

NORTH REARDON STREAM RESTORATION

BID NO. TBD

OFFICE OF WATERSHED PROTECTION AND RESTORATION

HARFORD COUNTY, MARYLAND

90% DESIGN PLANS – NOT FOR CONSTRUCTION

PROJECT OVERVIEW:
THE SCOPE OF THIS PROJECT IS THE RESTORATION OF TWO STREAMS, REARDON BRANCH (SR-3) & AN UNNAMED TRIBUTARY TO REARDON BRANCH (SR-9), TOTALING APPROXIMATELY 2,227 LINEAR FEET. 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 HABITAT RESTORATION AND INVESTIGATING THE POSSIBILITY OF A FISH LADDER. 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. SR-3 BEGINS AT A DUAL ENDWALL CONSISTING OF A 60" RCP & 48"X 72" ELLIPTICAL CMP WHILE SR-9 ORIGINATES UPSTREAM OF A FAILED 27" RCP. BOTH STREAMS ARE ALMOST ENTIRELY LOCATED ON HARFORD COUNTY PARKS AND RECREATION PROPERTY; HOWEVER, THE UPSTREAM EXTENTS OF BOTH ARE LOCATED ON PRIVATE PROPERTIES (SR-3 : THE FIRST HARFORD SQUARE ASSOCIATION INC., SR-9 : MAGNOLIA ESTATES MHC LLC).

PROJECT SUMMARY

TOTAL LENGTH OF STREAM RESTORED: 2,227 LF

STREAM USE CLASS: USE I

STREAM CLOSURE PERIOD: MARCH 15 – JUNE 1

LOAD REDUCTIONS:

STREAM	TSS REDUCTION	TN REDUCTION	TP REDUCTION
SR-3	434 TONS/YR	403 LBS/YR	99 LBS/YR
SR-9	75 TONS/YR	95 LBS/YR	19 LBS/YR
TOTAL	509 TONS/YR	498 LBS/YR	118 LBS/YR

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

IA CREDIT SUMMARY:

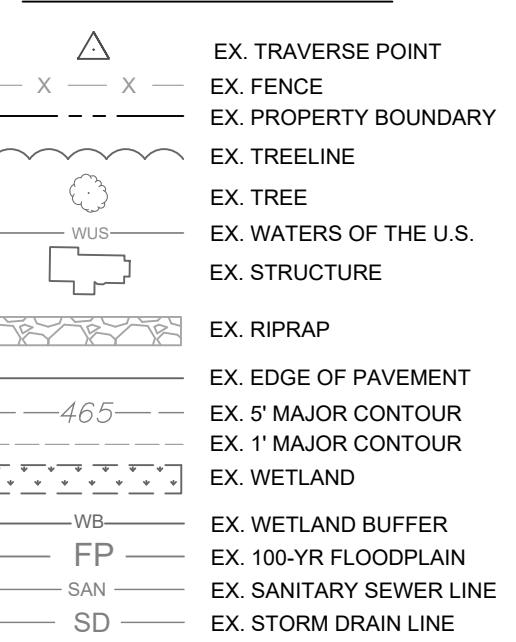
STREAM	DA	IA	PE REQ.	PE PROV.	IA CREDIT
SR-3	162.9 AC	49.9 AC	N/A IN	N/A IN	58 AC
SR-9	47.8 AC	6.9 AC	N/A IN	N/A IN	11 AC

IMPERVIOUS ACRE CREDITS CALCULATED USING EQUIVALENT IMPERVIOUS ACRE METHODOLOGY

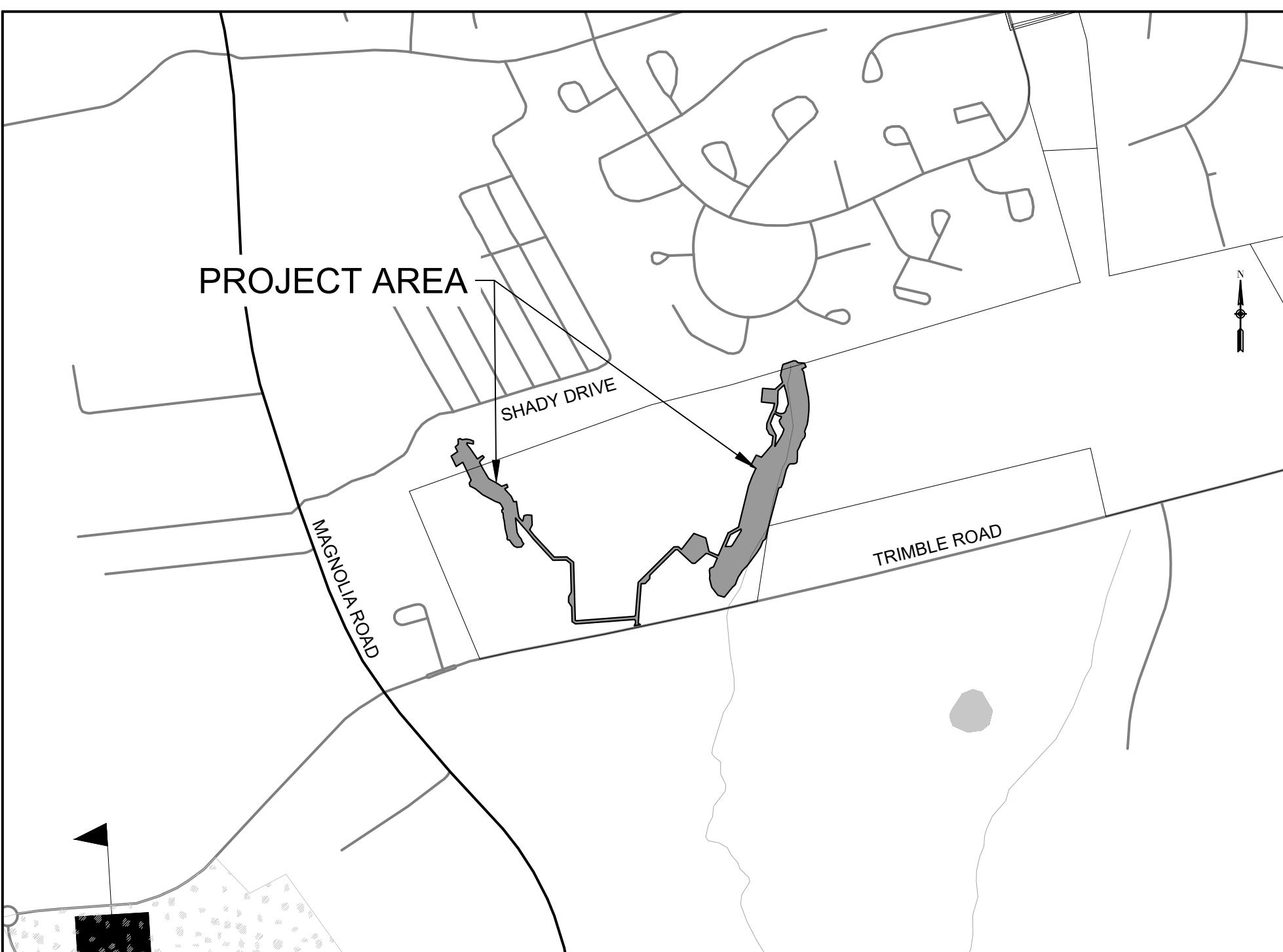
90% DESIGN INDEX OF SHEETS

SHEET NO.	DESCRIPTION	TITLE
1	GN-01	TITLE SHEET
2	OV-01	OVERVIEW SHEET
3	DA-01	DRAINAGE AREA MAP
4 - 7	GE-01 - GE-04	GEOMETRY SHEETS
8 - 14	SR-01 - SR-07	GRADING PLAN
15 - 16	PR-01 - PR-02	PROFILE SHEETS
17 - 21	DE-01 - DE-05	DETAIL SHEETS
22 - 32	CS-01 - CS-08	CROSS-SECTION SHEETS
33 - 38	ES-01 - ES-06	EROSION AND SEDIMENT CONTROL PLAN
39	EN-01	EROSION AND SEDIMENT CONTROL NOTES
40 - 41	ED-01 - ED-02	EROSION AND SEDIMENT CONTROL DETAILS
42 - 47	LS-01 - LS-06	LANDSCAPE PLAN
48	LD-01	LANDSCAPE NOTES AND DETAILS
49	MT-01	MAINTENANCE OF TRAFFIC PLAN

STANDARD SYMBOLS

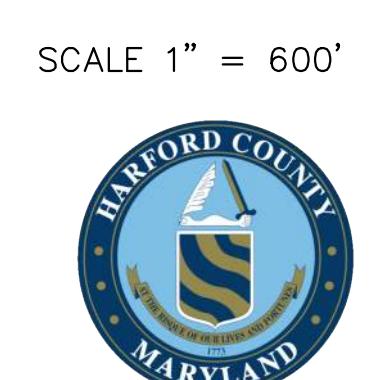


SEE PLAN SHEETS FOR PROPOSED FEATURES LEGEND



LOCATION MAP

OVERALL LIMIT OF DISTURBANCE:
249,213 SQ. FT // 5.72 AC.



EROSION AND SEDIMENT CONTROL PLAN #:	
TECHNICAL REVIEW BY:	
HARFORD SOIL CONSERVATION DISTRICT	
APPROVED BY:	
HARFORD SOIL CONSERVATION DISTRICT	

BILLING NO. XXXXX	
EG-SWMENG- XXXXX-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: 01/01/2025.

S/C PLAN # TBD	Revisions
GP # TBD	
6/14/24	

HARFORD COUNTY, MARYLAND	
NORTH REARDON STREAM RESTORATION	
Drawn By : PJB , JLL	Scale :
Designed By : IPT , PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. GN-01 of GN-01	Sheet No. 01 of 49

GENERAL NOTES

1. SPECIFICATIONS: ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH MARYLAND STATE HIGHWAY ADMINISTRATIONS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DATED JULY 2023 AND THE MOST RECENT REVISIONS THEREOF AND ADDITIONS THERETO UNLESS OTHERWISE NOTED.
2. UTILITIES: UTILITY LOCATIONS SHOWN ON THE PLANS ARE BASED ON LIMITED INFORMATION AVAILABLE; HOWEVER, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF THIS INFORMATION. THE COST OF REPAIR OR REPLACEMENT OF ANY SUCH FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE BORNE BY THE CONTRACTOR.
3. STANDARD DETAILS: REFERENCE MADE TO STANDARDS ARE TAKEN FROM THE HARFORD COUNTY ROAD CODE, BOOK OF STANDARD DETAILS AND FROM THE MARYLAND STATE HIGHWAY ADMINISTRATIONS BOOK OF STANDARDS. THE CONTRACTOR IS RESPONSIBLE FOR INCIDENTAL COSTS. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY THAT THE STANDARD DRAWINGS IN HIS POSSESSION ARE THE LATEST REVISED STANDARDS UP TO AND INCLUDING THE DATE OF THE ADVERTISEMENT OF THIS CONTRACT.
4. RIGHT-OF-WAY LINES: RIGHT-OF-WAY LINES SHOWN ON THESE PLANS DO NOT INCLUDE EASEMENTS. THEY ARE FOR ASSISTANCE ONLY. THESE LINES DO NOT REPRESENT THE OFFICIAL FEEWAY ACQUISITION LINES FOR OFFICIAL FEWAY RIGHT-OF-WAY AND EASEMENT PLATS. SEE THE APPROPRIATE RIGHT-OF-WAY PLATS.
5. SOIL CONSERVATION: THE CONTRACTOR SHALL NOT DISTURB THE EXISTING VEGETATION OUTSIDE THE LIMITS OF DISTURBANCE. SOIL STABILIZATION WILL FOLLOW THE 2011 MARYLAND SOIL EROSION AND SEDIMENT CONTROL SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. THE CONTRACTOR WILL OBTAIN APPROVAL OF THE HARFORD COUNTY SOIL CONSERVATION DISTRICT FOR THESE PLANS IN CONTROLLING SEDIMENT EROSION FOR THE BORROW AREA AND DISPOSING OF ANY WASTE EXCAVATION.
6. EXISTING SIGNS: ALL SIGNS DISTURBED DURING CONSTRUCTION SHALL BE TEMPORARILY RESET IMMEDIATELY AND PERMANENTLY RESET AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE INCIDENTAL TO ALL OTHER ITEMS IN THE CONTRACT.
7. TOPOGRAPHIC SURVEY PERFORMED BY CENTURY ENGINEERING, LLC. IN MARCH 2023.

SURVEYS:

HORIZONTAL CONTROLS – COORDINATES SHOWN ON THE PLANS ARE BASED ON MCS NAD83/(2011) VIA GPS AND TIED TO THE FOLLOWING NGS CORS REFERENCE STATIONS:

DF6305 UMBC U OF MD BALT COOP CORS ARP
N391524.360 W0764241.468 38304.8

DL3184 LOYOLA R CORS ARP
N393408.726 W0755914.995 33056.1

VERTICAL CONTROLS – ELEVATIONS SHOWN ON THE PLANS ARE BASED ON MCS NAVD88.

OWNER'S CERTIFICATION

I/we certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that any responsible personnel involved in the construction project will have a certification of attendance at a Department of Natural Resources Approved Training Program for the control of sediment and erosion before beginning the project. I also authorize periodic onsite inspection by the Harford Soil Conservation District or their authorized agents, or as deemed necessary

Owner _____ Date _____

AS-BUILT CERTIFICATION

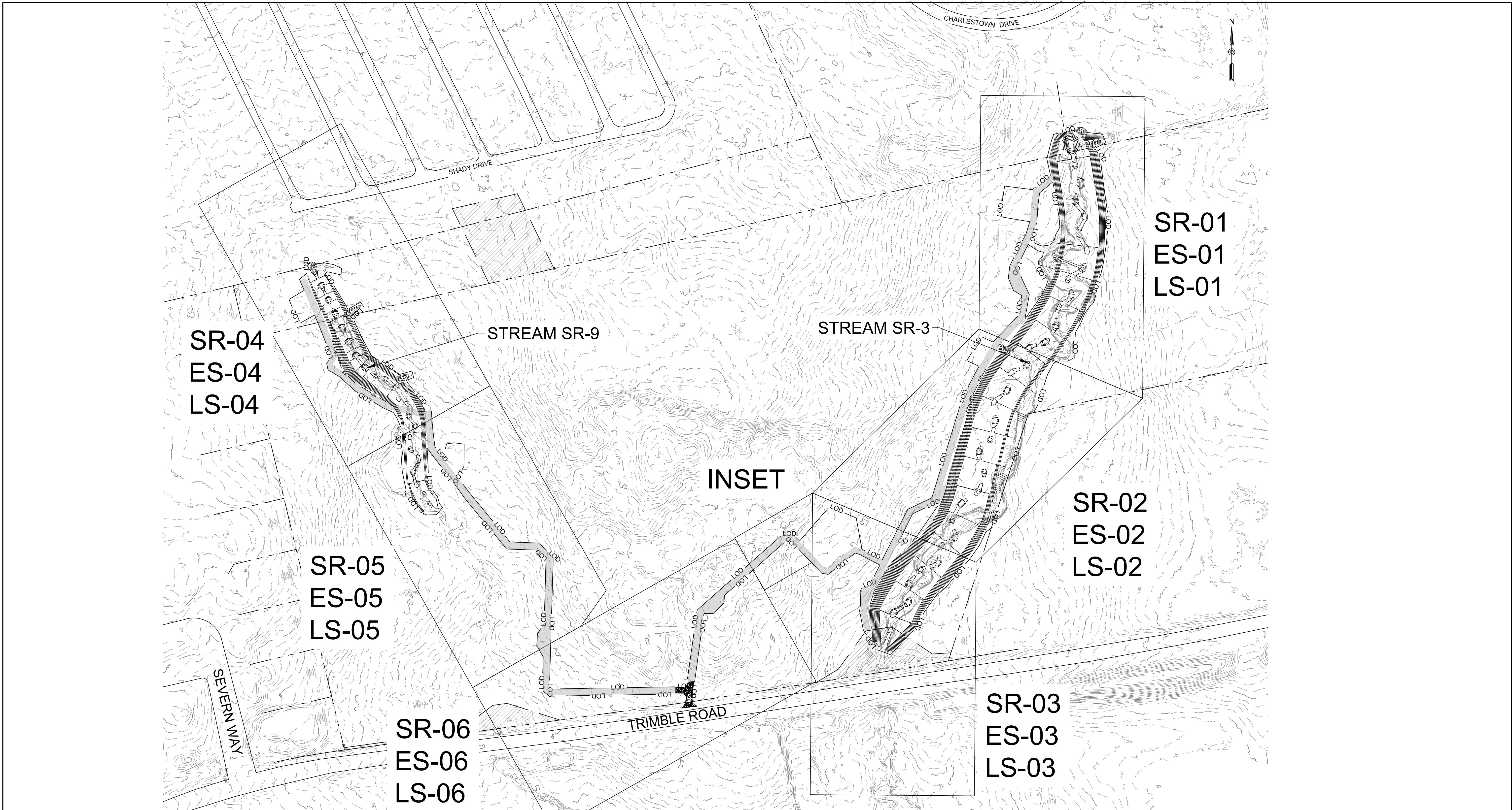
I hereby certify that the facility shown on this plan was constructed as shown on the "As-Built" plans and meets the approved plans and specifications.

Signed: _____
Print 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.

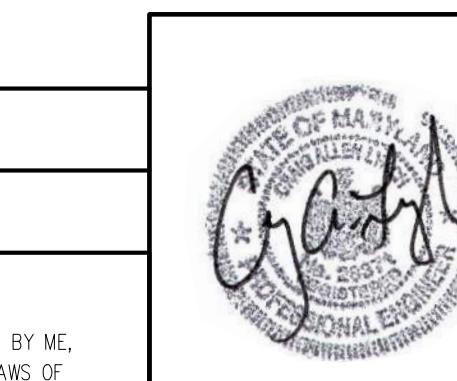
OWNER:	HARFORD COUNTY PARKS AND RECREATION L: 1014 F: 008;MAP 65, GRID 4D, PARCEL 852
	FIRST HARFORD SQUARE ASSOCIATION INC. L:936 F:484;PARCEL 952 LOT N/A PLAT 27077 L:903 F:1023;PARCEL 949, LOT N/A PLAT 25011
	MAGNOLIA ESTATES MHC LLC L:11442 F:457;MAP 65, GRID 4D, PARCEL 806

PREPARED BY :	CENTURY ENGINEERING A Kleinfelder Company
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100' 0 100' 200'
ORIGINAL SCALE: 1"=100'

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: 01/01/2025.
6/14/24



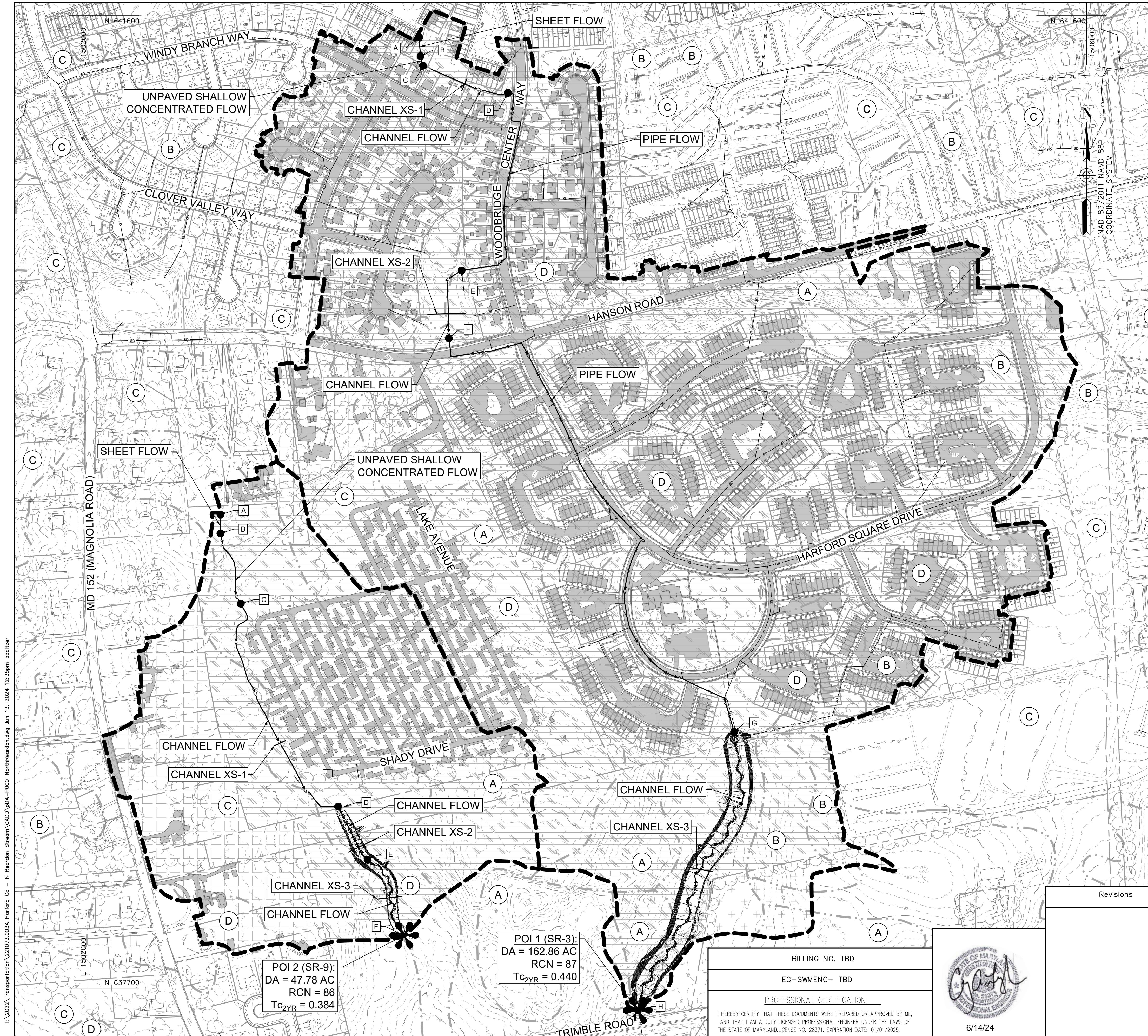
Revisions

Drawn By :	PJB , JLL	Scale :	1" = 100'
Designed By :	IPT , PJB	Date :	06 / 24
Reviewed By :	CAL		
Drawing No.	OV-01 of OV-01	Sheet No.	02 of 49

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

OVERVIEW SHEET



LEGEND

2' GIS CONTOUR	150	DRAINAGE STUDY POINT
ROADWAY/BUILDING OUTLINE		FLOW PATH/SEGMENT
SOIL BOUNDARY	• • •	RIGHT-OF-WAY - IMPERVIOUS
PROPERTY LINE	—	R3/R4 - RES. DISTRICTS $\frac{1}{2}$ AC
STORM DRAIN	SD SD SD	R1 - RES. DISTRICTS $\frac{1}{4}$ AC
TREE LINE	+	LI - LIGHT INDUSTRIAL DISTRICT
DRAINAGE DIVIDE	— — —	1' PROPOSED CONTOUR

NOTES:

1. DRAINAGE PATTERNS REMAIN CONSISTENT FROM EXISTING TO PROPOSED CONDITIONS. ULTIMATE ZONING CONDITIONS GOVERN OVER EXISTING LAND USE CONDITIONS.
2. ZONING DESIGNATION RIGHT-OF-WAY WAS FULLY DEVELOPED AND ENTIRELY IMPERVIOUS. PAVED PARKING LOTS, ROOFS, AND DRIVEWAYS WERE UTILIZED FOR CLASSIFICATION IN WINTR55.
3. MAXIMUM LENGTH OF OVERLAND FLOW (SHEET FLOW) IS 75 FEET PER SECTION II.D. OF THE HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS ROADWAY & STORMDRAIN DESIGN STANDARDS, DECEMBER 2, 2008.
4. 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.

POI-1 (SR-3) ULTIMATE ZONING LAND USE DETAILS

LAND USE	HSG	AREA (AC)	RCN
INDUSTRIAL	A	0.513	81
INDUSTRIAL	B	1.375	88
INDUSTRIAL	D	1.080	93
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	A	30.250	77
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	B	22.009	85
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	C	41.349	90
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	D	60.704	92
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	C	4.197	80
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	D	1.381	85
TOTAL	N/A	162.86	87

POI-2 (SR-9) ULTIMATE ZONING LAND USE DETAILS

LAND USE	HSG	AREA (AC)	RCN
PAVED PARKING LOTS, ROOFS, DRIVEWAYS	C	0.168	98
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	A	6.477	77
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	C	8.093	90
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	D	18.586	92
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	C	12.805	80
RESIDENTIAL DISTRICTS ($\frac{1}{2}$ AC)	D	1.654	85
TOTAL	N/A	47.78	86

POI-1 (SR-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	75	0.118	0.150	-	0.063
B-C	SHALLOW CONC.	40	0.068	0.050	4.20	0.003
C-D	CHANNEL	364	0.043	0.060	2.14	0.047
D-E	PIPE	914	-	-	7.00	0.036
E-F	CHANNEL	304	0.002	0.032	1.12	0.075
F-G	PIPE	2300	-	-	7.00	0.091
G-H	CHANNEL	1345	0.016	0.066	3.02	0.124

TIME OF CONCENTRATION = 0.440

POI-2 (SR-9) 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	75	0.050	0.400	-	0.195
B-C	SHALLOW CONC.	303	0.048	0.050	3.60	0.023
C-D	CHANNEL	1003	0.030	0.060	2.42	0.115
D-E	CHANNEL	245	0.053	0.045	7.36	0.009
E-F	CHANNEL	384	0.020	0.066	2.61	0.041

TIME OF CONCENTRATION = 0.384

Revisions

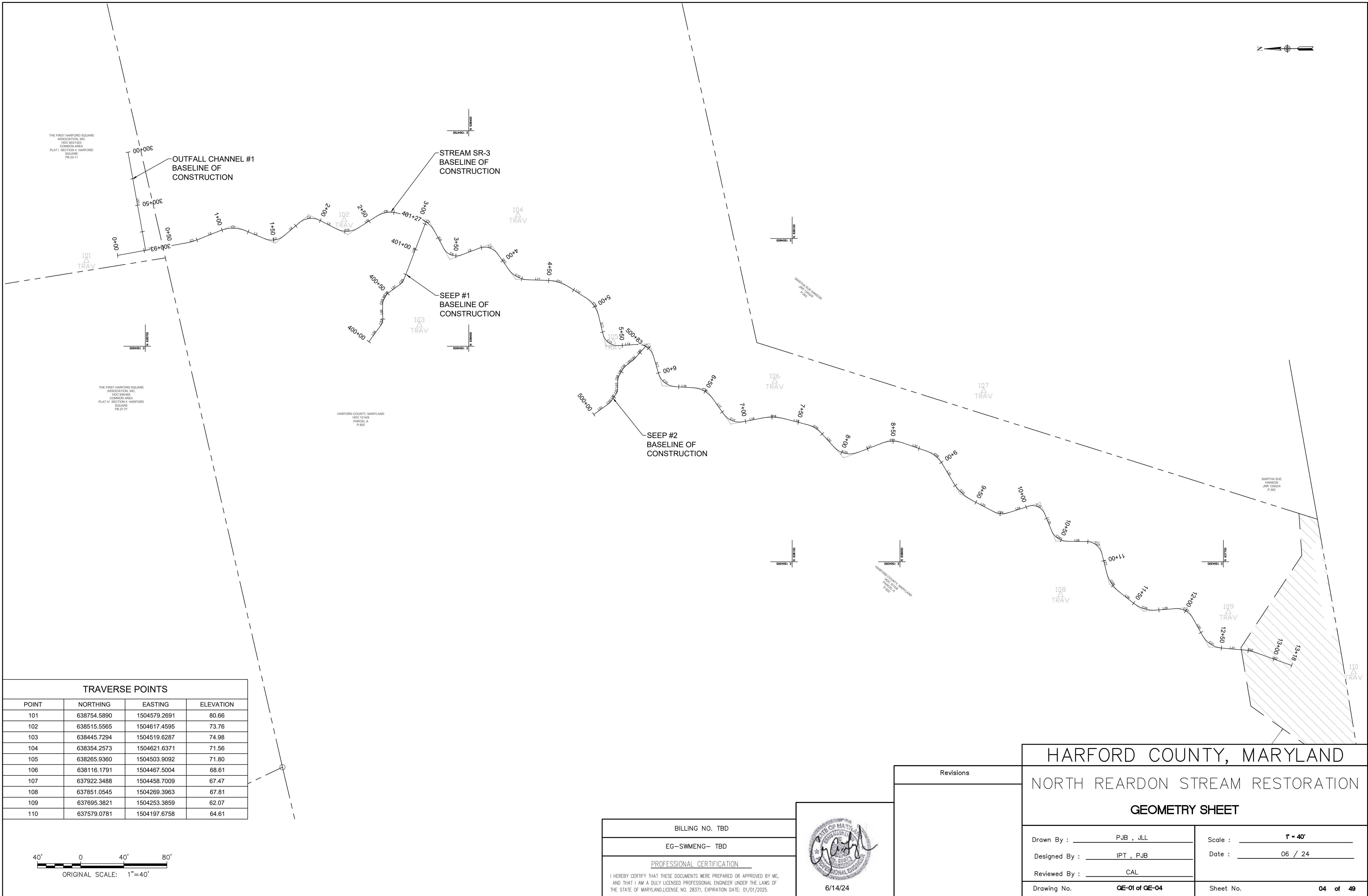
Original Scale: 1" = 200'

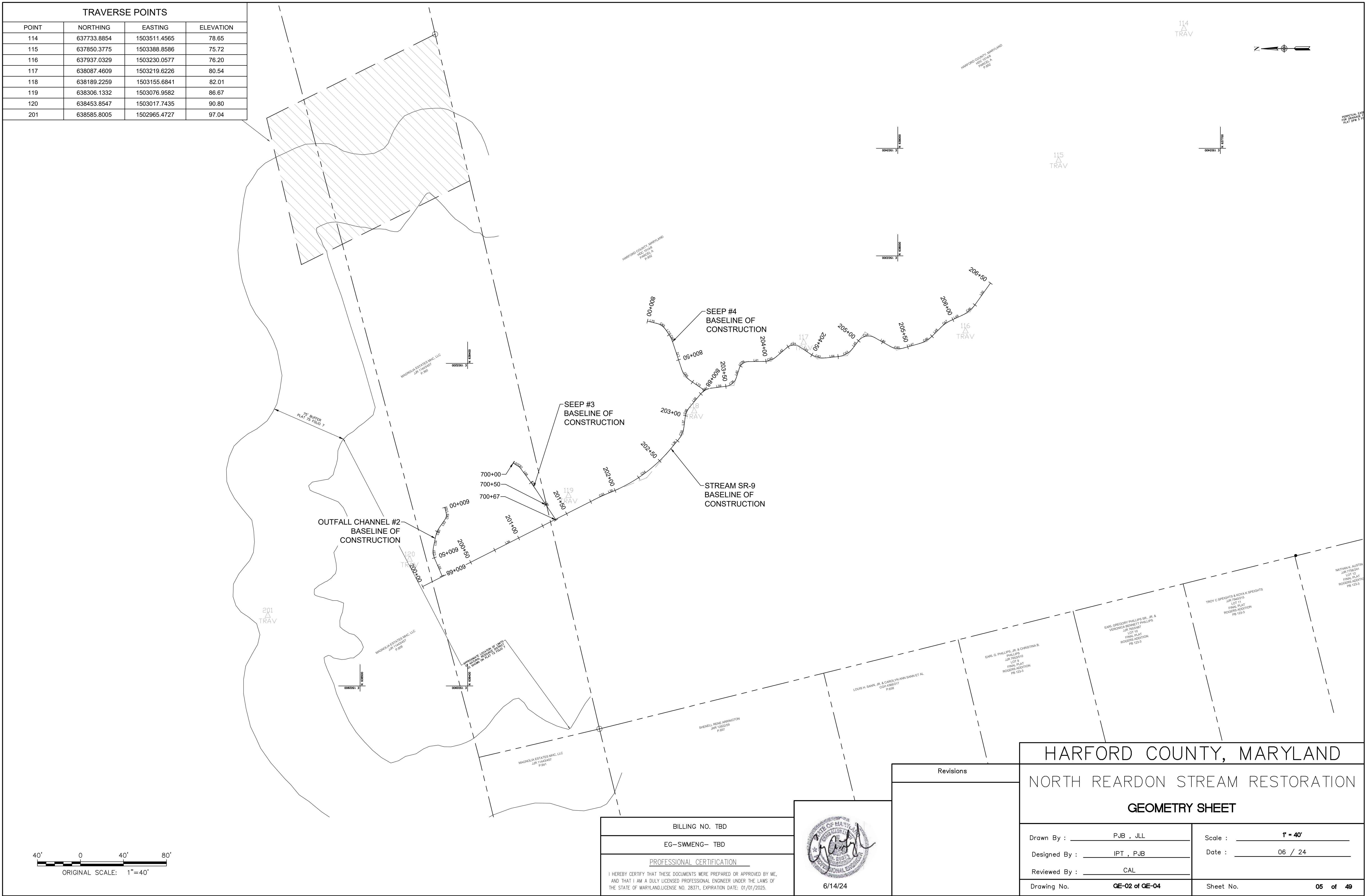
HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION
DRAINAGE AREA MAP
ULTIMATE CONDITIONS

Drawn By : JCG	Scale : 1" = 200'
Designed By : IPT, PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. DA-01 of DA-01	Sheet No. 03 of 49

HCG DWG ID No.: SC-174th





SR-3 STREAM ALIGNMENT													
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELT A	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L1			0+00.00	0+62.03	62.028		S10° 15' 18.45"E	638725.214,1504584.3204	638664.6842,1504595.3633				
C1	638656.5690,1504596.8316	0+70.28			16.438	81.620	S16° 01' 29.21"E	638664.6842,1504595.3633	638648.9115,1504599.8935	011° 32' 21.51"	070° 11' 53.56"	8.25	0.42
L2			0+78.47	0+98.41	19.940		S21° 47' 39.96"E	638648.9115,1504599.8935	638630.3964,1504607.2969	044° 28' 06.52"	184° 12' 25.60"	12.71	2.50
C2	638618.5903,1504612.0177	1+11.12			24.140	31.104	S0° 26' 23.30"W	638630.3964,1504607.2969	638606.6580,1504607.1162				
L3			1+22.55	1+41.75	19.200		S22° 40' 26.56"W	638606.6580,1504607.1162	638589.1423,1504599.7150				
C3	638579.3675,1504595.6313	1+52.34			18.999	17.242	S08° 53' 33.63"E	638589.1423,1504599.7150	638571.3072,1504602.5055	063° 08' 00.38"	332° 18' 13.36"	10.59	2.99
L4			1+60.75	1+79.04	18.295		S40° 27' 33.82"E	638571.3072,1504602.5055	638575.3874,1504614.3771				
C4	638548.4722,1504621.9805	1+90.76			20.676	17.602	S06° 48' 29.30"E	638557.3874,1504614.3771	638558.0175,1504616.6896	067° 18' 09.05"	325° 30' 47.73"	11.72	3.54
L5			1+99.72	2+17.09	17.375		S28° 50' 35.23"W	638558.0175,1504616.6896	638522.5148,1504608.8440				
C5	638512.1797,1504603.6136	2+28.67			21.059	20.337	S02° 49' 18.19"E	638522.5148,1504608.8440	638502.4091,1504609.8350	059° 19' 46.83"	281° 44' 14.66"	11.58	3.07
L6			2+38.15	2+57.90	19.752		S32° 29' 11.60"E	638502.4091,1504609.8350	638485.7483,1504620.4436				
C6	638477.0227,1504625.9995	2+68.25			19.583	24.583	S09° 39' 57.68"E	638485.7483,1504620.4436	638466.9499,1504623.6454	045° 38' 27.86"	233° 04' 05.76"	10.34	2.09
L7			2+77.48	2+96.65	19.170		S13° 09' 16.25"W	638466.9499,1504623.6454	638448.2834,1504619.2828				
C7	638436.9388,1504616.6315	3+08.30			21.871	25.651	S37° 34' 53.68"W	638448.2834,1504619.2828	638431.4709,1504606.3440	048° 51' 14.86"	223° 22' 08.70"	11.65	2.52
L8			3+18.52	3+36.08	17.552		S62° 00' 31.11"W	638431.4709,1504606.3440	638423.2333,1504590.8457				
C8	638417.7415,1504580.5135	3+47.78			19.167	13.242	S20° 32' 41.70"W	638423.2333,1504590.8457	638406.8118,1504584.6913	082° 55' 38.81"	432° 40' 00.53"	11.70	4.43
L9			3+55.24	3+72.60	17.353		S20° 55' 07.71"E	638406.8118,1504584.6913	638390.6029,1504590.8870				
C9	638379.7970,1504595.0174	3+84.16			19.689	14.944	S16° 49' 31.55"W	638390.6029,1504590.8870	638373.0907,1504585.5912	075° 29' 18.51"	383° 24' 19.23"	11.57	3.95
L10			3+92.28	4+09.60	17.317		S54° 34' 10.80"W	638373.0907,1504585.5912	638363.0517,1504571.4809				
C10	638356.3591,1504562.0740	4+21.15			21.443	23.347	S28° 15' 27.19"E	638363.0517,1504571.4809	638344.8210,1504561.6821	052° 37' 27.21"	245° 24' 52.37"	11.54	2.70
L11			4+31.04	4+48.26	17.213		S01° 56' 43.59"E	638344.8210,1504561.6821	638327.6176,1504561.0977				
C11	638316.1486,1504560.7082	4+59.73			22.407	42.104	S17° 11' 29.26"W	638327.6176,1504560.7077	638304.6434,1504554.5529	030° 29' 31.34"	136° 04' 58.73"	11.48	1.54
L12			4+70.66	4+87.96	17.290		S32° 26' 14.93"W	638306.4634,1504554.5529	638291.8706,1504545.2786				
C12	638282.1421,1504539.0958	4+99.48			21.912	28.561	S54° 24' 57.11"W	638282.1421,1504539.0958	638279.4305,1504527.8923	043° 57' 24.35"	200° 36' 21.85"	11.53	2.24
L13			5+09.87	5+27.14	17.277		S76° 23' 39.28"W	638279.4305,1504527.8923	638275.3663,1504511.1004				
C13	638272.6569,1504499.9058	5+38.66			19.185	13.773	S36° 29' 22.95"W	638272.6569,1504499.9058	638261.1596,1504500.5919	079° 48' 32.66"	416° 00' 12.44"	11.52	4.18
L14			5+46.33	5+63.79	17.459		S03° 24' 53.38"E	638261.1596,1504500.5919	638243.7312,1504501.6319				
C14	638232.1122,1504502.3252	5+75.43			19.675	14.660	S35° 02' 03.75"W	638242.7312,1504501.6319	638228.8032,1504491.1658	076° 53' 54.25"	390° 50' 25.84"	11.64	4.06
L15			5+83.46	6+00.90	17.438		S73° 29' 00.87"W	638228.8032,1504491.1658	638223.8456,1504474.4470				
C15	638220.5406,1504463.3010	6+12.53			20.301	16.663	S38° 34' 51.64"W	638220.5406,1504463.3010	638208.9389,1504462.5552	069° 48' 18.46"	343° 50' 35.68"	11.63	3.65
L16			6+21.20	6+38.42	17.219		S03° 40' 42.41"W	638197.9389,1504462.5552	638191.7556,1504461.4505				
C16	638180.3000,1504460.7140	6+49.90			21.427	24.107	S29° 08' 29.00"W	638197.9389,1504460.4505	638173.6510,1504451.3564	050° 55' 33.18"	237° 40' 28.05"	11.48	2.59
L17			6+59.85	6+77.22	17.370		S54° 36' 15.59"W	638173.6510,1504451.3564	638163.5899,1504437.1969				
C17	638156.8826,1504427.7572	6+88.80			20.586	18.022	S21° 52' 56.08"E	638163.5899,1504437.1969	638145.5092,1504429.9350	065° 26' 39.02"	317° 54' 49.86"	11.58	3.40
L18			6+97.80	7+15.07	17.262		S10° 50' 23.43"E	638145.5092,1504429.9350	638128.5553,1504433.1813				
C18	638117.2528,1504435.3456	7+26.57			22.638	51.066	S01° 51' 35.33"W	638128.5553,1504433.1813	638106.1144,1504432.4527	025° 23' 57.52"	112° 11' 58.04"	11.51	1.28
L19			7+37.70	7+57.69	19.987		S14° 33' 34.09"W	638106.1144,1504432.4527	638086.7696,1504427.4283				
C19	638078.0477,1504425.1630	7+66.70			17.508	30.006	S31° 16' 29.97"W	638087.0477,1504425.1630	638072.0170,1504418.4674	033° 25' 51.76"	190° 56' 42.38"	9.01	1.32
L20			7+75.20	7+91.12	15.920		S47° 59' 25.86"W	638072.0170,1504418.4674	638061.3626,15044				

OUTFALL 1 ALIGNMENT													
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L51			300+00.00	300+92.51	92.513		S79° 51' 41.79"W	638716.0278,1504680.0886	638699.7431,1504589.0204				

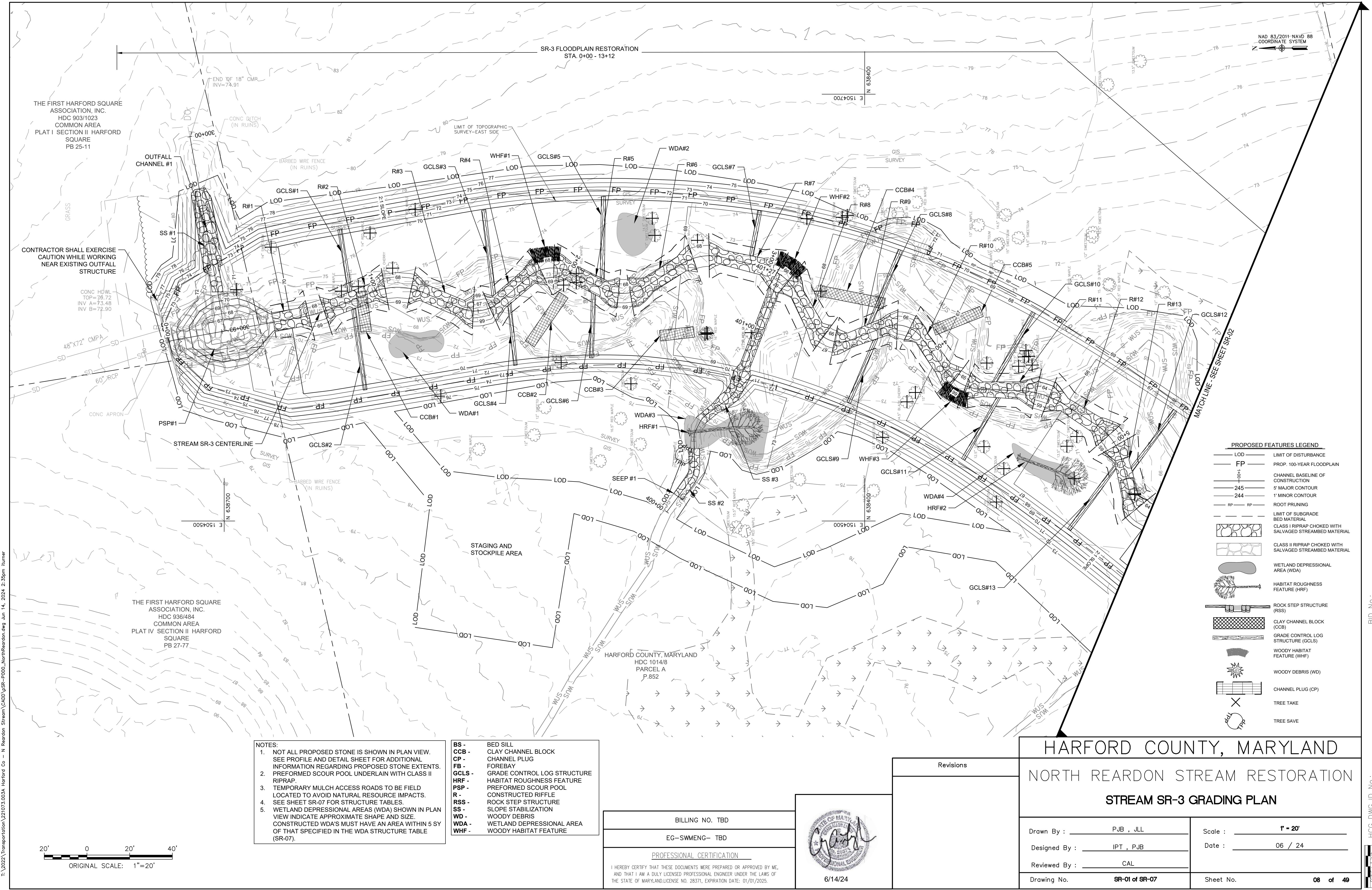
SEEP 1 ALIGNMENT													
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L59			400+00.00	400+18.39	18.391		S53° 35' 36.18"E	638492.6788,1504504.2531	638481.7633,1504519.0549				
C52	638479.6598,1504521.9074	400+21.94		6.836	10.497	S72° 14' 59.02"E	638481.7633,1504519.0549	638479.7159,1504525.4511	037° 18' 45.68"	545° 49' 40.43"	3.54	0.58	
L60			400+25.23	400+38.05	12.819		N89° 05' 38.14"E	638479.7159,1504525.4511	638479.9186,1504538.2687				
C53	638479.9590,1504540.8219	400+40.60		5.005	10.244	S76° 54' 33.32"E	638479.9186,1504538.2687	638478.9621,1504543.0953	027° 59' 37.09"	559° 18' 38.22"	2.55	0.31	
L56			400+43.05	400+46.38	3.327		S62° 54' 44.77"E	638478.9621,1504543.0953	638477.2812,1504546.0574				
C54	638476.1286,1504548.3112	400+48.91		4.972	10.717	S49° 37' 20.55"E	638477.2812,1504546.0574	638474.0892,1504549.8110	026° 34' 48.44"	534° 37' 30.61"	2.53	0.29	
L57			400+51.35	400+64.30	12.953		S36° 19' 56.33"E	638474.0892,1504549.8110	638463.6545,1504557.4851				
C55	638461.1660,1504559.3152	400+67.39		6.009	10.514	S52° 42' 15.73"E	638463.6545,1504557.4851	638460.0629,1504562.2005	032° 44' 38.79"	544° 55' 30.86"	3.09	0.44	
L58			400+70.31	401+27.38	57.069		S69° 04' 35.12"E	638460.0629,1504562.2005	638439.6823,1504615.5062				

