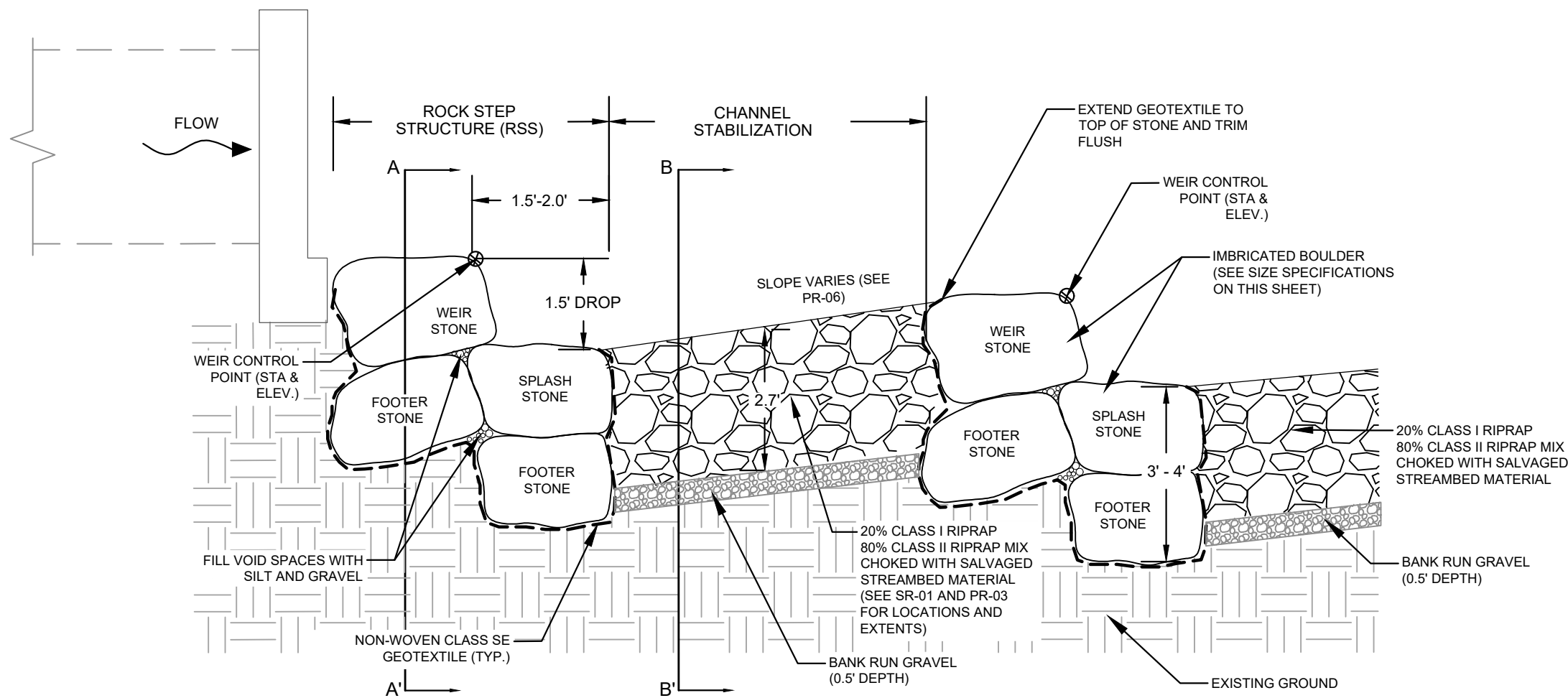


Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
DETAIL SHEET	
Drawn By : <u>PJB</u>	Scale : <u>N/A</u>
Designed By : <u>IPT , PJB</u>	Date : <u>10 / 25</u>
Reviewed By : <u>CAL</u>	
Drawing No. <u>DE-01 of DE-06</u>	Sheet No. <u>16 of 44</u>



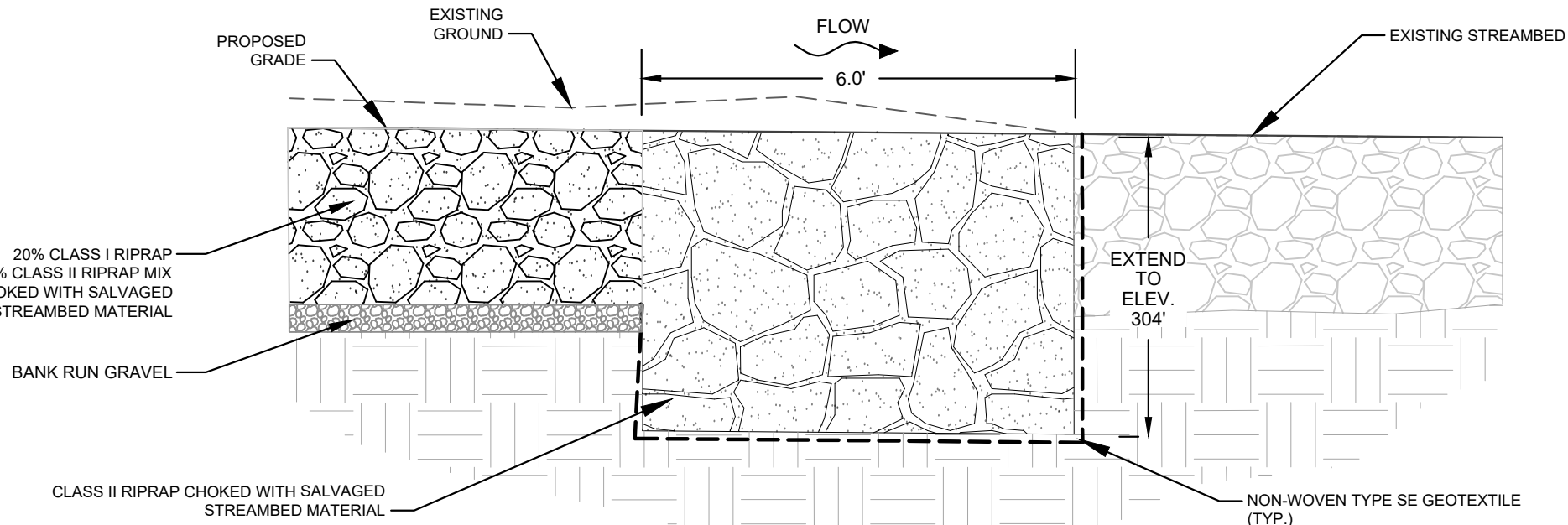
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ROCK STEP STRUCTURE (RSS) - PROFILE VIEW

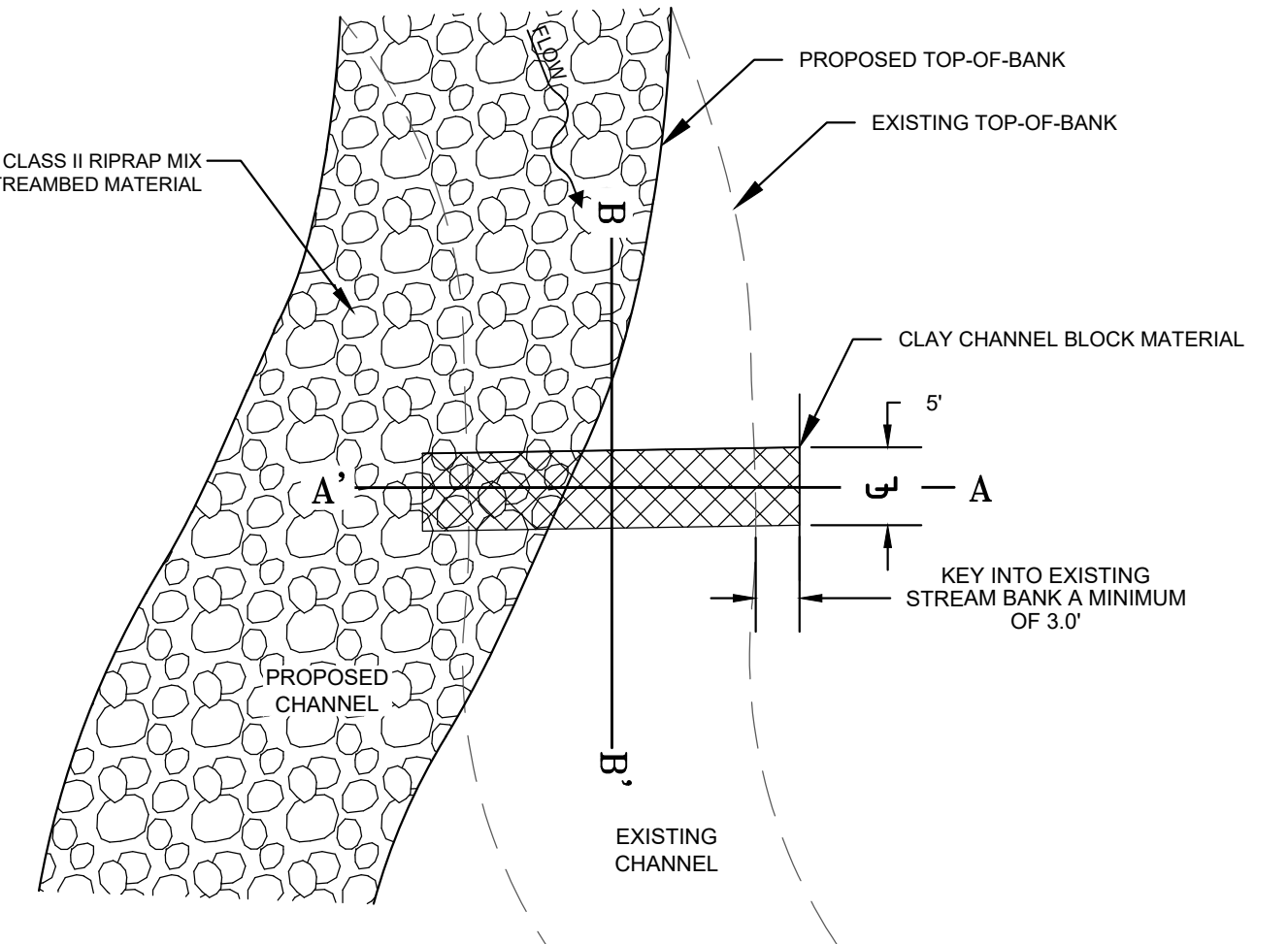
NOTE: REFER TO GRADING PLAN SHEETS (SR-01) FOR LOCATIONS OF ROCK STEP STRUCTURES.

NOT TO SCALE



BED SILL (BS) - UNT TO BYNUM RUN REACH 1 - PROFILE VIEW

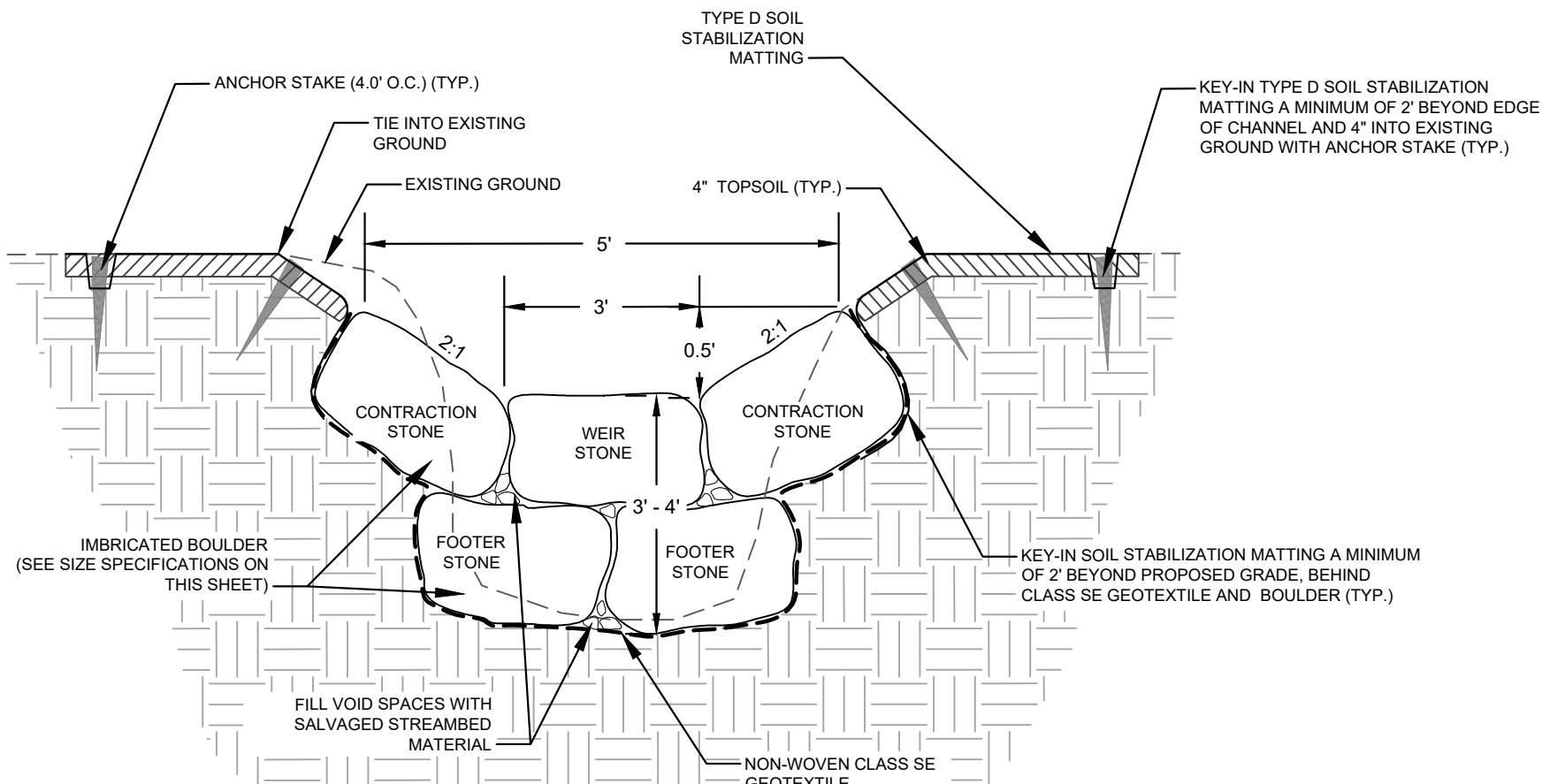
NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) - PLAN VIEW

NOTE: SEE CLAY CHANNEL BLOCK CROSS-SECTION DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION REGARDING SUBGRADE CONSTRUCTION.

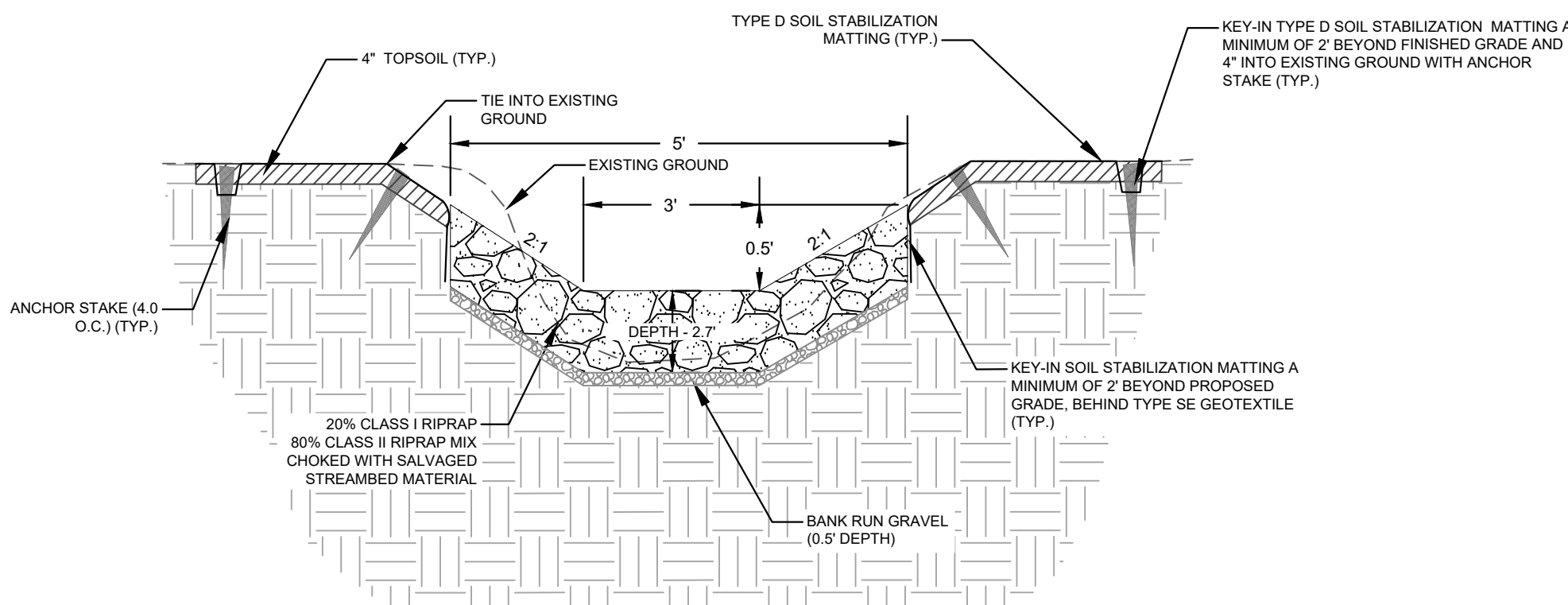
NOT TO SCALE



ROCK STEP STRUCTURE (RSS) - WEIR / SPLASH STONE (SECTION A-A')

NOTE: REFER TO GRADING PLAN SHEETS (SR-01) FOR LOCATIONS OF ROCK STEP STRUCTURES.

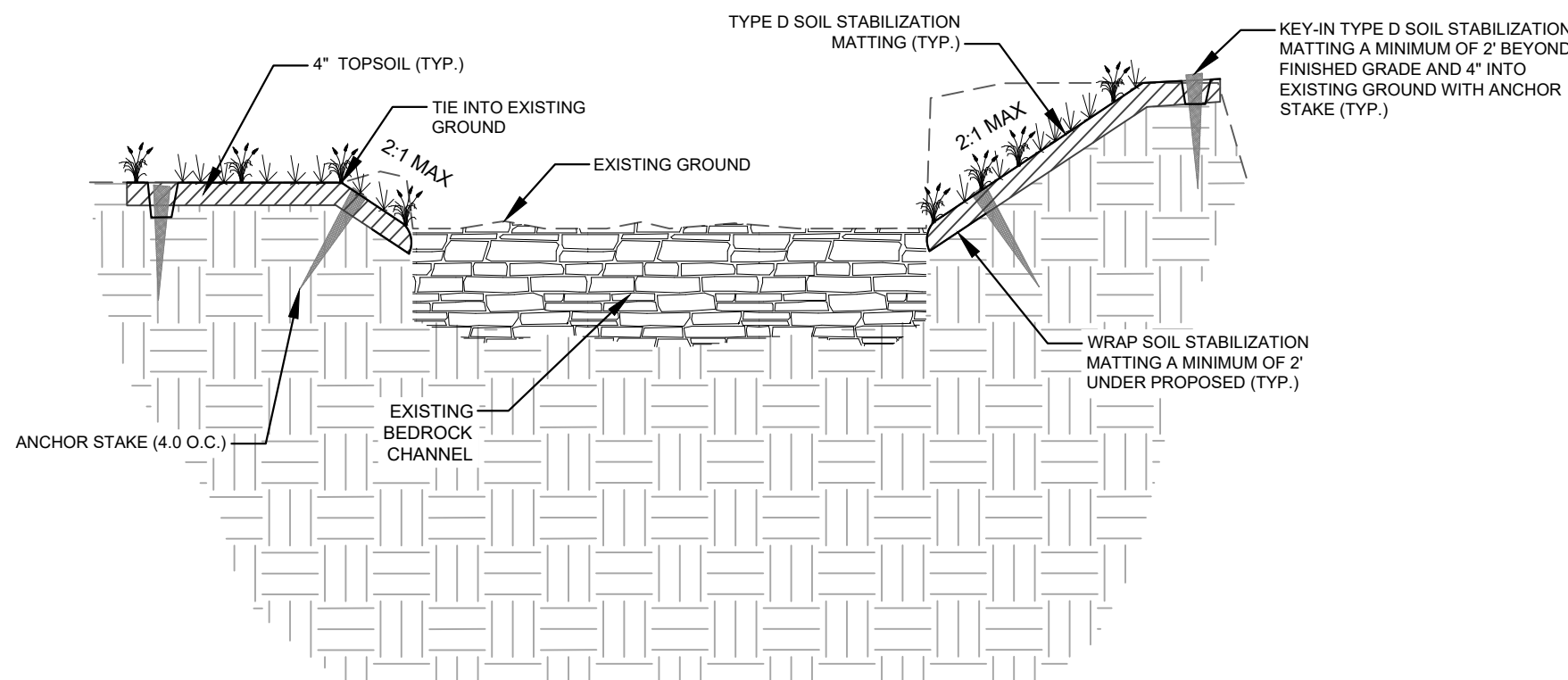
NOT TO SCALE



ROCK STEP STRUCTURE (RSS) - CHANNEL STABILIZATION (SECTION B-B')

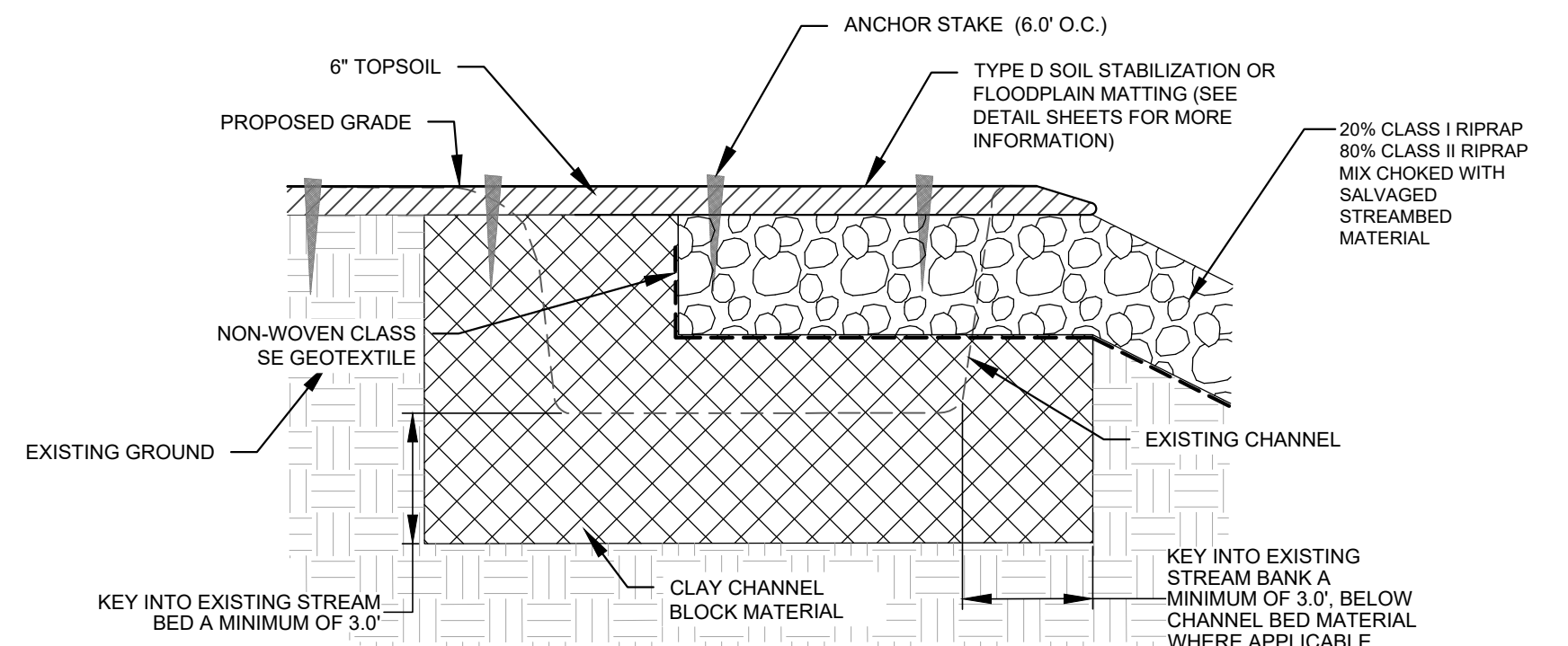
NOTE: CHANNEL TO TRANSITION TO 0.5' BANK HEIGHTS ALONG FLOODPLAIN.

NOT TO SCALE



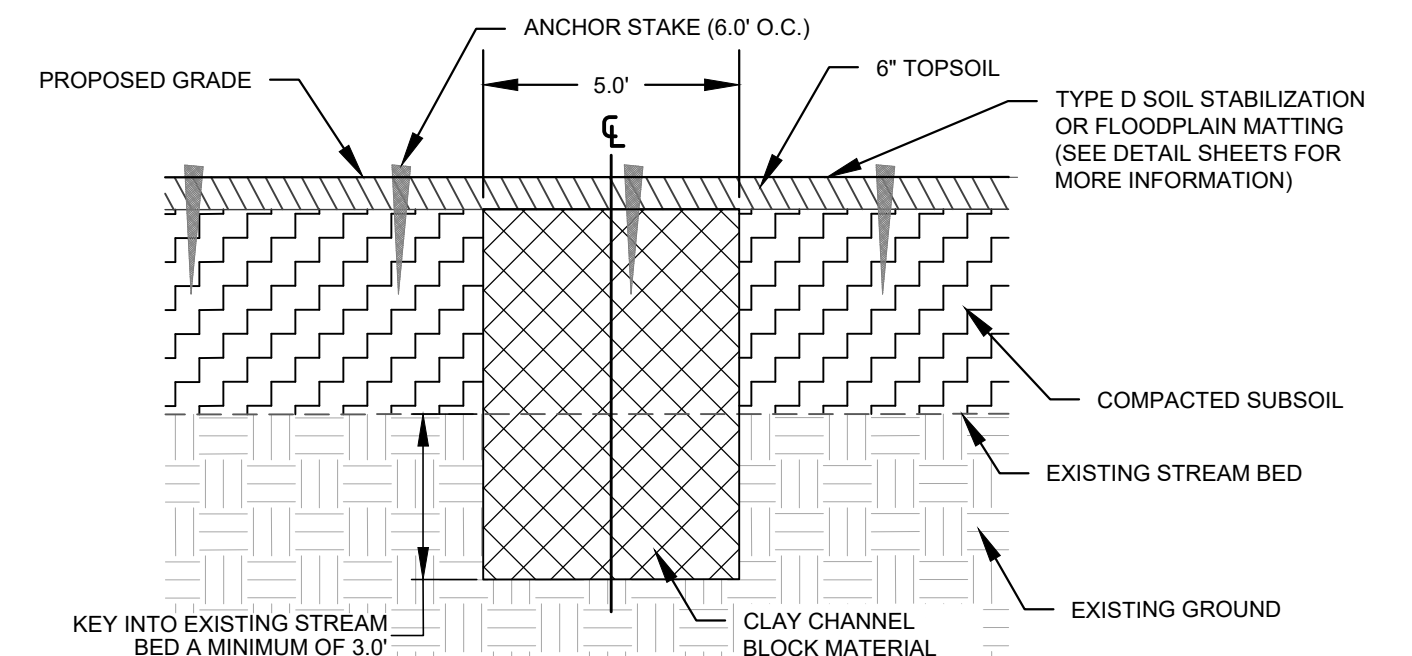
BANK STABILIZATION ONLY ALONG BEDROCK CHANNEL  
UNT TO BYNUM RUN REACH 2 - TYPICAL SECTION

NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) - CROSS SECTION A-A'

NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) - CROSS SECTION B-B'

NOT TO SCALE

- NOTES:
- ALL TYPICAL SECTIONS ARE AS VIEWED FACING DOWNSTREAM
  - ANCHOR STAKES SHALL BE SPACED 4.0' O.C. WITHIN 10' OF CHANNEL EDGE, OVER SUBGRADE RIPRAP, AND ALONG ALL SEAMS. ANCHOR STAKES SHALL BE SPACED 6.0' O.C. IN ALL OTHER LOCATIONS.
  - SEEDING MUST OCCUR PRIOR TO PLACEMENT OF TYPE D SOIL STABILIZATION MATTING AND/OR FLOODPLAIN MATTING.
  - WHEN PLACING RIPRAP MIX, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SALVAGED STREAMBED MATERIAL SHALL BE WASHING INTO THE RIPRAP TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED.

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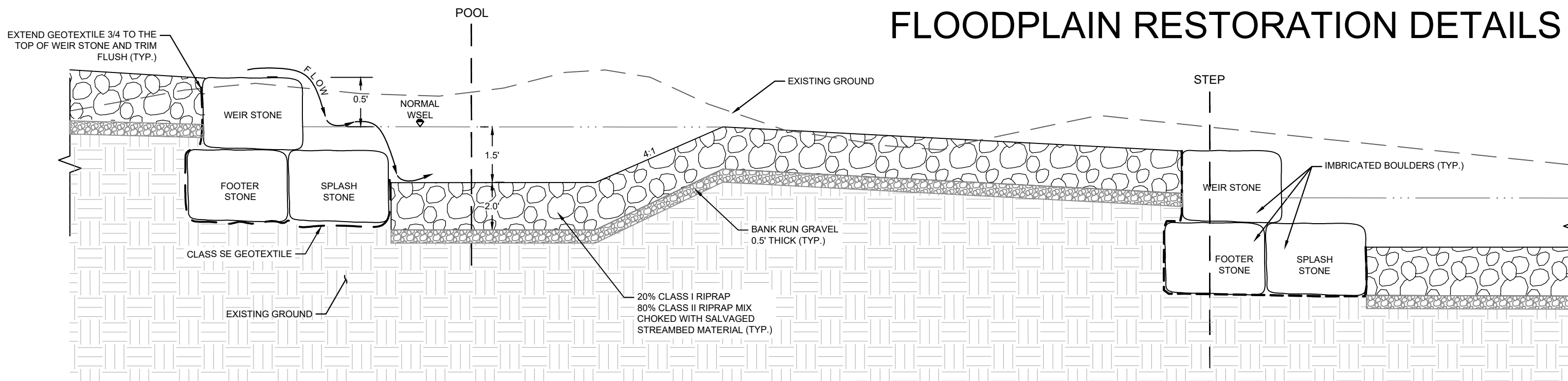


Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
DETAIL SHEET	
Drawn By : PJB	Scale : N/A
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. DE-02 of DE-06	Sheet No. 17 of 44



## FLOODPLAIN RESTORATION DETAILS - UNT TO BYNUM RUN (REACH 3)

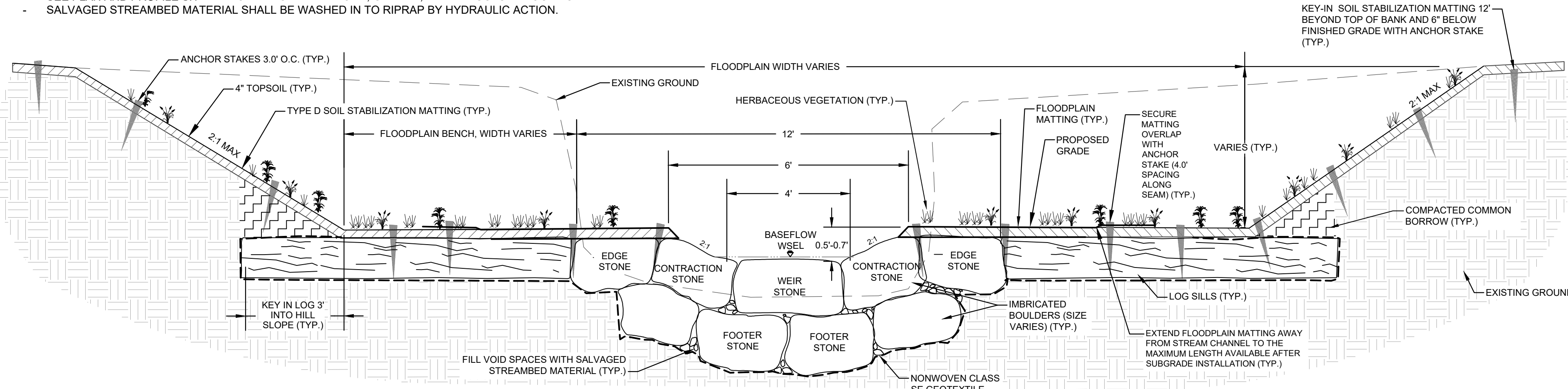


BOULDER STEP STRUCTURE (BSS) - UNT TO BYNUM RUN REACH 3 - PROFILE VIEW A-A

NOTES:

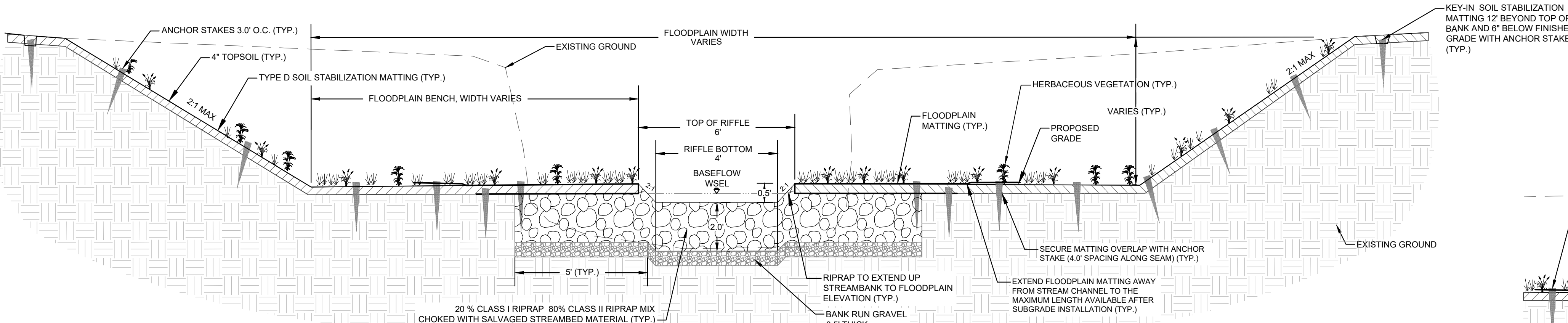
- SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS.
- SALVAGED STREAMBED MATERIAL SHALL BE WASHED IN TO RIPRAP BY HYDRAULIC ACTION.

NOT TO SCALE

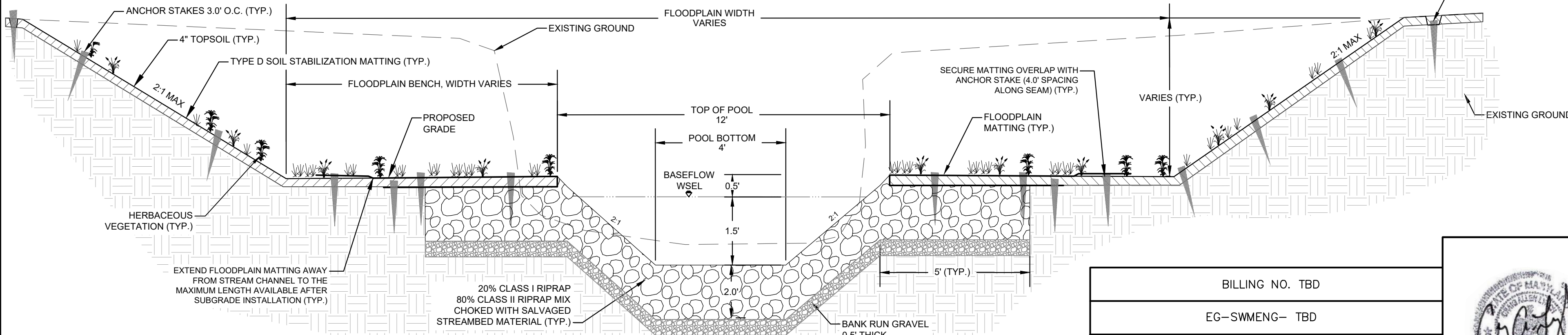


BOULDER STEP STRUCTURE (BSS) - UNT TO BYNUM RUN REACH 3 - SECTION VIEW E-E' (STEP)

NOT TO SCALE



BOULDER STEP STRUCTURE (BSS) - UNT TO BYNUM RUN REACH 3 - SECTION VIEW D-D' (RIFFLE



BOULDER STEP STRUCTURE (BSS) - UNT TO BYNUM RUN REACH 3 - SECTION VIEW C-C' (POOL)

NOT TO SCALE

BILLING NO. TB

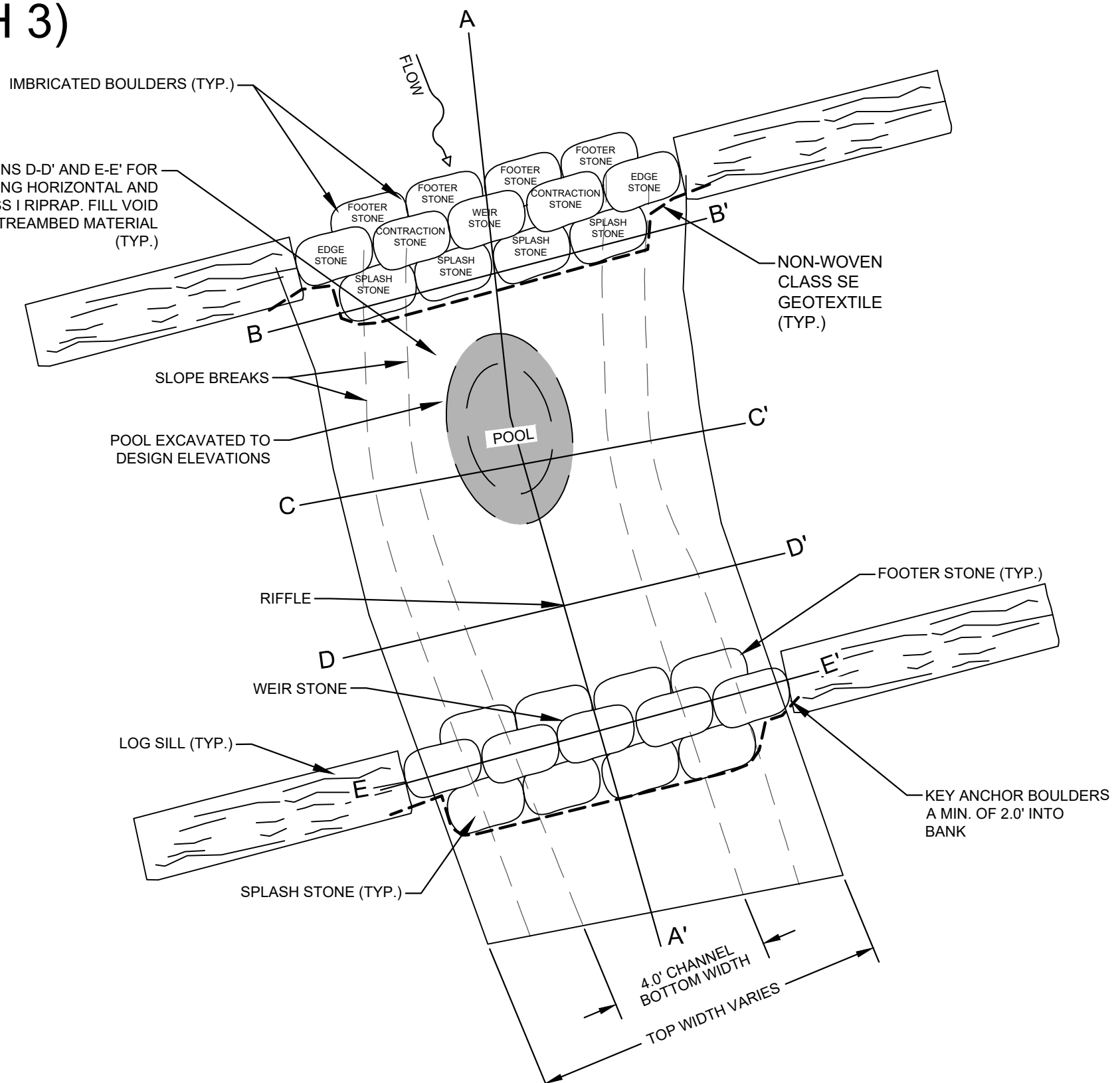
EG-SWMENG- TBI

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AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF  
THE STATE OF MARYLAND. LICENSE NO. 28371. EXPIRATION DATE: 01/01/2027.



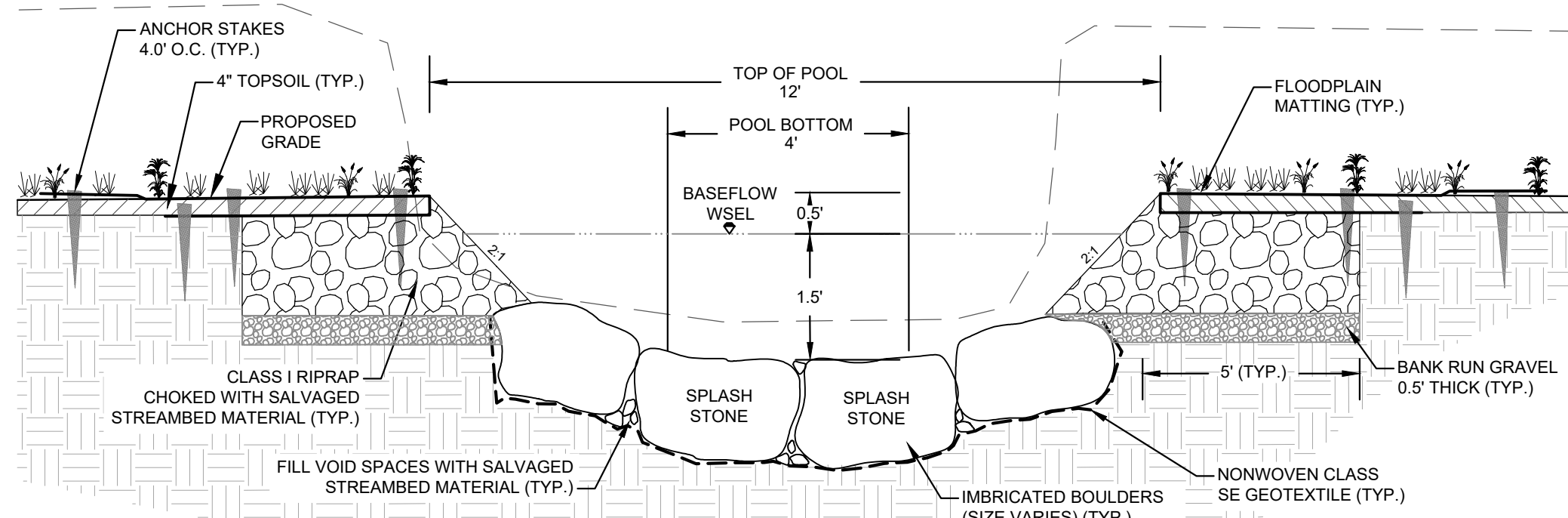
10/9/202



BOULDER STEP STRUCTURES (BSS) - UNT TO BYNUM RUN REACH 3 - PLAN VIEW

NOTE: SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS

NOT TO SCALE



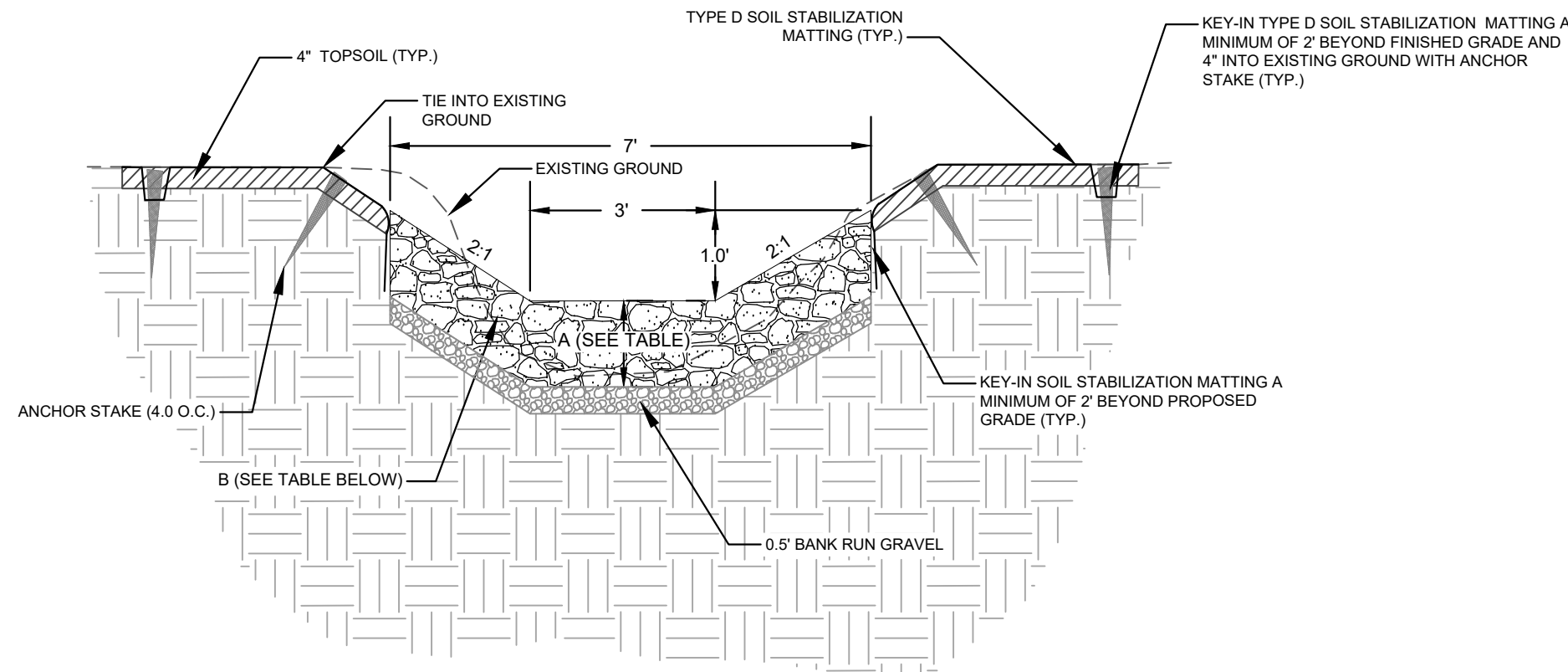
BOULDER STEP STRUCTURE (BSS) - UNT TO BYNUM RUN REACH 3 - SECTION VIEW B-B' (POOL WITH SPLASH STONE)

NOT TO SCALE

		HARFORD COUNTY, MARYLAND	
Revisions		BENNETT PLACE STREAM RESTORATION	
		DETAIL SHEET	
		Drawn By : _____ PJB Designed By : _____ IPT, PJB Reviewed By : _____ CAL	Scale : _____ N/A Date : _____ 10 / 25
		Drawing No. DE-03 of DE-06	Sheet No. 18 of 44



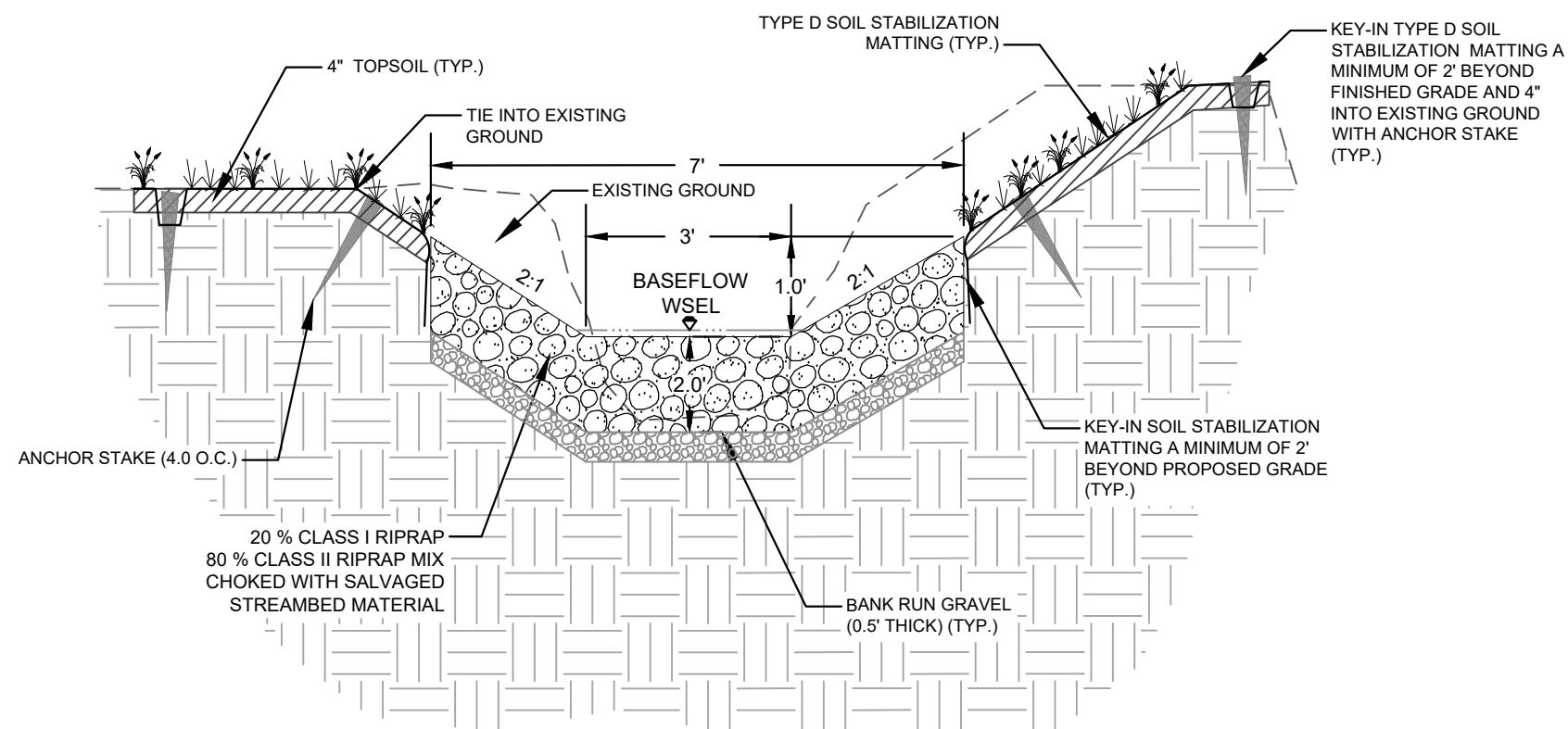
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RIPRAP STABILIZATION (RS) - SLOPE SECTION

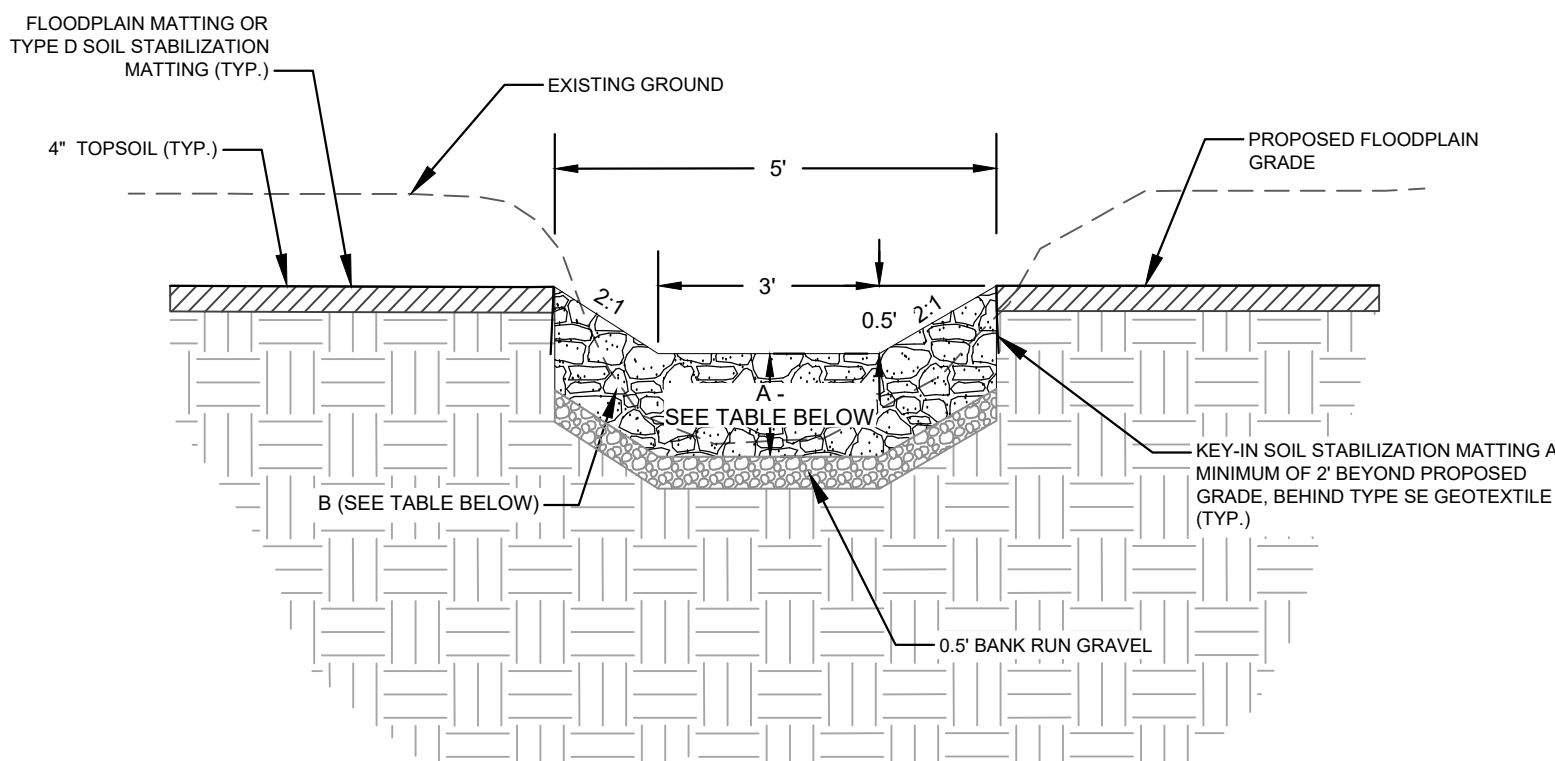
NOTE: RS#3 ON OUTFALL #4 TO HAVE TYPE SE GEOTEXTILE IN PLACE OF BANK RUN GRAVEL.