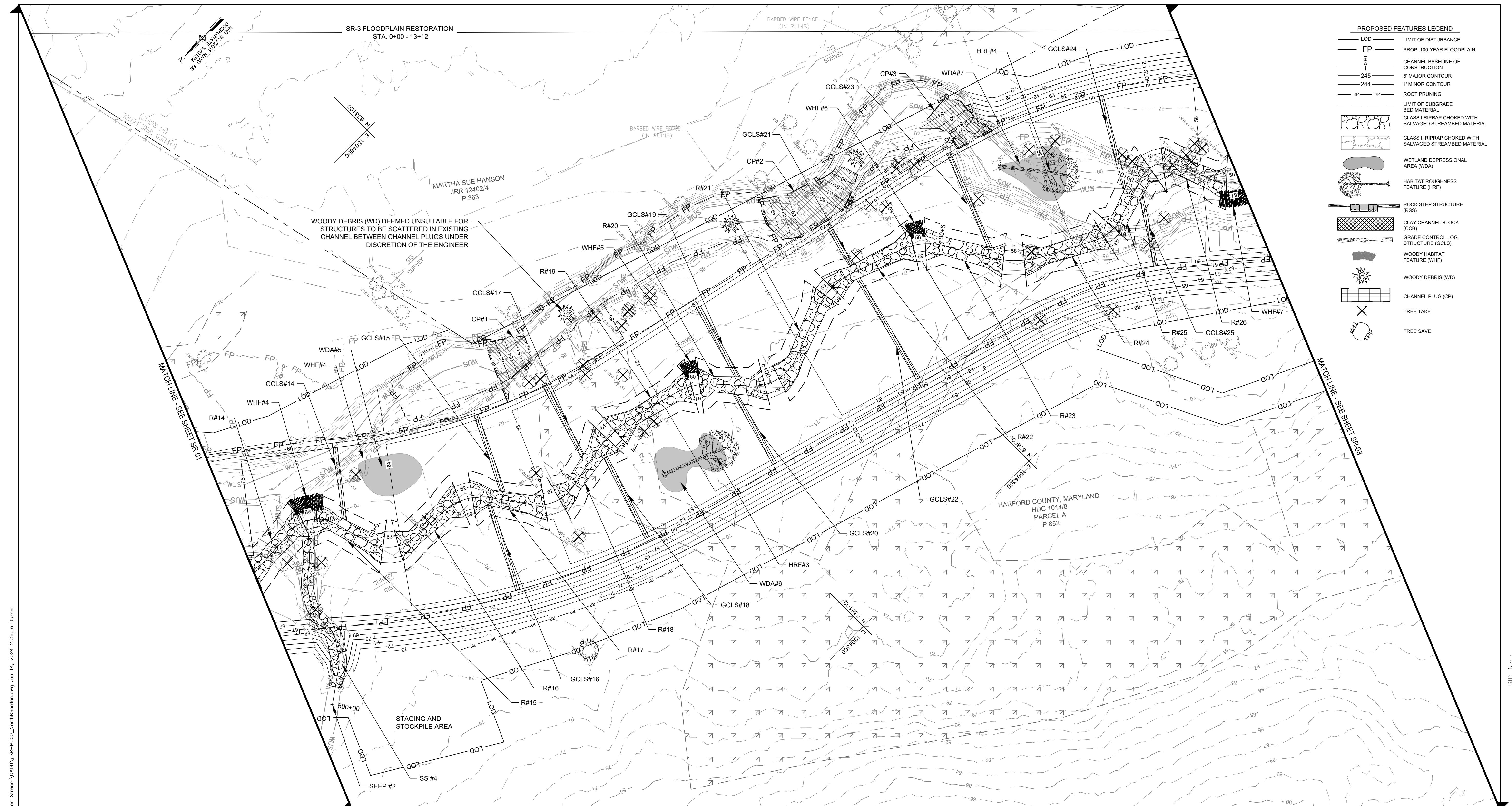
SEEP 2 ALIGNMENT													
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L61			500+00.00	500+16.07	16.072		S35° 40' 56.09"E	638284.0141,1504436.7274	638270.9590,1504446.1023				
C56	638268.9591,1504447.5384	500+18.53		4.875	14.091	S45° 35' 35.41"E	638270.9590,1504446.1023	638267.5648,1504449.5675	019° 49' 18.64"	406° 36' 51.56"	2.46	0.21	
L62			500+20.95	500+28.05	7.099		S55° 30' 14.73"E	638267.5648,1504449.5675	638263.5442,1504455.4184				
C57	638261.8342,1504457.9068	500+31.07		5.858	9.801	S72° 37' 36.24"E	638263.5442,1504455.4184	638261.8210,1504460.9261	034° 14' 43.01"	584° 36' 44.85"	3.02	0.45	
L63			500+33.90	500+39.74	5.834		S89° 44' 57.74"E	638261.8210,1504460.9261	638261.7955,1504466.7602				
C58	638261.7785,1504470.6495	500+43.63		7.593	14.224	S74° 27' 27.43"E	638261.7955,1504466.7602	638259.7849,1504473.9891	030° 35' 07.22"	402° 47' 51.51"	3.89	0.52	
L64			500+47.33	500+51.82	4.487		S59° 09' 50.52"E	638259.7849,1504473.9891	638257.4848,1504477.8420				
C59	638255.9515,1504480.4105	500+54.81		5.919	16.615	S48° 57' 28.45"E	638257.4848,1504477.8420	638253.6186,1504482.2830	020° 24' 44.13"	344° 50' 04.71"	2.99	0.27	
L65			500+57.74	500+65.54	7.805		S38° 45' 06.39"E	638253.6186,1504482.2830	638247.5314,1504487.1688				
C60	638246.6159,1504487.9036	500+66.72		2.343	14.180	S43° 29' 03.94"E	638247.5314,1504487.1688	638245.8336,1504488.7790	009° 27' 55.11"	404° 03' 00.43"	1.17	0.05	
L66			500+67.89	500+82.80	14.913		S48° 13' 01.50"E	638245.8336,1504488.7790	638235.8966,1504499.8996				

OUTFALL 2 ALIGNMENT													
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L52			600+00.00	600+05.33	5.328		S75° 50' 17.27"W	638421.2293,1503060.8697	638419.9258,1503060.8697				
C49	638419.0985,1503057.5911	600+08.71			6.346	7.430	N79° 41' 32.93"W	638419.9258,1503060.8697	638421.0272,1503054.8138	048° 56' 19.61"	771° 07' 15.51"	3.38	0.73
L53			600+11.67	600+18.91	7.236		N55° 13' 23.12"W	638421.0272,1503054.8138	638425.1543,1503048.8705				
C50	638428.8317,1503043.5748	600+25.36			12.714	31.061	N66° 56' 57.44"W	638428.8317,1503043.5748	638430.0978,1503037.2530	023° 27' 08.63"	184° 27' 35.51"	6.45	0.66
L54			600+31.62	600+39.77	8.150		N78° 40' 31.76"W	638430.0978,1503037.2530	638431.6981,1503029.2621				
C51	638432.8293,1503023.6133	600+45.53			11.173	18.588	S84° 06' 17.78"W	638432.8293,1503023.6133	638430.5677,1503018.3147	034° 26' 20.92"	308° 14' 03.84"	5.76	0.87
L55			600+50.95	600+68.33	17.383		S66° 53' 07.33"W	638430.5677,1503018.3147	638423.7435,1503002.3268				

SEEP 3 ALIGNMENT													
POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE

<tbl_r





NOTES:

1. NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
2. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
3. SEE SHEET SR-07 FOR STRUCTURE TABLE.
4. WETLAND DEPRESSIVE AREAS (WDA) SHOWN IN PLAN VIEW INDICATE APPROXIMATE SHAPE AND SIZE. CONSTRUCTED WDAS MUST HAVE AN AREA WITHIN 5 SY OF THAT SPECIFIED IN THE WDA STRUCTURE TABLE (SR-07).

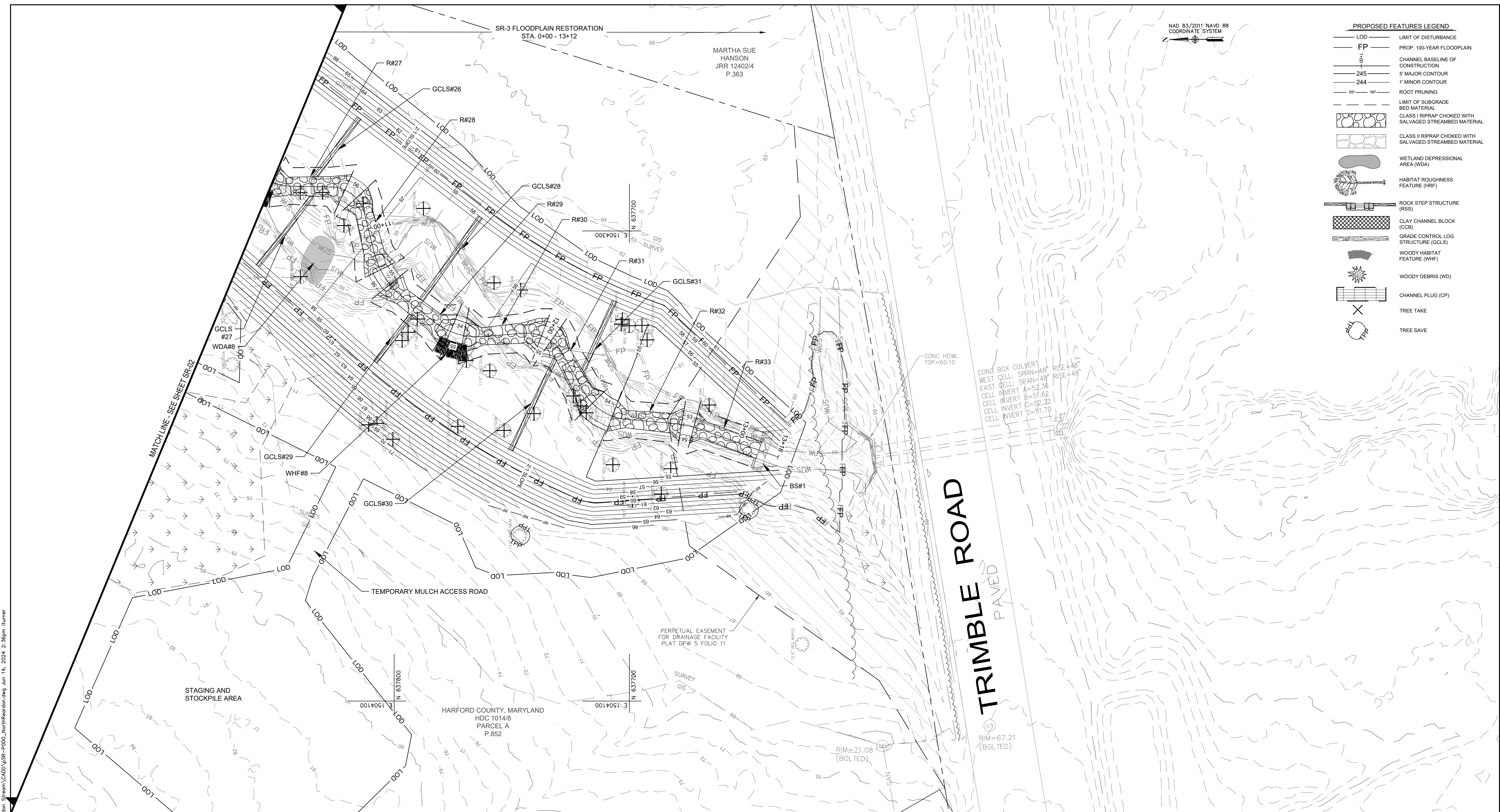
BS -	BED SILL
CCB -	CLAY CHANNEL BLOCK
CP -	CHANNEL PLUG
FB -	FOREBAY
GCLS -	GRADE CONTROL LOG STRUCTURE
HRF -	HABITAT ROUGHNESS FEATURE
PSP -	PREFORMED SCOUR POOL
R -	CONSTRUCTED RIFFLE
RSS -	ROCK STEP STRUCTURE
SS -	SLOPE STABILIZATION
WD -	WOODY DEBRIS
WDA -	WETLAND DEPRESSIVE AREA
WHF -	WOODY HABITAT FEATURE

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

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: 01/01/2025.	
6/14/24	

Revisions	

HARFORD COUNTY, MARYLAND	
NORTH REARDON STREAM RESTORATION	
STREAM SR-3 GRADING PLAN	
Drawn By : PJB , JLL	Scale : 1" = 20'
Designed By : IPT , PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. SR-02 of SR-07	Sheet No. 09 of 49



: \2022\Transportation\221073.003A Harford Co - N Reardon Stream\pSR-P000_NorthReardon.dwg Jun 14, 2024 2:36pm iturner

MATCH LINE - SEE SHEET SR-06

NOTES:

1. NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
2. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
3. SEE SHEET SR-07 FOR STRUCTURE TABLES.
4. WETLAND DEPRESSSIONAL 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 (SR-07).

BS -	BED SILL
CCB -	CLAY CHANNEL BLOCK
CP -	CHANNEL PLUG
FB -	FOREBAY
GCLS -	GRADE CONTROL LOG STRUCTURE
HRF -	HABITAT ROUGHNESS FEATURE
PSP -	PREFORMED SCOUR POOL
R -	CONSTRUCTED RIFFLE
RSS -	ROCK STEP STRUCTURE
SS -	SLOPE STABILIZATION
WD -	WOODY DEBRIS
WDA -	WETLAND DEPRESSATIONAL AREA
WHF -	WOODY HABITAT FEATURE

BILLING NO. TBD	
EG-SWMENG- TBD	
<u>PROFESSIONAL CERTIFICATION</u>	
<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: 01/01/2025.</p>	
6/14/24	

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: 01/01/2025.

Rev.

HARFORD COUNTY, MARYLAND

STREAM SR-3 GRADING PLAN

Own By : PJB , JLL

Scale : 1" = 20'

signed By : IPT , PJB

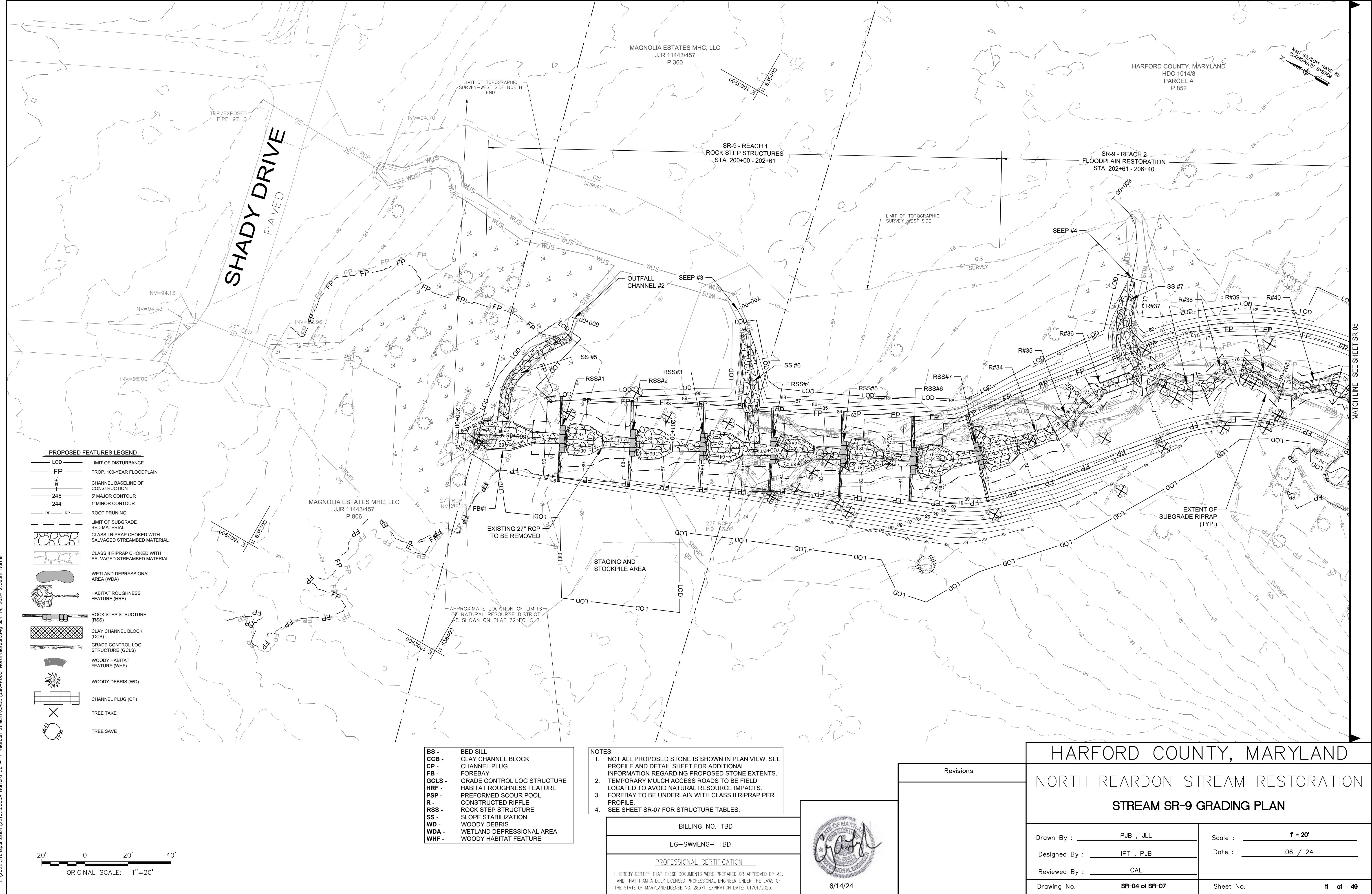
Date : 06 / 24

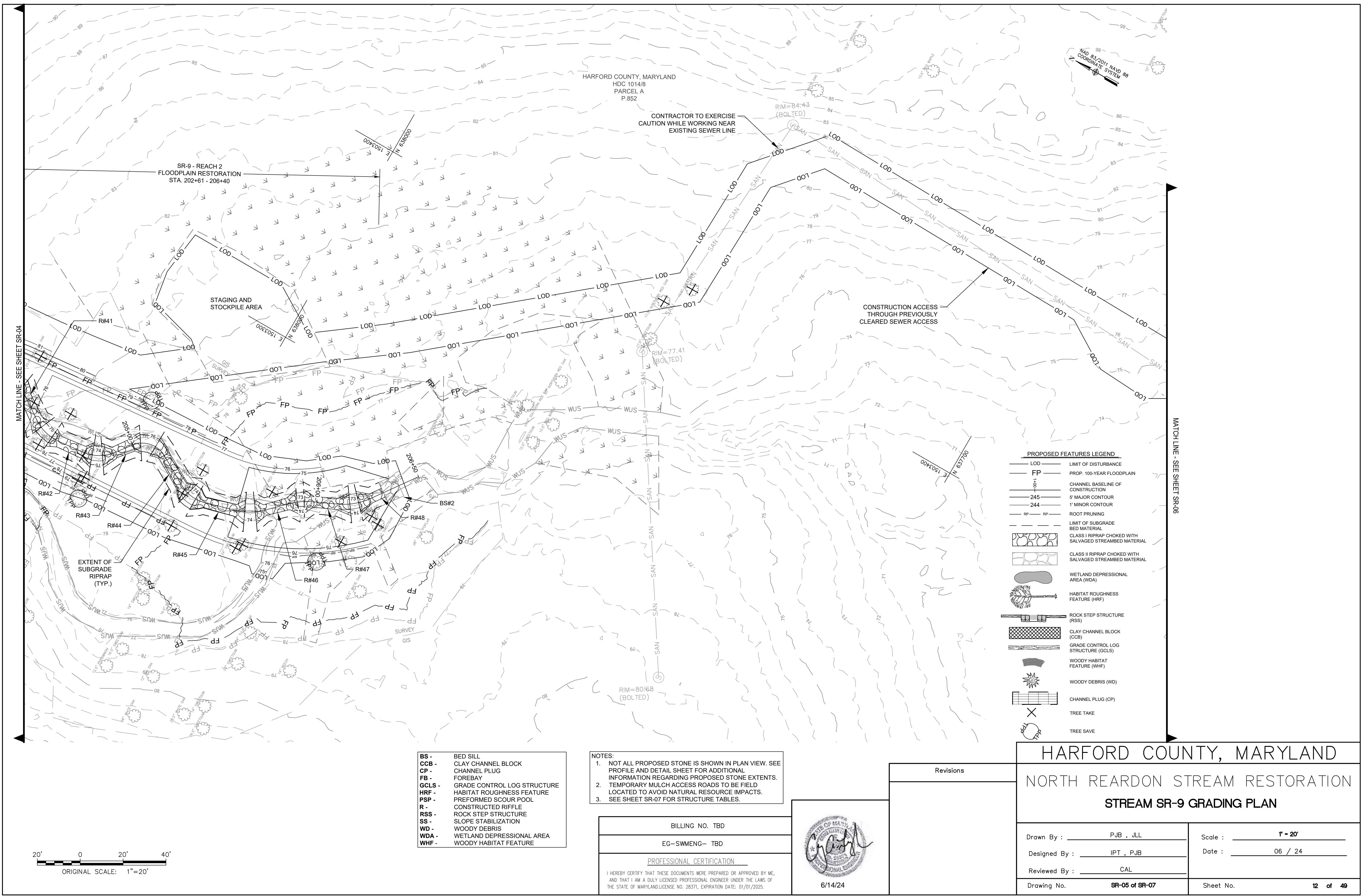
iewed By : CAL

Page No. **SR-03 of SR-07**

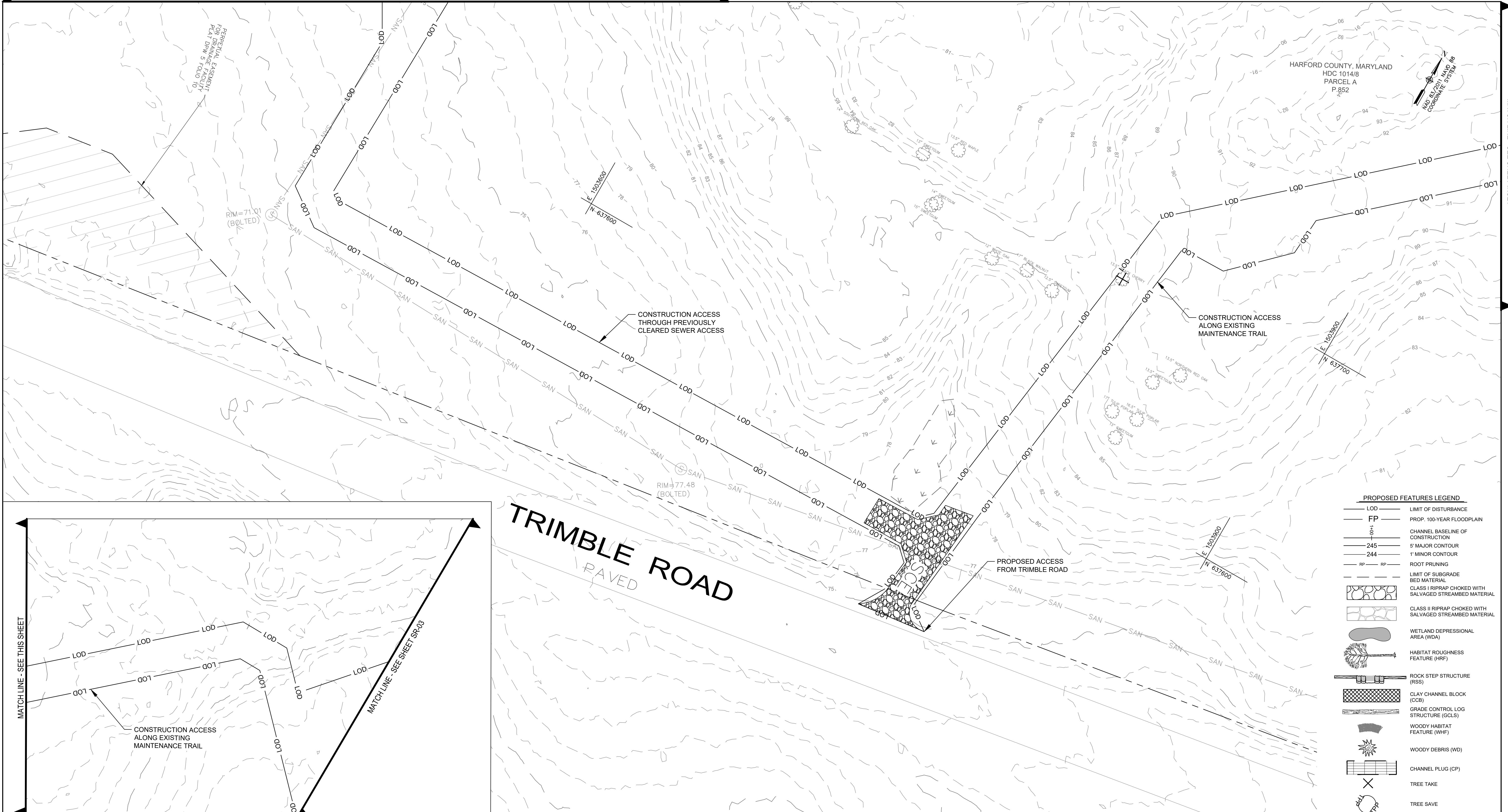
Sheet No. 10 of 49

HCC DWG ID No.:





MATCH LINE - SEE SHEET SR-05



BS -	BED SILL
CCB -	CLAY CHANNEL BLOCK
CP -	CHANNEL PLUG
FB -	FOREBAY
GCLS -	GRADE CONTROL LOG STRUCTURE
HRF -	HABITAT ROUGHNESS FEATURE
PSP -	PREFORMED SCOUR POOL
R -	CONSTRUCTED RIFFLE
RSS -	ROCK STEP STRUCTURE
SS -	SLOPE STABILIZATION
WD -	WOODY DEBRIS
WDA -	WETLAND DEPRESSIVE AREA
WHF -	WOODY HABITAT FEATURE

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

BILLING NO. TBD	
EG-SWMENG- TBD	
PROFESSIONAL CERTIFICATION	
<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. 26371, EXPIRATION DATE: 01/01/2025.</p> <p>6/14/24</p>	

Revisions

HARFORD COUNTY, MARYLAND	
NORTH REARDON STREAM RESTORATION	
GRADING PLAN	
Drawn By : PJB , JLL	Scale : 1" = 20'
Designed By : IPT , PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. SR-06 of SR-07	
Sheet No. 13 of 49	

CONSTRUCTED RIFFLE (R)					
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO	
1	N/A	0+49.55	0+62.03	0+66.53	
2	0+74.00	0+78.47	0+98.41	1+04.60	
3	1+16.56	1+22.55	1+41.75	1+47.75	
4	1+54.62	1+60.74	1+79.04	1+85.04	
5	1+93.72	1+99.72	2+17.09	2+22.72	
6	2+32.54	2+39.73	2+57.90	2+63.90	
7	2+71.48	2+77.48	2+96.65	3+04.65	
8	3+10.52	3+18.52	3+36.08	3+42.08	
9	3+47.74	3+55.24	3+72.60	3+78.62	
10	3+84.78	3+92.28	4+09.60	4+17.10	
11	4+23.04	4+31.04	4+48.26	4+56.26	
12	4+62.66	4+70.66	4+78.96	4+95.96	
13	5+01.87	5+09.87	5+27.14	5+33.14	

GRADE CONTROL LOG STRUCTURE (GCLS)					
GCLS #	STA FROM	OFFSET	STA TO	OFFSET	LENGTH (LF)
1	0+88.51	4.0 L	0+94.99	33.0 L	30
2	0+87.11	4.2 R	0+78.21	41.3 R	38
3	1+60.82	3.7 L	1+80.41	37.7 L	41
4	1+64.05	3.6 R	1+99.10	29.4 R	29
5	2+14.66	3.9 L	1+99.10	38.7 L	39
6	2+14.11	4.0 R	2+20.84	32.3 R	30
7	2+90.83	3.8 L	2+89.86	25.2 L	21
8	3+66.40	4.0 L	3+78.64	35.2 L	37
9	4+36.62	3.7 L	4+51.17	37.0 L	32
10	4+38.65	3.7 R	4+27.78	33.7 R	37
11	5+14.45	3.5 L	5+01.56	32.3 L	33
12	5+11.35	3.5 R	5+29.51	32.3 R	35
13	5+86.68	3.7 L	5+78.41	33.0 L	37

WETLAND DEPRESSATIONAL AREA (WDA)	
WDA #	AREA (SY)
1	28
2	30
3	79
4	29

CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
14	5+40.33	5+46.33	5+63.79	5+69.79
15	5+75.96	5+83.46	6+00.90	6+06.90
16	6+13.70	6+21.20	6+38.42	6+46.42
17	6+51.85	6+59.85	6+77.22	6+83.21
18	6+89.80	6+97.80	7+15.07	7+23.07
19	7+27.70	7+37.70	7+57.69	7+65.69
20	7+69.20	7+75.20	7+91.12	7+97.12
21	8+03.08	8+15.18	8+38.92	8+44.92
22	8+49.20	8+59.45	8+82.21	8+88.52
23	8+93.80	9+02.03	9+21.97	9+27.96
24	9+36.87	9+45.62	9+68.14	9+72.60
25	9+77.97	9+82.50	10+02.17	10+08.17
26	10+14.22	10+20.62	10+36.93	10+42.96

GRADE CONTROL LOG STRUCTURE (GCLS)					
GCLS #	STA FROM	OFFSET	STA TO	OFFSET	LENGTH (LF)
14	5+86.68	3.7 L	5+78.41	33.0 L	33
15	6+64.17	3.7 L	6+54.85	35.1 L	35
16	6+59.90	3.4 R	6+77.39	36.9 R	39
17	7+11.09	4.1 L	7+22.24	35.8 L	35
18	7+16.13	4.4 R	6+97.72	38.5 R	39
19	7+85.26	3.6 L	7+70.93	34.6 L	34
20	7+84.81	3.9 R	7+95.59	34.0 R	36
21	8+61.19	3.1 L	8+59.35	23.4 L	20
22	8+61.20	3.1 R	8+28.70	51.1 R	50
23	9+20.90	4.3 L	8+98.63	39.4 L	44
24	9+95.74	4.3 L	10+08.30	37.5 L	41
25	9+94.97	4.1 R	9+77.89	24.1 R	30

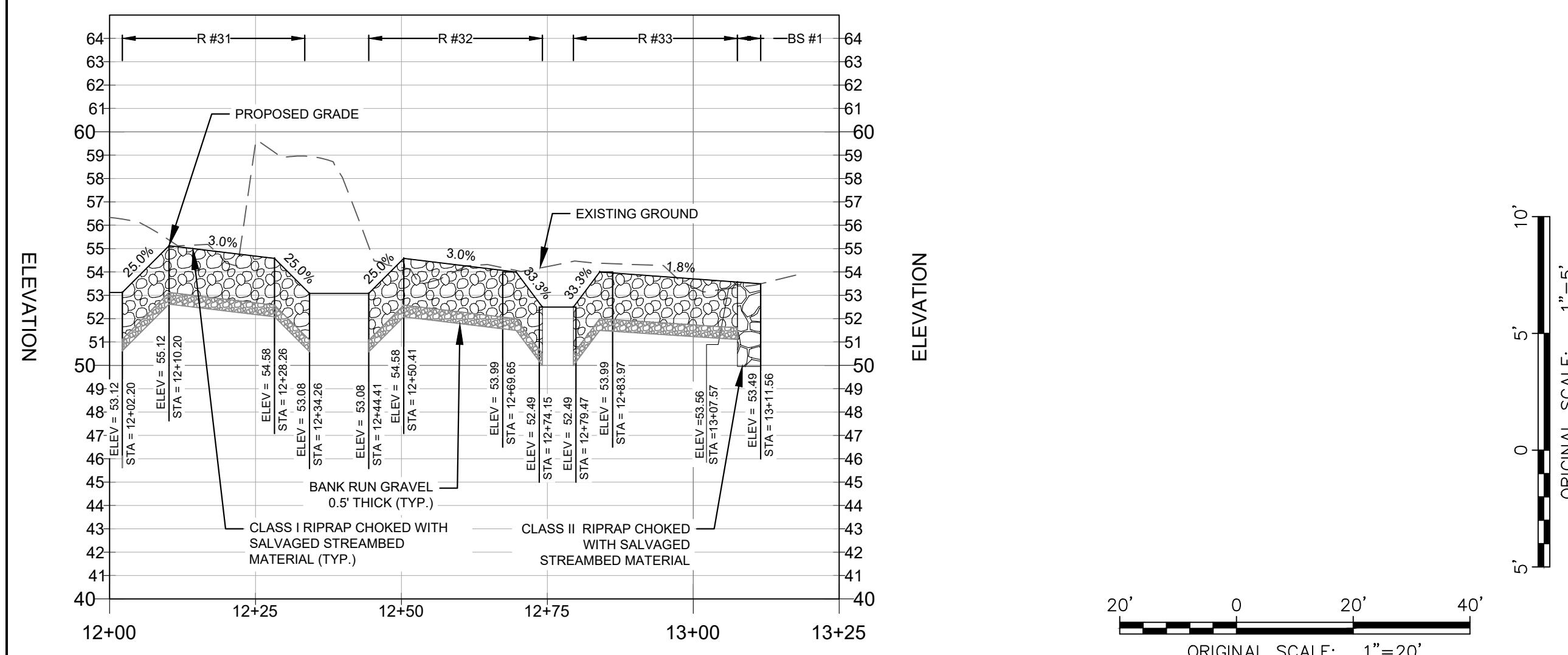
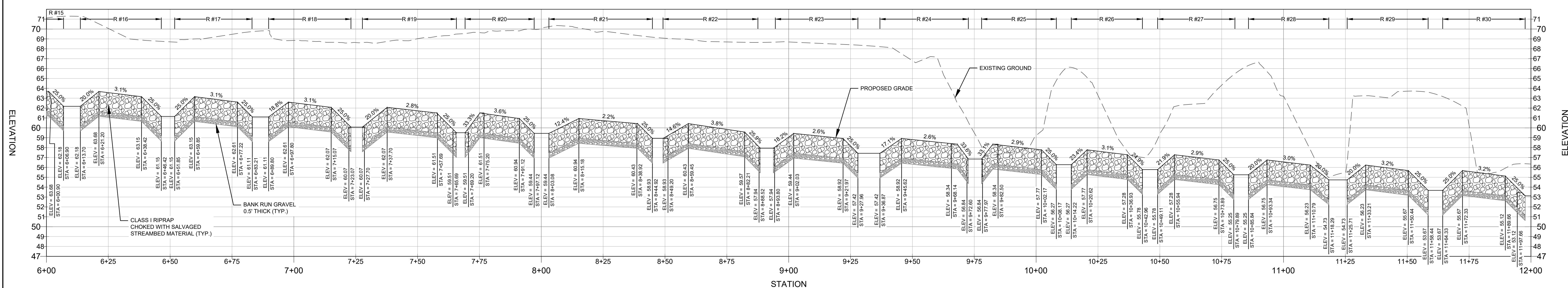
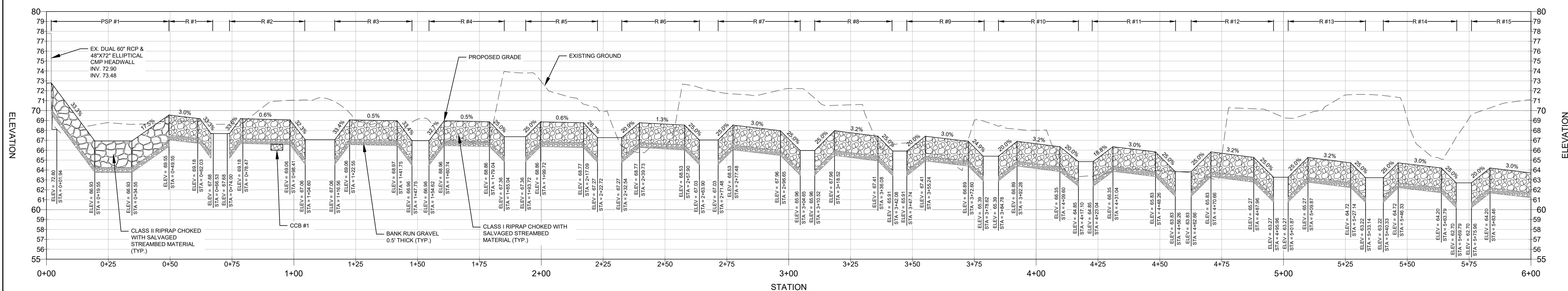
WETLAND DEPRESSATIONAL AREA (WDA)	
WDA #	AREA (SY)
5	41
6	46
7	46

SLOPE STABILIZATION (SS)		
CHANNEL	STA FROM	STA TO
SS #1	300+24.99	300+74.81
SS #2	400+08.52	400+33.74
SS #3	400+47.49	401+20.42

CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
14	5+40.33	5+46.33	5+63.79	5+69.79
15	5+75.96	5+83.46	6+00.90	6+06.90
16	6+13.70	6+21.20	6+38.42	6+46.42
17	6+51.85	6+59.85	6+77.22	6+83.21
18	6+89.80	6+97.80	7+15.07	7+23.07
19	7+27.70	7+37.70	7+57.69	7+65.69
20	7+69.20	7+75.20	7+91.12	7+97.12
21	8+03.08	8+15.18	8+38.92	8+44.92
22	8+49.20	8+59.45	8+82.21	8+88.52
23	8+93.80	9+02.03	9+21.97	9+27.96
24	9+36.87	9+45.62	9+68.14	9+72.60
25	9+77.97	9+82.50	10+02.17	10+08.17
26	10+14.22	10+20.62	10+36.93	10+42.96

GRADE CONTROL LOG STRUCTURE (GCLS)					
GCLS #	STA FROM	OFFSET	STA TO	OFFSET	LENGTH (LF)
14	5+86.68	3.7 L	5+78.41	33.0 L	33
15	6+64.17	3.7 L	6+54.85	35.1 L	35
16	6+59.90	3.4 R	6+77.39	36.9 R	39
17	7+11.09	4.1 L	7+22.24	35.8 L	35
18	7+16.13	4.4 R	6+97.72	38.5 R	

STREAM SR-3 PROFILE



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: 01/01/2025.

6/14/24

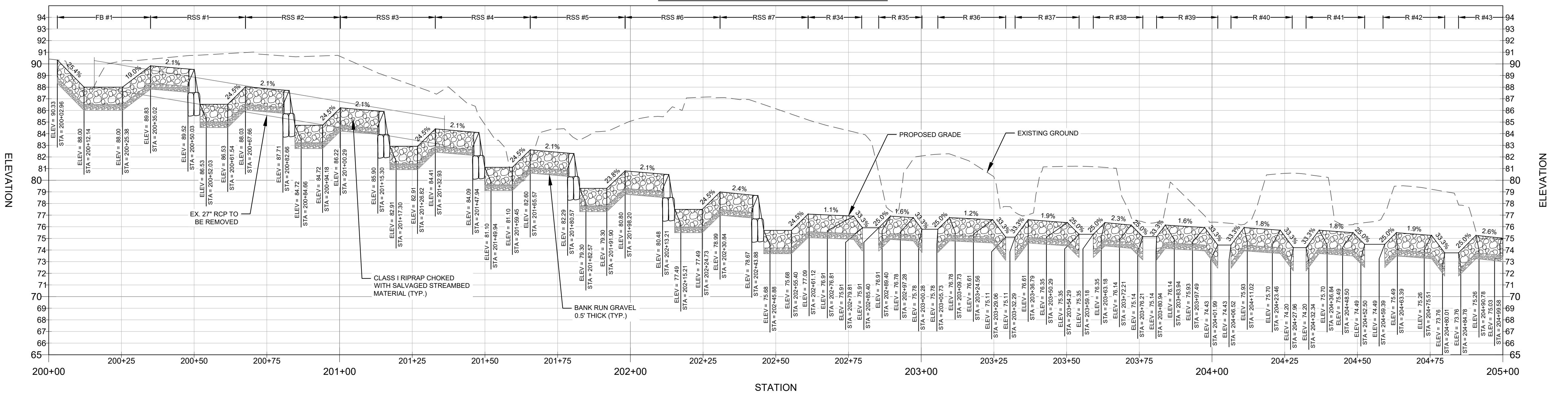
HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

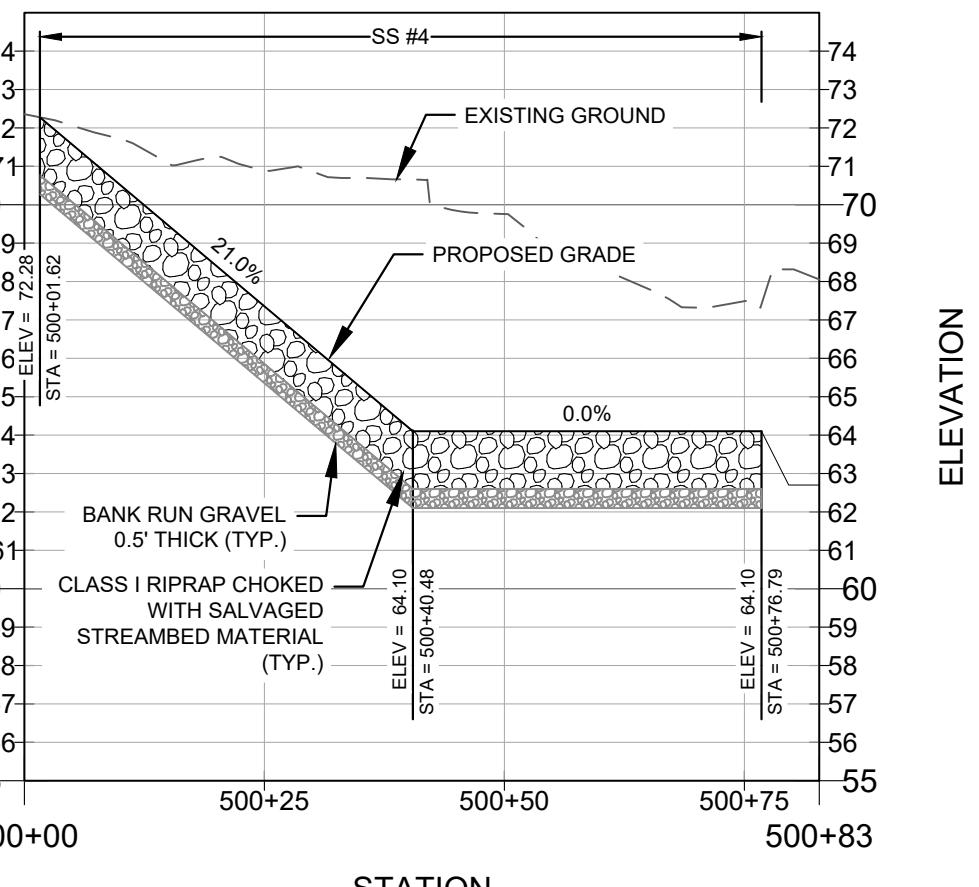
PROFILE SHEET

Drawn By : PJB , JLL	Scale : AS SHOWN
Designed By : IPT , PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. PR-01 of PR-02	Sheet No. 15 of 49

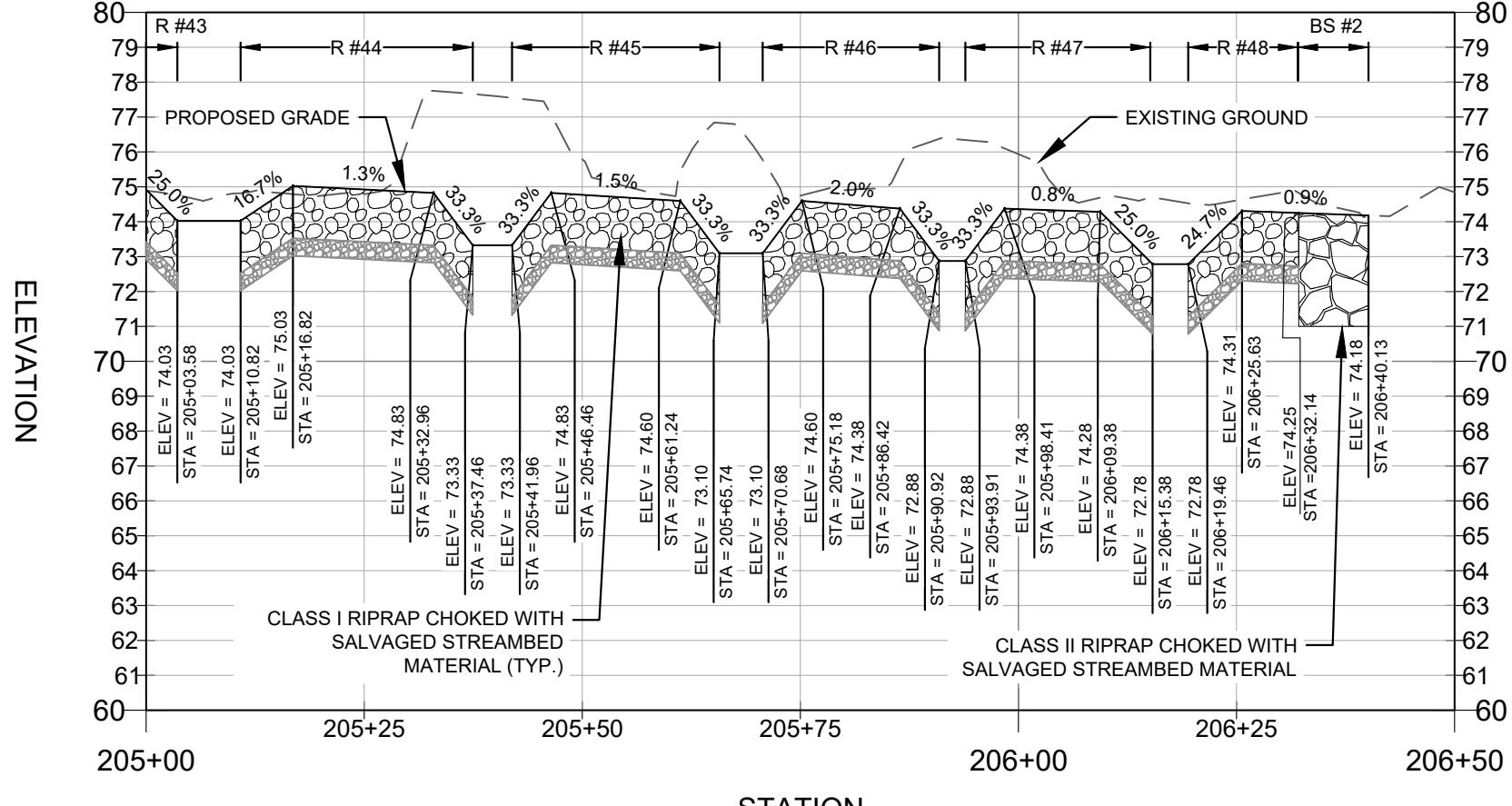
STREAM SR-9 PROFILE



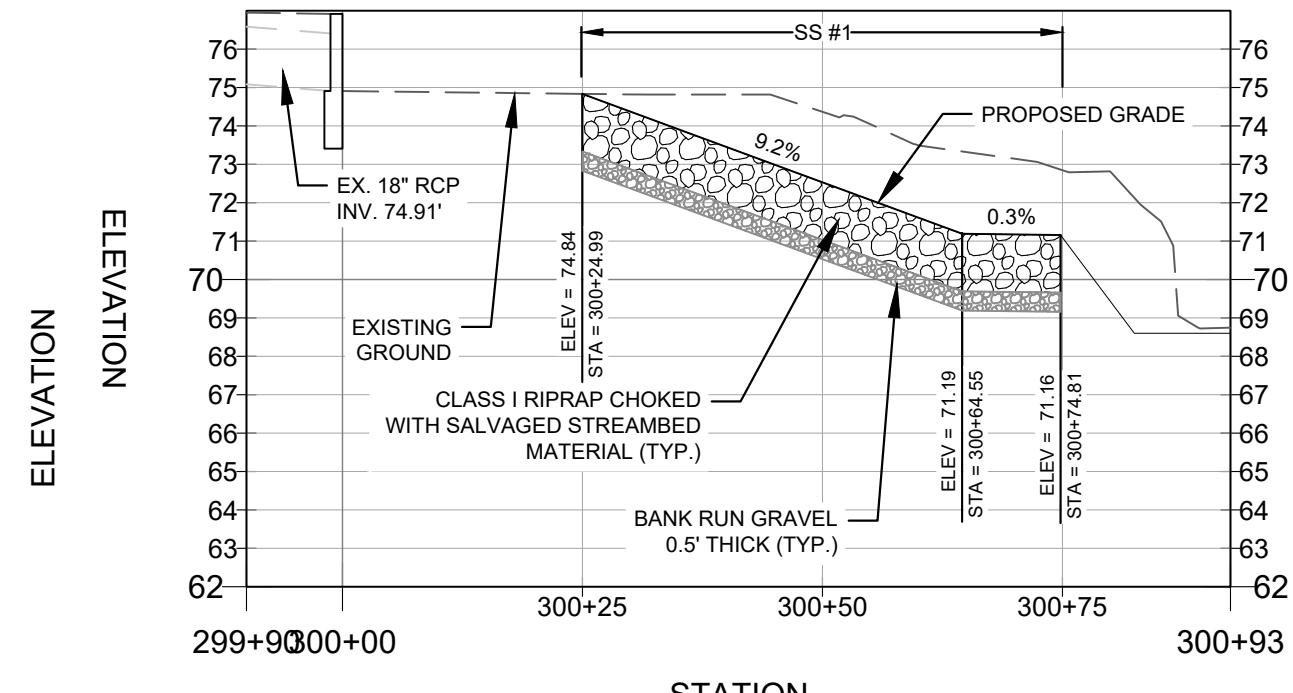
SEEP #2



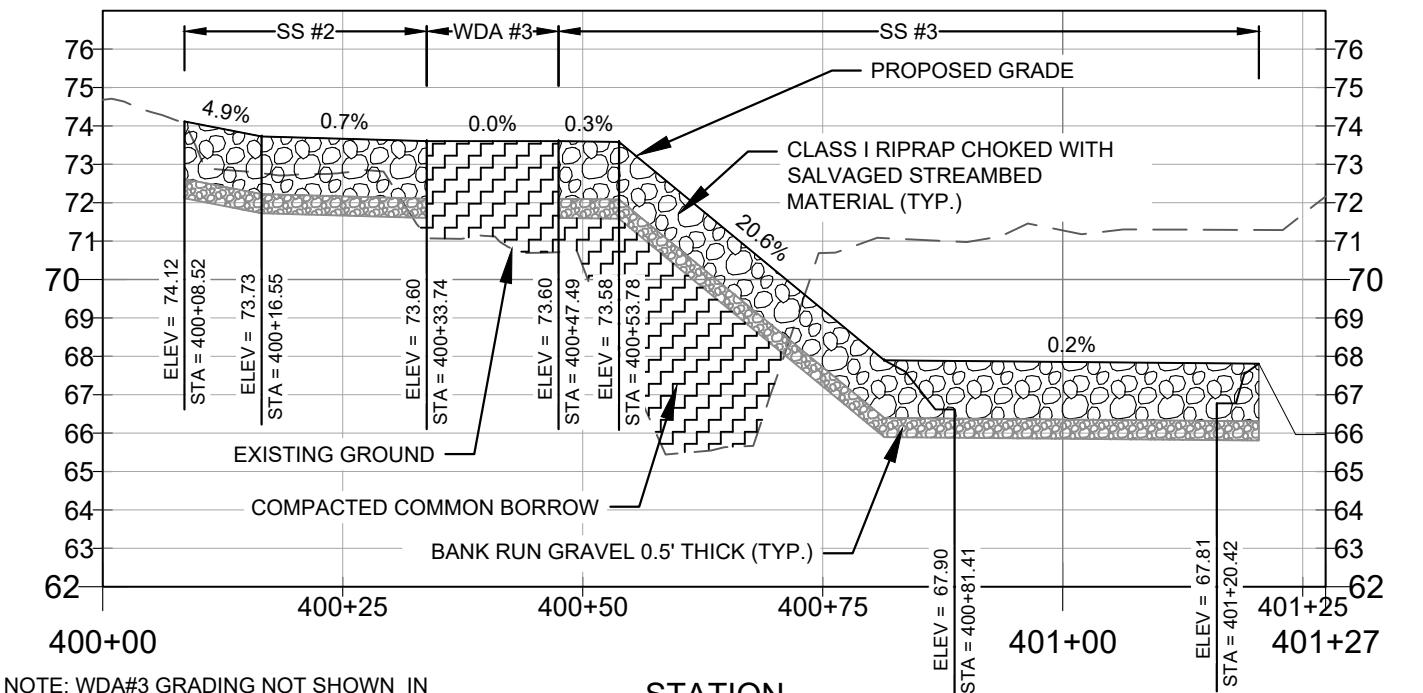
STREAM SR-9 PROFILE CONTINUED



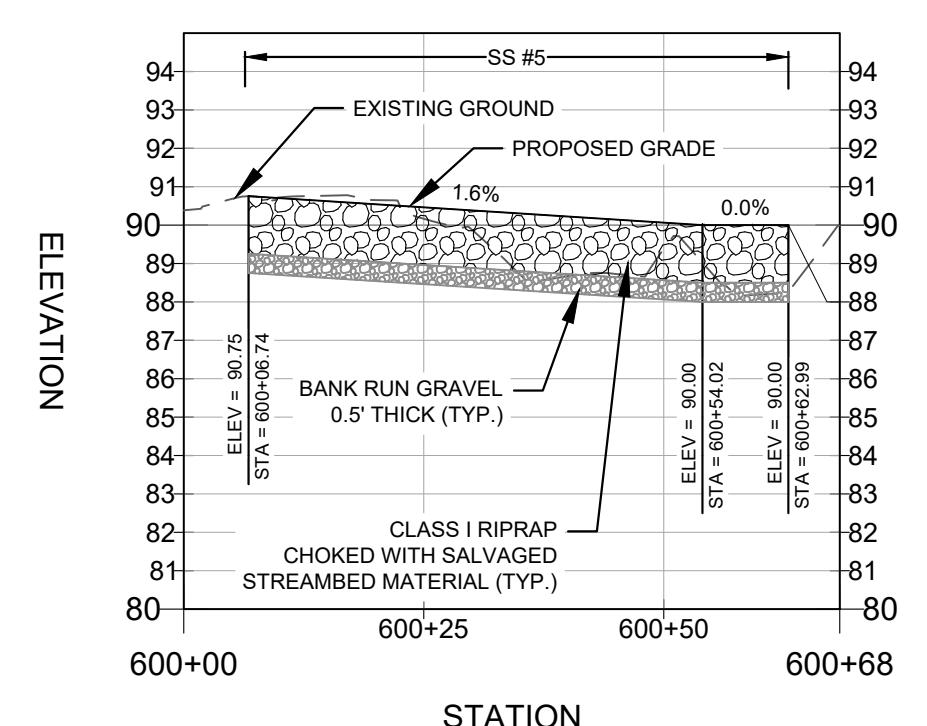
OUTFALL CHANNEL #1



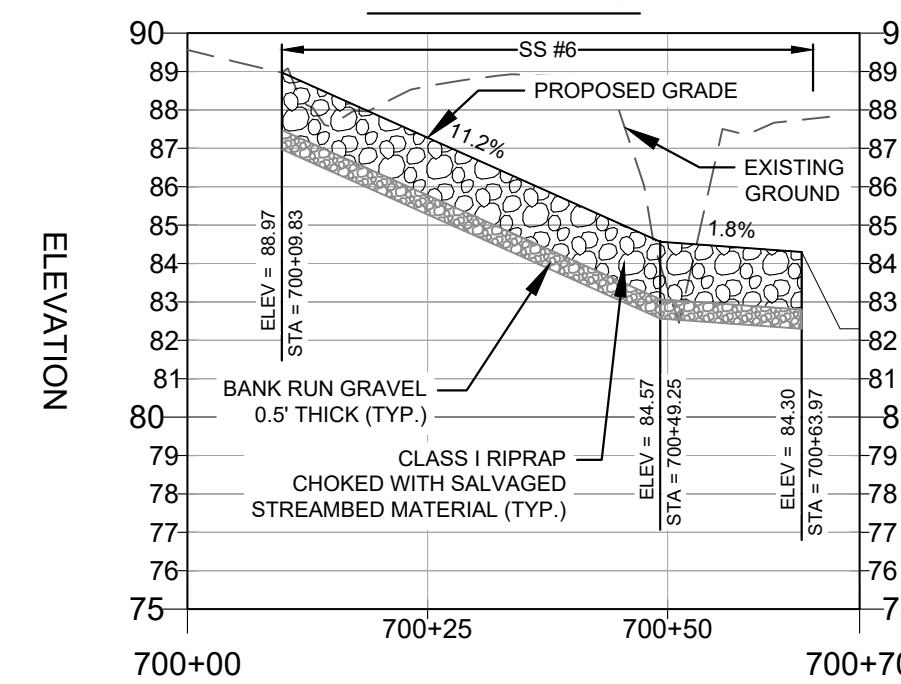
SEEP #1



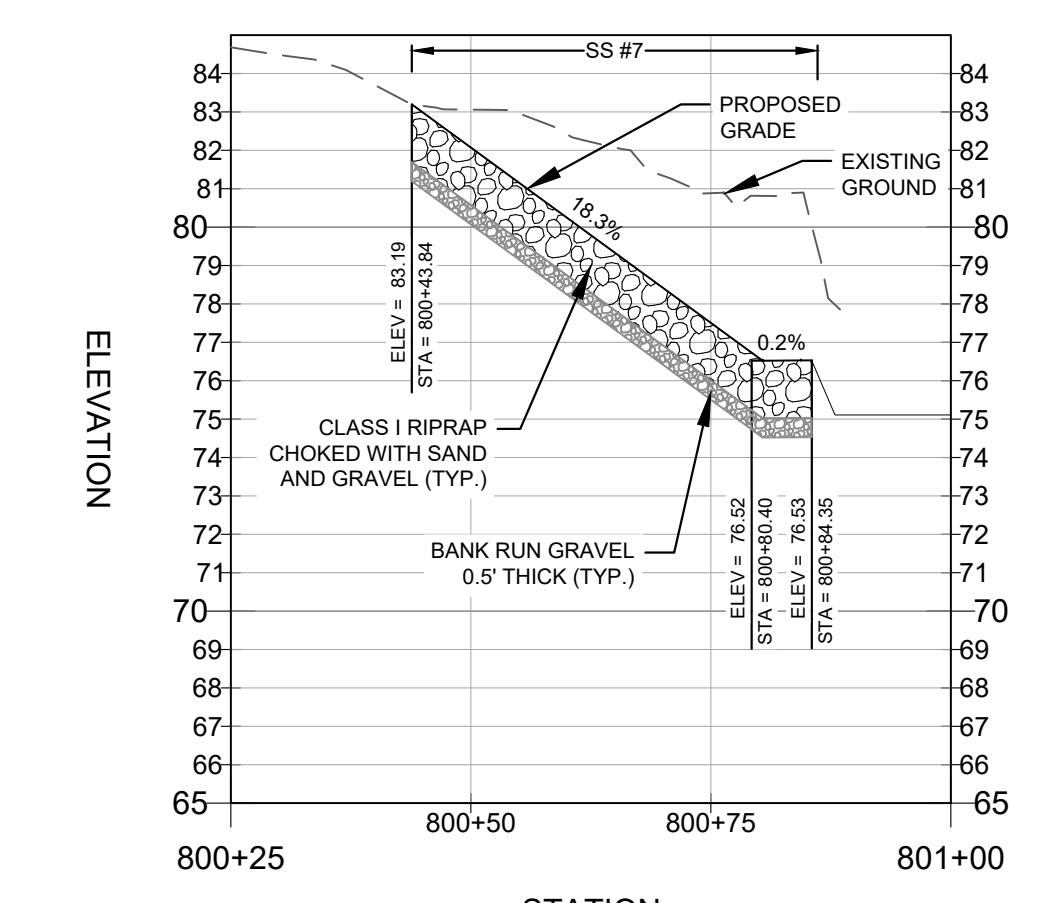
OUTFALL CHANNEL #2



SEEP #3



SEEP #4



NOTE: FOR LOCATIONS OF GRADE CONTROL LOG STRUCTURES, CLAY CHANNEL BLOCKS, AND WETLAND DEPRESSATIONAL AREAS REFER TO GRADING PLAN SHEETS.

HARFORD COUNTY, MARYLAND NORTH REARDON STREAM RESTORATION

PROFILE SHEET

Revisions	
BILLING NO. TBD	
EG-SWMENG- TBD	
PROFESSIONAL CERTIFICATION	
<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: 01/01/2025.</p> <p>6/14/24</p>	

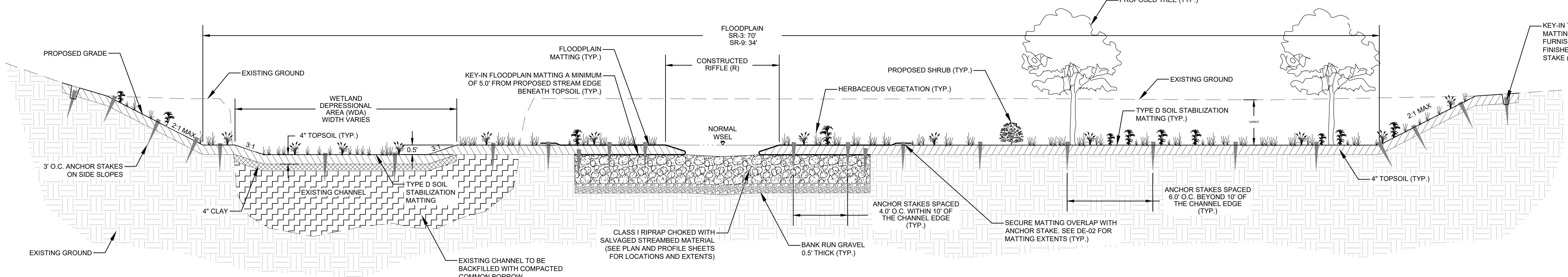
Drawn By : <u>PJB, JLL</u>	Scale : <u>AS SHOWN</u>
Designed By : <u>IPT, PJB</u>	Date : <u>06 / 24</u>
Reviewed By : <u>CAL</u>	
Drawing No. <u>PR-02 of PR-02</u>	
Sheet No. <u>16 of 49</u>	

BID No.:

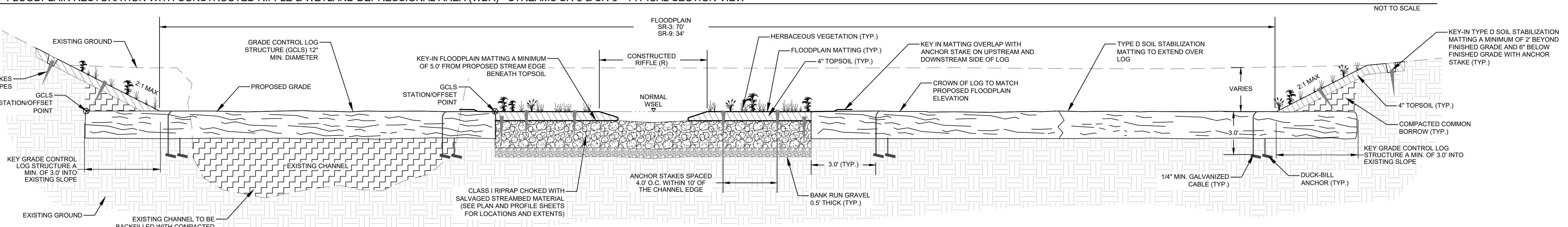
HCG DWG ID No.:

SCAL 1"=10'

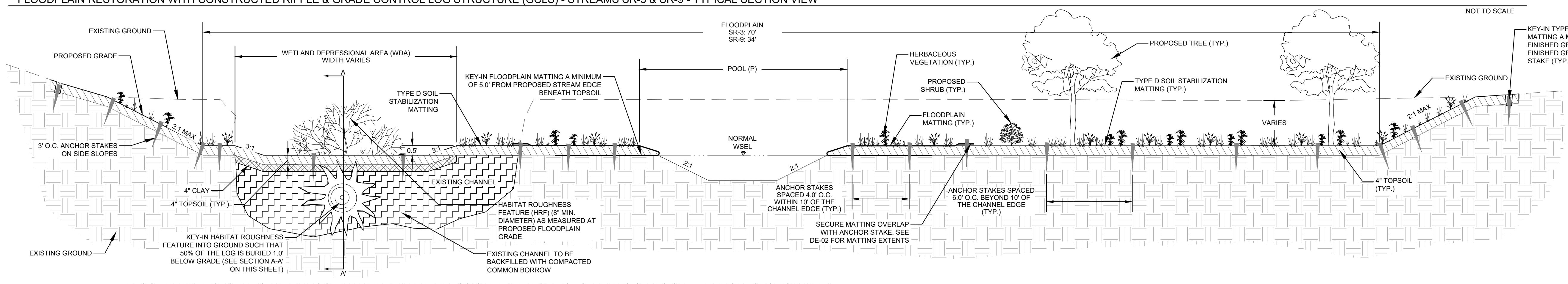
FLOODPLAIN RESTORATION DETAILS - STREAMS SR-3 & SR-9



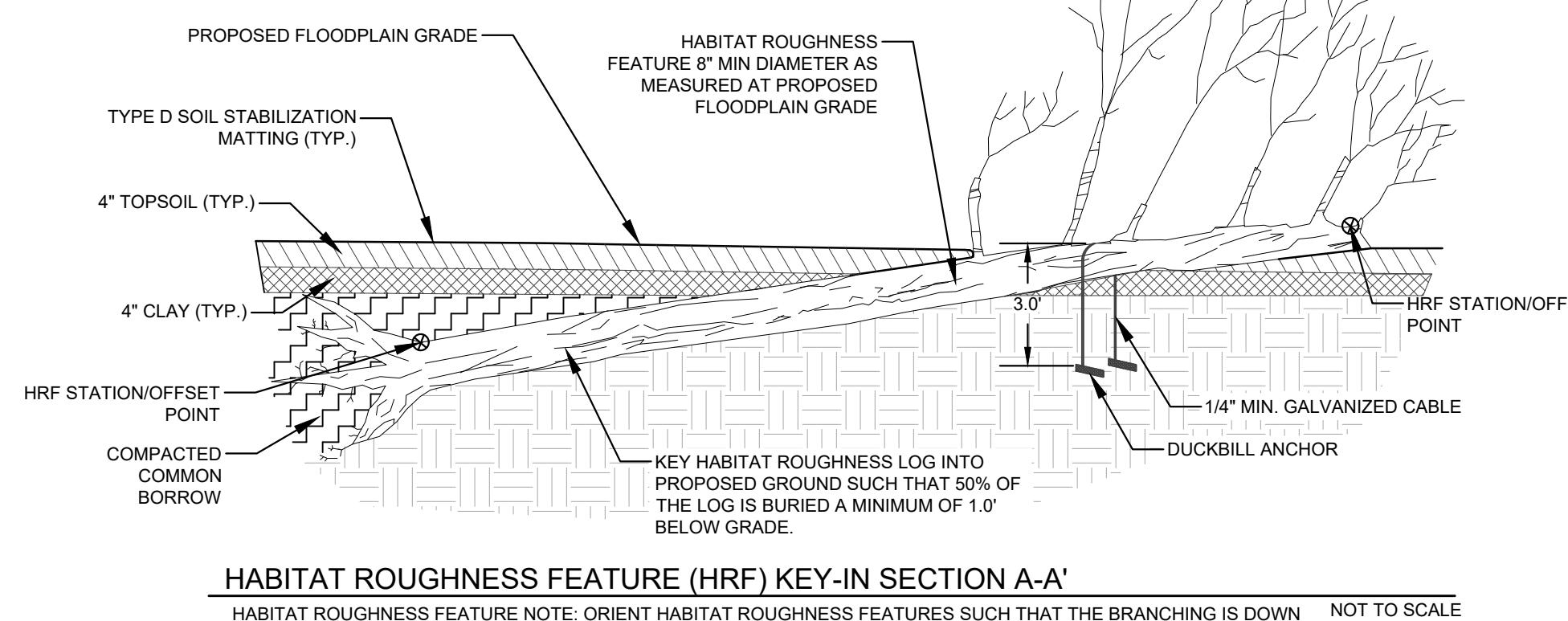
FLOODPLAIN RESTORATION WITH CONSTRUCTED RIFFLE & WETLAND DEPRESSATIONAL AREA (WDA) - STREAMS SR-3 & SR-9 - TYPICAL SECTION VIEW



FLOODPLAIN RESTORATION WITH CONSTRUCTED RIFFLE & GRADE CONTROL LOG STRUCTURE (GCLS) - STREAMS SR-3 & SR-9 - TYPICAL SECTION VIEW



FLOODPLAIN RESTORATION WITH POOL AND WETLAND DEPRESSATIONAL AREA (WDA) - STREAMS SR-3 & SR-9 - TYPICAL SECTION VIEW



NOTES:

1. ANCHOR STAKES SHALL BE SPACED 4.0' O.C. WITHIN 10' OF CHANNEL EDGE, OVER SUPERGRADE FURNISHED RIPRAP, AND 2.0' O.C. ALONG ALL SEAMS. ANCHOR STAKES SHALL BE SPACED 6.0' O.C. ON SIDE SLOPES.
2. WHEN PLACING CLASS I RIPRAP, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SALVAGED STREAMBED MATERIAL SHALL BE WASHED INTO THE CLASS I RIPRAP TO ENSURE ALL INTERSTITIAL Voids ARE FILLED AND SURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED.
3. SEEDING MUST OCCUR PRIOR TO PLACEMENT OF TYPE D SOIL STABILIZATION MATTING AND/OR FLOODPLAIN MATTING.
4. ALL MATTING SHALL OVERLAP IN A DOWN VALLEY OR DOWNSTREAM DIRECTION.
5. 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.

9. SEE SHEET DE-02 FOR RIPRAP AND BANK RUN GRAVEL TABLES

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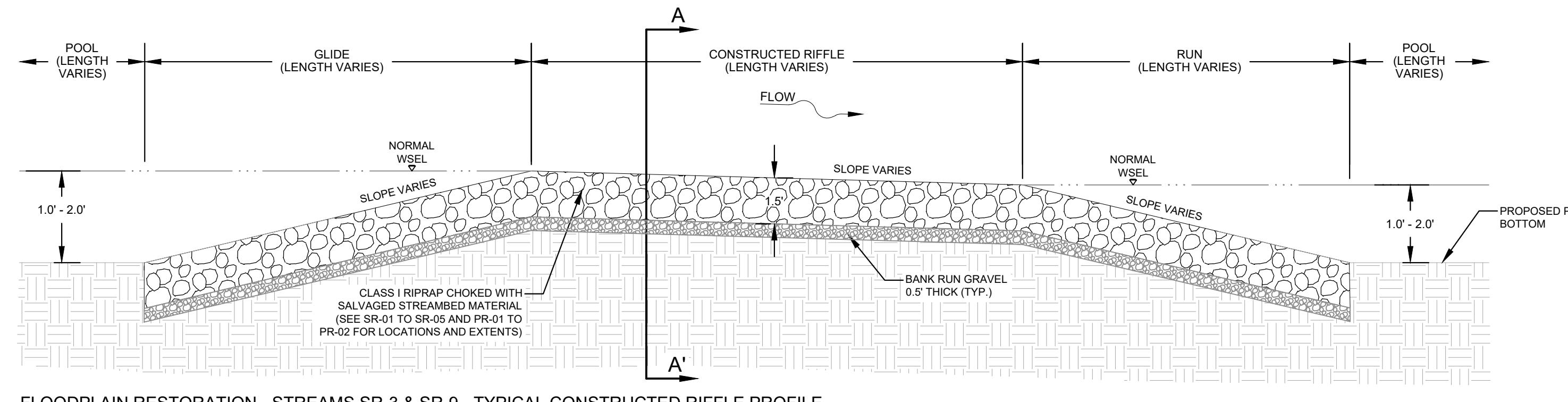
6/14/24

Revisions	
Drawn By : PJB , JLL	
Designed By : IPT , PJB	
Reviewed By : CAL	
Drawing No. DE-01 of DE-05	
Sheet No. 17 of 49	

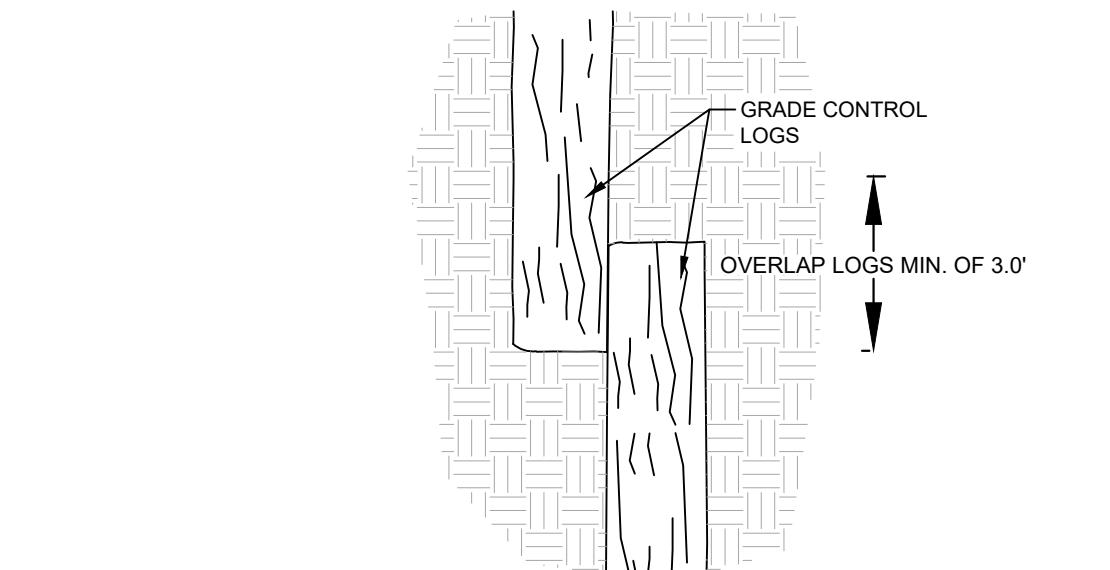
HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

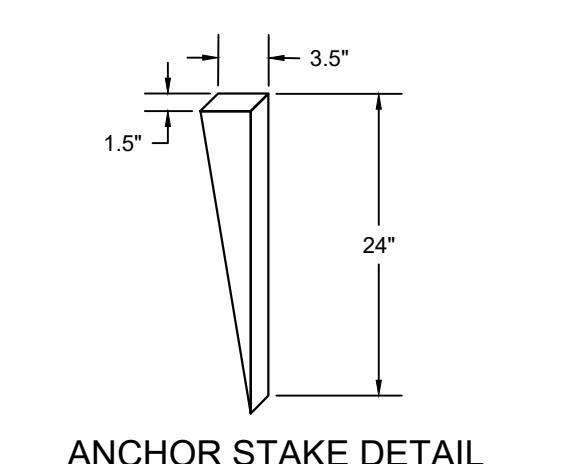


FLOODPLAIN RESTORATION - STREAMS SR-3 & SR-9 - TYPICAL CONSTRUCTED RIFFLE PROFILE

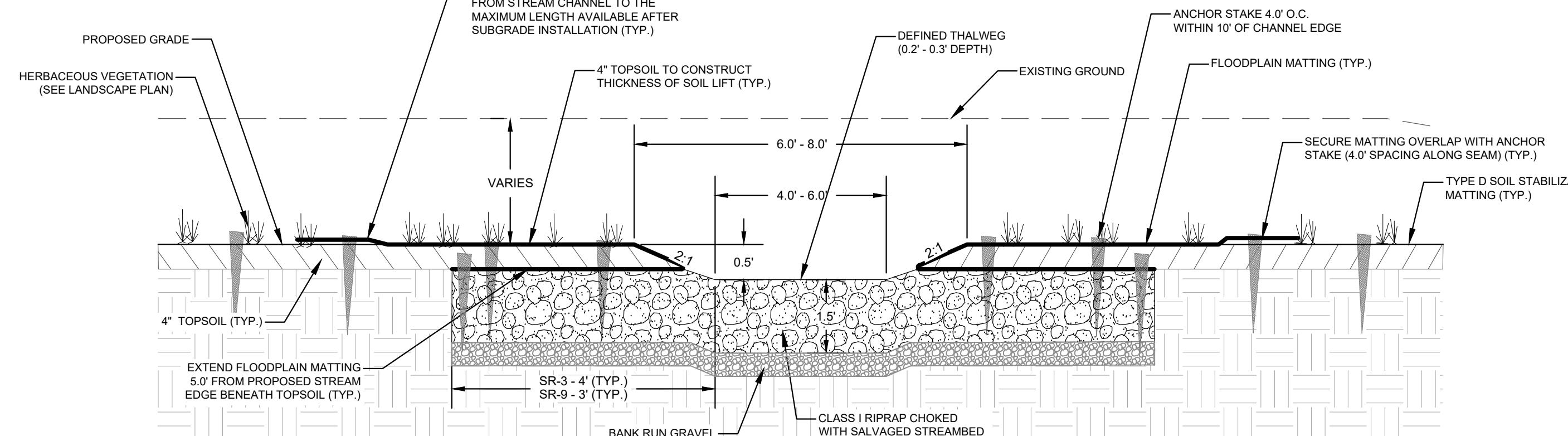


GRADE CONTROL LOG OVERLAP - PLAN VIEW

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



ANCHOR STAKE DETAIL
NOT TO SCALE
NOTE: ANCHOR STAKES SHALL BE TAPERED TWO FOOT LONG WOODEN STAKES CONSISTING OF STANDARD 2" X 4" WOODEN BOARDS CUT DIAGONALLY.



FLOODPLAIN RESTORATION - STREAMS SR-3 & SR-9 - CONSTRUCTED RIFFLE - SECTION A-A'

MD SHA STANDARD RIPRAP SIZE CLASSES		
MD SHA RIPRAP	D ₅₀	D ₁₀₀
CLASS I	9.5 IN	15 IN
CLASS II	16 IN	24 IN

NOTE: MD SHA RIPRAP SIZE CLASSES USED TO SIZE STONE THAT, IN CONJUNCTION WITH MEETING COLOR AND COMPOSITION REQUIREMENTS, WILL QUALIFY FOR USE AS RIPRAP.

TYPE D SOIL STABILIZATION MATTING SPECIFICATION

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 lbs/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

BANK RUN GRAVEL

% OF PARTICLE SIZE LESS THAN	PARTICLE DIAMETER PASSING THROUGH SIEVE (IN) OR SIEVE NO.
100	2.5 IN.
85	1 IN.
60-85	0.5 IN.
35-85	No. 10
20-55	No. 40

GEOTEXTILE SPECIFICATION

MARYLAND APPLICATION CLASS	TYPE OF GEOTEXTILE	GRAB STRENGTH lb	PUNCTURE STRENGTH lb	PERMEABILITY sec	APPARENT OPENING SIZE, MAX	TRAPEZOID TEAR STRENGTH (MD ²) lb
SE	TYPE I NONWOVEN MONOFILAMENT	160	310	0.50	0.43	55
	TYPE II WOVEN MONOFILAMENT	250	495	0.50	0.41	90
PE	TYPE I NONWOVEN MONOFILAMENT	160	310	0.20	0.25	55
	TYPE II WOVEN MONOFILAMENT	250	495	0.20	0.25	90
SI	TYPE I NONWOVEN MONOFILAMENT	200	450	0.70	0.41	80
	TYPE II WOVEN MONOFILAMENT	250	450	0.70	0.41	90
ST	TYPE I NONWOVEN	200	310	0.20	0.25	55
	TYPE II WOVEN	250	450	0.20	0.25	90
F	TYPE I NONWOVEN	200	220	0.10	0.22	80
	TYPE II WOVEN MONOFILAMENT	250	370	0.10	0.22	70
E	TYPE I NONWOVEN	160	310	0.20	0.30	80
	TYPE II WOVEN MONOFILAMENT	250	450	0.20	0.30	90

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: ALL PROPERTY VALUES ARE BASED ON AVERAGE ROLL VALUES 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

FLOODPLAIN MATTING SPECIFICATION

Nedia
Enterprises, Inc.

Tel: (888) 725-6899
Fax: (571) 223-0202

Technical Specifications for

Nedia KoiWrap™ 1000

Nedia KoiWrap™ 1000 is a double layered biodegradable erosion control fabric made up of an outer layer of high strength coir fabric and an inner layer of lightweight jute fabric tied together at regular intervals. Ideal for banks, encapsulated soil lifts; this product effectively replaces the traditional use of a coir fiber matting in combination with a non-woven coir blanket.

Property	Test Method	Typical Value
Thickness	ASTM D 5199	0.35 in 0.90 cm
Mass per unit area	ASTM D 5261	33.3 oz/sq.yd 1130 g/sq.m
Wide Width Tensile Strength MD X TD (Primary Layer)	ASTM D 4595	1008 x 938 lbs/ft 14.7 x 13.7 kN/m
Machine Elongation MD X TD (Primary Layer)	ASTM D 4595	30% x 26%
Wide Width Tensile Strength MD X TD (Secondary Layer)	ASTM D 4595	612 x 468 lbs/ft 8.94 x 8.83 kN/m
Machine Elongation MD X TD (Secondary Layer)	ASTM D 4595	8% x 9%
Puncture Strength (Secondary Layer)	GRI GS1	553 lbs 2,461 N
Flexural Rigidity (Stiffness)	ASTM D 1388	0.692 x 0.690 oz-in 49.8 x 49.7 g-cm
Water Absorption	ASTM D 1117	146%
shear Stress (Tensile Strength)	Flume Test	4.5 psf 215 Pa
Water Velocity (Recommended)	Flume Test	12 ft/sec 3.7 m/sec
Functional Longevity	Observed	3 to 5 years
Permeability	ASTM D 4491	3.07 sec
Permeability	ASTM D 4491	1.03 in/sec 2.61 cm/sec
Flow Rate	ASTM D 4491	229 gal/min/sq.ft 9.36 cu.m/min/sq.m
Standard Roll Size: 13.1' x 83' (4m x 25m) - 120 sq/roll		



www.nedia.com + info@nedia.com

NOTES:

1. NEDIA KOIRWRAP 1000 MAY BE SUBSTITUTED WITH MATTING MEETING OR EXCEEDING NEDI KOIRWRAP 1000 STANDARDS.
2. ALL MATTING SUBSTITUTIONS MUST BE APPROVED BY THE PROJECT ENGINEER PRIOR TO INSTALLATION.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Revisions

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EG-SWMENG- TBD	
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6/14/24	

Drawn By : PJB , JLL

Scale : N/A

Designed By : IPT , PJB

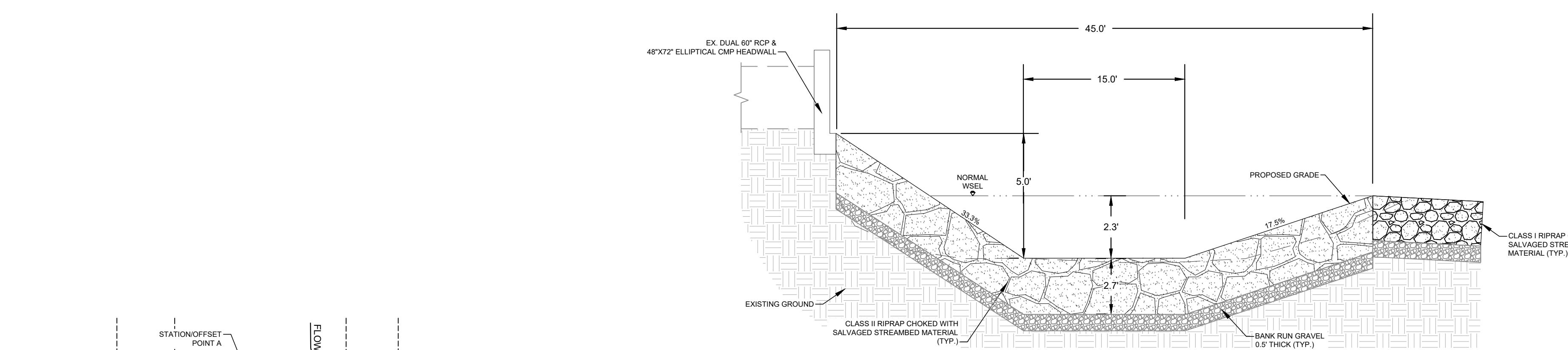
Date : 06 / 24

Reviewed By : CAL

Sheet No.

Drawing No. DE-02 of DE-05

18 of 49



PRE-FORMED SCOUR POOL (PSP) - TYPICAL DETAIL - PROFILE VIEW

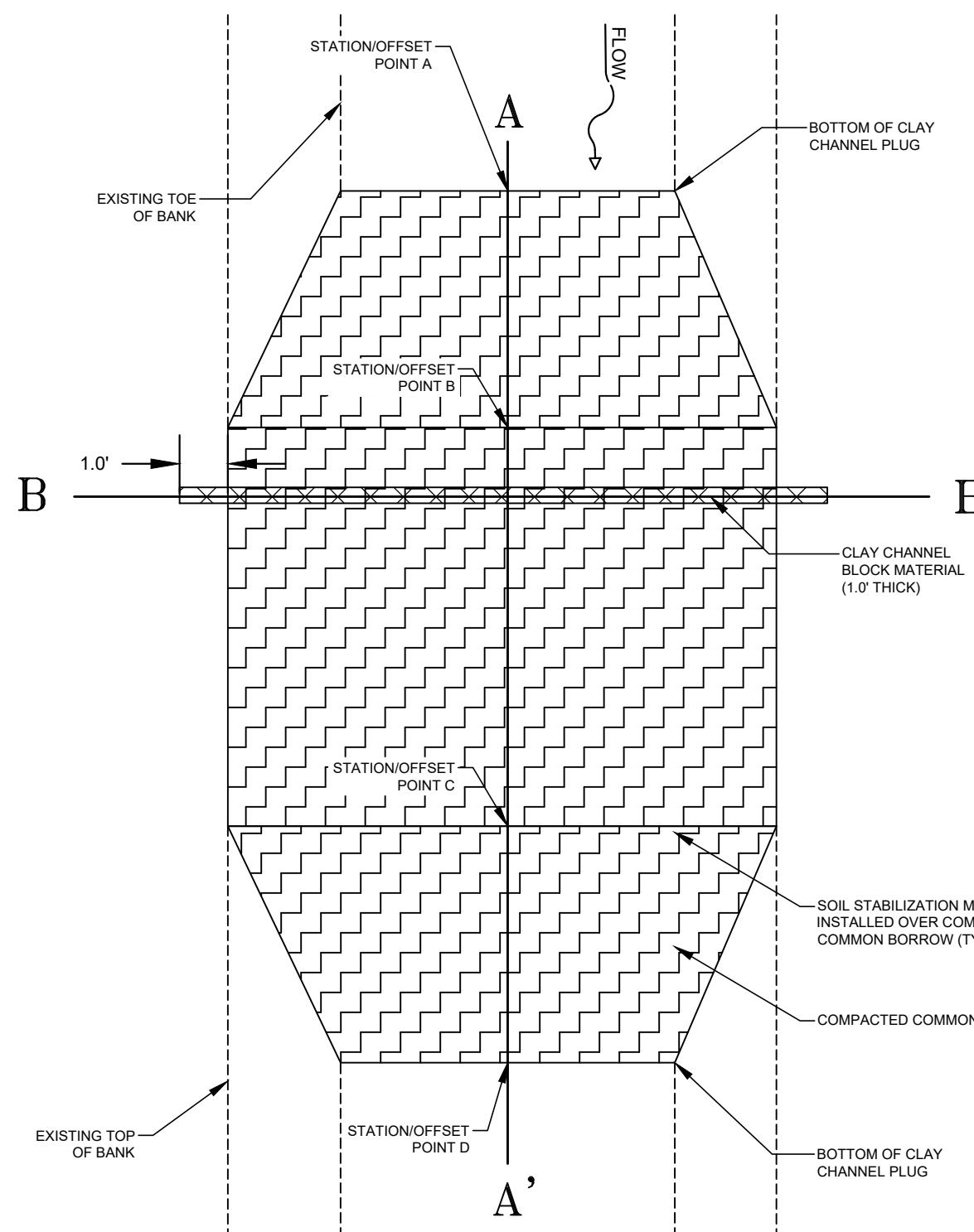
NOTES:

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

FOREBAY (FB) - TYPICAL DETAIL - PROFILE VIEW

NOTES:

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

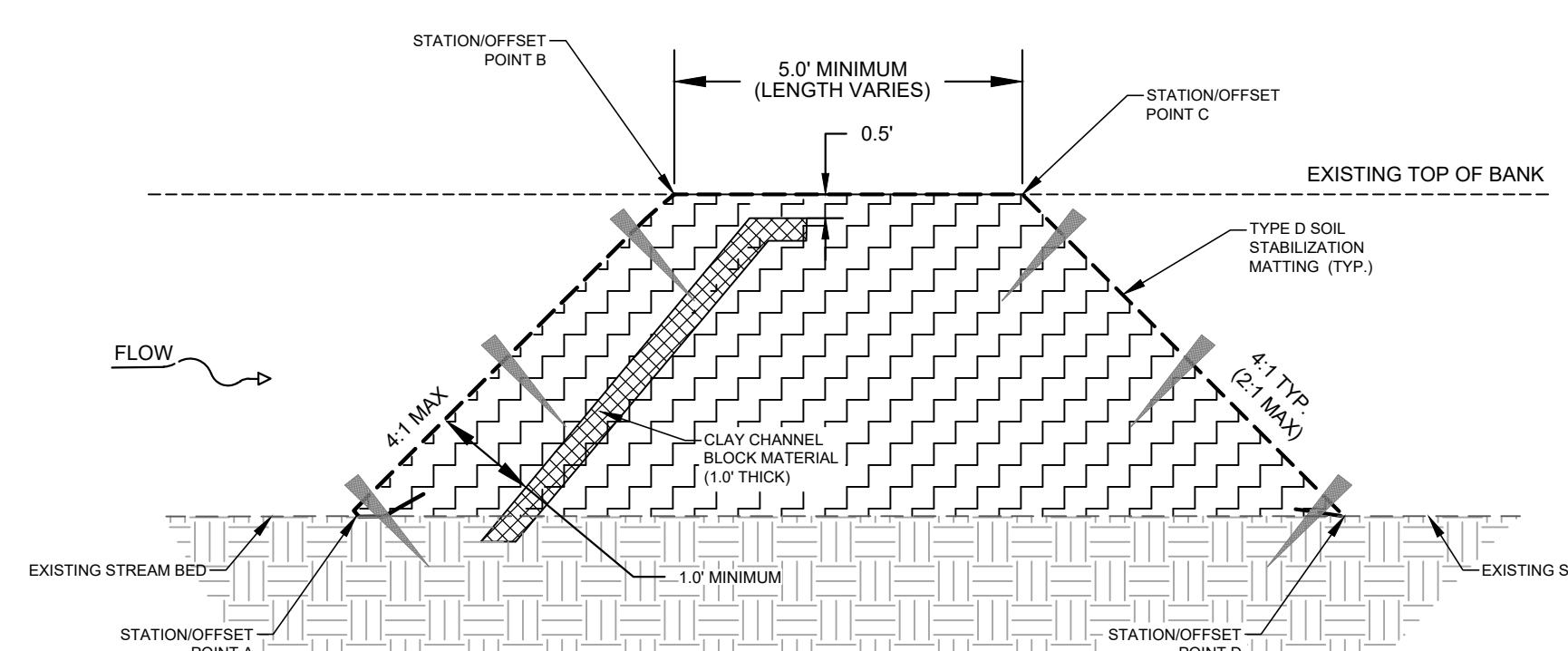


FORMED SCOUR POOL (PSP) - TYPICAL DETAIL - SECTION VIEW

THE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS
SALVAGED STREAMBED MATERIAL TO BE WASHED INTO RIPRAP BY HYDRAULIC ACTION.