NOT TO SCALE



BASEFLOW CHANNEL (BC) - TRIBUTARY 1 - TYPICAL SECTION

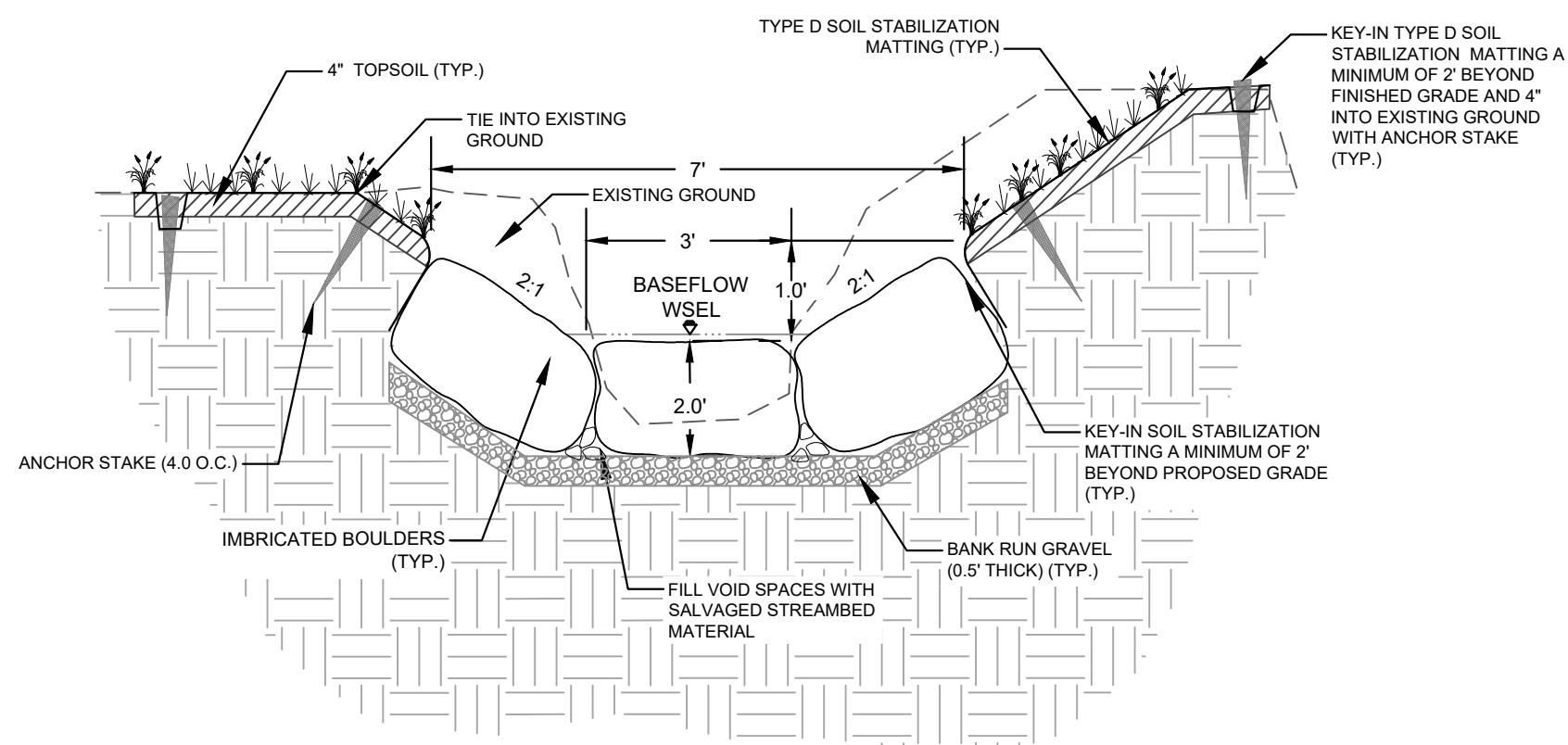
NOT TO SCALE



RIPRAP STABILIZATION (RS) - RECEIVING CHANNEL SECTION

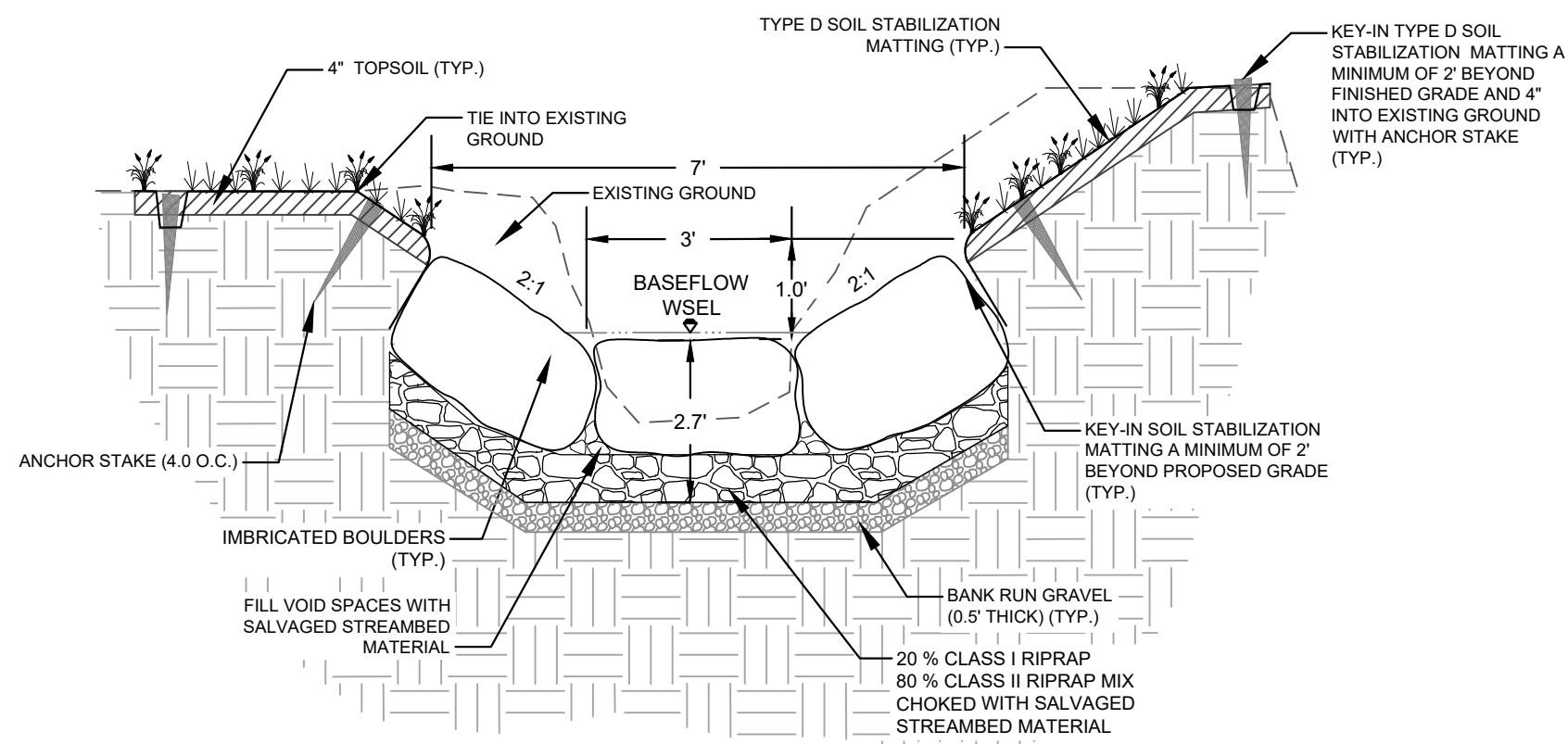
NOTE: RS#3 ON OUTFALL #4 TO HAVE TYPE SE GEOTEXTILE IN PLACE OF BANK RUN GRAVEL.

NOT TO SCALE



BOULDER GRADE CONTROL (BGC) - TRIBUTARY 1 TYPICAL SECTION

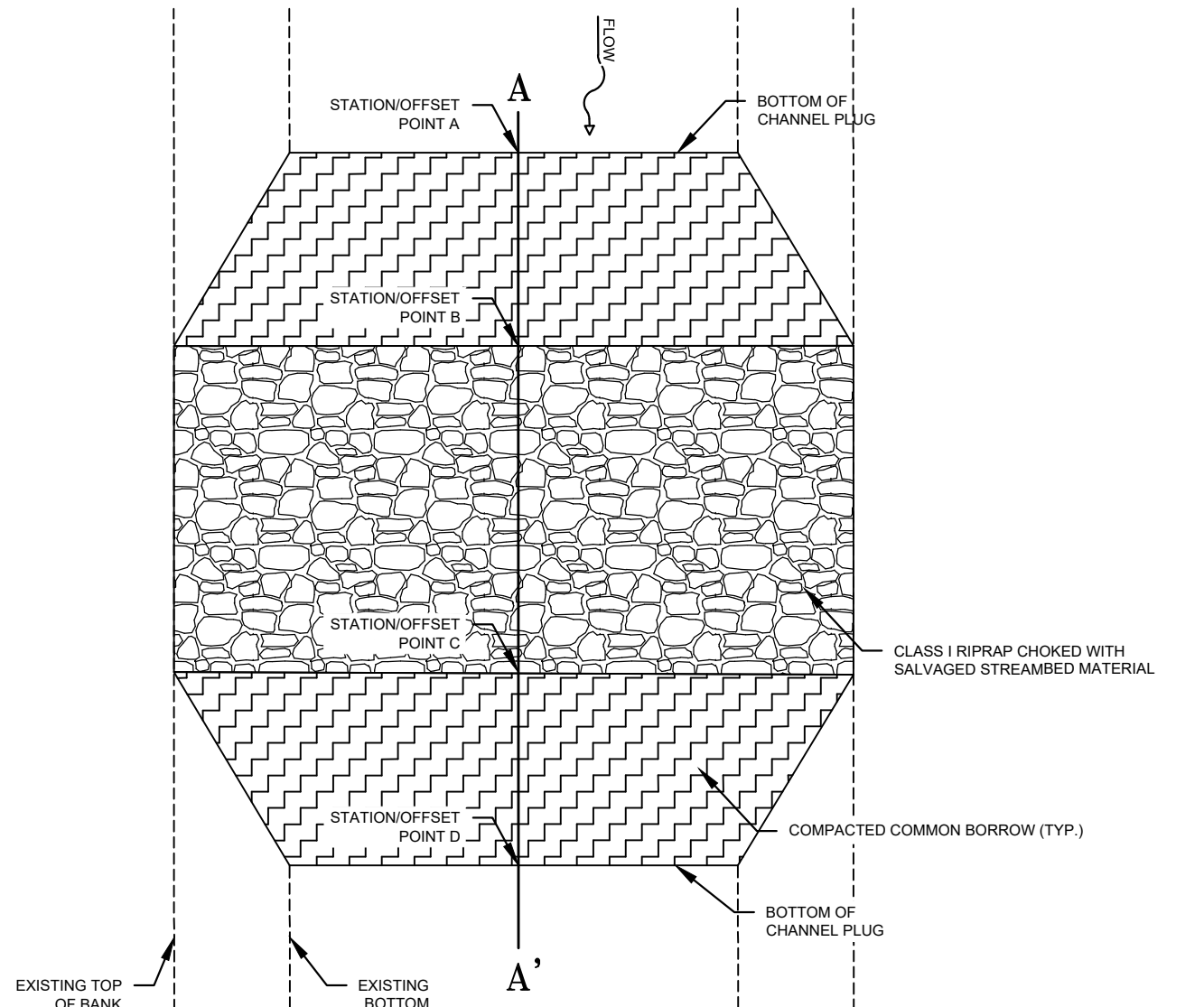
NOT TO SCALE



BOULDER GRADE CONTROL (BGC) - OUTFALL #6 TYPICAL SECTION

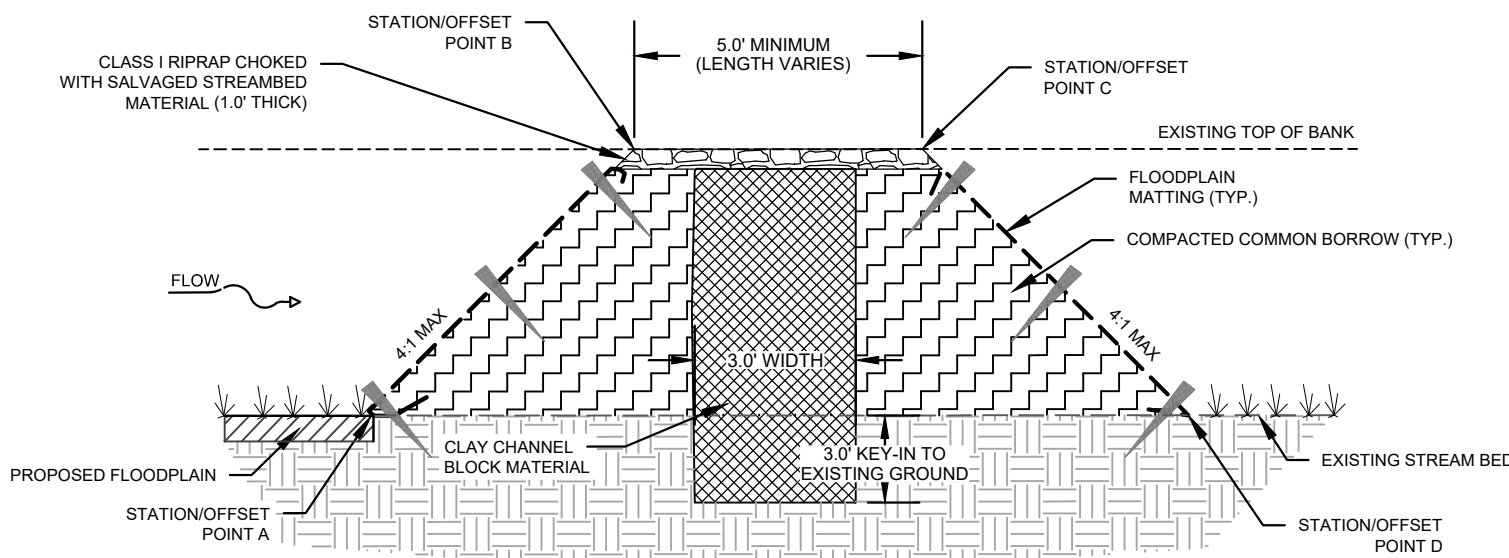
NOTES: DEPTH OF RIPRAP MIX IS DEPENDANT ON THE HEIGHT OF THE IMBRICATED BOULDER (SEE IMBRICATED BOULDER SPECIFICATION ON SHEET DE-06 FOR ACCEPTABLE RANGE OF BOULDER HEIGHTS) . TOTAL DEPTH BGC & RIPRAP MIX TO TOTAL 2.7'

NOT TO SCALE



CHANNEL PLUG (CP) - PLAN VIEW

NOT TO SCALE



CHANNEL PLUG (CP) - CROSS SECTION A-A'

NOT TO SCALE

CHANNEL PLUG SEQUENCE OF CONSTRUCTION:  
1) EXCAVATE EXISTING STREAM BED TO INSTALL THE CLAY CHANNEL BLOCK MATERIAL.  
2) BACKFILL OVER THE CLAY CHANNEL BLOCK MATERIAL WITH COMPACTED COMMON BORROW.  
3) INSTALL SOIL STABILIZATION MATTING AND CHANNEL BED MATERIAL AS SHOWN.

NOTES:  
1) STATION OFFSET POINTS A & D TIE-IN TO THE EXISTING STREAMBED AND TOE OF SLOPE.  
2) STATION OFFSET POINTS B & C TIE-IN TO THE TOP OF BANK.  
3) CLAY CHANNEL BLOCK MATERIAL TO EXTEND THE FILL LENGTH OF THE TOP OF THE CHANNEL PLUG, FROM TOP OF BANK TO TOP OF BANK.  
4) SHAPEDIMENSIONS OF THE CHANNEL PLUG VARY WITH THE EXISTING CHANNEL CONDITIONS.  
5) FLOW ARROW DEPICTED REFLECTS CHANNEL PLUGS #1 & #3, FOR CHANNEL PLUGS #2 & #4 FLOW WOULD BE THE OPPOSITE DIRECTION.

RIPRAP STABILIZATION MATERIALS		
CHANNEL	DEPTH (A)	RIPRAP (B)
OUTFALL #2	1.5'	CLASS I
OUTFALL #3	2.7'	20% CLASS I : 80% CLASS II MIX
OUTFALL #4	2.0'	20% CLASS I : 80% CLASS II MIX
OUTFALL #6	2.7'	20% CLASS I : 80% CLASS II MIX
OUTFALL #7	1.5'	CLASS I

NOTES: ALL RIPRAP TO BE CHOKED WITH SALVAGED STREAMBED MATERIAL

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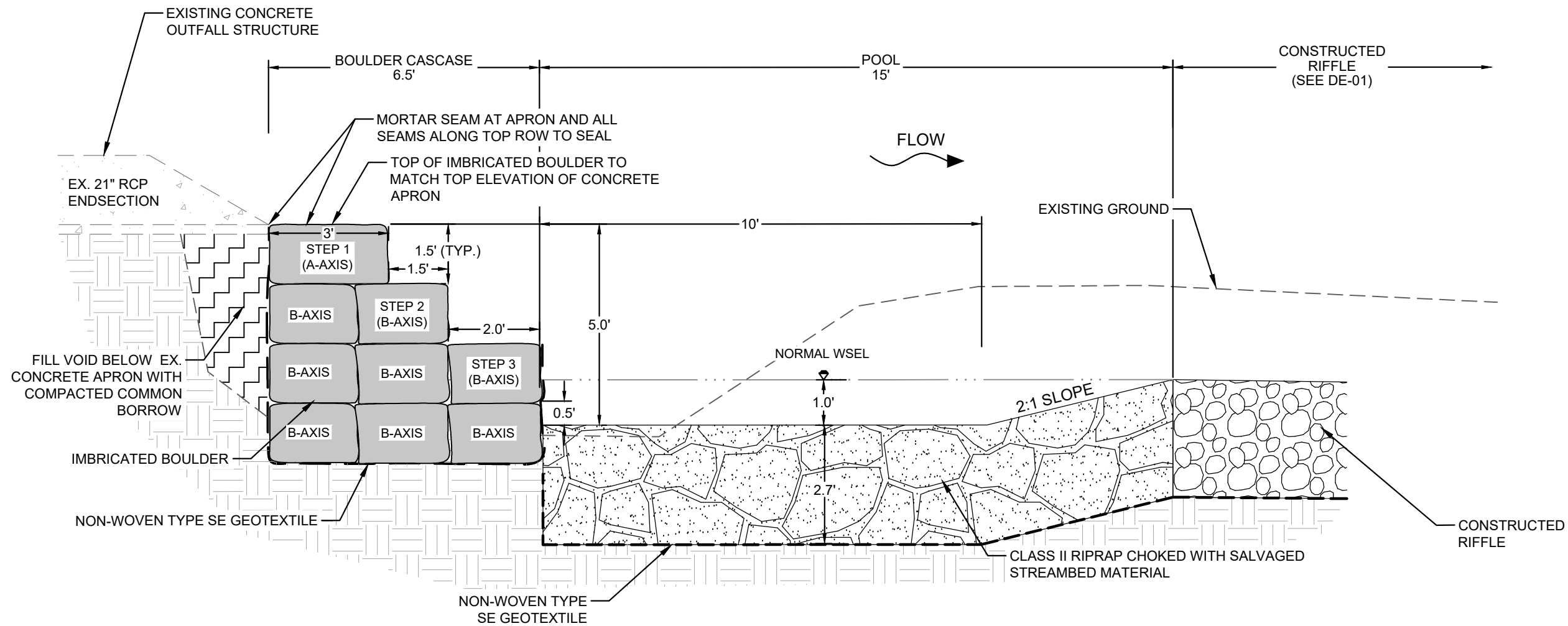


Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
DETAIL SHEET	
Drawn By : PJB	Scale : N/A
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. DE-04 of DE-06	Sheet No. 19 of 44

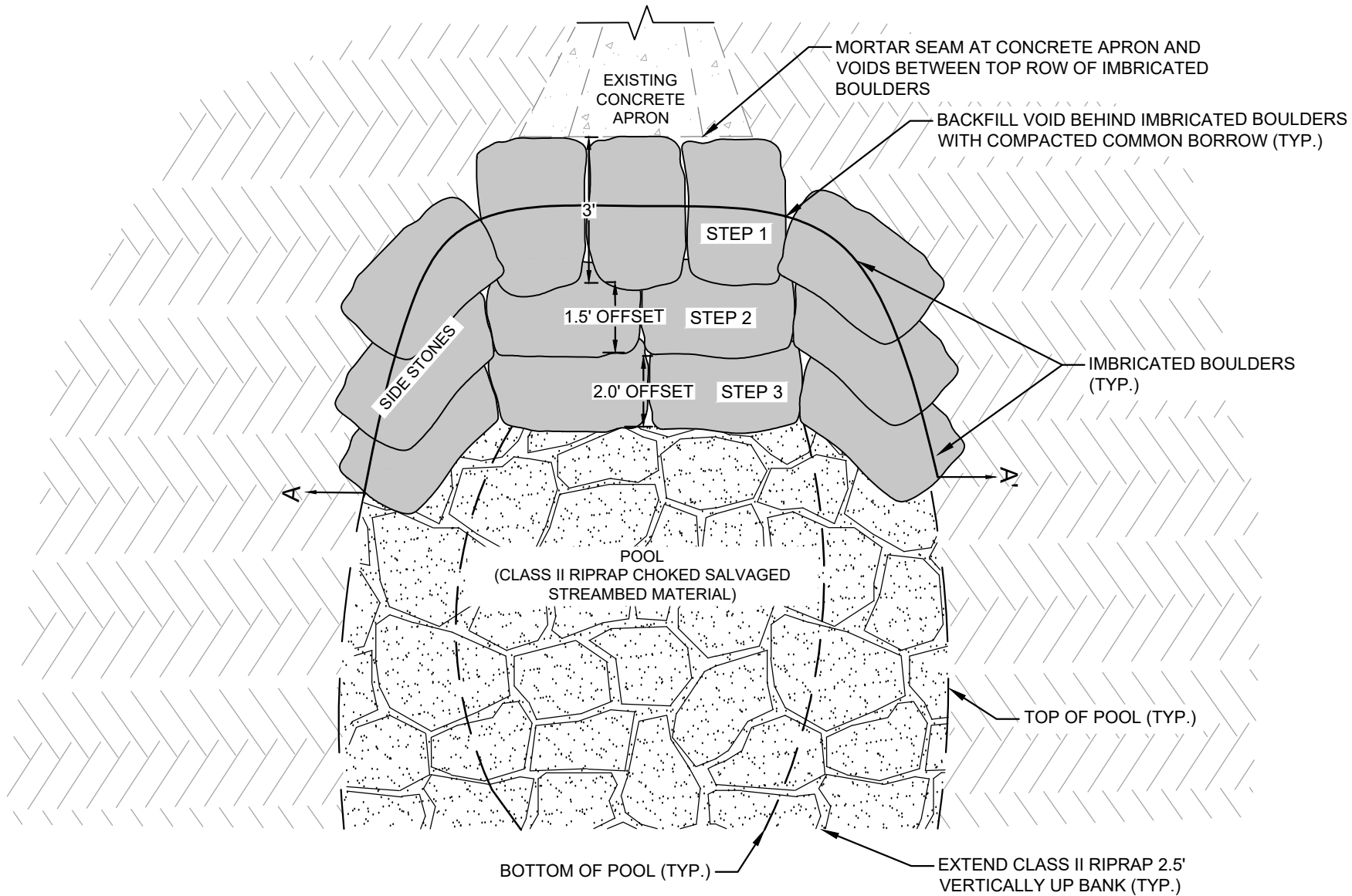


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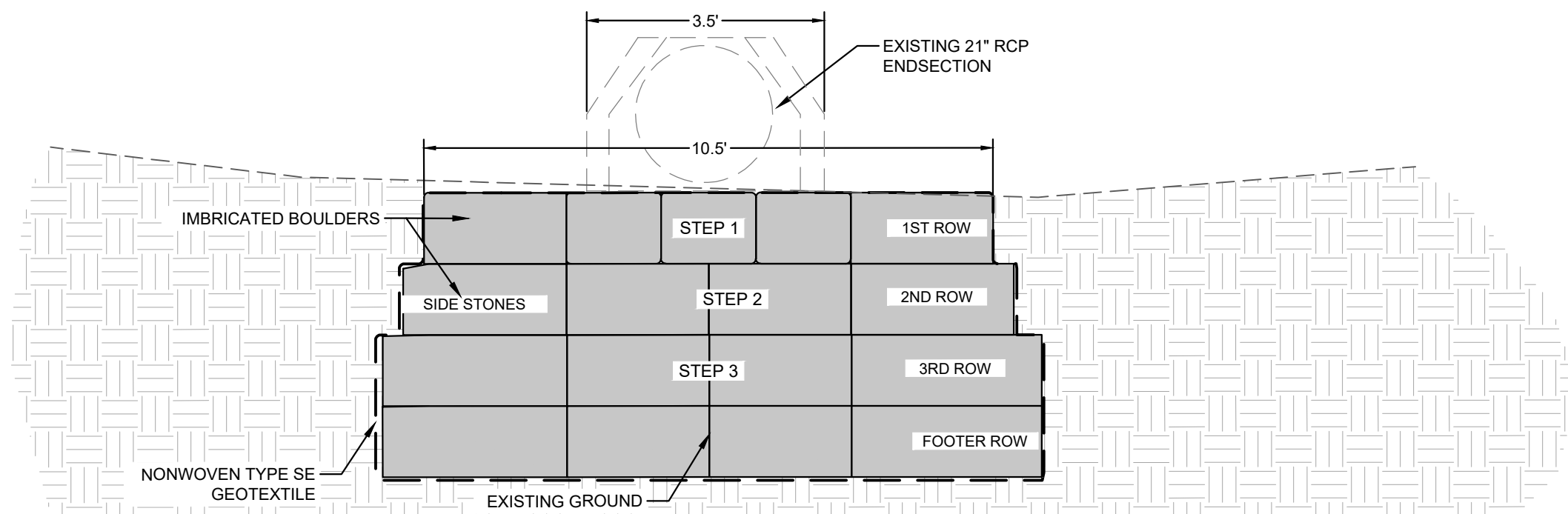
OUTFALL #5 TO UNT TO BYNUM RUN REACH 1 - BOULDER CASCADE STRUCTURE (BCS) - PROFILE VIEW

NOT TO SCALE



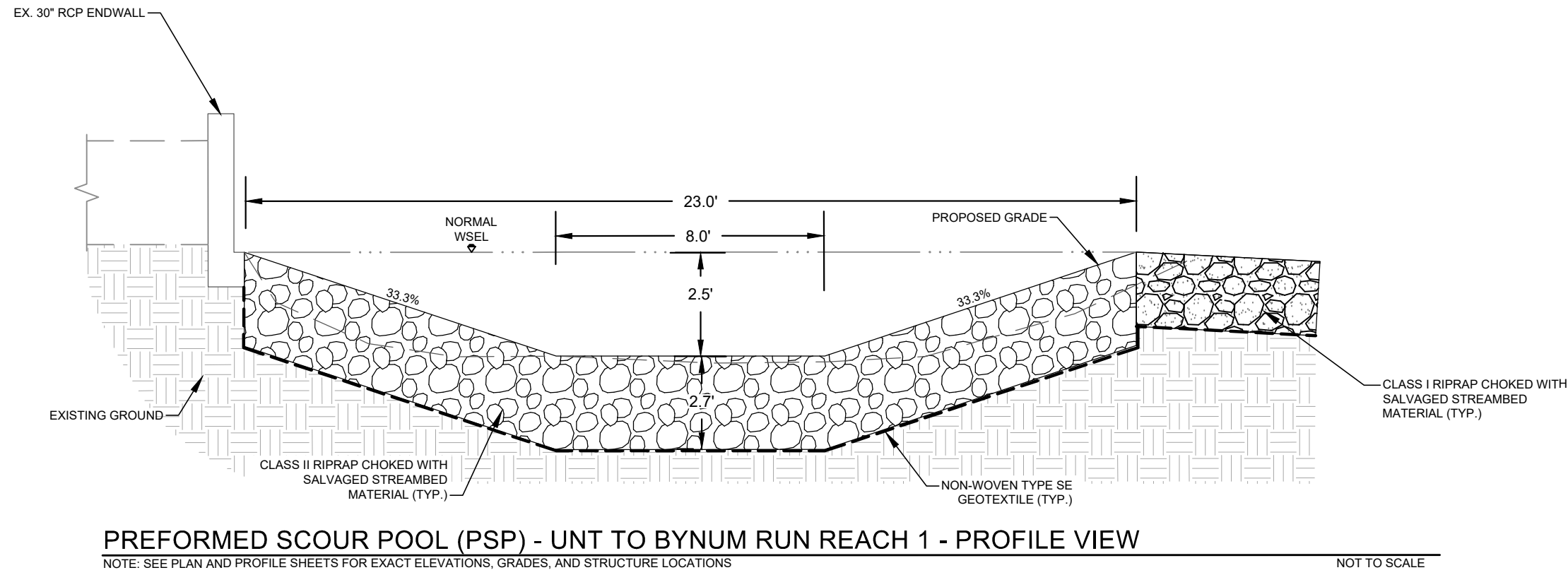
OUTFALL #5 TO UNT TO BYNUM RUN REACH 1 - BOULDER CASCADE STRUCTURE (BCS) - PLAN VIEW

NOT TO SCALE



OUTFALL #5 TO UNT TO BYNUM RUN REACH 1 - BOULDER CASCADE STRUCTURE (BCS) - SECTION VIEW A-A'

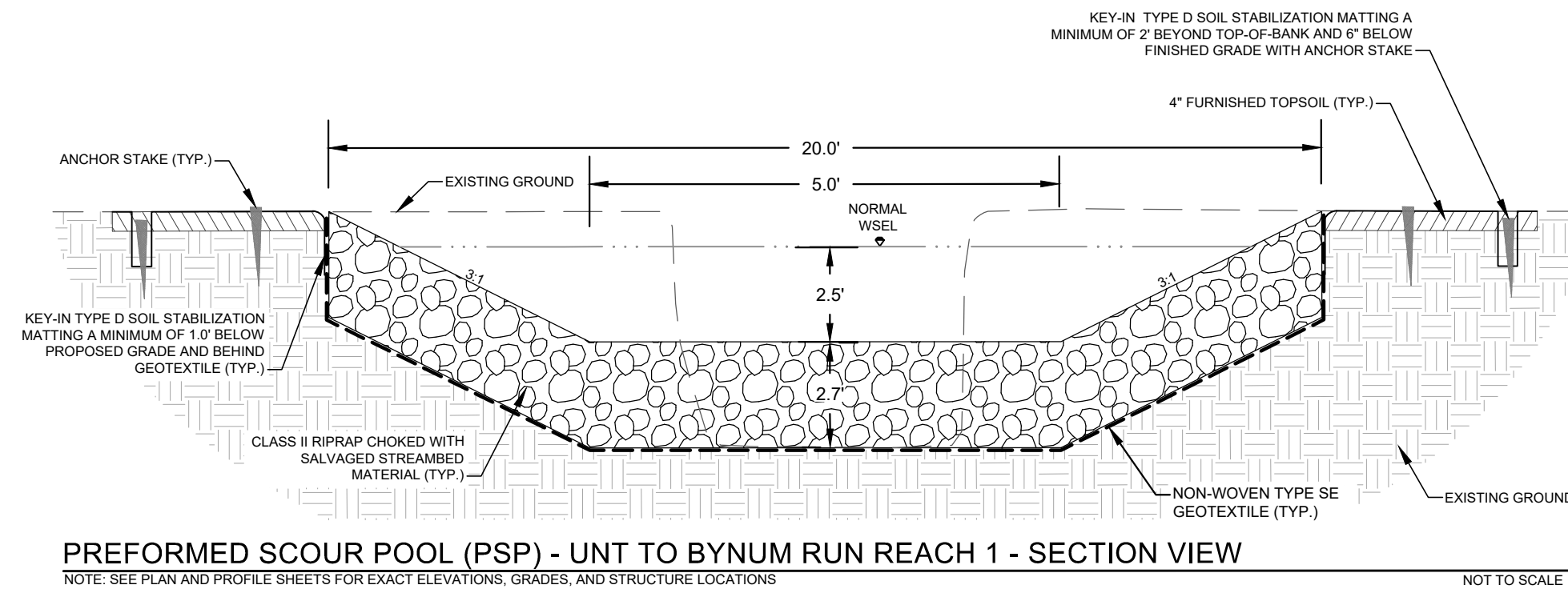
NOT TO SCALE



PREFORMED SCOUR POOL (PSP) - UNT TO BYNUM RUN REACH 1 - PROFILE VIEW

NOTE: SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS

NOT TO SCALE



PREFORMED SCOUR POOL (PSP) - UNT TO BYNUM RUN REACH 1 - SECTION VIEW

NOTE: SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS

NOT TO SCALE

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DETAIL SHEET	
Drawn By : PJB	Scale : N/A
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
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MATERIAL SPECIFICATIONS

RIPRAP (FURNISHED STONE)

MD SHA STANDARD RIPRAP SIZE CLASSES				
MD SHA RIPRAP	D <sub>50</sub>	D <sub>100</sub>	WEIGHT	% OF TOTAL BY WEIGHT
CLASS I	9.5 in.	15 in.	> 150 IB	0
			> 40 IB	50
			< 2 IB	10 MAX
CLASS II	16 in.	24 in.	> 700 IB	0
			> 200 IB	50
			< 20 IB	10 MAX

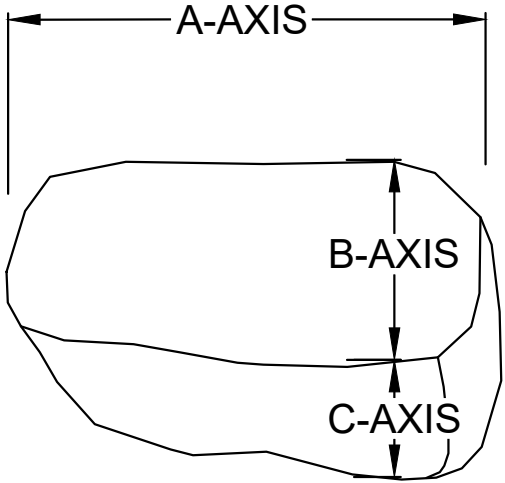
NOTE: OPTIMUM GRADATION IS 50% OF THE STONE BEING ABOVE AND 50% BELOW THE MIDSIZE.

FURNISHED STONE NOTES:

- STONE MUST MEET THE ABOVE REQUIREMENTS AND BE APPROVED BY THE ENGINEER.
- ALL FURNISHED STONE USED MUST HAVE A MINIMUM DENSITY GREATER THAN 160 LBS/FT<sup>3</sup> AND BE BROWN OR GRAY IN COLOR. NO WHITE STONE WILL BE ALLOWED. THE STONE SHALL NOT DISINTEGRATE FROM THE ACTION OF AIR, WATER, OR HANDLING AND PLACING GRANULAR SEDIMENTARY STONE (I.E. LIMESTONE) WILL GENERALLY BE UNACCEPTABLE.
- FURNISHED STONE SHALL BE COMPOSED OF ANGULAR QUARRY STONE. NO ROUND STONE WILL BE PERMITTED.
- CONCRETE WILL NOT BE CONSIDERED AS AN ALTERNATIVE FOR STONE.

IMBRICATED BOULDER SIZE SPECIFICATIONS				
	A AXIS (LONG)	B AXIS (INTERMEDIATE)	C AXIS (SHORT)	WEIGHT
MINIMUM SIZE	2.5 FT.	2.0 FT.	1.5 FT.	1200 LBS.
MAXIMUM SIZE	4.0 FT.	3.0 FT.	2.0 FT.	3840 LBS.

IMBRICATED BOULDERS SHALL HAVE A MINIMUM DENSITY GREATER THAN 160 LBS/FT<sup>3</sup> AND BE BROWN OR GRAY IN COLOR. NO WHITE STONE WILL BE ALLOWED. THE STONE SHALL NOT DISINTEGRATE FROM THE ACTION OF AIR, WATER, OR HANDLING AND PLACING GRANULAR SEDIMENTARY STONE WILL GENERALLY BE UNACCEPTABLE. CONCRETE WILL NOT BE CONSIDERED AS AN ALTERNATIVE FOR STONE.



IMBRICATED BOULDER DETAIL - TYPICAL DETAIL

NOT TO SCALE

SILT AND GRAVEL	
% PARTICLE SIZE LESS THAN	PARTICLE DIAMETER PASSING THROUGH SIEVE (IN) OR SIEVE NO.
100	2.5 in.
85	1 in.
50	0.5 in.
30	No. 40
16	No. 200

SILT AND GRAVEL NOTES:

- THE USE OF SILT AND GRAVEL FROM WITHIN THE EXISTING CHANNEL IS PREFERRED OVER FURNISHED MATERIAL. IF SUFFICIENT SALVAGEABLE SILT AND GRAVEL IS AVAILABLE AND APPROVED BY THE ENGINEER, THIS MATERIAL IS TO BE USED PRIOR TO FURNISHED SILT AND GRAVEL.
- SILT AND GRAVEL SHALL CONSIST OF A MIXTURE OF STONES, SAND, AND OTHER FINE SEDIMENTS (I.E. CLAY, SILT, ETC.). BANK RUN GRAVEL OR SIMILAR MAY BE USED AS FURNISHED SILT AND GRAVEL IF MATERIAL REQUIREMENTS ARE MET.
- THE ENGINEER SHALL APPROVE THE SIZE AND COMPOSITION MATERIAL TO BE USED AS SILT AND GRAVEL.
- SILT AND GRAVEL SHALL NOT BE COMPOSED OF RIPRAP OR WASHED STONE. NO LIMESTONE SHALL BE ACCEPTED.
- STONE SHALL BE BROWN OR GRAY IN COLOR. NO WHITE STONE WILL BE ALLOWED.

STRUCTURE CONSTRUCTION NOTES:

- EXCAVATE THE BED AND BANKS ACCORDING TO THE PLANS TO OBTAIN THE NECESSARY SUBGRADE. PLACE NONWOVEN GEOTEXTILE CLASS SE AS ILLUSTRATED ON THE CONTRACT DOCUMENTS. GEOTEXTILE TORN OR DAMAGED SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. GEOTEXTILE SHALL BE KEYED-IN AND TRIMMED TO AVOID EXPOSED EDGES UPON COMPLETION OF CONSTRUCTION.
- RIPRAP SHALL BE PLACED SO THAT SMALL AND LARGE STONES ARE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SILT AND GRAVEL SHALL BE WASHED-INTO THE FURNISHED STONE TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SURFACE FLOW IS ACHIEVED. SURFACE FLOW MUST BE APPROVED BY THE ENGINEER.
- PLACED MATERIAL NOT CONFORMING TO THE SPECIFIED LIMITS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST. A DEFINED THALWEG MUST BE ACHIEVED AND APPROVED.

GRADE CONTROL LOG STRUCTURE

LOGS: GRADE CONTROL LOG STRUCTURES SHALL CONSIST OF HARDWOOD LOGS WITH A MINIMUM 12 INCH DIAMETER. LOGS SHALL BE FROM WITHIN THE LIMIT OF DISTURBANCE.

DUCK BILL ANCHOR: THE DUCK BILL ANCHOR SHALL BE DUCKBILL 88-DB1 OR SIMILAR WITH A MINIMUM HOLDING STRENGTH OF 3,000 LBS AND A 1/4 INCH GALVANIZED WIRE WITH A MINIMUM BREAKING STRENGTH OF 3,000 LBS. DUCKBILL ANCHORS ARE TO BE INSTALLED 3 FEET FROM ENDS OF LOG AND 3 FEET BELOW GRADE. GALVANIZED WIRE, AND ANY BOLT OR COUPLING NECESSARY IS INCIDENTAL TO THE GRADE CONTROL LOG STRUCTURE.

COMMON BORROW

COMMON BORROW SHALL BE PER MDOT MSHA 916.01 COMMON BORROW. COMMON BORROW SHALL BE A NATURAL, FRIABLE SUBSURFACE SOIL UNIFORM IN TEXTURE AND FREE FROM ANY PARTS OF NON-NATIVE INVASIVE SPECIES. MATERIAL SHALL BE FREE OF ROOTS, CONCRETE, AND STONES LARGER THAN 3- INCHES. FROZEN MATERIAL WILL NOT BE APPROVED FOR USE AS COMMON BORROW.

PLACING, SPREADING, AND COMPACTING COMMON BORROW. COMMON BORROW SHALL BE PLACED, SPREAD, AND COMPACTED IN MAXIMUM LAYERS OF 8 IN. TO PRODUCE A UNIFORM FIRM LAYER OF COMMON BORROW. THE COMPLETED WORK SHALL BE IN CONFORMANCE WITH THE THICKNESS, LINES, GRADES, AND ELEVATIONS SPECIFIED IN THE CONTRACT DOCUMENTS. STONES AND OTHER FOREIGN MATERIAL LARGER THAN 4 IN. SHALL BE REMOVED AND DISPOSED BY THE CONTRACTOR. SLOPES 4:1 TO 2:1 SHALL BE TRACKED WITH CLEATED TRACT TYPE EQUIPMENT OPERATING PERPENDICULAR TO THE SLOPE.

COMMON BORROW SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION CAN BE OBTAINED WITH THE EQUIPMENT USED. THE "REQUIRED DEGREE OF COMPACTION" SHALL BE UNDERSTOOD TO MEAN THAT, IF THE COMMON BORROW IS FORMED INTO A BALL IT SHALL NOT CRUMBLE AND SHALL NOT BE SO WET THAT WATER MAY BE SQUEEZED FROM THE MATERIAL.

TOPSOIL

FURNISHED TOPSOIL- FURNISHED TOPSOIL SHALL BE PER MDOT SHA 920.01.02.

SALVAGING TOPSOIL-

SALVAGING TOPSOIL SHALL BE PER MDOT SHA 701.03.03 AND MDOT SHA 920.01.01. REMOVE EXISTING VEGETATION, BRUSH, AND OTHER DEBRIS FROM AREAS WHERE TOPSOIL IS TO BE . REMOVE TOPSOIL TO A MAXIMUM DEPTH OF 18 INCHES OR AS DIRECTED BY THE ENGINEER. PREFERENCE SHOULD BE GIVEN TO SOIL BETWEEN 12 AND 18 INCHES. INSPECT TOPSOIL FOR WEEDS AND SEPARATE AS NECESSARY TO ENSURE INVASIVE WEEDS ARE NOT INCLUDED IN STOCKPILED TOPSOIL. TESTING OF TOPSOIL MAY BE REQUESTED AT THE DIRECTION OF THE ENGINEER AND/OR HARFORD COUNTY. FURNISHED TOPSOIL IS ONLY TO BE INSTALLED WHEN THERE IS NO ADEQUATE TOPSOIL ONSITE AND MUST BE APPROVED BY HARFORD COUNTY PRIOR TO INSTALLATION.

PLACING TOPSOIL-

THE PLACEMENT OF TOPSOIL SHALL BE PER MDOT SHA 701.03.05 PLACING TOPSOIL.

MEASUREMENT AND PAYMENT-

SALVAGING TOPSOIL WILL NOT BE MEASURED BUT WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PER FOR CLASS 5 EXCAVATION. SEPARATING, STOCKPILING, AND DISPOSAL OF OVERBURDEN AND SOIL CONTAINING PROHIBITED WEEDS SHALL BE INCIDENTAL TO SALVAGING TOPSOIL.

PLACING TOPSOIL WILL BE MEASURED AND PAID AT THE CONTRACT UNIT PRICE FOR THE SPECIFIED DEPTH PER SQUARE YARD. THE PAYMENT WILL INCLUDE ALL WORK AND INCIDENTALS REQUIRED TO REMOVE SOIL FROM STOCKPILES AND PLACE TO THE SPECIFIED DEPTH PER THE CONTRACT DOCUMENTS. EXCAVATION TO ACHIEVE THE PROPER SUBGRADE FOR THE PLACEMENT OF THE SPECIFIED DEPTH OF TOPSOIL WILL BE PAID AS CLASS 5 CHANNEL OR STREAM CHANGE EXCAVATION.

CLAY CHANNEL BLOCK MATERIAL

CLAY MATERIAL USED FOR THE CLAY CHANNEL BLOCKS, CHANNEL PLUGS, AND AS A LINER BELOW THE WETLAND DEPRESSIONAL AREAS MUST BE UNIFIED SOIL CLASSIFICATION SC OR CL-ML AND SHALL PASS A MINIMUM OF 35% COMPONENTS THROUGH THE #200 SIEVE.

PLACE CLAY CHANNEL BLOCK MATERIAL IN MAXIMUM 8-INCH THICK PRE-COMPACTION LAYERS. EACH LAYER OF FILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ENSURE MAXIMUM COMPACTION AND MINIMUM PERMEABILITY AND WILL BE APPROVED BY THE ENGINEER.

TYPE D SOIL STABILIZATION MATTING

**Type D Soil Stabilization Matting.** Matting for the bank treatment areas shall consist of a machine produced mat of degradable natural fibers and shall meet the following minimum specifications:

Material:	Woven coir fiber yarn or twine
Thickness:	0.25 in.
Elongation (Dry/Wet):	29%/35%
Weight:	20 oz/SY
Open Area:	50%
Size:	6 ft. wide X 150 ft in length (100 SY per roll)
Flow Velocity:	8 ft./sec.
Life Expectancy:	3 years

FLOODPLAIN MATTING

FLOODPLAIN MATTING SHALL BE NEDIA KOIRWRAP 1000 OR SIMILAR AND CONSISTS OF A DOUBLE LAYERED FABRIC CONSISTING OF AN OUTER LAYER OF HIGH STRENGTH COIR FABRIC AND AN INNER LAYER OF LIGHTWEIGHT JUTE FABRIC TIED TOGETHER AT REGULAR INTERVALS. THE OUTER COIR FABRIC LAYER SHALL MEET THE SPECIFICATIONS FOR TYPE D SOIL STABILIZATION MATTING SHOWN ABOVE. THE INNER JUTE FABRIC LAYER SHALL CONSIST OF 100 PERCENT COCONUT NON-WOVEN FIBER MATRIX STITCHED BETWEEN BIODEGRADABLE COTTON NETTING, OR SIMILAR. SUPPLY A MINIMUM OF 8 FT WIDTH BY 100 FT LONG ROLLS. THE FLOODPLAIN MATTING WILL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

PROPERTY	TEST METHOD	MINIMUM VALUE - *MAXIMUM VALUE*
MASS PER UNIT AREA	ASTM D 6475	11.0 oz/sq yd
THICKNESS	ASTM D 6525	0.31 in
TENSILE STRENGTH (MD x TD)	ASTM D 6818	240 x 164 lb/ft
ELONGATION (MD x TD)	ASTM D 6818	*10.9 % x 16 %*
LIGHT PENETRATION	ASTM D 6567	10 %
WATER ABSORPTION	ASTM D 1117	255 %
UNVEGETATED SHEAR STRESS	ASTM D 6460	2.25 lb/sq ft
UNVEGETATED VELOCITY	ASTM D 6460	9.0 ft/s

NOTE: ALL REFERENCES TO MDOT SHA REFER TO THE MD SHA STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION MATERIALS, 2025, AND ALL SUBSEQUENT REVISIONS.

GEOTEXTILE:

Class	Type of Geotextile	Grab Strength (lb) D4632	Puncture Strength (lb) D6241	Permittivity (cfs) D4491	Apparent Opening Size (max mm) D4751	Trapezoid Tear Strength (lb) D4533
SE	Nonwoven	160	310	0.20	0.30	80

NOTE 1: ALL PROPERTY VALUES IN THE ABOVE TABLE ARE BASED ON MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPLE DIRECTION EXCEPT FOR APPARENT OPENING SIZE.

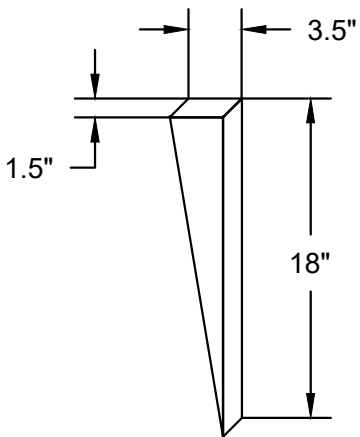
NOTE 2: THE ULTRAVIOLET STABILITY SHALL BE 50 PERCENT AFTER 500 HRS OF EXPOSURE FOR ALL CLASSES, EXCEPT CLASS F, WHICH SHALL BE 70 PERCENT (D 4355).

\*15% ELONGATION FOR SILT FENCE AND MONOFILAMENT WOVEN GEOTEXTILE IN MACHINE DIRECTION

\*\*THIS IS A MINIMUM APPARENT OPENING SIZE, NOT A MAXIMUM.

\*\*\*MACHINE DIRECTION

MEASUREMENT AND PAYMENT: GEOTEXTILE FABRIC IS INCIDENTAL TO THE APPLICABLE STRUCTURE OR UNIT PRICE OF THE APPLICABLE FURNISHED STONE ITEM.



ANCHOR STAKE DETAIL  
NOT TO SCALE

NOTE:

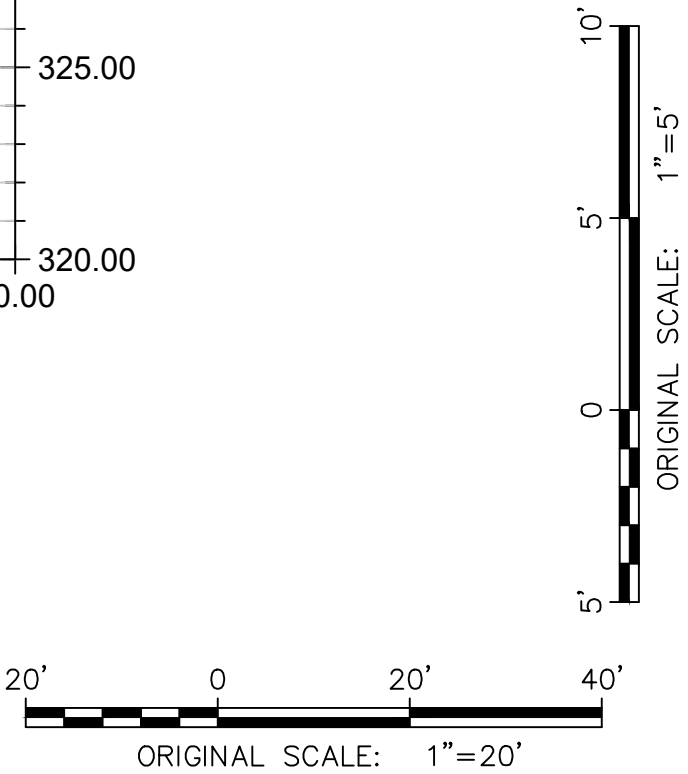
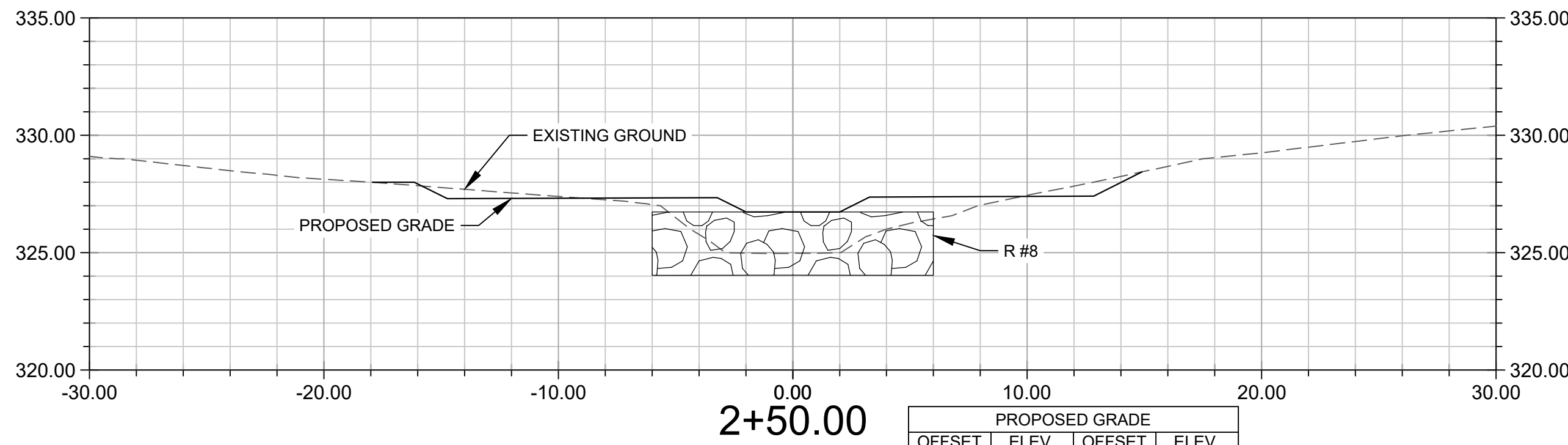
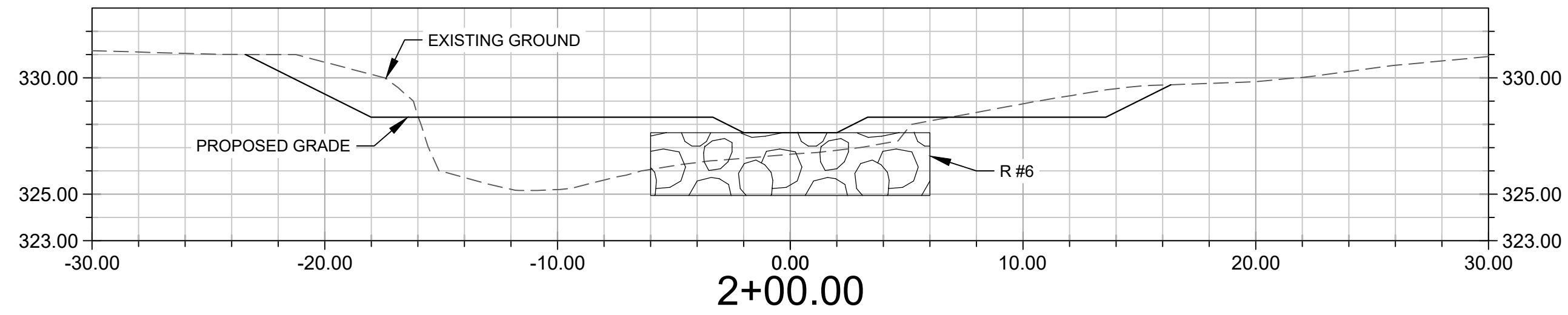
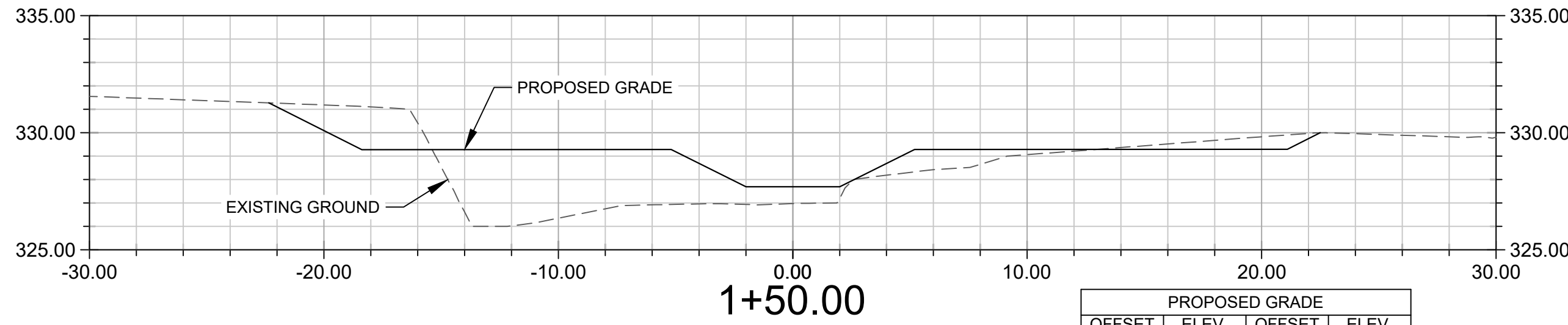
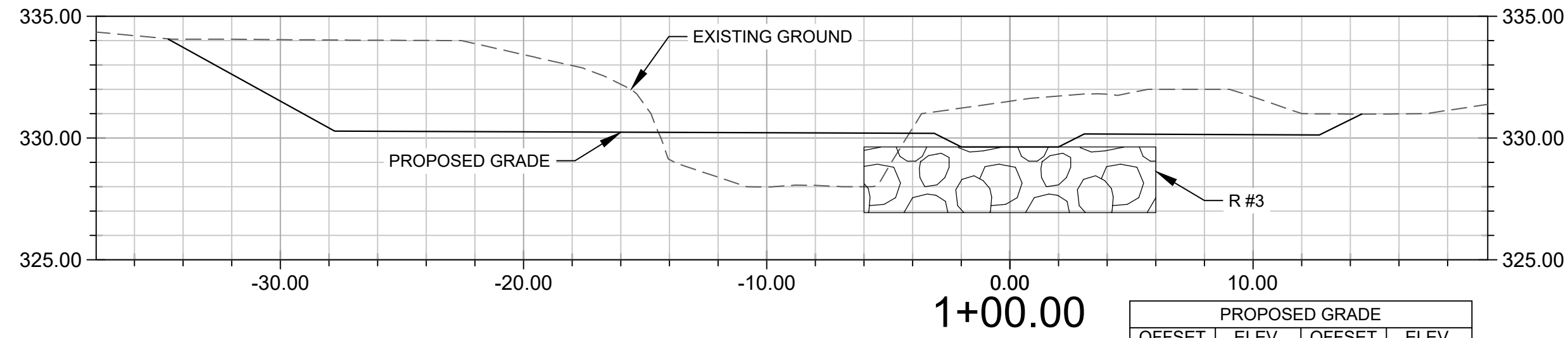
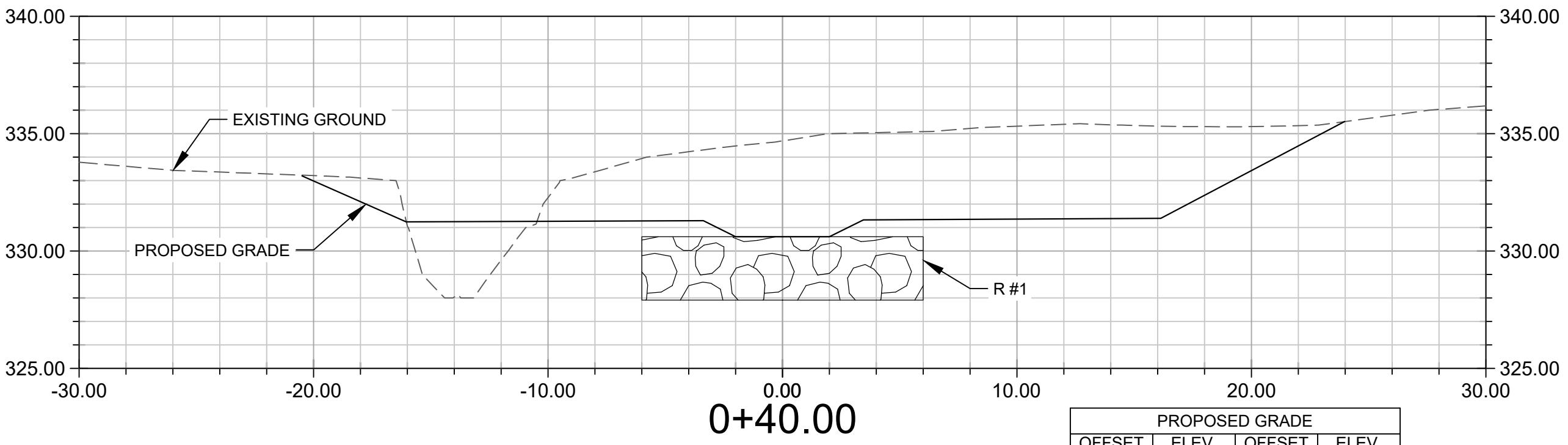
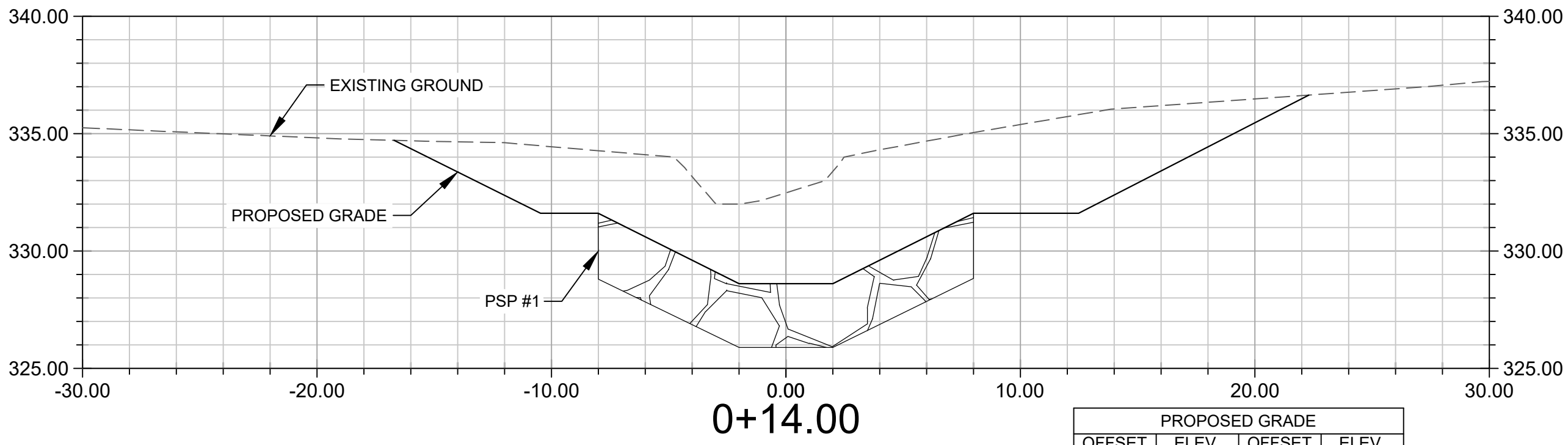
- ANCHOR STAKES SHALL BE TAPERED WOODEN STAKES CONSISTING OF STANDARD 2" X 4" WOODEN BOARDS CUT DIAGONALLY.
- ANCHOR STAKES SHALL BE INSTALLED AT THE MINIMUM SPACING SPECIFIED ON DETAIL SHEETS DE-01 TO DE-06 AND AT ANY LOCATION CRITICAL TO SECURING THE STABILIZATION MATTING.