CHANNEL PLUG (CP) - CROSS SECTION B-

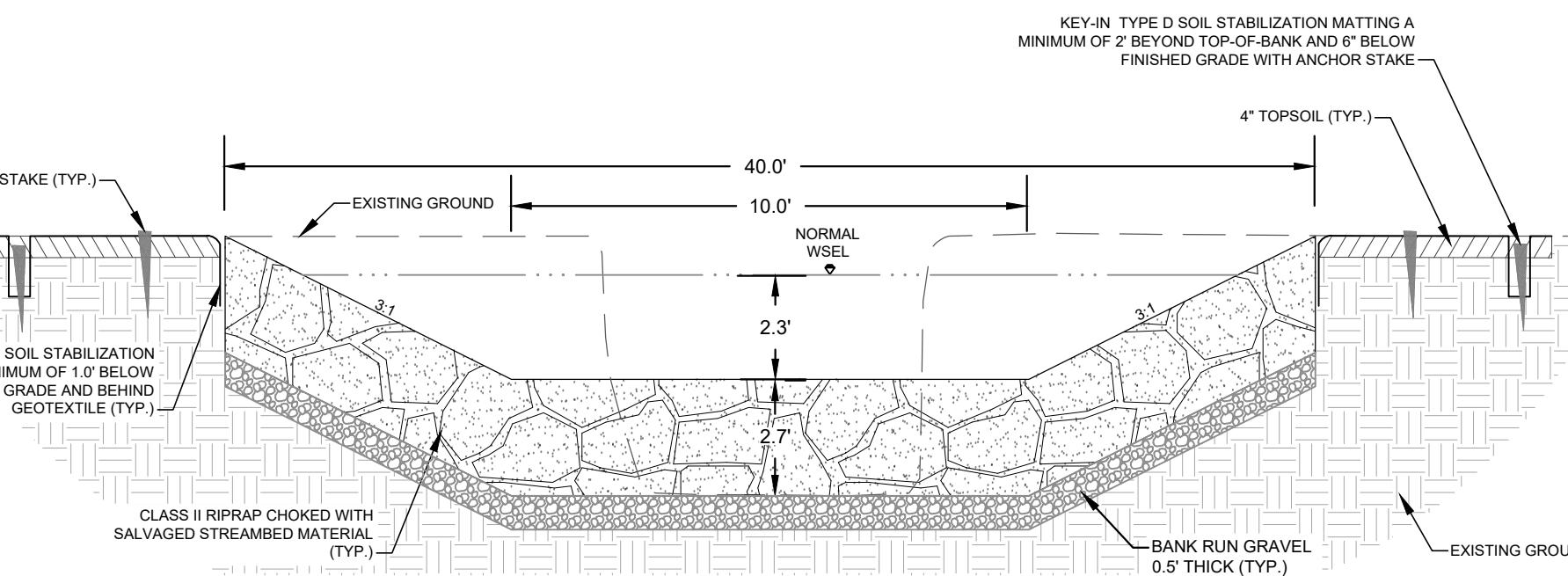


CHANNEL PLUG (CP) - CROSS SECTION A-A'

NOT TO SCALE

CHANNEL PLUG SEQUENCE OF CONSTRUCTION:

- 1) THE EXISTING CHANNEL SHALL BE FILLED WITH ON-SITE COMPAKTED COMMON BORROW. PORTIONS OF THE EXISTING CHANNEL ARE OUTSIDE OF THE LOD, SEE SHEET SR-02 FOR EXTENTS OF CHANNEL FILL.
- 2) THE CHANNEL PLUG SHALL BE CONSTRUCTED DOWNSTREAM TO UPSTREAM, THE TOP OF THE CHANNEL PLUG SHALL TIE INTO THE TOP OF EXISTING BANK ELEVATION.
- 3) PRIOR TO REACHING FINAL GRADE OF THE UPSTREAM SLOPE, THE CLAY CHANNEL BLOCK MATERIAL SHALL BE LAID FLAT ON THE UPSTREAM SLOPE AND KEYED IN A MINIMUM OF 1.0' INTO THE BED AND BANK. CLAY CHANNEL BLOCK MATERIAL IS TO BE PLACED AND COMPAKTED TO REACH A THICKNESS OF 1.0'.
- 4) ONCE CLAY CHANNEL BLOCK MATERIAL IS INSTALLED, CONTINUE BUILDING CHANNEL PLUG TO FINAL GRADE SHOWN.
- 5) INSTALL SOIL STABILIZATION MATTING AS SHOWN.



FORMED SCOUR POOL (PSP) - TYPICAL DETAIL - SECTION VIEW

THE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS
SALVAGED STREAMBED MATERIAL TO BE WASHED INTO RIPRAP BY HYDRAULIC ACTION.

KEY-IN TYPE D SOIL STABILIZATION MATTING A
MINIMUM OF 2' BEYOND TOP-OF-BANK AND 6" BELOW
FINISHED GRADE WITH ANCHOR STAKE

COMPACTED COMMON BORROW

1.0'

0.5'

EXISTING GROUND

CLAY CHANNEL BLOCK MATERIAL (1.0' THICK)

CLAY CHANNEL BLOCK MATERIAL SHALL BE KEYED
IN A MINIMUM OF 1.0' INTO

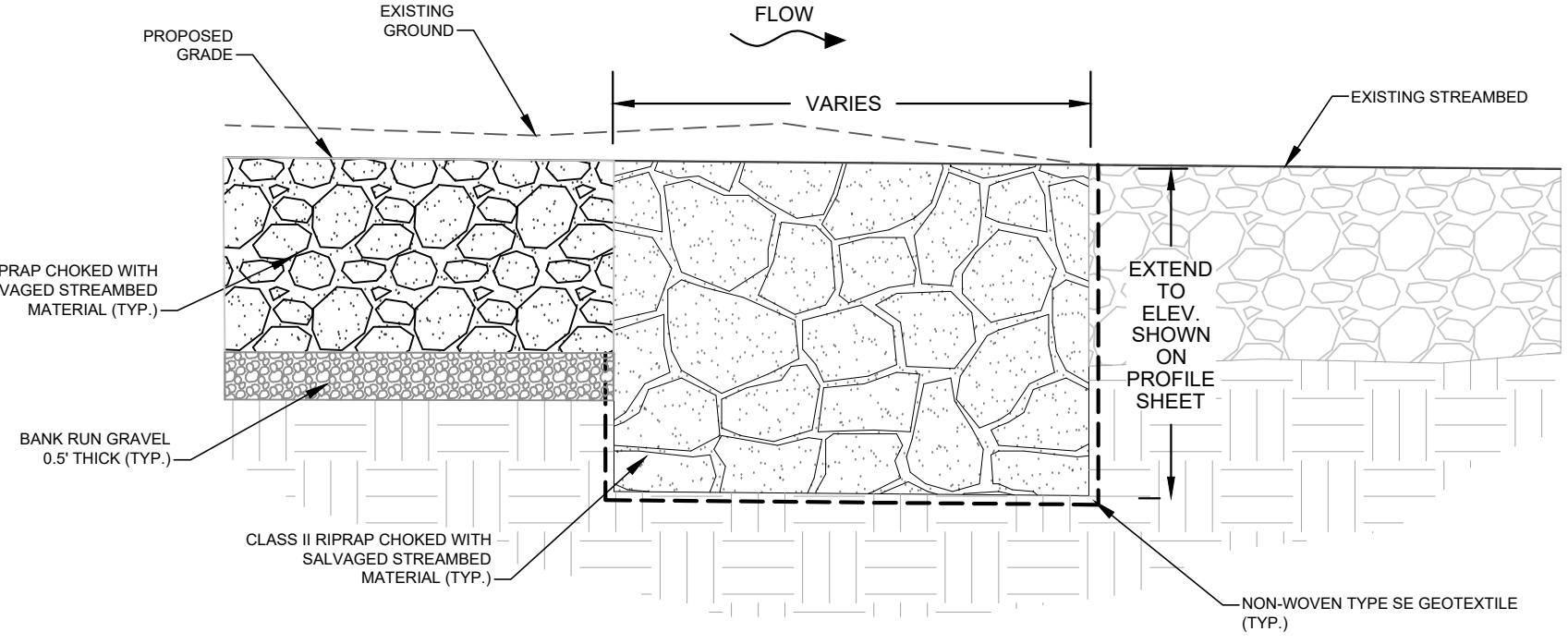
Detailed description: This technical diagram shows a cross-section of a soil stabilization project. At the top, a label specifies 'KEY-IN TYPE D SOIL STABILIZATION MATTING A MINIMUM OF 2' BEYOND TOP-OF-BANK AND 6" BELOW FINISHED GRADE WITH ANCHOR STAKE'. Below this, a line labeled 'COMPACTED COMMON BORROW' points to a horizontal surface. A vertical dimension line indicates a height of '1.0'' from the bottom of the matting to the 'EXISTING GROUND' line. A horizontal dimension line indicates a distance of '0.5'' from the 'EXISTING GROUND' line to the edge of the matting. The matting itself is represented by a grid pattern. A thick vertical line labeled 'CLAY CHANNEL BLOCK MATERIAL (1.0' THICK)' extends from the bottom of the matting into the ground. A note at the bottom right states 'CLAY CHANNEL BLOCK MATERIAL SHALL BE KEYED IN A MINIMUM OF 1.0' INTO'.



FOREBAY (FB) - TYPICAL DETAIL - SECTION VIEW

NOTES:

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



BED SILL - PROFILE VIEW

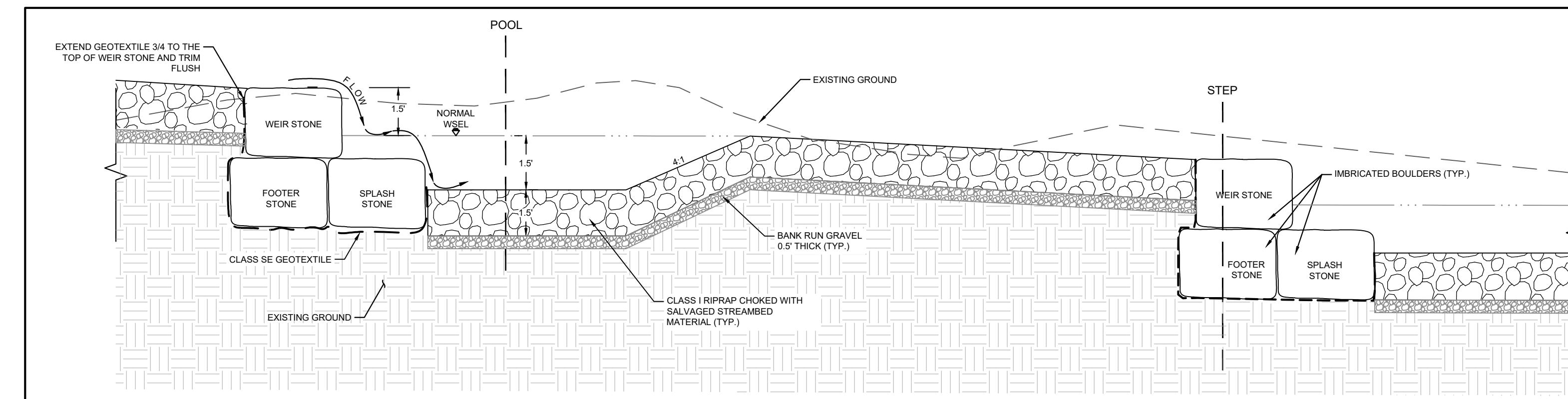
NOTES:

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

HARFORD COUNTY MARYI AND

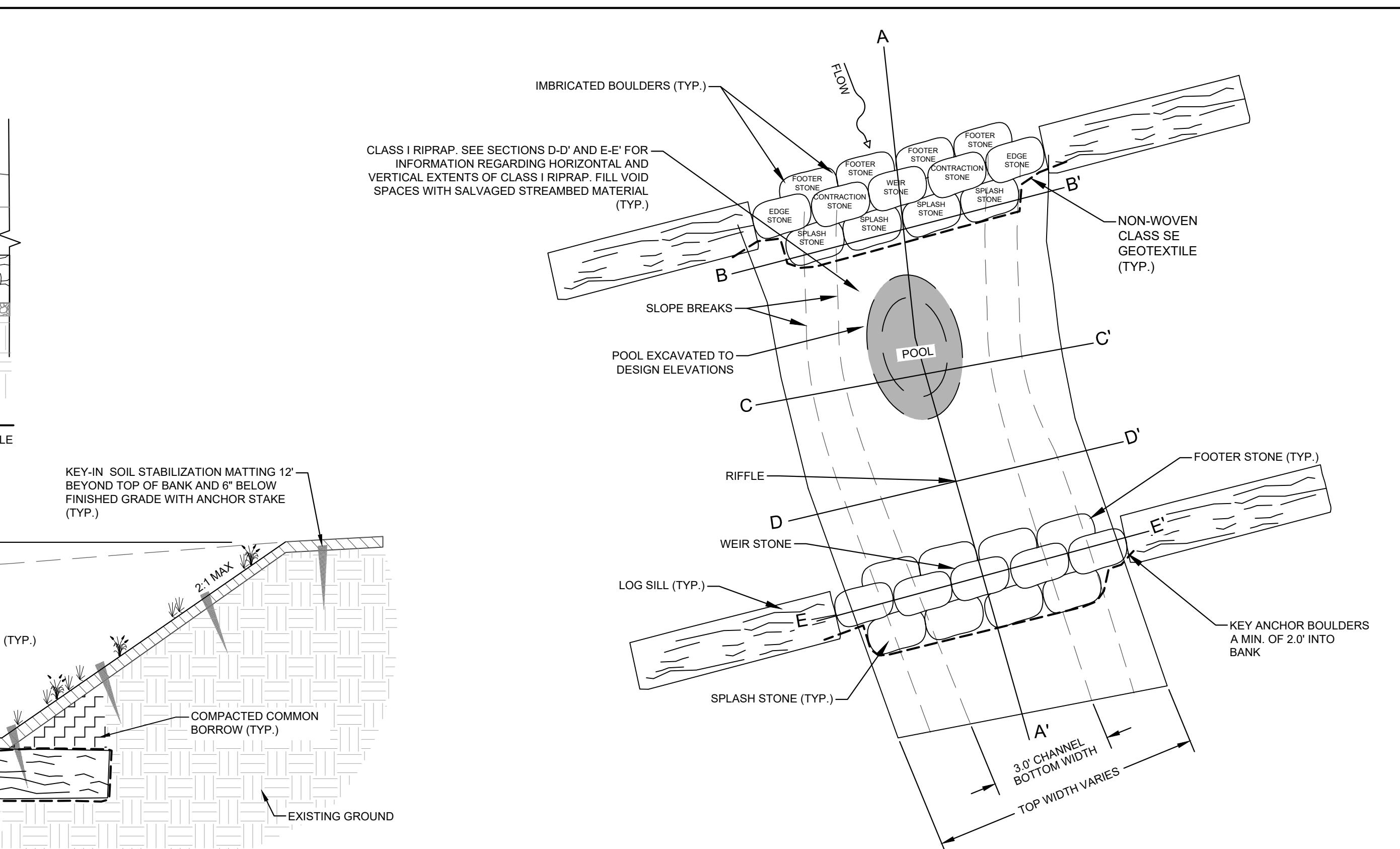
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STREAM SR-9 ROCK STEP STRUCTURE (RSS) - PROFILE VIEW A-A'

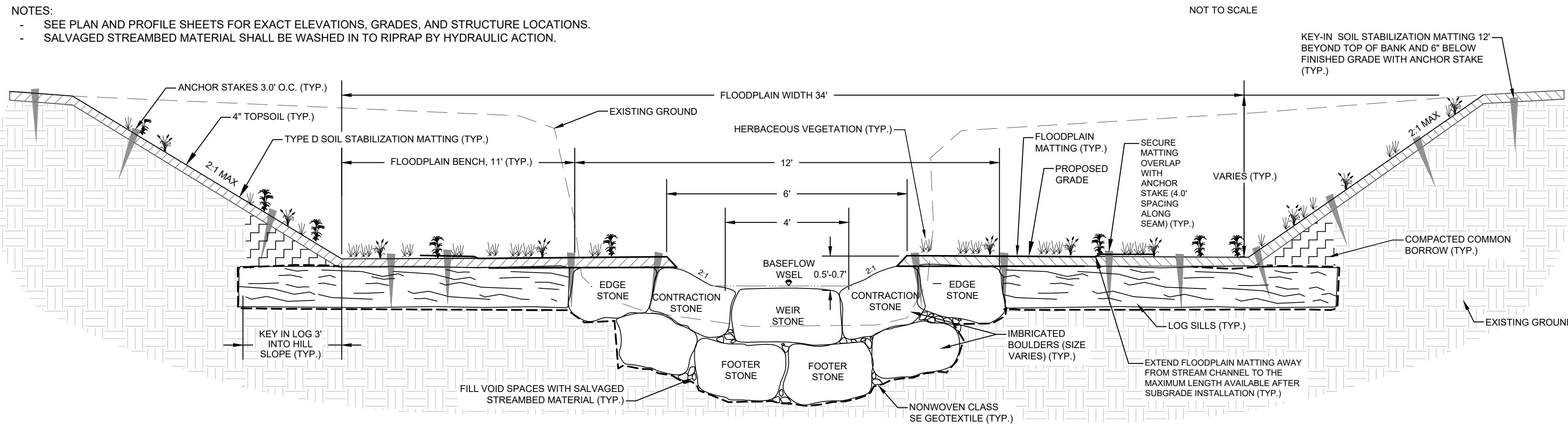
NOTES:
 - SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS.
 - SALVAGED STREAMBED MATERIAL SHALL BE WASHED IN TO RIPRAP BY HYDRAULIC ACTION.



STREAM SR-9 - ROCK STEP STRUCTURES (RSS) - PLAN VIEW

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

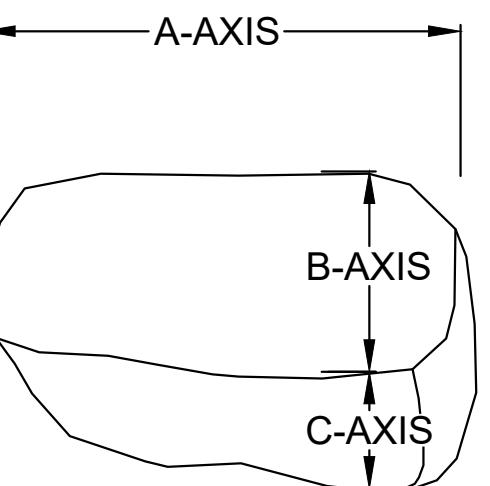
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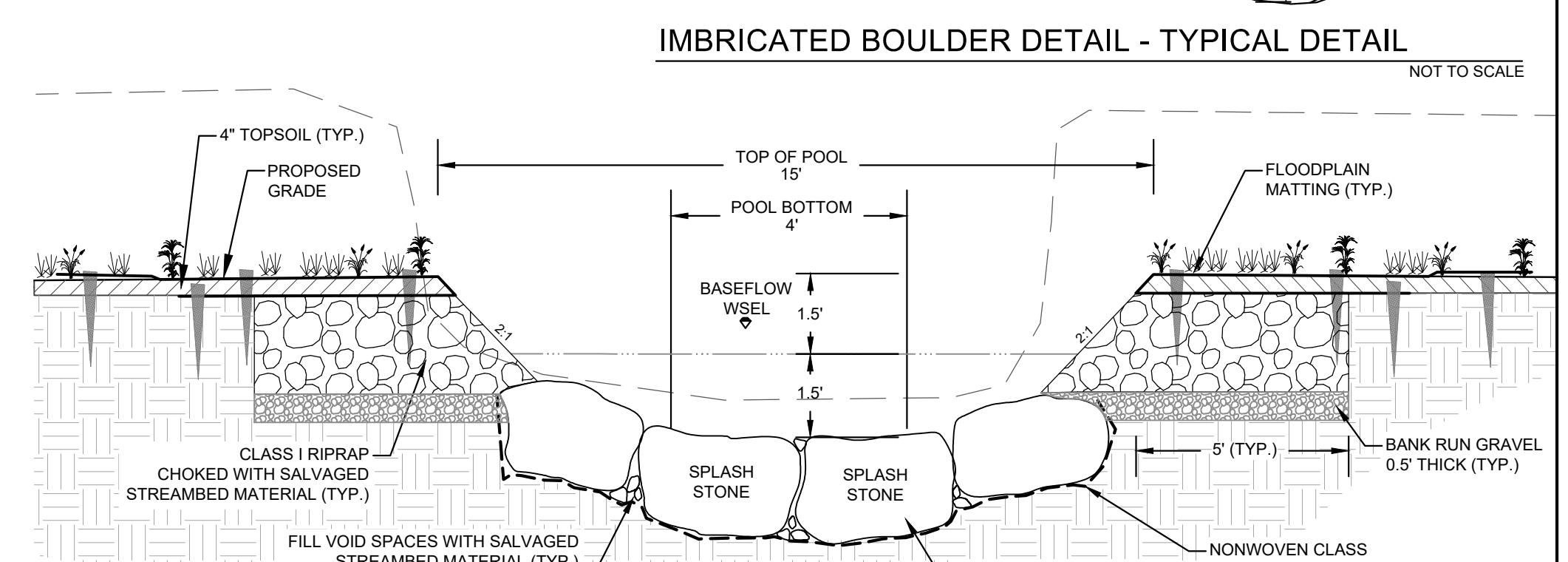
STREAM SR-9 ROCK STEP STRUCTURE (RSS) - SECTION VIEW E-E' (STEP)

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

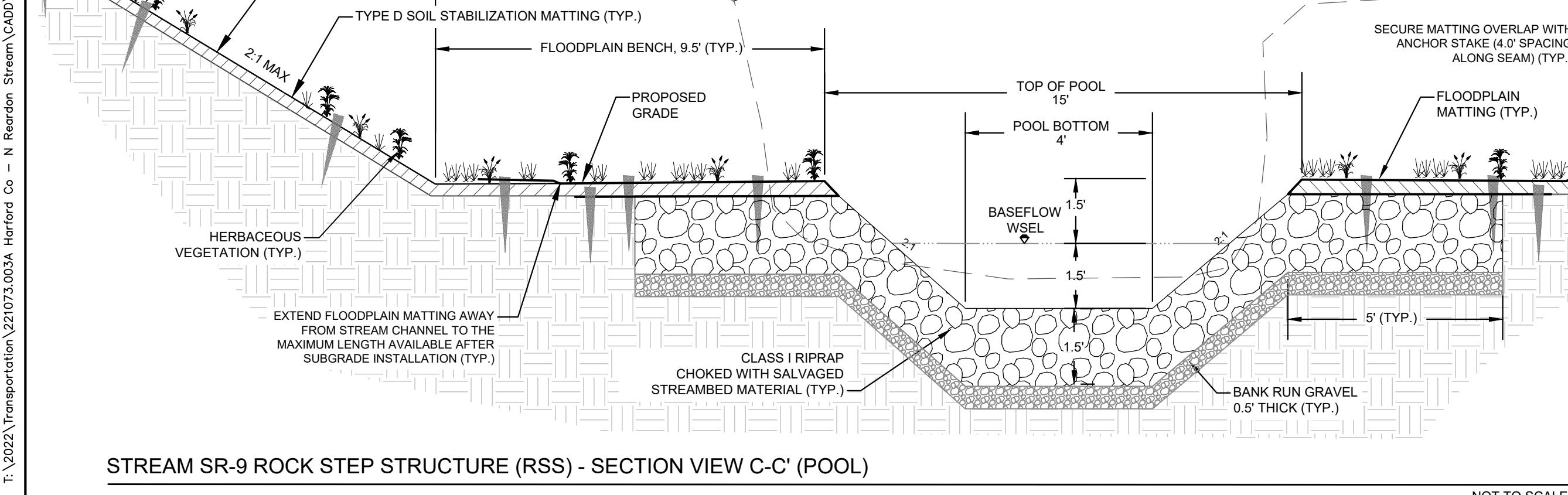
IMBRICATED BOULDERS SHALL HAVE A MINIMUM DENSITY GREATER THAN 150 IBS/FT³ AND BE BROWN OR GRAY IN COLOR. NO WHITE STONE WILL BE ALLOWED. THE STONE SHALL NOT DISINTEGRATE FROM THE ACTION OF AIR, WATER, OR HANDLING AND PLACING. GRANULAR SEDIMENTARY STONE WILL GENERALLY BE UNACCEPTABLE. CONCRETE WILL NOT BE CONSIDERED AS AN ALTERNATIVE FOR STONE.



IMBRICATED BOULDER DETAIL - TYPICAL DETAIL



STREAM SR-9 ROCK STEP STRUCTURE (RSS) - SECTION VIEW D-D' (RIFFLE)



STREAM SR-9 ROCK STEP STRUCTURE (RSS) - SECTION VIEW C-C' (POOL)

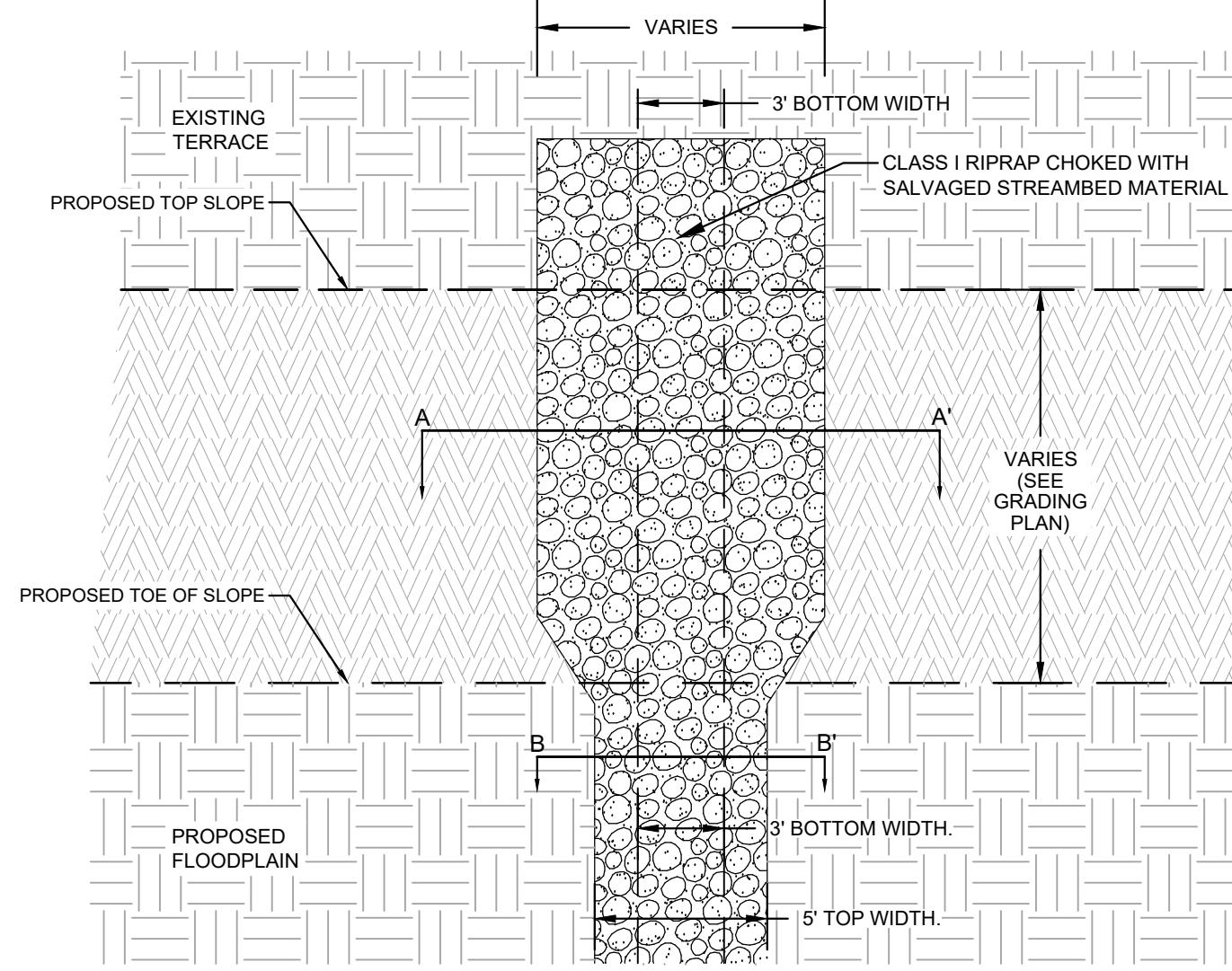
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HARFORD COUNTY, MARYLAND

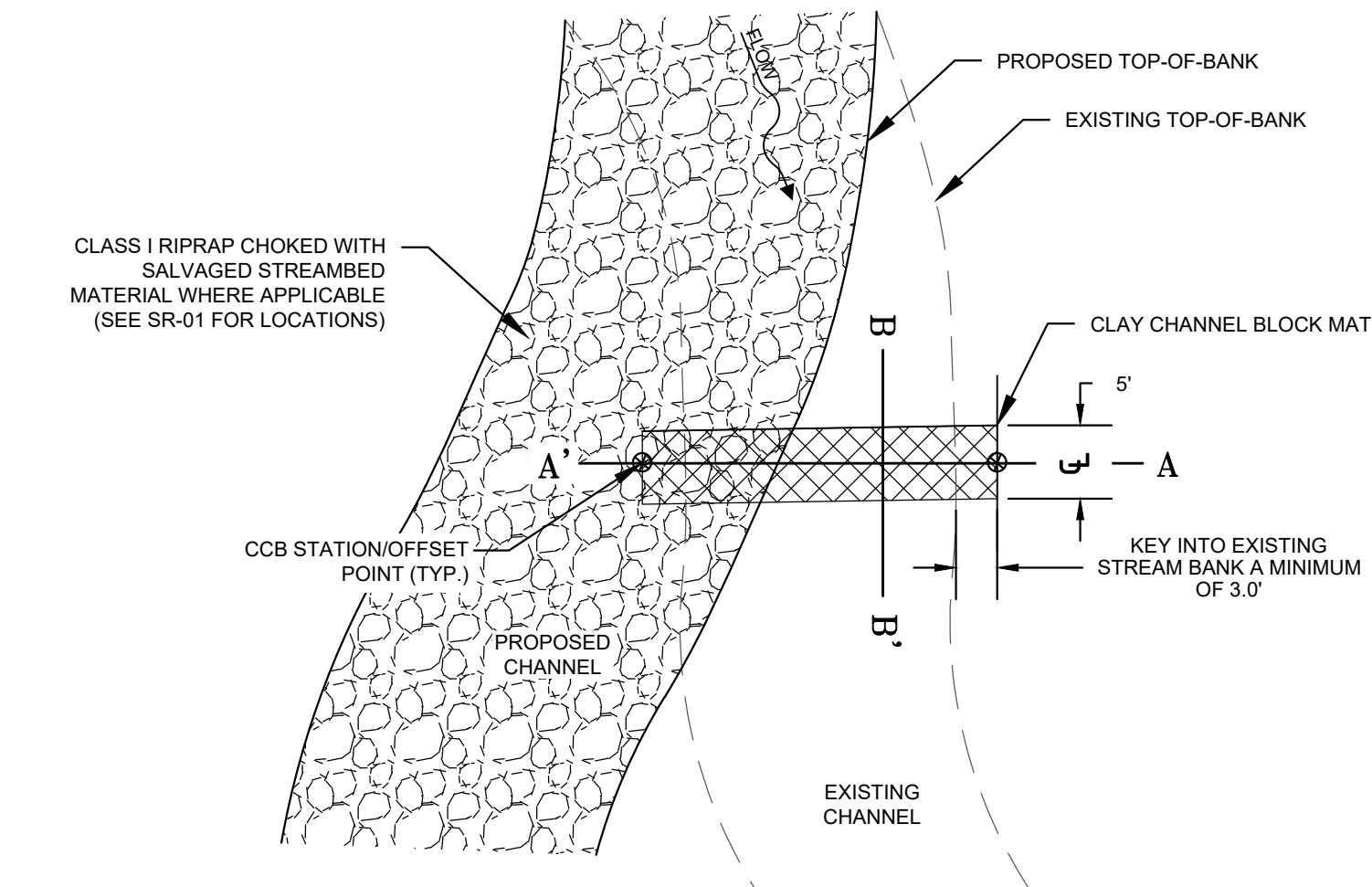
NORTH REARDON STREAM RESTORATION

DETAIL SHEET

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Designed By :	IPT , PJB	Date :	06 / 24
Reviewed By :	CAL		
Drawing No.	DE-04 of DE-05	Sheet No.	20 of 49



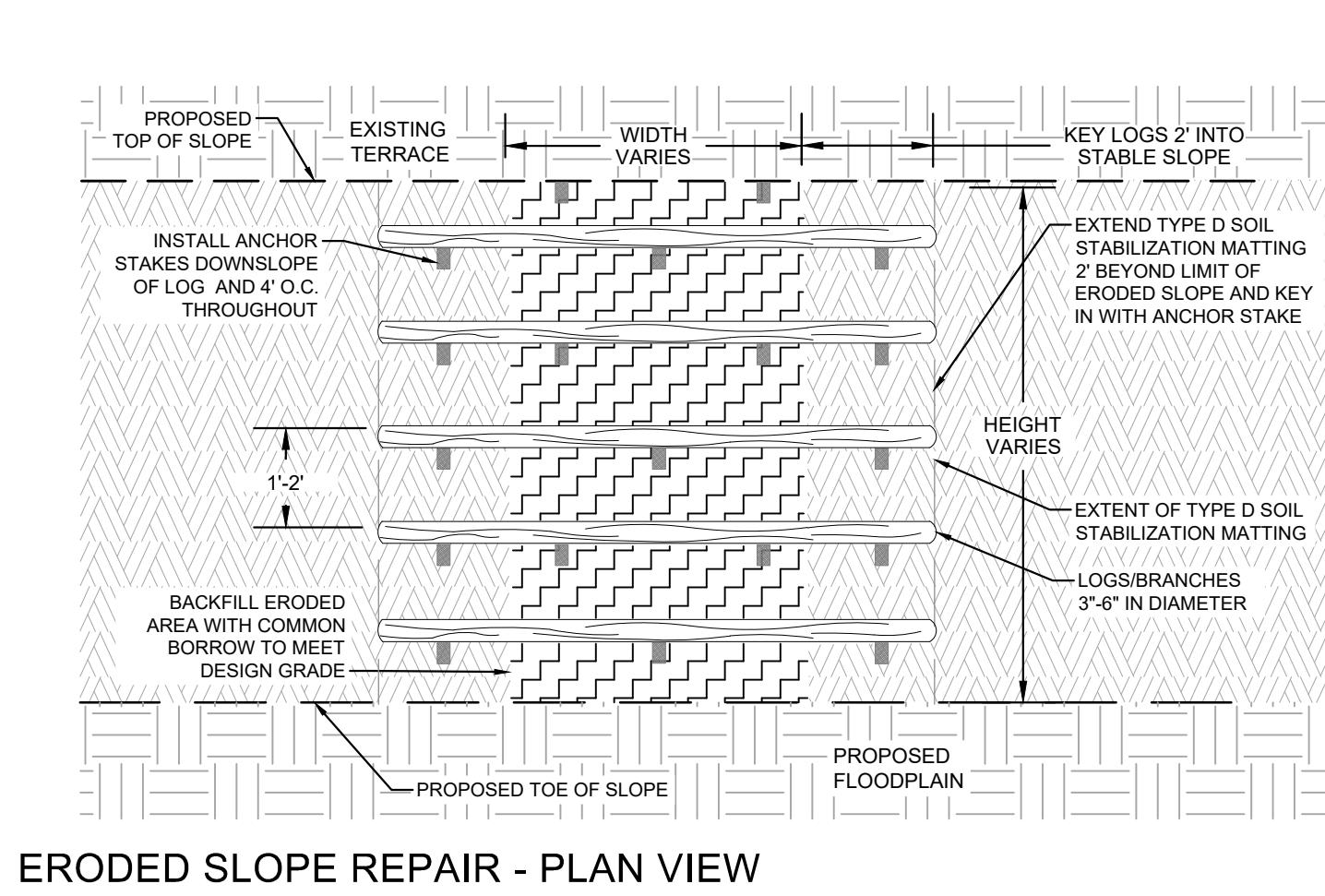
SLOPE STABILIZATION (SS) - PLAN VIEW



CLAY CHANNEL BLOCK (CCB) - PLAN VIEW

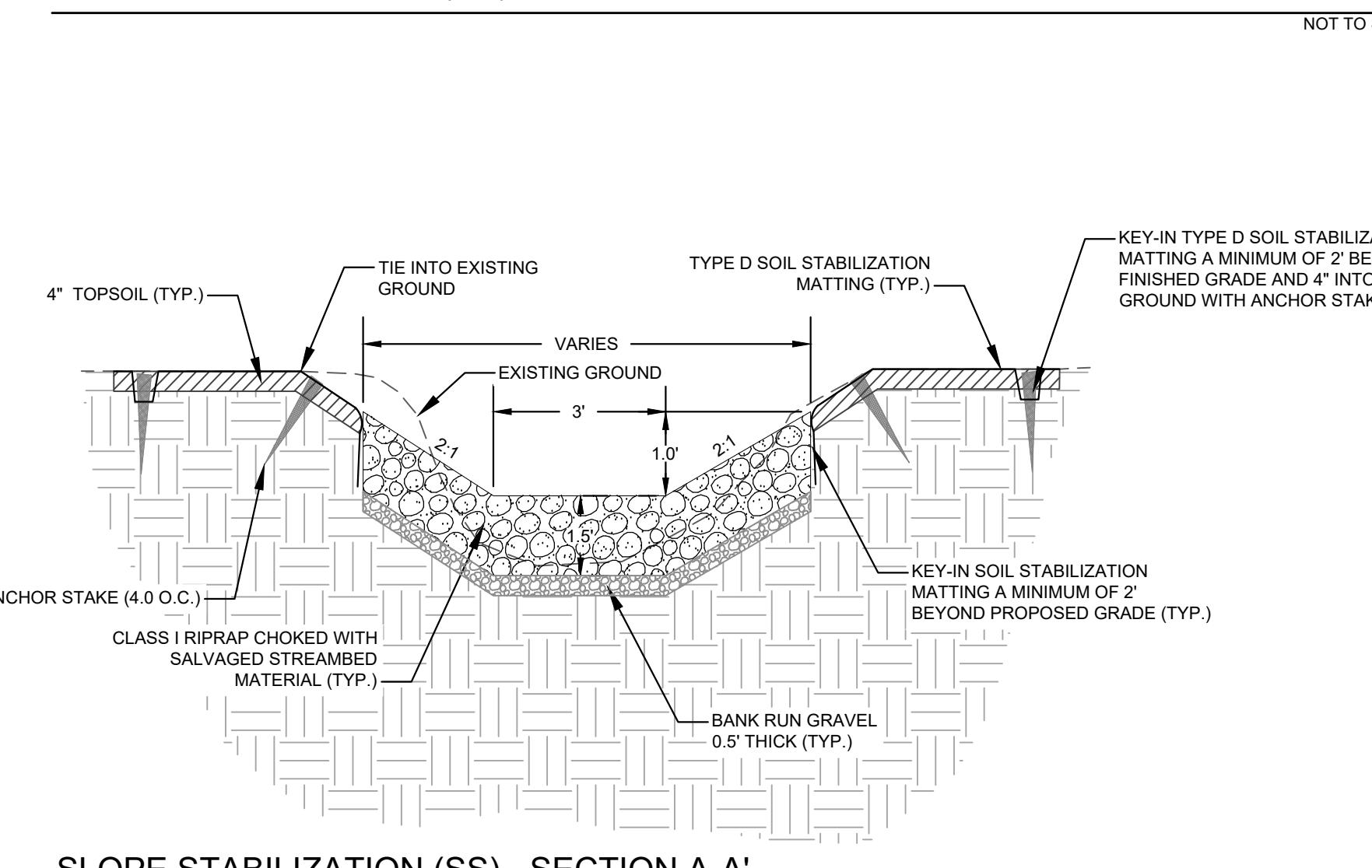
NOTE: SEE CLAY CHANNEL BLOCK CROSS-SECTION DETAILS
ON THIS SHEET FOR ADDITIONAL INFORMATION REGARDING
SUBGRADE CONSTRUCTION.

NOT TO SCALE

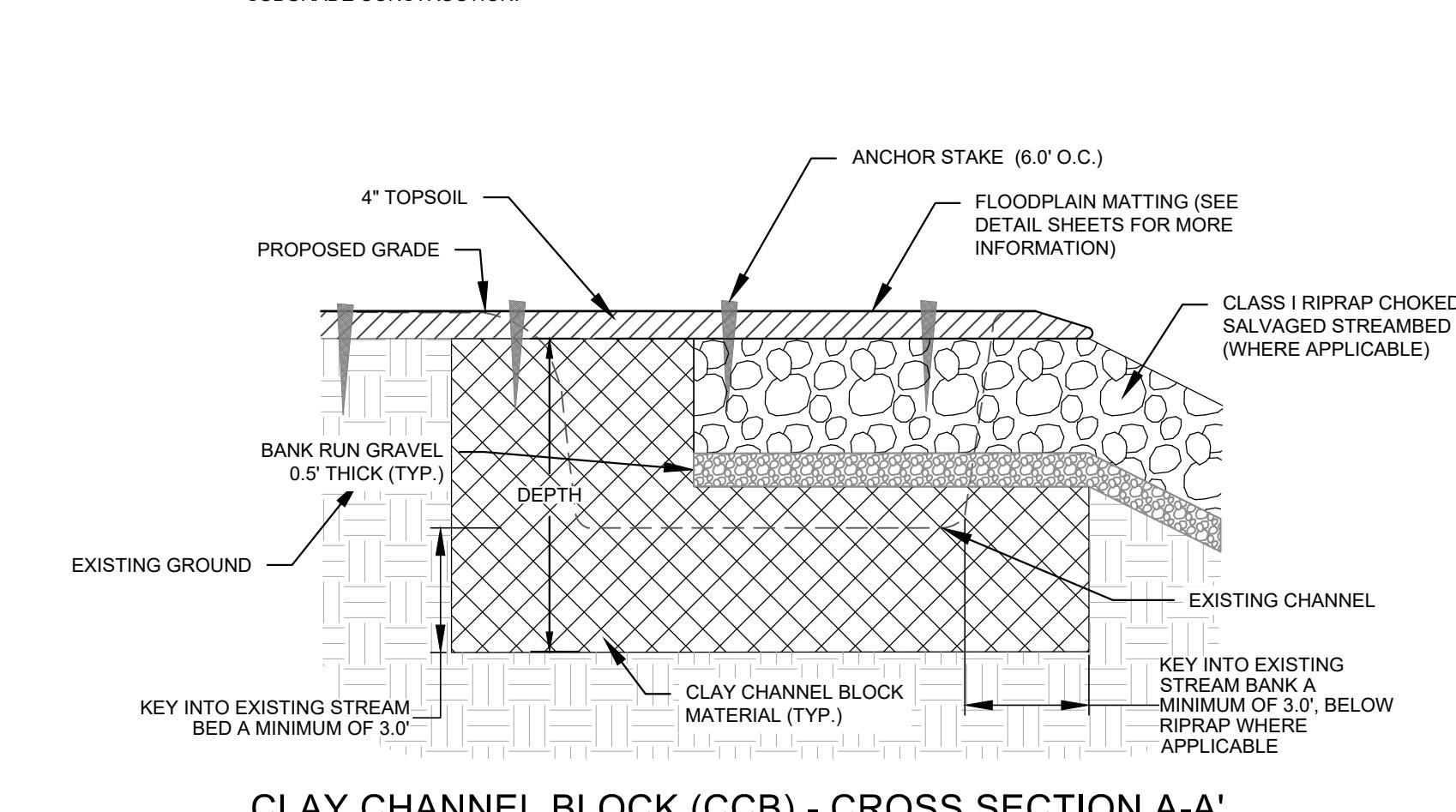


ERODED SLOPE REPAIR - PLAN VIEW

NOT TO SCALE

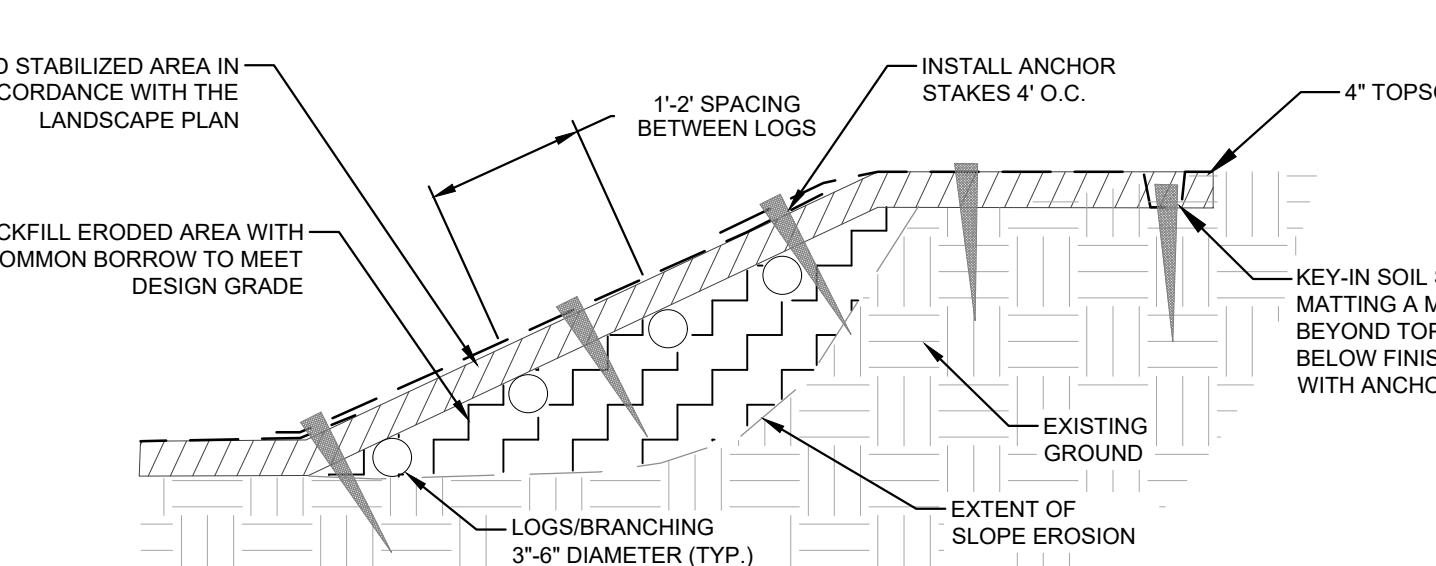


SLOPE STABILIZATION (SS) - SECTION A-A



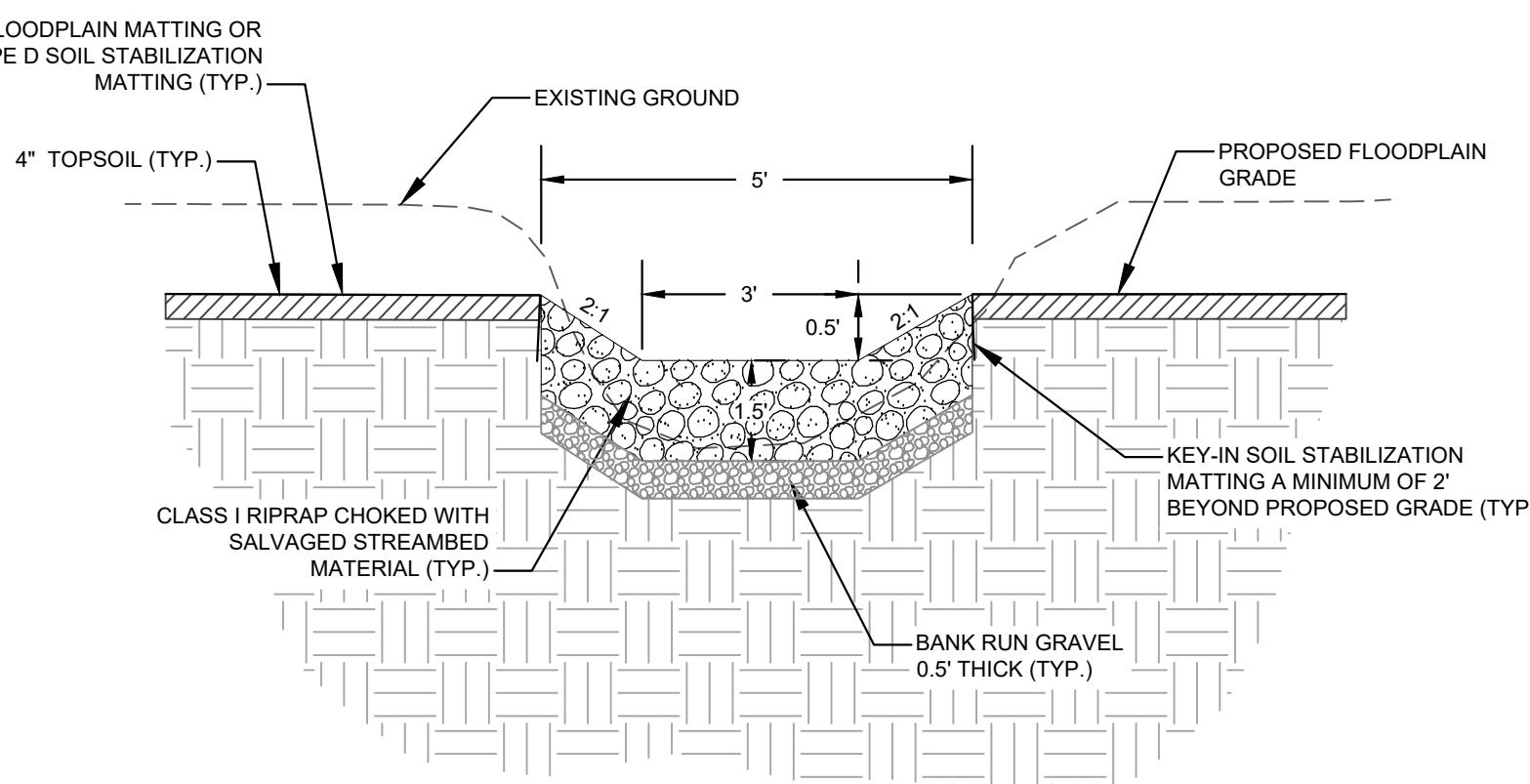
CLAY CHANNEL BLOCK (CCB) - CROSS SECTION A-A'

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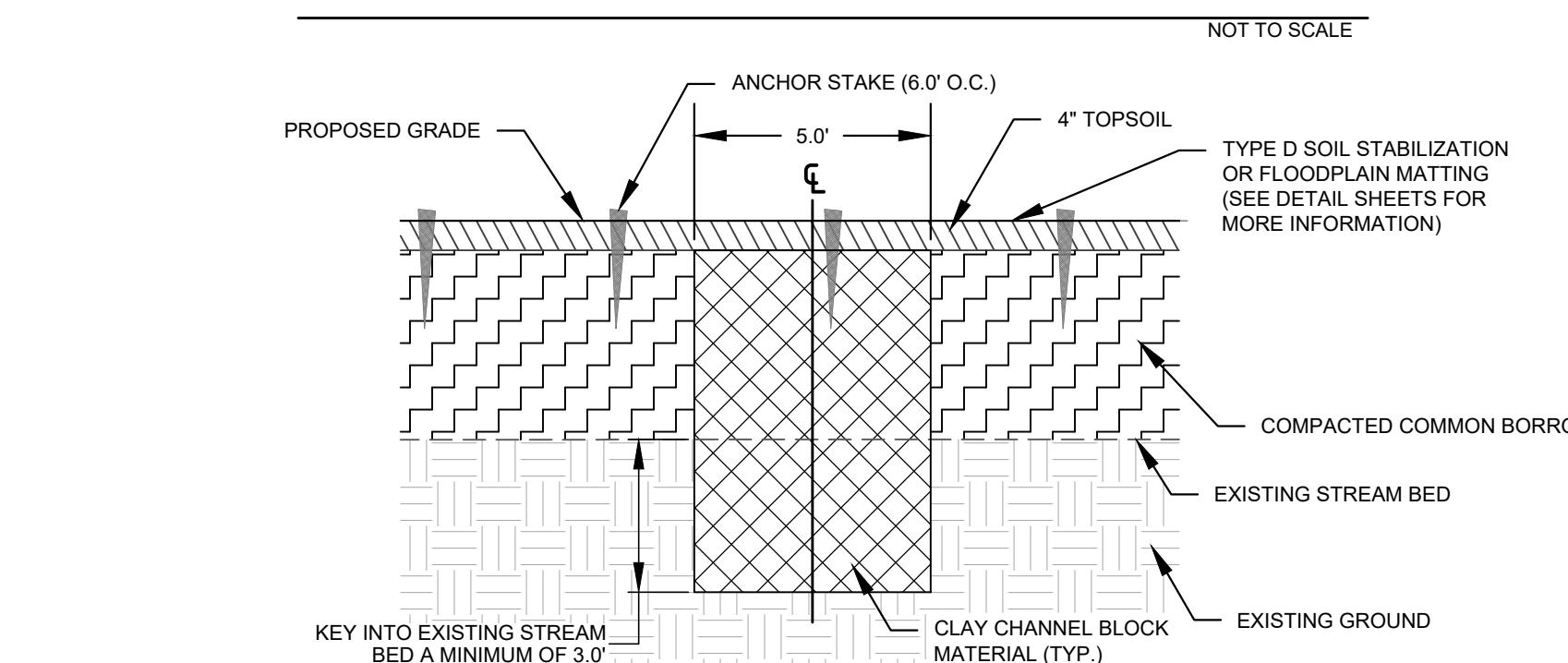


ERODED SLOPE REPAIR - SECTION VIEW

NOT TO SCALE



SLOPE STABILIZATION (SS) - SECTION B-



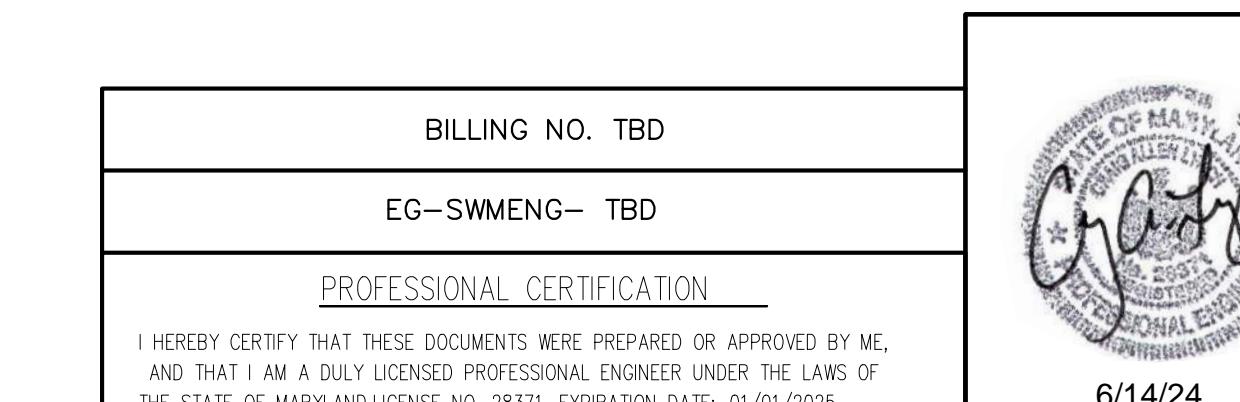
CLAY CHANNEL BLOCK (CCB) - CROSS SECTION B-B'

NOT TO SCALE

- NOT TO SCALE

NOTES:

 1. ALL TYPICAL SECTIONS ARE AS VIEWED FACING DOWNSTREAM
 2. CLAY SHALL BE PLACED IN 12" LIFTS.
 3. ANCHOR STAKES SHALL BE SPACED 4.0' O.C. WITHIN 10' OF CHANNEL EDGE, OVER SUBGRADE FURNISHED RIPRAP, AND ALONG ALL SEAMS. ANCHOR STAKES SHALL BE SPACED 6.0' O.C. IN ALL OTHER LOCATIONS.
 4. SEEDING MUST OCCUR PRIOR TO PLACEMENT OF TYPE D SOIL STABILIZATION MATTING AND/OR FLOODPLAIN MATTING.
 5. WHEN PLACING FURNISHED RIPRAP, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SALVAGED STREAMBED MATERIAL SHALL BE WASHING INTO THE FURNISHED RIPRAP TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED.



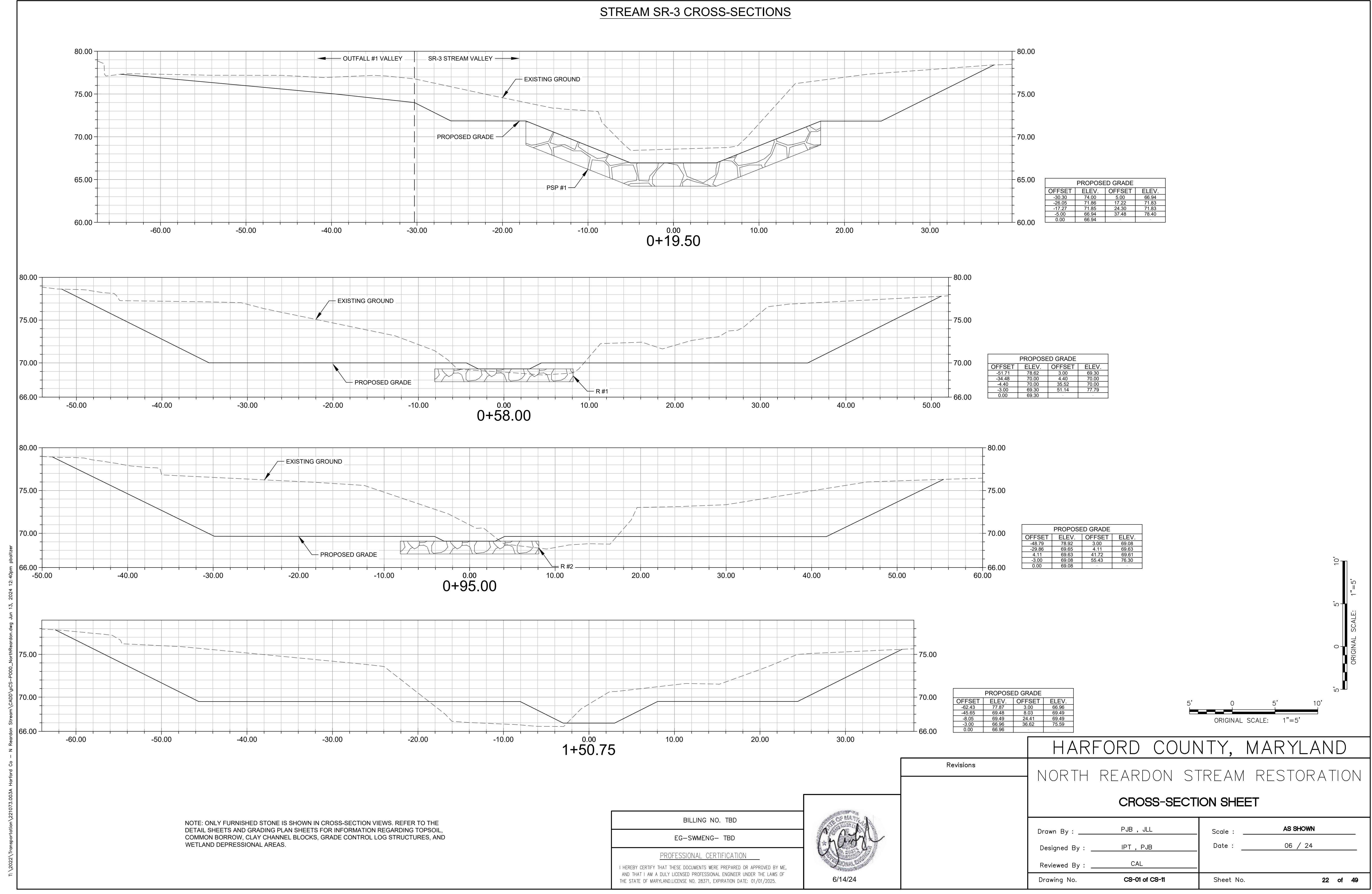
HARFORD COUNTY, MARYI AND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

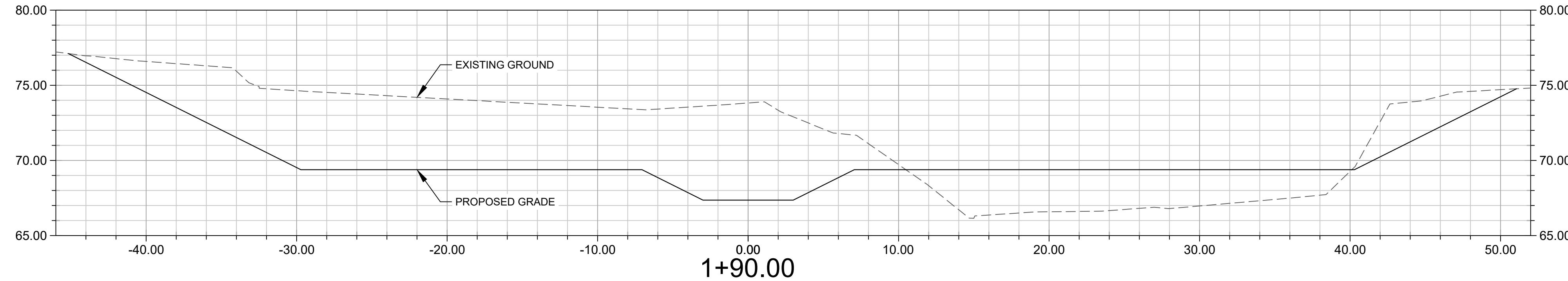
Revisions	HARFORD COUNTY, MARYLAND
	<p style="text-align: center;">NORTH REARDON STREAM RESTORATION</p> <p style="text-align: center;">DETAIL SHEET</p>
	<p>Drawn By : <u>PJB , JLL</u></p> <p>Designed By : <u>IPT , PJB</u></p> <p>Reviewed By : <u>CAL</u></p>
	<p>Scale : <u>N/A</u></p> <p>Date : <u>06 / 24</u></p>
Drawing No.	<p style="text-align: center;">DE-05 of DE-05</p>
Sheet No.	

STREAM SR-3 CROSS-SECTIONS



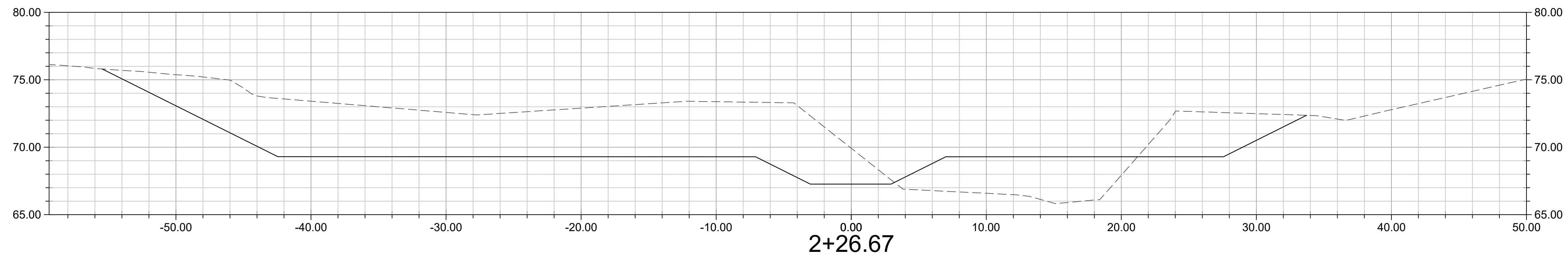
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STREAM SR-3 CROSS-SECTIONS

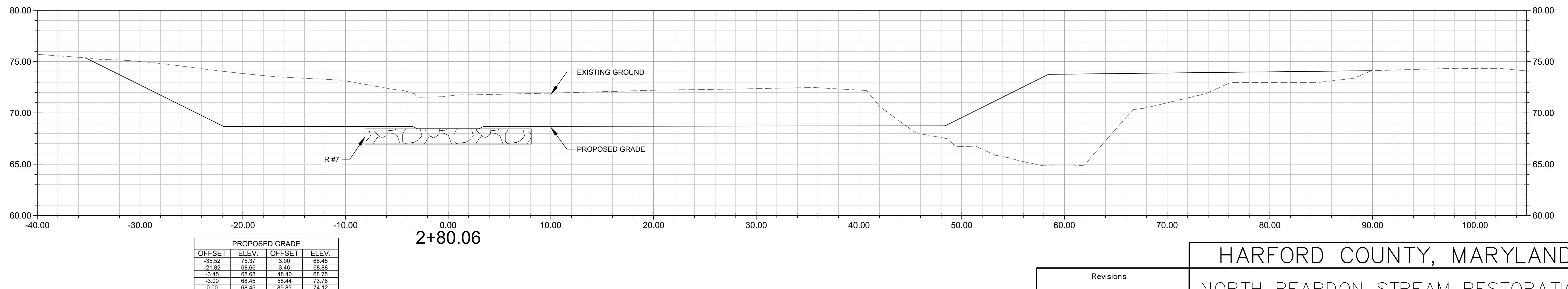


PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-45.79	77.17	3.00	67.36
-29.72	69.39	7.05	69.39
-7.05	69.39	40.29	69.39
-3.00	67.36	51.06	74.77
0.00	67.36		

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



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-55.46	75.80	3.00	67.27
-47.16	69.30	7.05	69.28
-7.05	69.29	27.36	69.29
-3.00	67.27	33.72	72.37
0.00	67.27		



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: 01/01/2025.

6/14/24

Revisions

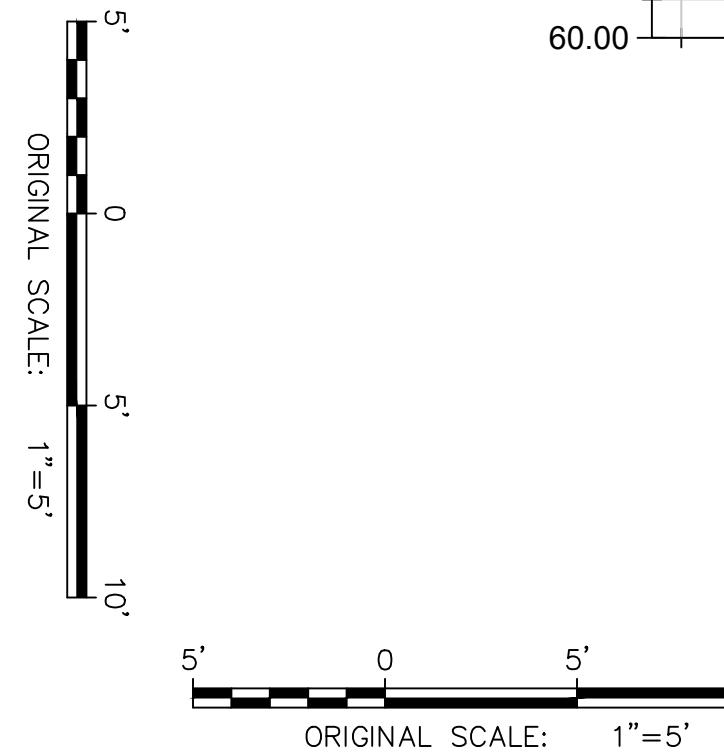
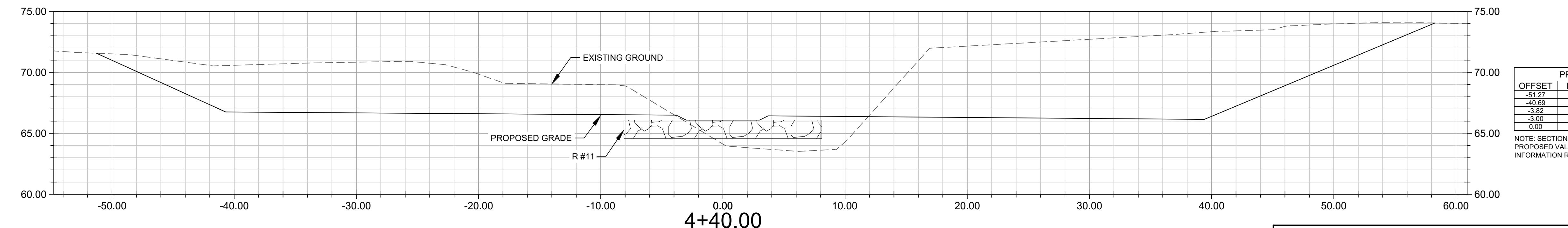
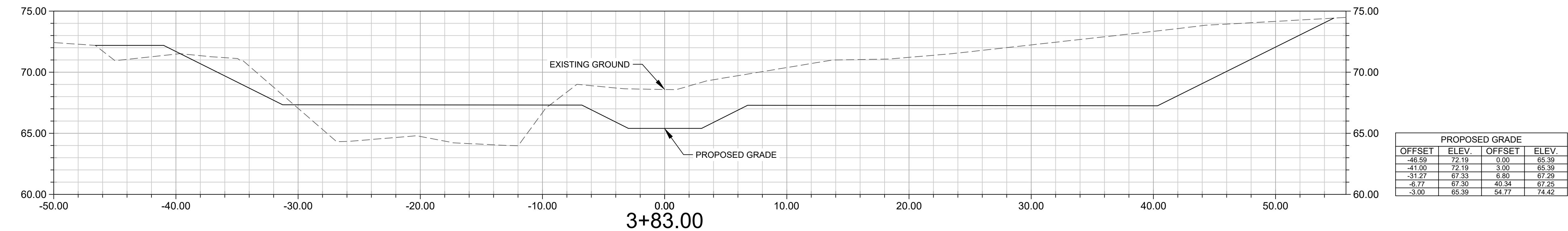
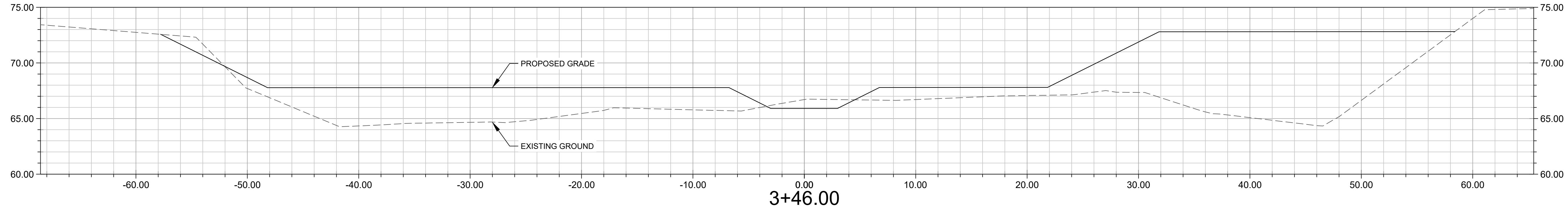
HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By : PJB , JLL	AS SHOWN
Designed By : IPT , PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. CS-02 of CS-11	Sheet No. 23 of 49

STREAM SR-3 CROSS-SECTIONS



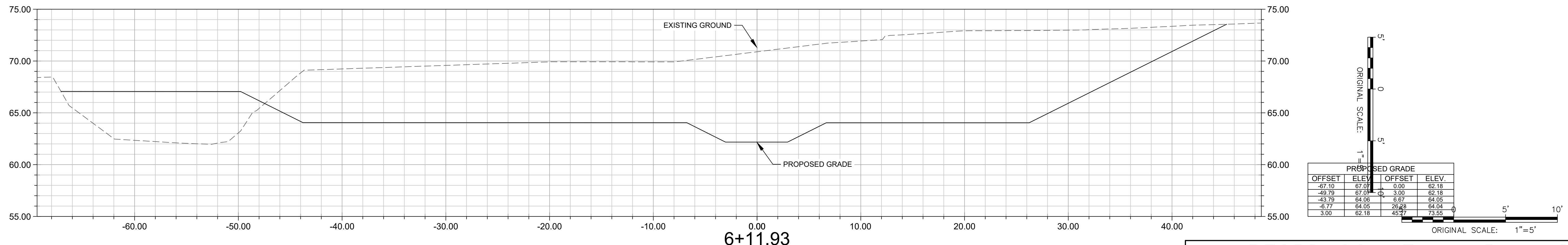
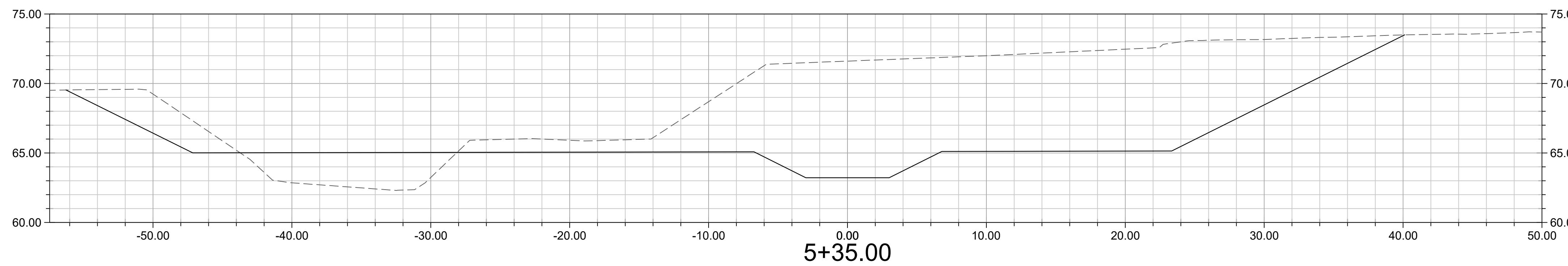
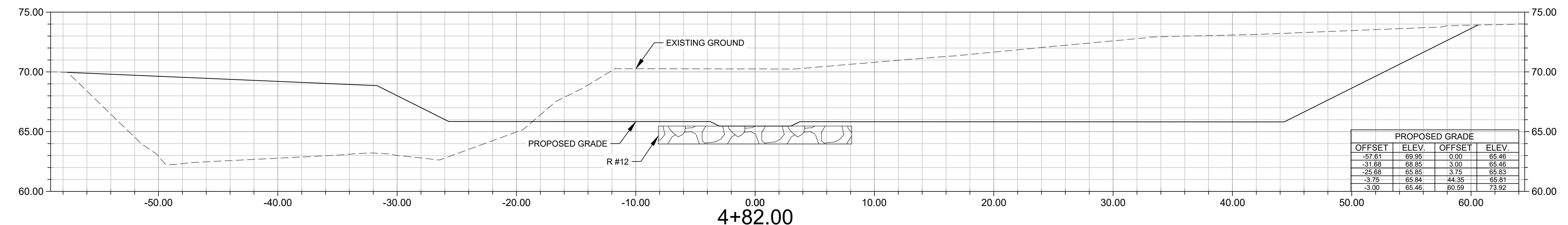
NOTE: ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTION VIEWS. REFER TO THE DETAIL SHEETS AND GRADING PLAN SHEETS FOR INFORMATION REGARDING TOPSOIL, COMMON BORROW, CLAY CHANNEL BLOCKS, GRADE CONTROL LOG STRUCTURES, AND WETLAND DEPRESSONAL AREAS.

BILLING NO. TBD
EG-SWMENG- TBD
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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: 01/01/2025.

6/14/24

HARFORD COUNTY, MARYLAND
NORTH REARDON STREAM RESTORATION
CROSS-SECTION SHEET
Drawn By : PJB , JLL
Designed By : IPT , PJB
Reviewed By : CAL
Drawing No. CS-03 of CS-11
Sheet No. 24 of 49

STREAM SR-3 CROSS-SECTIONS



HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

BILLING NO. TBD	
EG-SWMENG- TBD	
PROFESSIONAL CERTIFICATION	
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6/14/24	

Revisions

Drawn By : PJB , JLL

Scale : AS SHOWN

Designed By : IPT , PJB

Date : 06 / 24

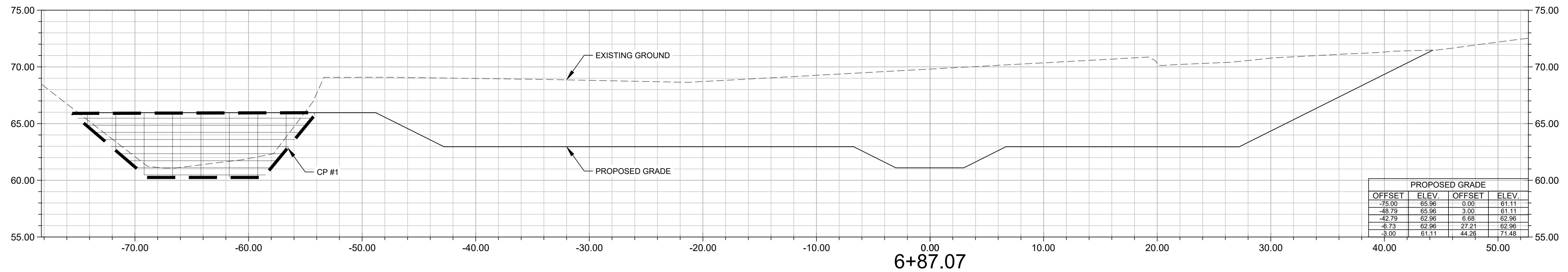
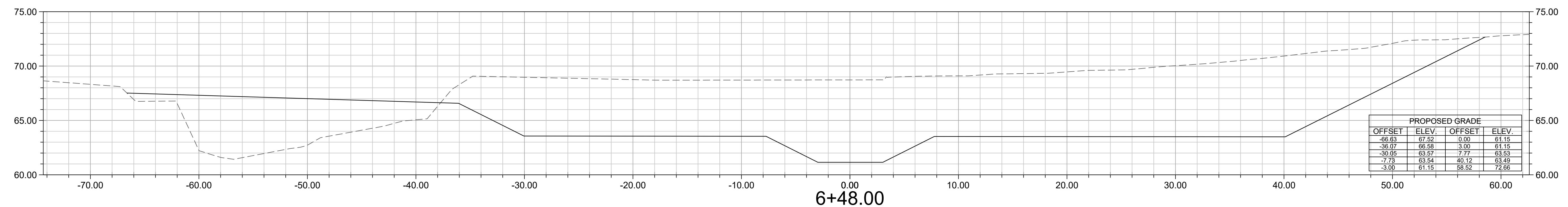
Reviewed By : CAL

Drawing No. CS-04 of CS-11

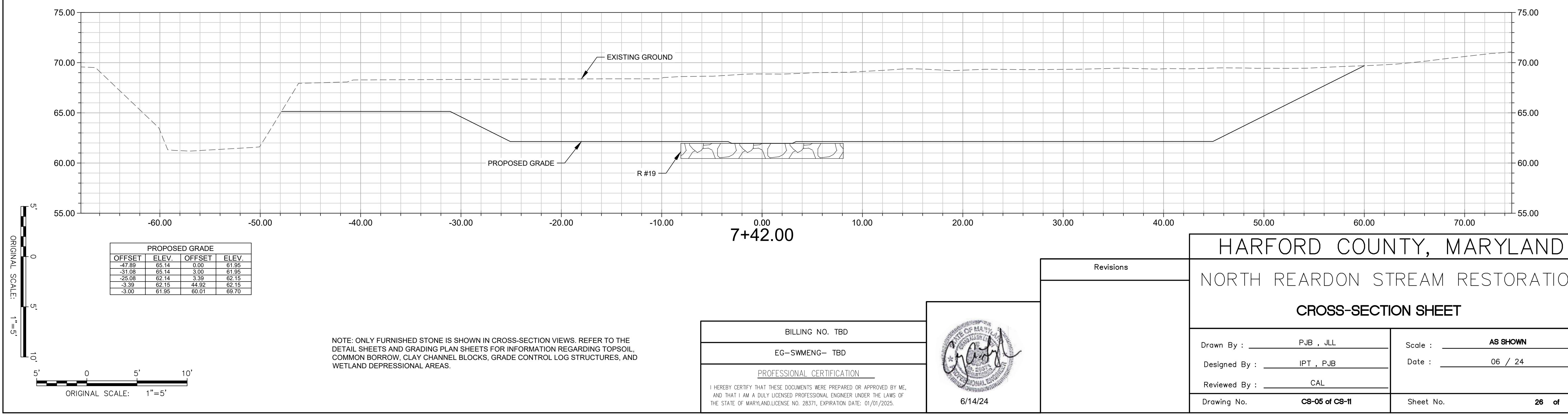
Sheet No.

25 of 49

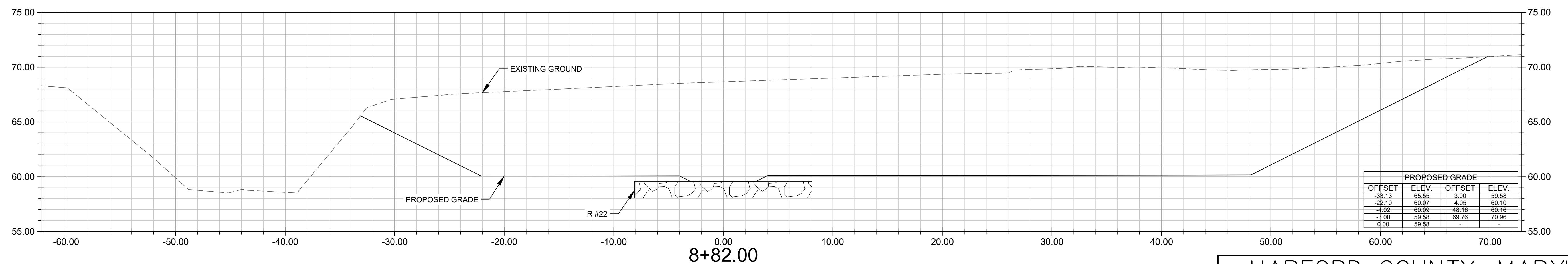
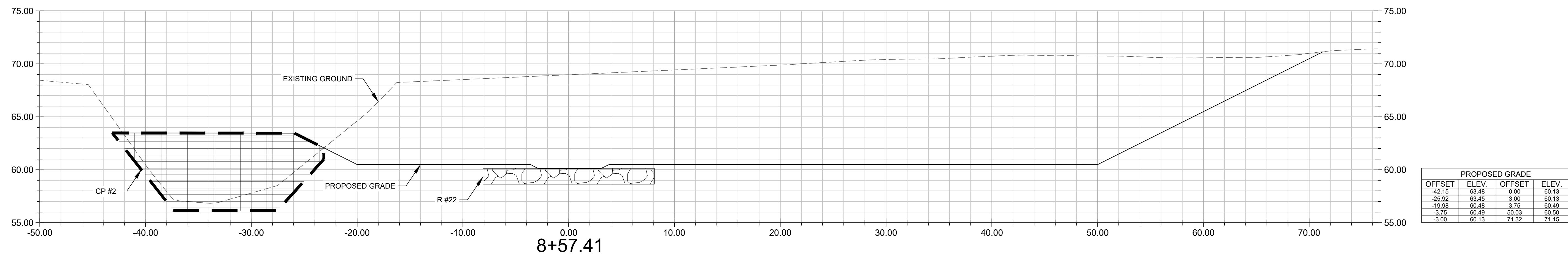
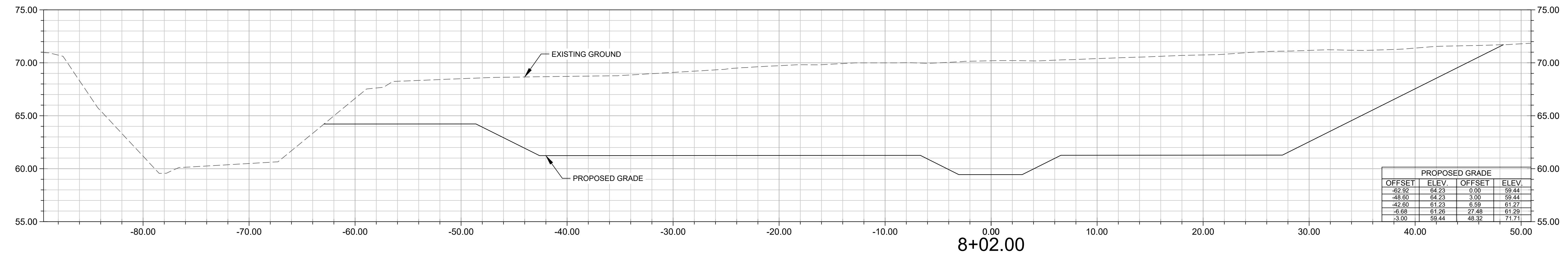
STREAM SR-3 CROSS-SECTIONS



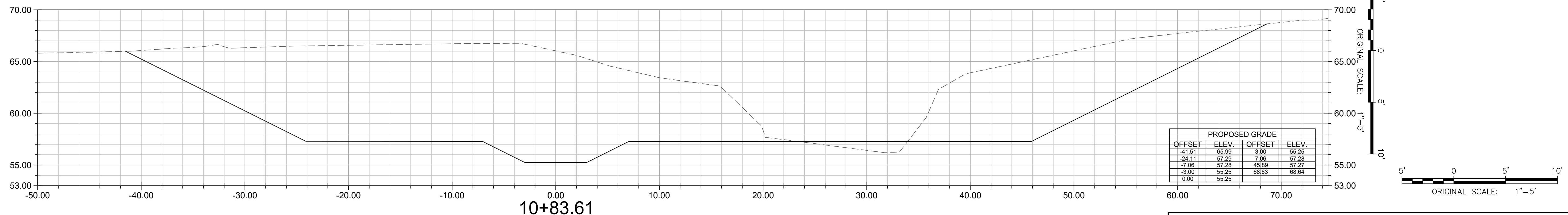
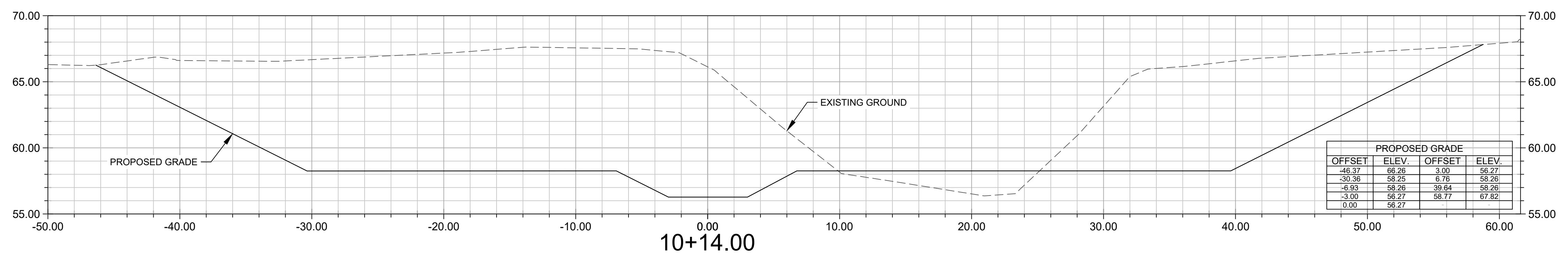
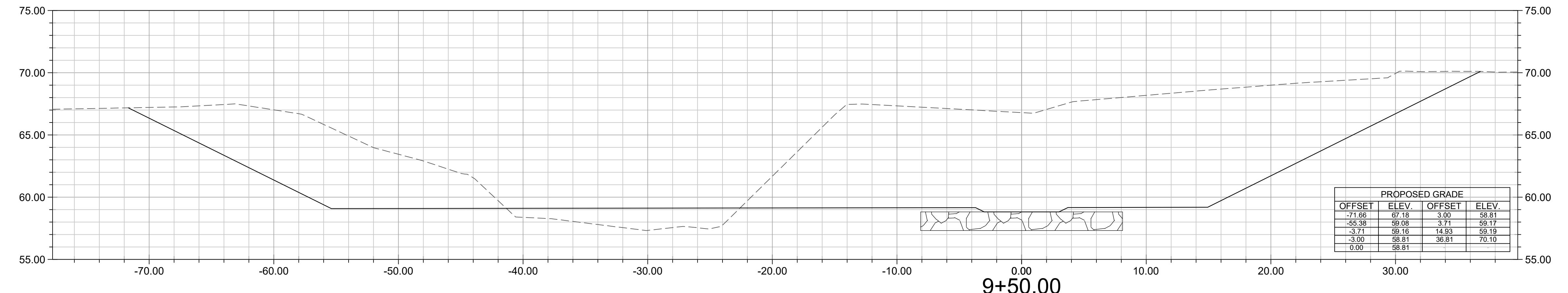
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STREAM SR-3 CROSS-SECTIONS



STREAM SR-3 CROSS-SECTIONS



HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Revisions	
Drawn By :	PJB , JLL
Designed By :	IPT , PJB
Reviewed By :	CAL
Drawing No.	CS-07 of CS-11
Sheet No.	28 of 49

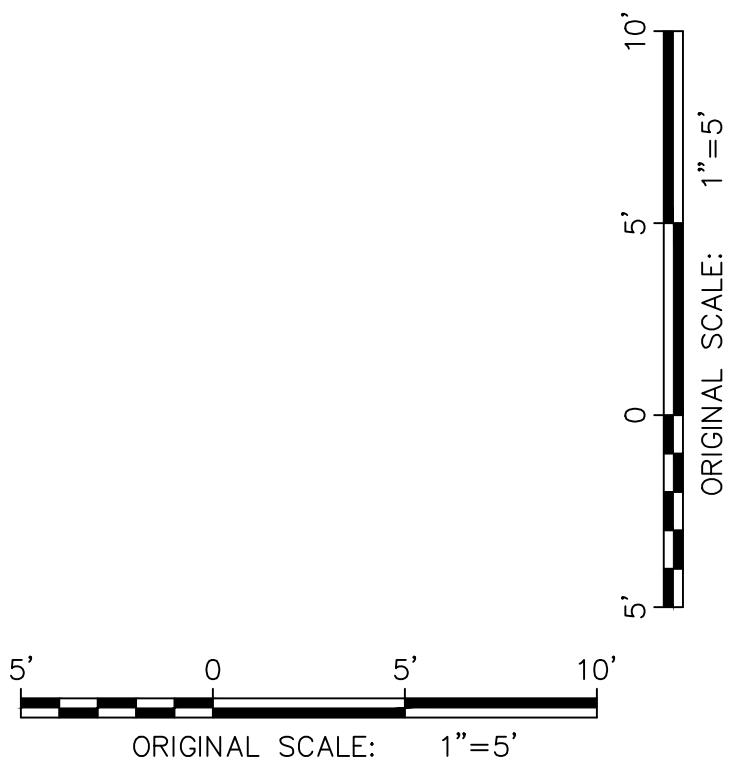
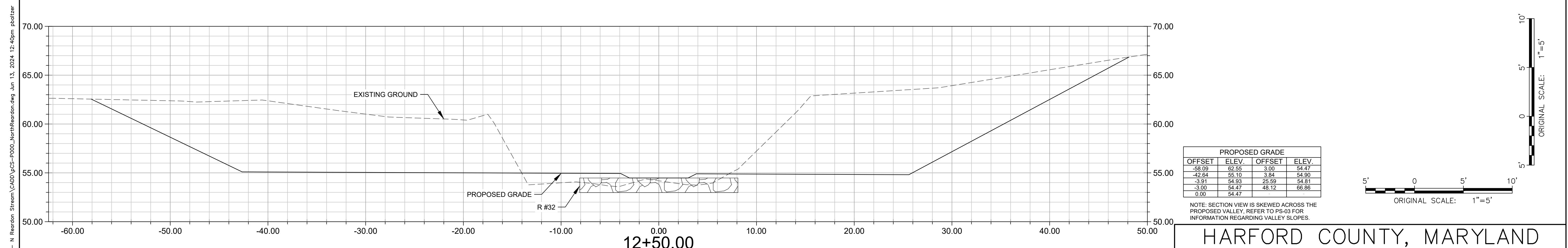
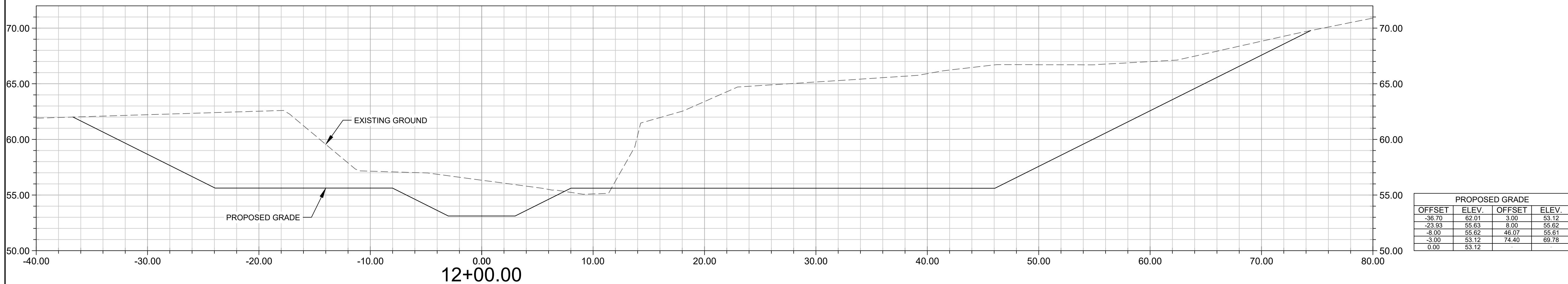
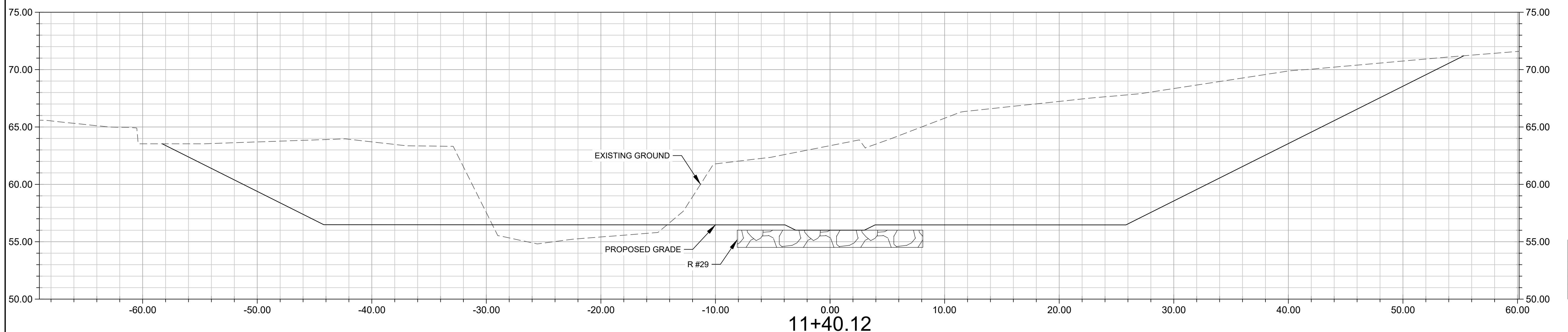
BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION

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: 01/01/2025.