		HARFORD COUNTY, MARYLAND	
		BENNETT PLACE STREAM RESTORATION	
		DETAIL SHEET	
BILLING NO. TBD		Revisions	
EG--SWMENG-- TBD			
PROFESSIONAL CERTIFICATION			
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.			
10/9/2025			
Drawn By : PJB		Scale : N/A	
Designed By : IPT , PJB		Date : 10 / 25	
Reviewed By : CAL			
Drawing No. DE-06 of DE-06		Sheet No. 21 of 44	



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UNT TO BYNUM RUN - REACH 1  
CROSS-SECTIONS



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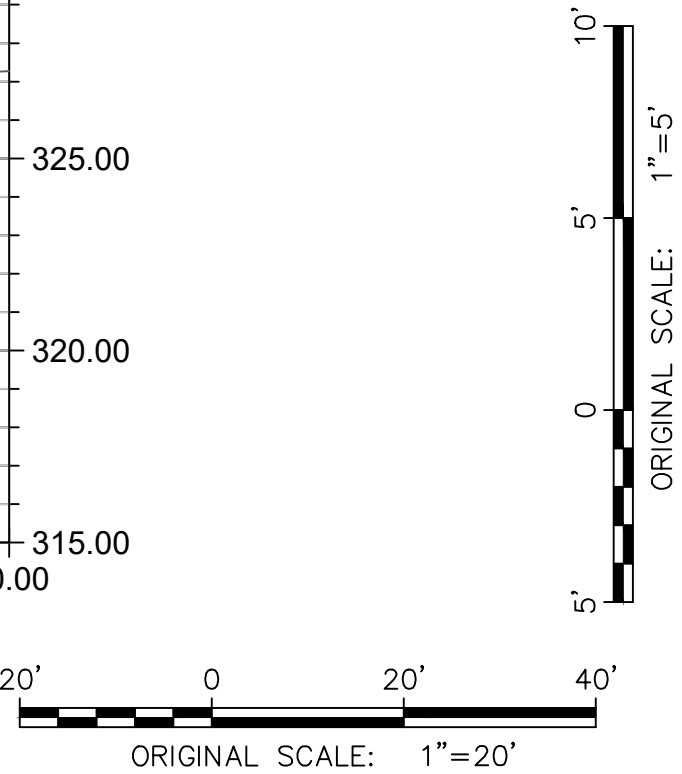
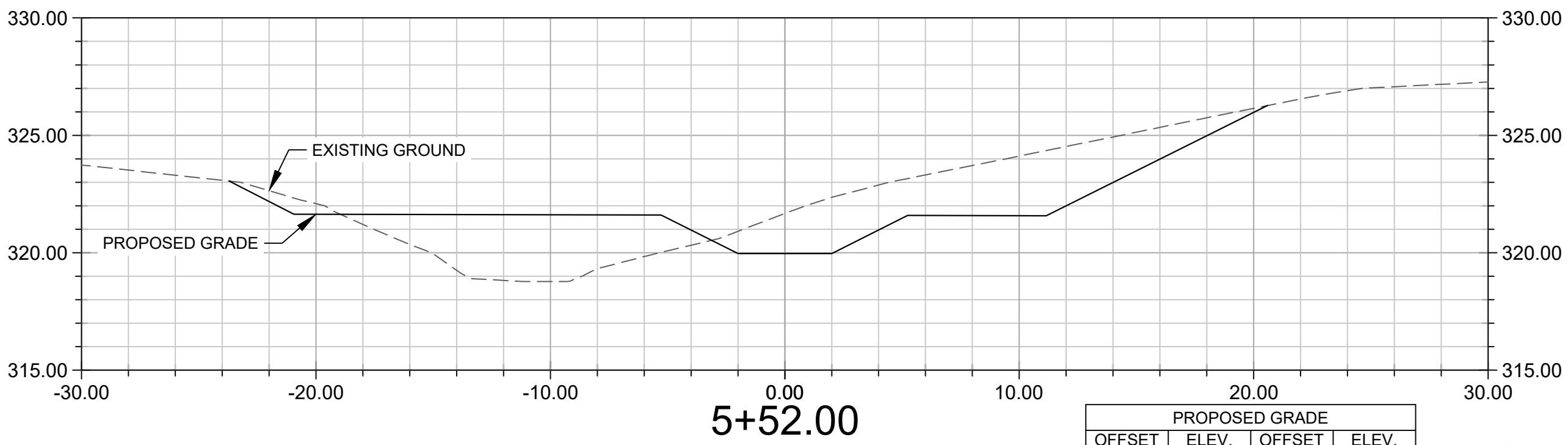
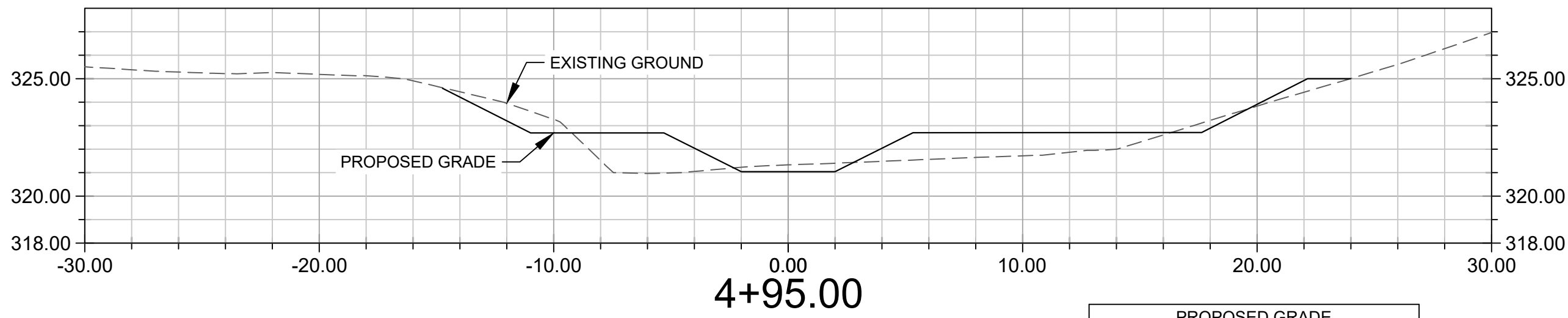
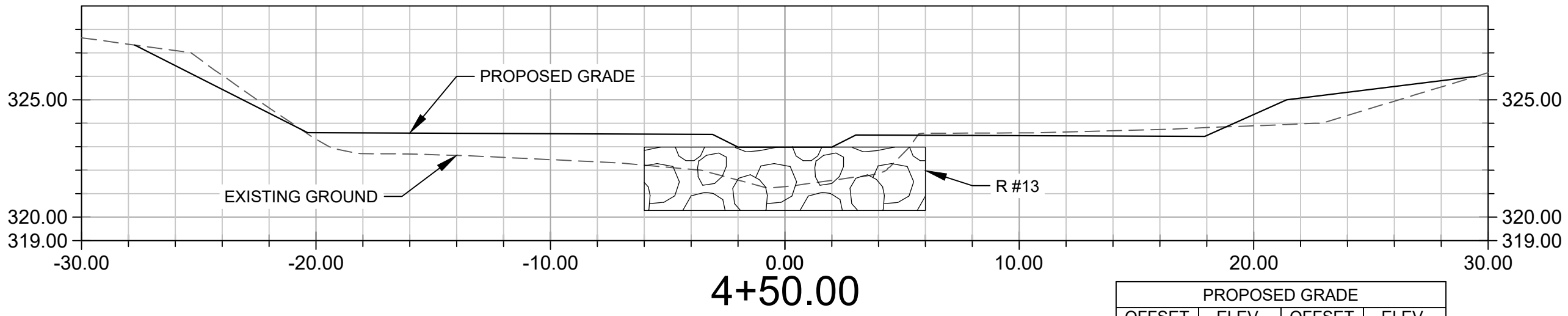
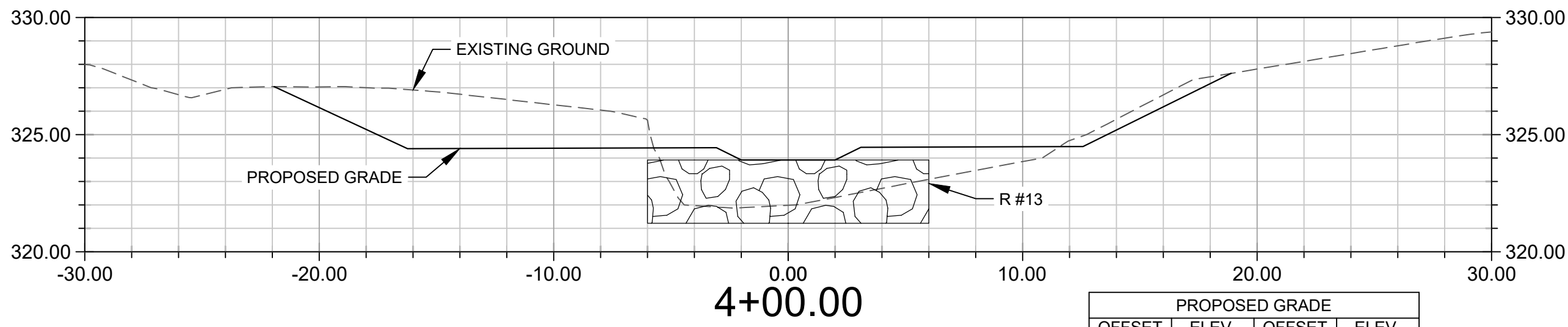
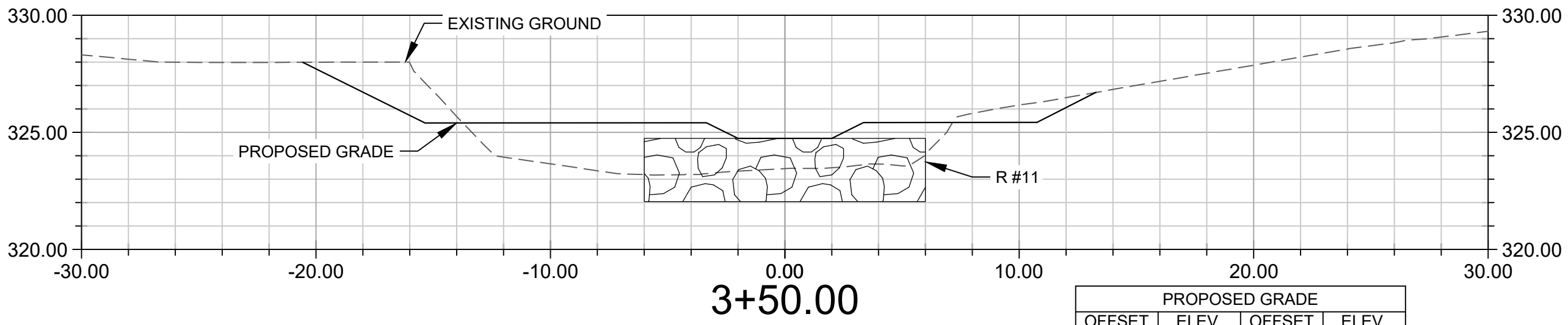
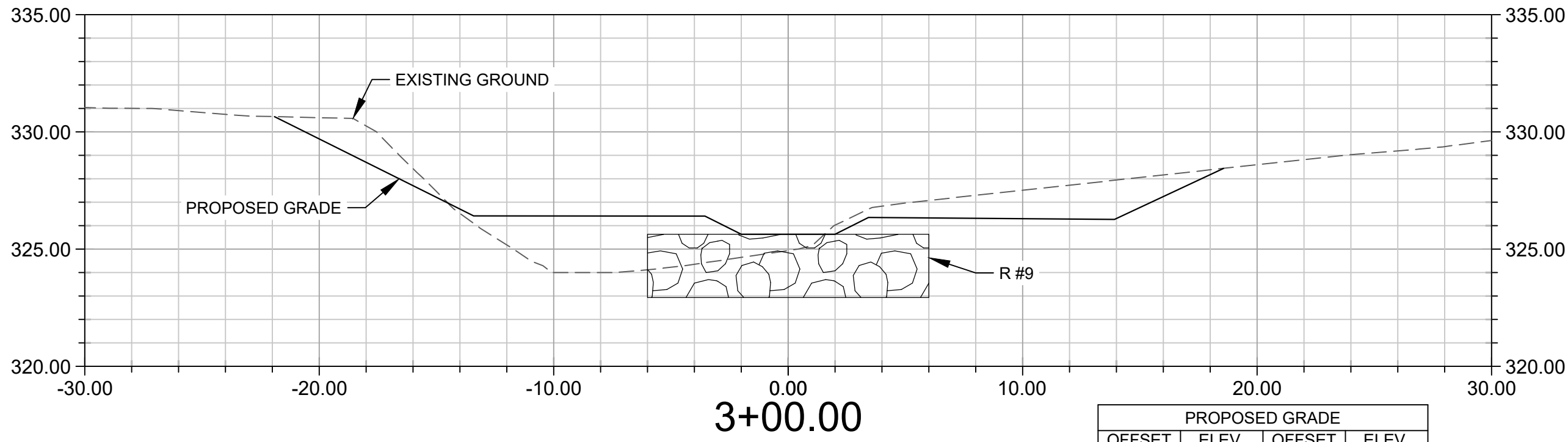


Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
CROSS-SECTION SHEET	
Drawn By : PJB	Scale : AS SHOWN
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. CS-01 of CS-08	Sheet No. 22 of 44



UNT TO BYNUM RUN - REACH 1  
CROSS-SECTIONS



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HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

CROSS-SECTION SHEET

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Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. CS-02 of CS-08

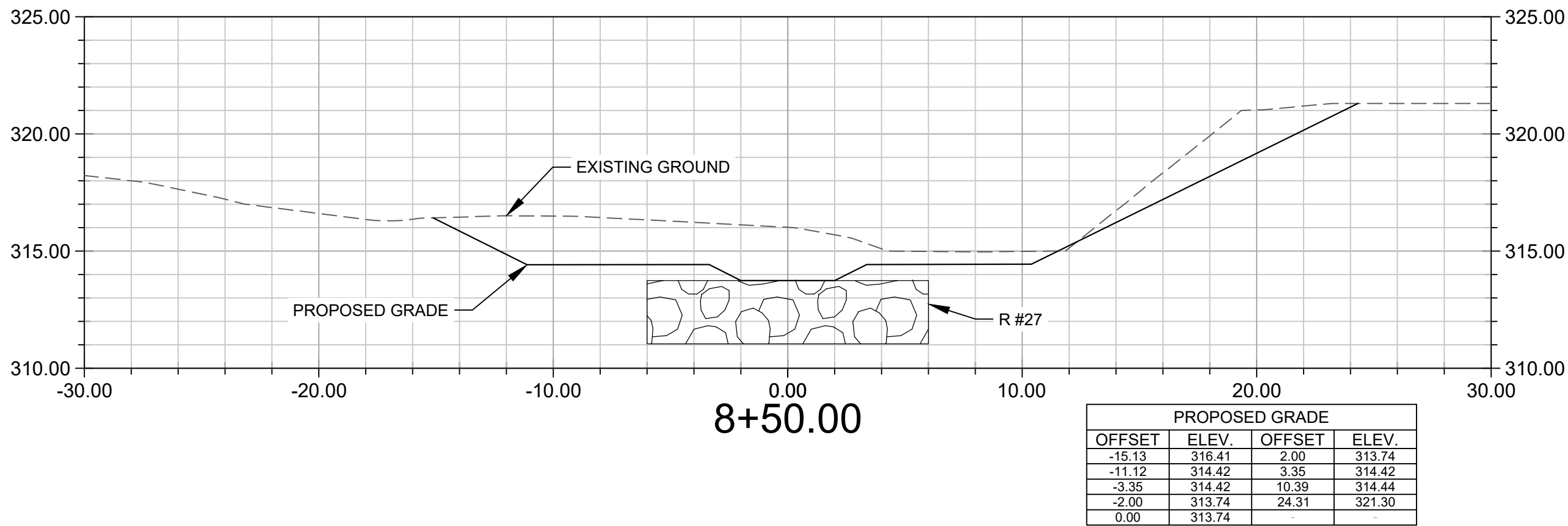
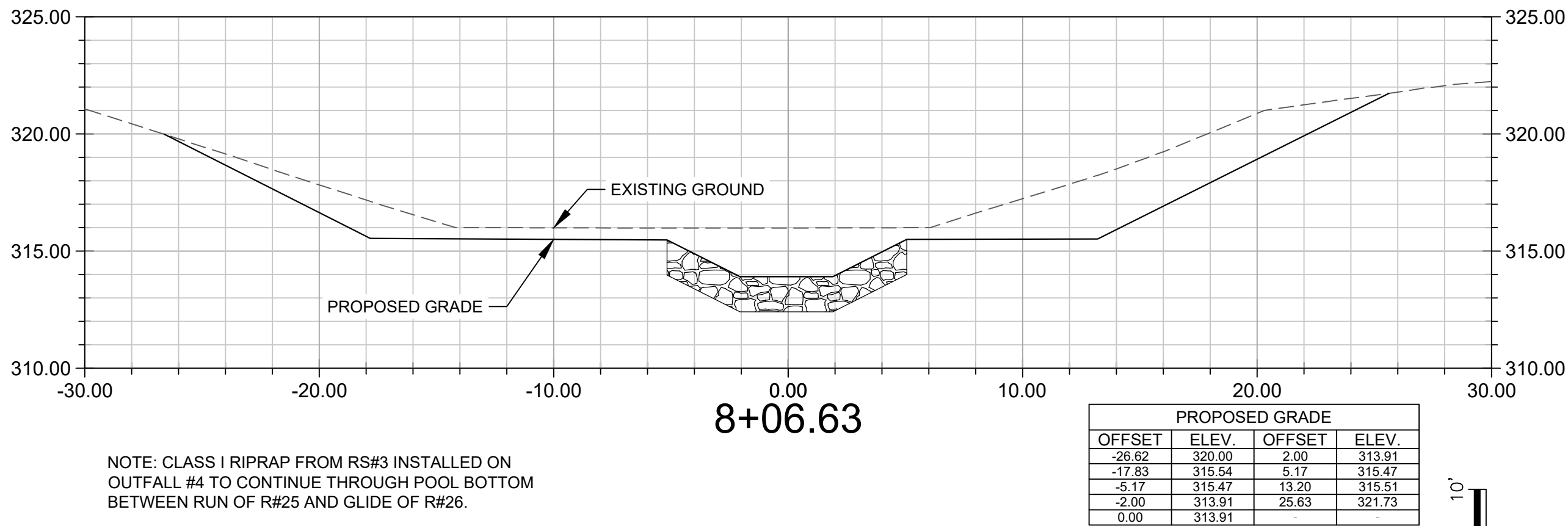
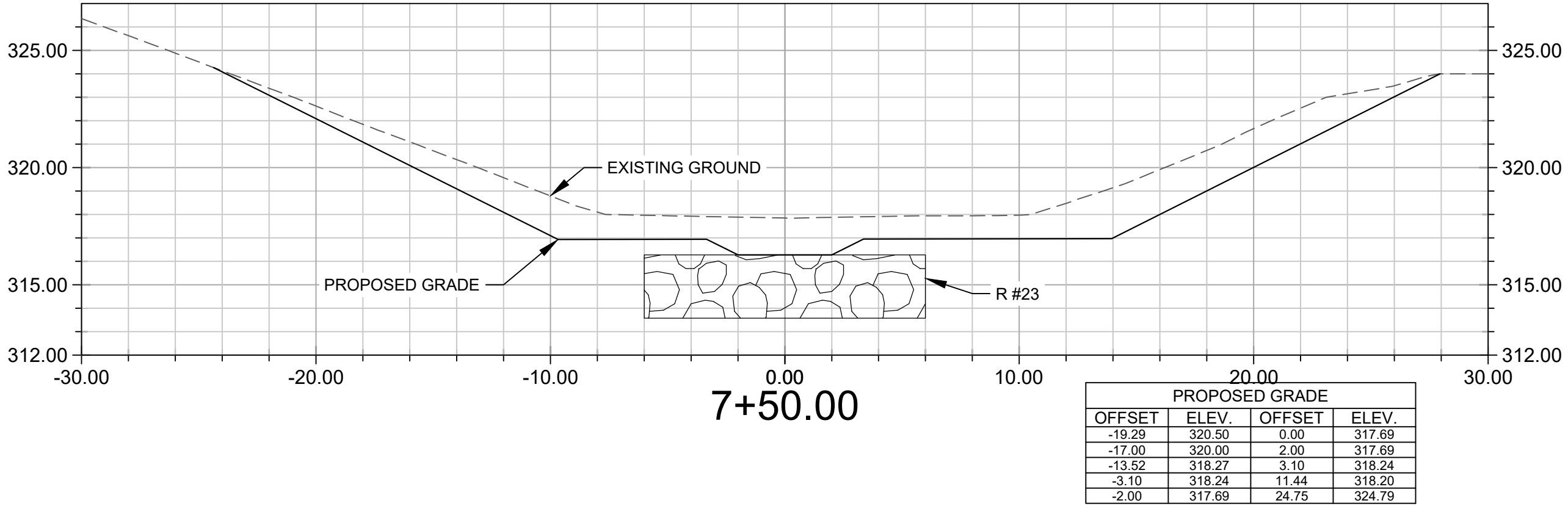
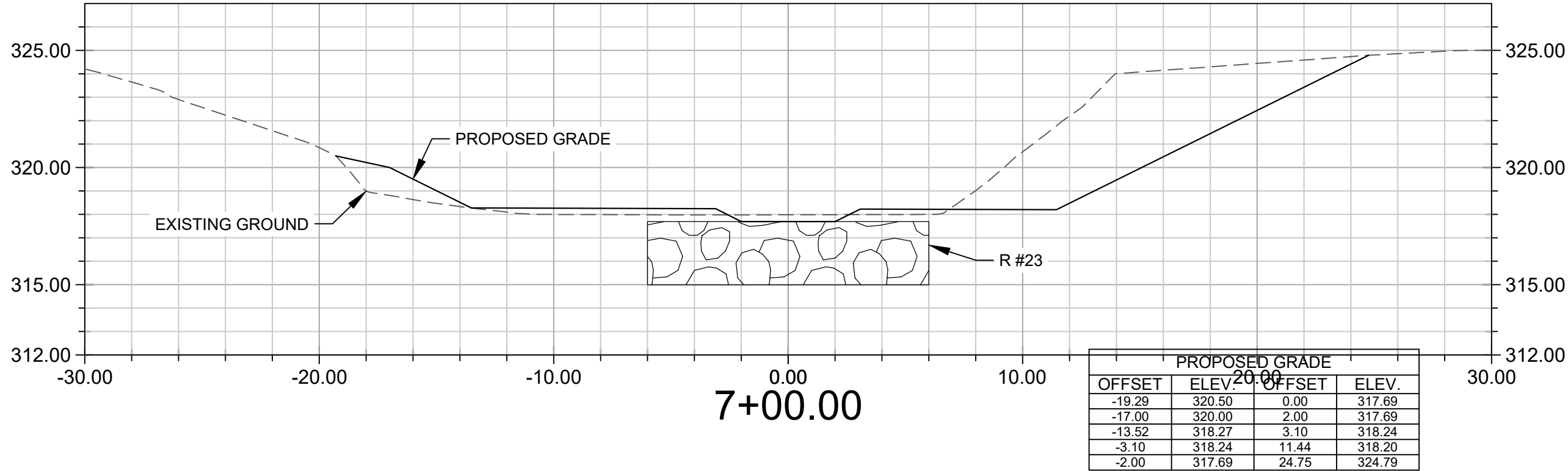
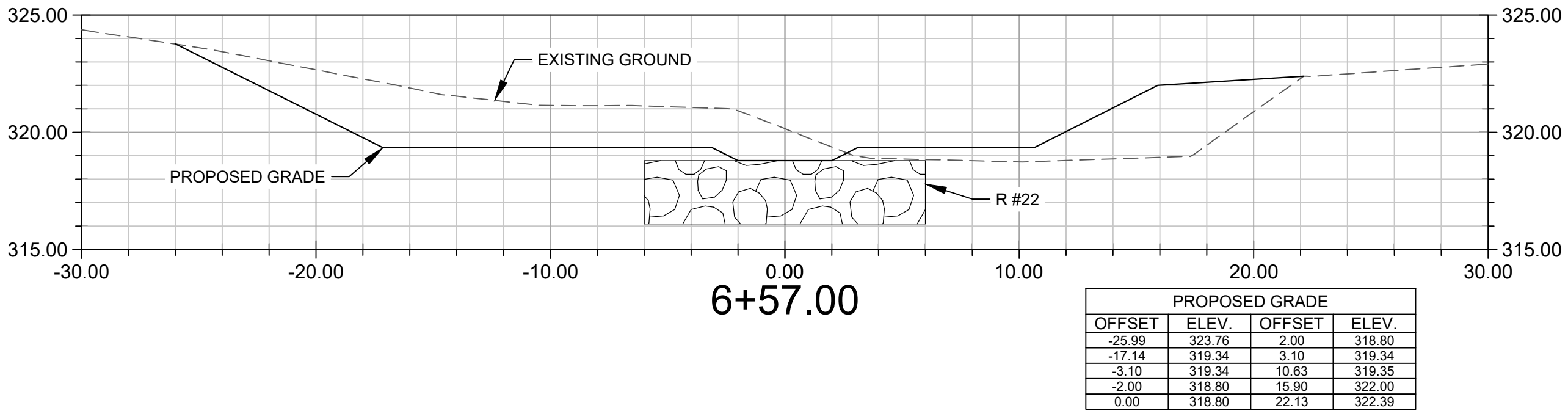
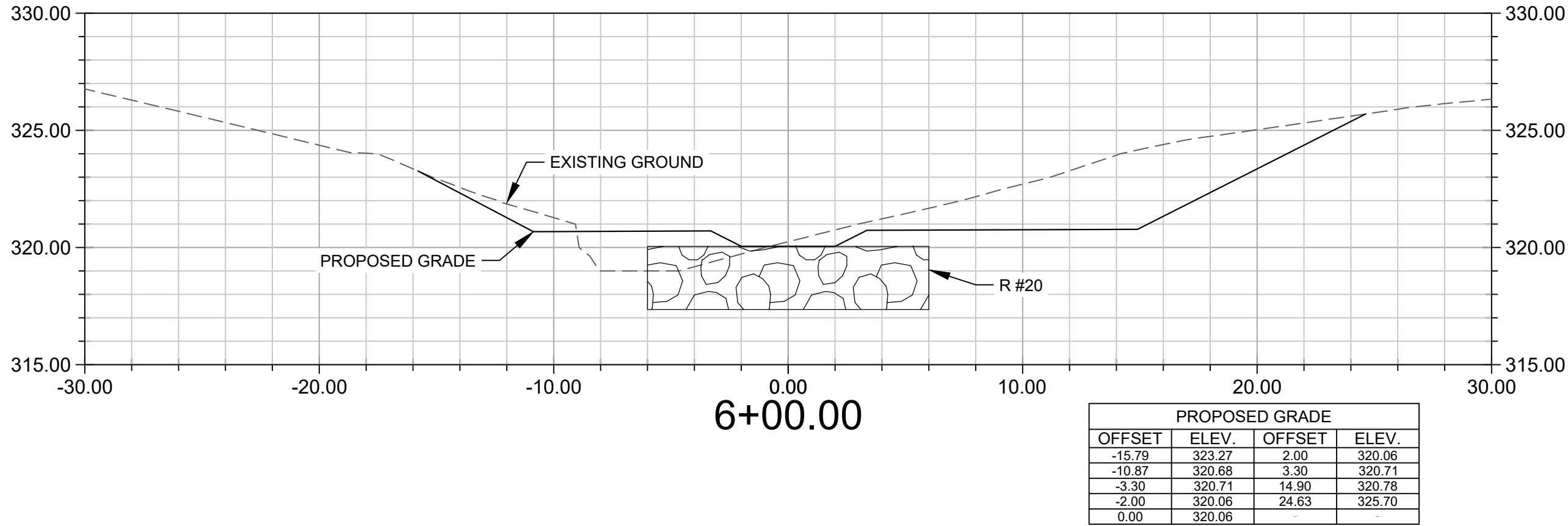
Scale : AS SHOWN

Date : 10 / 25

Sheet No. 23 of 44



UNT TO BYNUM RUN - REACH 1  
CROSS-SECTIONS



NOTE: CLASS I RIPRAP FROM RS#3 INSTALLED ON  
OUTFALL #4 TO CONTINUE THROUGH POOL BOTTOM  
BETWEEN RUN OF R#25 AND GLIDE OF R#26.

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-26.62	320.00	2.00	313.91
-17.83	315.54	5.17	315.47
-5.17	315.47	13.20	315.51
-2.00	313.91	25.63	321.73
0.00	313.91		



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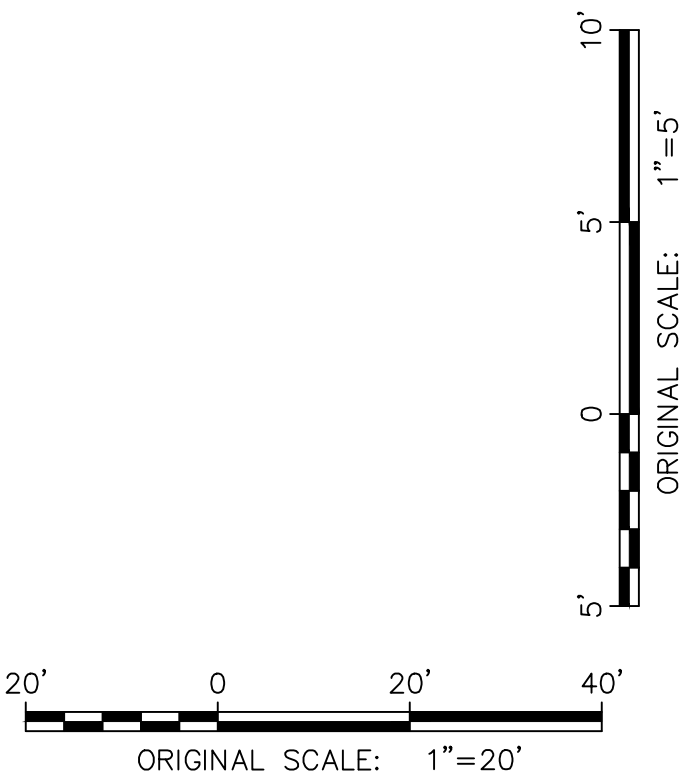
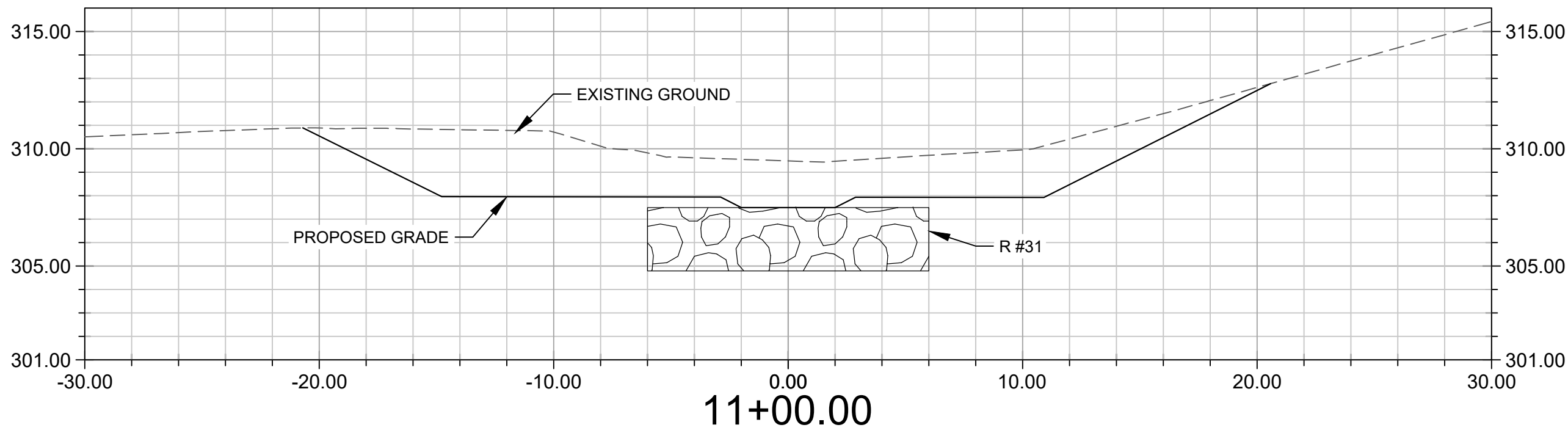
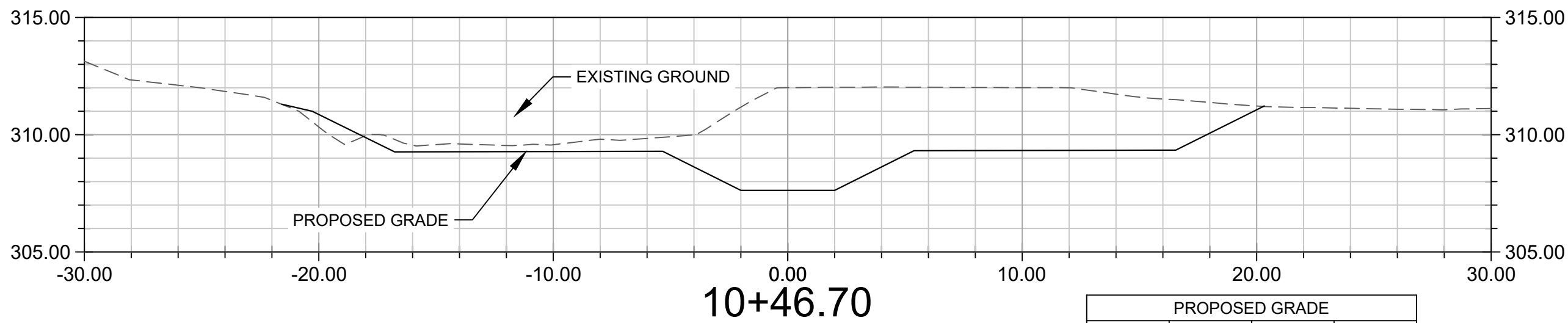
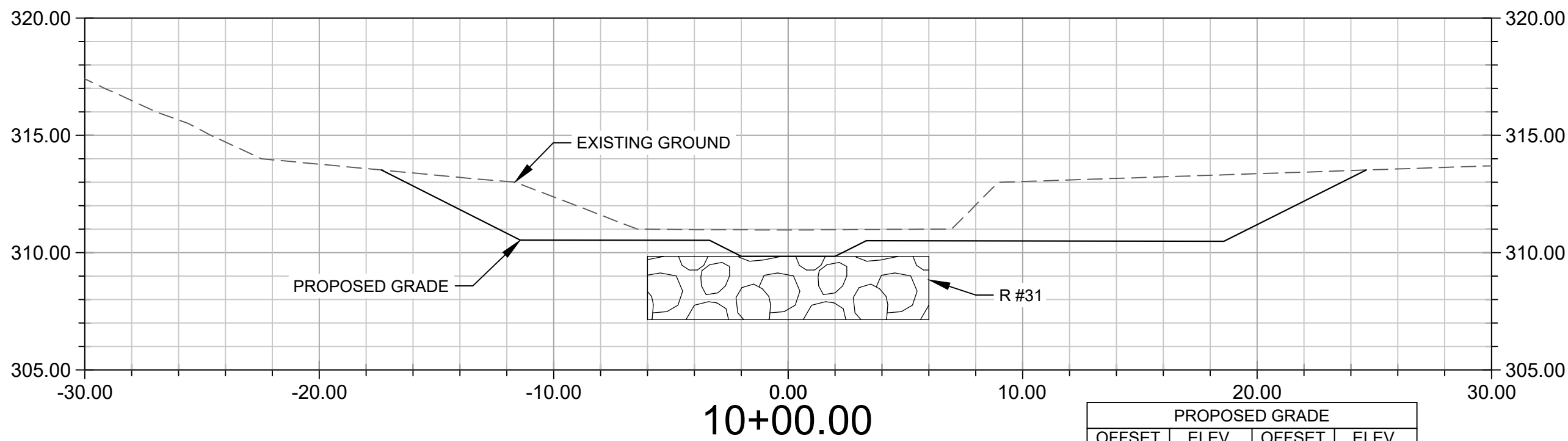
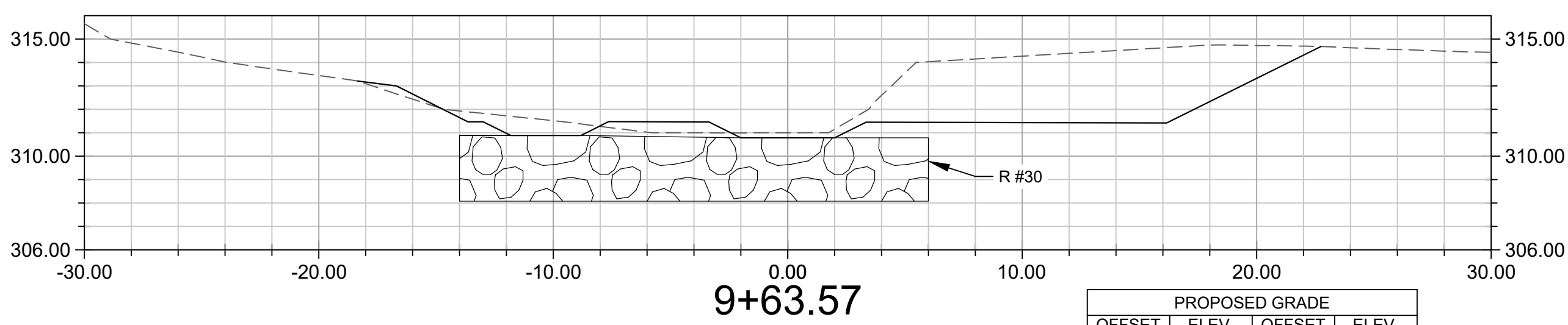
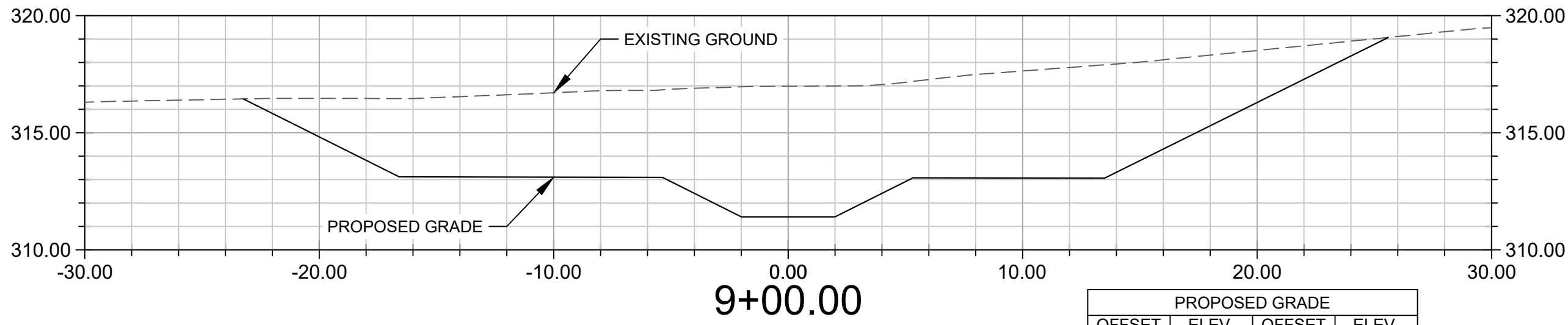


Revisions	

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
CROSS-SECTION SHEET	
Drawn By : PJB	Scale : AS SHOWN
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. CS-03 of CS-08	Sheet No. 24 of 44



UNT TO BYNUM RUN - REACH 1  
CROSS-SECTIONS



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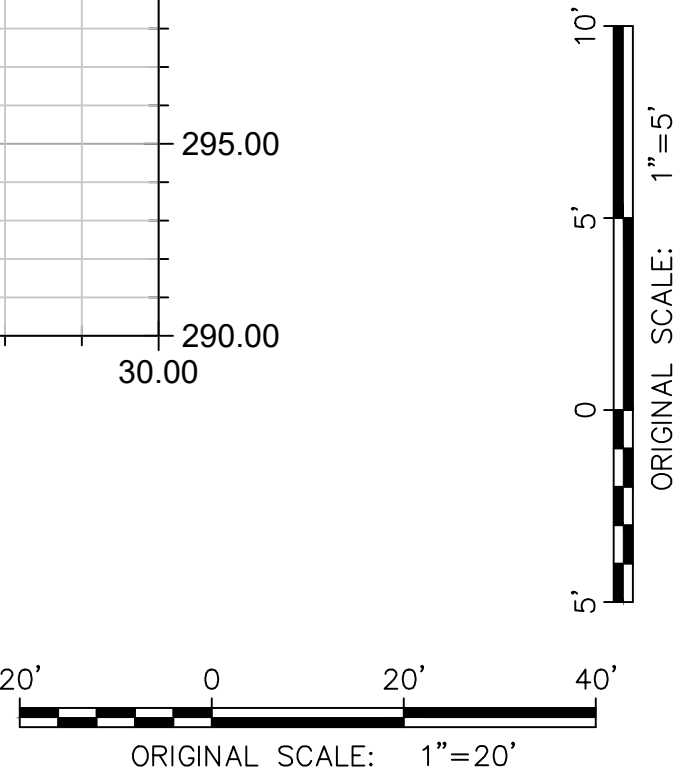
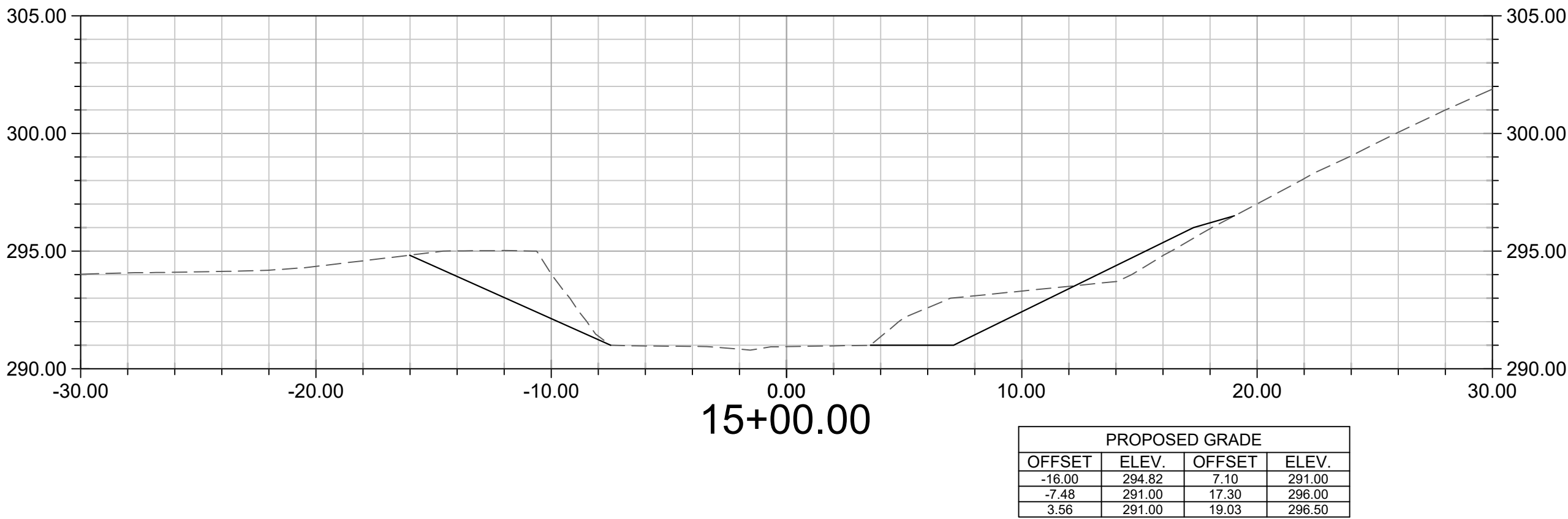
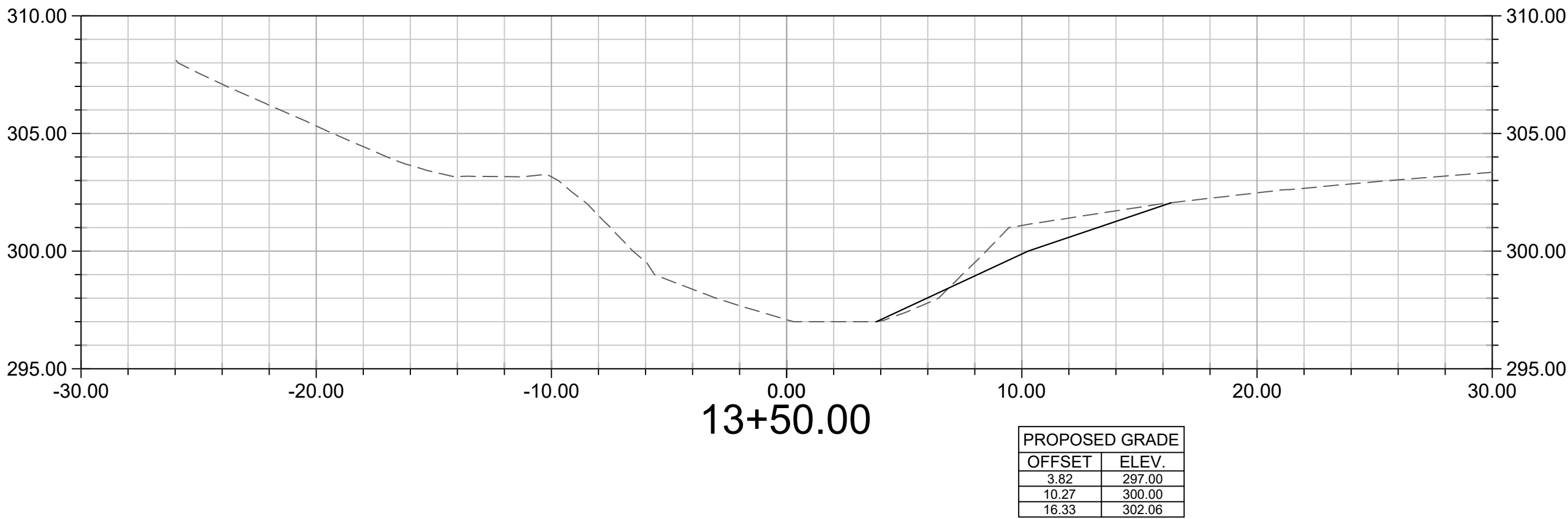
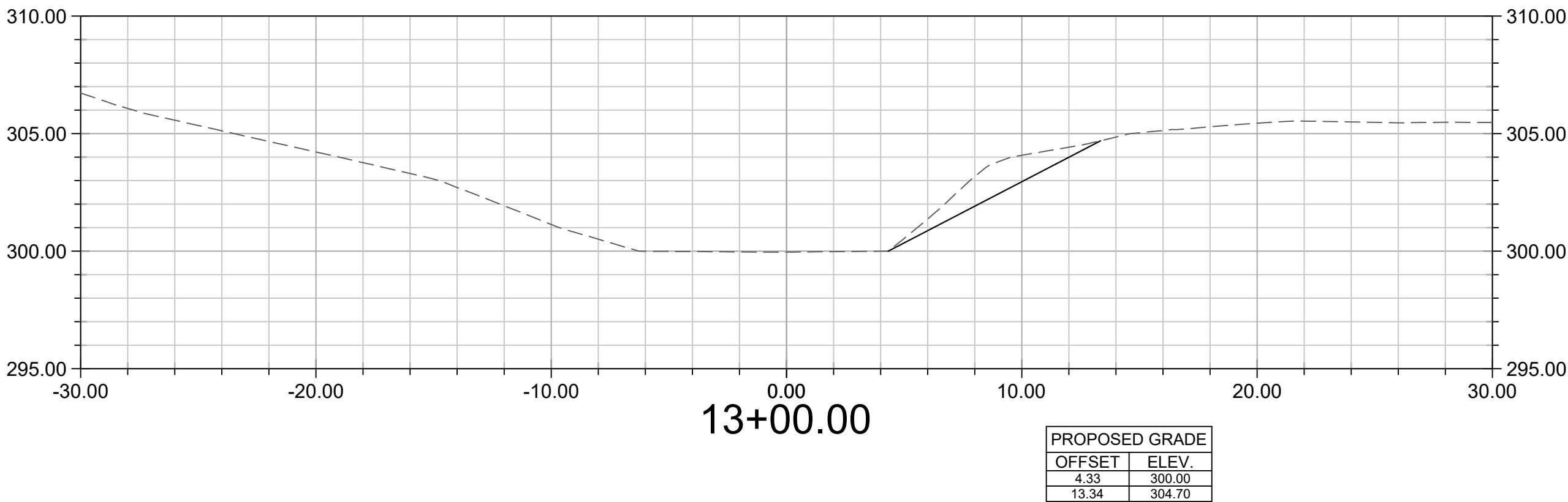
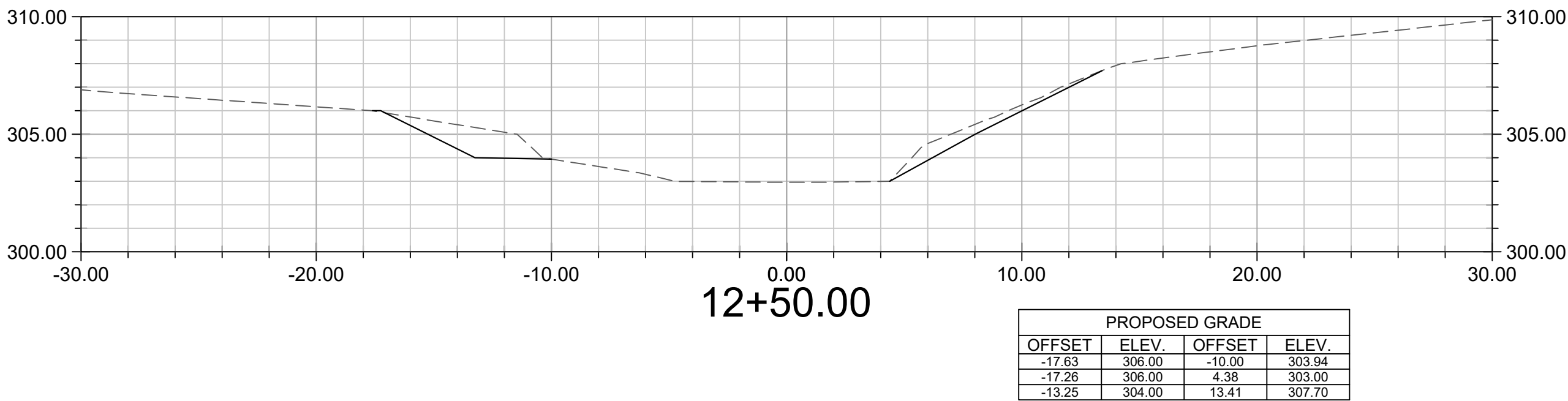
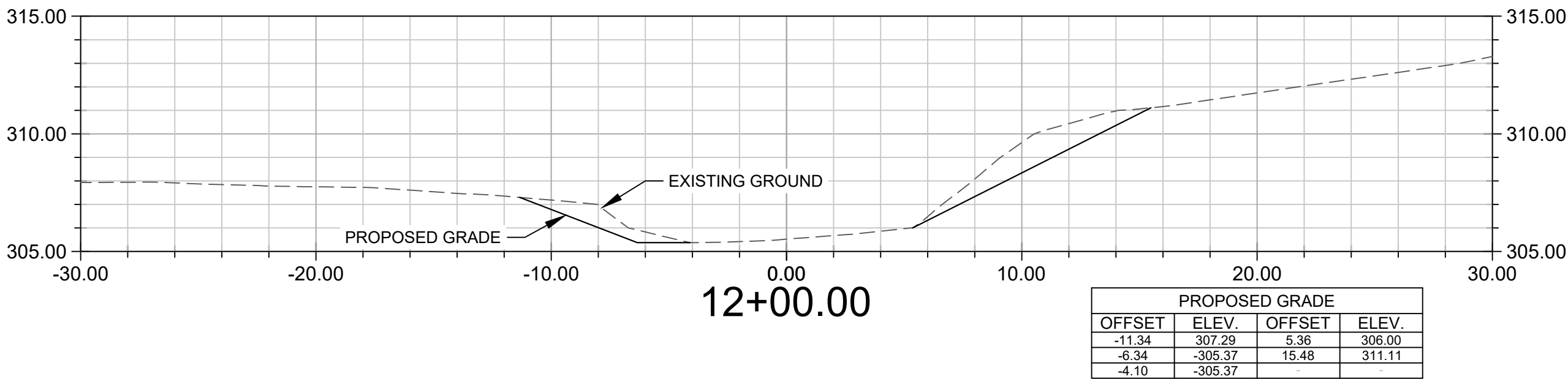
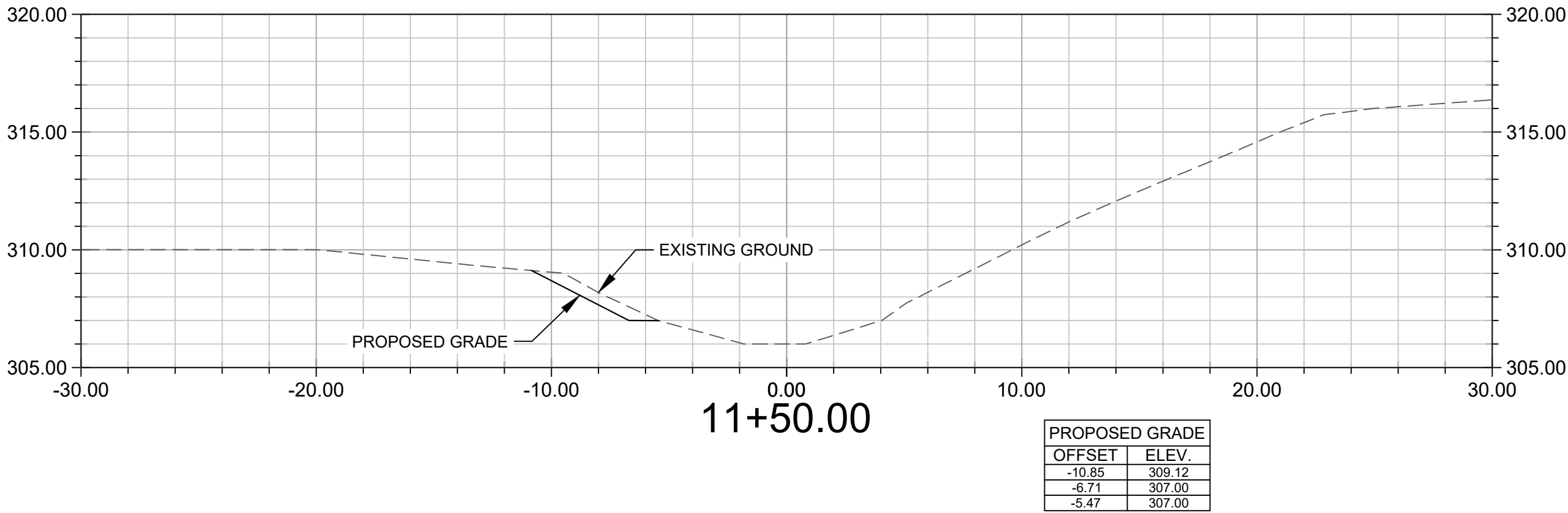
Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
CROSS-SECTION SHEET	
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Reviewed By : CAL	
Drawing No. CS-04 of CS-08	Sheet No. 25 of 44