6/14/24

NOTE: ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTION VIEWS. REFER TO THE DETAIL SHEETS AND GRADING PLAN SHEETS FOR INFORMATION REGARDING TOPSOIL, COMMON BORROW, CLAY CHANNEL BLOCKS, GRADE CONTROL LOG STRUCTURES, AND WETLAND DEPRESSATIONAL AREAS.

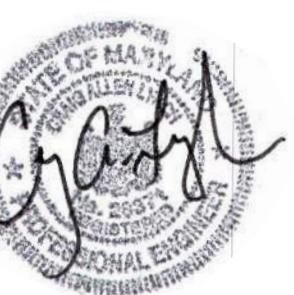
STREAM SR-3 CROSS-SECTIONS



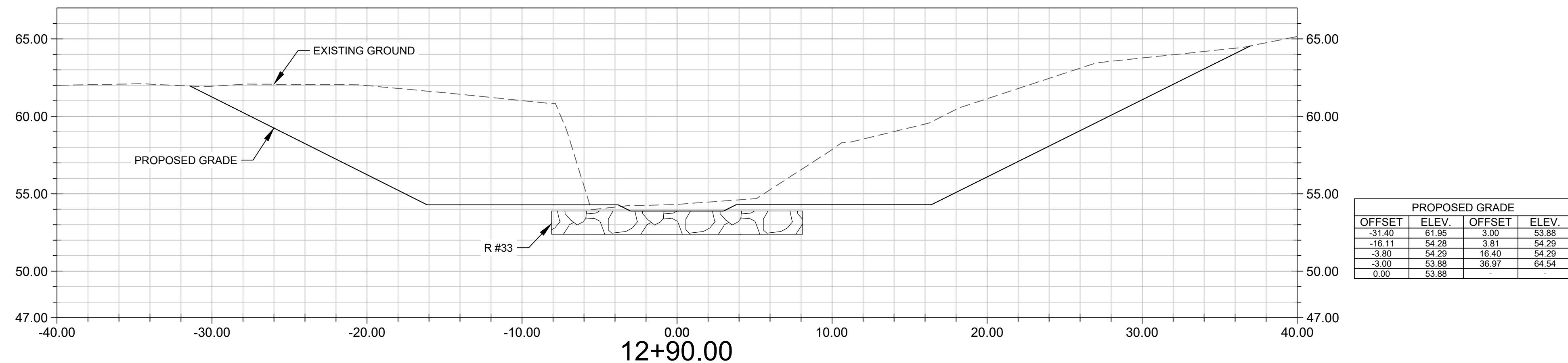
HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

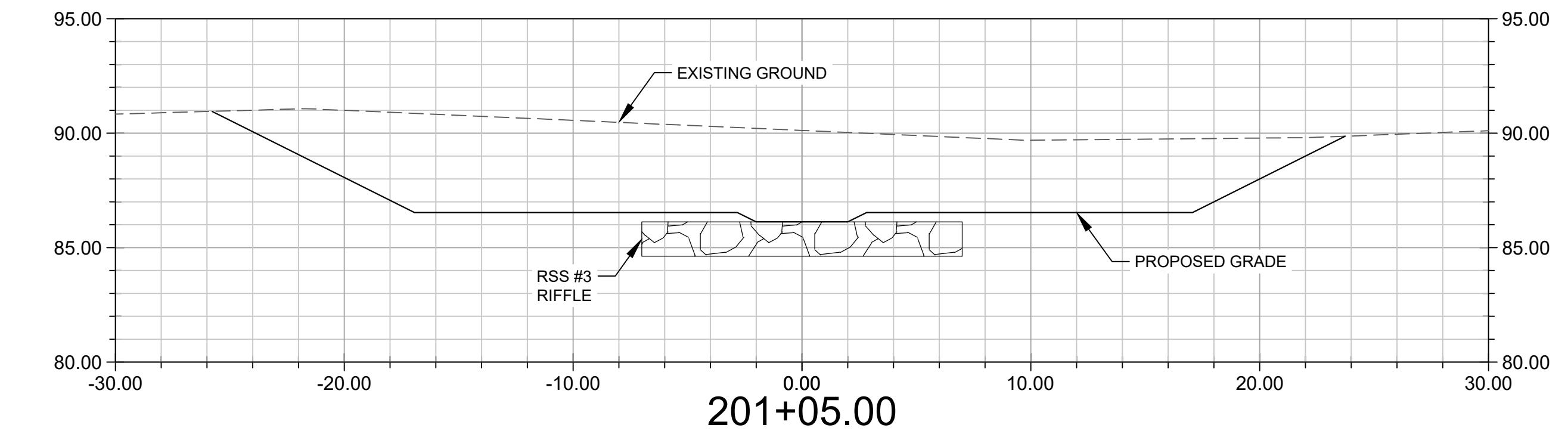
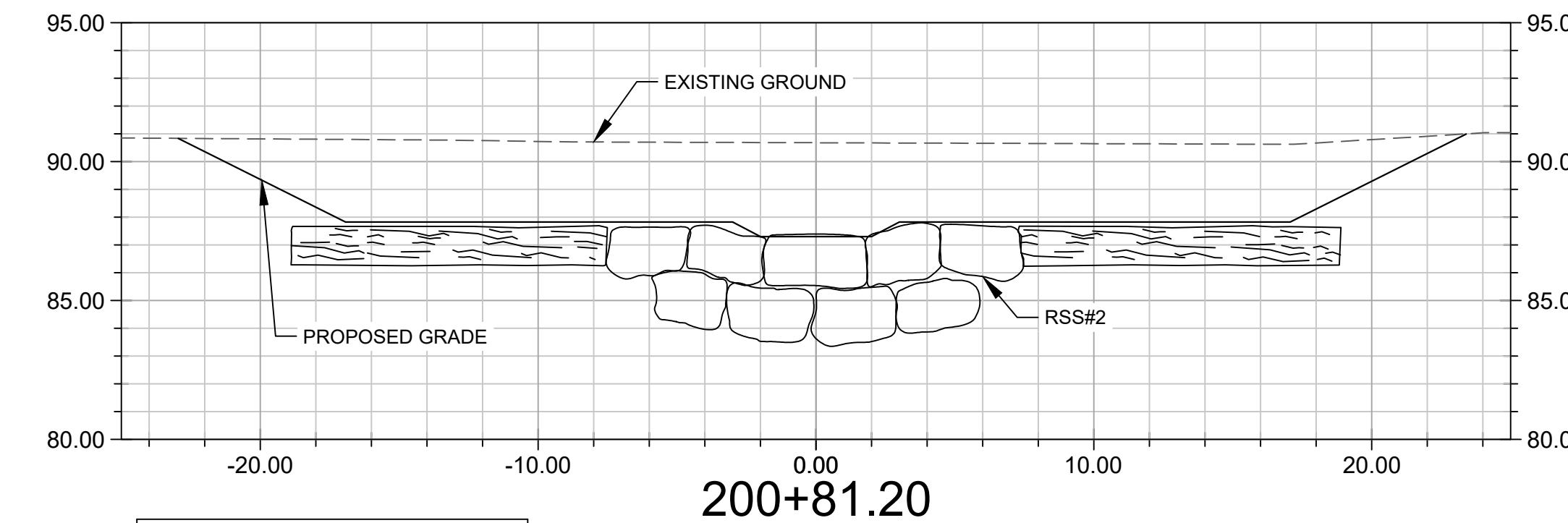
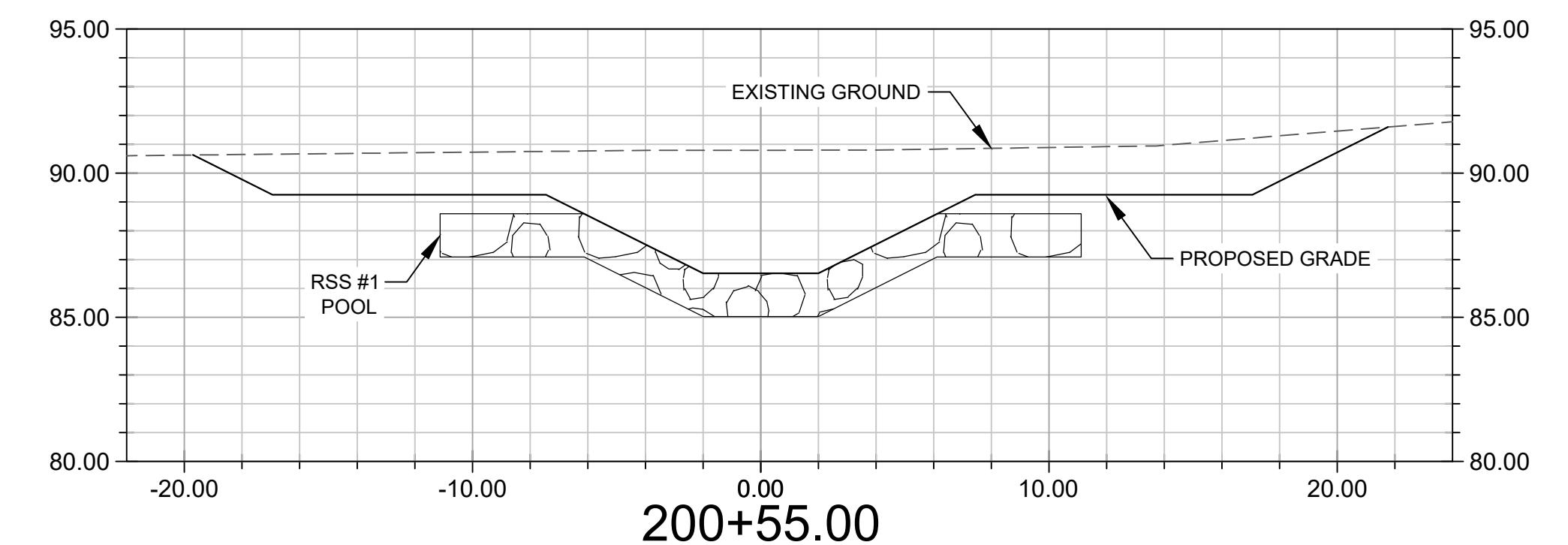
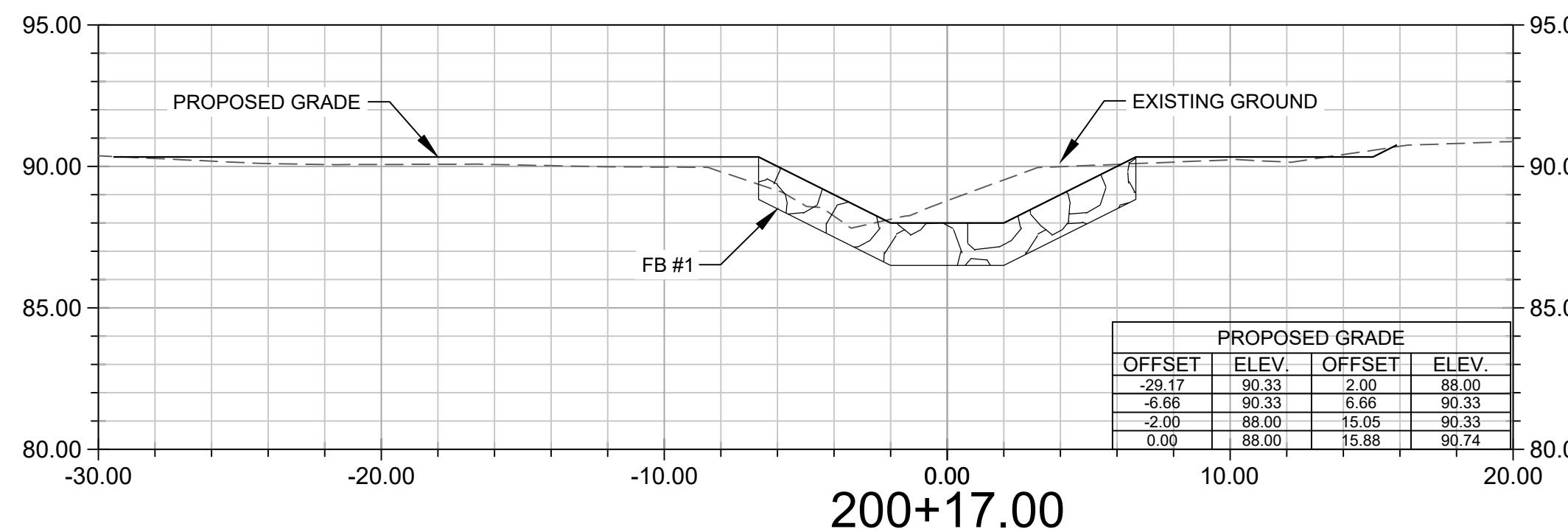
CROSS-SECTION SHEET

Revisions	
BILLING NO. TBD	
EG-SWMENG- TBD	
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 <small>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: 01/01/2025.</small>	
6/14/24	6/14/24
Drawn By : PJB , JLL	Scale : AS SHOWN
Designed By : IPT , PJB	Date : 06 / 24
Reviewed By : CAL	
Drawing No. CS-08 of CS-11	
Sheet No. 29 of 49	

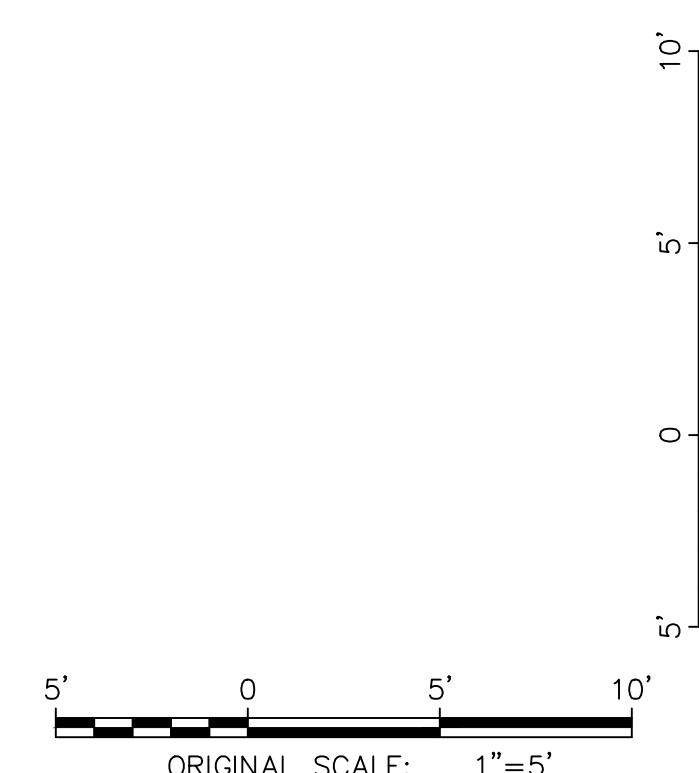
STREAM SR-3 CROSS-SECTIONS



STREAM SR-9 CROSS-SECTIONS



NOTE: ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTION VIEWS. REFER TO THE DETAIL SHEETS AND GRADING PLAN SHEETS FOR INFORMATION REGARDING TOPSOIL, COMMON BORROW, CLAY CHANNEL BLOCKS, GRADE CONTROL LOG STRUCTURES, AND WETLAND DEPRESSSIONAL AREAS.

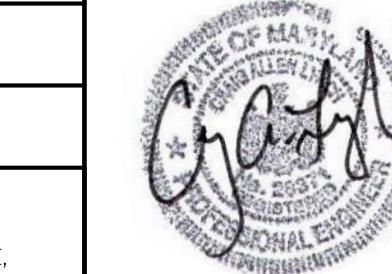


I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 01/01/2025.

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION



6/14/24

Revisions

Drawn By : <u>PJB , JLL</u>	Scale : <u>AS SHOWN</u>
Designed By : <u>IPT , PJB</u>	Date : <u>06 / 24</u>
Reviewed By : <u>CAL</u>	
Drawing No. <u>CS-09 of CS-11</u>	Sheet No. <u>30 of 49</u>

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

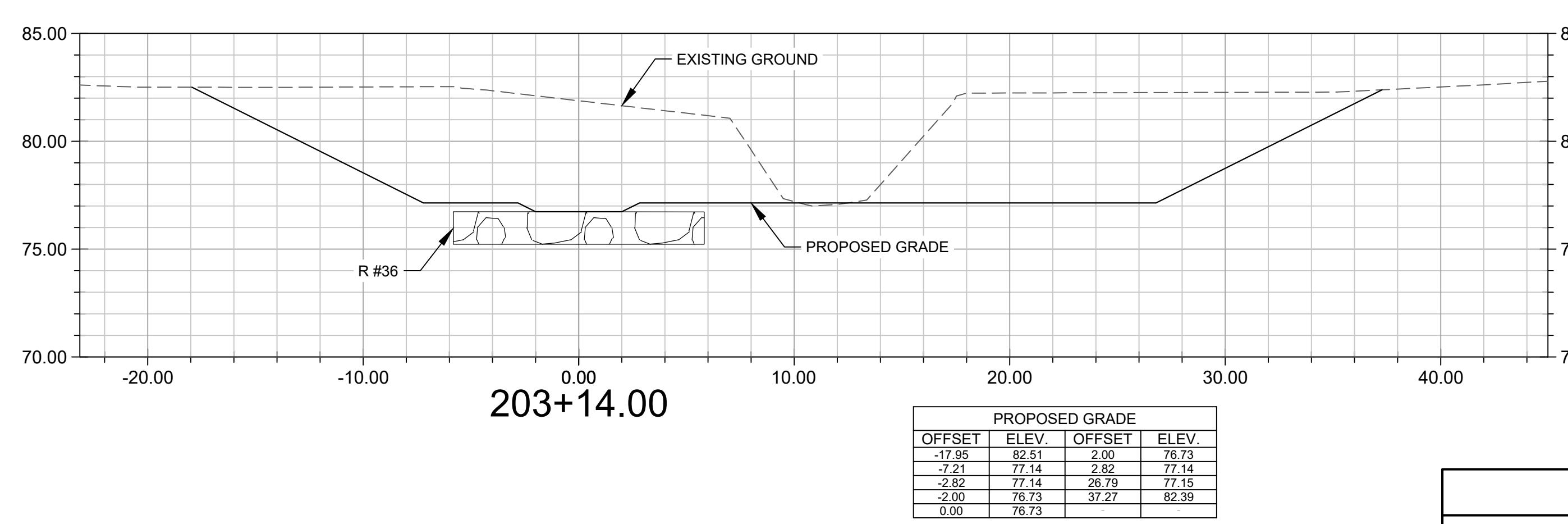
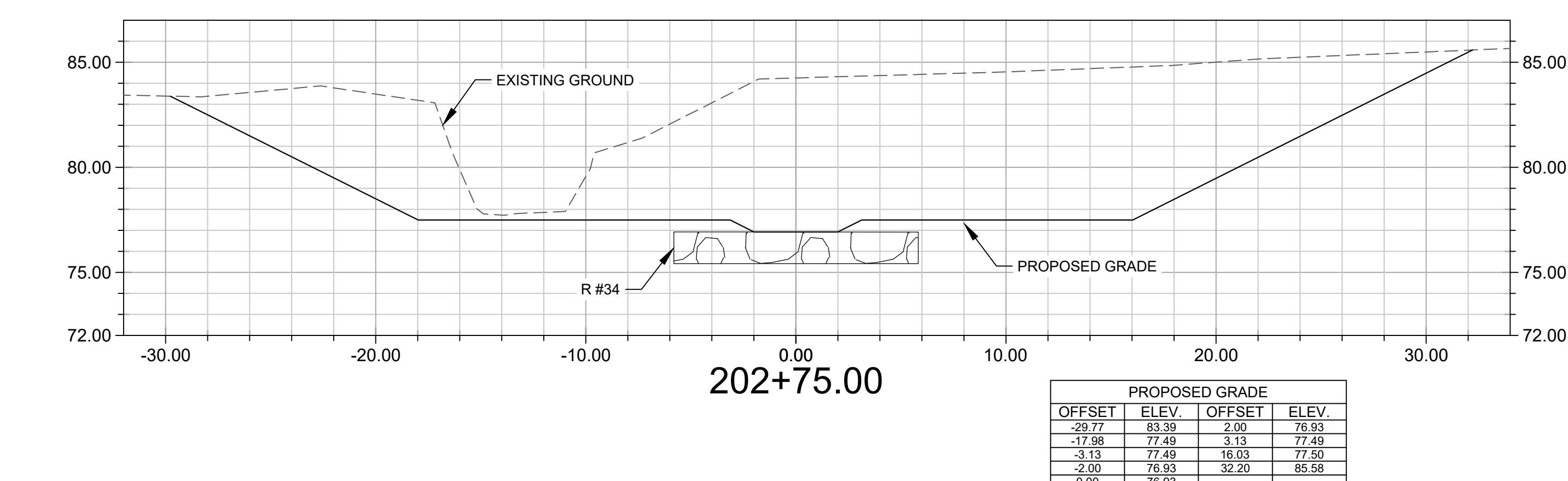
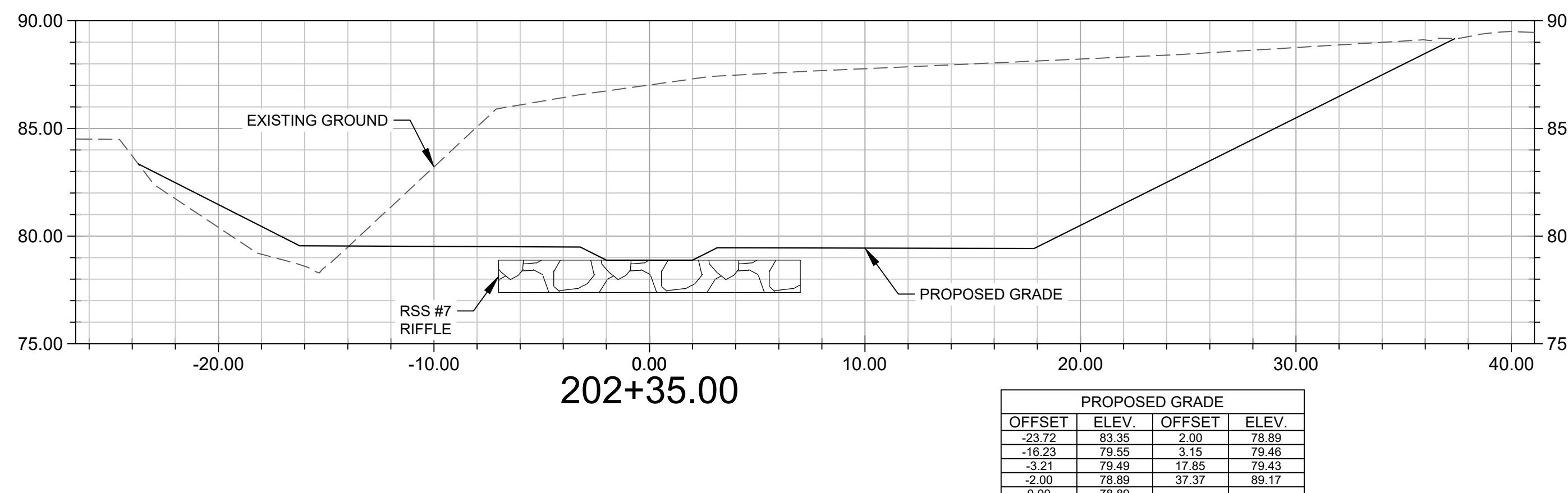
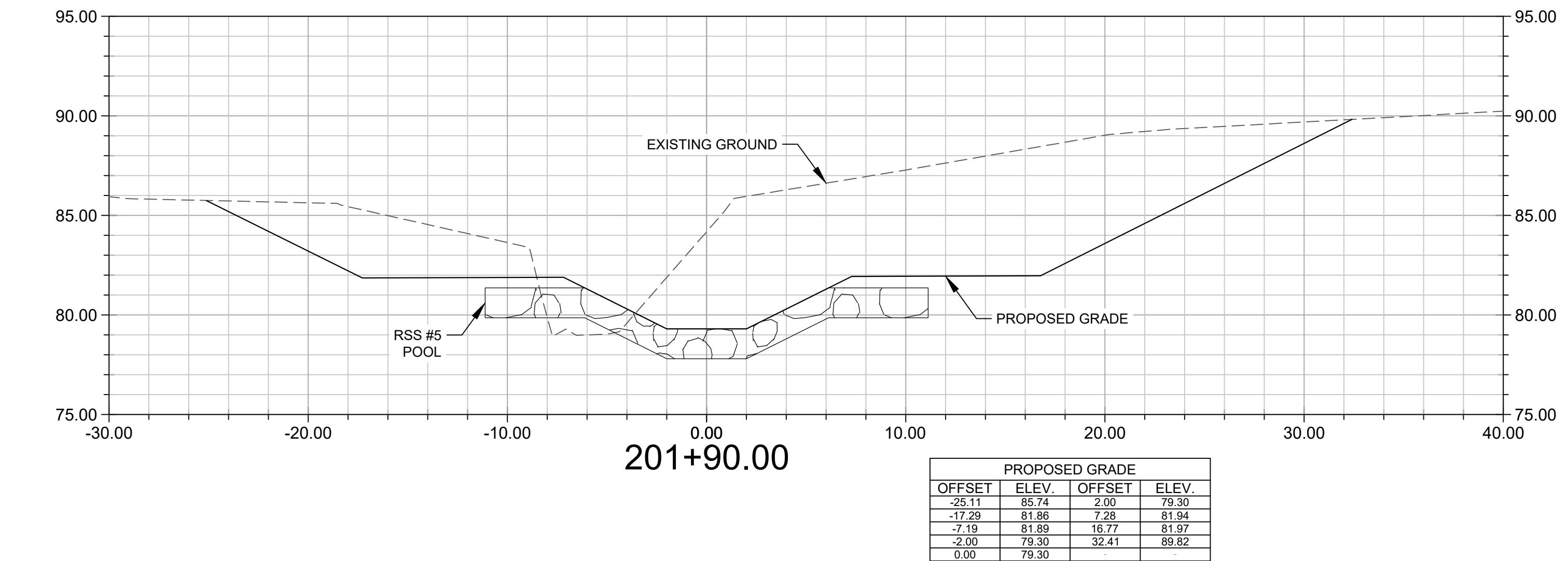
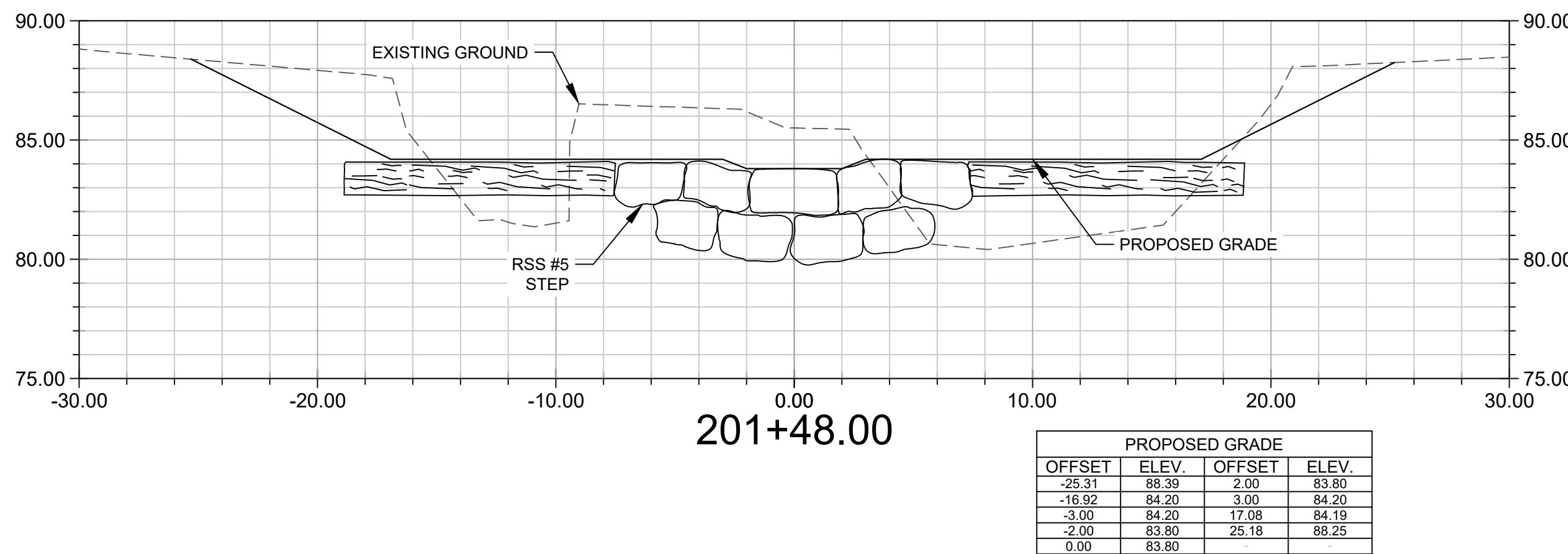
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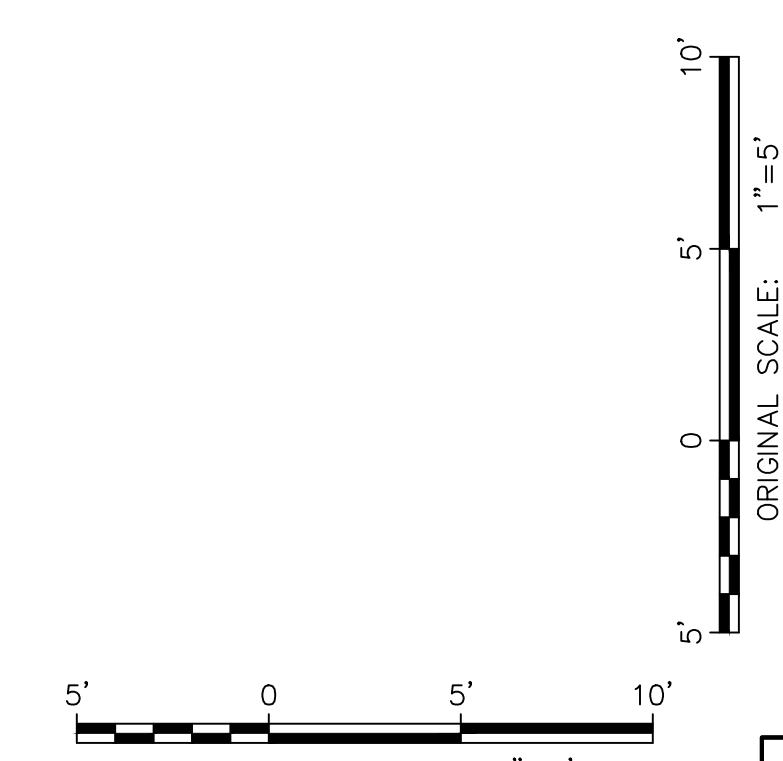
HCG DWG ID No.:

Scale: 1"=5'

STREAM SR-9 CROSS-SECTIONS



NOTE: ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTION VIEWS. REFER TO THE DETAIL SHEETS AND GRADING PLAN SHEETS FOR INFORMATION REGARDING TOPSOIL, COMMON BORROW, CLAY CHANNEL BLOCKS, GRADE CONTROL LOG STRUCTURES, AND WETLAND DEPRESSATIONAL AREAS.



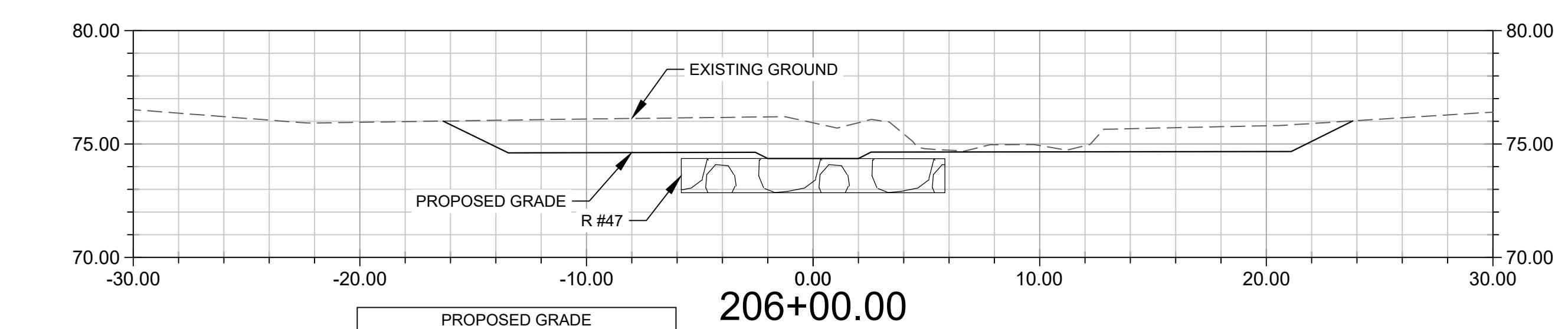
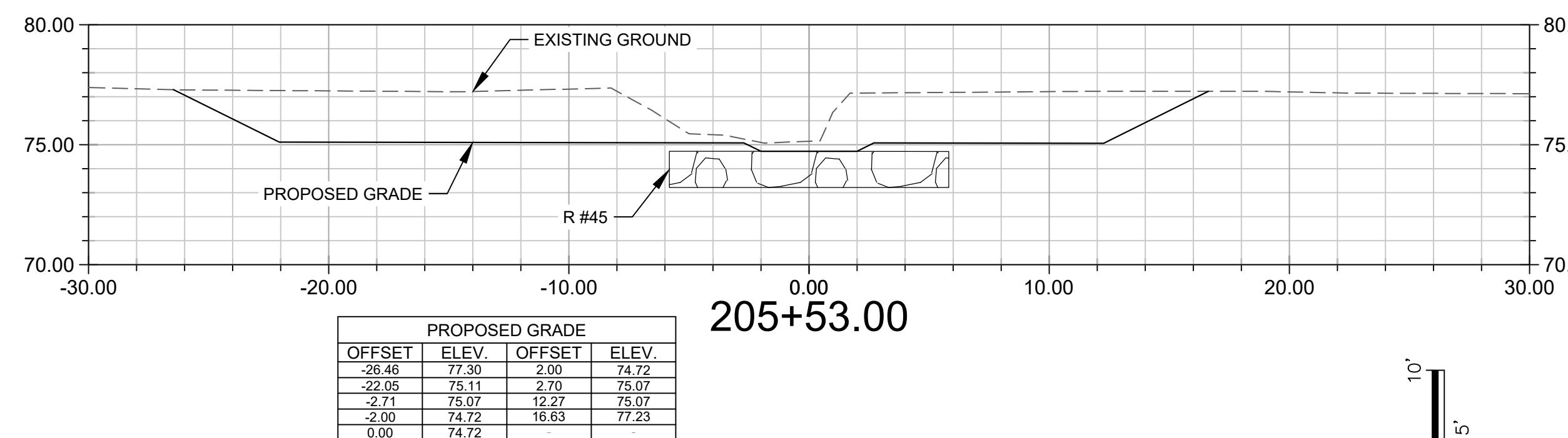
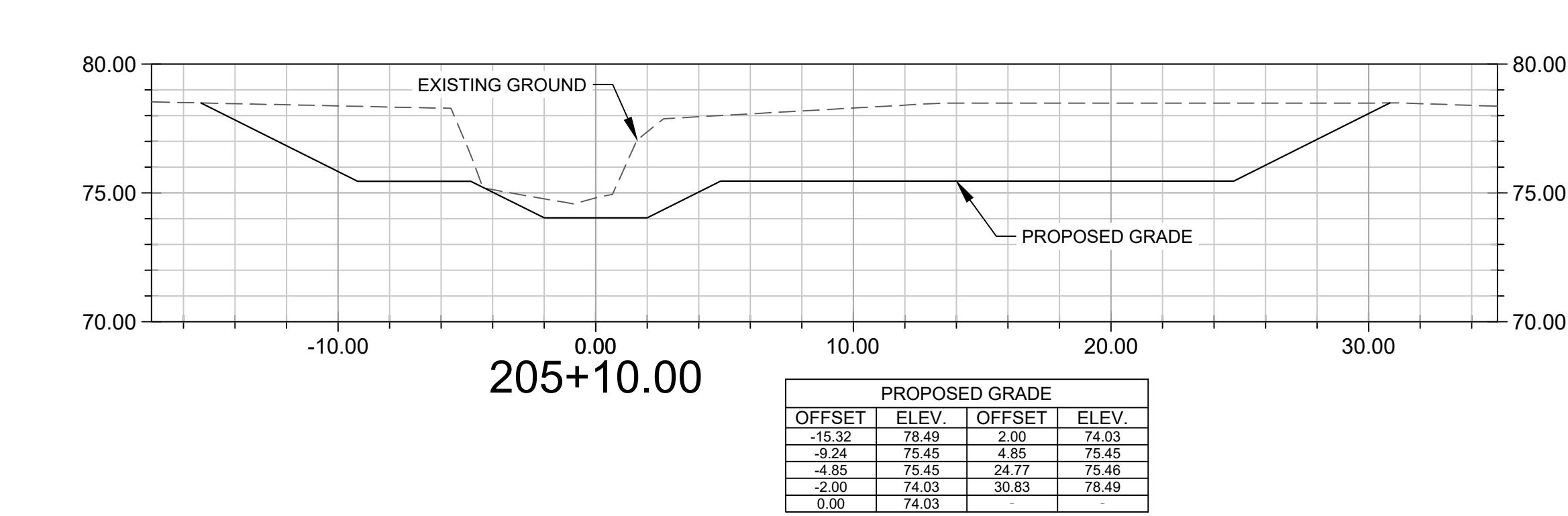
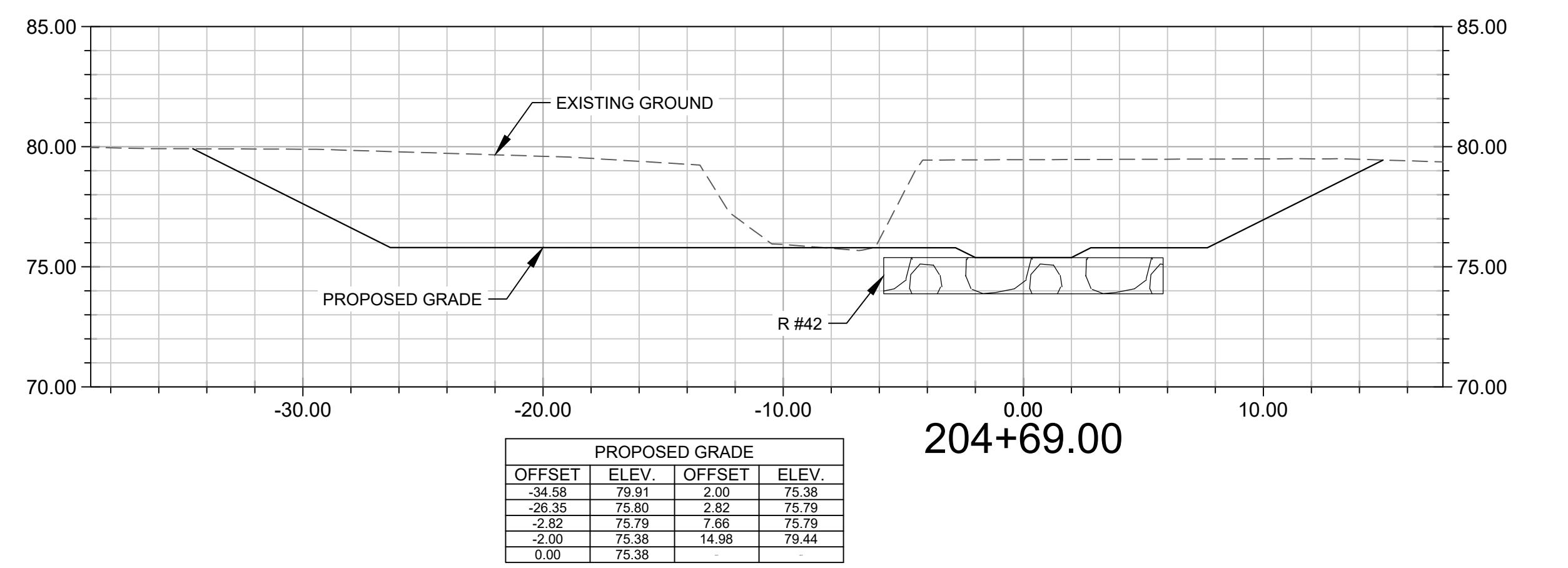
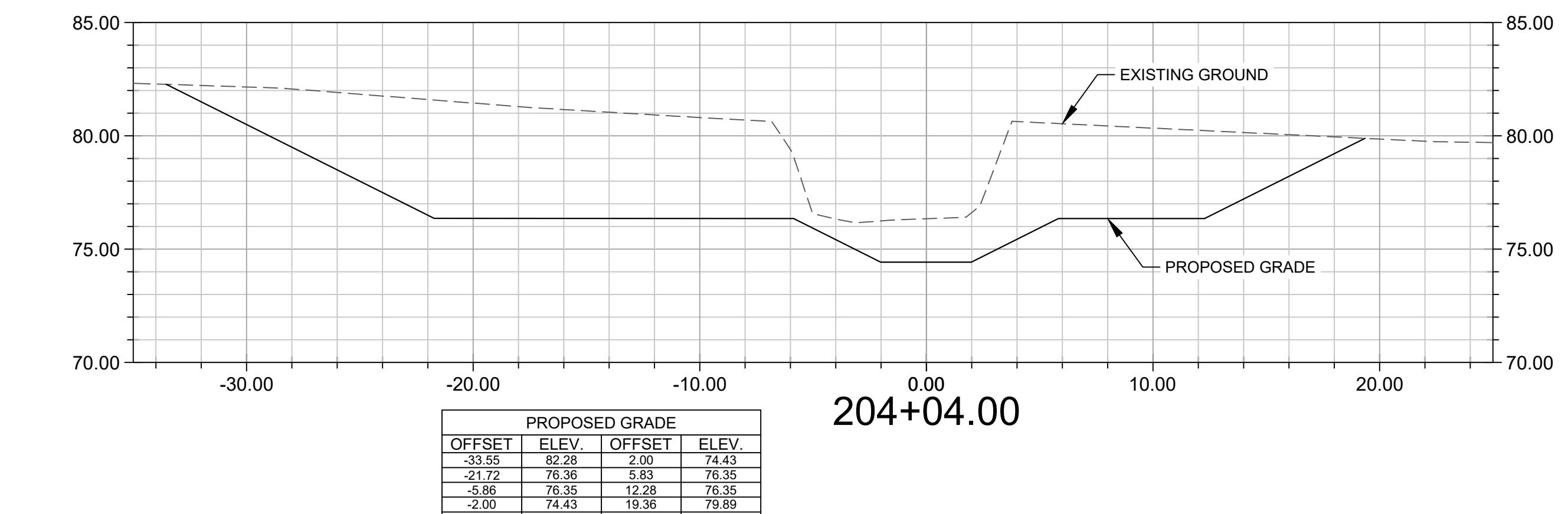
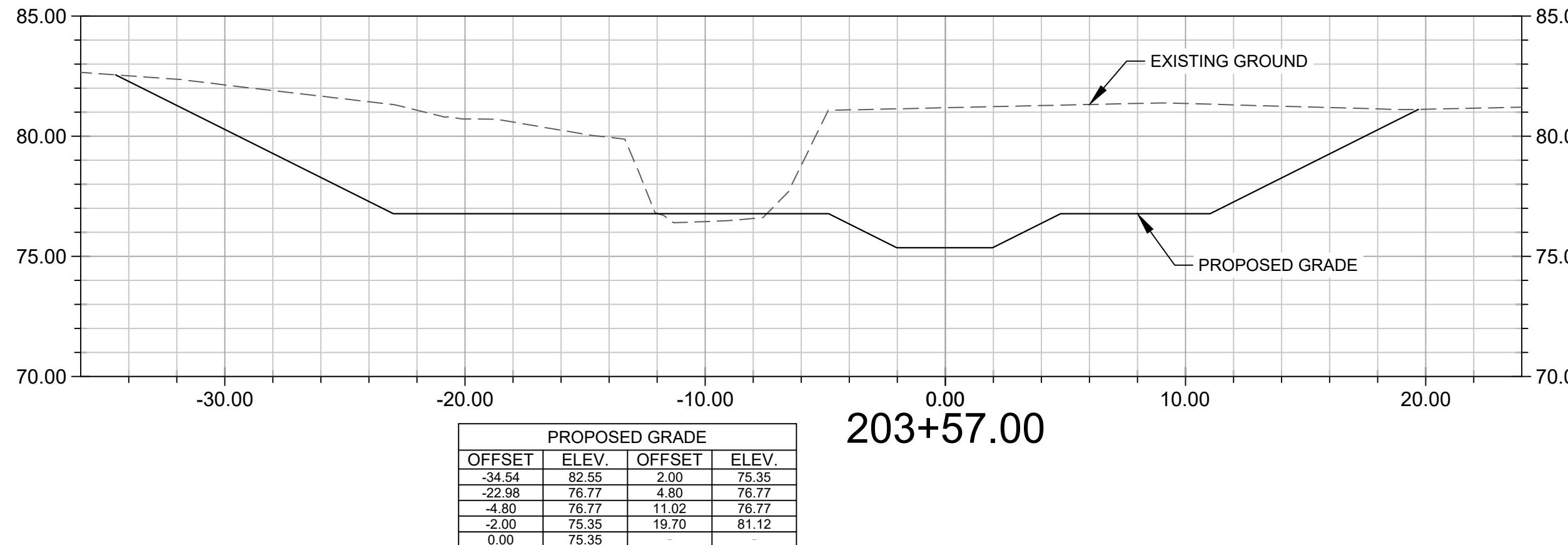
BILLING NO. TBD
EG-SWMENG- TBD
PROFESSIONAL CERTIFICATION

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: 01/01/2025.

6/14/24

HARFORD COUNTY, MARYLAND	
NORTH REARDON STREAM RESTORATION	
CROSS-SECTION SHEET	
Drawn By : <u>PJB , JLL</u>	Scale : <u>AS SHOWN</u>
Designed By : <u>IPT , PJB</u>	Date : <u>06 / 24</u>
Reviewed By : <u>CAL</u>	
Drawing No. <u>CS-10 of CS-11</u>	Sheet No. <u>31 of 49</u>

STREAM SR-9 CROSS-SECTIONS



NOTE: ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTION VIEWS. REFER TO THE DETAIL SHEETS AND GRADING PLAN SHEETS FOR INFORMATION REGARDING TOPSOIL, COMMON BORROW, CLAY CHANNEL BLOCKS, GRADE CONTROL LOG STRUCTURES, AND WETLAND DEPRESSIONAL AREAS.

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

A circular library stamp with a decorative border containing the text "STATE OF MARYLAND" and "STATE LIBRARY". The center of the stamp contains a five-pointed star and the date "1955". A large, handwritten signature is written across the center of the stamp.

6/14/24

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

BRIBES

项目一 项目

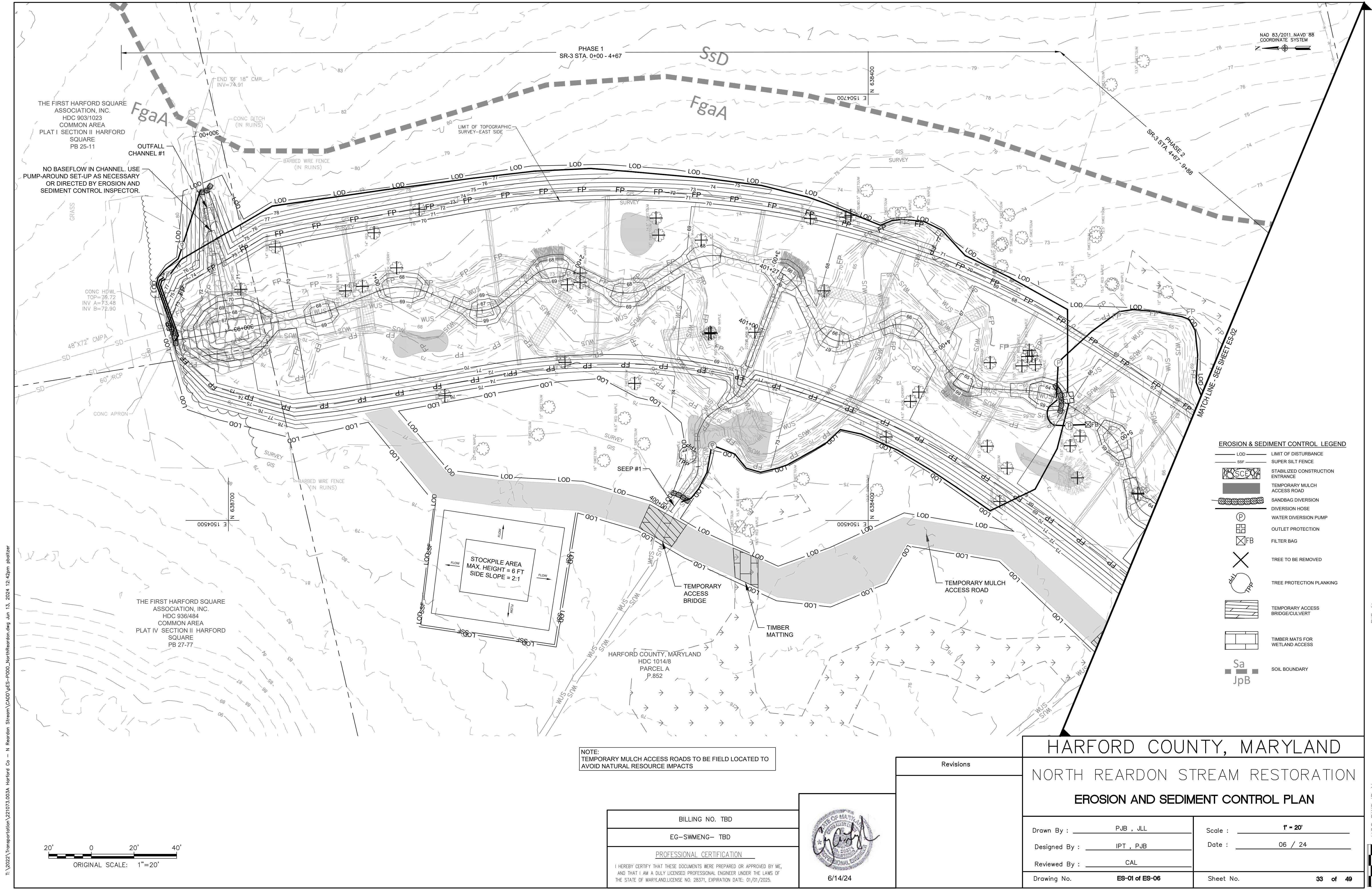
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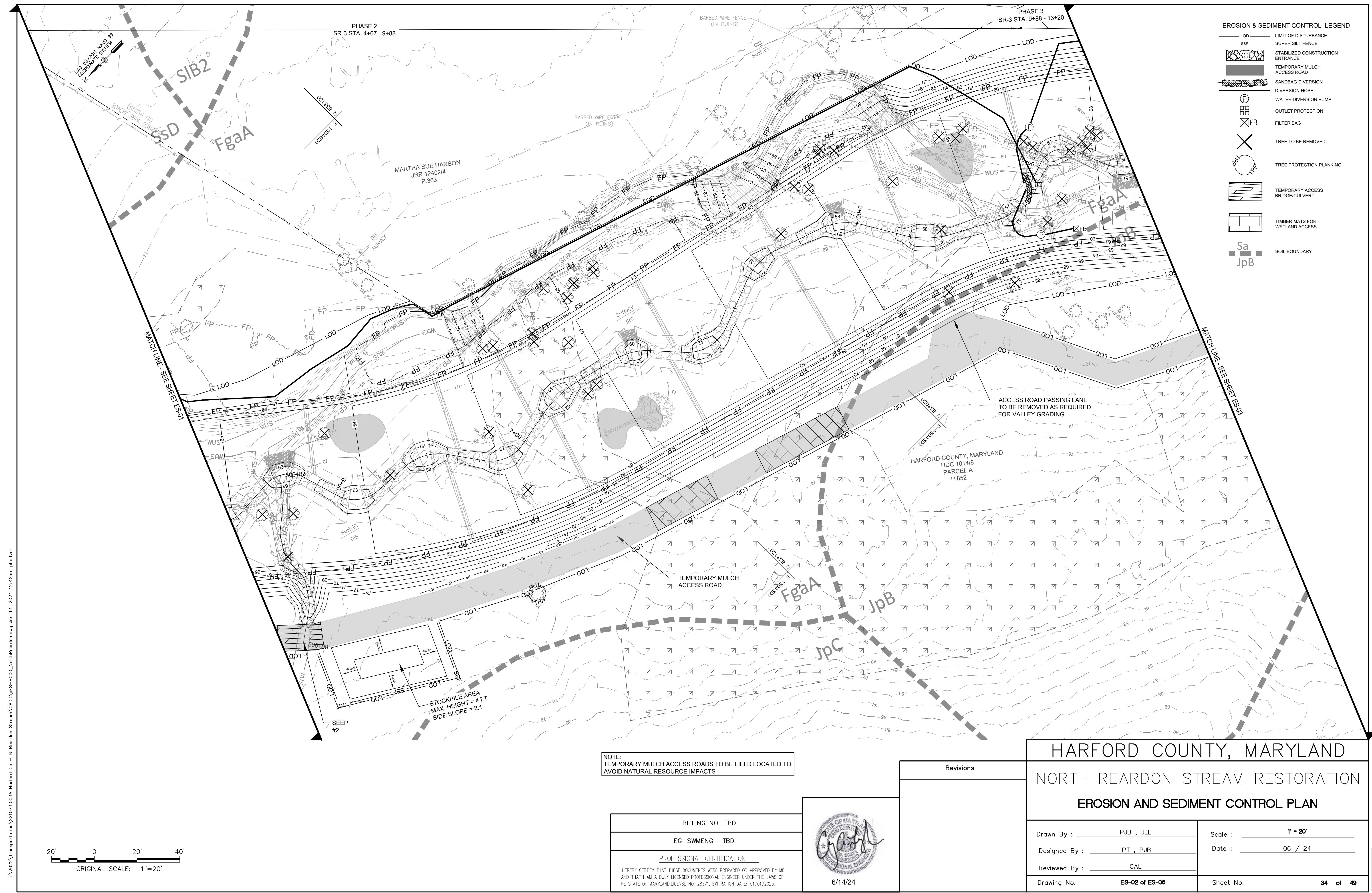
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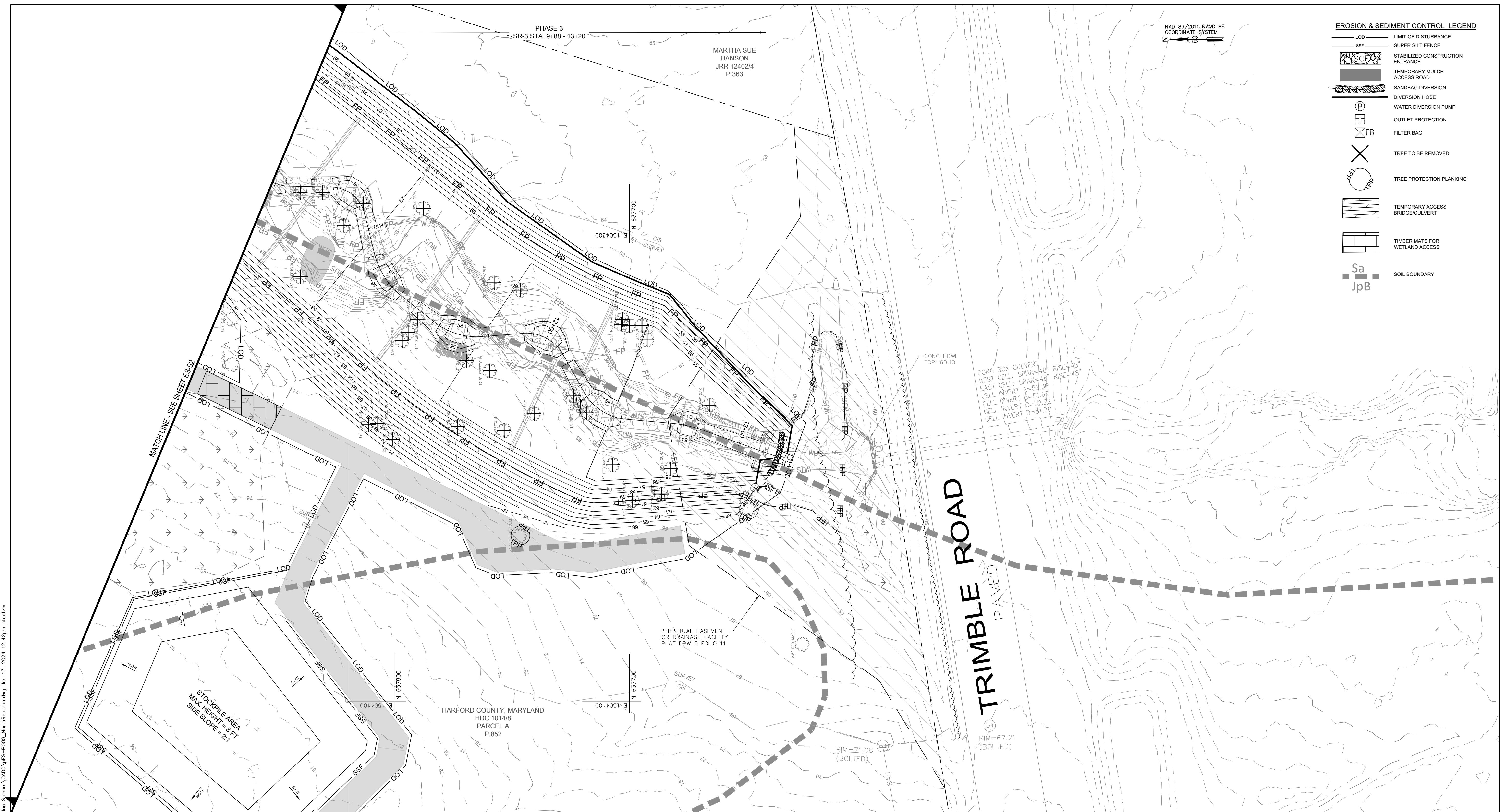
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:\2022\Transportation\221073.003A_Harford Co - N Reardon Stream\CADD\pES-P000_NorthReardon.dwg Jun 13, 2024 12:42pm pbaltzer

MATCH LINE - SEE SHEET ES-06

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

A scale bar diagram. It features a horizontal line with tick marks. The tick mark at the center is labeled '0'. The tick mark to the left is labeled '20'' and the tick mark to the right is labeled '20''. Below the line, the text 'ORIGINAL SCALE: 1"=20'' is centered.

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: 01/01/2025.

A circular library stamp with a decorative border containing text. The text includes 'STATE OF MARYLAND', 'CHAMBERS LIBRARY', 'THE UNIVERSITY OF MARYLAND', 'PROFESSIONAL EDUCATION', and 'LIBRARIES'. A large, cursive signature is written across the center of the stamp.

6/14/24

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By : _____ PJB , JLL

Scale : 1" = 20'

Designed By : IPT , PJB

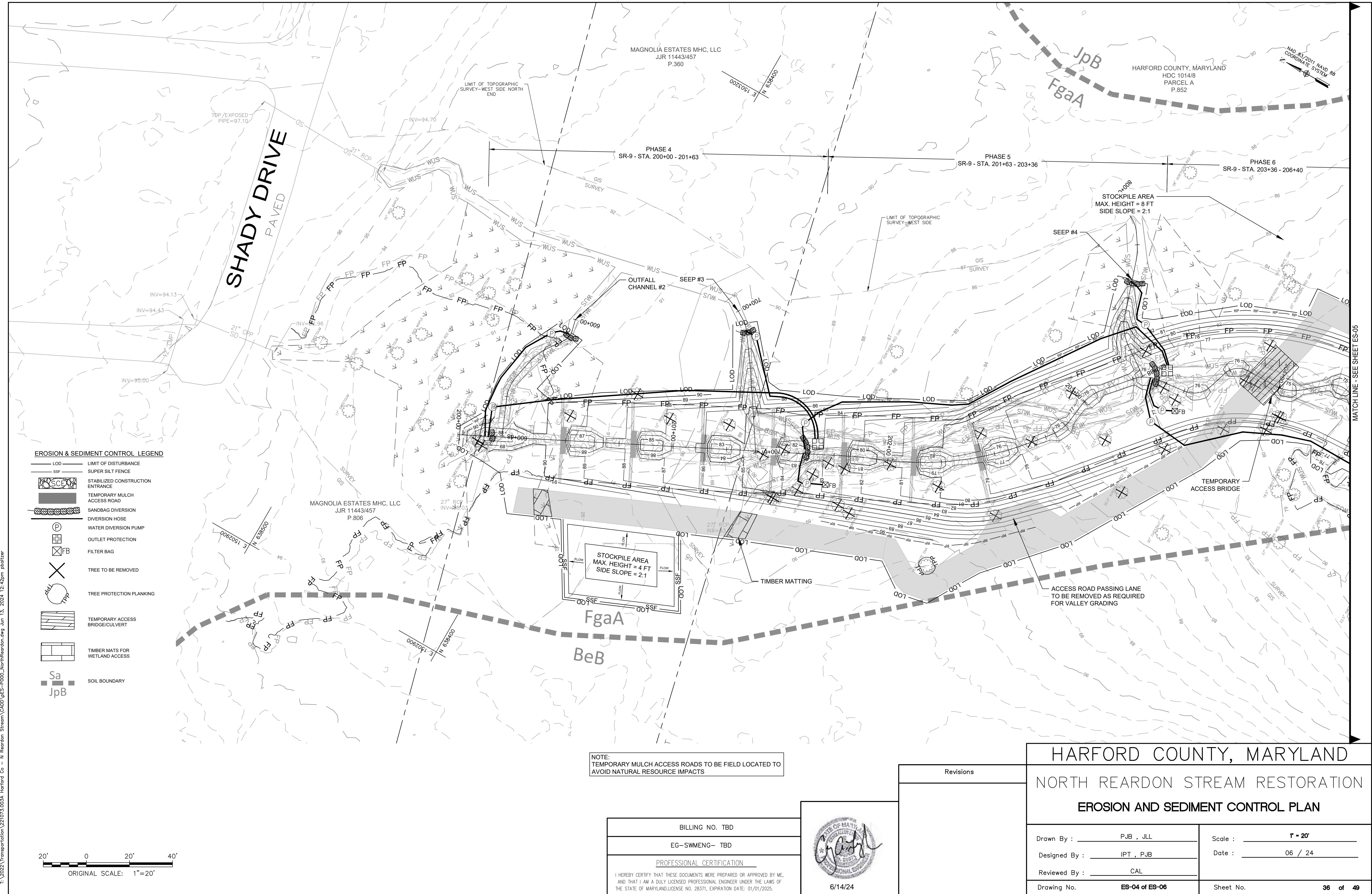
Date : 06 / 24

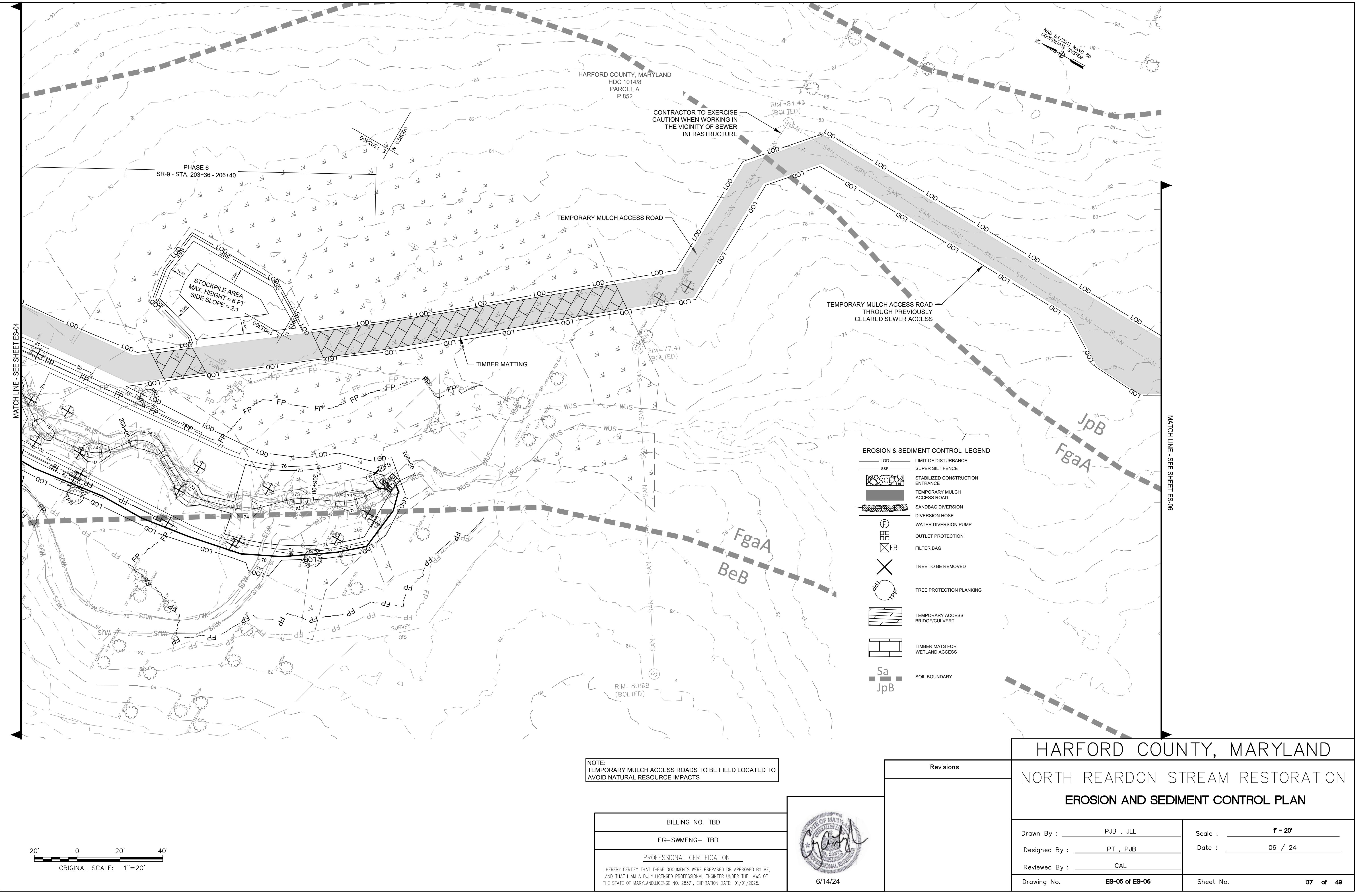
Reviewed By : CAL

Drawing No. **ES-03 of ES-06**

Sheet No. 35 of 49

ION





MATCH LINE - SEE SHEET ES-

MATCHLINE - SEE SHEET INSET

BID No.:

SCALE : 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pES-P000_NorthReardon.dwg Jun 13, 2024 12:43pm pbaltzer

HARFORD COUNTY, MARYLAND
HDC 1014/8
PARCEL A
P.852

EROSION & SEDIMENT CONTROL LEGEND

- LOD — LIMIT OF DISTURBANCE
- SSF — SUPER SILT FENCE
- SCED — STABILIZED CONSTRUCTION ENTRANCE
- TMAR — TEMPORARY MULCH ACCESS ROAD
- SDIV — SANDBAG DIVERSION
- DIVH — DIVERSION HOSE
- WDP — WATER DIVERSION PUMP
- OP — OUTLET PROTECTION
- FB — FILTER BAG
- X — TREE TO BE REMOVED
- TPP — TREE PROTECTION PLANKING
- TAB — TEMPORARY ACCESS BRIDGE/CULVERT
- TMA — TIMBER MATS FOR WETLAND ACCESS
- Sa — SOIL BOUNDARY
- JpB — JETTY BOUNDARY

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

Revisions

BILLING NO. TBD
EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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THE STATE OF MARYLAND LICENSE NO. 28371, EXPIRATION DATE: 07/01/2025.

6/14/24

Drawn By : PJB , JLL **Scale :** 1" = 20'
Designed By : IPT , PJB **Date :** 06 / 24
Reviewed By : CAL

Drawing No. ES-06 of ES-06 **Sheet No.** 38 of 49

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

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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THE STATE OF MARYLAND LICENSE NO. 28371 EXPIRATION DATE: 01/01/2025

THE STATE OF MARYLAND LICENSE NO. 28571, EXPIRATION DATE: 01/01/2025.

Rev

HARFORD COUNTY, MARYLAND

EROSION AND SEDIMENT CONTROL PLAN

Drawn By : PJB , JLL Scale : 1" = 20'

Designed By : IPT , PJB Date : 06 / 24

Reviewed By : CAL

Drawing No. **ES-06 of ES-06** Sheet No. **38 of 49**

ORIGINAL SCALE: 1"=20'

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: 01/01/2025

THE STATE OF MARYLAND LICENSE NO. 28571, EXPIRATION DATE: 01/01/2025.

of 49

61 49

HARFORD COUNTY SEDIMENT CONTROL NOTES

- THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS. FURTHER, NO CONSTRUCTION ACTIVITY SHALL TAKE PLACE UNTIL ALL REQUIRED PERMITS HAVE BEEN OBTAINED.
- THE LIMITS OF DISTURBANCE SHALL BE INDICATED ON THE FIELD PRIOR TO GRADING OF THE SITE TO ENSURE COMPLIANCE WITH APPROVED PLANS. ALL PERMITTED DISTURBANCE AREAS WILL BE DELINEATED WITH BLAZE ORANGE FENCE AS WELL AS ANY SWM INFILTRATION PRACTICE PRIOR TO ANY CLEANING 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.
- 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 APPROVAL FROM DPW.
- ALL WATERWAYS AND WAYS 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.
- 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.
- WORKING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
 - THREE CALENDAR DAYS ON SLOPES GREATER THAN 3:1, ALL WATERWAYS AND TO THE SURFACE OF ALL PERIMETER CONTROLS.
 - SEVEN CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS OF THE PROJECT SITE.
- DUST CONTROL MUST BE MANAGED AS PART OF ALL SEDIMENT CONTROL PLANS. FAILURE TO DO SO IS A VIOLATION OF THIS PLAN.
- SEDIMENT BASINS MUST BE BUILT TO DESIGN SPECIFICATIONS SHOWN ON THE PLAN. IF THE BASIN IS TO BE USED AS A SWM FACILITY, THE BASIN WILL BE BUILT IN ACCORDANCE WITH THE LATEST MD-378 STANDARDS AND SPECIFICATIONS. SITE MATERIALS MUST BE USED. NO CHANGES OR MODIFICATIONS WILL BE MADE WITHOUT WRITTEN AUTHORIZATION OF THE HARFORD SOIL CONSERVATION DISTRICT.
- TEMPORARY FENCING SHALL BE PLACED AROUND ALL SEDIMENT BASINS, TRAPS, AND PONDS DURING CONSTRUCTION AND SITE GRADING.
- 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 NOINPDES REGULATIONS. A COPY OF THE APPROVED SEDIMENT CONTROL PLANS SHALL BE AVAILABLE AT THE SITE AT ALL TIMES.
- ENSURE POSITIVE DRAINAGE TO ALL ROAD INLETS DURING ALL PHASES OF ROAD CONSTRUCTION TO ENSURE NO INLETS ARE CLOGGED.
- CONCRETE FLOORS SHALL BE DONE IN CONFORMANCE WITH 2011 EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS FOR LAND GRADING.
- 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.
- 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.
- ALL MATERIAL ORIGINATING FROM THE DEVELOPMENT OF THE PROPERTY AND DEPOSITED ON THE PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
- STORM DRAIN INLETS AND OUTLETS SHALL BE PROTECTED PER 2011 EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS.
- 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.
- TRAPS TO BE REMOVED SHALL BE DEWATERED AS PER THE 2011 EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS.
- PRIOR TO REMOVAL OF TRAPS OR CONVERSION OF SEDIMENT BASINS TO SWM FACILITIES, THE STORM DRAINS WILL BE FLUSHED.
- 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

- SEEDBED PREPARATION:**
Loosen a minimum of three inches along upper soil by discing, raking or other acceptable means.
- 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.
- 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.
- 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 VEGETATION STABILIZATION NOTES

- ALL DISTURBED AREAS, WHICH ARE NOT TO BE PAVED, SHALL BE PERMANENTLY STABILIZED AS FOLLOWS:**
 - SEEDBED PREPARATION:**
Loosen a minimum of three inches along upper soil by raking, discing, or other acceptable means after spreading four inches of topsoil.
 - 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.
 - 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 30 lbs. per acre of Pearl or Foxtail Millet.
 - FOR PERIOD OF OCTOBER 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.
 - Use sod, provided the ground is suitable and thawed; comply with the 2011 STANDARD AND SPECIFICATION addressing "SOD" (pages B-23 & B-24).
- 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

- 72 HOURS PRIOR TO THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL HAVE ALL LIMIT OF DISTURBANCE (LOD) AND EROSION AND SEDIMENT CONTROL (ESC) DEVICES STAKED OUT IN THE SITE FOR REVIEW AND APPROVAL BY THE COUNTY. CLEARING LIMITS SHALL BE PUBLISHED IN THE PERMITTED LOCATIONS FOR CLEARING AND FENCING INSTALLATION. CONTRACTOR MUST ENSURE CLEAN WATER IS PUMPED DOWNSTREAM OF THE ACTIVE WORK AREAS TO AN MDE APPROVED FILTERING DEVICE.
- 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 I RIPRAP OR IMPERMEABLE SHEETING AS NECESSARY.
- 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 AREA WITH TYPE D SOIL STABILIZATION AND/OR FLOODPLAIN MATTING.
- 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.
- THE PUMP USED TO DIVERT STREAM FLOW SHALL BE SIZED AS NOTED ON THE ESC PLAN UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR.
- 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 BAG 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.
- REMOVE THE TEMPORARY MULCH ACCESS ROAD, TEMPORARY ACCESS BRIDGES, AND STOCKPILE AREAS AS NECESSARY TO PERFORM GRADING OPERATIONS AND STRUCTURE INSTALLATION.
- THE DIVERSION HOSE SHALL BE DISCHARGED IN A NON-ERODIVE 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.
- 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 APPROVAL OF THE COUNTY INSPECTOR.
- 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.
- PROPOSED CONSTRUCTION ENTRANCES (SCE) MUST BE RESTORED TO ORIGINAL STATE OR BETTER AT THE END OF THE PROJECT.
- CONTRACTOR SHALL REMOVE AND REPLACE SIDEWALK AND CURB AND GUTTER TO THE NEAREST JOINT IF REQUIRED AT CONSTRUCTION ENTRANCES

PHASE 1

- INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ON REARDON BRANCH (SR-3) FROM STATIONS 0+00 TO 4+67, OUTFALL #1, AND SEEP #1 WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE 1 CONSTRUCTION.
- CONSTRUCT THE SCOUR POOL, STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 0+00 TO 4+67, WORKING FROM UPSTREAM TO DOWNSTREAM ON REARDON BRANCH (SR-3). AS CONSTRUCTION PROGRESSES, CONSTRUCT THE OUTFALL #1 AND SEEP #1 CHANNELS.
- REMOVE STAGING AND STOCKPILE AREAS ASSOCIATED WITH PHASE 1 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD AS NECESSARY AS CONSTRUCTION PROGRESSES DOWNSTREAM.
- PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 1, PROCEED TO PHASE 2.

PHASE 2

- INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ON REARDON BRANCH (SR-3) FROM STATIONS 4+67 TO 9+88 AND SEEP #2 WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE 2 CONSTRUCTION.
- CONSTRUCT THE STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 4+67 TO 9+88, WORKING FROM UPSTREAM TO DOWNSTREAM ON REARDON BRANCH (SR-3). AS CONSTRUCTION PROGRESSES, CONSTRUCT THE SEEP #2 CHANNEL.
- REMOVE STAGING AND STOCKPILE AREAS ASSOCIATED WITH PHASE 2 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD AS NECESSARY AS CONSTRUCTION PROGRESSES DOWNSTREAM.
- PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 2, PROCEED TO PHASE 3.

PHASE 3

- INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ON REARDON BRANCH (SR-3) FROM STATIONS 9+88 TO 13+20 WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE 3 CONSTRUCTION.
- CONSTRUCT THE STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 9+88 TO 13+20, WORKING FROM UPSTREAM TO DOWNSTREAM ON REARDON BRANCH (SR-3).
- UPON COMPLETION OF THE STREAM CHANNEL AND FLOODPLAIN CONSTRUCTION, REMOVE TEMPORARY MULCH ACCESS ROAD. REMOVE MAIN STAGING AND STOCKPILE AREA ASSOCIATED WITH PHASES 1-3 CONSTRUCTION.
- PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING.
- UPON COMPLETION OF GRADING AND STRUCTURE INSTALLATION IN PHASES 1-3, 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 3, PROCEED TO PHASE 4.

PHASE 4

- INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ALONG UNT TO REARDON BRANCH (SR-9). FROM STATIONS 200+00 TO 201+63, OUTFALL #2, AND SEEP #3 WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE 4 CONSTRUCTION.
- CONSTRUCT THE FOREBAY, OUTFALL #2 CHANNEL, ROCK STEP STRUCTURES, STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BENCHES BETWEEN STATIONS 200+00 TO 201+63 WORKING FROM UPSTREAM TO DOWNSTREAM ON THE UNT TO REARDON BRANCH (SR-9). AS CONSTRUCTION PROGRESSES, CONSTRUCT THE SEEP #3 CHANNEL.
- PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 4, PROCEED TO PHASE 5.

PHASE 5

- INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE AS NECESSARY TO PERFORM IN STREAM WORK ALONG UNT TO REARDON BRANCH (SR-9). FROM STATIONS 201+63 TO 203+36, AND SEEP #4 WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE 5 CONSTRUCTION.
- CONSTRUCT THE PROPOSED STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 203+36 TO 206+40, WORKING FROM UPSTREAM TO DOWNSTREAM ON UNT TO REARDON BRANCH (SR-9). AS CONSTRUCTION PROGRESSES, CONSTRUCT THE SEEP #4 CHANNEL.
- UPON COMPLETION OF THE STREAM AND FLOODPLAIN CONSTRUCTION, REMOVE STAGING AND STOCKPILE AREA ASSOCIATED WITH PHASES 4 & 5 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD AND TEMPORARY ACCESS BRIDGE ASSOCIATED WITH PHASES 4 & 5 CONSTRUCTION.
- PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 5, PROCEED TO PHASE 6.

PHASE 6

- INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE TO PERFORM IN STREAM WORK ON UNT TO REARDON BRANCH (SR-9). FROM STATIONS 203+36 TO 206+40, WORKING FROM UPSTREAM TO DOWNSTREAM. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING OPERATIONS REQUIRED FOR PHASE 6 CONSTRUCTION.
- CONSTRUCT THE PROPOSED STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 203+36 TO 206+40, WORKING FROM UPSTREAM TO DOWNSTREAM ON UNT TO REARDON BRANCH (SR-9).
- UPON COMPLETION OF THE STREAM AND FLOODPLAIN CONSTRUCTION, REMOVE STAGING AND STOCKPILE AREA ASSOCIATED WITH PHASES 4-6 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD ASSOCIATED WITH PHASE 6 CONSTRUCTION.
- PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, STABILIZATION MATTING.
- UPON COMPLETION OF GRADING AND STRUCTURE INSTALLATION IN PHASE 6, AND WITH APPROVAL FROM THE COUNTY INSPECTOR, DESIGN ENGINEER, AND COUNTY PROJECT MANAGER, THE CONTRACTOR MAY REMOVE REMAINING E&SC MEASURES WITHIN PHASE 6. ANY AREAS DISTURBED BY REMOVING THE E&SC DEVICES SHALL BE STABILIZED IMMEDIATELY.

PROJECT COMPLETION

- 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.
- COMPLETE FINAL PERMANENT VEGETATIVE STABILIZATION AND PLANTING OF SITE PER THE LANDSCAPE PLAN.
- CONDUCT A PUNCH LIST WALK-THROUGH WITH THE COUNTY PROJECT MANAGER, THE DESIGN ENGINEER, AND THE COUNTY INSPECTOR.
- CORRECT ANY OUTSTANDING ITEMS FOLLOWING THE PUNCH LIST WALK-THROUGH.
- WITH WRITTEN APPROVAL FROM THE COUNTY INSPECTOR, DESIGN ENGINEER, AND COUNTY PROJECT MANAGER, REMOVE ANY REMAINING SEDIMENT CONTROL DEVICES.

SEQUENCE OF CONSTRUCTION GENERAL NOTES:

- 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 PUMPED DOWNSTREAM OF THE ACTIVE WORK AREAS TO AN MDE APPROVED FILTERING DEVICE.
- 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 I RIPRAP OR IMPERMEABLE SHEETING AS NECESSARY.
- 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 AREA WITH TYPE D SOIL STABILIZATION AND/OR FLOODPLAIN MATTING.
- 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.
- THE PUMP USED TO DIVERT STREAM FLOW SHALL BE SIZED AS NOTED ON THE ESC PLAN UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR.
- 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 BAG 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.
- 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.
- THE PUMP USED TO DIVERT STREAM FLOW SHALL BE SIZED AS NOTED ON THE ESC PLAN UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR.
- 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 BAG 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.
- 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.
- THE PUMP USED TO DIVERT STREAM FLOW SHALL BE SIZED AS NOTED ON THE ESC PLAN UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR.
- 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 BAG 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.
- 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.
- THE PUMP USED TO DIVERT STREAM FLOW SHALL BE SIZED AS NOTED ON THE ESC PLAN UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR.
- PUMP AROUND OPERATIONS SHALL BE INSTALLED AND REMOVED FROM THE STREAM EACH WORKING DAY. THE CONTRACTOR SHALL EMPLOY THE USE OF AN

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 sediment control manager of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should state 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 construction of the channel and sediment diversion 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.
- Walls and slopes should be protected from erosion by the use of sediment control measures, such as sediment control mats, or other approved source. The measure should be located such that the water drains back into 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.
- If 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 tributary until the main stem is completed.
- 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.

TABLE H.2: STONE SIZE

TYPE	SIZE RANGE	#50	#100	AAHTO	MIN/GE
NUMBER 1 ^a	3/8" TO 1 1/2" in	1/2 in	1 1/2 in	M-43	N/A
NUMBER 1 ^a	2 to 3 in	2 1/2 in	3 in	M-43	N/A
RIPRAP (CLASS D)	4 to 7 in	5 1/2 in	7 in	N/A	N/A
CLASS I	N/A	9 1/2 in	15 in	N/A	40 lb
CLASS II	N/A	16 in	24 in	N/A	200 lb
CLASS III	N/A	23 in	34 in	N/A	600 lb

^a This designation is to be used in the construction of a stone outlet or check dam.

^b This designation is to be used for riprap.

^c When calculating the stone outlet or check dam, bring about one of 100 cubic feet to the outlet.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

**MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2000**

MULCH ACCESS PATH DETAIL
NOT TO SCALE

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.
3. 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.

TEMPORARY TIMBER MATTING AND MULCH ACCESS ROUTE DETAIL
NOT TO SCALE

NOTES:

- MULCH 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 MINIMIZES 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, CARLED 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.

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. 26371, EXPIRATION DATE: 01/01/2025.