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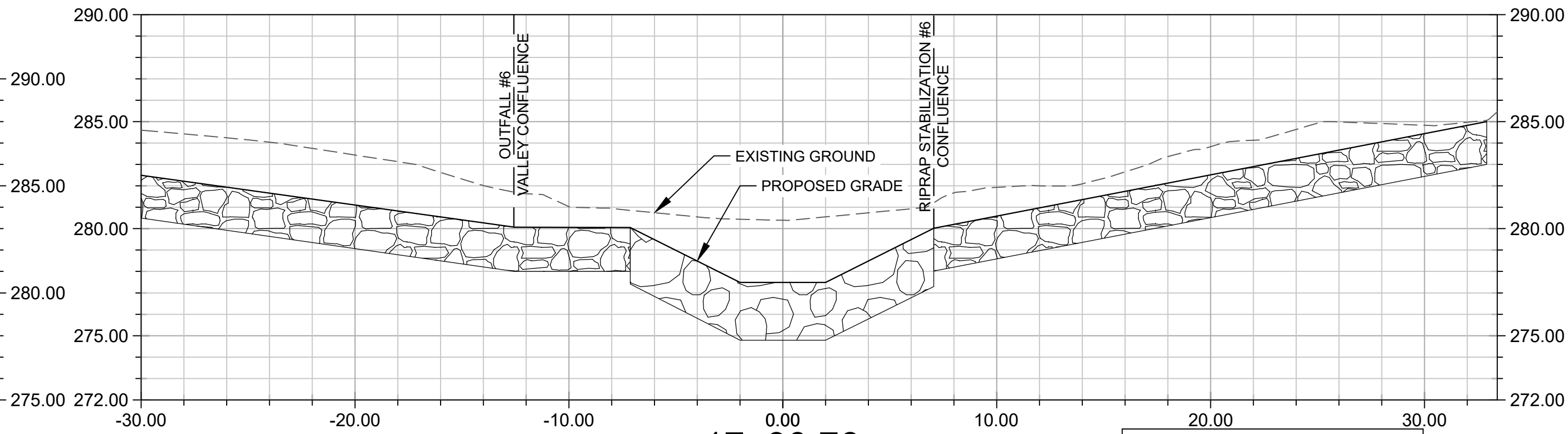
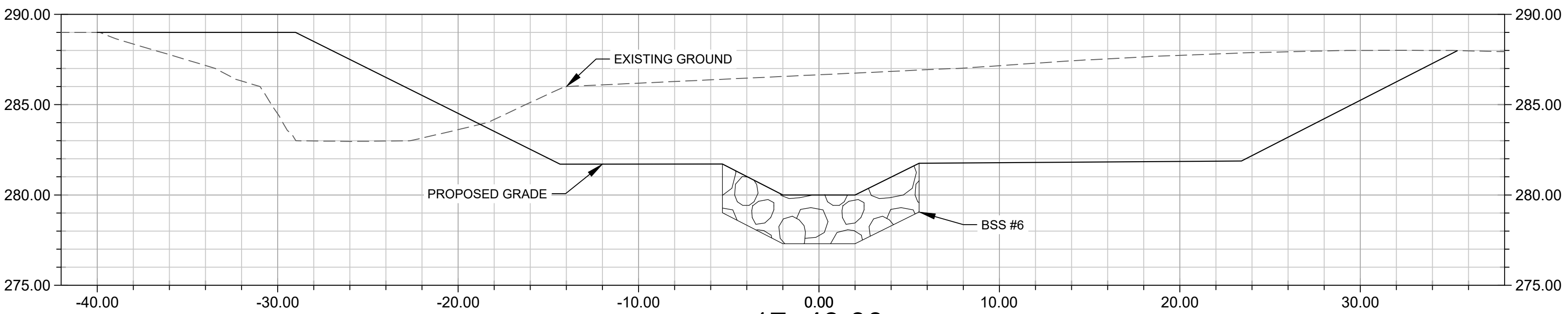
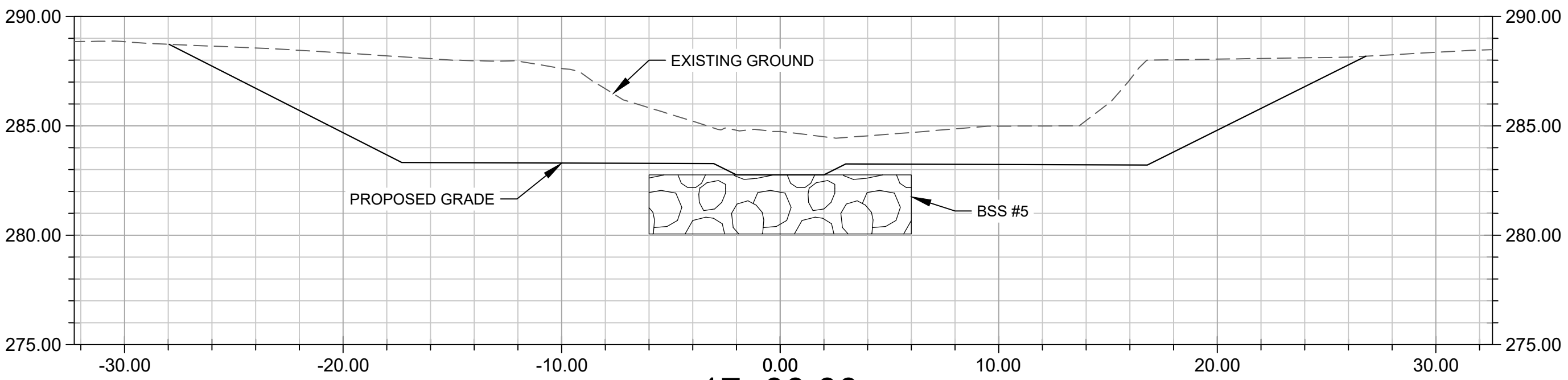
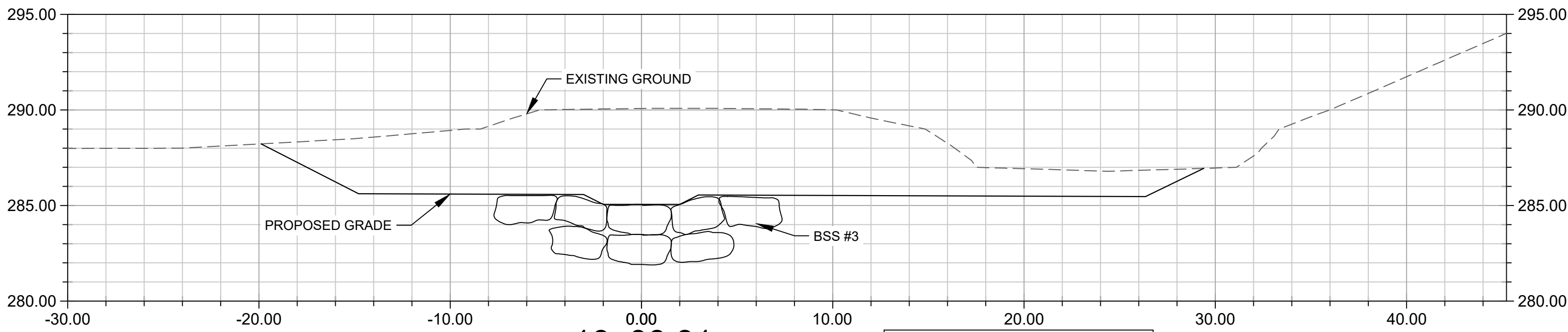
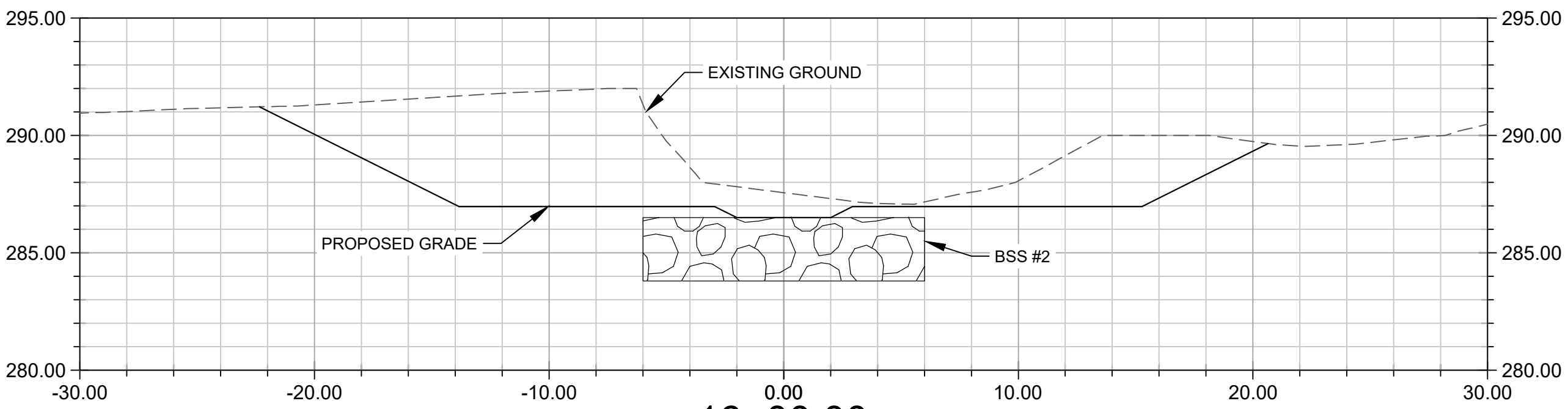
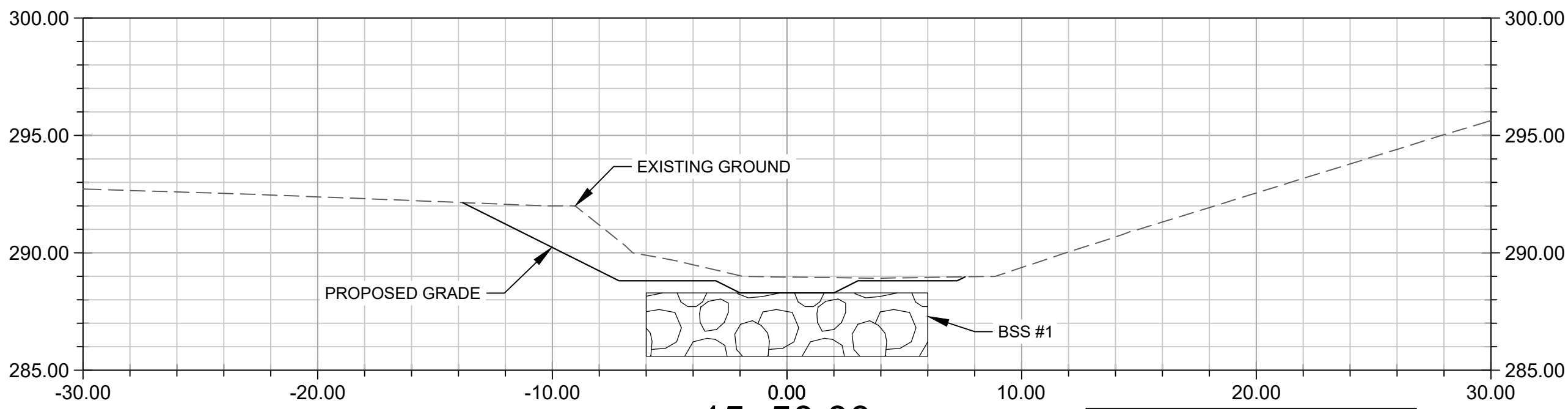


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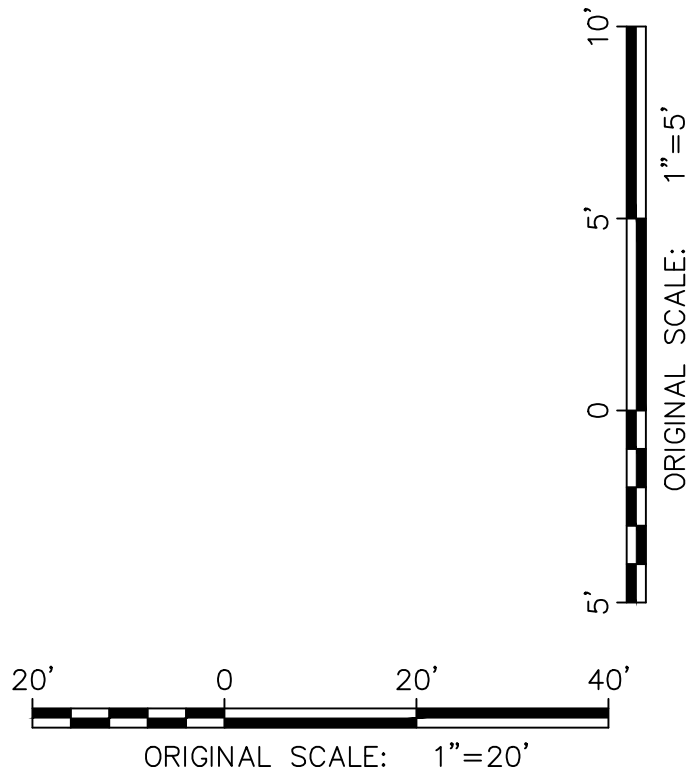
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BENNETT PLACE STREAM RESTORATION	
CROSS-SECTION SHEET	
Drawn By : PJB	Scale : AS SHOWN
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. CS-05 of CS-08	Sheet No. 26 of 44



UNT TO BYNUM RUN - REACH 3  
CROSS-SECTIONS



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Revisions	

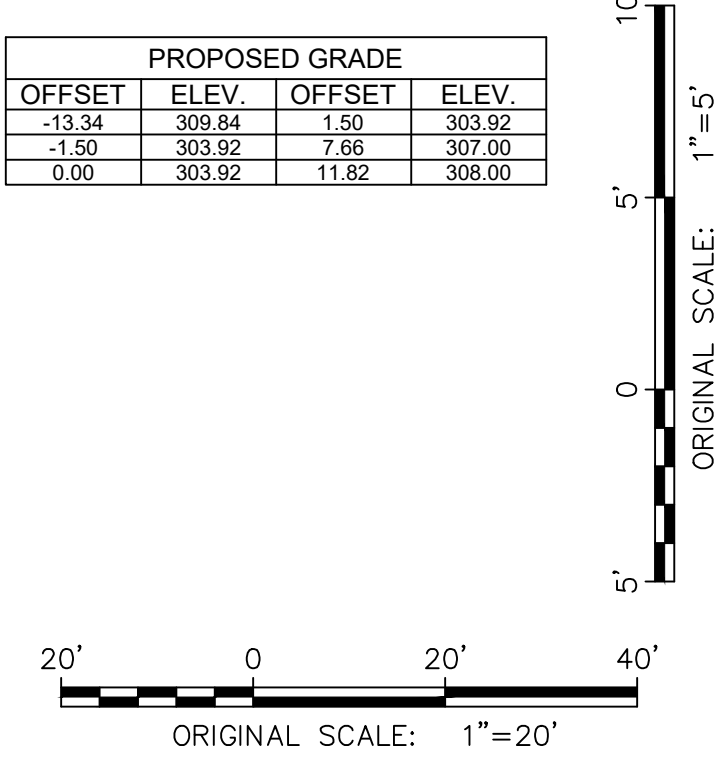
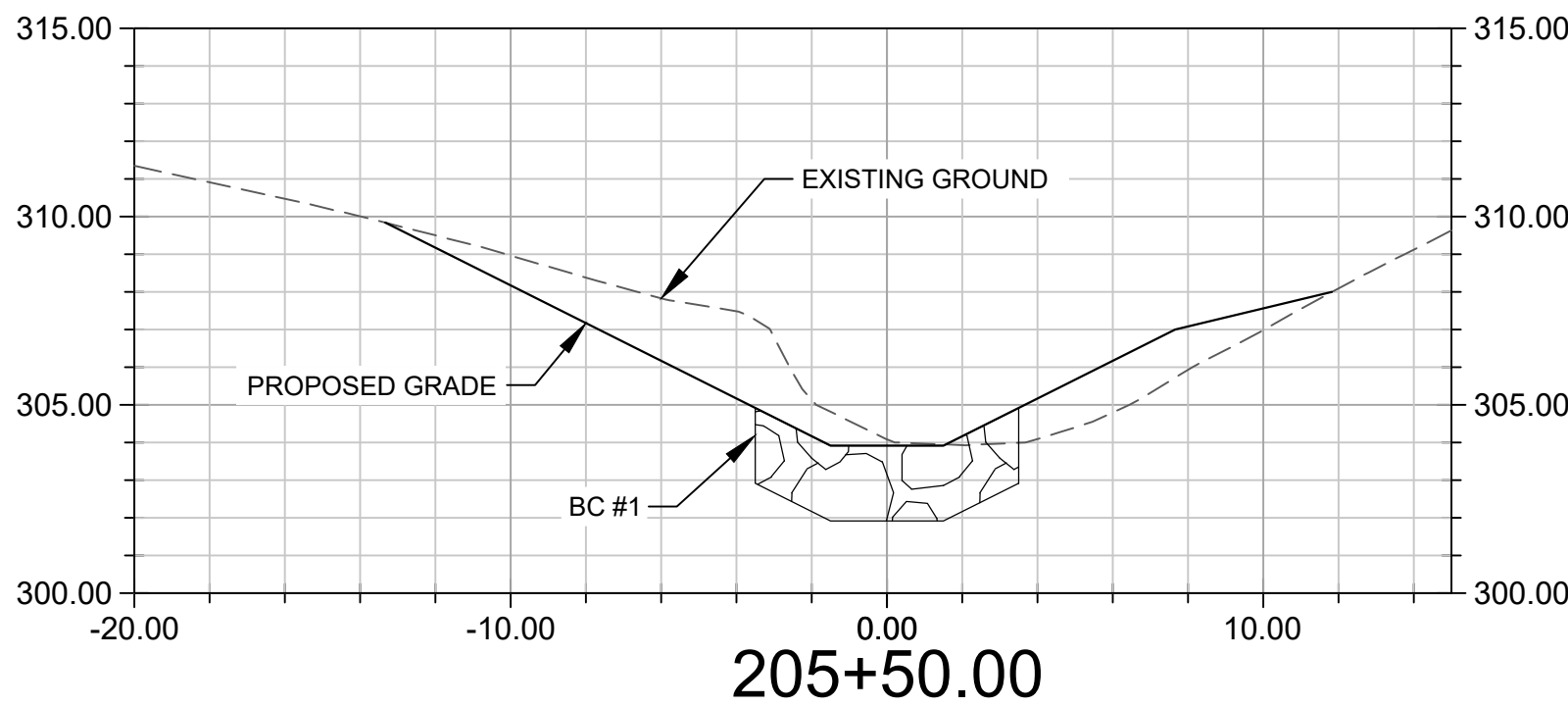
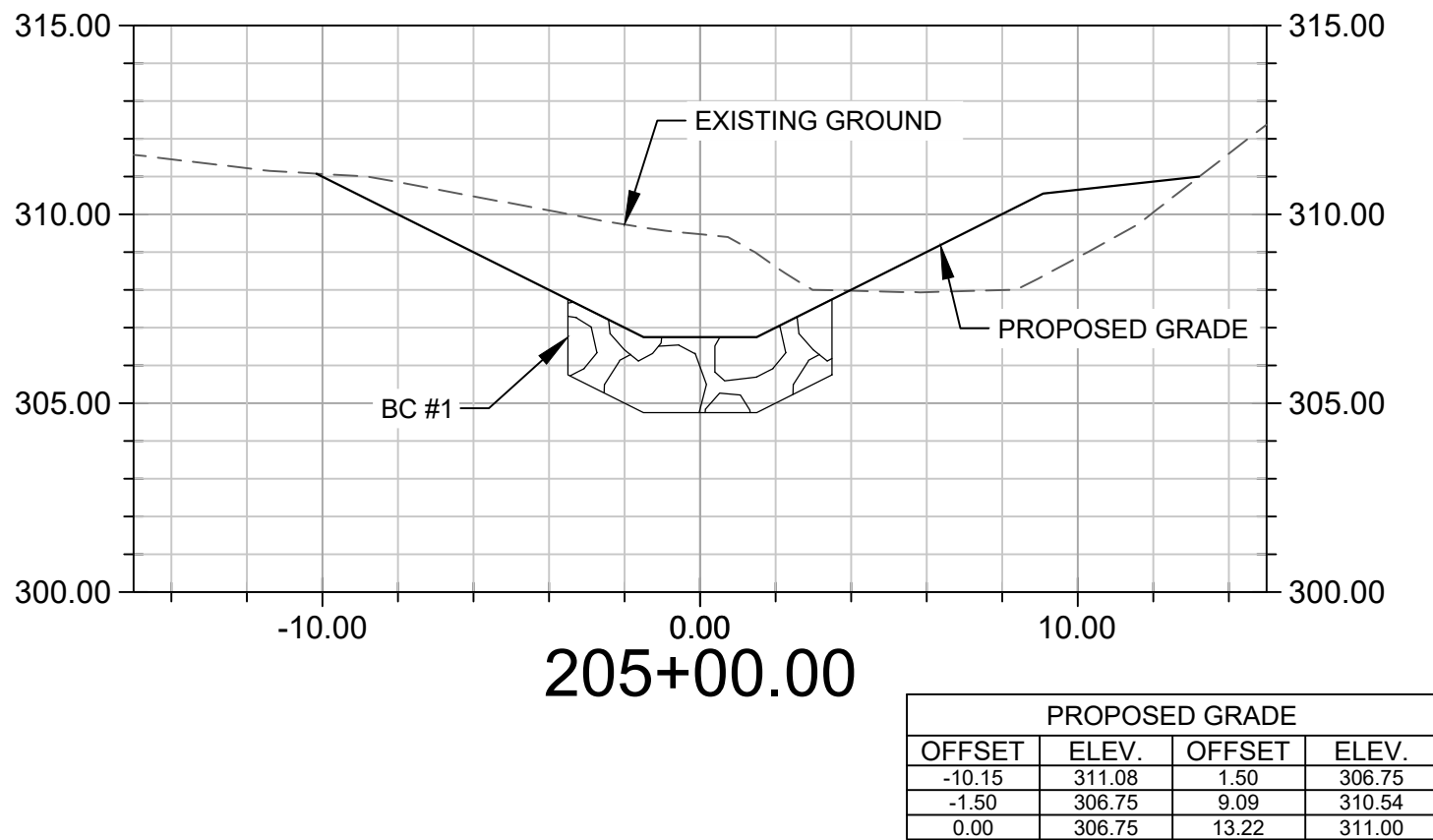
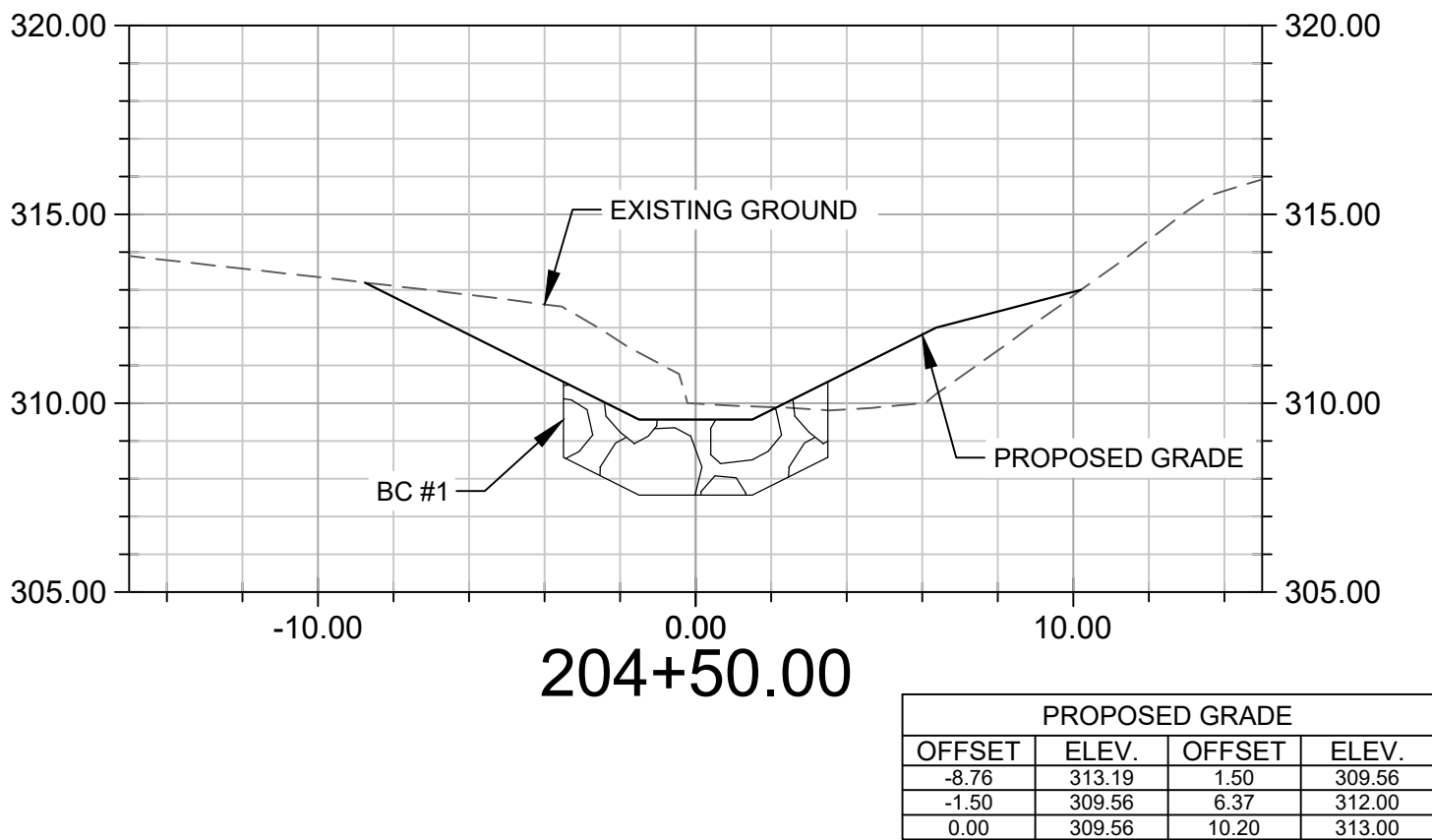
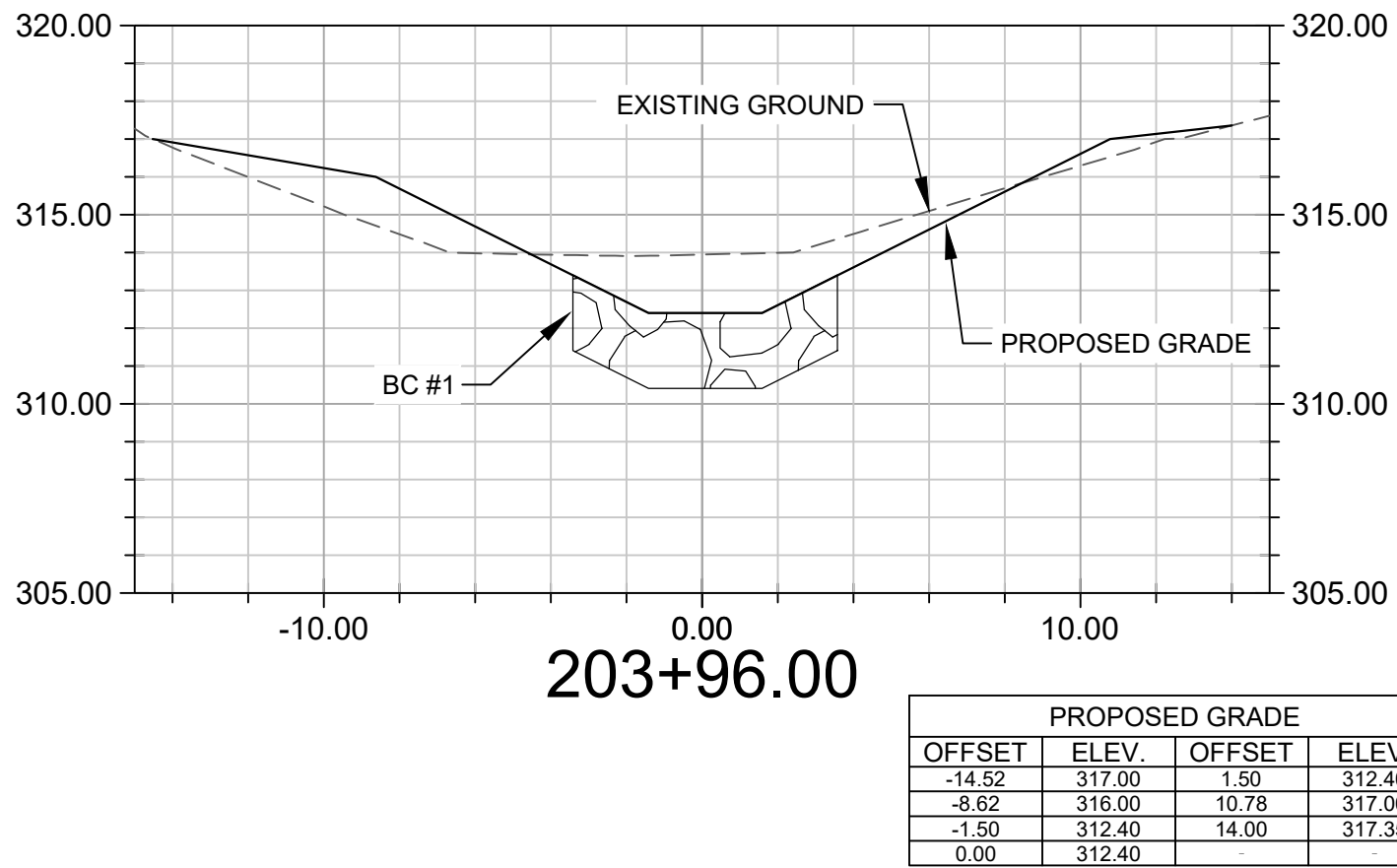
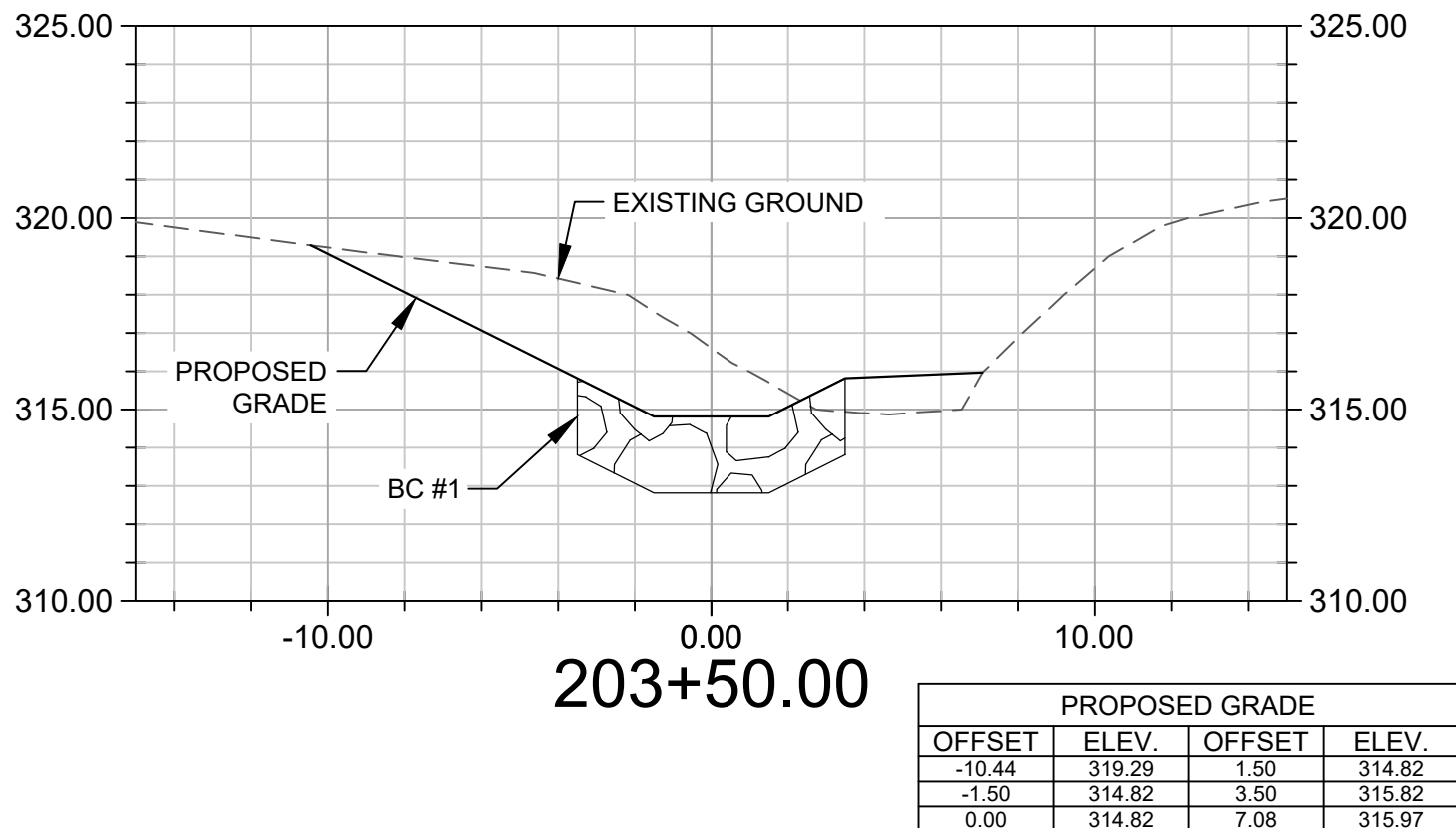
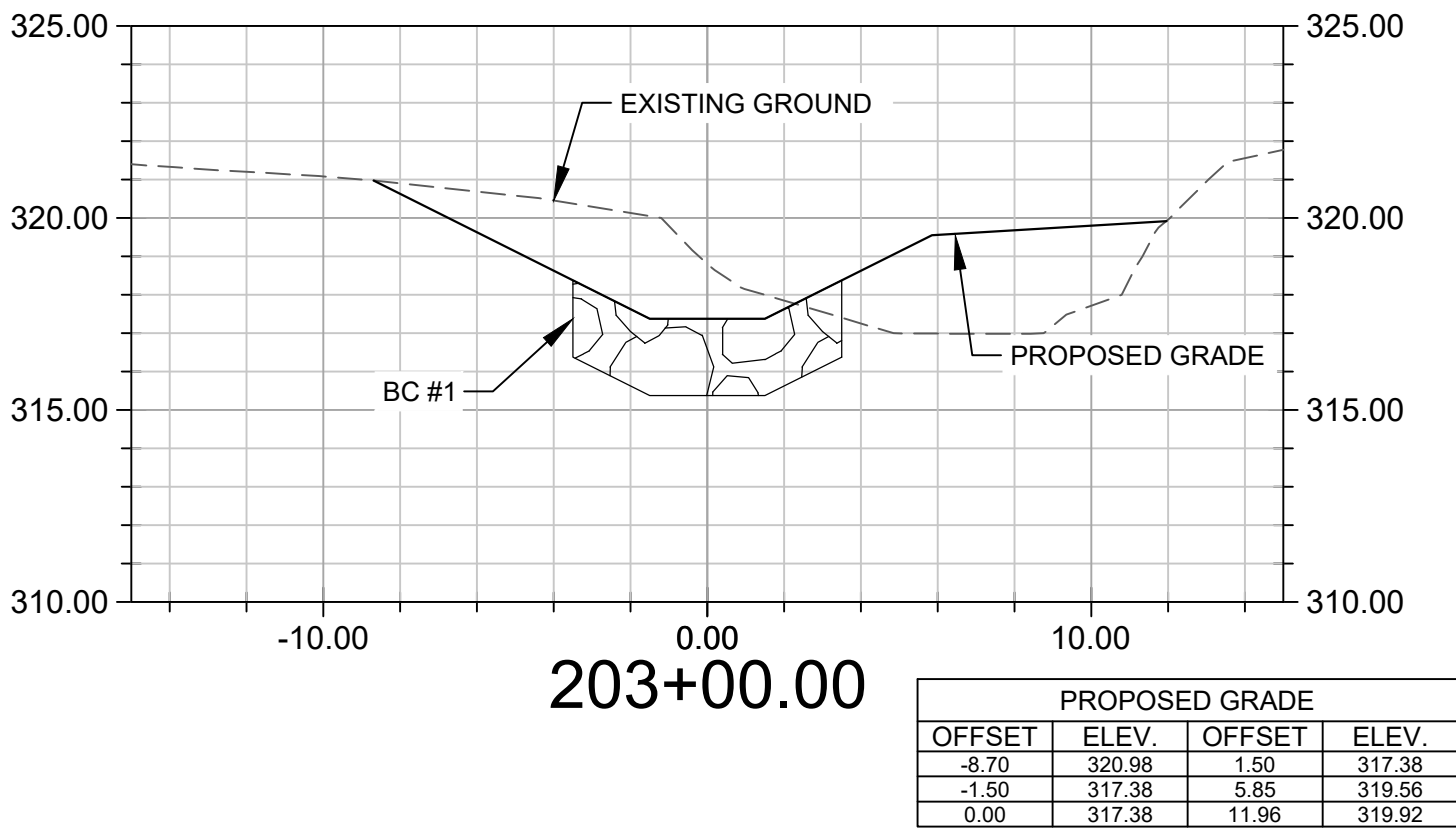
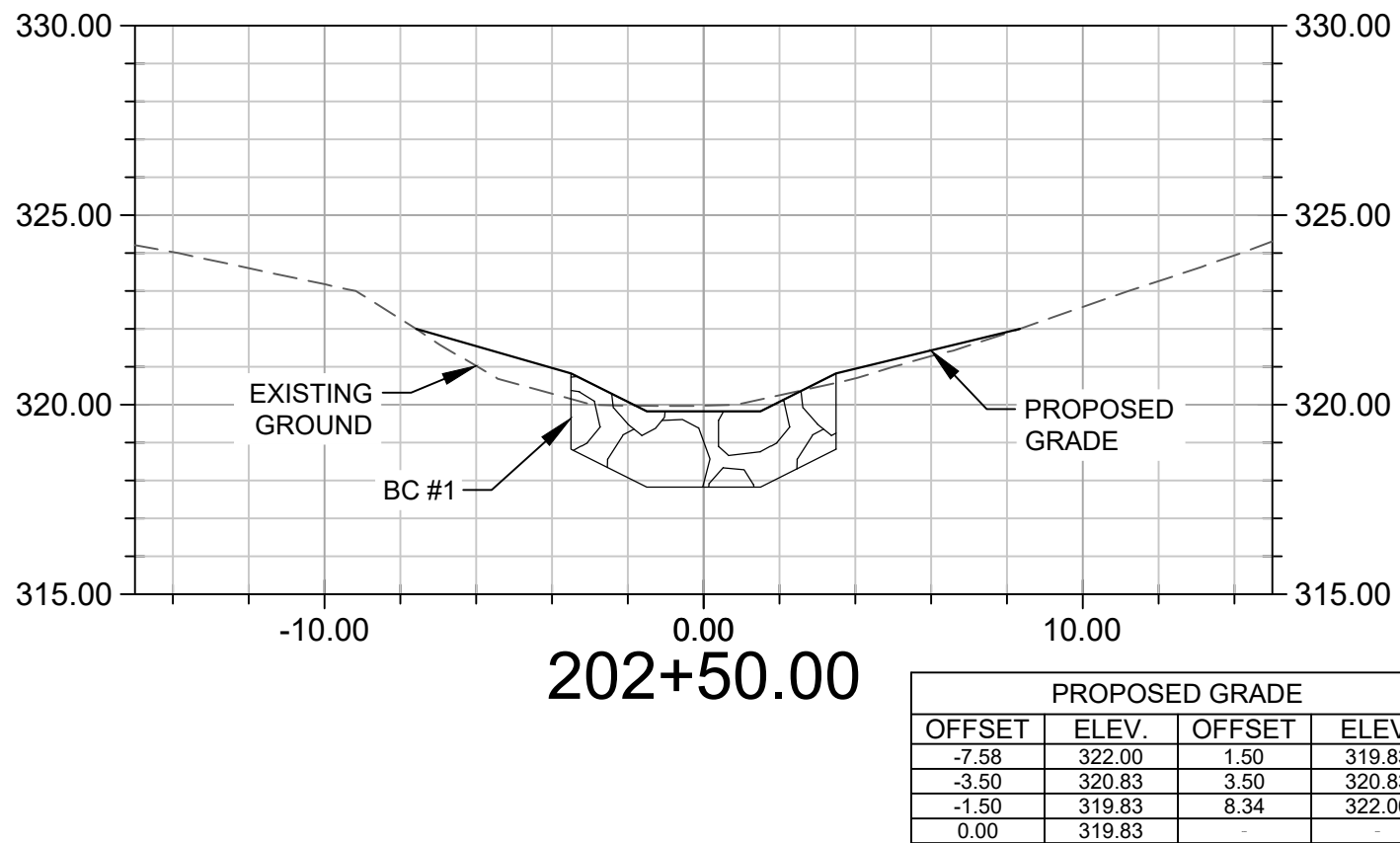
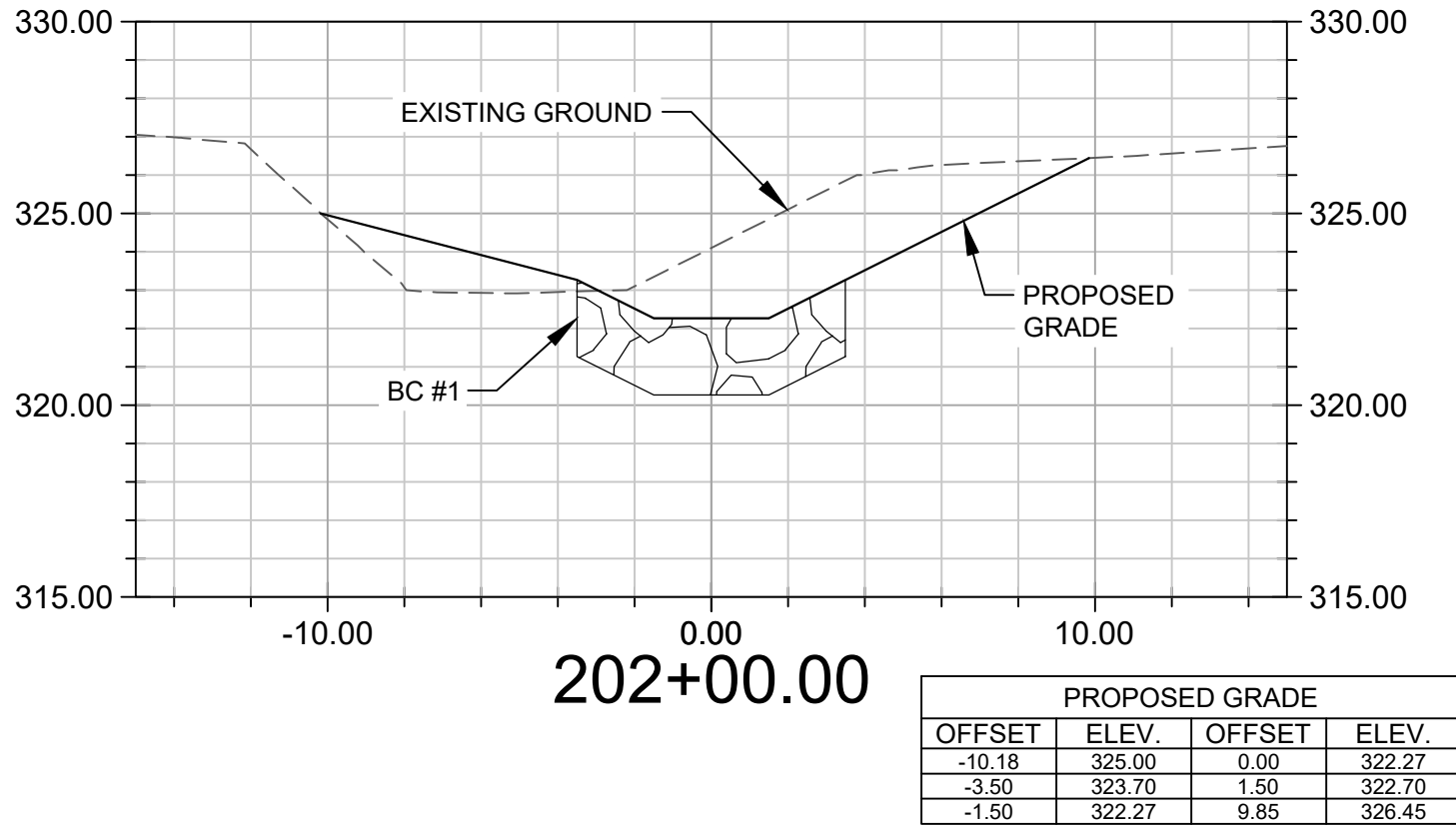
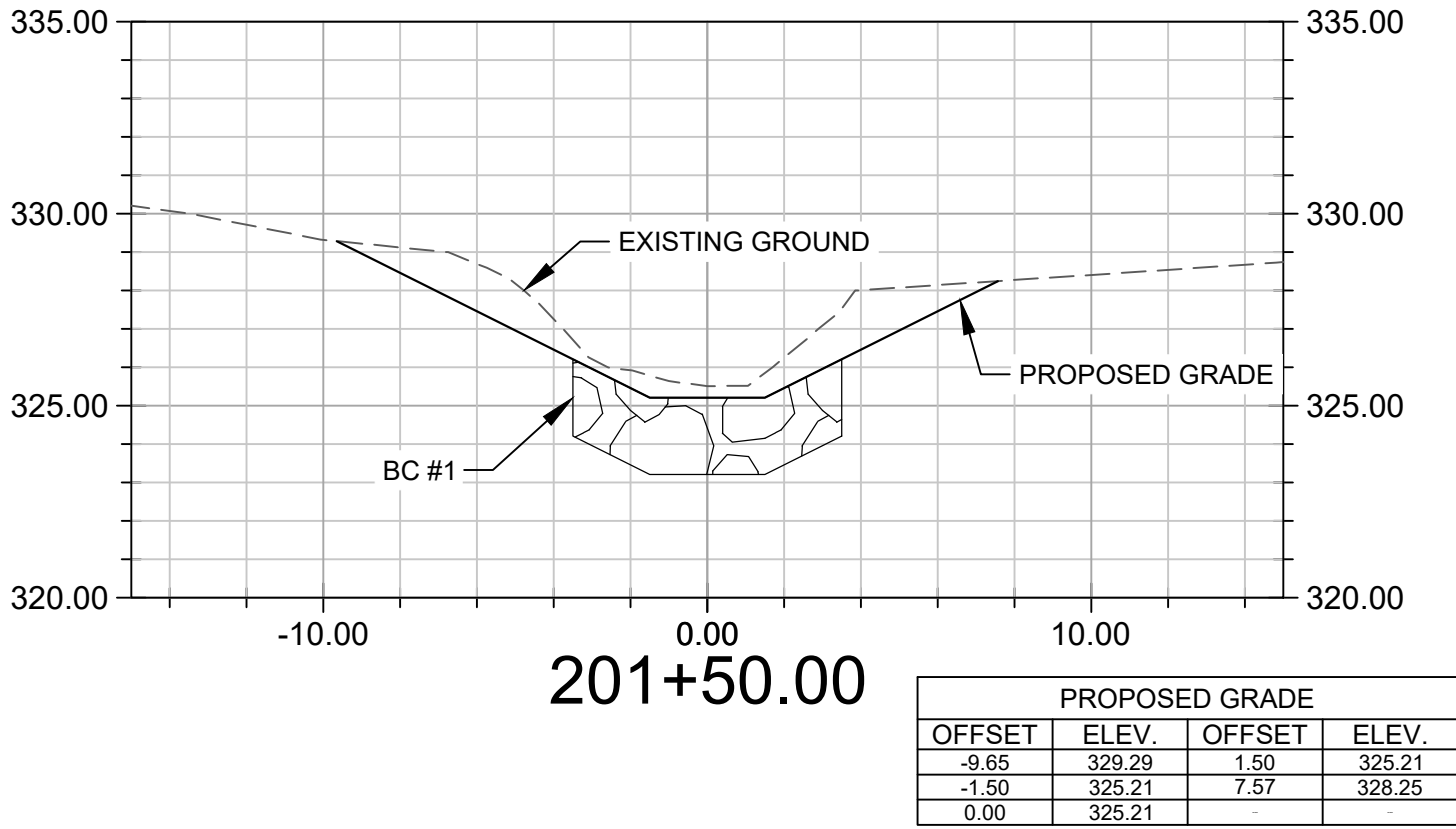
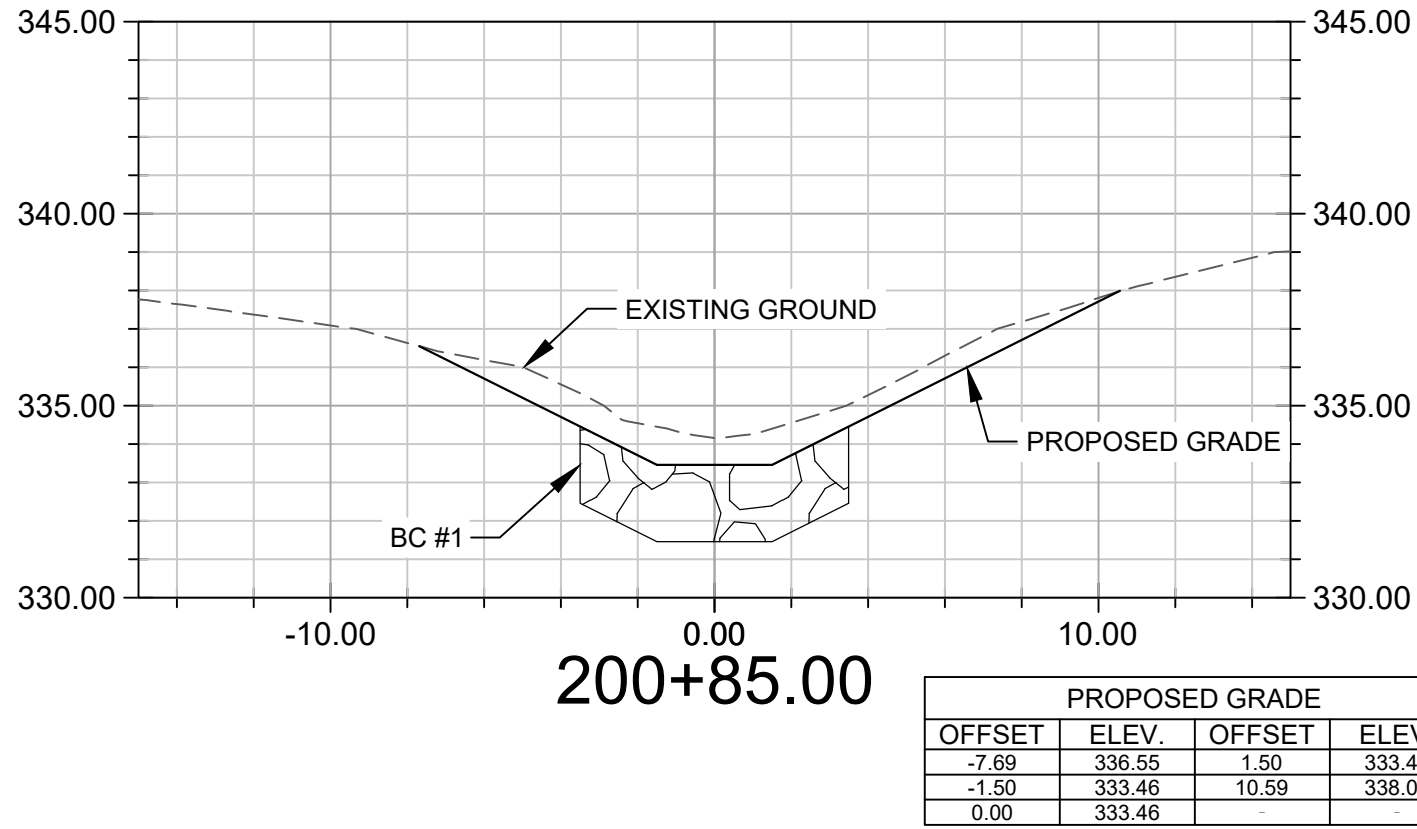
HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
CROSS-SECTION SHEET	
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Designed By : IPT , PJB	Date : 10 / 25
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Drawing No. CS-06 of CS-08	Sheet No. 27 of 44

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HCG DWG ID No.:  
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TRIBUTARY 1 CROSS-SECTIONS



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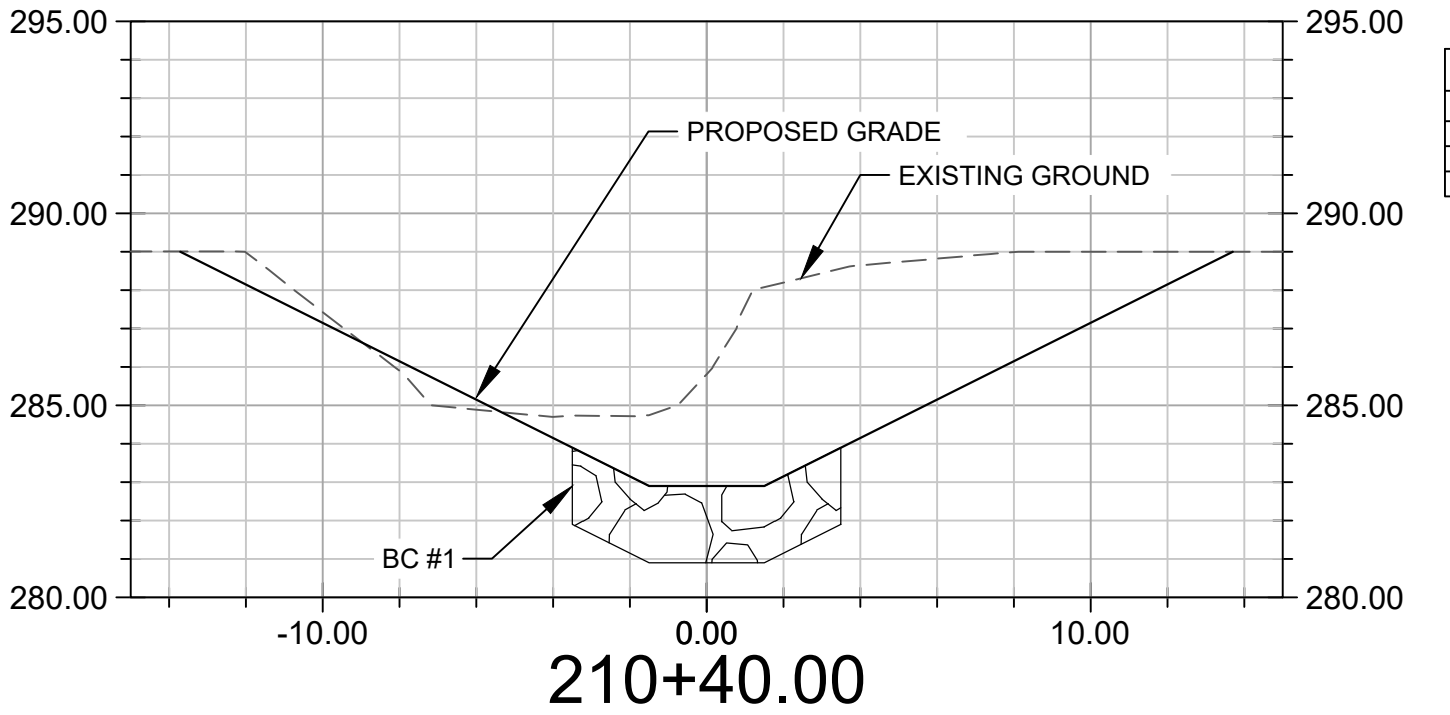
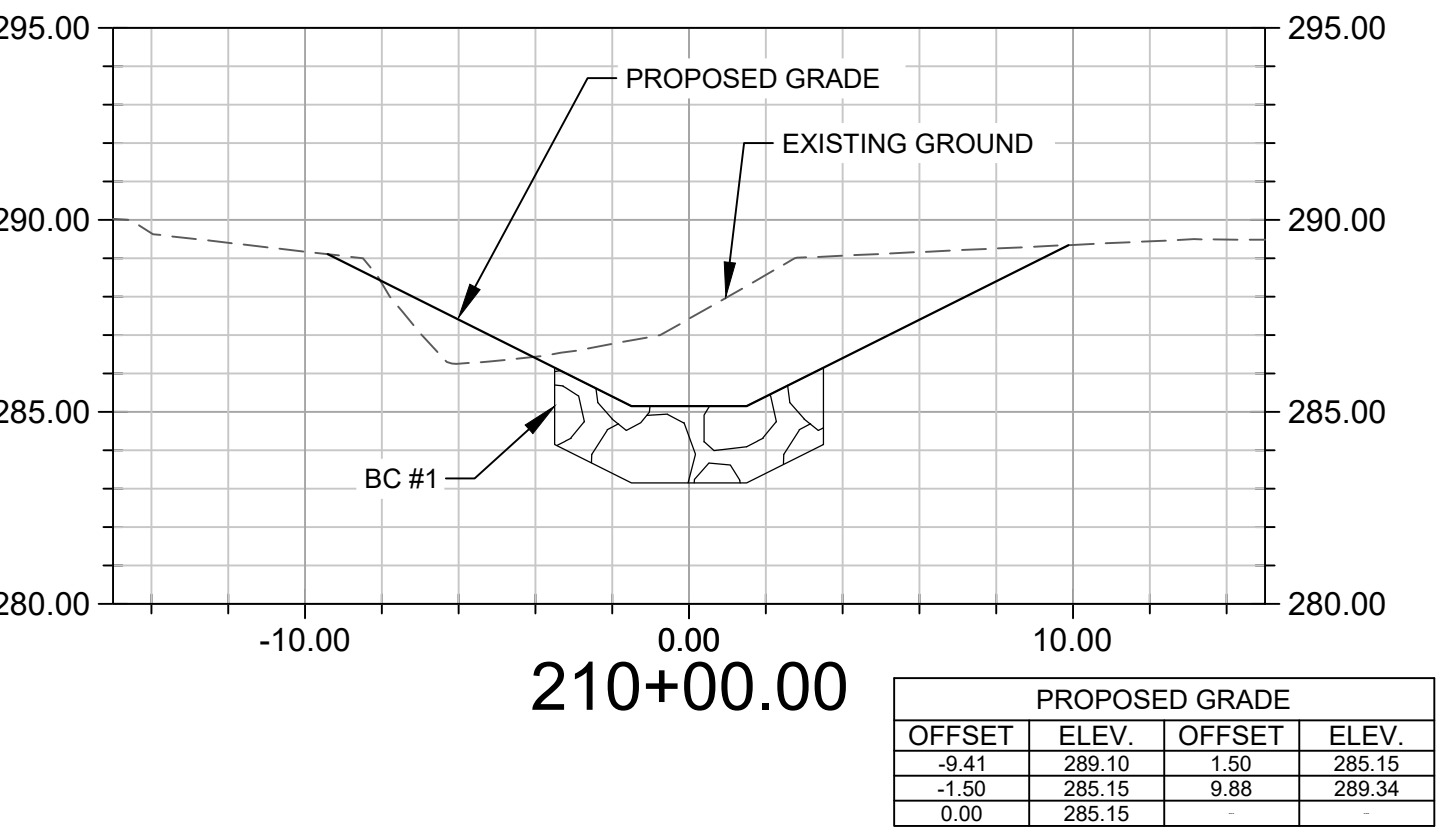
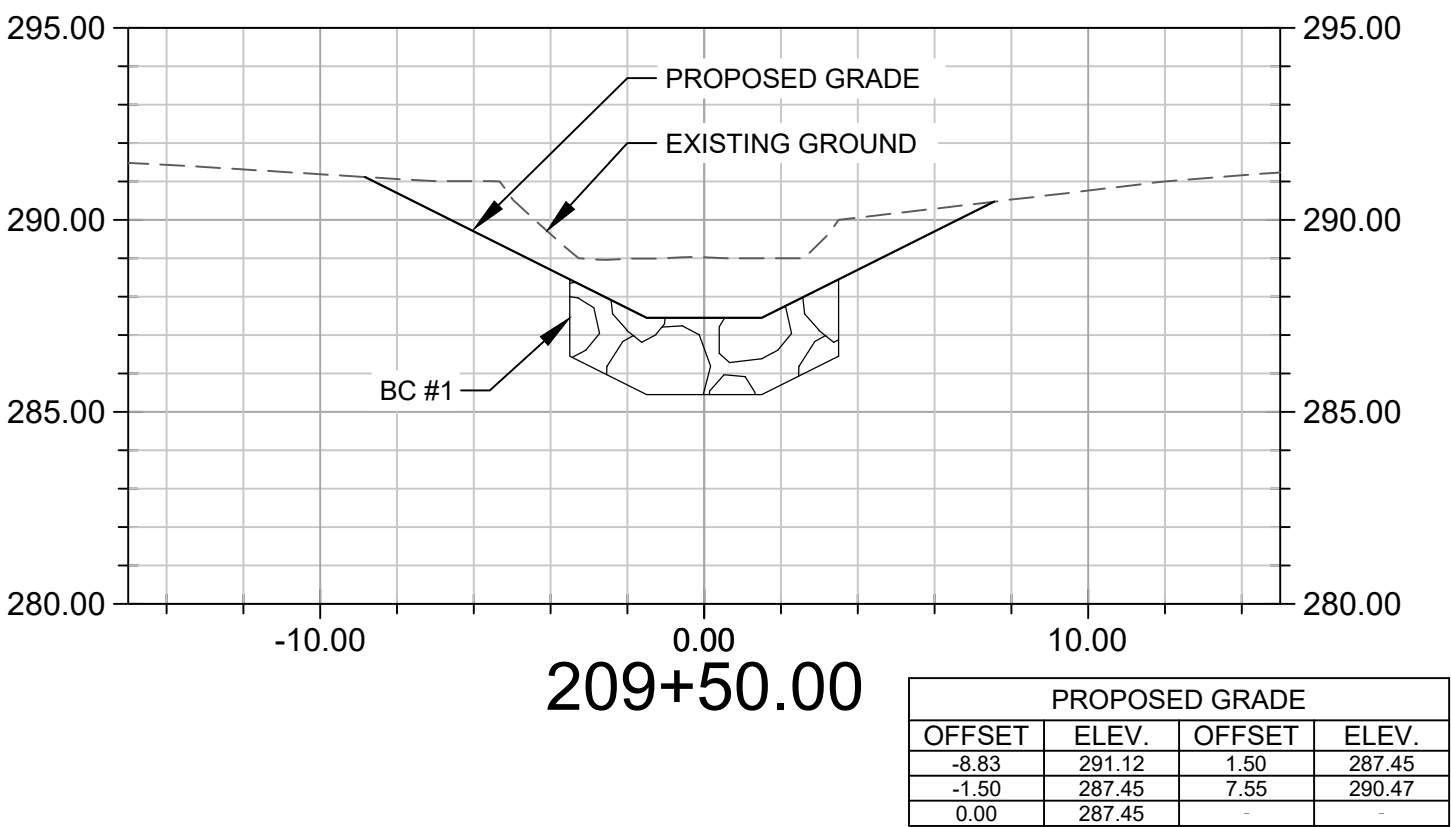
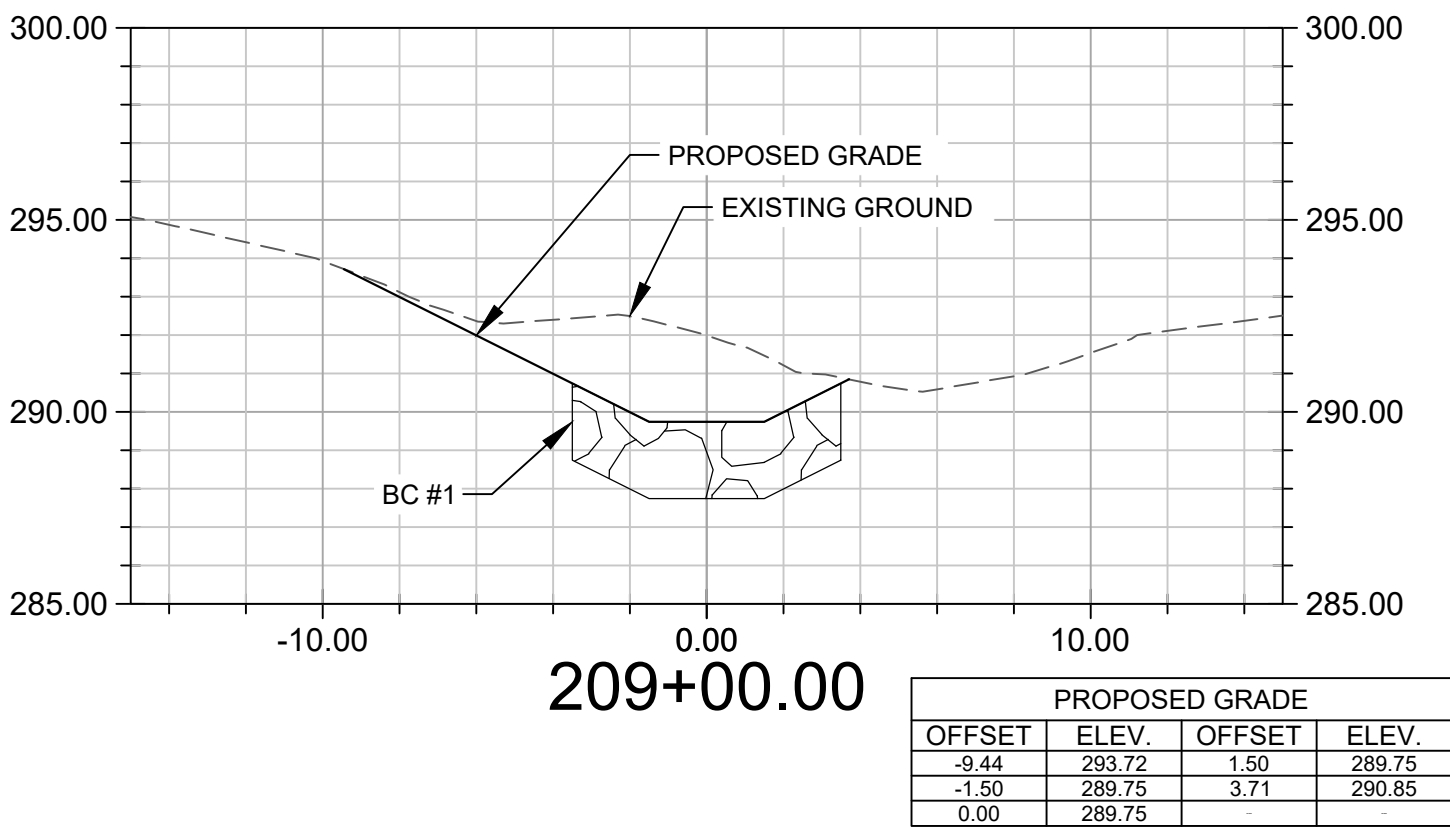
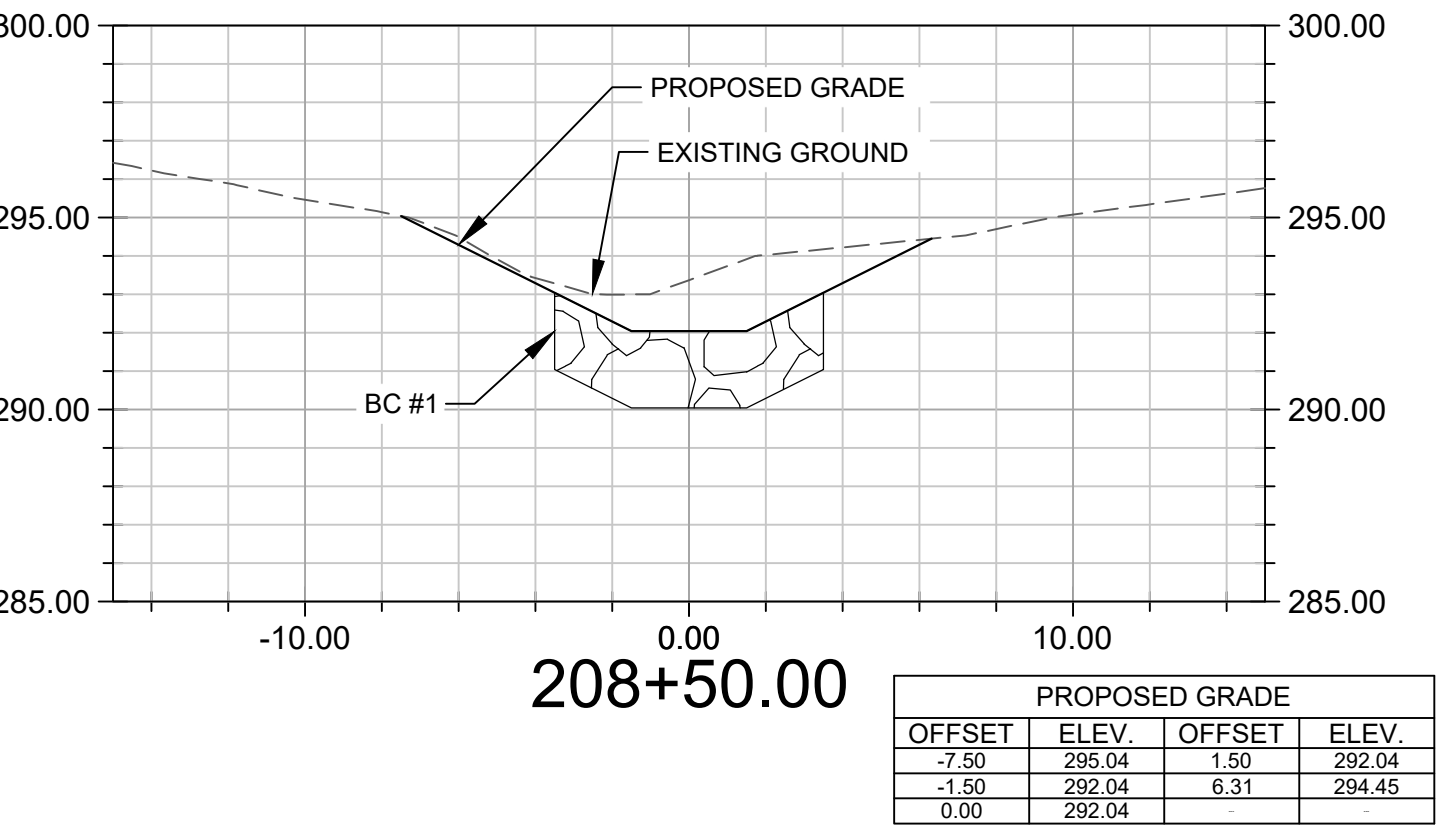
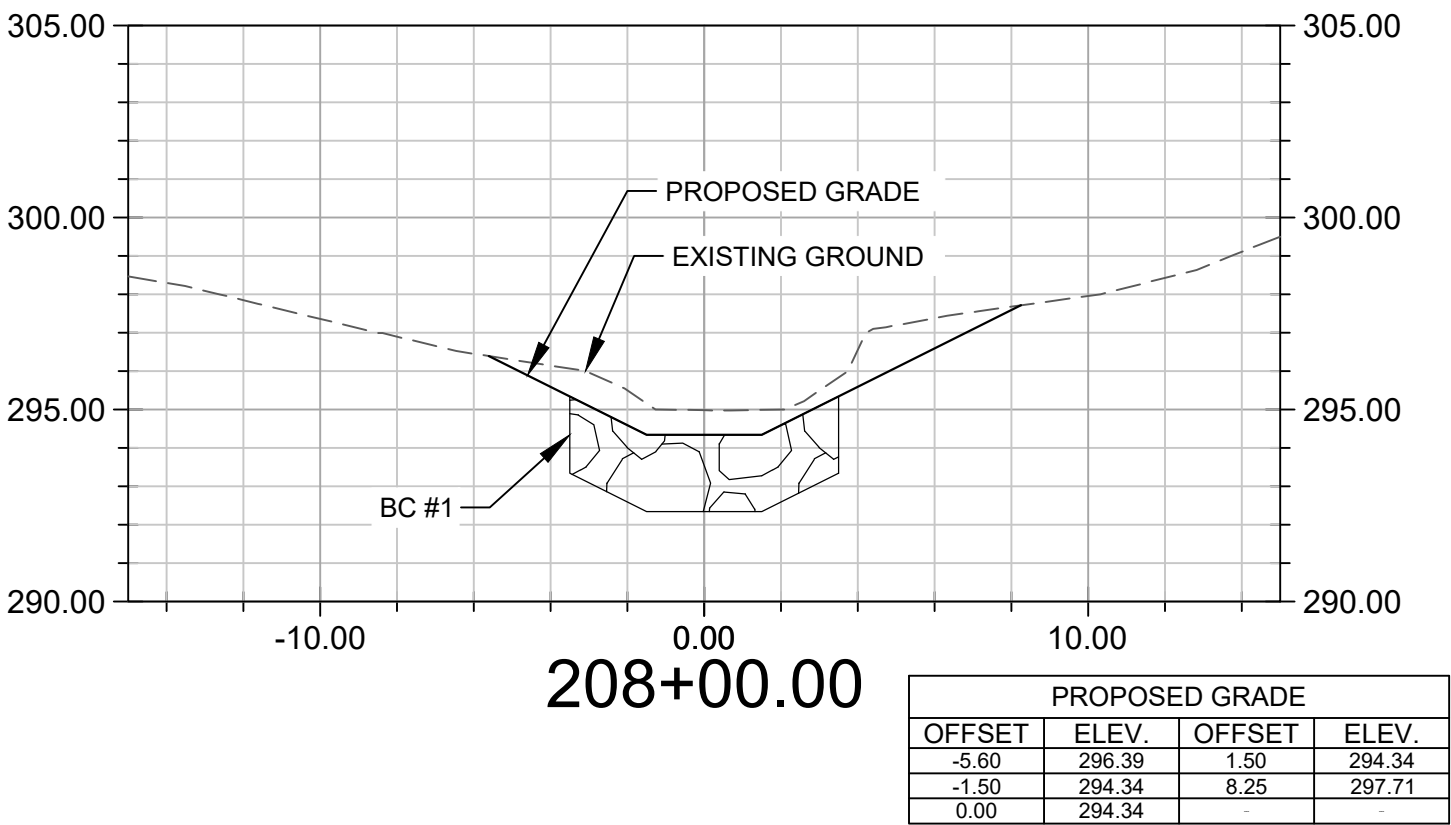
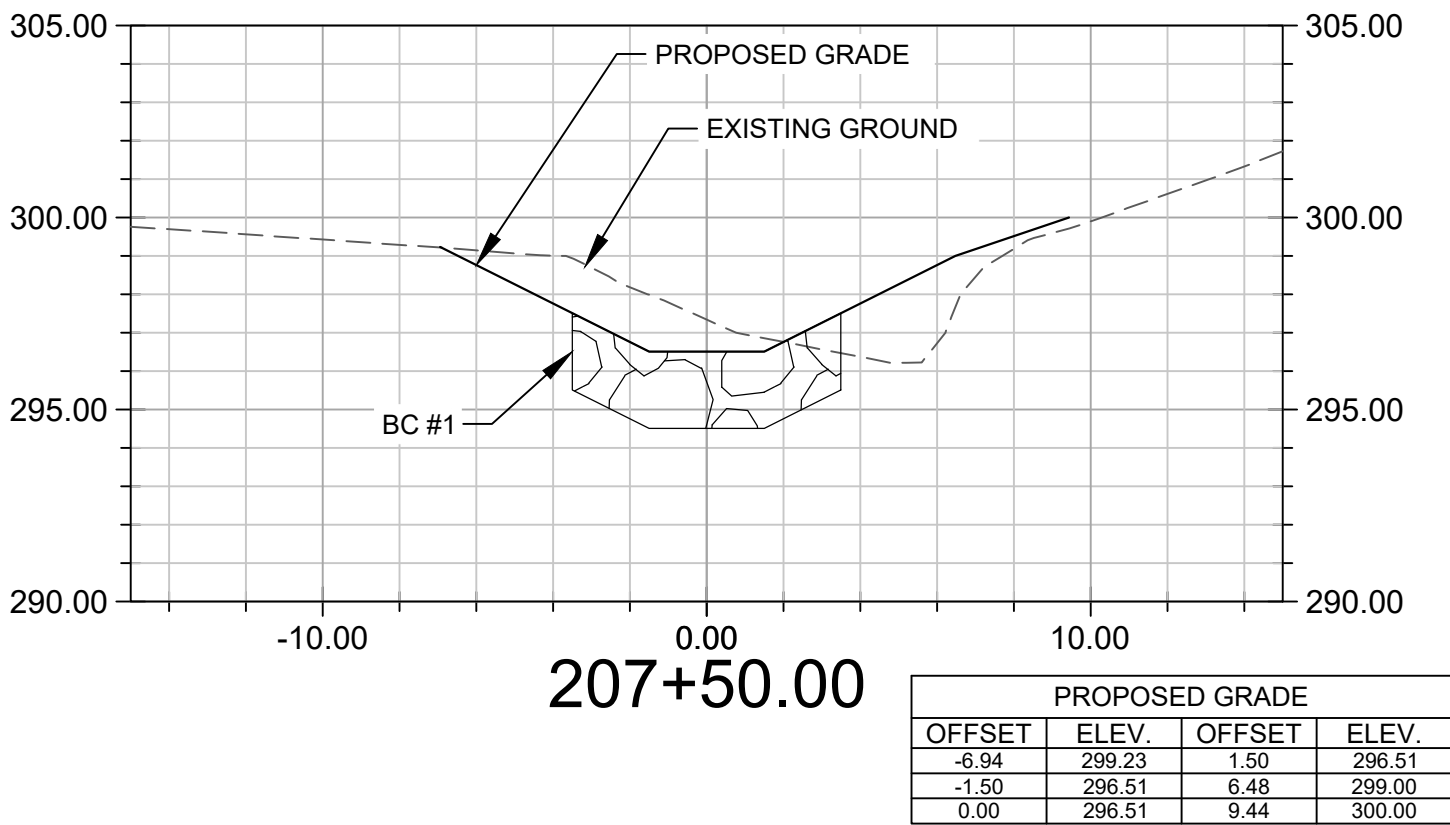
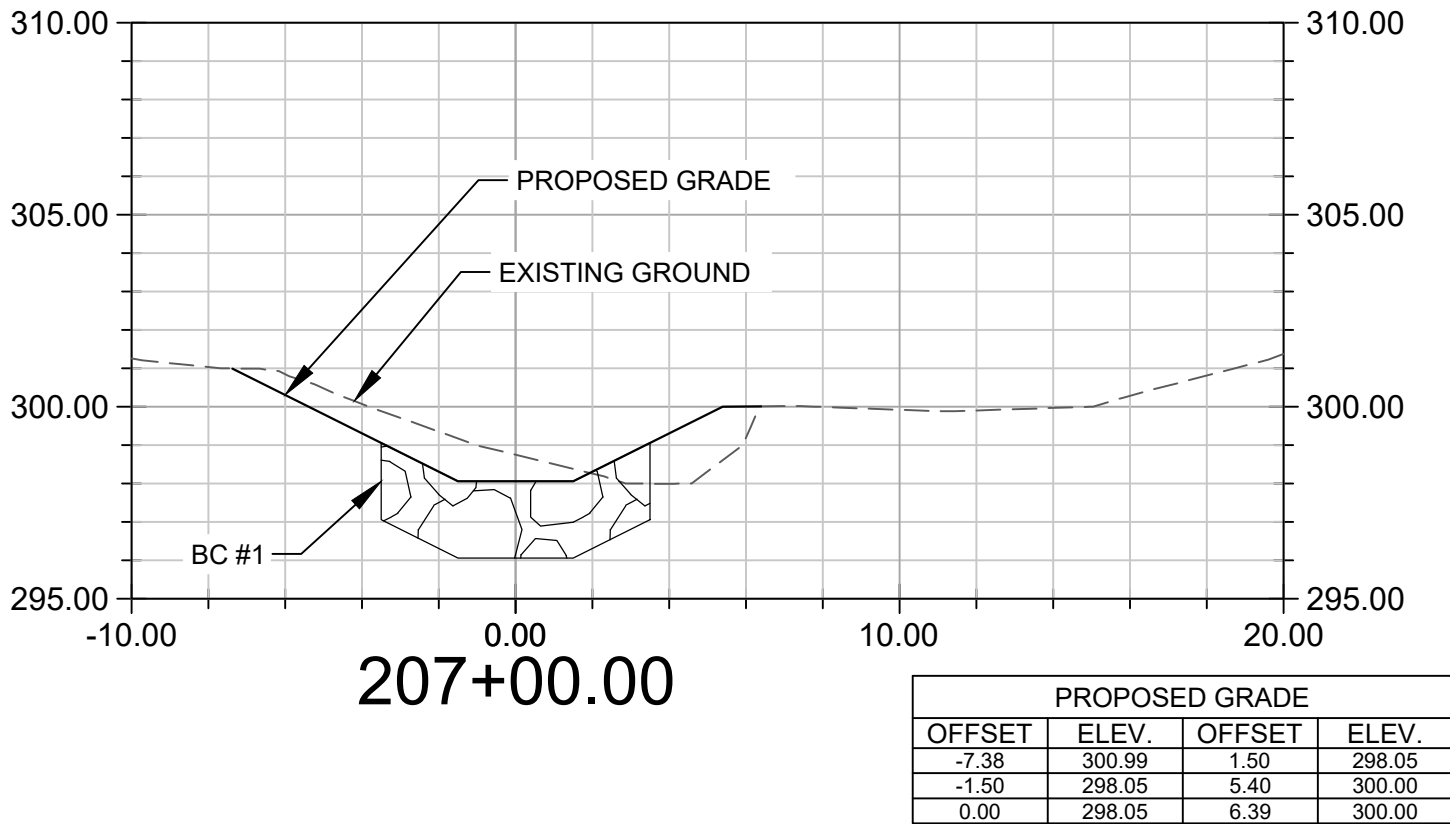
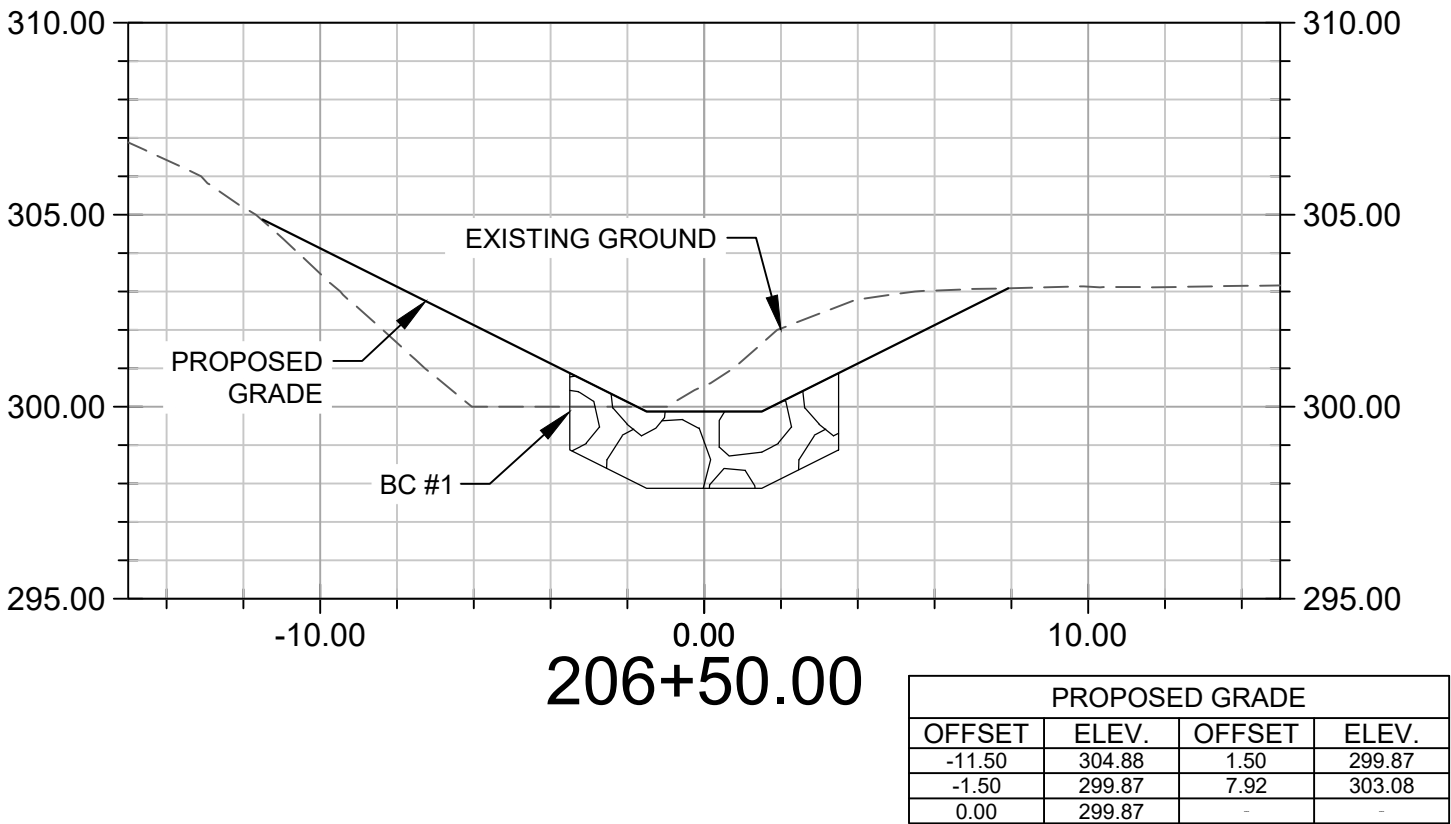
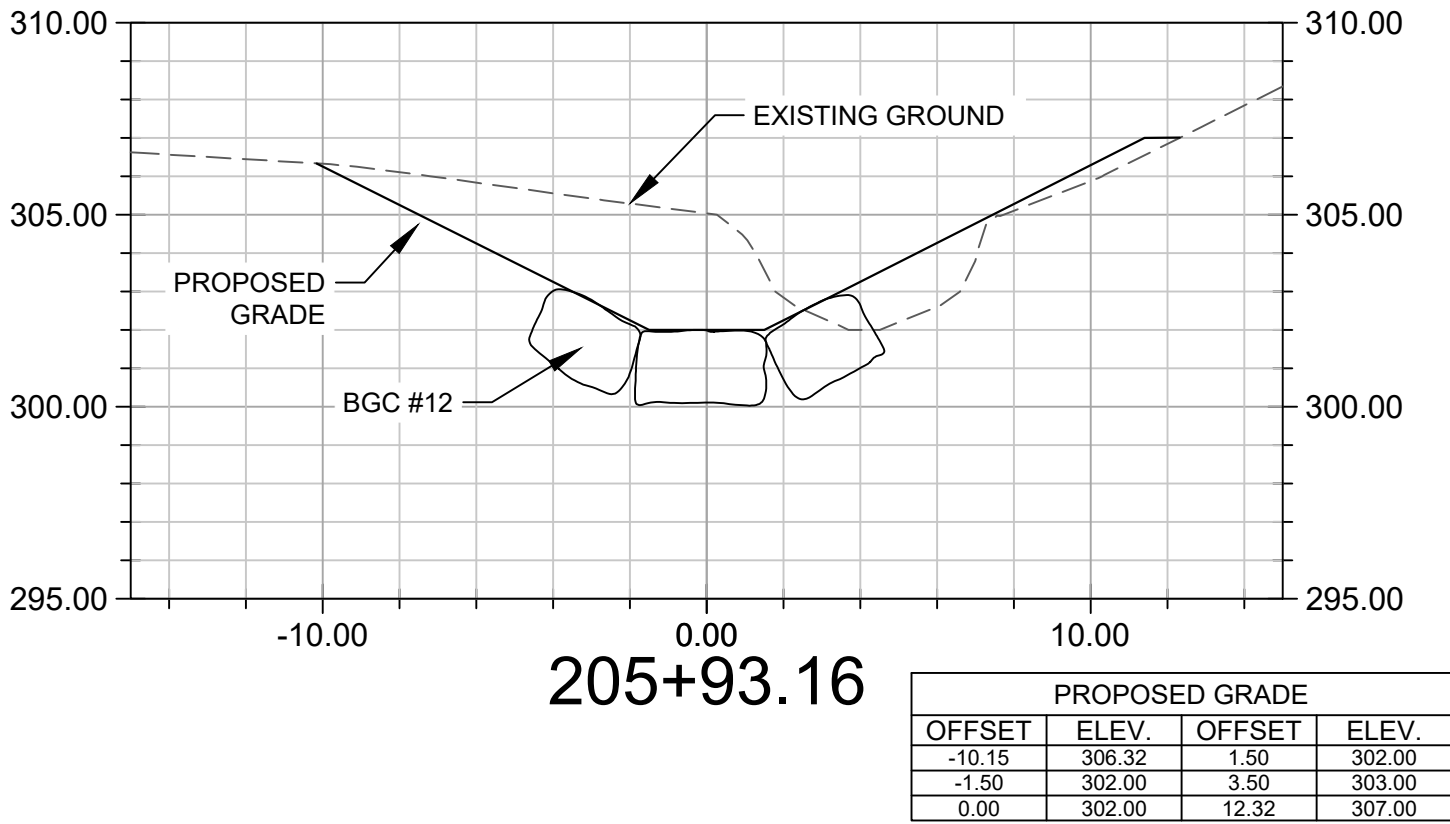


Revisions	

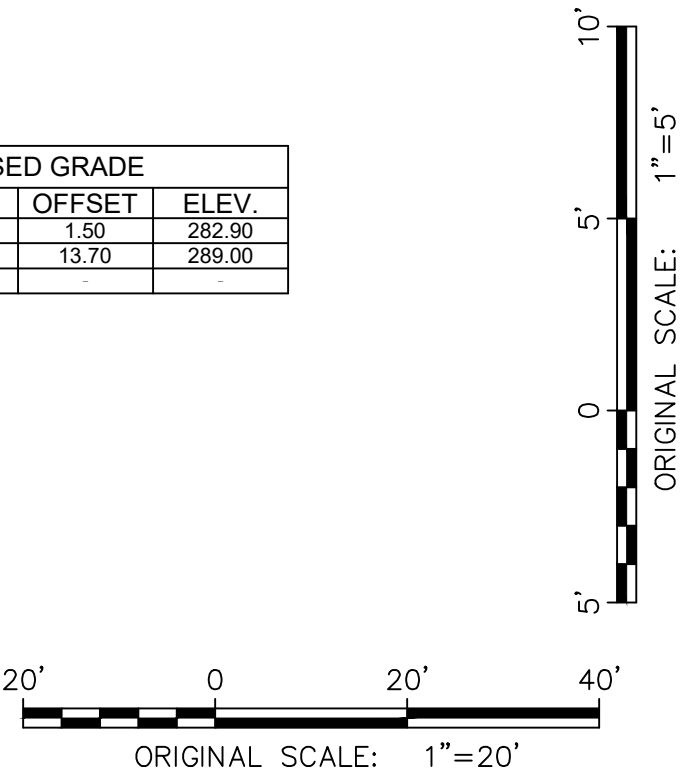
HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
CROSS-SECTION SHEET	
Drawn By : PJB	Scale : AS SHOWN
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. CS-07 of CS-08	Sheet No. 28 of 44



TRIBUTARY 1 CROSS-SECTIONS



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-13.70	289.00	1.50	282.90
-1.50	282.90	13.70	289.00
0.00	282.90		



BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,  
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF  
THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



Revisions	

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By : PJB

Designed By : IPT , PJB

Reviewed By : CAL

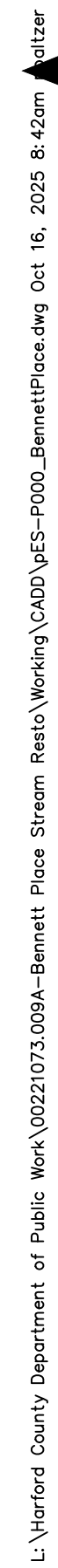
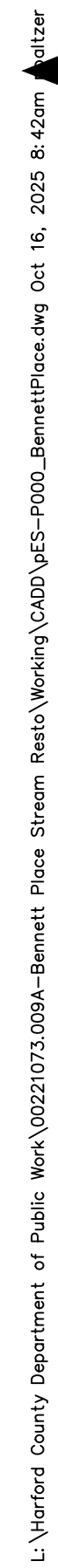
Drawing No. CS-08 of CS-08

Scale : AS SHOWN

Date : 10 / 25












Sheet No. 29 of 44





NOTE:
1. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
2. TREE TAKE SUMMARY TABLE PROVIDED ON SHEET ES-05.

## EROSION & SEDIMENT CONTROL LEGEND

_____ LOD	LIMIT OF DISTURBANCE
_____ SSF	SUPER SILT FENCE
_____ DF	DIVERSION FENCE
	STABILIZED CONSTRUCTION ENTRANCE
	TEMPORARY MULCH ACCESS ROAD
	SANDBAG DIVERSION
_____	DIVERSION HOSE
	WATER DIVERSION PUMP
	OUTLET PROTECTION
	FILTER BAG
	TREE TO BE REMOVED
	TREE PROTECTION PLANKING
	TEMPORARY ACCESS BRIDGE/CULVERT
	TIMBER MATS FOR WETLAND ACCESS
	SOIL BOUNDARY



BILLING NO. TBD
EG-SWMENG- TBD
<u>PROFESSIONAL CERTIFICATION</u>
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 283731, EXPIRATION DATE: 01/01/2027.



Revisions	

HARFORD COUNTY, MARYLAND
BENNETT PLACE STREAM RESTORATION
EROSION AND SEDIMENT CONTROL PLAN

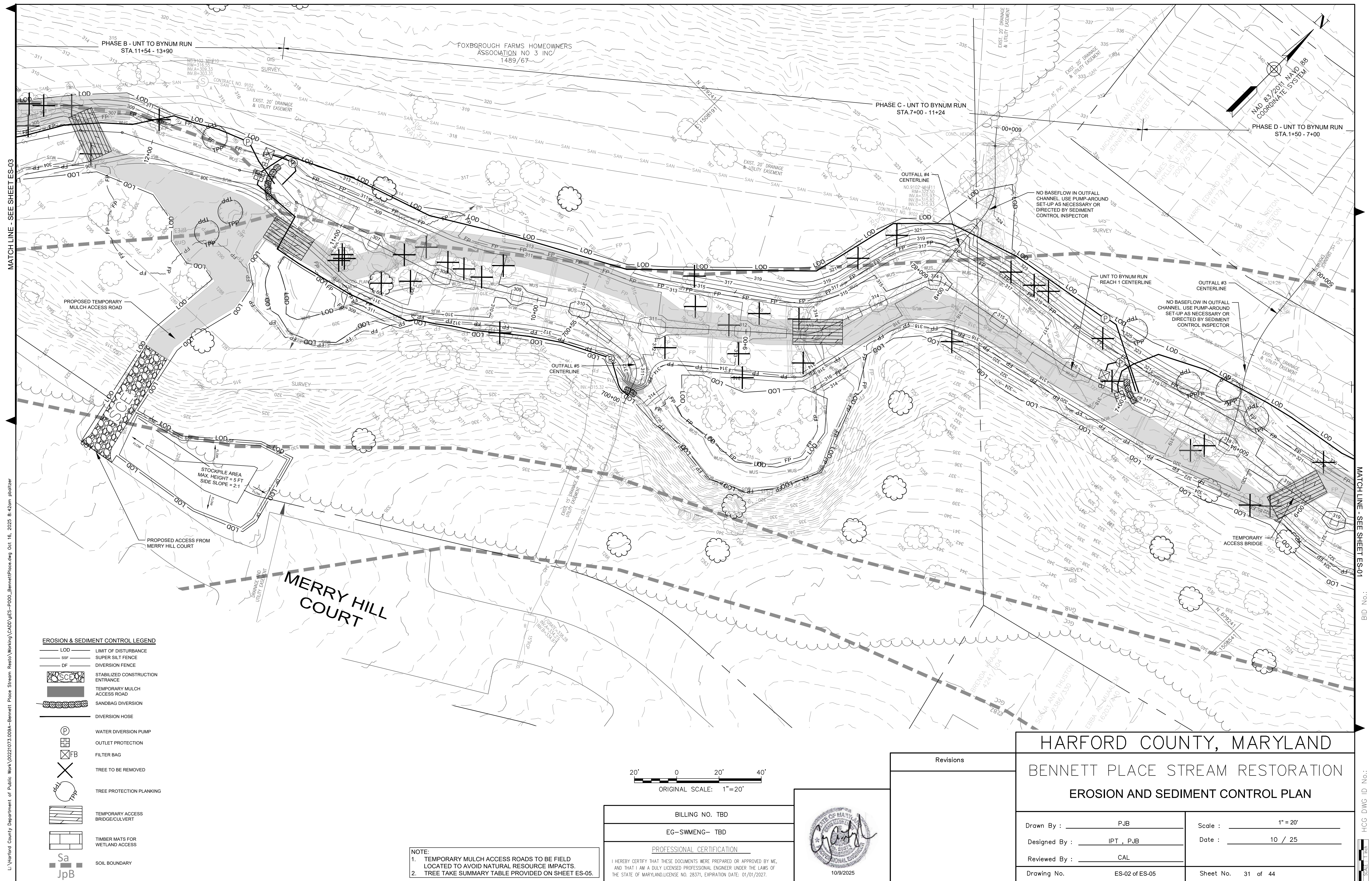
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Designed By : _____	IPT, PJB	Date : _____	10 / 25
Reviewed By : _____	CAL		
Drawing No.	ES-01 of ES-05	Sheet No.	30 of 44

BID No.:

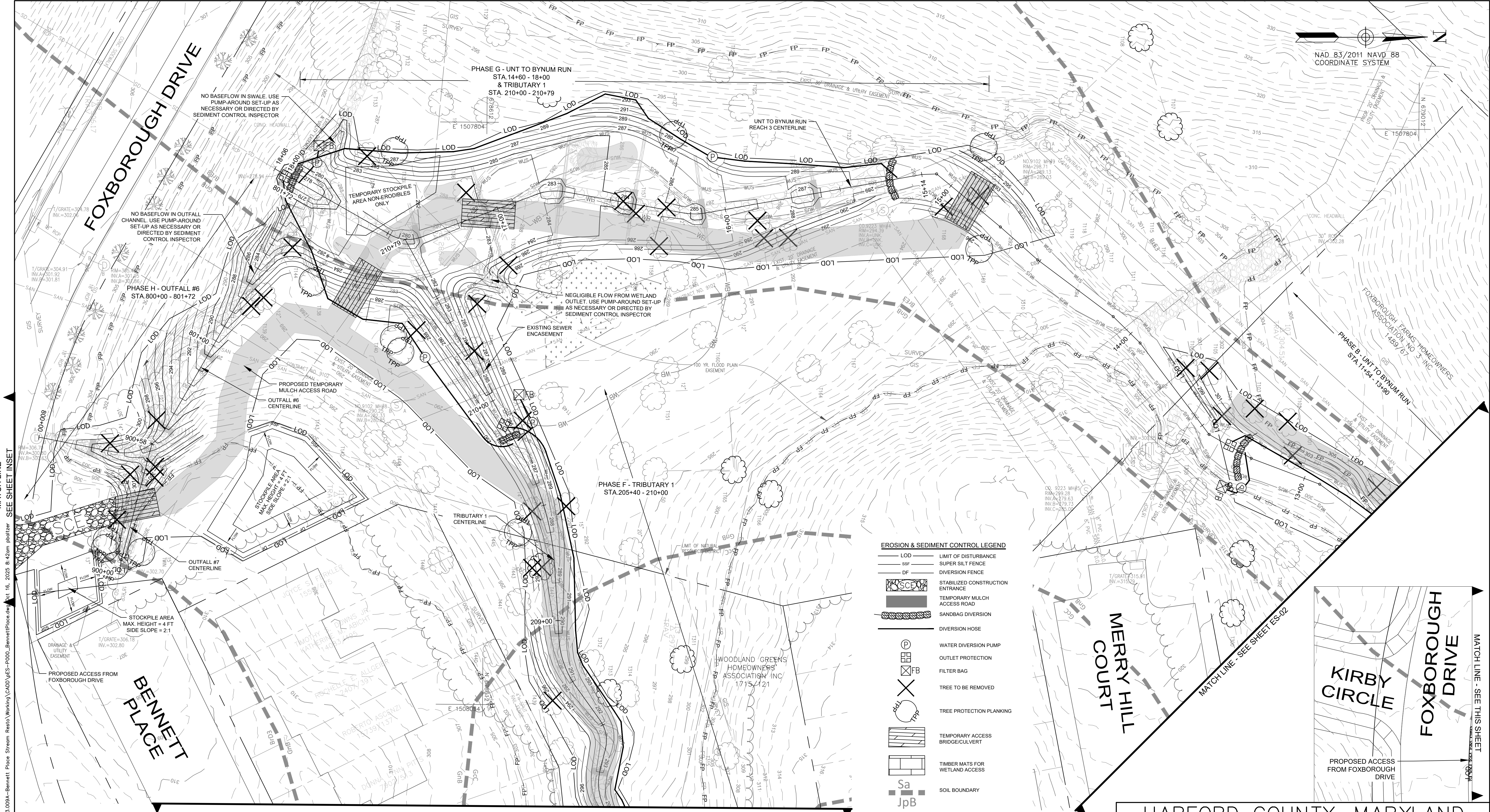
HCG DWG ID No.:

SCALE: 1 inch









NAD 83/2011 NAVD 88  
COORDINATE SYSTEM

- EROSION & SEDIMENT CONTROL LEGEND**
- LOD LIMIT OF DISTURBANCE
  - SSF SUPER SILT FENCE
  - DF DIVERSION FENCE
  - SCD STABILIZED CONSTRUCTION ENTRANCE
  - TM TEMPORARY MULCH ACCESS ROAD
  - SD SANDBAG DIVERSION
  - DH DIVERSION HOSE
  - WP WATER DIVERSION PUMP
  - OP OUTLET PROTECTION
  - FB FILTER BAG
  - TR TREE TO BE REMOVED
  - TPP TREE PROTECTION PLANKING
  - TAB TEMPORARY ACCESS BRIDGE/CULVERT
  - TMT TIMBER MATS FOR WETLAND ACCESS
  - Sa JpB SOIL BOUNDARY

20' 0 20' 40'  
ORIGINAL SCALE: 1"=20'

NOTE:  
1. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.  
2. TREE TAKE SUMMARY TABLE PROVIDED ON SHEET ES-05.

BILLING NO. TBD  
EG-SWMENG- TBD  
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



Revisions

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By : PJB

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. ES-03 of ES-05

Scale : 1" = 20'

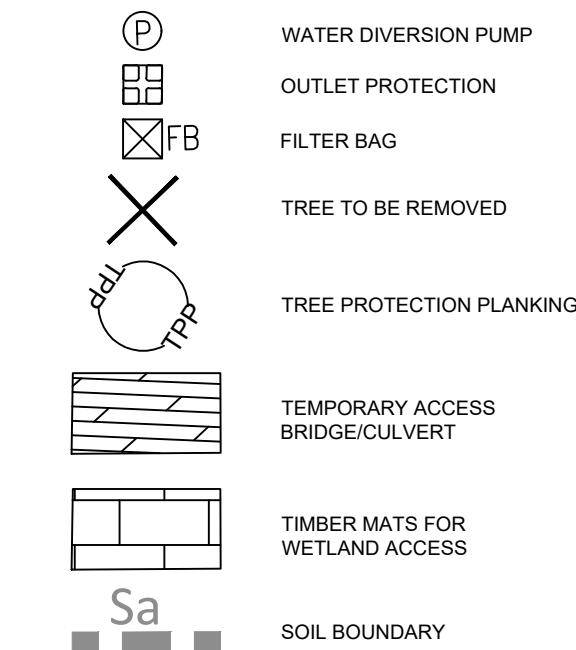
Date : 10 / 25

Sheet No. 32 of 44

L:\Harford County\Department of Public Work\Resto Working\CADD\ES-000-BennettPlace.dwg Oct 16, 2025 8:42am phatzer  
MATCH LINE - SEE SHEET INSET

MATCH LINE - SEE THIS SHEET  
MATCH LINE - SEE SHEET ES-02  
HCG DWG ID No.:  
SUBMIT TABLE





MATCH LINE - SEE SHEET ES-03

# BENNETT PLACE

MERRY HILL  
COURT

CHASE F - TRIBUTARY  
STA 205+40 - 210+00

PHASE E - TRIBUTARY 1  
STA 200+00 - 205+40

TRIBUTARY 1  
CENTERLINE

NEGLIGIBLE FLOW FROM WETLAND  
OUTLET. USE PUMP-AROUND SET  
AS NECESSARY OR DIRECTED BY  
SEDIMENT CONTROL INSPECTOR

NO BASEFLOW IN OUTFALL  
CHANNEL. USE PUMP-AROUND  
SET-UP AS NECESSARY OR  
DIRECTED BY SEDIMENT  
CONTROL INSPECTOR

— PROPOSED TEMPORARY

MAIL CH LINE - SEE SHEET S-03

BID No.:



SCALE: 1/4" = 1'-0"

HCG DWG ID No: \_\_\_\_\_



BILLING NO. TRD

EG-SWMENG- TBD

## PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME  
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF  
THE STATE OF MARYLAND. LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



10/9/2025

## Revisions

HARFORD COUNTY, MARYLAND

# BENNETT PLACE STREAM RESTORATION

## EROSION AND SEDIMENT CONTROL PLAN

Drawn By : \_\_\_\_\_ PJB

Scale: 1" = 20'

Designed By :                     IPT , PJB                    

Date : 10 / 25

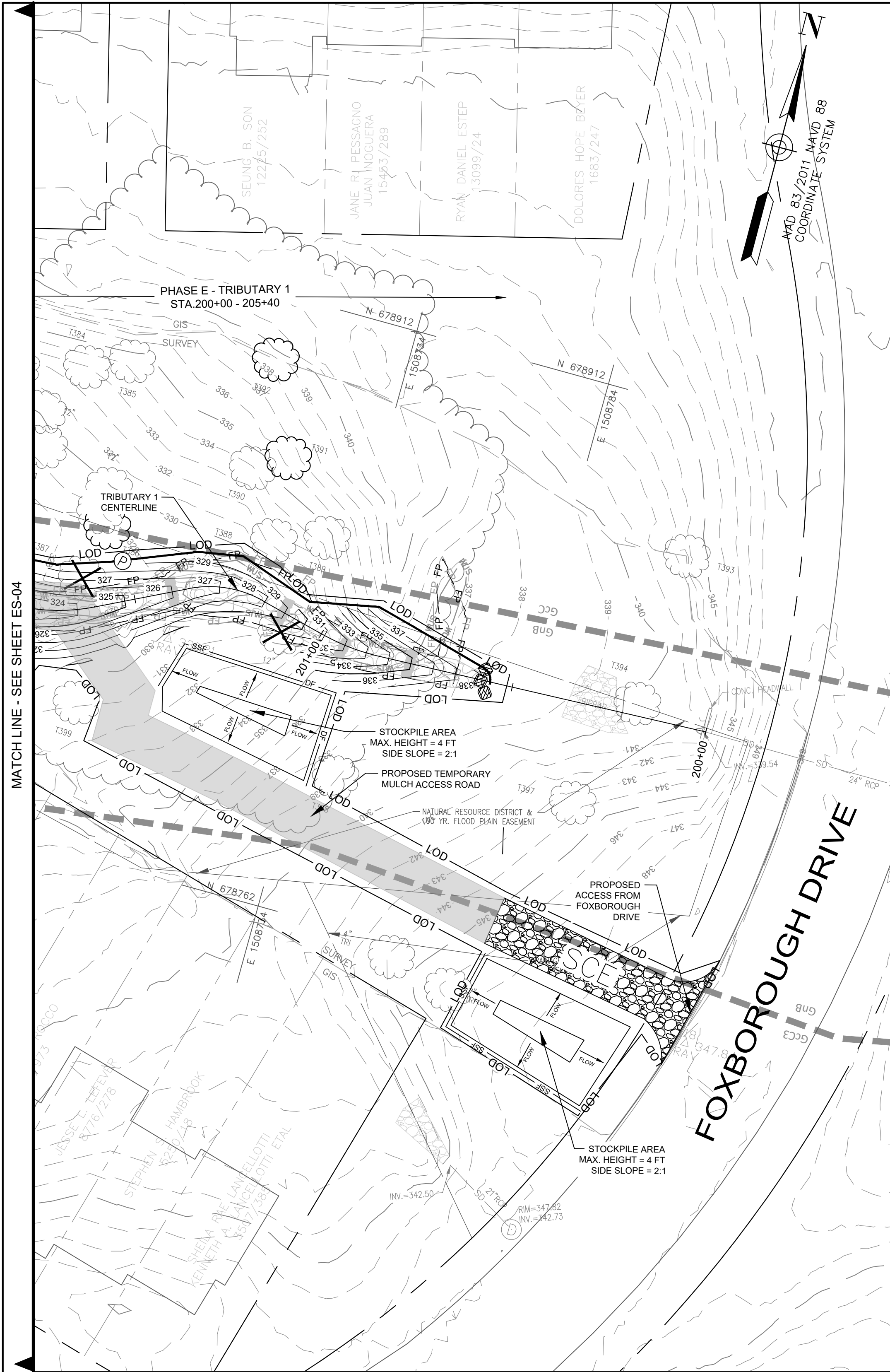
Reviewed By : \_\_\_\_\_ CAL

Drawing No.	ES-04 of ES-05
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Sheet No. 33 of 44

NOTE:
1. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
2. TREE TAKE SUMMARY TABLE PROVIDED ON SHEET ES-05.

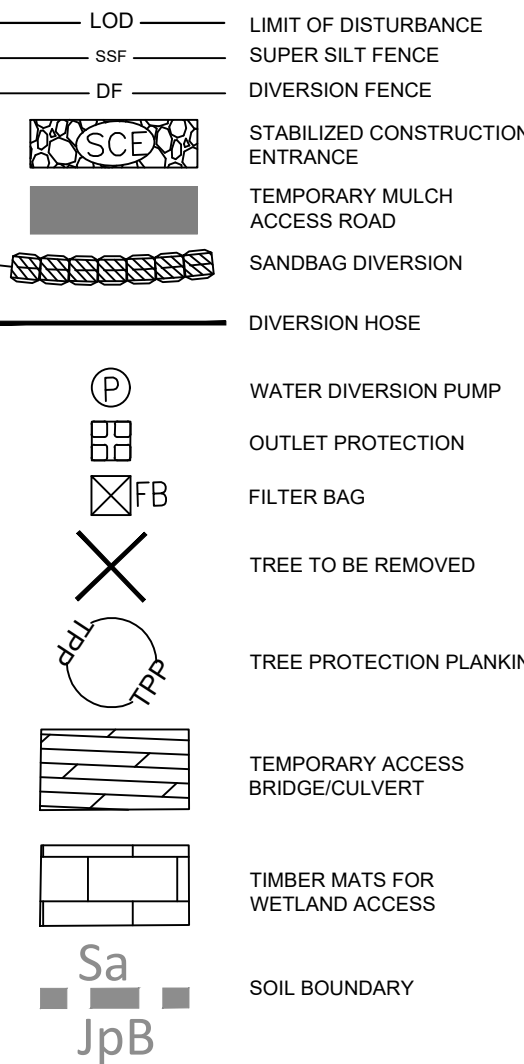




TREE TAKE SUMMARY TABLE

Tree Number	Specimen Tree Number	Species	DBH (inches)	Condition
T3		Bowlder Maple ( <i>Acer negundo</i> )	15.8	Poor
T12		Red Maple ( <i>Acer rubrum</i> )	19.2	Fair
T17		Red Maple ( <i>Acer rubrum</i> )	17.8	Fair
T18	ST3	Tulip Poplar ( <i>Liriodendron tulipifera</i> )	30.4	Fair
T19		Red Maple ( <i>Acer rubrum</i> )	14.4	Fair
T20		Red Maple ( <i>Acer rubrum</i> )	18.8	Fair
T21		Red Maple ( <i>Acer rubrum</i> )	17.1	Fair
T22		Red Maple ( <i>Acer rubrum</i> )	18.4	Fair
T35		Bowlder Maple ( <i>Acer negundo</i> )	24.3	Poor
T37		American Beech ( <i>Fagus grandifolia</i> )	23.6	Fair
T39		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	28.1	Fair
T40		White Ash ( <i>Fraxinus americana</i> )	28.1	Fair
T41		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	19.5	Fair
T44		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	19.6	Fair
T48		American Beech ( <i>Fagus grandifolia</i> )	16.8	Fair
T49		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	19.4	Fair
T57		American Beech ( <i>Fagus grandifolia</i> )	17.6	Fair
T58		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	20.6	Good
T59		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	26.8	Good
T60		American Beech ( <i>Fagus grandifolia</i> )	17.3	Fair
T61		American Beech ( <i>Fagus grandifolia</i> )	20.6	Fair
T62		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	14.9	Fair
T64		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	23.3	Fair
T78		American Beech ( <i>Fagus grandifolia</i> )	12.4	Poor
T79		American Beech ( <i>Fagus grandifolia</i> )	13.4	Fair
T80		American Beech ( <i>Fagus grandifolia</i> )	15.4	Fair
T81		Northern Red Oak ( <i>Quercus rubra</i> )	17.0	Fair
T82		Northern Red Oak ( <i>Quercus rubra</i> )	16.4	Poor
T85		Red Maple ( <i>Acer rubrum</i> )	16.9	Poor
T86		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	14.9	Poor
T87		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	25.5	Good
T93		American Beech ( <i>Fagus grandifolia</i> )	13.9	Fair
T96		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	21.3	Good
T97		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	14.4	Fair
T98		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	13.5	Fair
T99		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	16.2	Good
T101		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	14.8	Fair
T102		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	14.6	Fair
T103		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	14.1	Good
T104		American Sycamore ( <i>Platanus occidentalis</i> )	18.1	Fair
T105		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	24.6	Fair
T106		American Beech ( <i>Fagus grandifolia</i> )	17.5	Fair
T121		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	17.7	Fair
T134		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	23.3	Good
T136		American Beech ( <i>Fagus grandifolia</i> )	23.6	Fair
T139		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	13.0	Fair
T141		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	17.7	Fair
T144		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	13.6	Poor
T145		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	15.7	Fair
T146		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	16.1	Poor
T147		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	15.0	Good
T155		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	21.1	Fair
T156		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	21.6	Good
T157		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	17.1	Fair
T158		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	12.1	Good
T161		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	20.3	Fair
T162		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	16.2	Fair
T163		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	13.1	Fair
T168		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	13.1	Fair
T171		Black Willow ( <i>Salix nigra</i> )	12.8	Poor
T172		Black Cherry ( <i>Prunus serotina</i> )	15.0	Poor
T177		Red Maple ( <i>Acer rubrum</i> )	22.3	Fair
T178		Black Willow ( <i>Salix nigra</i> )	16.0	Poor
T180		Red Maple ( <i>Acer rubrum</i> )	13.3	Poor
T199		Red Maple ( <i>Acer rubrum</i> )	17.2	Good
T200		Red Maple ( <i>Acer rubrum</i> )	15.7	Poor
T201		Red Maple ( <i>Acer rubrum</i> )	15.3	Fair
T215		Red Maple ( <i>Acer rubrum</i> )	27.6	Fair
T219		Black Cherry ( <i>Prunus serotina</i> )	14.8	Fair
T224		Black Cherry ( <i>Prunus serotina</i> )	12.8	Poor
T225	ST25	American Beech ( <i>Fagus grandifolia</i> )	31.3	Fair
T226		Silver Maple ( <i>Acer saccharinum</i> )	19.2	Poor
T227	ST26	Tulip Poplar ( <i>Liriodendron tulipifera</i> )	33.9	Poor
T228		American Elm ( <i>Ulmus americana</i> )	22.3	Poor
T229		Northern Red Oak ( <i>Quercus rubra</i> )	23.5	Fair
T230		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	24.2	Good
T231	ST27	Northern Red Oak ( <i>Quercus rubra</i> )	31.4	Fair
T234		Red Maple ( <i>Acer rubrum</i> )	12.6	Fair
T276		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	21.0	Fair
T330		American Beech ( <i>Fagus grandifolia</i> )	29.0	Fair
T331		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	28.9	Fair
T364		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	26.0	Fair
T365		American Beech ( <i>Fagus grandifolia</i> )	21.8	Poor
T387		Black Cherry ( <i>Prunus serotina</i> )	12.0	Poor
T401		Red Maple ( <i>Acer rubrum</i> )	16.7	Poor
T408		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	26.6	Good
T418	ST57	American Beech ( <i>Fagus grandifolia</i> )	40.5	Fair
T419		Black Cherry ( <i>Prunus serotina</i> )	21.4	Fair
T425		Red Maple ( <i>Acer rubrum</i> )	17.9	Poor
T431		Tulip Poplar ( <i>Liriodendron tulipifera</i> )	28.5	Fair
T439		American Beech ( <i>Fagus grandifolia</i> )	12.5	Fair
T442	ST59	Tulip Poplar ( <i>Liriodendron tulipifera</i> )	37.3	Fair
T443		American Beech ( <i>Fagus grandifolia</i> )	12.7	Fair

EROSION & SEDIMENT CONTROL LEGEND



NOTE:  
TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED  
TO AVOID NATURAL RESOURCE IMPACTS.

93 TREES GREATER THAN 12" DBH TO BE REMOVED PER SURVEY  
CONDUCTED BY CENTURY ENGINEERING LLC. IN JUNE 2025.

BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



10/9/2025

Revisions	HARFORD COUNTY, MARYLAND	
	BENNETT PLACE STREAM RESTORATION	
	EROSION AND SEDIMENT CONTROL PLAN	
Drawn By : _____	PJB	Scale : _____ 1" = 20'
Designed By : _____	IPT , PJB	Date : _____ 10 / 25
Reviewed By : _____	CAL	
Drawing No. _____	ES-05 of ES-05	Sheet No. 34 of 44



L:\Harford County Department of Public Work\00221073-009A-Bennett Place Stream Resto Working\CADD\VEN-P000\_BennettPlace.dwg Oct 16, 2025 8:43:20m phaltzer

- HARFORD COUNTY SEDIMENT CONTROL NOTES**
1. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS. FURTHER, NO CONSTRUCTION ACTIVITY SHALL TAKE PLACE UNTIL ALL REQUIRED PERMITS HAVE BEEN OBTAINED.
  2. THE LIMITS OF DISTURBANCE SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO GRADING OF THE SITE TO ENSURE COMPLIANCE WITH APPROVED PLANS. ALL FOREST RETENTION AREAS WILL BE DELINEATED WITH BLAZE ORANGE FENCE AS WELL AS ANY SWM INFILTRATION PRACTICE PRIOR TO ANY CLEARING. WORK BEYOND THE LIMITS OF DISTURBANCE AND IN ANY AREA INSIDE THE FOREST RETENTION AND SWM INFILTRATION AREA IS CONSIDERED TO BE A VIOLATION OF THIS PLAN.
  3. ALL SEDIMENT CONTROL PRACTICES MUST BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITY. UPON COMPLETION OF THE INSTALLATION OF PERIMETER SEDIMENT CONTROL PRACTICES THE SITE MUST BE INSPECTED BY THE DEPARTMENT OF PUBLIC WORKS (DPW). NO ADDITIONAL CONSTRUCTION ACTIVITY WILL BE AUTHORIZED WITHOUT THE APPROVAL FROM DPW.
  4. ALL POINTS OF INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD INTO PUBLIC WAYS. DURING CONSTRUCTION, EVERY MEANS WILL BE TAKEN TO CONTROL SOIL EROSION AND SILTATION. IF NECESSARY A WASH RACK MAY NEED TO BE ESTABLISHED.
  5. EARTH DIKES, SEDIMENT TRAPS, ETC. WILL BE LOCATED AS SHOWN ON THESE DRAWINGS. FIELD CHANGES AND MINOR ADJUSTMENTS ARE PERMISSIBLE AS LONG AS THE INSTALLATION FUNCTIONS AND CONFORMS TO SPECIFICATIONS. THE SITE INSPECTOR PRIOR TO INSTALLATION MUST APPROVE ALL SUCH CHANGES. MAJOR CHANGES TO THE APPROVED PLAN WILL REQUIRE RE-APPROVAL BY THE HARFORD SOIL CONSERVATION DISTRICT.
  6. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
    - (a) THREE CALENDAR DAYS ON SLOPES GREATER THAN 3:1, ALL WATERWAYS AND TO THE SURFACE OF ALL PERIMETER CONTROLS.
    - (b) SEVEN CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS OF THE PROJECT SITE.
  7. DUST CONTROL MUST BE MANAGED AS PART OF ALL SEDIMENT CONTROL PLANS. FAILURE TO DO SO IS A VIOLATION OF THIS PLAN.
  8. SEDIMENT BASINS MUST BE BUILT TO DESIGN SPECIFICATIONS SHOWN ON THE PLAN. IF THE BASIN IS TO BE USED AS A FUTURE SWM FACILITY, THE BASIN WILL BE BUILT IN ACCORDANCE WITH THE LATEST MD-378 STANDARDS AND SPECIFICATIONS. SPECIFIED MATERIALS MUST BE USED. NO CHANGES OR MODIFICATIONS WILL BE MADE WITHOUT WRITTEN AUTHORIZATION OF THE HARFORD SOIL CONSERVATION DISTRICT.
  9. TEMPORARY FENCING SHALL BE PLACED AROUND ALL SEDIMENT BASINS, TRAPS, AND PONDS DURING CONSTRUCTION AND SITE GRADING.
  10. AT THE END OF EACH WORKING DAY ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT OPERATIONAL. A WEEKLY LOG WILL BE KEPT IN ACCORDANCE WITH MDPDES REGULATIONS. A COPY OF THE APPROVED SEDIMENT CONTROL PLANS SHALL BE AVAILABLE AT THE SITE AT ALL TIMES.
  11. ENSURE POSITIVE DRAINAGE TO ALL ROAD INLETS DURING ALL PHASES OF ROAD CONSTRUCTION TO ENSURE POSITIVE FLOW TO TRAPS AND/OR BASINS.
  12. CUT AND/OR FILL SHALL BE DONE IN CONFORMANCE WITH 2011 EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS FOR LAND GRADING.
  13. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRAVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY CONVEY WATER DOWN SLOPES WITHOUT CAUSING EROSION.
  14. OFF-SITE WASTE OR BORROW AREAS SHALL HAVE AN APPROVED EROSION AND SEDIMENT CONTROL PLAN PRIOR TO THE IMPORT OR EXPORT OF MATERIAL TO/FROM THE PROJECT SITE.
  15. ALL MATERIAL ORIGINATING FROM THE DEVELOPMENT OF THE PROPERTY AND DEPOSITED ON THE PUBLIC RIGHT-OF-WAY SHALL BE IMMEDIATELY REMOVED.
  16. STORM DRAIN INLETS AND OUTLETS SHALL BE PROTECTED PER 2011 EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS.
  17. TOPSOIL, LIMING, FERTILIZING, SEEDING, MULCHING, SOD, ETC. ARE ALL ESSENTIAL PARTS OF THE SEDIMENT CONTROL PLAN AND MUST BE COMPLETED ALONG WITH ALL OTHER PRACTICES.
  18. TRAPS TO BE REMOVED SHALL BE DEWATERED AS PER THE 2011 EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS.
  19. PRIOR TO REMOVAL OF TRAPS OR CONVERSION OF SEDIMENT BASINS TO SWM FACILITIES, THE STORM DRAINS WILL BE FLUSHED.
  20. SEDIMENT CONTROL PRACTICES WILL BE MAINTAINED UNTIL ALL DISTURBED AREAS FOR WHICH THE PRACTICES WERE INSTALLED HAVE BEEN STABILIZED. SEDIMENT CONTROL PRACTICES MAY BE REMOVED ONLY WITH THE AUTHORIZATION OF THE DPW INSPECTOR. ALL DISTURBED AREAS RESULTING FROM THE REMOVAL OF SEDIMENT CONTROL DEVICES SHALL BE STABILIZED IMMEDIATELY. REMOVAL PRIOR TO INSPECTOR'S APPROVAL CONSTITUTES A VIOLATION.

Revised July 2019

#### TEMPORARY VEGETATION STABILIZATION NOTES

- A) SEEDBED PREPARATION:**  
Loosen a minimum of three inches along upper soil by discing, raking or other acceptable means.
- B) SOIL AMENDMENTS:**  
Incorporate 436 lbs. per acre of 10-20-20 fertilizer and two (2) tons per acre of lime by discing or other acceptable means.
- C) SEEDING: \***  
FOR PERIODS OF MARCH 1 TO APRIL 30 AND AUGUST 15 TO NOVEMBER 15: Seed with 2.5 bu. per acre of Cereal Rye or 40 lbs. per acre of Annual Ryegrass.  
  
FOR PERIOD OF MAY 1 TO AUGUST 14: Seed with 3 lbs. per acre of Weeping Lovegrass or 30 lbs. per acre of Pearl or Foxtail Millet.  
  
FOR THE PERIOD OF NOVEMBER 16 TO FEBRUARY 28: Protect the site by applying two (2) tons per acre of well anchored straw mulch and seed as soon as possible in the spring.
- D) MULCHING SPECIFICATIONS:**  
Mulch shall be applied to all seeded areas immediately after seeding.  
  
Apply two (2) tons per acre of straw over all seeded areas. If a mulch anchoring tool is to be used, the rate shall be increased to 2.5 tons per acre. \*\*  
  
Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind and water. The type of mulch anchoring used must comply with the 2011 MARYLAND STANDARD AND SPECIFICATIONS.

\* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE 2011 MARYLAND STANDARD AND SPECIFICATIONS, B-4-4: "TEMPORARY SEEDING", TABLE B-1 (PAGE B.20).

\*\* IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE 2011 MARYLAND STANDARD AND SPECIFICATION, B-4-3: "SEEDING AND MULCHING" (PAGES B.15 – B.17).

Revised: 9/27/22

#### PERMANENT VEGETATIVE STABILIZATION NOTES

- ALL DISTURBED AREAS, WHICH ARE NOT TO BE PAVED, SHALL BE PERMANENTLY STABILIZED AS FOLLOWS:**
- A) SEEDBED PREPARATION:**  
Loosen a minimum of three inches along upper soil by raking, discing, or other acceptable means after spreading four inches of topsoil.
- B) SOIL AMENDMENTS:**  
Incorporate 225 lbs. per acre of 10-20-20 fertilizer and two tons per acre of lime by discing or other acceptable means.
- C) SEEDING: \***  
FOR PERIODS OF MARCH 1 TO MAY 15 AND AUGUST 15 TO OCTOBER 15: Seed with 60 lbs. per acre of Tall Fescue, 40 lbs. per acre of Kentucky Bluegrass, and 20 lbs. per acre of Perennial Ryegrass.  
  
FOR PERIOD OF MAY 16 TO AUGUST 14: Seed with 100 lbs. per acre of Tall Fescue and 3 lbs. per acre of Weeping Lovegrass or 5 lbs. of Pearl or Foxtail Millet.  
  
FOR PERIOD OF OCTOBER 16 TO FEBRUARY 28:  
Option 1: Protect the site by applying two (2) tons per acre of well anchored straw mulch and seed as soon as possible in the spring.  
Option 2: Use sod, provided the ground is suitable and thawed; comply with the 2011 MARYLAND STANDARD AND SPECIFICATION addressing "SOD" (pages B.23 & B.24).
- D) MULCHING SPECIFICATIONS:**  
Mulch shall be applied to all seeded areas immediately after seeding.  
  
Apply two (2) tons per acre of straw over all seeded areas. If a mulch anchoring tool is to be used, the rate shall be increased to 2.5 tons per acre.  
  
\*\* Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind and water. The type of mulch anchoring used must comply with the 2011 MARYLAND STANDARD AND SPECIFICATIONS.
- \* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE 2011 MARYLAND STANDARD AND SPECIFICATIONS, B-4-5: "PERMANENT SEEDING", TABLE B-3 (PAGES B.26 TO B.31)
- \*\* IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE 2011 MARYLAND STANDARD AND SPECIFICATION, B-4-3: "SEEDING AND MULCHING" (PAGES B.15 – B.17)

Revised: 9/27/22

## SEQUENCE OF CONSTRUCTION

1. 72 HOURS PRIOR TO THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL HAVE ALL LIMITS OF DISTURBANCE (LOD) AND EROSION AND SEDIMENT CONTROL (ESC) DEVICES STAKED OUT IN THE FIELD FOR REVIEW AND APPROVAL BY THE COUNTY. CLEARING LIMITS SHALL BE ROUGH STAKED IN ORDER TO FACILITATE LOCATION FOR TRECHING AND FENCING INSTALLATION. CONTACT MISS UTILITY AND HARFORD COUNTY TO HAVE ALL UTILITIES MARKED. THIS STREAM HAS BEEN DESIGNATED AS A MARYLAND USE CLASS III AND IS THEREFORE SUBJECT TO STREAM CLOSURE FROM OCTOBER 1 TO APRIL 30, INCLUSIVE, DURING ANY YEAR. NO IN-STREAM WORK CAN BE PERFORMED DURING THIS PERIOD.
2. PRIOR TO ANY CLEARING, GRADING, OR INSTALLATION OF EROSION SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ON-SITE WITH THE A REPRESENTATIVE FROM HARFORD COUNTY OFFICE OF WATERSHED PROTECTION AND RESTORATION (WPR), DESIGN ENGINEER, AND COUNTY DESIGNATED INSPECTOR.
3. ONLY TREES 12" DBH (DIAMETER AT BREAST HEIGHT) OR GREATER ARE SHOWN ON THE ESC PLANS. CONTRACTOR IS TO CONDUCT A SITE VISIT WITH THE DESIGN ENGINEER AND REPRESENTATIVE FROM WPR TO VERIFY TREES TO BE SAVED AND TREES TO BE REMOVED. IF ANY TREE MARKED TO BE SAVED IS DEAD OR DYING, NOTIFY THE DESIGN ENGINEER PRIOR TO INSTALLATION OF PLANKING. CONTRACTOR SHALL MARK TREES TO BE SALVAGED DURING THE CLEARING PROCESS FOR USE IN GRADE CONTROL STRUCTURES AND LOG SILLS. CONTRACTOR MUST ENSURE ENOUGH TREES ARE SALVAGED DURING THE CLEARING PROCESS TO BUILD STRUCTURES REQUIRING SALVAGED LOGS AS FURNISHED LOGS WILL NOT BE PERMITTED.

#### GENERAL SITE PREPARATION (UNT TO BYNUM RUN REACHES 1 & 2)

4. MANUALLY INSTALL HIGH VISIBILITY ORANGE CONSTRUCTION FENCE ALONG THE LIMITS OF DISTURBANCE AND TREE PROTECTION PLANKING (TPP) FOR PHASES A-D CONSTRUCTION.
5. CLEAR FOR AND INSTALL THE TEMPORARY MULCH ACCESS ROADS, STABILIZED CONSTRUCTION ENTRANCES, SUPER SILT FENCE, DIVERSION FENCE, TEMPORARY ACCESS BRIDGE/CULVERTS, AND STOCKPILE AREAS REQUIRED FOR PHASES A-D CONSTRUCTION. PERFORM ROOT PRUNING PER THE CONTRACT DOCUMENTS AND BRANCH PRUNING AS NECESSARY.

#### PHASE A

6. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE NECESSARY TO PERFORM IN STREAM WORK ON UNT TO BYNUM RUN FROM STATIONS 0+00 TO 1+50 AND OUTFALL #1, WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE A CONSTRUCTION.
7. CONSTRUCT THE SCOUR POOL, STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 0+00 TO 1+50, WORKING FROM UPSTREAM TO DOWNSTREAM ON UNT TO BYNUM RUN, AS CONSTRUCTION PROGRESSES, CONSTRUCT THE OUTFALL #1 CHANNEL.
8. REMOVE TEMPORARY MULCH ACCESS ROAD AS NECESSARY AS CONSTRUCTION PROGRESSES DOWNSTREAM.
9. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE A, PROCEED TO PHASE B.

#### PHASE B

10. GRADE STREAM BANKS BETWEEN STATIONS 13+90 TO 11+24, WORKING FROM DOWNSTREAM TO UPSTREAM ON UNT TO BYNUM RUN.
11. REMOVE TEMPORARY MULCH ACCESS ROAD AS NECESSARY AS CONSTRUCTION PROGRESSES DOWNSTREAM.
12. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE B, PROCEED TO PHASE C.

#### PHASE C

13. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ON UNT TO BYNUM RUN FROM STATIONS 7+00 TO 11+24, OUTFALL #4, AND OUTFALL #5, WORKING FROM DOWNSTREAM TO UPSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE C CONSTRUCTION.
14. CONSTRUCT THE STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 7+00 TO 11+24, WORKING FROM DOWNSTREAM TO UPSTREAM ON UNT TO BYNUM RUN. AS CONSTRUCTION PROGRESSES, CONSTRUCT THE OUTFALL #4 RIPRAP STABILIZATION AND OUTFALL #5 CHANNEL.
15. UPON COMPLETION OF THE STREAM CHANNEL AND FLOODPLAIN CONSTRUCTION, REMOVE TEMPORARY MULCH ACCESS ROAD.
16. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND ACCEPTANCE OF PHASE C, PROCEED TO PHASE D.

#### PHASE D

17. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ON UNT TO BYNUM RUN FROM STATIONS 1+50 TO 7+00 AND OUTFALL #2 & OUTFALL #3, WORKING FROM DOWNSTREAM TO UPSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE D CONSTRUCTION.
18. CONSTRUCT THE STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 1+50 TO 7+00, WORKING FROM DOWNSTREAM TO UPSTREAM ON UNT TO BYNUM RUN. AS CONSTRUCTION PROGRESSES, CONSTRUCT THE OUTFALL #2 & OUTFALL #3 RIPRAP STABILIZATIONS.
19. UPON COMPLETION OF THE STREAM CHANNEL AND FLOODPLAIN CONSTRUCTION, REMOVE TEMPORARY MULCH ACCESS ROAD. REMOVE MAIN STAGING AND STOCKPILE AREA ASSOCIATED WITH PHASES A-D CONSTRUCTION.
20. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING.
21. UPON COMPLETION OF GRADING AND STRUCTURE INSTALLATION IN PHASES A-D, AND WITH APPROVAL FROM THE COUNTY INSPECTOR, DESIGN ENGINEER, AND COUNTY PROJECT MANAGER, THE CONTRACTOR MAY REMOVE ESC MEASURES. ANY AREAS DISTURBED BY REMOVING THE ESC DEVICES SHALL BE STABILIZED IMMEDIATELY. UPON COMPLETION AND ACCEPTANCE OF PHASE D, PROCEED TO PHASE E.

#### GENERAL SITE PREPARATION (UNT TO BYNUM RUN REACH 3 & TRIBUTARY 1)

22. MANUALLY INSTALL HIGH VISIBILITY ORANGE CONSTRUCTION FENCE ALONG THE LIMITS OF DISTURBANCE AND TREE PROTECTION PLANKING (TPP) FOR PHASES E - H CONSTRUCTION.
23. CLEAR FOR AND INSTALL THE TEMPORARY MULCH ACCESS ROADS (EXCLUDING THE IN-CHANNEL ACCESS ROAD ON TRIBUTARY 1), SUPER SILT FENCE, TEMPORARY ACCESS BRIDGES, AND STOCKPILE AREAS REQUIRED FOR PHASES E - H CONSTRUCTION. PERFORM ROOT PRUNING PER THE CONTRACT DOCUMENTS AND BRANCH PRUNING AS NECESSARY.

#### PHASE E

24. ROUGH GRADE THE TRIBUTARY 1 VALLEY CORRIDOR AS NEEDED TO FACILITATE INSTALLATION OF THE TEMPORARY MULCH ACCESS ROAD FROM STA. 200+00 TO 205+40 WORKING FROM UPSTREAM TO DOWNSTREAM.
25. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE NECESSARY TO PERFORM IN STREAM WORK ALONG TRIBUTARY 1, FROM STATIONS 200+00 TO 205+40 WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE E CONSTRUCTION.
26. CONSTRUCT THE STREAM CHANNEL BETWEEN STATIONS 200+00 TO 205+40 WORKING FROM DOWNSTREAM TO UPSTREAM ON TRIBUTARY 1. AS CONSTRUCTION PROGRESSES UPSTREAM, CONCURRENTLY REMOVE HAUL ROAD TO FACILITATE CONSTRUCTION.
27. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING.
28. UPON COMPLETION AND STABILIZATION OF PHASE E, REMOVE STAGING AND STOCKPILE AREA AT THE TRIBUTARY 1 STABILIZED CONSTRUCTION ENTRANCE AND PROCEED TO PHASE F.

#### PHASE F

24. ROUGH GRADE THE TRIBUTARY 1 VALLEY CORRIDOR AS NEEDED TO FACILITATE INSTALLATION OF THE TEMPORARY MULCH ACCESS ROAD FROM STA. 205+40 TO 210+00 WORKING FROM DOWNSTREAM TO UPSTREAM.
25. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE NECESSARY TO PERFORM IN STREAM WORK ALONG TRIBUTARY 1, FROM STATIONS 205+40 TO 210+00 WORKING FROM DOWNSTREAM TO UPSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE F CONSTRUCTION.
26. CONSTRUCT THE STREAM CHANNEL BETWEEN STATIONS 205+40 TO 210+00 WORKING FROM UPSTREAM TO DOWNSTREAM ON TRIBUTARY 1. AS CONSTRUCTION PROGRESSES DOWNSTREAM, CONCURRENTLY REMOVE HAUL ROAD TO FACILITATE CONSTRUCTION.
27. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING.
28. UPON COMPLETION AND STABILIZATION OF PHASE F, PROCEED TO PHASE G.

#### PHASE G

29. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE NECESSARY TO PERFORM IN STREAM WORK ALONG UNT TO BYNUM RUN, FROM STATIONS 14+90 TO 18+00, AND TRIBUTARY 1, FROM STA. 210+00 TO 210+86, WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE G CONSTRUCTION.
30. CONSTRUCT THE BOULDER STEP STRUCTURES, STREAM CHANNEL, STREAM BANKS AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 14+90 TO 18+00, WORKING FROM UPSTREAM TO DOWNSTREAM ALONG THE UNT TO BYNUM RUN. AS CONSTRUCTION PROGRESSES, CONSTRUCT TRIBUTARY 1 STREAM CHANNEL AND ASSOCIATED VALLEY FROM STA.210+00 TO 210+86 FROM UPSTREAM TO DOWNSTREAM.
31. UPON COMPLETION OF THE STREAM AND FLOODPLAIN CONSTRUCTION, REMOVE STAGING AND STOCKPILE AREA ASSOCIATED WITH PHASE G CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD AND TEMPORARY ACCESS BRIDGE ASSOCIATED WITH PHASE G CONSTRUCTION.
32. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE G, PROCEED TO PHASE H.

#### PHASE H

33. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE TO PERFORM IN STREAM WORK ON OUTFALL #6, FROM STATIONS 800+00 TO 801+72, AND OUTFALL #7, WORKING FROM DOWNSTREAM TO UPSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE H CONSTRUCTION.
34. CONSTRUCT THE PROPOSED RIPRAP STABILIZATION BETWEEN STATIONS 800+00 TO 801+72, WORKING FROM DOWNSTREAM TO UPSTREAM ON OUTFALL #6, AS CONSTRUCTION PROGRESSES, CONSTRUCT OUTFALL #7 RIPRAP STABILIZATION.
35. UPON COMPLETION OF THE STREAM CONSTRUCTION, REMOVE MAIN STAGING AND STOCKPILE AREAS ASSOCIATED WITH PHASES G & H CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD ASSOCIATED WITH PHASE H CONSTRUCTION.
36. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, STABILIZATION MATTING.
37. UPON COMPLETION OF GRADING AND STRUCTURE INSTALLATION IN PHASE H, AND WITH APPROVAL FROM THE COUNTY INSPECTOR, DESIGN ENGINEER, AND COUNTY PROJECT MANAGER, THE CONTRACTOR MAY REMOVE REMAINING E&SC MEASURES WITHIN PHASES E - H. ANY AREAS DISTURBED BY REMOVING THE E&SC DEVICES SHALL BE STABILIZED IMMEDIATELY.

#### PROJECT COMPLETION

38. COMPLETE IN-KIND RESTORATION OF ANY DAMAGE TO EXISTING INFRASTRUCTURE EITHER ON-SITE OR OFF-SITE. THIS INCLUDES BUT IS NOT LIMITED TO: SIDEWALK, CURB AND GUTTER, PAVEMENT, UTILITY APPURTENANCES, TREES, SIGNS, ETC.
39. COMPLETE FINAL PERMANENT VEGETATIVE STABILIZATION AND PLANTING OF SITE PER THE LANDSCAPE PLAN.
40. CONDUCT A PUNCH LIST WALK-THROUGH WITH THE COUNTY PROJECT MANAGER, THE DESIGN ENGINEER, AND THE COUNTY INSPECTOR.
41. CORRECT ANY OUTSTANDING ITEMS FOLLOWING THE PUNCH LIST WALK-THROUGH.
42. WITH WRITTEN APPROVAL FROM THE COUNTY INSPECTOR, DESIGN ENGINEER, AND COUNTY PROJECT MANAGER, REMOVE ANY REMAINING SEDIMENT CONTROL DEVICES.

#### SEQUENCE OF CONSTRUCTION GENERAL NOTES:

1. CONTRACTOR MAY WORK MULTIPLE PHASES SIMULTANEOUSLY IN NON-CONTIGUOUS ORDER WITH WRITTEN APPROVAL FROM THE COUNTY PROJECT MANAGER AND DESIGN ENGINEER. CONTRACTOR MUST ENSURE CLEAN WATER IS DIVERTED AROUND ALL ACTIVE WORK AREAS AND SEDIMENT LADEN WATER IS PUMPED DOWNSTREAM OF THE ACTIVE WORK AREAS TO AN MDE APPROVED FILTERING DEVICE.
2. CONSTRUCTION SHALL BE PERFORMED SUCH THAT ANY AREA OF DISTURBANCE CAN BE STABILIZED AT THE END OF EACH WORKING DAY, ENSURING POSITIVE DRAINAGE IS MAINTAINED FROM THE PROPOSED CHANNEL TO THE EXISTING CHANNEL. THIS SHALL BE COMPLETED THROUGH TEMPORARY GRADING AND TEMPORARY STABILIZATION WITH CLASS 1 RIPRAP OR IMPERMEABLE SHEETING AS NECESSARY.
3. PERMANENT STABILIZATION INCLUDING SEED INSTALLATION, FLOODPLAIN MATTING AND/OR TYPE D SOIL STABILIZATION MATTING SHALL BE PERFORMED CONCURRENTLY WITH GRADING OPERATIONS AND STRUCTURE INSTALLATION AS SHOWN ON THE GRADING PLANS AND DETAILS. PERMANENT SEED MUST BE APPLIED PER THE LANDSCAPE PLAN PRIOR TO PERMANENTLY STABILIZING ANY AREAS WITH TYPE D SOIL STABILIZATION AND/OR FLOODPLAIN MATTING.
4. THE PUMP AROUND PRACTICE IS TO BE USED TO DIVERT BASE FLOW CONDITIONS. ALL WORK IS TO BE PERFORMED IN DRY WEATHER CONDITIONS. DURING RAIN EVENTS THE CONTRACTOR MUST REMOVE THE PUMP AROUND OPERATION FROM WITHIN THE STREAM CHANNEL.
5. THE PUMP USED TO DIVERT STREAM FLOW SHALL BE SIZED AS NOTED ON THE ESC PLAN UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR.
6. PUMP AROUND OPERATIONS SHALL BE INSTALLED AND REMOVED FROM THE STREAM EACH WORKING DAY. THE CONTRACTOR SHALL EMPLOY THE USE OF AN MDE APPROVED DEWATERING FILTER BAGS OR A PORTABLE SEDIMENT TANK AS NECESSARY TO PERFORM GRADING OPERATIONS IN DRY CONDITIONS. THE CONTRACTOR SHALL MAKE PROVISIONS FOR TEMPORARY E&SC CONTROLS IN DISTURBED AREAS SHOULD MAJOR RAINFALL OCCUR DURING THE WORKING DAY.
7. REMOVE THE TEMPORARY MULCH ACCESS ROAD, TEMPORARY ACCESS BRIDGES, AND STOCKPILE AREAS AS NECESSARY TO PERFORM GRADING OPERATIONS AND STRUCTURE INSTALLATION.
8. THE DIVERSION HOSE SHALL BE DISCHARGED IN A NON-EROSIVE MANNER AS SHOWN ON THE PUMP AROUND PRACTICE DETAIL. THE CONTRACTOR SHALL SIZE PUMPING OPERATIONS ADEQUATELY TO DIVERT BASE FLOW DURING CONSTRUCTION. AT THE END OF EACH WORKING DAY, THE CONTRACTOR SHALL STABILIZE ALL DISTURBED AREAS THAT DO NOT DRAIN TO AN MDE APPROVED SEDIMENT CONTROL MEASURE. SET AND RE-SET PUMP AROUND PRACTICE AND ASSOCIATED CONTROLS AS NEEDED TO PERFORM GRADING OPERATIONS ON A DAILY BASIS.
9. THE LOCATIONS OF SANDBAG DIVERSIONS AND DIVERSION PIPES SHOWN ON THE E&SC PLAN MAY BE ADJUSTED OR RELOCATED DURING CONSTRUCTION AS LONG AS THEY REMAIN OPERATIONAL PER THE PUMP AROUND PRACTICE DETAIL AND SPECIFICATIONS, AND WITH THE APPROVAL OF THE COUNTY INSPECTOR.
10. CLEARING AND GRUBBING SHALL BE LIMITED TO EACH PHASE AS NOTED IN THE SEQUENCE OF CONSTRUCTION UNLESS REQUIRED FOR ESC DEVICE OR TEMPORARY ACCESS ROAD INSTALLATION. CLEAR CUTTING OF THE SITE IS NOT PERMITTED UNLESS WRITTEN AUTHORIZATION IS GRANTED BY THE COUNTY PROJECT MANAGER AND DESIGN ENGINEER.
11. PROPOSED STABILIZED CONSTRUCTION ENTRANCES (SCE) MUST BE RESTORED TO ORIGINAL STATE OR BETTER AT THE END OF THE PROJECT.
12. CONTRACTOR SHALL REMOVE AND REPLACE SIDEWALK AND CURB AND GUTTER TO THE NEAREST JOINT IF REQUIRED AT CONSTRUCTION ENTRANCES

#### BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3. DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE, METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (*LOLIUM MULTIFLORUM*), MILLET (*SETARIA ITALICA*), BARLEY (*HORDEUM SP.*), OATS (*UNIOILA SP.*), AND/OR RYE (*SECALE CEREALE*). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM: USE I-P WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

#### DEVELOPER'S/LANDOWNER'S CERTIFICATION

I/We hereby certify that all proposed work shown on these construction drawing(s) will be I/We also understand that it is my/our responsibility to accomplish pursuant to these plans, have the construction supervised and certified, including the submittal of "As-Built" plans within 30 days of completion, by a Registered Professional Engineer.

Signed: \_\_\_\_\_  
Print Name: \_\_\_\_\_  
Date: \_\_\_\_\_  
P.E. No.: \_\_\_\_\_

#### ENGINEER'S CERTIFICATION

I hereby certify that this plan has been prepared by me, or under my supervision, and meets the minimum standards of the Harford County Department of Public Works and/or the United States Department of Agriculture, Soil Conservation Service, and/or the Maryland Department of the Environment, Water Management Administration.

Signed: *C. A. Lytle*  
Print Name: Craig A. Lytle  
Date: 10/29/25  
P.E. No.: 28371

Site Analysis:  
Total Site Area 150,110 SF / 3.45 AC  
Total Disturbed Area 150,110 SF / 3.45 AC  
Area to be paved 0 SF / 0.0 AC  
Area to be stabilized 150,110 SF / 3.45 AC  
Cut 4,064 CY  
Fill 900 CY  
Topsoil 985 CY

NPDES ID PT. N: 678562.086 E: 1507852.717

#### Revisions

BILLING NO. TBD

EG-SWMENG-TBD

#### PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.

#### B-3 STANDARDS AND SPECIFICATIONS

##### FOR LAND GRADING

Definition  
Reshaping the existing land surface to provide suitable topography for building facilities and other site

Purpose  
To provide erosion control and vegetative establishment for extreme changes in grade.

Conditions Where Practice  
Applies Earth disturbances or extreme grade modifications on steep or long slopes.

##### Design Criteria

The grading plan should be based on the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surroundings to avoid extreme grade modifications. submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, adjacent properties, drainage patterns, measures for water removal, and vegetative treatment, etc.

Many jurisdictions have regulations and design procedures already established for land grading that must be followed. The plan must show existing and proposed contours for the area(s) to be graded including practices for erosion control, slope stabilization, and safe conveyance of runoff (e.g., waterways, lined channels, reverse benches, grade stabilization structures). The grading/construction plans are to include the phasing of these practices and consideration of the following:

1. Provisions to safely convey surface runoff to storm drains, protected outlets or stable water courses to ensure that surface runoff will not damage slopes or other graded areas.
2. Cut and fill slopes, stabilized with grasses, no steeper than 2:1. (Where the slope is to be mowed, the slope should be no steeper than 3:1, but 4:1 is preferred because of safety factors related to mowing steep slopes.) Slopes steeper than 2:1 require special design and stabilization considerations to be shown on the plans.
3. Benching per Detail B-3-1 whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet; for 3:1 slopes, when it exceeds 30 feet; and for 4:1 slopes, when it exceeds 40 feet. Locate benches to divide the slope face as equally as possible and to convey the water to a stable outlet. Soils, seeps, rock outcrops, etc. are to be taken into consideration when designing benches.
  - A. Provide benches with a minimum width of six feet for ease of maintenance. Design benches with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth.
  - B. Grade the longitudinal slope of the bench between 2 percent and 3 percent, unless accompanied by appropriate design and computations.
  - C. The maximum allowable flow length within a bench is 800 feet unless accompanied by appropriate design and computations.
4. Diversion of surface water from the face of all cut and fill slopes using earth dikes or swales. Convey surface water down slope using a designed structure, and:  
  
Protect the face of all graded slopes from surface runoff until they are stabilized.

Do not subject the slope's face to any concentrated flow of surface water such as from natural drainage ways, graded swales, downspouts, etc.

Protect the face of the slope by special erosion control materials to include, but not be limited to, approved vegetative stabilization practices, riprap or other approved stabilization methods.

5. Serrated slopes as shown in Detail B-3-2. The steepest allowable slope for ripable rock is 1.5:1. For non rock surfaces, the slopes are to be 2:1 or flatter. These steps will weather and act to hold moisture, lime, fertilizer and seed thus producing a much quicker and longer lived vegetative cover and better slope stabilization.

6. Subsurface drainage provisions. Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

7. Proximity to adjacent property. Slopes must not be created close to property lines without adequate protection against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.

8. Quality of fill material. Fill material must be free of brush, rubbish, logs, stumps, building debris, and other objectionable material. Do not place frozen materials in the fill nor place the fill material on a frozen foundation.

9. Stabilization. Stabilize all disturbed areas structurally or vegetatively in compliance with Section B-4 Standards and Specifications for Stabilization Practices.

Maintenance  
The line, grade, and cross section of benching and serrated slopes must be maintained. Benches and serrated slopes must continuously meet the requirements for Adequate Vegetative Establishment in accordance with

#### B-4-8 STANDARDS AND SPECIFICATIONS

##### FOR STOCKPILE AREA

Definition  
A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose  
To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies  
Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

##### Design Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance  
The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3

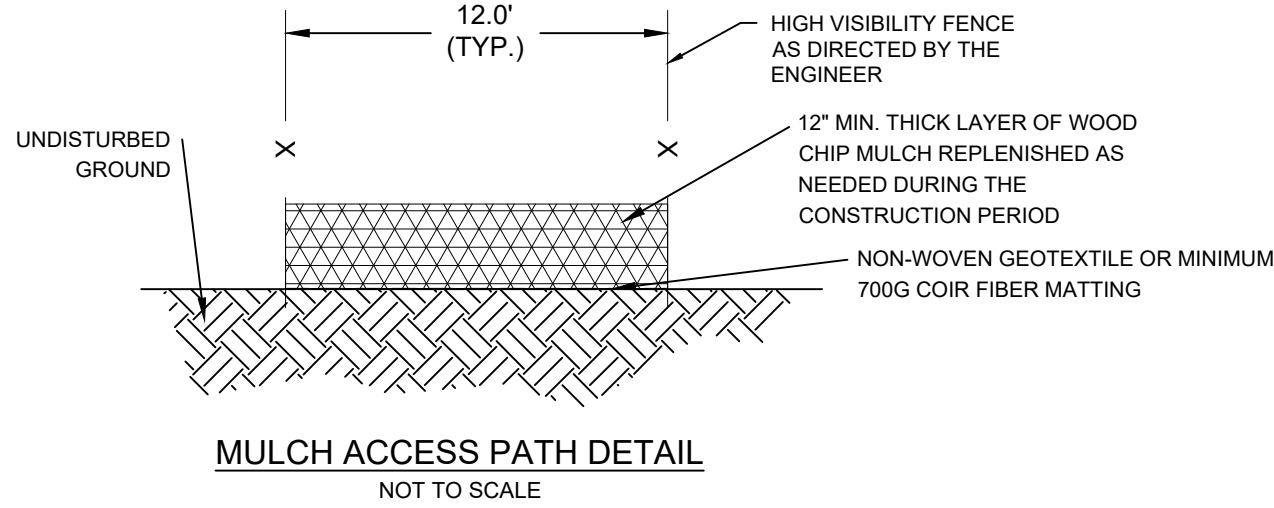
HARFORD COUNTY, MARYLAND



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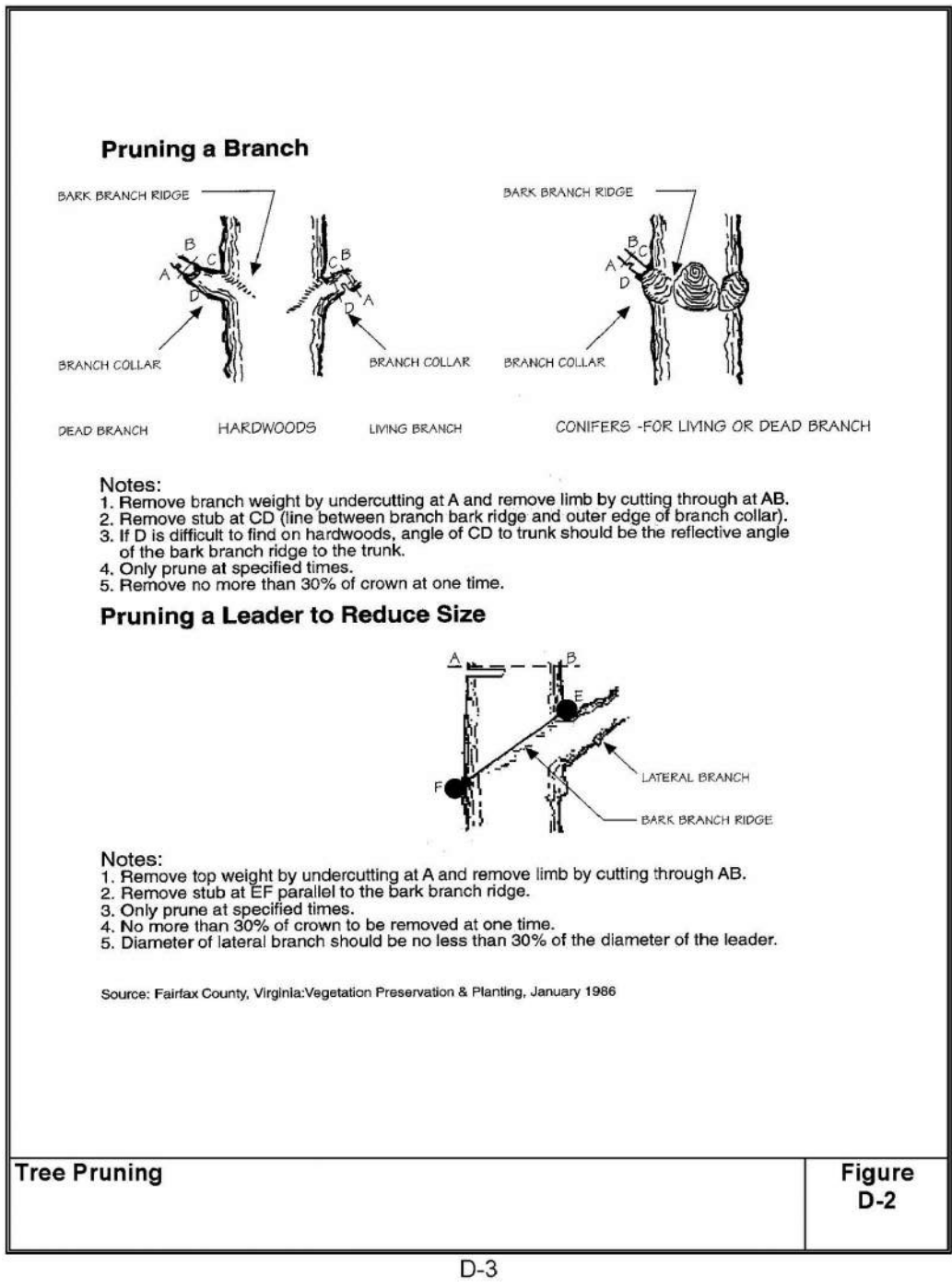
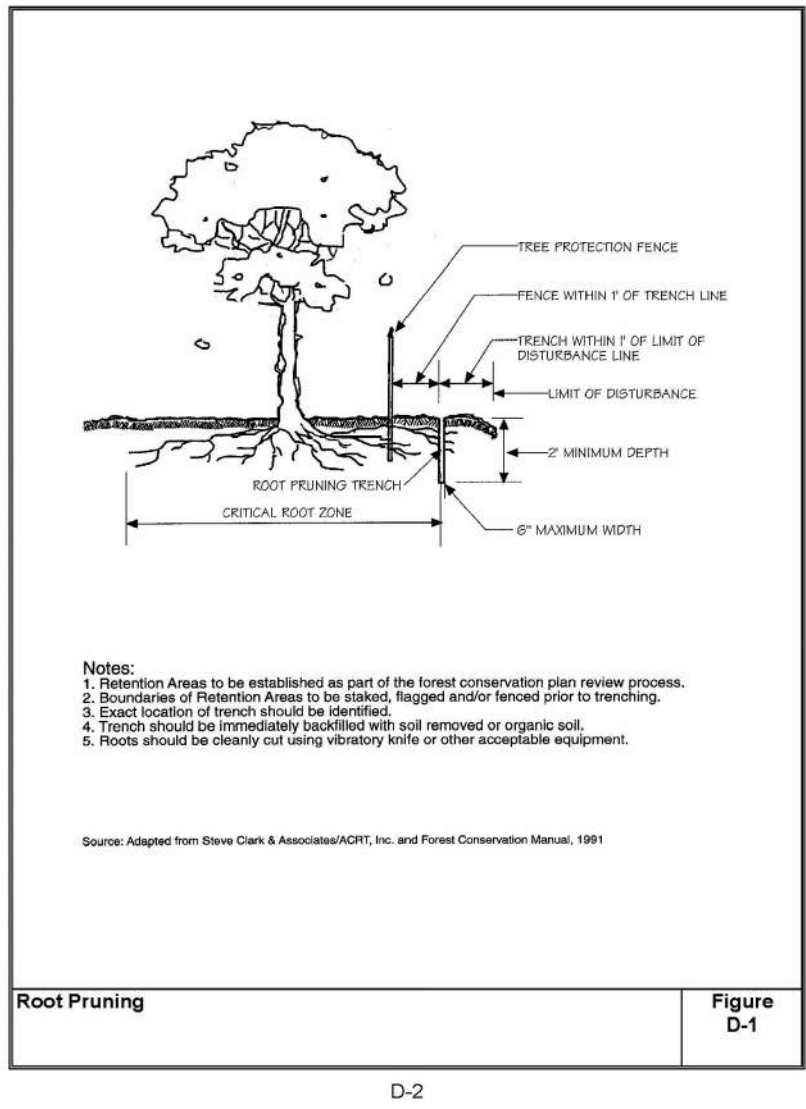
GEOTEXTILE					
MARYLAND APPLICATION CLASS	TYPE OF GEOTEXTILE	GRADE STRENGTH (lb/ft <sup>2</sup> )	TENSILE STRENGTH (lb/ft)	PERMEABILITY (in <sup>2</sup> /ft <sup>2</sup> )	APPROXIMATE OPENING SIZE (in)
B1	NONWOVEN	100	310	0.50	0.43
	WOVEN	100	310	0.50	0.43
	MONOLAMINAR	200	620	0.50	0.43
	WOVEN	200	620	0.50	0.43
B2	NONWOVEN	150	465	0.25	0.25
	WOVEN	150	465	0.25	0.25
	MONOLAMINAR	300	930	0.25	0.25
	WOVEN	300	930	0.25	0.25
B3	NONWOVEN	200	620	0.75	0.43
	WOVEN	200	620	0.75	0.43
	MONOLAMINAR	400	1240	0.75	0.43
	WOVEN	400	1240	0.75	0.43
B4	NONWOVEN	300	930	0.50	0.25
	WOVEN	300	930	0.50	0.25
	MONOLAMINAR	600	1860	0.50	0.25
	WOVEN	600	1860	0.50	0.25
B5	NONWOVEN	400	1240	0.25	0.25
	WOVEN	400	1240	0.25	0.25
	MONOLAMINAR	800	2480	0.25	0.25
	WOVEN	800	2480	0.25	0.25
B6	NONWOVEN	500	1550	0.10	0.10
	WOVEN	500	1550	0.10	0.10
	MONOLAMINAR	1000	3100	0.10	0.10
	WOVEN	1000	3100	0.10	0.10
B7	NONWOVEN	600	1860	0.05	0.05
	WOVEN	600	1860	0.05	0.05
	MONOLAMINAR	1200	3720	0.05	0.05
	WOVEN	1200	3720	0.05	0.05
B8	NONWOVEN	800	2480	0.02	0.02
	WOVEN	800	2480	0.02	0.02
	MONOLAMINAR	1600	4960	0.02	0.02
	WOVEN	1600	4960	0.02	0.02

NOTE 1: ALL PROPERTY VALUES IN THE GEOTEXTILE TABLE ARE BASED ON MINIMUM AVERAGE ROLL VALUES IN THE WEAREST PRINCIPLE DIRECTION EXCEPT FOR APPARENT OPENING SIZE.  
NOTE 2: THE ULTRAVIOLET STABILITY SHALL BE 50 PERCENT AFTER 500 HRS OF EXPOSURE FOR ALL CLASSES.  
EXCEPT CLASS F, WHICH SHALL BE 70 PERCENT (D 4355).  
\*10% ELONGATION FOR SL FENCE AND MONOLAMINAR WOVEN GEOTEXTILE IN MACHINE DIRECTION  
\*\*THIS IS A MINIMUM APPARENT OPENING SIZE, NOT A MAXIMUM  
\*\*\*MACHINE DIRECTION



- MULCH ACCESS PATH DETAIL NOTES:**
- ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. MINOR ADJUSTMENTS TO THE ALIGNMENT THAT MINIMIZES TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR.
  - AS FIELD CONDITIONS WARRANT, ADDITIONAL WOOD CHIP MULCH (EXCEEDING THE MINIMUM 12") MAY BE REQUIRED AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR TO AVOID RUTTING OF THE SOIL SURFACE.
  - TIMBER MAT ACCESS PATH IS REQUIRED WHEN CROSSING WETLANDS.
  - CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION PERIOD. UPON COMPLETION OF THE PROJECT, MULCH CAN REMAIN IN PLACE, BEING SPREAD THROUGHOUT THE SITE AT A MAXIMUM DEPTH OF 2". THE CONTRACTOR MUST ENSURE THAT THIS PROCESS IS DONE THROUGHOUT THE GRADING PROCESS, IN A MANNER WHICH ENSURES PROPOSED GRADES ARE MET AND MAINTAINED, WITHOUT DISTURBANCE TO FINAL SEEDING AND PLANTING OF THE SITE.
  - SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF ACCESS PATH, AT DIRECTION OF THE ENGINEER. IF SOILS ARE EXPOSED AND RUTTED BELOW MULCH MATTING, CONTRACTOR TO ADDRESS ACCORDINGLY TO RESTORE NATURAL CONDITIONS. STABILIZE ALL EXPOSED SOIL WITH APPROPRIATE PERMANENT SEED MIX, AS DEFINED IN THE LANDSCAPE PLANS. SOIL STABILIZATION MATTING MAY BE REQUIRED AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR TO STABILIZE SLOPED AREAS.
  - THE ACCESS PATH IS DESIGNED TO PREVENT COMPACTION OF EXISTING SOILS USING LOW PRESSURE EQUIPMENT WHICH EXERTS NO MORE THAN 12 PSI. IF THE CONTRACTOR INTENDS TO USE ANY EQUIPMENT WITH HIGHER LOADS, ADDITIONAL PROTECTION MEASURES MUST BE PROVIDED, AND THOSE MEASURES MUST BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
  - MINIMUM 700-GRAM COIR FIBER MATTING COULD BE USED IN LIEU OF NON-WOVEN GEOTEXTILE.
  - NONWOVEN GEOTEXTILE SHALL BE PLACED WITH THE SEAMS PARALLEL TO THE FLOW OF TRAFFIC. OVERLAP MATTING 18-INCH MINIMUM AT SEAMS.
  - WOODCHIP MULCH SHALL BE DERIVED FROM FRESH OR AGED HARDWOOD OR PINE MATERIALS INCLUDING BARK AND WOOD FRAGMENTS. WOOD CHIPS SHALL BE FREE OF LEAVES, VINES, INCLUDING POISON IVY, TRASH AND FOREIGN MATTER, AND MAY INCLUDE CHUNKS UP TO 3 INCHES IN ANY DIMENSION.

#### TREE ROOT PRUNING – TYPICAL DETAIL

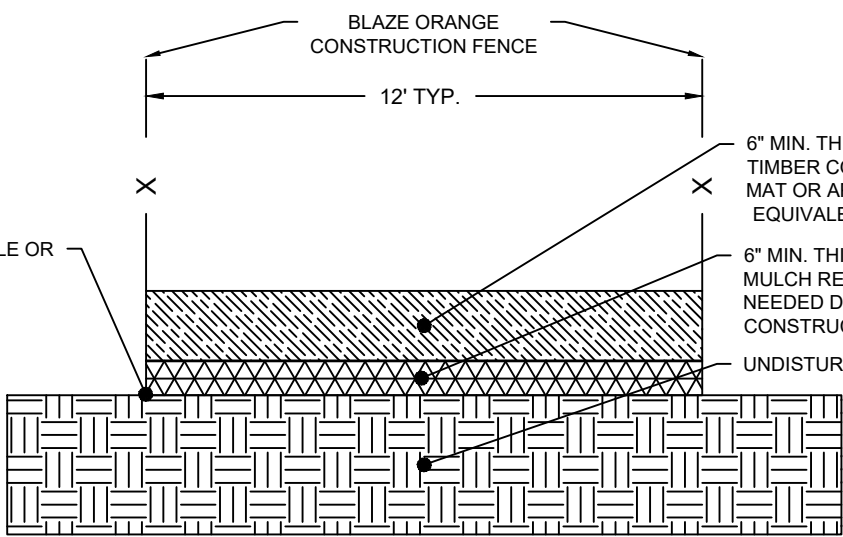


#### MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

- DESCRIPTION**  
The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.
- IMPLEMENTATION SEQUENCE**  
Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):
- Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the County's or utility company's satisfaction.
  - The contractor should notify the County sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
  - The contractor should conduct a pre-construction meeting on site with the County sediment control inspector, the County project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the County or local authority.
  - Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
  - Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the County or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
  - Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.
  - Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
  - Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).
  - All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
  - After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
  - A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
  - If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
  - The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
  - After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

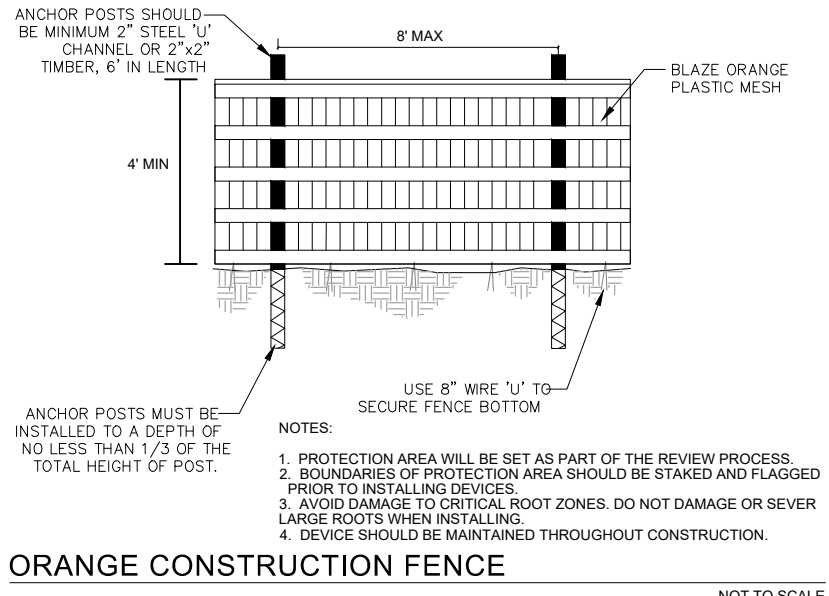
#### TEMPORARY INSTREAM CONSTRUCTION MEASURES



- NOTES:**
- TIMBER MATS TO BE INSTALLED AS NEEDED AS SHOWN ON THE APPROVED PLAN AND OVER CRITICAL ROOT ZONES OF TREES. IN WETLANDS, WETLAND BUFFERS, AND OVER SANITARY PIPES AT THE DIRECTION OF THE ENGINEER.
  - MULCH AND TIMBER MATS SHALL BE PLACED PRIOR TO HEAVY EQUIPMENT TRAVERSING THE ACCESS ROUTE. MATS SHOULD BE PLACED END TO END TO FORM A CONTINUOUS SPAN FOR THE ENTIRE LENGTH OF THE AREA TO BE PROTECTED.
  - ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND INSPECTORS.
  - THE CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION. UPON COMPLETION OF THE PROJECT, THE MULCH AND TIMBER MATTING SHALL BE REMOVED IN THEIR ENTIRETY AND THE ACCESS ROUTE RESTORED TO PRE-CONSTRUCTION CONDITION UNLESS OTHERWISE NOTED ON THE PLANS OR DIRECTED BY THE ENGINEER.
  - MATS SHALL BE INSPECTED FREQUENTLY AND MAINTAINED OR REPLACED AS NECESSARY TO ENSURE PROPER FUNCTION.
  - INDIVIDUAL MATS SHALL BE SECURELY CONSTRUCTED WITH INDIVIDUAL COMPONENT LAYERS BOLTED, CABLED OR OTHERWISE SECURELY FASTENED.
  - TIMBER MATS SHALL EITHER BE NEW OR POWER WASHED PRIOR TO ARRIVING ON SITE IF PREVIOUSLY USED.
  - MINIMUM 700-GRAM COIR FIBER MATTING COULD BE USED IN LIEU OF NON-WOVEN GEOTEXTILE.

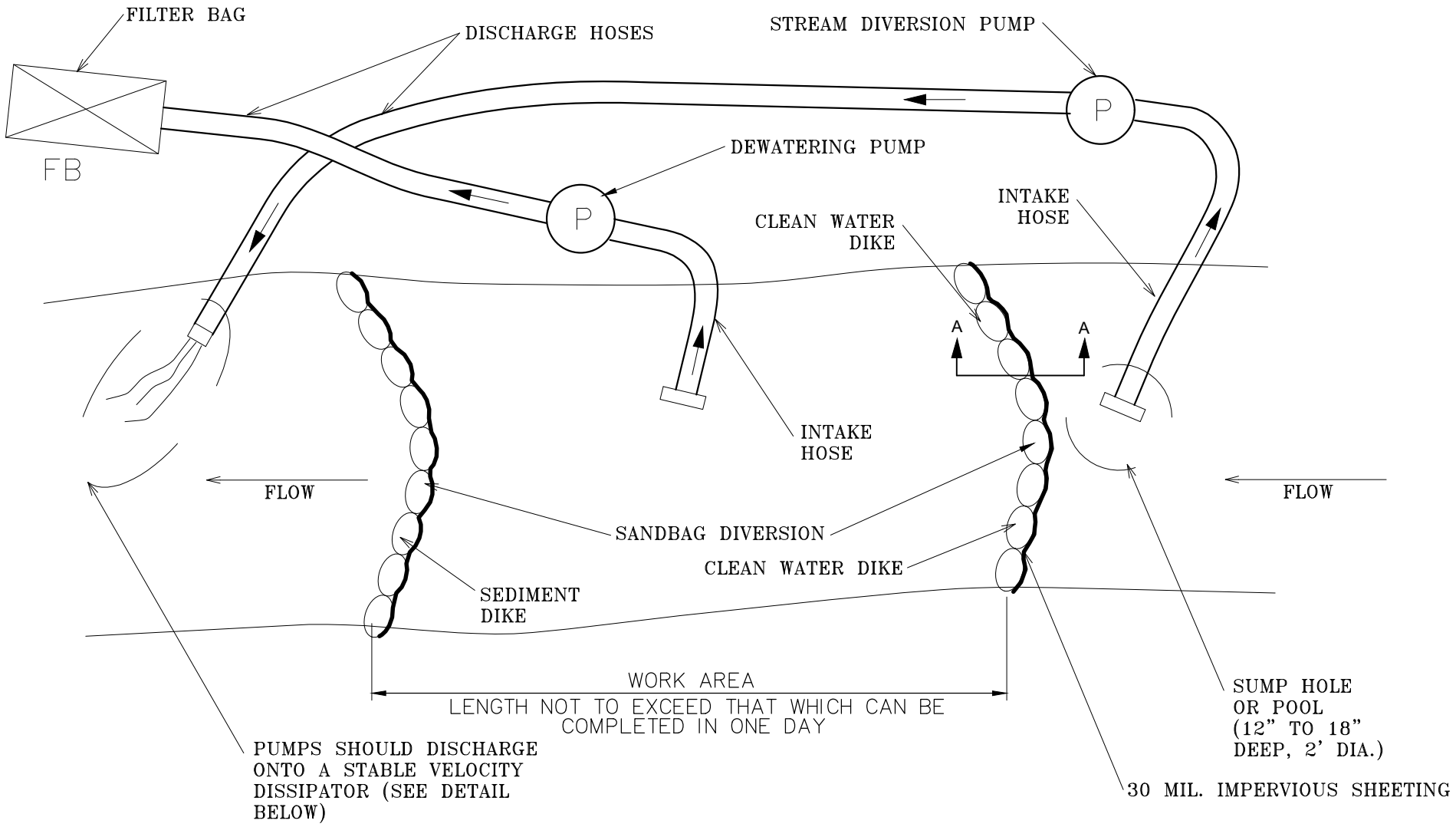
#### TEMPORARY TIMBER MATTING AND MULCH ACCESS ROUTE DETAIL

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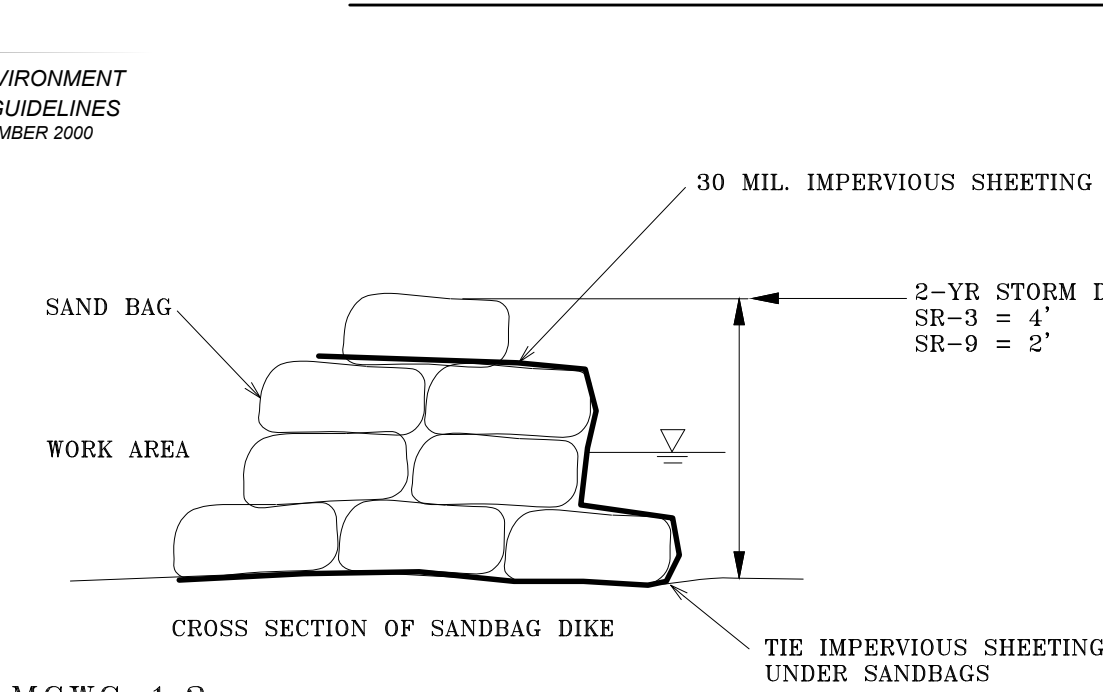


#### ORANGE CONSTRUCTION FENCE

NOT TO SCALE

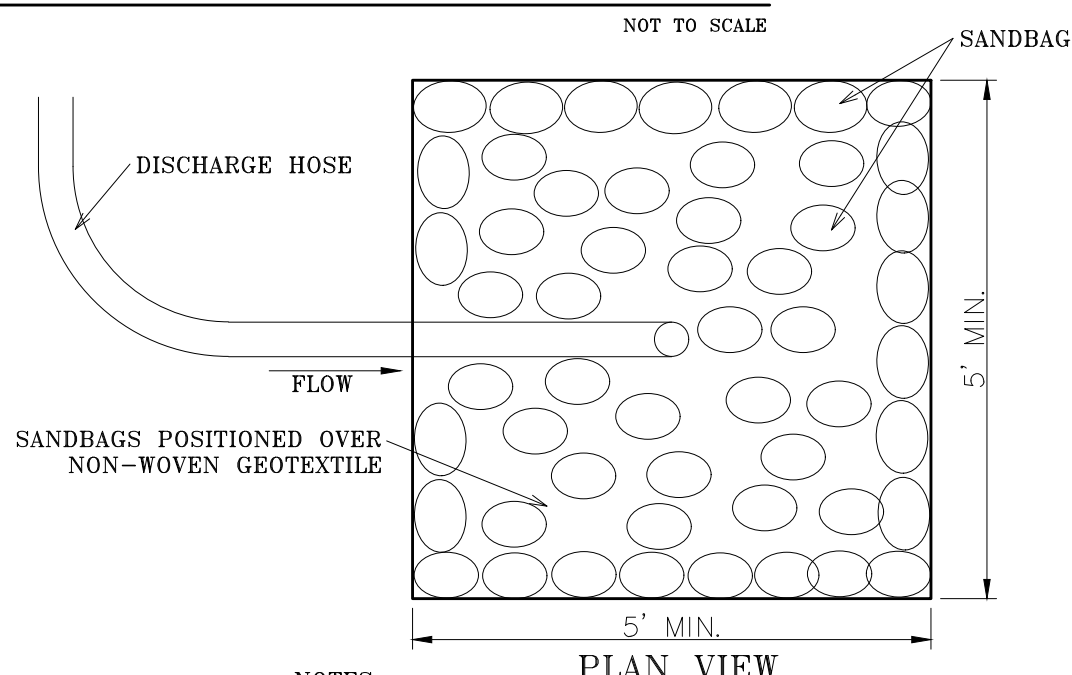


#### SANDBAG DIVERSION, WITH PUMP AROUND PLAN VIEW



#### MGWC 1.2 SANDBAG DIVERSION, WITH PUMP AROUND PRACTICE-SECTION A-A

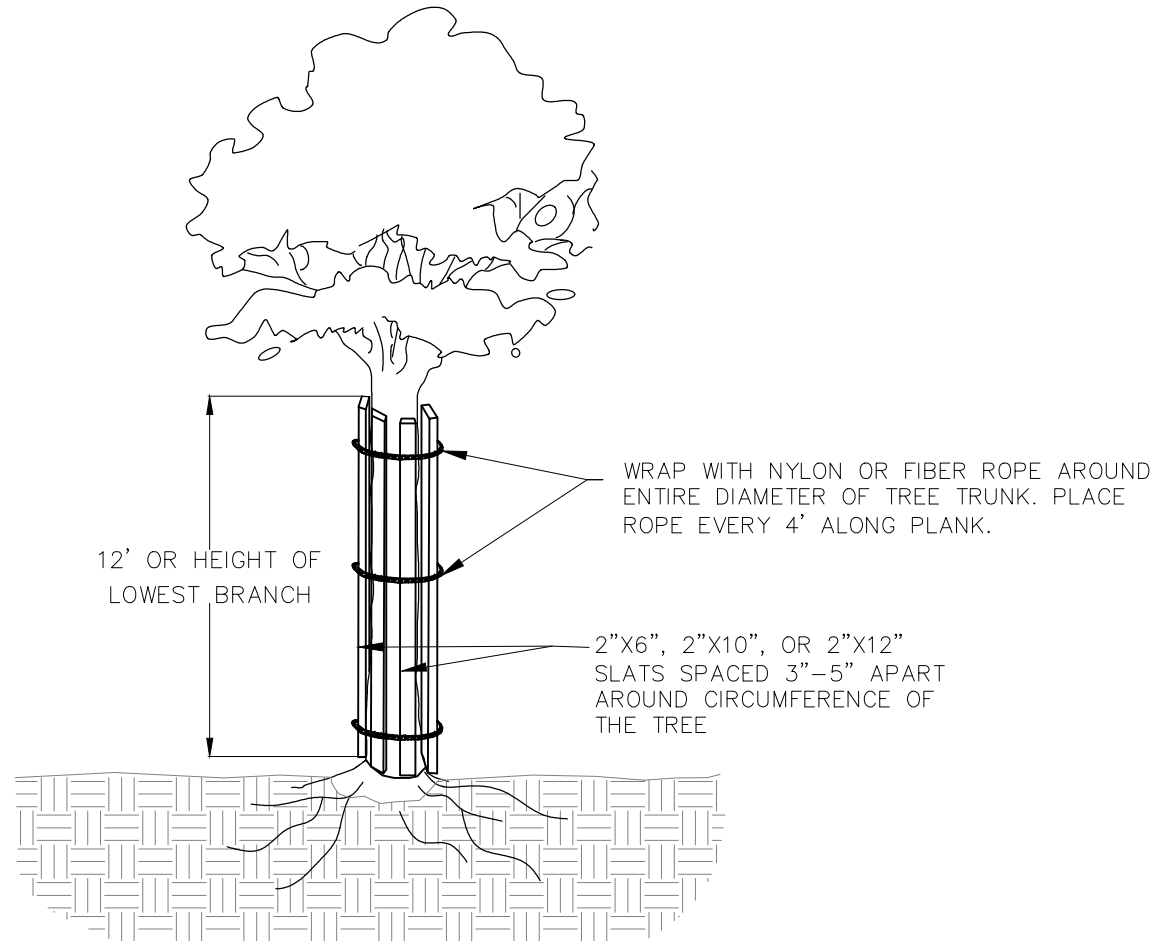
NOT TO SCALE



- NOTES:**
- PLACE DISCHARGE HOSE IN CENTER OF VELOCITY DISSIPATOR.
  - VELOCITY DISSIPATOR SHALL BE LOCATED INSIDE THE LOD.

#### VELOCITY DISSIPATOR

NOT TO SCALE



#### TREE PROTECTION PLANKING (TPP) DETAIL

Not To Scale

- NOTES:**
- Protective planking shall be erected prior to clearing, grading or construction begins. Protective measures shall remain in place for the duration of construction.
  - Notify County and Engineer if any tree to be planked appears to be dead or dying prior to installing Tree Protection Planking.

## HARFORD COUNTY, MARYLAND

### BENNETT PLACE STREAM RESTORATION

#### EROSION AND SEDIMENT CONTROL DETAILS

Drawn By : <u>PJB</u>	Scale : <u>N/A</u>
Designed By : <u>IPT, PJB</u>	Date : <u>10 / 25</u>
Reviewed By : <u>CAL</u>	
Drawing No. <u>ED-01 of ED-02</u>	Sheet No. <u>36</u> of <u>44</u>

BILLING NO. TBD  
EG-SWMG- TBD  
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.

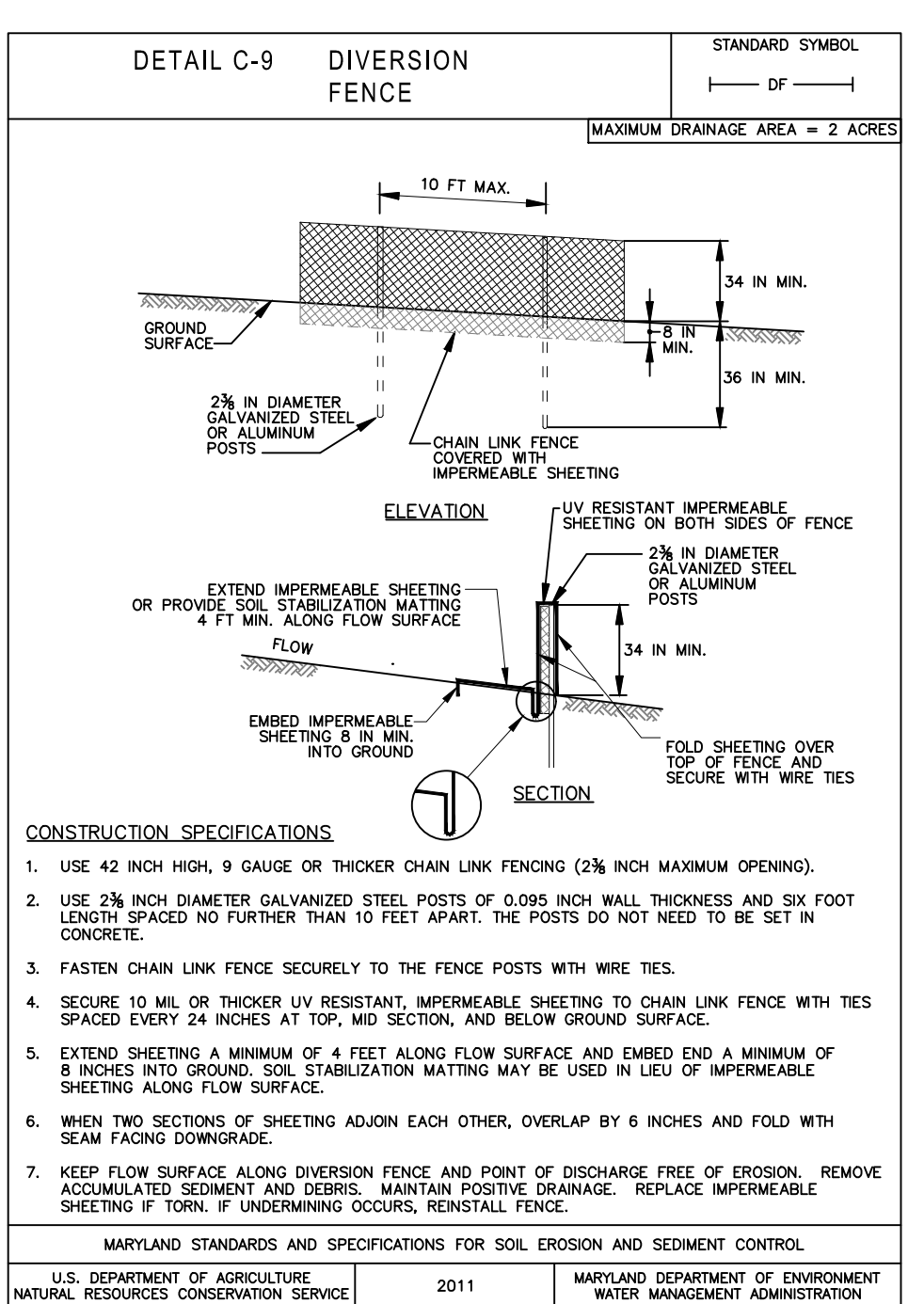
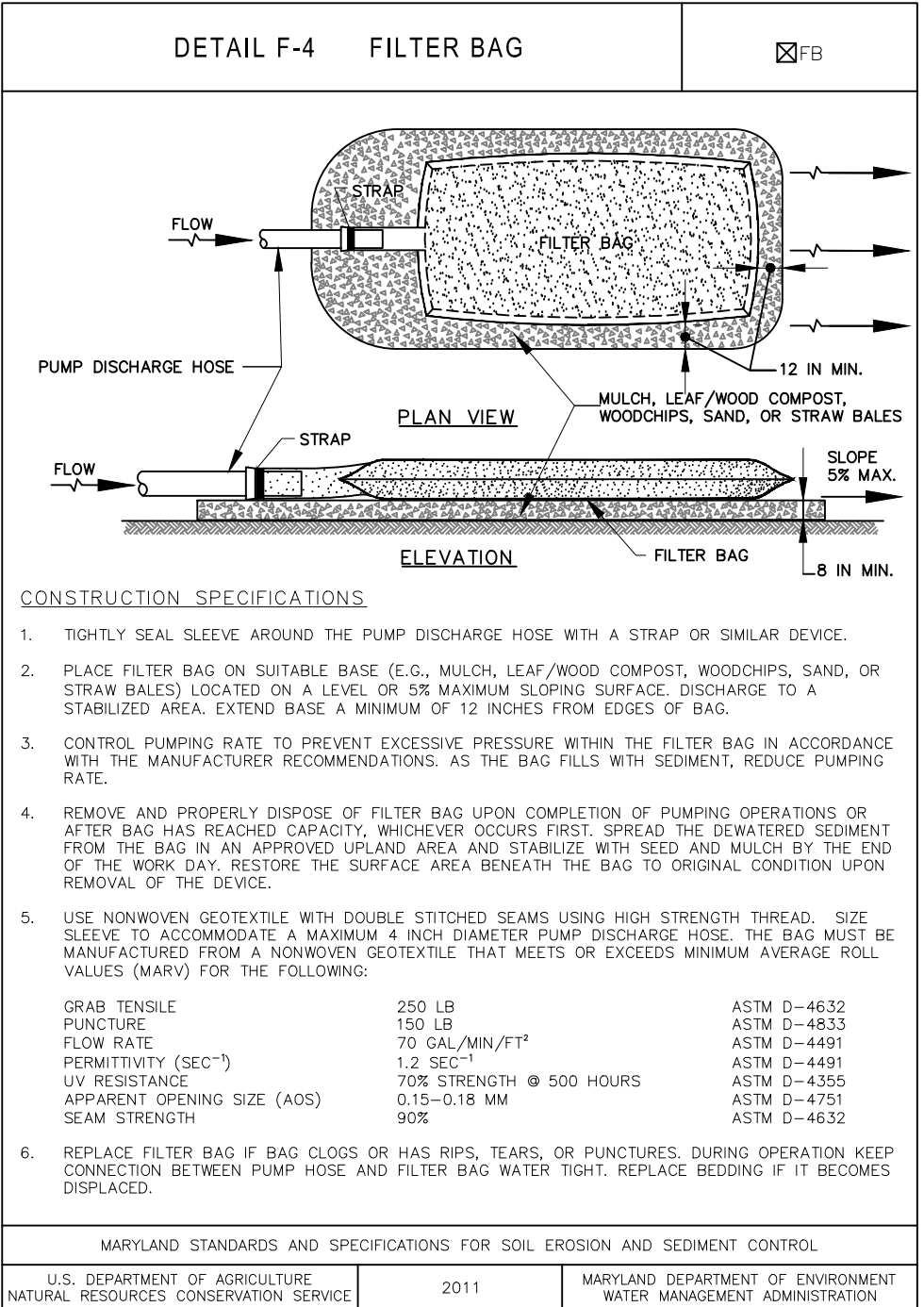
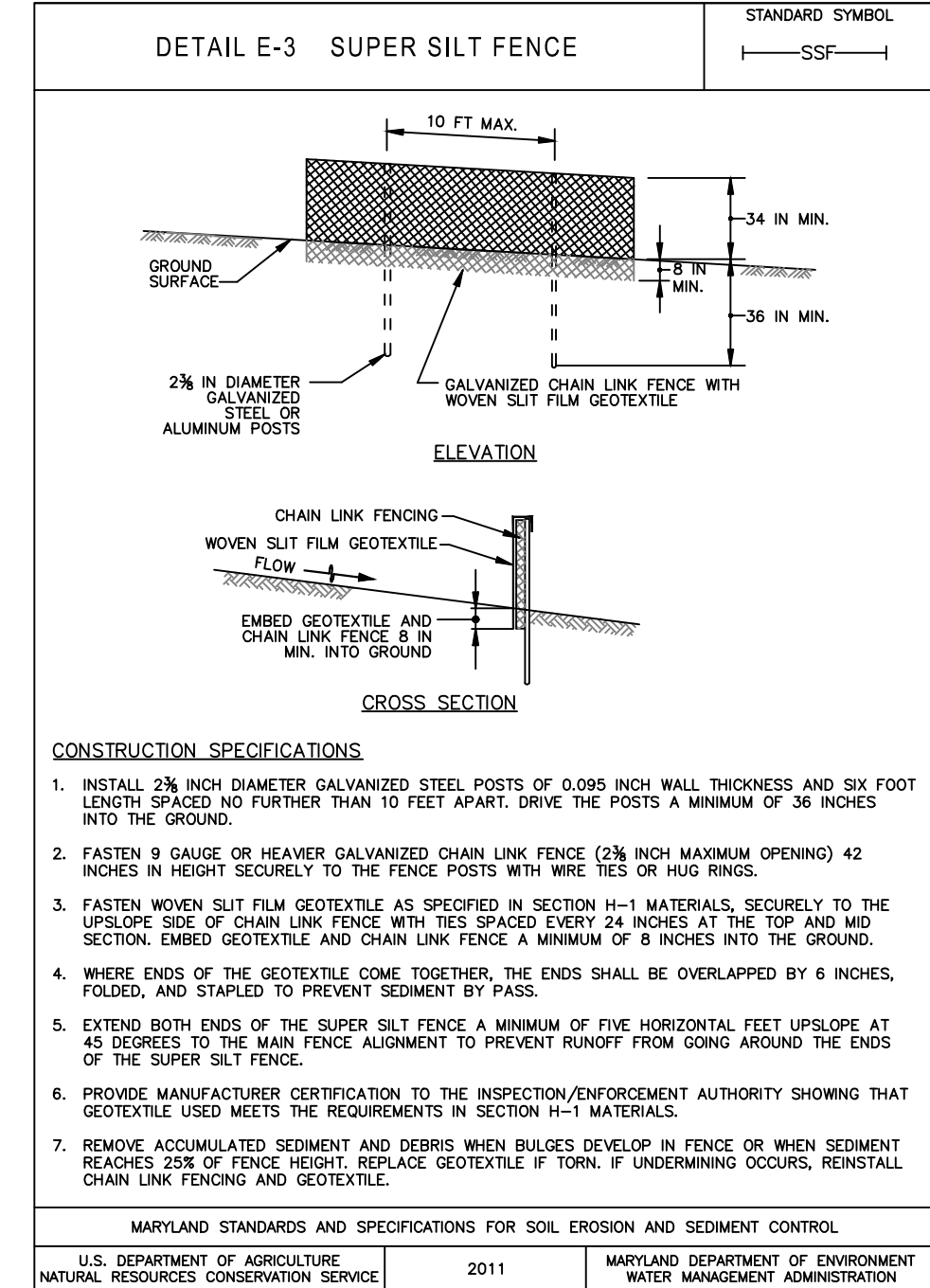
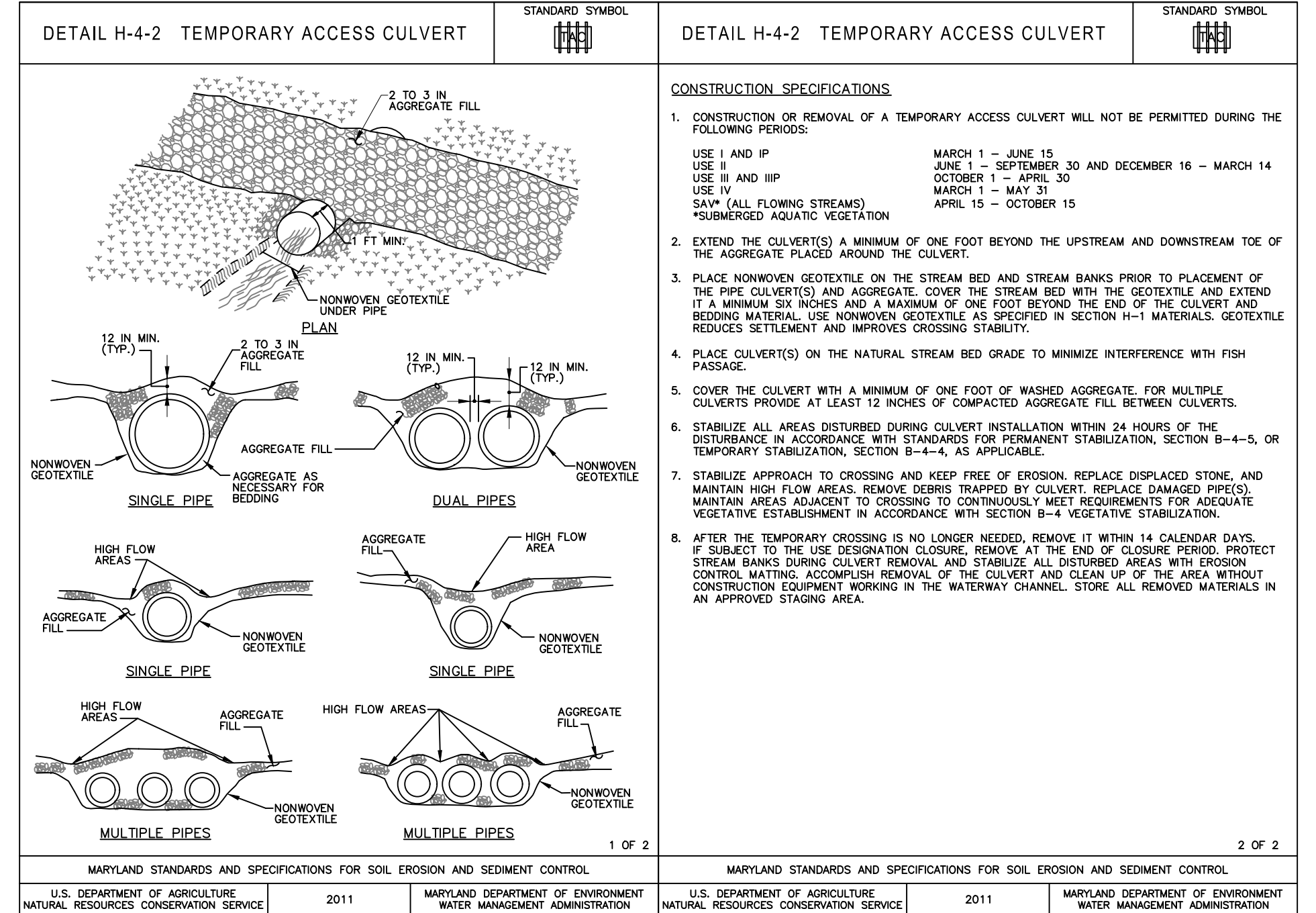
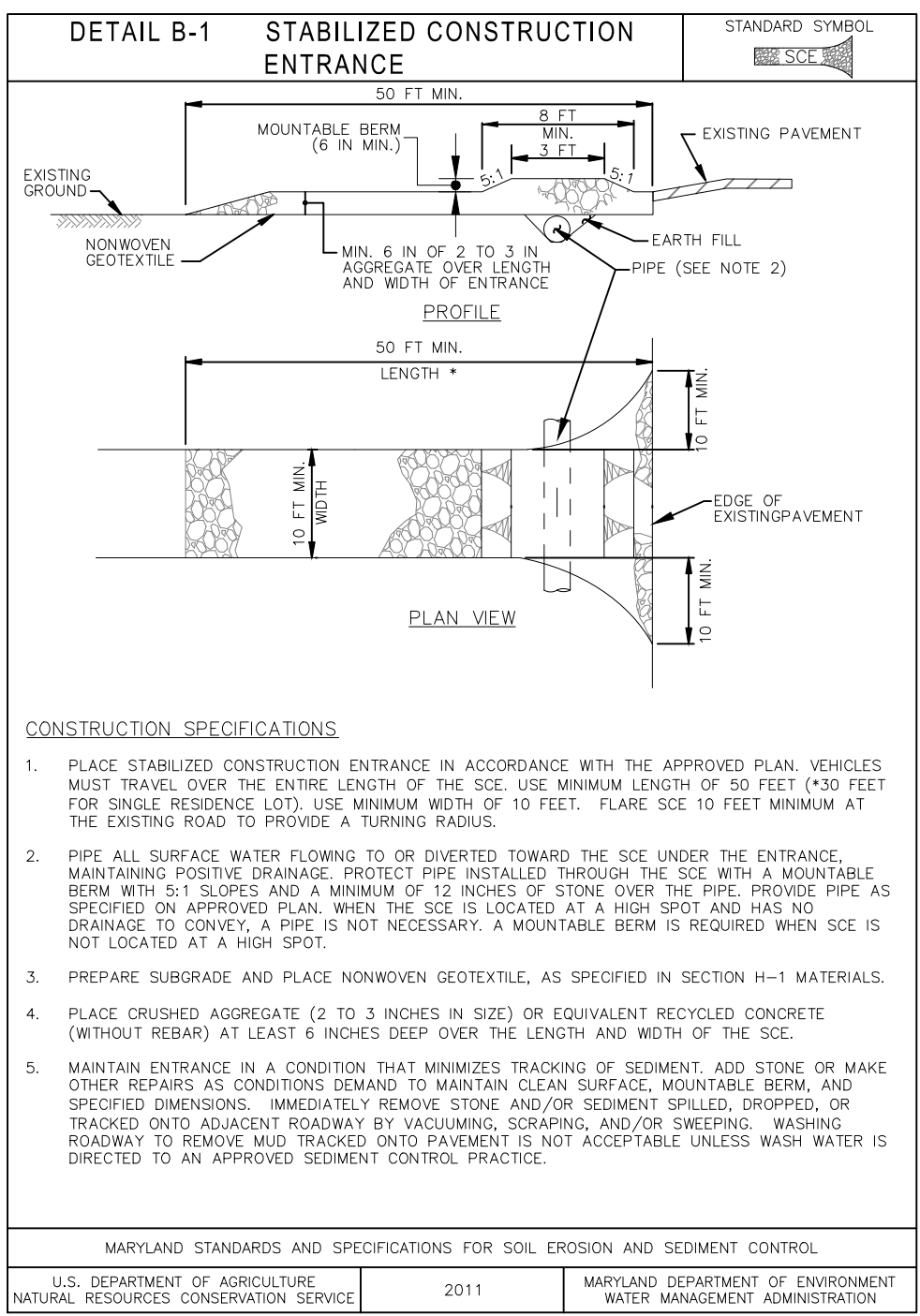
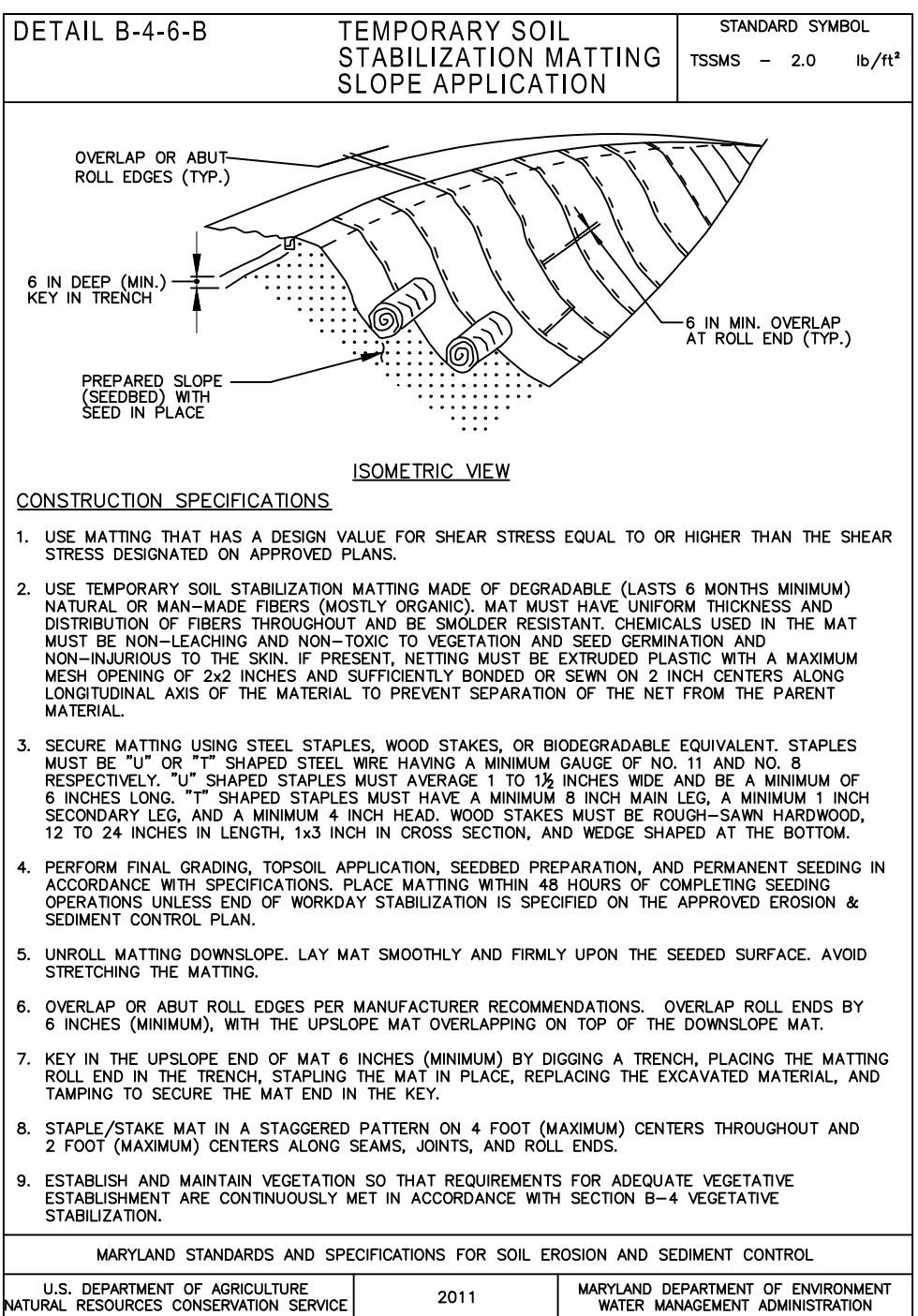
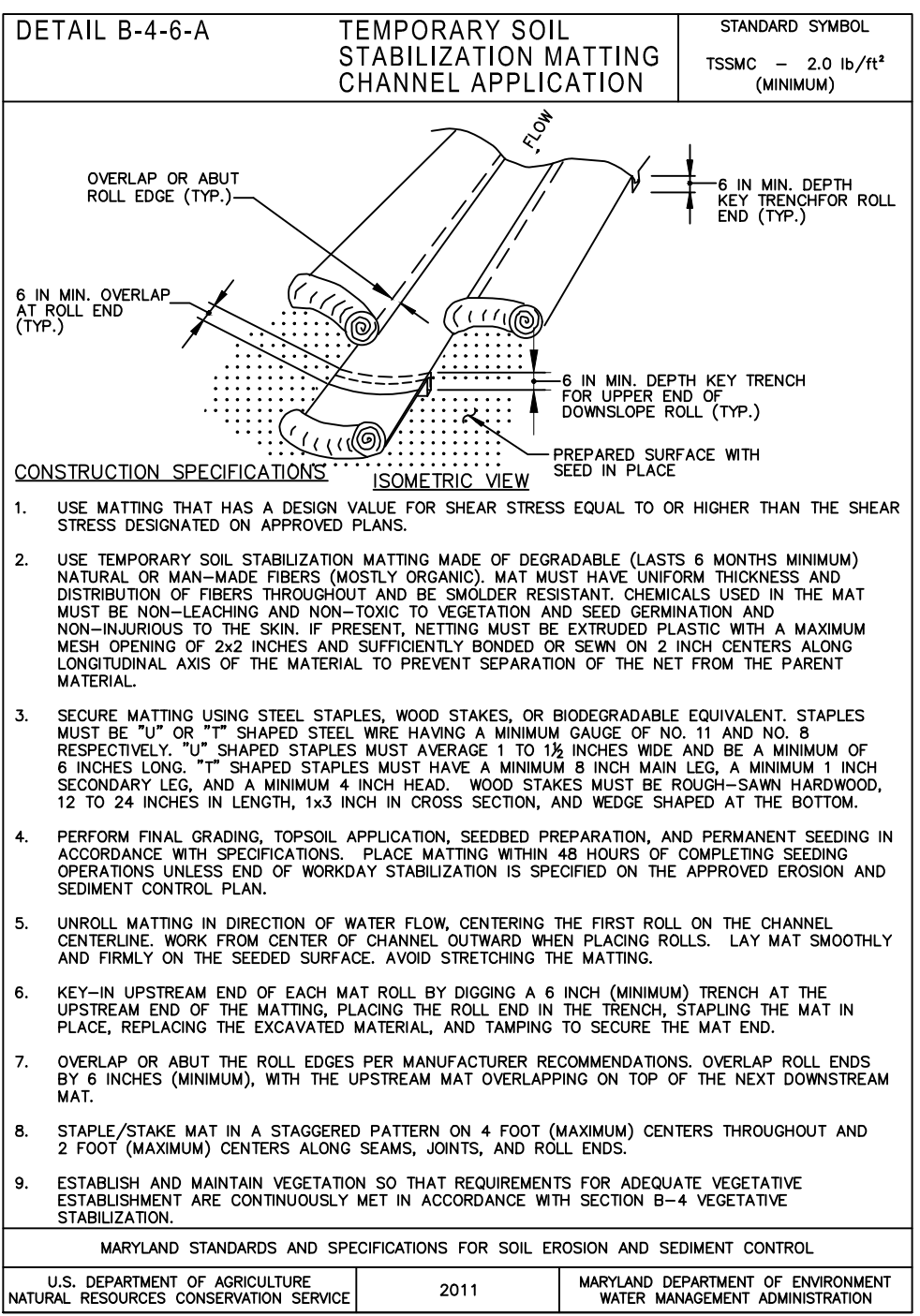
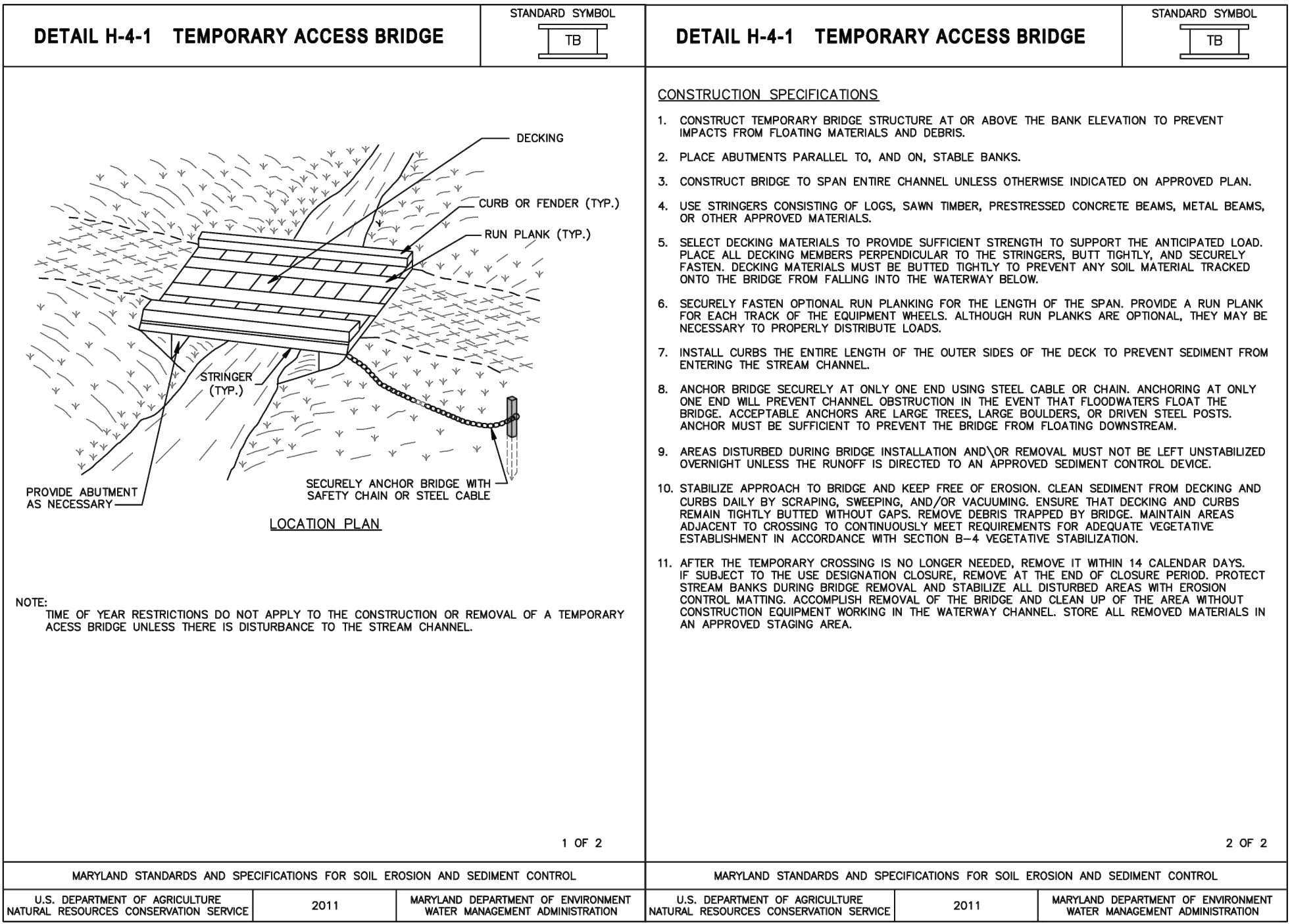


10/9/2025

BID No.:

H-CG DWG ID No.: 28371





# HARFORD COUNTY, MARYLAND

## BENNETT PLACE STREAM RESTORATION

### EROSION AND SEDIMENT CONTROL DETAILS

Drawn By :	PJB	Scale :	N/A
Designed By :	IPT , PJB	Date :	10 / 25
Reviewed By :	CAL		
Drawing No.	ED-02 of ED-02	Sheet No.	37 of 44

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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10/9/2025



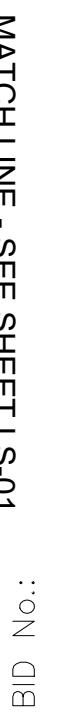
MATCH LINE - SEE SHEET LS-02

L:\Harford County Department of Public Work\00221073.0094-Bennett Place Stream Restoration\00221073.0094-Bennett Place Stream Restoration.dwg Oct 16, 2023 8:44am



<p>PLANTING LEGEND</p> <table><tr><td></td><td>RIPIARIAN FOREST ZONE 19,019 SF // 0.44 AC</td></tr><tr><td></td><td>RIPIARIAN SEED ONLY ZONE 2,959 SF // 0.07 AC</td></tr><tr><td></td><td>FLOODPLAIN FOREST ZONE 13,288 SF // 0.31 AC</td></tr><tr><td></td><td>FLOODPLAIN SEED ONLY ZONE 446 // 0.01 AC</td></tr><tr><td></td><td>WETLAND ENHANCEMENT ZONE 662 SF // 0.01 AC</td></tr><tr><td></td><td>TURFGRASS 1,339 SF // 0.03 AC</td></tr></table>			RIPIARIAN FOREST ZONE 19,019 SF // 0.44 AC		RIPIARIAN SEED ONLY ZONE 2,959 SF // 0.07 AC		FLOODPLAIN FOREST ZONE 13,288 SF // 0.31 AC		FLOODPLAIN SEED ONLY ZONE 446 // 0.01 AC		WETLAND ENHANCEMENT ZONE 662 SF // 0.01 AC		TURFGRASS 1,339 SF // 0.03 AC	<p>20' 0 20' 40'</p> <p>ORIGINAL SCALE: 1"=20'</p>	<p>BILLING NO. TBD</p> <p>EG-SWMENG- TBD</p> <p>PROFESSIONAL CERTIFICATION</p> <p>I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.</p> <p></p> <p>10/9/2025</p>	<table><tr><th colspan="2">Revisions</th></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>	Revisions								<p>HARFORD COUNTY, MARYLAND</p> <p>BENNETT PLACE STREAM RESTORATION</p> <p>LANDSCAPE PLAN</p> <table><tr><td>Drawn By : PJB</td><td>Scale : 1" = 20'</td></tr><tr><td>Designed By : IPT, PJB</td><td>Date : 10 / 25</td></tr><tr><td>Reviewed By : CAL</td><td> </td></tr><tr><td>Drawing No. LS-01 of LS-05</td><td>Sheet No. 38 of 44</td></tr></table>	Drawn By : PJB	Scale : 1" = 20'	Designed By : IPT, PJB	Date : 10 / 25	Reviewed By : CAL		Drawing No. LS-01 of LS-05	Sheet No. 38 of 44
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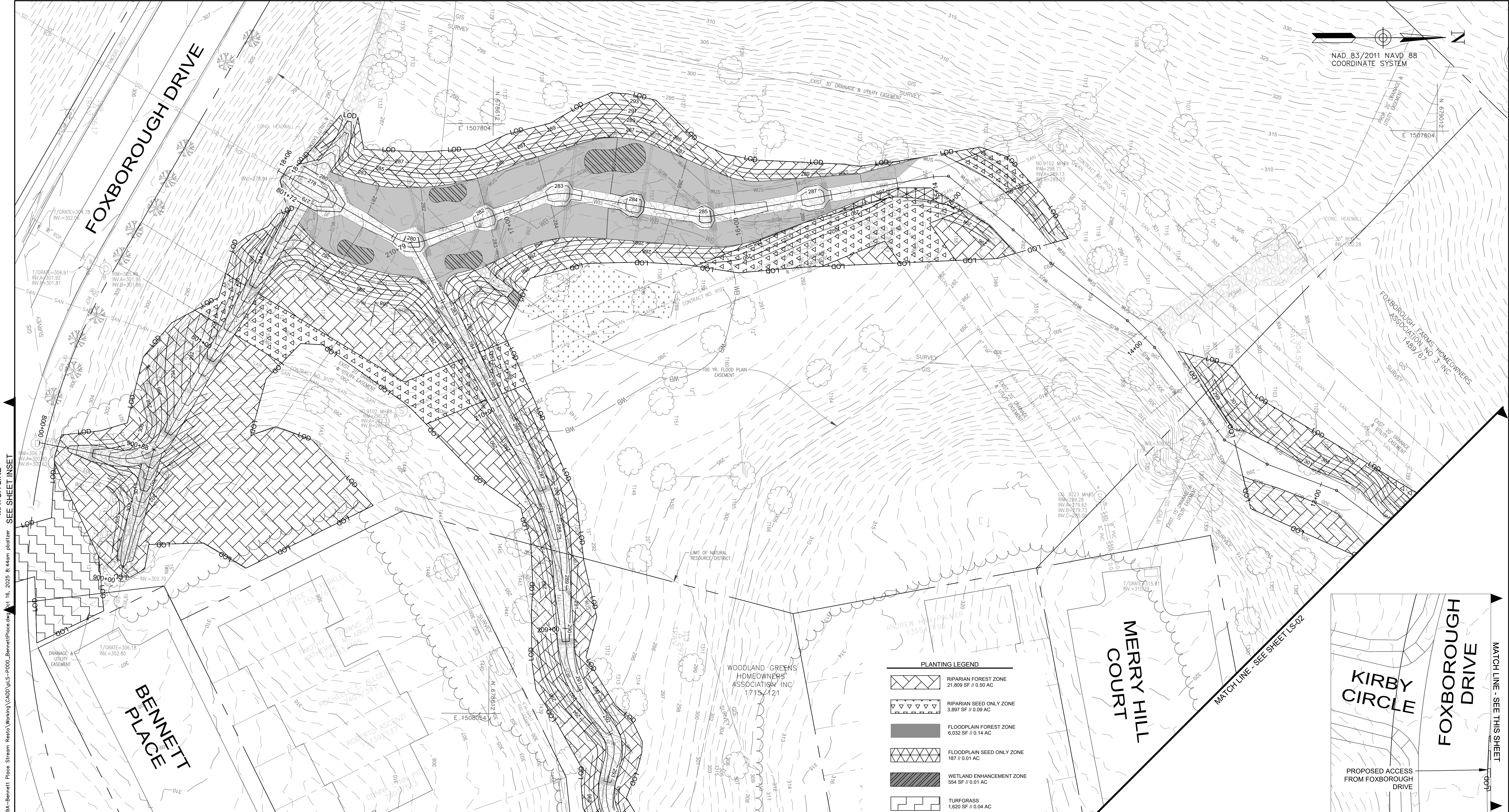
20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

10/9/2025

<h1 style="text-align: center;">HARFORD COUNTY, MARYLAND</h1>	
<h2 style="text-align: center;">BENNETT PLACE STREAM RESTORATION</h2>	
<h3 style="text-align: center;">LANDSCAPE PLAN</h3>	
Drawn By : <u>PJB</u>	Scale : <u>1" = 20'</u>
Designed By : <u>IPT , PJB</u>	Date : <u>10 / 25</u>
Reviewed By : <u>CAL</u>	
Drawing No. <u>LS-02 of LS-05</u>	Sheet No. <u>39</u> of <u>44</u>





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MATCH LINE - SEE SHEET INSET

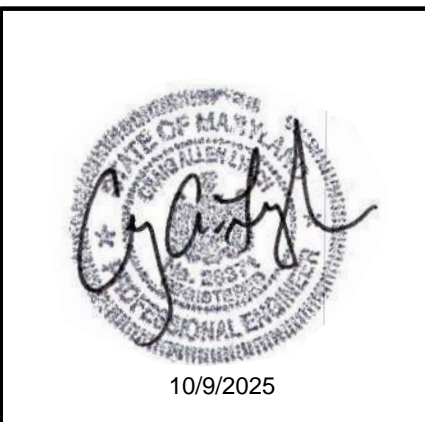
MATCH LINE - SEE SHEET LS-04

MATCHLINE - SEE SHEET LS-02

MATCH LINE - SEE THIS SHEET



BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



Revisions

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

LANDSCAPE PLAN

Drawn By : PJB

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. LS-03 of LS-05

Scale : 1" = 20'

Date : 10 / 25

Sheet No. 40 of 44

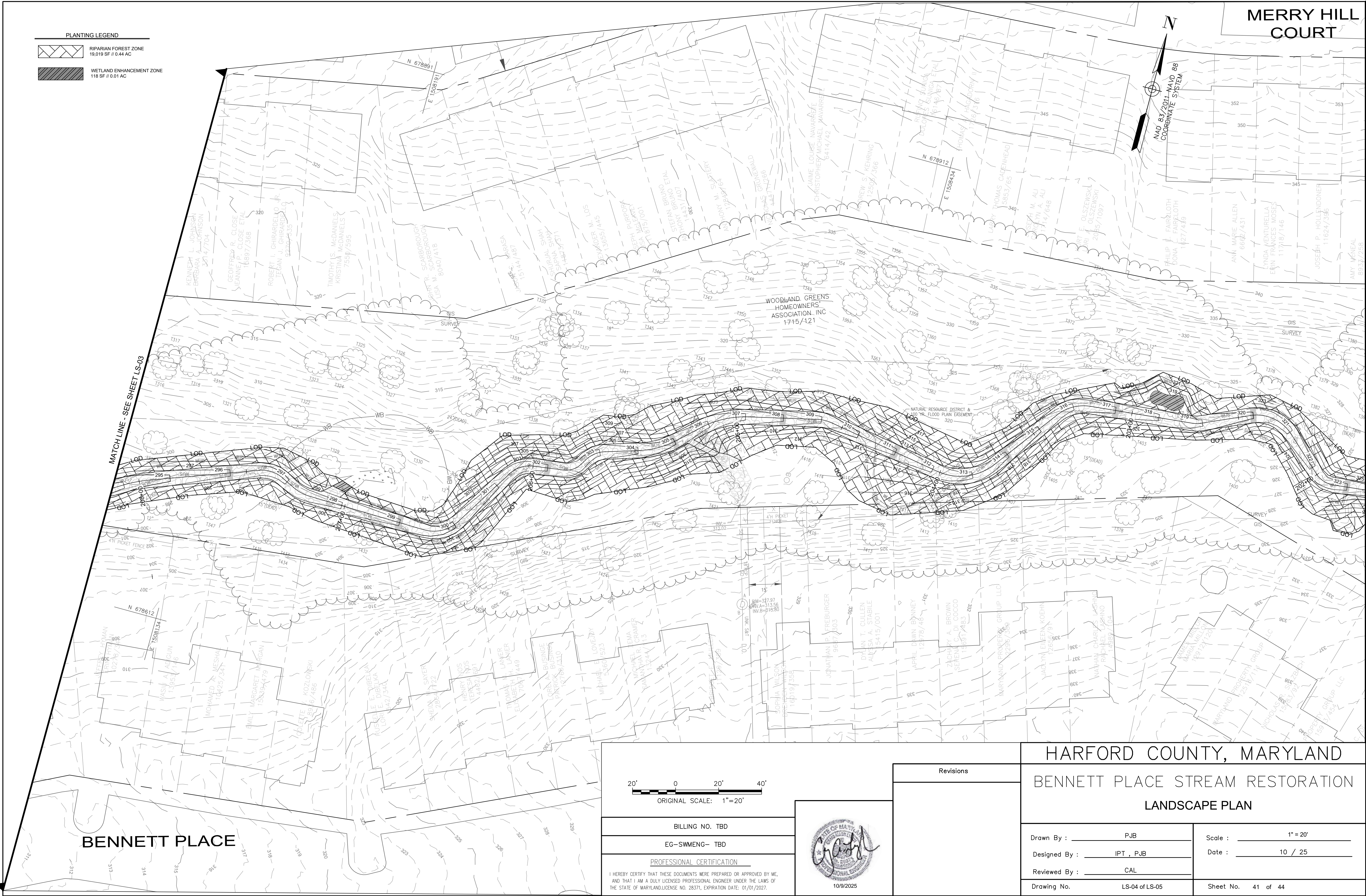


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PLANTING LEGEND

RIPARIAN FOREST ZONE  
19,019 SF // 0.44 AC

WETLAND ENHANCEMENT ZONE  
118 SF // 0.01 AC



20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

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EG-SWMENG- TBD

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10/9/2025

Revisions


HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

LANDSCAPE PLAN

Drawn By : PJB

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. LS-04 of LS-05

Scale : 1" = 20'

Date : 10 / 25

Sheet No. 41 of 44

MATCH LINE - SEE SHEET LS-05

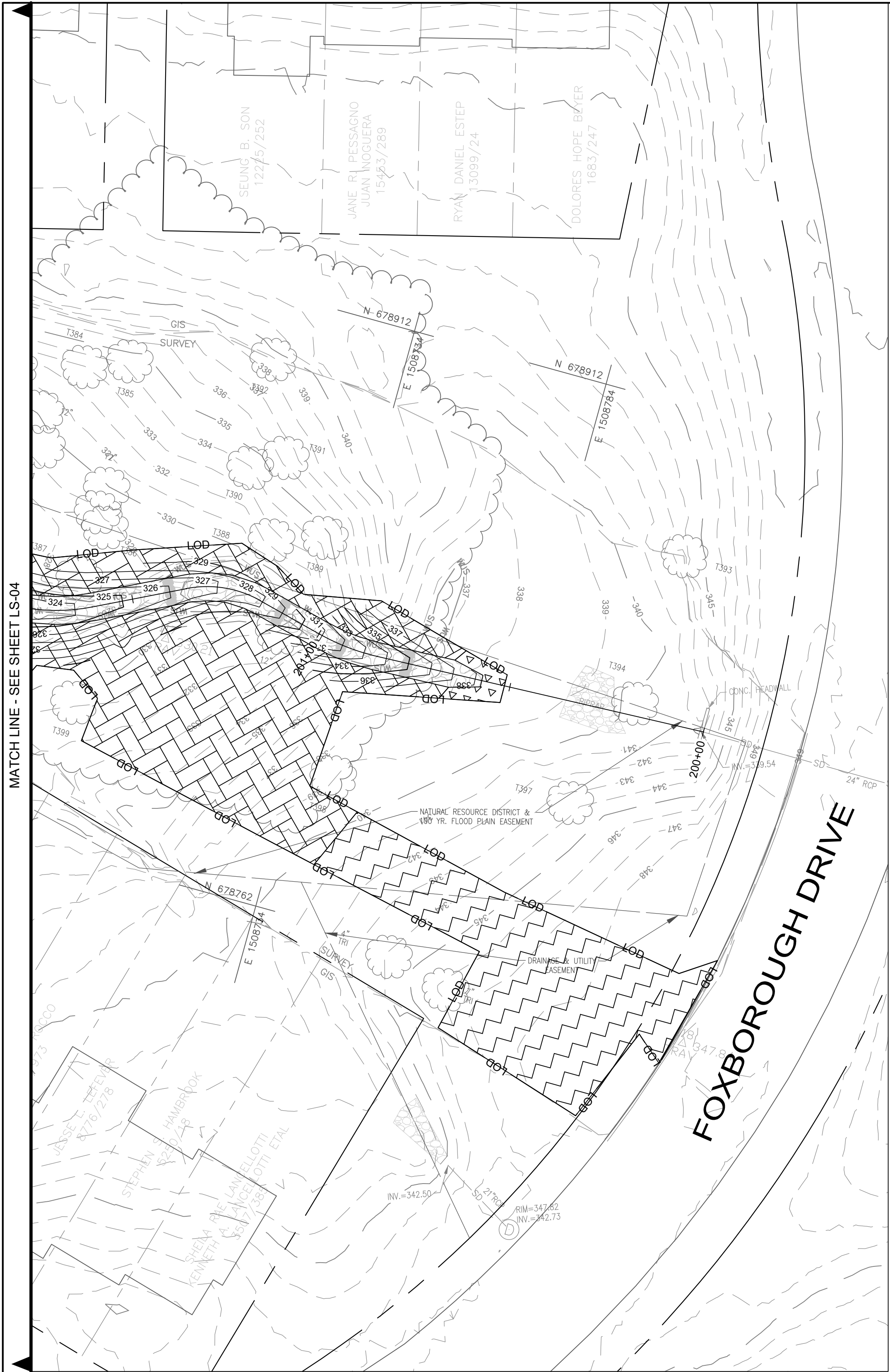
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HCG DWG ID No.: 

Sheet Title



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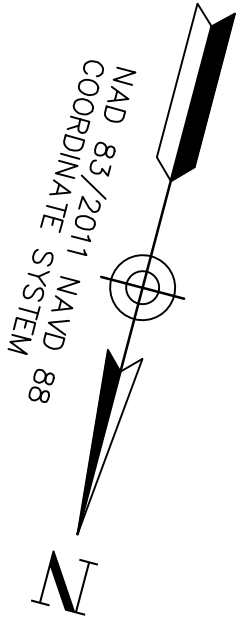
BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2027.



Revisions

HARFORD COUNTY, MARYLAND	
BENNETT PLACE STREAM RESTORATION	
LANDSCAPE PLAN	
Drawn By : PJB	Scale : 1" = 20'
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
Drawing No. LS-05 of LS-05	Sheet No. 42 of 44

PLANTING LEGEND	
	RIPARIAN FOREST ZONE 19,019 SF // 0.44 AC
	RIPARIAN SEED ONLY ZONE 2,959 SF // 0.07 AC
	TURFGRASS 2,737 SF // 0.06 AC





LANDSCAPING NOTES:

- GENERAL NOTES:-
- ALL PLANT MATERIAL WILL BE REINSPECTED FOR SURVIVAL BY DEPARTMENT OF PUBLIC WORKS ONE YEAR FOLLOWING INSTALLATION. A 10 PERCENT MAINTENANCE BOND WILL BE RETAINED DURING THIS TIME PERIOD.
- PLANT MATERIAL SELECTION:-
- THE CONTRACTOR SHALL FURNISH PLANT MATERIALS IN SIZES AND QUANTITIES SPECIFIED IN THE PLANT SCHEDULES.
  - NURSERY GROWN PLANT MATERIAL SHOULD MEET OR EXCEED THE REQUIREMENTS OF THE AMERICAN NURSERY & LANDSCAPE ASSOCIATIONS' (A.N.L.A.) LATEST EDITION OF 'AMERICAN STANDARD NURSERY STOCK' (ANSI Z60.1) SPECIFICATIONS, PARTICULARLY REGARDING THE SIZE, GROWTH, SIZE OF THE ROOT BALL, AND DENSITY OF BRANCH STRUCTURE.
  - ALL PLANTING MATERIAL SHALL BE SOURCED FROM WITHIN 100 MILES OF THE SITE.
  - NO SUBSTITUTIONS SHALL BE MADE WITHOUT THE WRITTEN CONSENT OF THE OWNER AND/OR LANDSCAPE ARCHITECT.
  - THE LANDSCAPE ARCHITECT OR OWNER SHALL HAVE THE RIGHT, AT ANY STAGE OF THE OPERATIONS, TO REJECT ANY AND ALL WORK AND MATERIALS WHICH, IN HIS OR HER OPINION, DOES NOT MEET THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS. ALL REJECTED MATERIAL SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

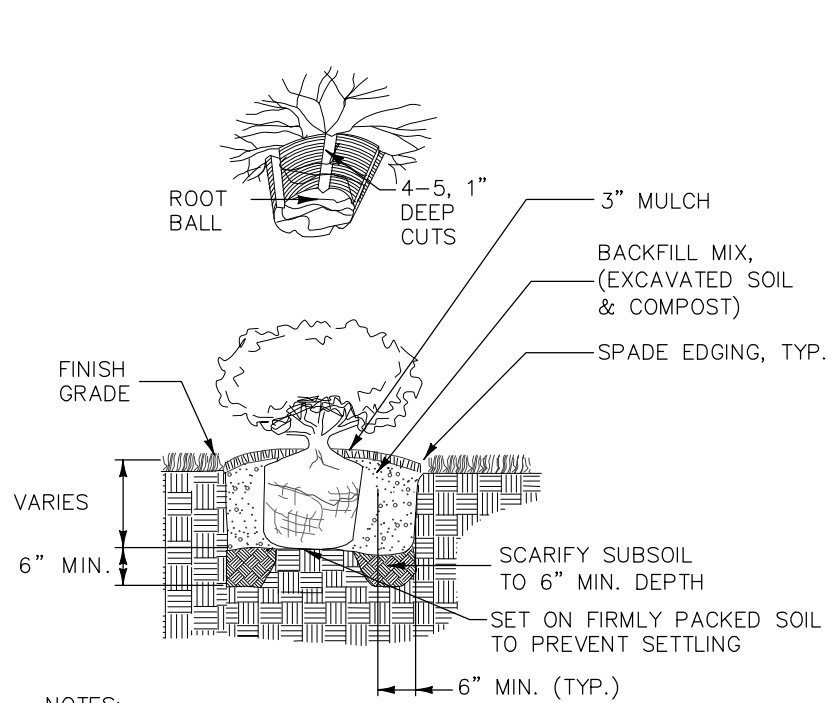
- PLANT MATERIAL TRANSPORT, APPROVAL, & STORAGE:-
- PLANT MATERIAL SHALL BE PROTECTED TO PREVENT SUN SCALD, DESICCATION, AND STRUCTURAL DAMAGE DURING TRANSPORT TO THE SITE. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT FROM THE SOURCE TO THE JOB SITE AND UNTIL PLANTED.
  - PLANT MATERIAL SHALL BE INSPECTED TO BE FREE OF DISEASE, DAMAGE, INSECT INFESTATION, AND VIGOR UPON DELIVERY TO THE SITE. ALL PLANTS SHOULD BE HEALTHY AND WELL STRUCTURED, NO HEEL-COLD STORAGE OR COLLECTED STOCK WILL BE ACCEPTED. PLANTS IN POOR CONDITION SHALL BE REJECTED, REMOVED FROM THE SITE AND REPLACED WITH ACCEPTABLE MATERIALS.
  - PLANT MATERIAL SHALL BE STORED IN A COOL, SHADED AREA ON THE SITE AND KEPT MOIST TO PREVENT DESICCATION UNTIL READY FOR PLANTING. PLANTING SHALL BEGIN WITHIN 24 HOURS OF PLANT DELIVERY TO THE SITE. PLANT MATERIAL THAT REMAINS UNPLANTED BEYOND 24 HOURS SHALL BE PROTECTED FROM DIRECT SUN, AND WEATHER AND KEPT MOIST. PLANT MATERIALS SHALL NOT BE LEFT UNPLANTED FOR MORE THAN 2 WEEKS.
  - THE CONTRACTOR IS REQUIRED TO OBTAIN CLEAN FRESH WATER FOR USE DURING PLANTING OPERATIONS AND THE SUBSEQUENT MAINTENANCE PERIOD.

- SITE PREPARATION AND PLANTING:-
- TREE PROTECTION FENCING DETAIL CAN BE FOUND WITHIN THE E&S NOTES AND DETAILS PLAN SHEETS.
  - ALL TREE PROTECTION MEASURES MUST BE IN PLACE AT THE TIME OF THE SEDIMENT & EROSION CONTROL INSPECTION, PRIOR TO THE COMMENCEMENT OF DEMOLITION, SITE CLEARING, GRADING, OR CONSTRUCTION. TREE PROTECTION DEVICES SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION. NO EQUIPMENT, TRUCKS, MATERIALS, OR DEBRIS MAY BE STORED WITHIN THE TREE PROTECTION AREAS DURING THE ENTIRE CONSTRUCTION PROJECT.
  - ALL TREES TO BE REMOVED MUST BE REMOVED IN A MANNER THAT WILL NOT DAMAGE THE REMAINING TREES. THE CONTRACTOR SHALL DISPOSE OF STUMPS AND MAJOR ROOTS OF ALL PLANTS TO BE REMOVED. ANY DEPRESSIONS CAUSED BY REMOVAL OPERATIONS SHALL BE REFILLED WITH FERTILE, FRIABLE, SOIL PLACED AND COMPACTED SO AS TO REESTABLISH PROPER GRADE FOR NEW PLANTING AND/OR LAWN AREAS.
  - ANY TREES THAT ARE TO REMAIN THAT ARE DAMAGED DURING THE CLEARING OPERATION MUST BE REPAIRED OR REMOVED AND REPLACED IN AN APPROVED MANNER BY AN MDL/ISA CERTIFIED ARBORIST OR HARFORD COUNTY REPRESENTATIVE AS SOON AS FINAL CLEARING HAS BEEN COMPLETED.
  - ROOT PRUNING MAY BE NECESSARY WHERE THE CRITICAL ROOT ZONE IS IMPACTED, AS DETERMINED BY THE PLAN PREPARER OR AN MDL/ISA CERTIFIED ARBORIST. PRUNING SHALL BE ALONG THE LOD ADJACENT TO TREE PROTECTION FENCING. A CERTIFIED ARBORIST SHALL SUPERVISE OR CONDUCT ROOT PRUNING.
  - REFER TO THE CONTRACT SPECIFICATIONS FOR ACCEPTABLE PLANTING PERIOD. PLANTING SHALL NOT BE COMPLETED IN SUB-FREEZING TEMPERATURES; WHEN THE GROUND IS FROZEN, WHEN WEATHER CONDITIONS WILL ADVERSELY AFFECT PLANT MATERIALS; OR WHEN THE SOIL IS TOO WET OR OTHERWISE IN A CONDITION NOT ACCEPTABLE FOR PLANTING.
  - MOW PLANTING AREA CLOSE TO THE GROUND ONE WEEK (OR LESS) PRIOR TO CONTAINER PLANTING DATE.
  - THE CONTRACTOR IS RESPONSIBLE FOR TESTING PROJECT SOILS. THE CONTRACTOR IS TO PROVIDE A CERTIFIED SOILS REPORT TO THE OWNER. THE CONTRACTOR SHALL VERIFY THAT THE SOILS ON SITE ARE ACCEPTABLE FOR THE PROPER GROWTH OF THE PROPOSED PLANT MATERIAL. SHOULD THE CONTRACTOR FIND POOR SOIL CONDITIONS, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE SOIL AMENDMENTS AS NECESSARY. THESE AMENDMENTS SHALL INCLUDE, BUT NOT BE LIMITED TO FERTILIZERS, LIME, AND TOPSOIL. PROPER PLANTING SOILS MUST BE VERIFIED PRIOR TO WHEN PLANTING MATERIALS ARE INSTALLED.

- TO ENSURE TREE SURVIVABILITY ALONG STEEP SLOPES THE FOLLOWING MEASURES WILL BE TAKEN:
  - THE ROOT COLLAR SHALL BE PLACED SLIGHTLY ABOVE GRADE TO PREVENT ROOTS FROM CIRCLING.
  - EARTHGROW OR A SIMILAR COMPOST SHALL BE USED WITHIN PLANTING PITS TO ENHANCE ORGANIC MATTER CONTENT WITHIN THE PLANTING PIT. PREPARE PLANTING PITS PER DETAILS AS SHOWN MDSA STANDARDS AND SPECIFICATIONS SECTION 710.03.04.
  - A SMALL PLANT SHELF SHALL BE CREATED FOR EACH INSTALLATION TO PREVENT UPHILL ROOTS FROM BEING PLANTED TOO DEEP. THE SLOPE SHALL BE CUT BACK TO CREATE A FLAT AREA UPSLOPE OF THE PLANTING PIT. THE ECCESS SOIL SHALL BE PLACED DOWNSLOPE OF THE PLANTING PIT TO EXTEND THE SHELF TO ENSURE DOWNSLOPE ROOTS WILL REMAIN BURIED. A SMALL BERM SHOULD BE FORMED AT THE DOWNSLOPE PORTION OF THIS NEWLY FORMED TERRACE TO RETAIN WATER FOR THE PLAN AND TO PREVENT EROSION.
- ALL WOODY LANDSCAPE MATERIAL (INCLUDING SHRUBS) SHALL ADHERE TO THE FOLLOWING MINIMUM OFFSETS:
  - 5 FEET FROM GAS LINE
  - 5 FEET FROM INLET, OUTFALL, OR MANHOLE
  - 5 FEET FROM PLACE STONE (IMBRICATED, RIP RAP, ETC.)
  - 5 FEET FROM UNDERGROUND ELECTRIC
  - 10 FEET FROM FIRE HYDRANT
  - 10 FEET FROM SANITARY SEWER
  - 10 FEET FROM WATER LINE
  - 10 FEET FROM EXISTING TREE
  - 15 FEET FROM LIGHT POLE OR LIGHT FIXTURE
- INSTALL PLANT MATERIALS PER MDSA STANDARDS AND SPECIFICATIONS 710.03.09.
- UPON COMPLETION OF ALL LANDSCAPING, AN ACCEPTANCE OF THE WORK SHALL BE HELD. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF THE OWNER FOR SCHEDULING OF THE INSPECTION AT LEAST SEVEN (7) DAYS PRIOR TO THE ANTICIPATED INSPECTION DATE.
- AFTER INSTALLATION OF PLANTS, THE CONTRACTOR SHALL MONITOR THE SOIL MOISTURE AND WATER NEEDS OF PLANTS AND SEED AS NECESSARY TO ENSURE SURVIVABILITY. WATERING PLANTING PITS AND SEEDED AREAS SHOULD OCCUR AS SPECIFIED IN MDSA STANDARDS AND SPECIFICATIONS SECTION 710.03.04(C).

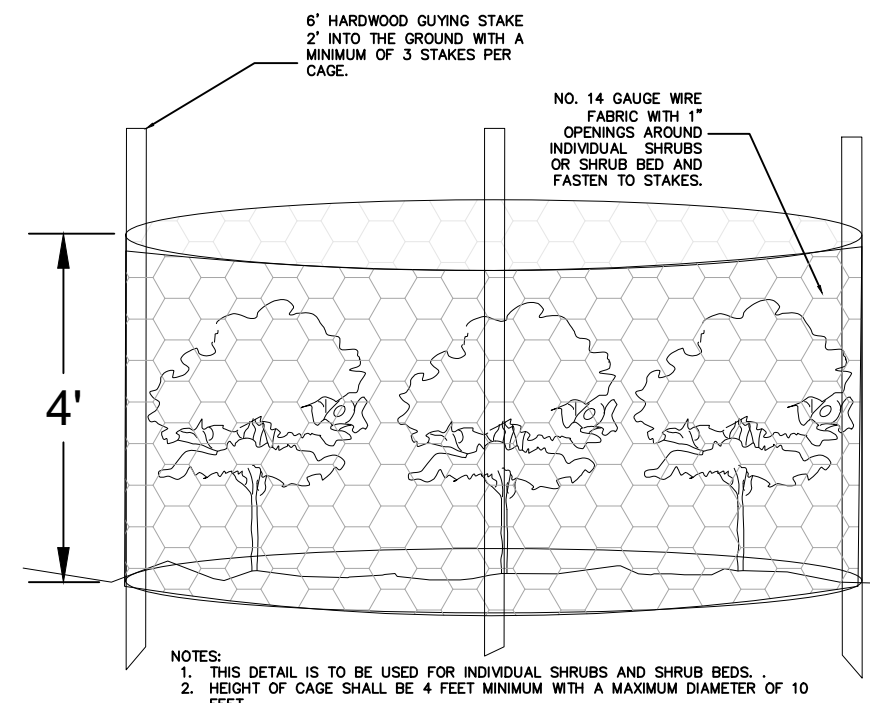
MAINTENANCE:-

- UPON COMPLETION OF INSTALLATION, THE PLANTING AREA IS TO BE MAINTAINED FOR A 2 YEAR PERIOD. AN 85% SURVIVAL RATE FOR WOODY MATERIAL AND AN 80% SURVIVAL RATE FOR HERBACEOUS PLUGS MUST BE ACHIEVED FROM THE DATE OF ACCEPTANCE TO THE TERMINATION OF THE MAINTENANCE PERIOD. MAINTENANCE SHALL BE AS FOLLOWS:
  - ANY PLANT MATERIAL SHOWING SIGNS OF DISTRESS ARE TO BE REPLACED IMMEDIATELY BY THE CONTRACTOR.
  - NATIVE VOLUNTEER SEEDLINGS SHALL BE REMOVED ONLY IF THEY ARE ADVERSELY IMPACTING THE GROWTH OF THE PLANTED MATERIAL. NON-NATIVE AND INVASIVE SPECIES ARE TO BE TREATED WITHIN THE ENTIRE PLANTING AREA THROUGH SELECTED AND APPROVED MEANS.
  - ALL MAN-MADE MATERIALS SHALL BE REMOVED FROM THE SITE WHICH WOULD IMPACT THE ESTABLISHMENT OF THE PLANTED MATERIALS.
  - THOROUGHLY WATER PLANTED MATERIAL ONCE WEEKLY OR AS NEEDED DURING THE GROWING SEASON.
- PLANTED MATERIAL IS TO BE MONITORED FOR SIGNS OF DAMAGE AND APPROPRIATE ACTIONS SHALL BE TAKEN TO PREVENT FURTHER DAMAGE. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING: PEST DAMAGE OR INFESTATION, DISEASE OR BROWSING; ANY DEAD OR DECIMATED MATERIAL SHALL BE REPLACED WITH THE IDENTICAL SPECIES OR AN APPROVED REPLACEMENT.
- AT THE END OF THE 2 YEAR MAINTENANCE PERIOD, THE SITE SHALL BE INSPECTED FOR THE 85% WOODY & 80% HERBACEOUS PLUG SURVIVAL RATES AS REQUIRED BY HARFORD COUNTY.



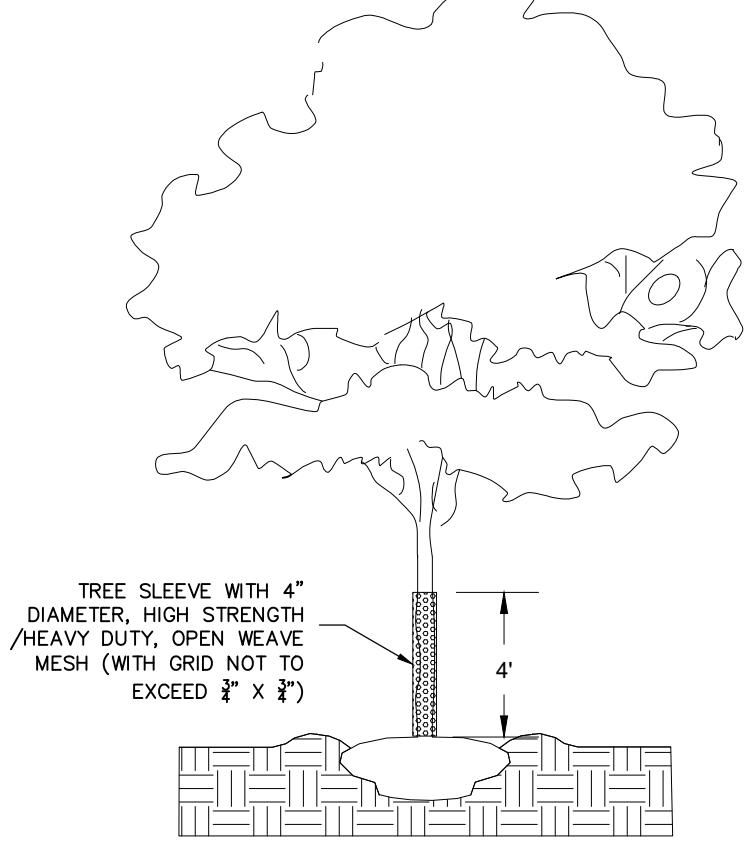
SHRUB PLANTING

Not To Scale



TREE AND SHRUB SHELTERS - WIRE CAGES

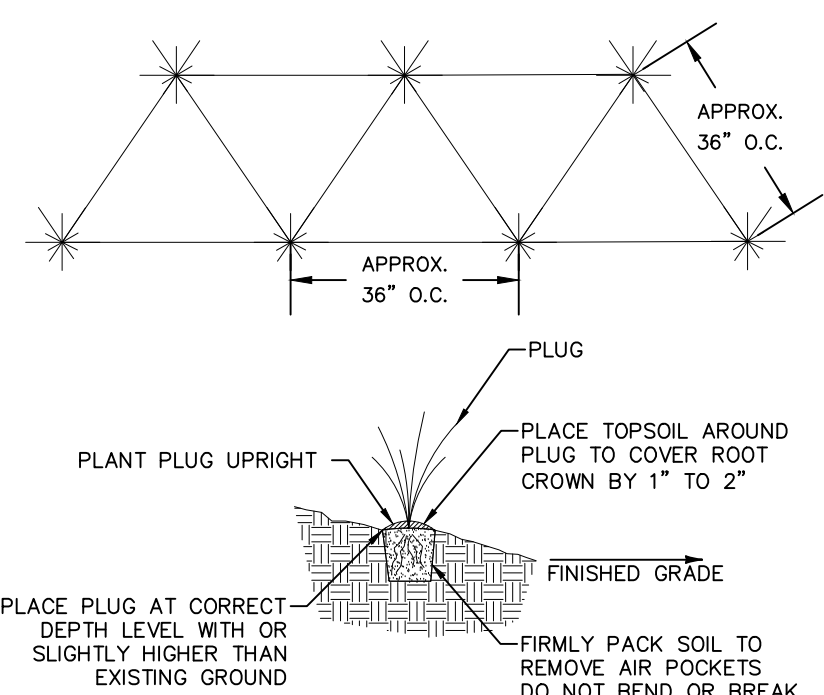
Not To Scale



TREE SLEEVE

Not To Scale

- NOTES:
- TO BE USED ON ALL SINGLE STEM TREES.
  - HEIGHT OF SHELTER TO BE ADJUSTED TO PREVENT CANOPY AND BRANCH DAMAGE.
  - TREE SLEEVES ARE TO BE CONSIDERED INCIDENTAL TO THE UNIT PRICE PER TREE INSTALLED.



2\" PERENNIAL PLUG DETAIL

Not To Scale

Riparian Seed Mix (84,358 SF / 1.94 AC)					
Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)	
<i>Sorghastrum nutans</i> , New England 2 Ecotype	Indiangrass	31.00%	18.60	36.08	
<i>Lolium multiflorum</i>	Annual Ryegrass	20.00%	12.00	23.28	
<i>Andropogon gerardii</i>	Big bluestem	14.00%	8.40	16.30	
<i>Elymus virginicus</i>	Virginia wildrye	10.00%	6.00	11.64	
<i>Elymus canadensis</i>	Canada wildrye	7.00%	4.20	8.15	
<i>Agrostis perennans</i>	Autumn betgrass	4.00%	2.40	4.66	
<i>Panicum virgatum</i>	Switchgrass	4.00%	2.40	4.66	
<i>Panicum clandestinum</i>	Deertongue	3.00%	1.80	3.49	
<i>Echinaceo purpurea</i>	Purple coneflower	1.50%	0.90	1.75	
<i>Chamaecrista fasciculata</i>	Partridge pea	1.30%	0.78	1.51	
<i>Helopsis helianthoides</i>	Oxeye sunflower	1.20%	0.72	1.40	
<i>Careopsis lanceolata</i>	Lanceleaf coreopsis	1.00%	0.60	1.16	
<i>Rudbeckia hirta</i>	Blackeyed Susan	1.00%	0.60	1.16	
<i>Asclepias syriaca</i>	Common milkweed	0.40%	0.24	0.47	
<i>Solidago rugosa</i>	Wrinkleleaf goldenrod	0.30%	0.18	0.35	
<i>Aster pilosus</i>	Heath aster	0.30%	0.18	0.35	
Total Application Rate of 60 lbs/AC			Total:	116.40	

Floodplain Forest Seed Mix (30,571 SF / 0.70 AC)					
Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)	
<i>Elymus riparius</i>	Riverbank wildrye	28.00%	11.20	7.84	
<i>Andropogon gerardii</i>	Big bluestem	20.00%	8.00	5.60	
<i>Panicum clandestinum</i>	Deertongue	10.00%	4.00	2.80	
<i>Carex lurida</i>	Shallow sedge	10.00%	4.00	2.80	
<i>Carex vulpinoidea</i>	Fox sedge	10.00%	4.00	2.80	
<i>Carex scoparia</i>	Blunt broom sedge	8.00%	3.20	2.24	
<i>Panicum virgatum</i>	Switchgrass	4.00%	1.60	1.12	
<i>Juncus effusus</i>	Soft rush	2.00%	0.80	0.56	
<i>Asclepias incarnata</i>	Swamp milkweed	2.00%	0.80	0.56	
<i>Eupatorium perfoliatum</i>	Common boneset	2.00%	0.80	0.56	
<i>Veronica noveboracensis</i>	New York ironweed	2.00%	0.80	0.56	
<i>Helopsis helianthoides</i>	Oxeye sunflower	2.00%	0.80	0.56	
Total Application Rate of 40 lbs/AC			Total:	28.00	

Wetland Enhancement Seed Mix* (3,518 SF / 0.08 AC)					
Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)	
<i>Carex lurida</i>	Lurid sedge	22.20%	4.44	0.36	
<i>Carex vulpinoidea</i>	Fox sedge	20.00%	4.00	0.32	
<i>Elymus virginicus</i>	Virginia wildrye	20.00%	4.00	0.32	
<i>Panicum clandestinum</i>	Deertongue	13.80%	2.76	0.22	
<i>Carex scoparia</i>	Blunt broom sedge	13.60%	2.72	0.22	
<i>Juncus effusus</i>	Soft rush	3.00%	0.60	0.05	
<i>Leersia oryzoides</i>	Rice cutgrass	2.00%	0.40	0.03	
<i>Carex crinita</i>	Fringed sedge	1.00%	0.20	0.02	
<i>Carex intumescens</i>	Star sedge	1.00%	0.20	0.02	
<i>Carex stipata</i>	Awl sedge	1.00%	0.20	0.02	
<i>Glyceria striata</i>	Fowl mannagrass	1.00%	0.20	0.02	
<i>Juncus tenuis</i>	Path rush	0.50%	0.10	0.01	
<i>Carex stricta</i>	Tussock sedge	0.30%	0.06	0.00	
<i>Scirpus atrovirens</i>	Green bulrush	0.30%	0.06	0.00	
<i>Scirpus cyperinus</i>	Woolgrass	0.30%	0.06	0.00	
Total Application Rate of 20 lbs/AC			Total:	1.60	

Turfgrass Seed Mix (8,573 SF / 0.20 AC)	
Seed Mix	Quantity (lbs)
SHA Turfgrass Seed Mix 920.06.07 (a)	40.0
Total Application Rate of 200 lbs/AC or 4.6 lbs per 1,000 SF	

Seeding Notes:  
1. Riparian and Floodplain seed mixes to be applied with 60lbs/ac foxtail millet (*Setaria italica*) as cover crop.

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EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION
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10/9/2025

Riparian Forest Plantings (76,116 SF / 1.75 AC)							
Species	Common Name	Layer	Size	Type	Spacing	Quantity	
<i>Acer rubrum</i>	Red maple	Canopy tree	6'-8' Height	#5 Container	20' O.C.	39	
<i>Celtis occidentalis</i>	Hackberry	Canopy tree	6'-8' Height	#5 Container	20' O.C.	39	
<i>Quercus palustris</i>	Pin oak	Canopy tree	6'-8' Height	#5 Container	20' O.C.	39	
<i>Liriodendron tulipifera</i>	Tuliptree	Canopy tree	6'-8' Height	#5 Container	20' O.C.	39	
<i>Nyssa sylvatica</i>	Blackgum	Canopy tree	6'-8' Height	#5 Container	20' O.C.	39	
Total:						195	
<i>Carpinus caroliniana</i>	American hornbeam	Understory tree	5' Height	#5 Container	12'-14' O.C.	45	
<i>Magnolia virginiana</i>	Sweetbay magnolia	Understory tree	4' Height	#5 Container	12'-14' O.C.	45	
<i>Juniperus virginiana</i>	Eastern red cedar	Understory tree	4' Height	#5 Container	12'-14' O.C.	45	
Total:						135	
<i>Ilex verticillata</i>	Common winterberry	Shrub	2'-3' Height	#2 Container	6'-8' O.C.	78	
<i>Cornus amomum</i>	Silky dogwood	Shrub	2'-3' Height	#2 Container	6'-8' O.C.	78	
<i>Viburnum dentatum</i>	Southern arrowwood	Shrub	2'-3' Height	#2 Container	6'-8' O.C.	78	
<i>Lindera benzoin</i>	Spicebush	Shrub	2'-3' Height	#2 Container	6'-8' O.C.	78	
Total:						310	

Note: Assume 100% canopy, 20% understory, and 20% understory coverage.

Shrubs to be planted in clusters of 3-5 per species.

Concentrate Juniperus virginiana in areas of steep slopes.

Floodplain Forest Plantings (29,938 SF / 0.69 AC)							
Species	Common Name	Layer	Size	Type	Spacing	Quantity	
<i>Platanus occidentalis</i>	American sycamore	Canopy Tree	6'-8' Height	#5 Container	30' O.C.	7	
<i>Liquidambar styraciflua</i>	Sweetgum	Canopy Tree	6'-8' Height	#5 Container	30' O.C.	7	
<i>Betula nigra</i>	River birch	Canopy Tree	6'-8' Height	#5 Container	30' O.C.	7	
<i>Quercus phellos</i>	Willow oak	Canopy Tree	6'-8' Height	#5 Container	30' O.C.	7	
<i>Quercus bicolor</i>	Swamp white oak	Canopy Tree	6'-8' Height	#5 Container	30' O.C.	7	
Total:						35	
<i>Cornus amomum</i>	Silky dogwood	Shrub	2'-3' Height	#2 Container	10' O.C.	15	
<i>Sambucus nigra</i>	Black elderberry	Shrub	2'-3' Height	#2 Container	10' O.C.	15	
<i>Alnus serrulata</i>	Smooth alder	Shrub	2'-3' Height	#2 Container	10' O.C.	15	
<i>Lindera benzoin</i>	Spicebush	Shrub	2'-3' Height	#2 Container	10' O.C.	15	
Total:						60	

Wetland Enhancement Plantings (3,518 SF / 0.08 AC)					
Species	Common Name	Size/Type	Spacing	Quantity	
<i>Iris versicolor</i>	Blue flag	DP-50 Plug	3' O.C.	95	
<i>Carex crinita</i>	Long hair sedge	DP-50 Plug	3' O.C.	95	
<i>Elymus riparius</i>	Riverbank wild-rye	DP-50 Plug	3' O.C.	95	
<i>Panicum virgatum</i>	Switchgrass	DP-50 Plug	3' O.C.	95	
<i>Carex stricta</i>	Tussock sedge	DP-50 Plug	3' O.C.	95	
<i>Verberna hastata</i>	Swamp verbena	DP-50 Plug	3' O.C.	95	
Total:				570	

Note: Intermingle drifts of 50 - 75 plants per species.

HARFORD COUNTY, MARYLAND

BENNETT PLACE STREAM RESTORATION

LANDSCAPE NOTES AND DETAILS

Drawn By : PJB	Scale : N/A
Designed By : IPT , PJB	Date : 10 / 25
Reviewed By : CAL	
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1. INSTALL MAINTENANCE OF TRAFFIC MEASURES AND DEVICES ALONG FOXBOROUGH DRIVE AS SHOWN ON THIS SHEET.
2. ARRANGE PRE-CONSTRUCTION MEETING WITH HARFORD COUNTY OFFICE OF WATERSHED PROTECTION AND RESTORATION AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
3. INSTALL SEDIMENT CONTROL MEASURES FOR WORK AREA.
4. CONSTRUCT IMPROVEMENTS.
5. AT THE END OF EACH WORKING DAY REMOVE TRAFFIC CONTROL DEVICES.

MAINTENANCE OF TRAFFIC NOTES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN PEDESTRIAN AND VEHICULAR TRAFFIC SAFETY ADEQUATELY AND CONTINUOUSLY ON ALL PORTION OF EXISTING FACILITIES AFFECTED BY THE WORK. IN ADDITION TO EXISTING FACILITIES UNDERGOING IMPROVEMENT, THIS RESPONSIBILITY ALSO EXTENDS TO CROSSROADS, APPROACHES, CROSSOVERS AND ENTRANCE AFFECTED OR MADE NECESSARY BY THE WORK.
2. WHERE THE CONTRACTOR'S SEQUENCE OF OPERATIONS RESULTS IN GRADE DIFFERENTIAL WHICH WOULD BE HAZARDOUS TO VEHICULAR TRAFFIC, THE CONTRACTOR, AT THE DIRECTION OF THE DIRECTOR, SHALL PROVIDE SUITABLE BARRIERS TO THE EXTENT DETERMINED BY THE DIRECTOR.
3. ALL MOT ACTIVITIES SHALL ADHERE TO THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION SHAL "BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES". PAVEMENT MARKINGS, DRUMS AND OTHER ITEMS USED FOR MOTH SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES AND STANDARDS PROVIDED IN CATEGORY "1" OF THE BOOK OF STANDARDS, MD 104.00.01 THRU MD 104.06.24, AND THE 2011 EDITION OF THE MARYLAND MANUAL ON UNIFORM CONTROL DEVICES (MDMUTCD).
4. LONG MINIMAL DISTANCE AND LOCATIONS OF ALL TEMPORARY ADVANCE WARNING SIGNS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS, AS APPROVED BY THE ENGINEER, TO AVOID CONFLICTS WITH PERMANENT SIGNS AND DRIVEWAYS, AND TO AVOID RESTRICTING INTERSECTION SIGHT DISTANCE PER THE LATEST EDITION OF THE ASHUTO STANDARD "A" BOOK ON GEOMETRIC DESIGN.
5. SIGNS USED FOR TEMPORARY TRAFFIC CONTROL THAT ARE NOT APPLICABLE FOR A PARTICULAR CONSTRUCTION PHASE SHALL BE REMOVED OR COMPLETELY COVERED WITH A NON-TRANSPARENT MATERIAL.
6. AT THE COMPLETION OF THE WORK (DAY), THE CONTRACTOR SHALL OPEN CLOSED LANES AND MAINTAIN THE EXISTING TRAVEL LANES.
7. NO CONSTRUCTION VEHICLES SHALL ENTER RESIDENTIAL STREETS OR ROADWAYS ADJACENT TO THE WORK ZONE.
8. NO COUNTY ROAD MAY BE CLOSED WITHOUT PRIOR APPROVAL. IN ORDER TO CLOSE A ROAD, THE COUNTY ENGINEER IS REQUIRED TO POST ADVANCE NOTICE OF DETOUR AND SIGNAGE. WITHOUTS OF DURATION, REQUIRE 2 (TWO) WEEK ADVANCED NOTICE SIGNS BE POSTED PRIOR TO ANY CLOSURE. THESE SIGNS CANNOT BE POSTED UNTIL THE DETOUR PLAN HAS BEEN APPROVED.
9. PRIOR TO BEGINNING ANY CONSTRUCTION WORK, THE CONTRACTOR SHALL MEET APPLICABLE REQUIREMENTS FOR SEDIMENT AND EROSION CONTROL FOR THE PROJECT. UPON COMPLETION OF ALL WORK ALL SEDIMENT AND EROSION CONTROL SHALL BE REMOVED AND THE GROUND RESTORED TO ORIGINAL CONDITION.
10. A DRIVEWAY ACCESS PERMIT IS REQUIRED FOR THE STABILIZED CONSTRUCTION ENTRANCE AND A UTILITY PERMIT FOR THE TRAFFIC CONTROL FOR THE SITE ACCESS ARE REQUIRED. THE CONTRACTOR SHALL APPLY ON THE HARFORD COUNTY WEBSITE THROUGH THE EPERMIT CENTER.
11. PRIOR TO AFTER CONSTRUCTION BEGIN.
12. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH ADJACENT CONSTRUCTION AND/OR MAINTENANCE ACTIVITIES TO ENSURE WORK ZONE SIGNING AND DEVICES PROVIDE CLEAR DIRECTION TO THE TRAVELING PUBLIC.
13. ALL ROAD WORK ON FOXBOROUGH DRIVE SHALL BE LIMITED FROM 9:00AM TO 3:00PM UNLESS PERMITTED OTHERWISE. IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK THE HARFORD COUNTY PUBLIC SCHOOL CALENDAR AND ADJUST WORKDAY SCHEDULES FOR EARLY DISMISSAL DAYS ACCORDINGLY.

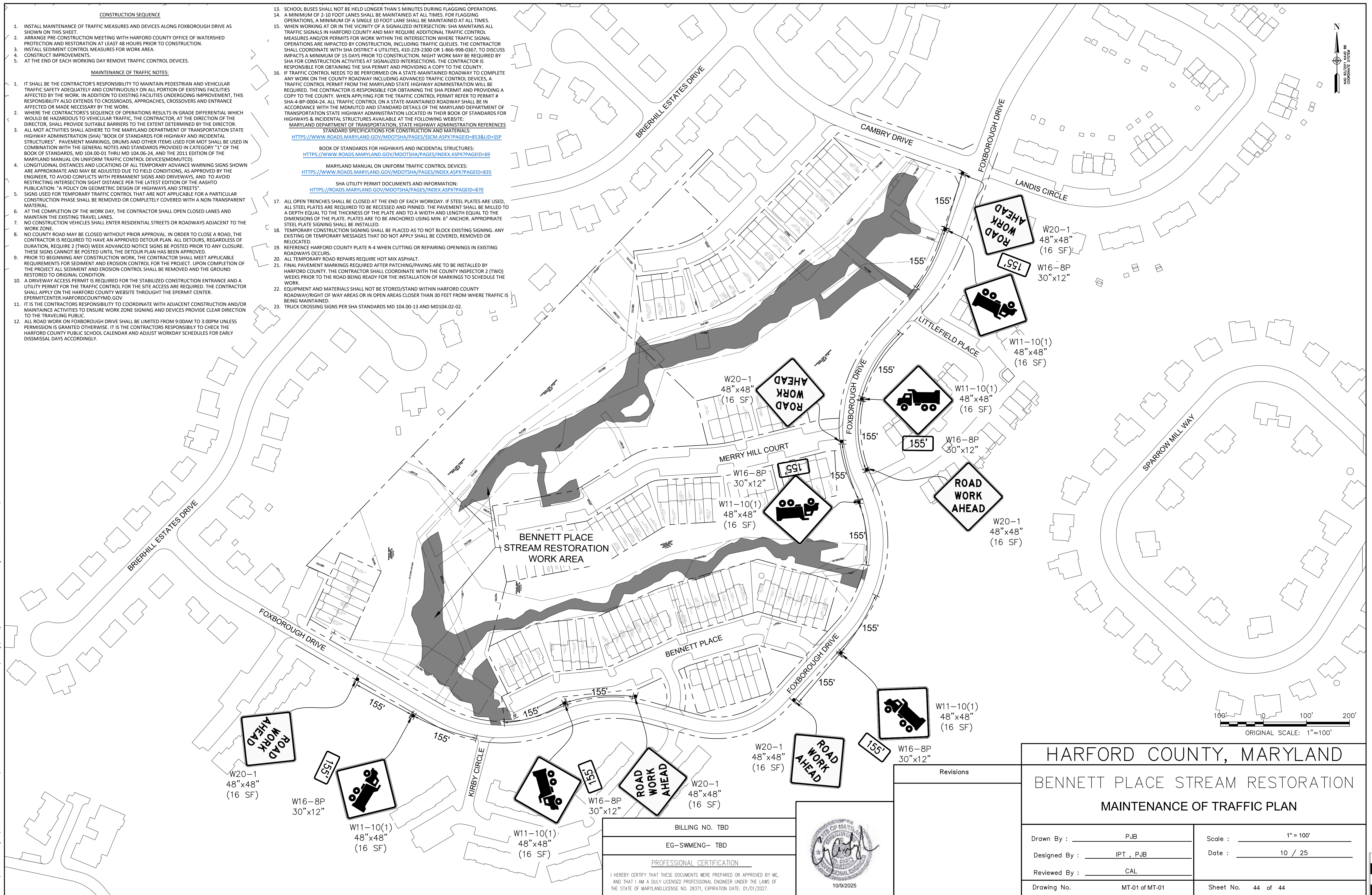
13. SCHOOL BUSES SHALL NOT BE HELD LONGER THAN 5 MINUTES DURING FLAGGING OPERATIONS.
14. A MINIMUM OF 2-10 FOOT LANES SHALL BE MAINTAINED AT ALL TIMES. FOR FLAGGING OPERATIONS, A MINIMUM OF A SINGLE 10 FOOT LANE SHALL BE MAINTAINED AT ALL TIMES.
15. WHEN OPERATING AT THE VICINITY OF A SIGNALIZED INTERSECTION, THE CONTRACTOR SHALL TRAFFIC SIGNALS IN HARFORD COUNTY AND MUST REQUIRE ADDITIONAL TRAFFIC CONTROL MEASURES AND/OR PERMITS FOR WORK WITHIN THE INTERSECTION WHERE TRAFFIC SIGNAL OPERATIONS ARE IMPACTED BY CONSTRUCTION, INCLUDING TRAFFIC QUEUES. THE CONTRACTOR SHALL COORDINATE WITH SHA DISTRICT 4 UTILITIES, 410-229-2300 OR 1-866-998-0387, TO DISCUSS THE MINIMUM REQUIRED TRAFFIC CONTROL PERMIT FOR THE PROJECT. THE PERMIT REQUIRED BY SHA FOR CONSTRUCTION ACTIVITIES AT SIGNALIZED INTERSECTIONS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE SHA PERMIT AND PROVIDING A COPY TO THE COUNTY.
16. IF TRAFFIC CONTROL NEEDS TO BE PERFORMED ON A STATE-MAINTAINED ROADWAY TO COMPLETE THE PROJECT, THE CONTRACTOR SHALL OBTAIN THE TRAFFIC CONTROL PERMIT FROM THE TRAFFIC CONTROL PERMIT FROM THE MARYLAND STATE HIGHWAY ADMINISTRATION WILL BE REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE SHA PERMIT AND PROVIDING A COPY TO THE COUNTY. WHEN APPLYING FOR THE TRAFFIC CONTROL PERMIT REFER TO PERMIT # 2024-0024-24, AND PROVIDE THE PROJECT INFORMATION AND THE PROJECT LOCATION IN ACCORDANCE WITH THE MDMDUT AND STANDARD DETAILS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION LOCATED IN THEIR BOOK OF STANDARDS FOR HIGHWAYS & INCIDENTAL STRUCTURES AVAILABLE AT THE FOLLOWING WEBSITE:
- MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION REFERENCES
- STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS:
- <https://www.roads.maryland.gov/MDOTSHA/PGMS/ASCS/ASCS.aspx?PAGEID=853&ID=SSP>

BOOK OF STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES:  
[HTTPS://WWW.ROADS.MARYLAND.GOV/MDOTSHA/PAGES/INDEX.ASPX?PAGEID=69](https://www.roads.maryland.gov/mdotsha/pages/index.aspx?pageid=69)

MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES:  
[HTTPS://WWW.ROADS.MARYLAND.GOV/MDOTSHA/PAGES/INDEX.ASPX?PAGEID=835](https://www.roads.maryland.gov/mdotsha/pages/index.aspx?pageid=835)

SHA UTILITY PERMIT DOCUMENTS AND INFORMATION:  
[HTTPS://ROADS.MARYLAND.GOV/MDOTSHA/PAGES/INDEX.ASPX?PAGEID=870](https://roads.maryland.gov/mdotsha/pages/index.aspx?pageid=870)

17. ALL OPEN TRENCHES SHALL BE CLOSED AT THE END OF EACH WORKDAY. IF STEEL PLATES ARE USED, ALL STEEL PLATES ARE REQUIRED TO BE RECESSED AND PINNED. THE PAVEMENT SHALL BE MILLED TO A DEPTH EQUAL TO THE THICKNESS OF THE PLATE AND TO A WIDTH AND LENGTH EQUAL TO THE DIMENSIONS OF THE PLATE. PLATES ARE TO BE ANCHORED USING MIN. 6" ANCHOR. APPROPRIATE STEEL PLATE SIGNING SHALL BE INSTALLED.
18. TEMPORARY CONSTRUCTION SIGNING SHALL BE PLACED AS TO NOT OBSCURE EXISTING SIGNING, ANY EXISTING OR TEMPORARY MESSAGES THAT DO NOT APPLY SHALL BE COVERED, REMOVED OR RELOCATED.
19. REFERENCE HARFORD COUNTY PLATE R-4 WHEN CUTTING OR REPAIRING OPENINGS IN EXISTING ROADWAY OCCURS.
20. ALL TEMPORARY ROAD REPAIRS REQUIRE HOT MIX ASPHALT.
21. FINAL PAVEMENT MARKINGS REQUIRED AFTER PATCHING/PAVING ARE TO BE INSTALLED BY HARFORD COUNTY. THE CONTRACTOR SHALL COORDINATE WITH THE COUNTY INSPECTOR 2 (TWO) WEEKS PRIOR TO THE ROAD BEING READY FOR THE INSTALLATION OF MARKINGS TO SCHEDULE THE WORK.
22. EQUIPMENT AND MATERIALS SHALL NOT BE STORED/STAND WITHIN HARFORD COUNTY ROADWAY/RIGHT OF WAY AREAS OR IN OPEN AREAS CLOSER THAN 30 FEET FROM WHERE TRAFFIC IS BEING MAINTAINED.
23. TRUCK CROSSING SIGNS PER SHA STANDARDS MD 104.00-13 AND MD104.02-02.



L: \\Harford County Department of Public Work\00221073.009A-Bennett Place Stream Resto\CADD\pMT-P000\_BennettPlace.dwg Oct 16, 2025 8:45am pbalizer

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SCALE : 1"=1'