6/14/24

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

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL DETAILS

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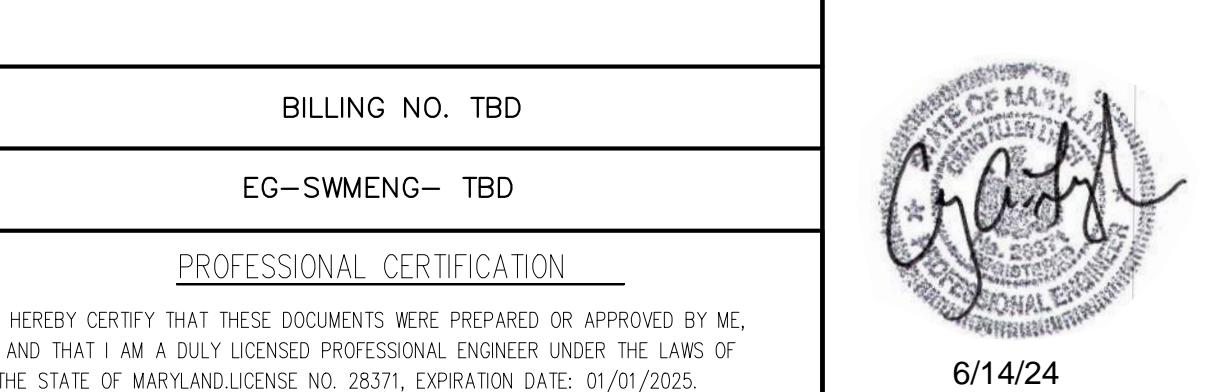
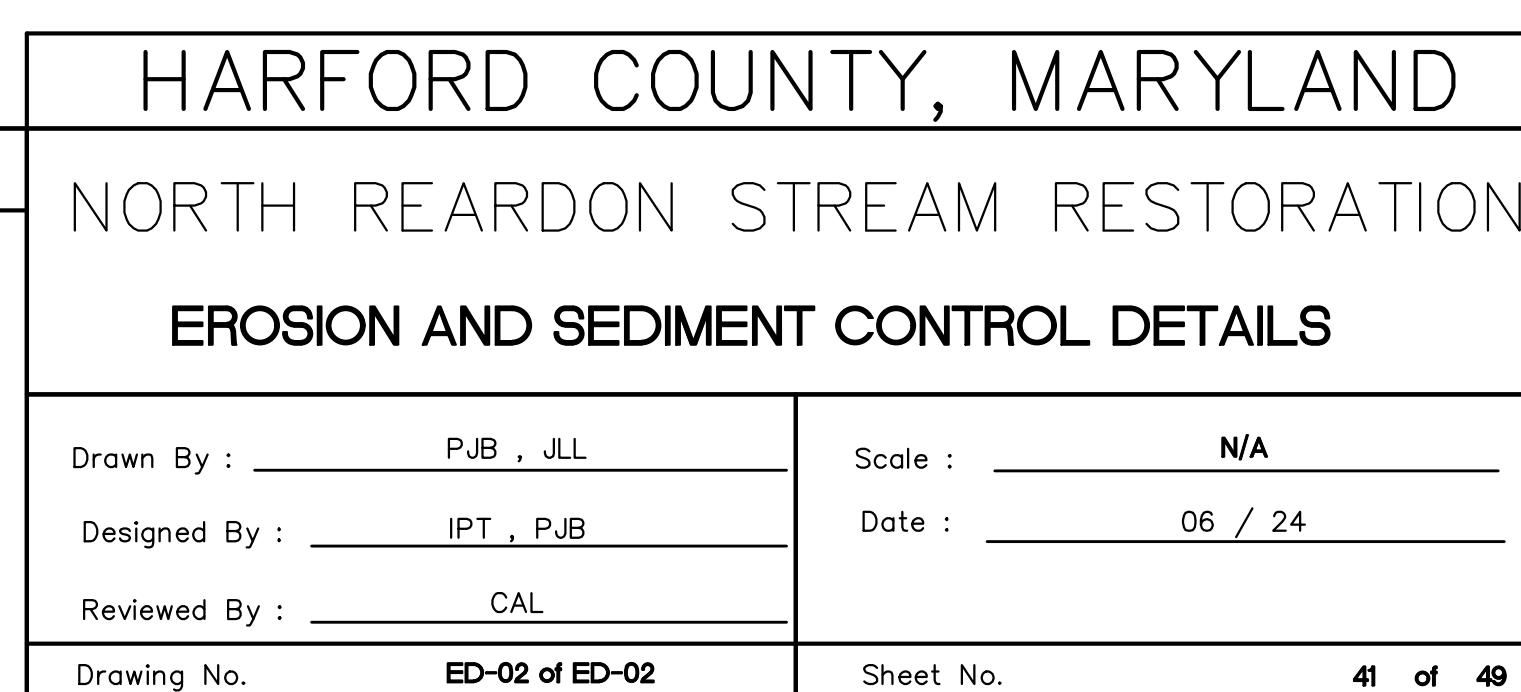
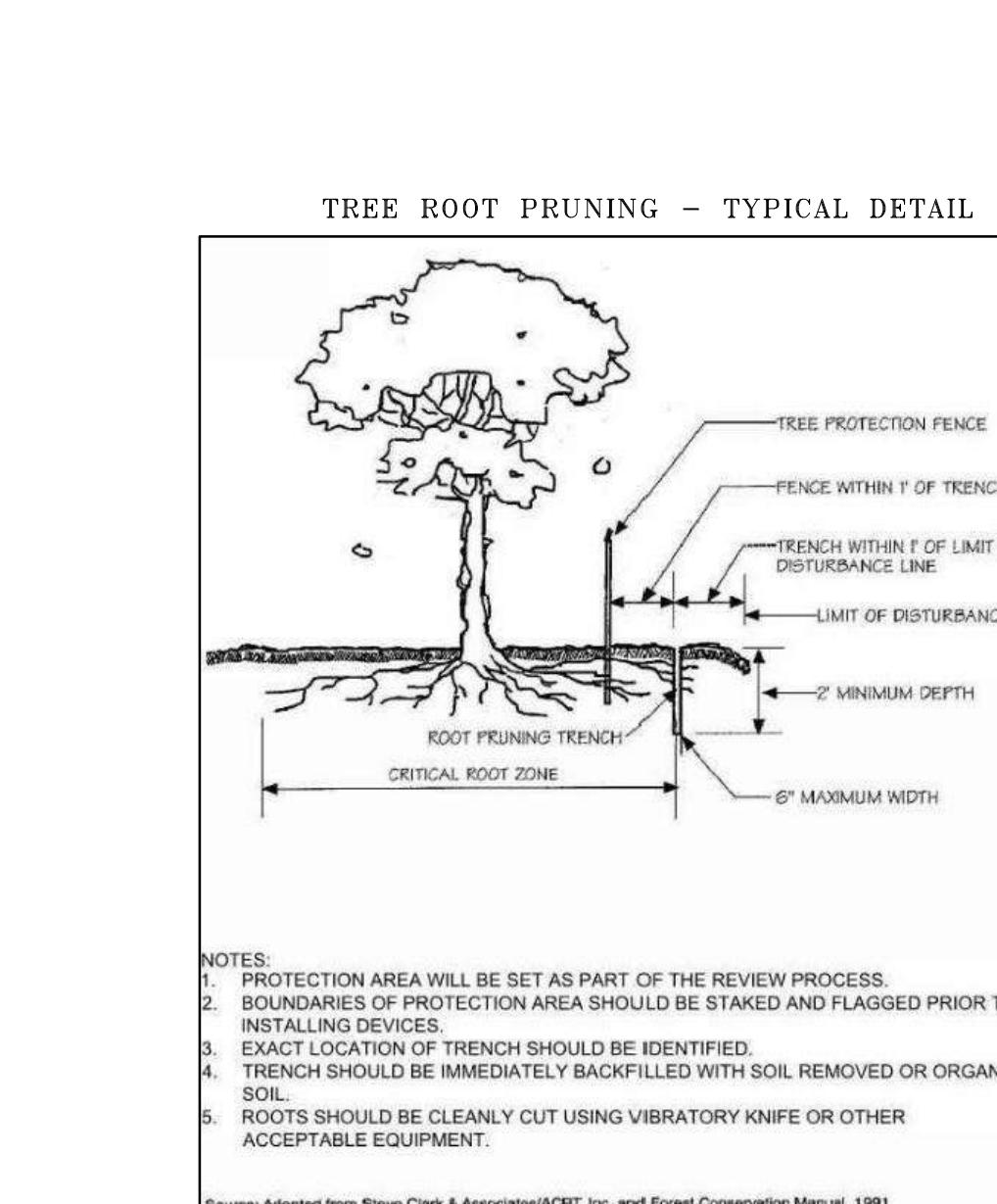
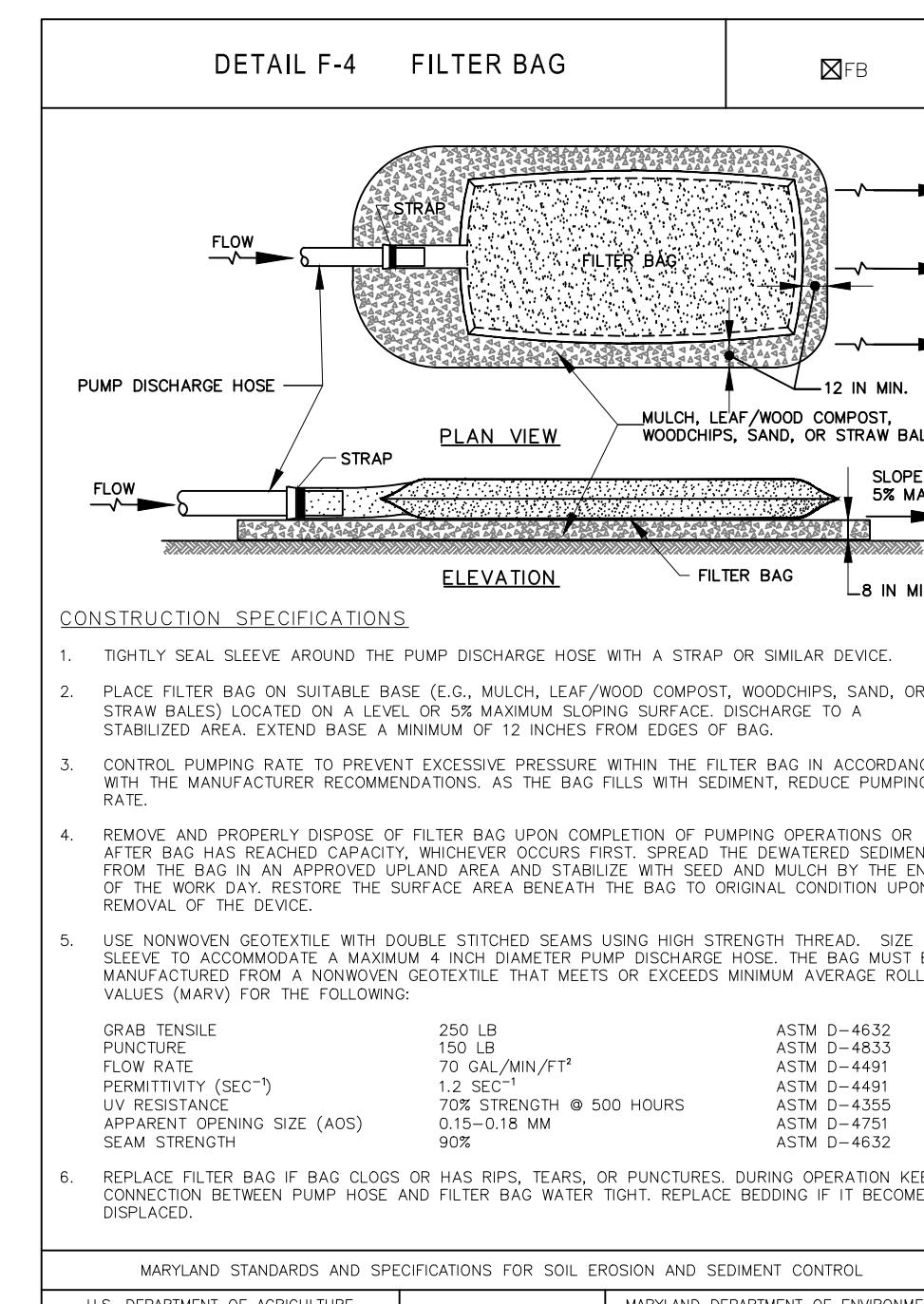
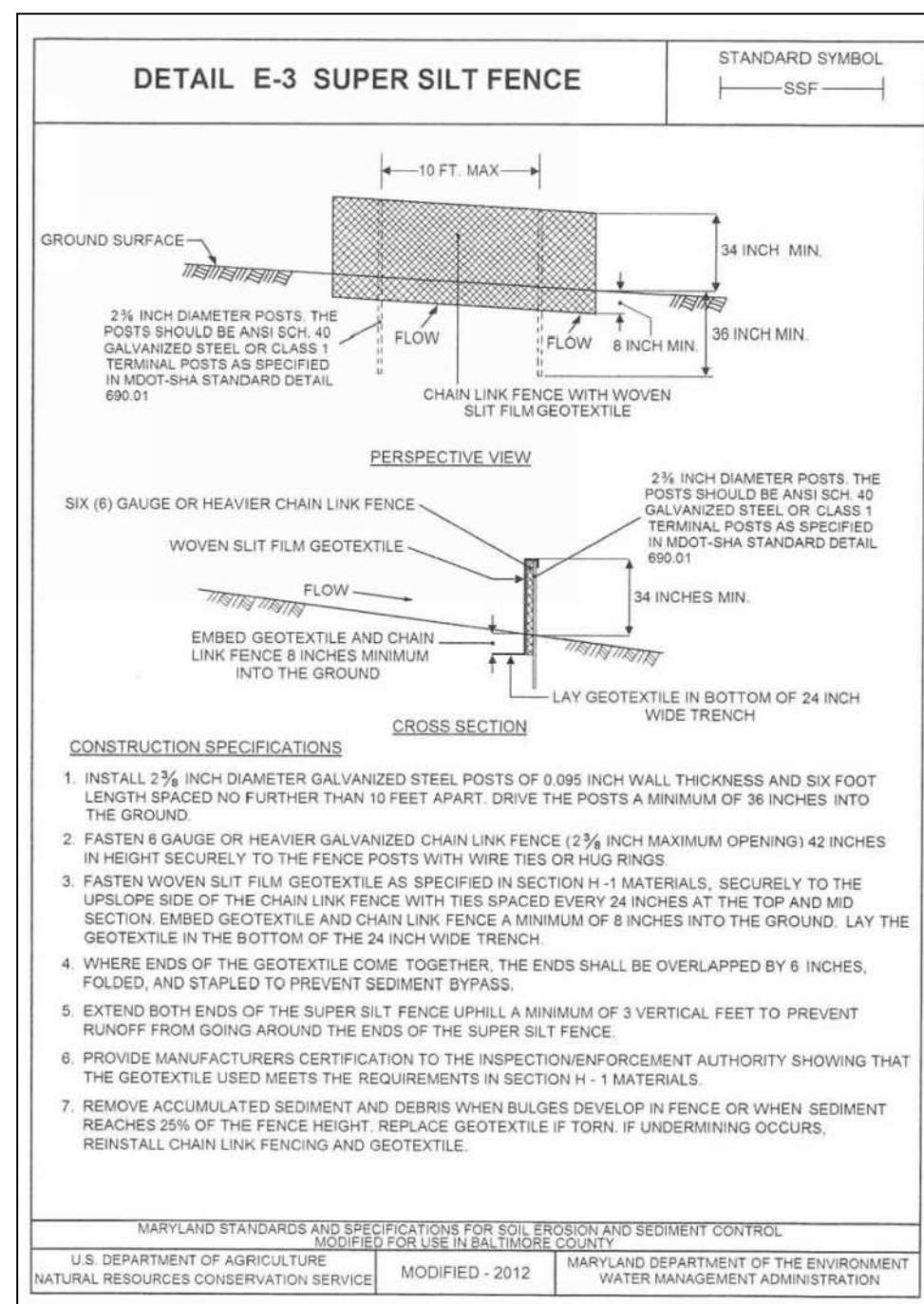
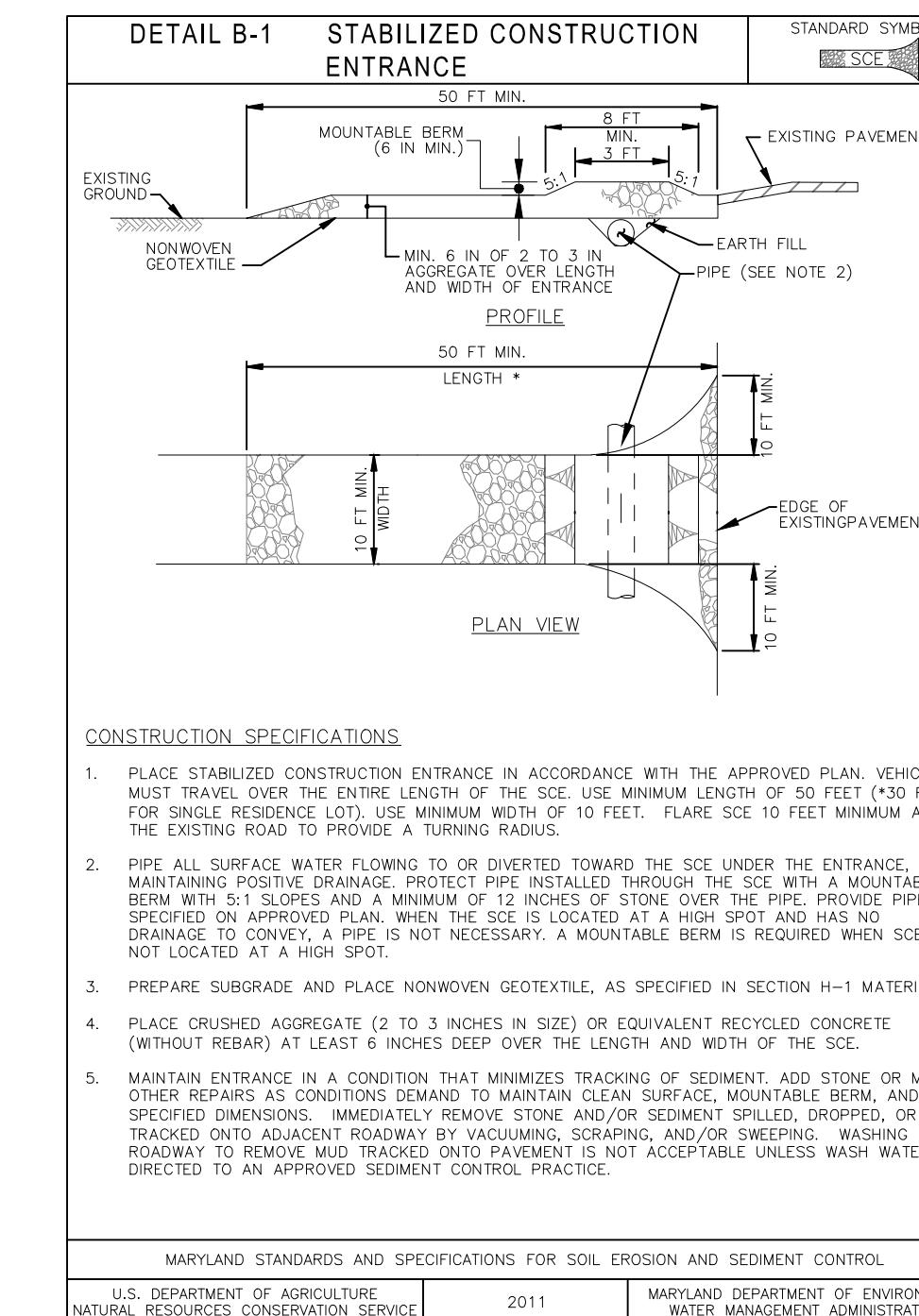
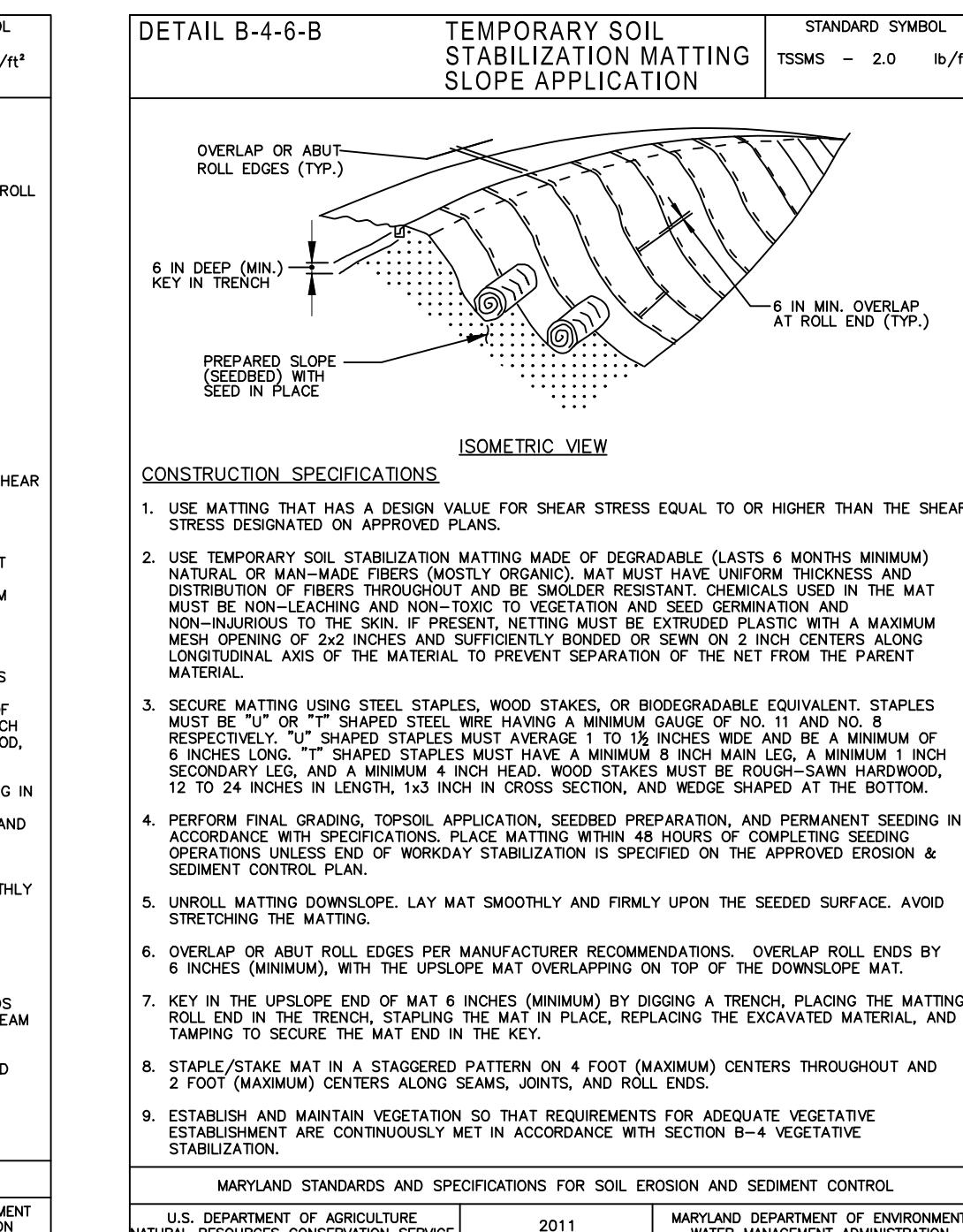
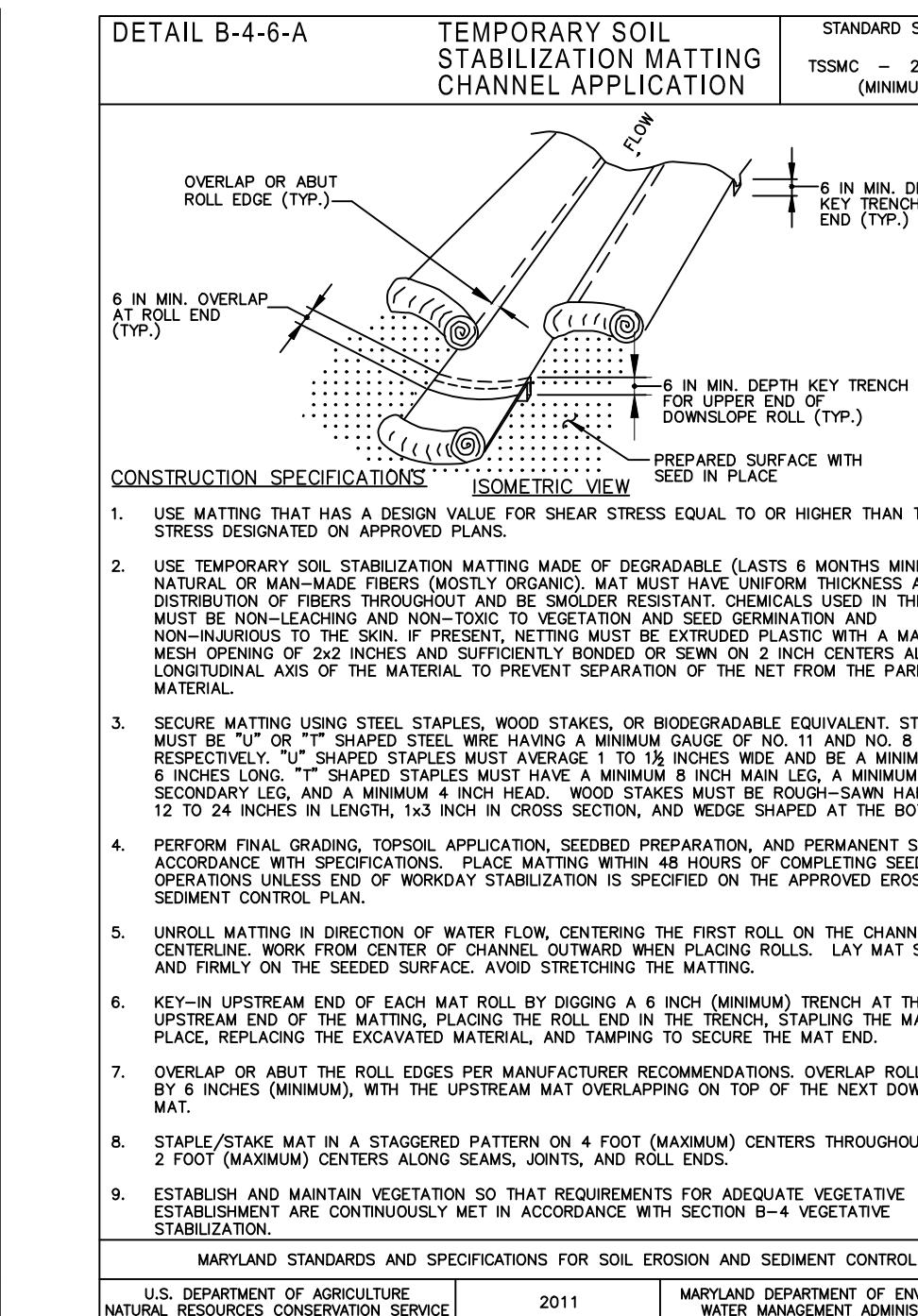
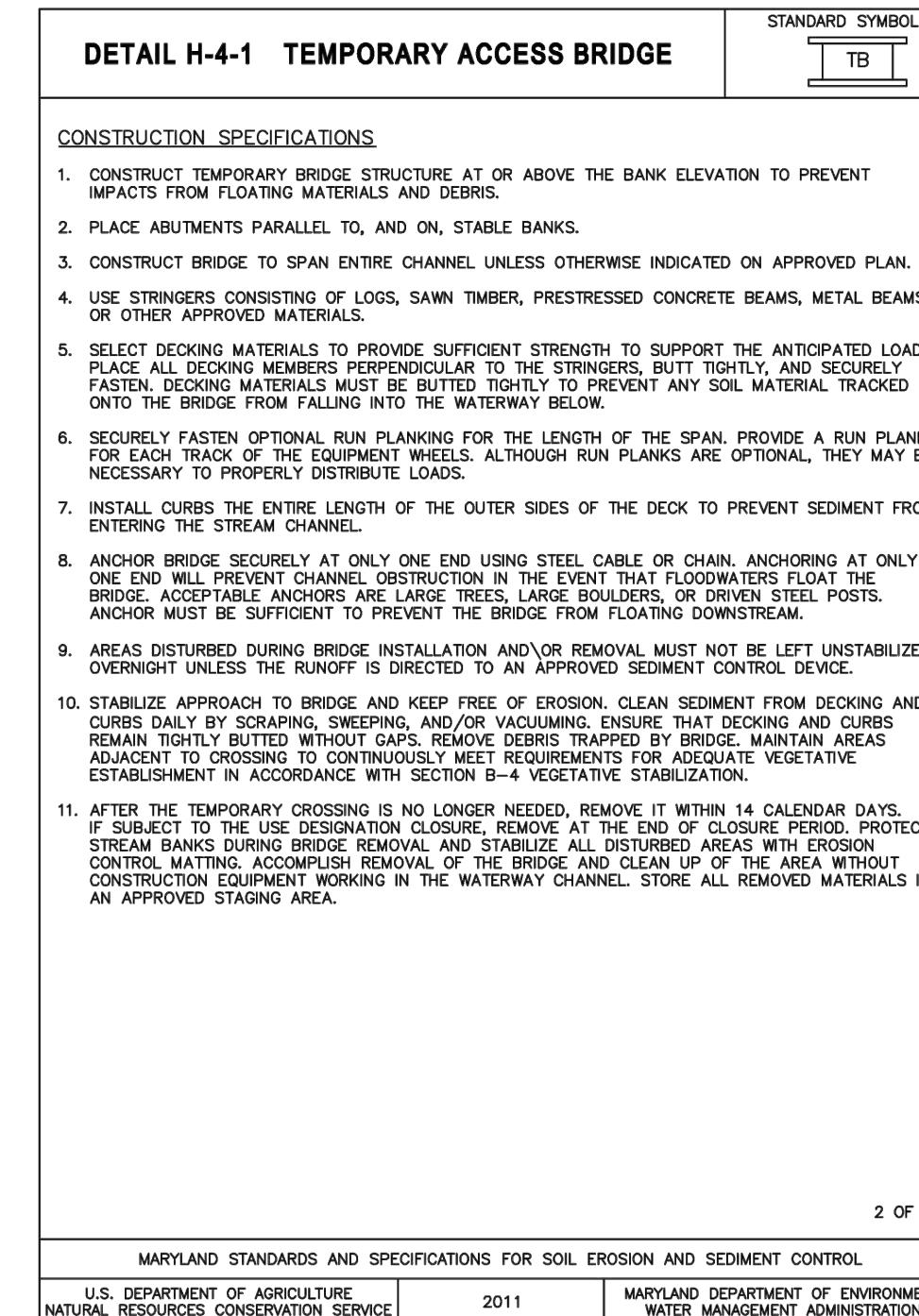
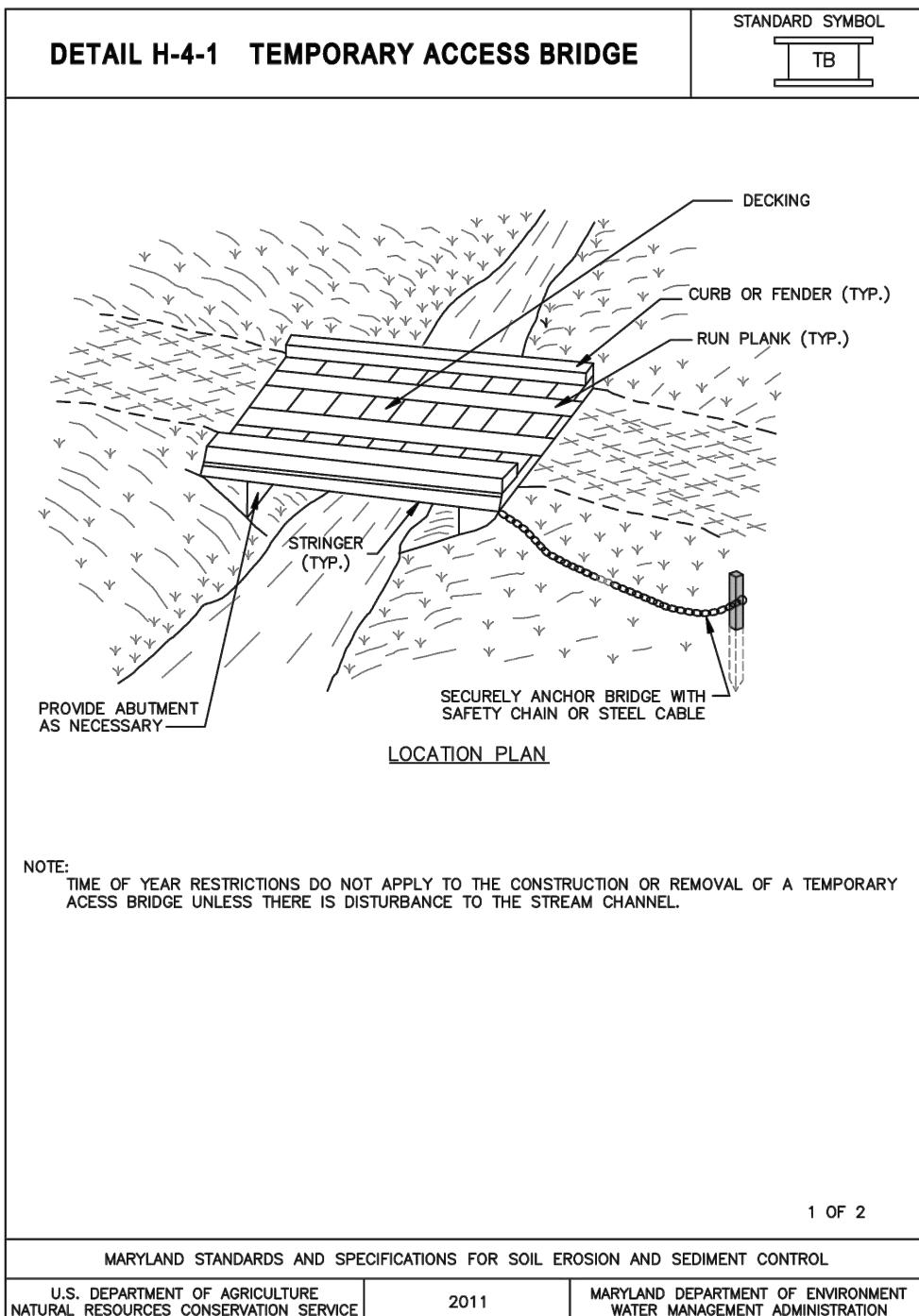
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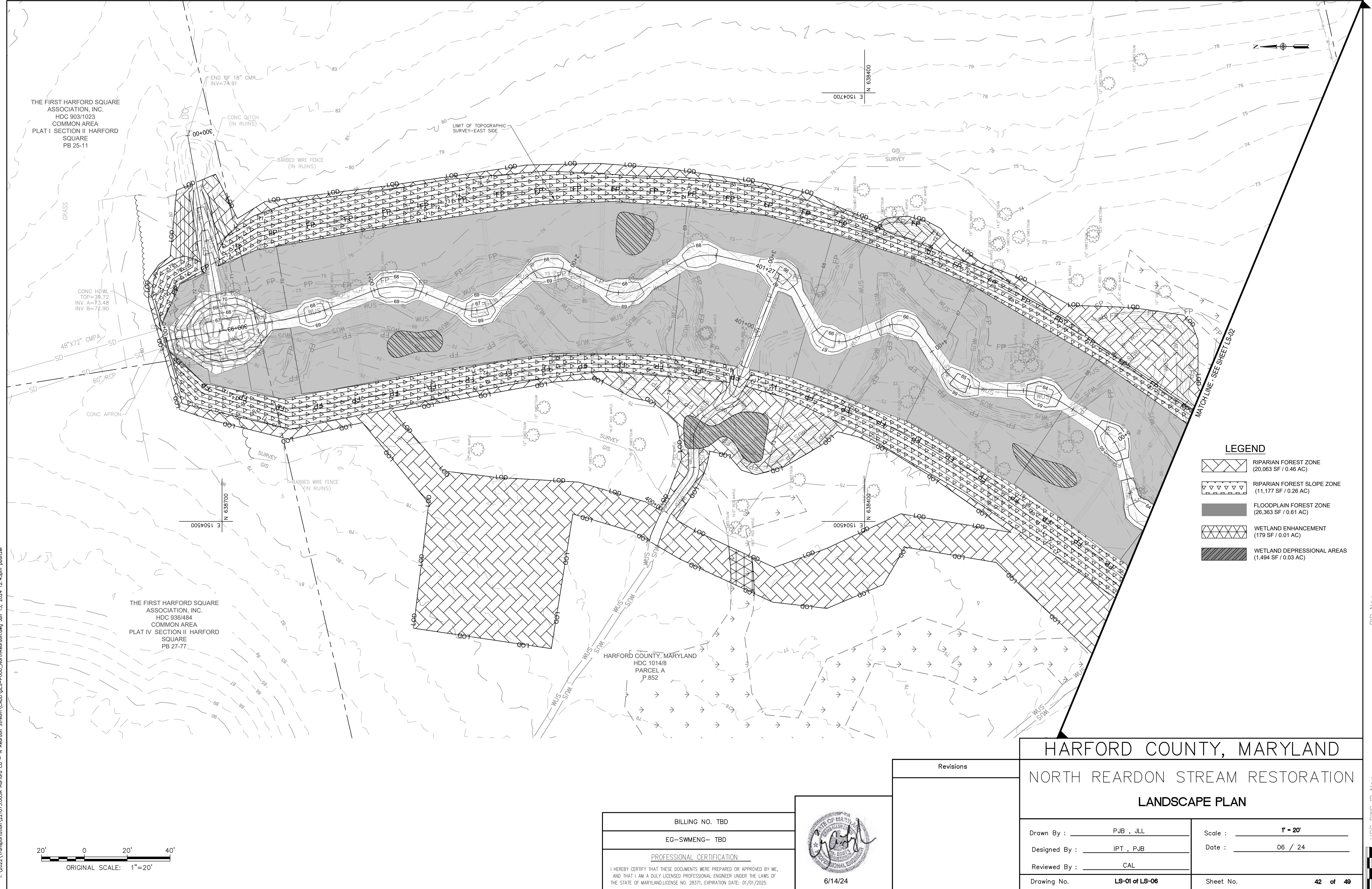
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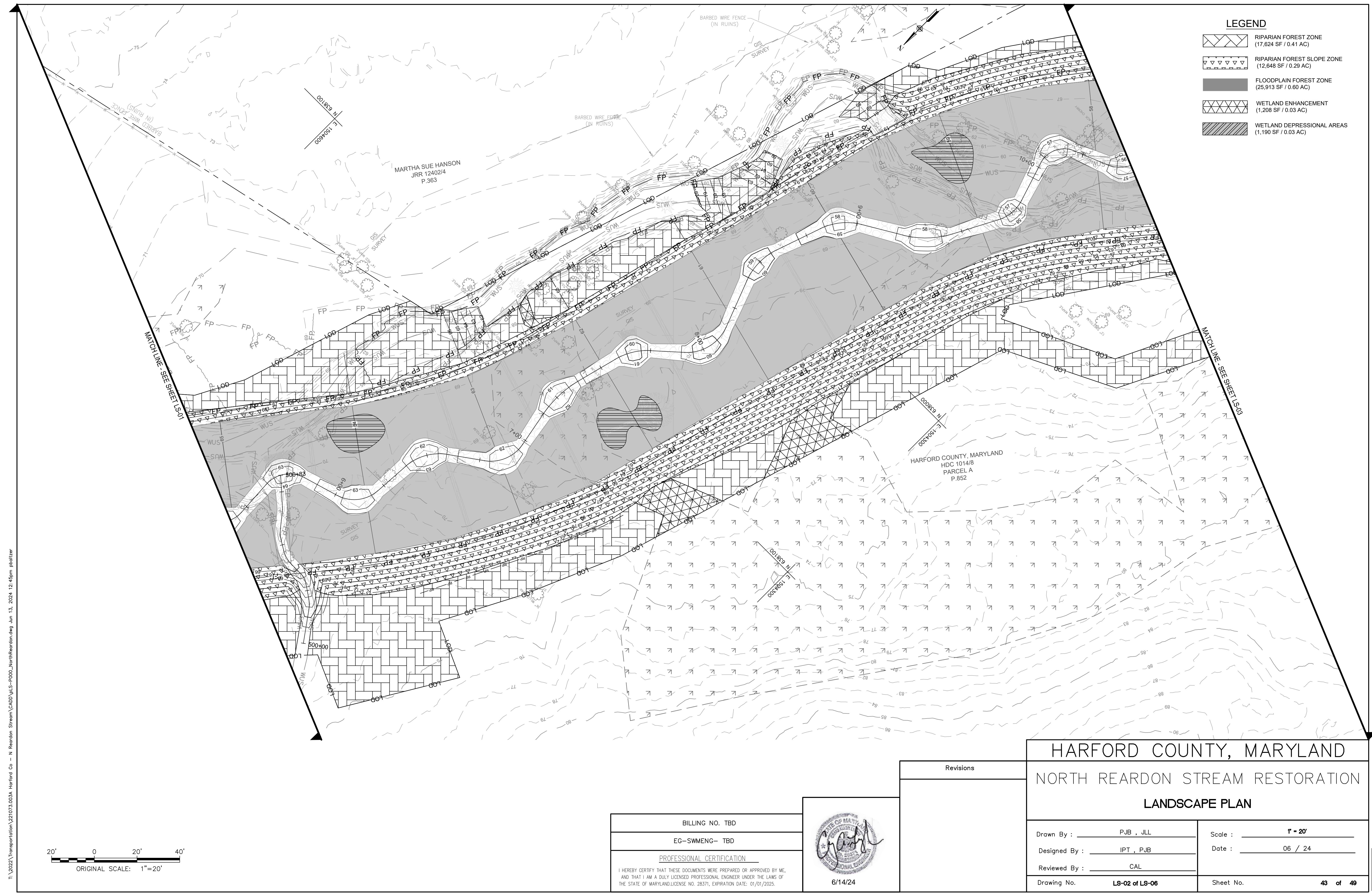
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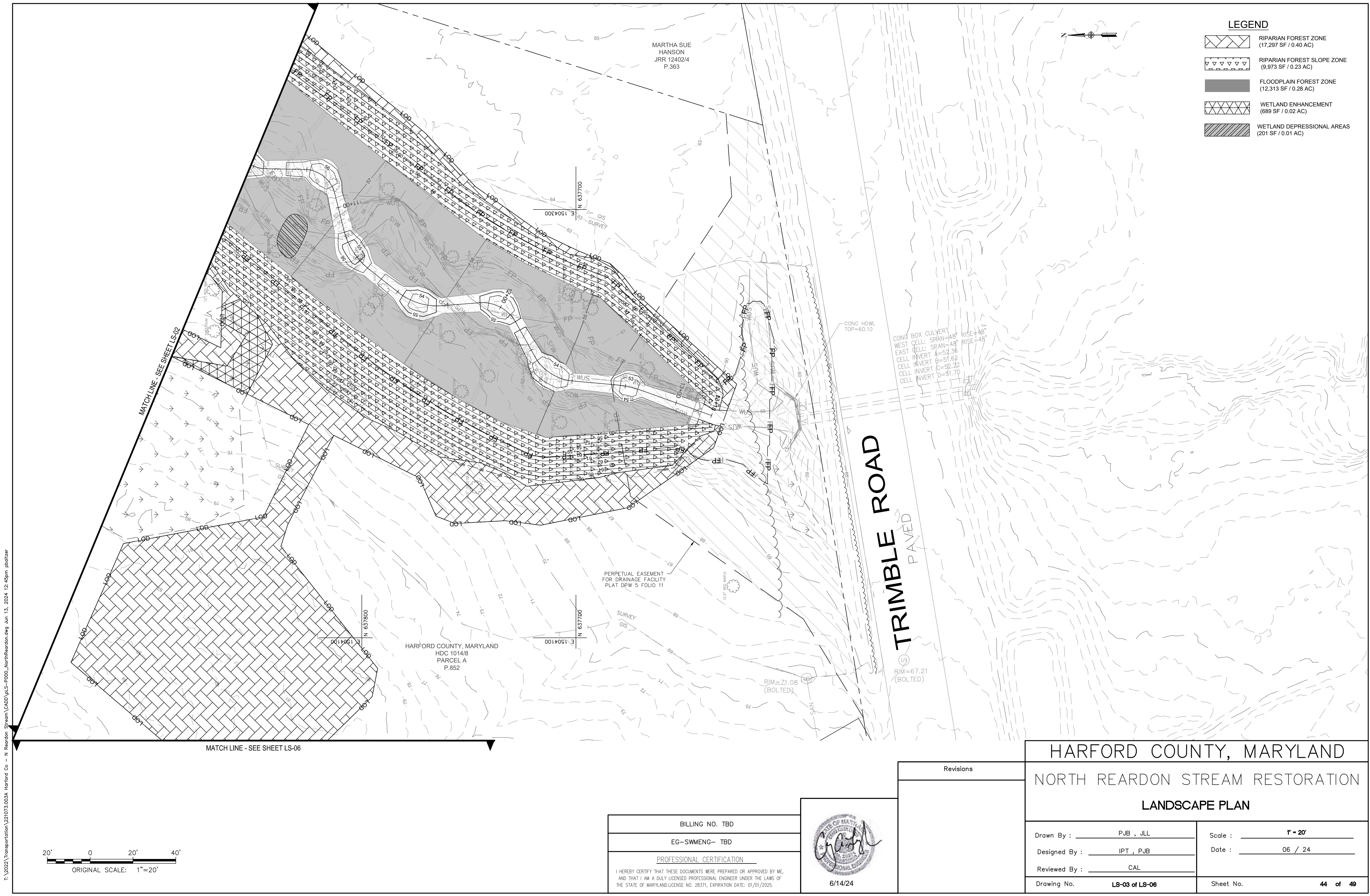
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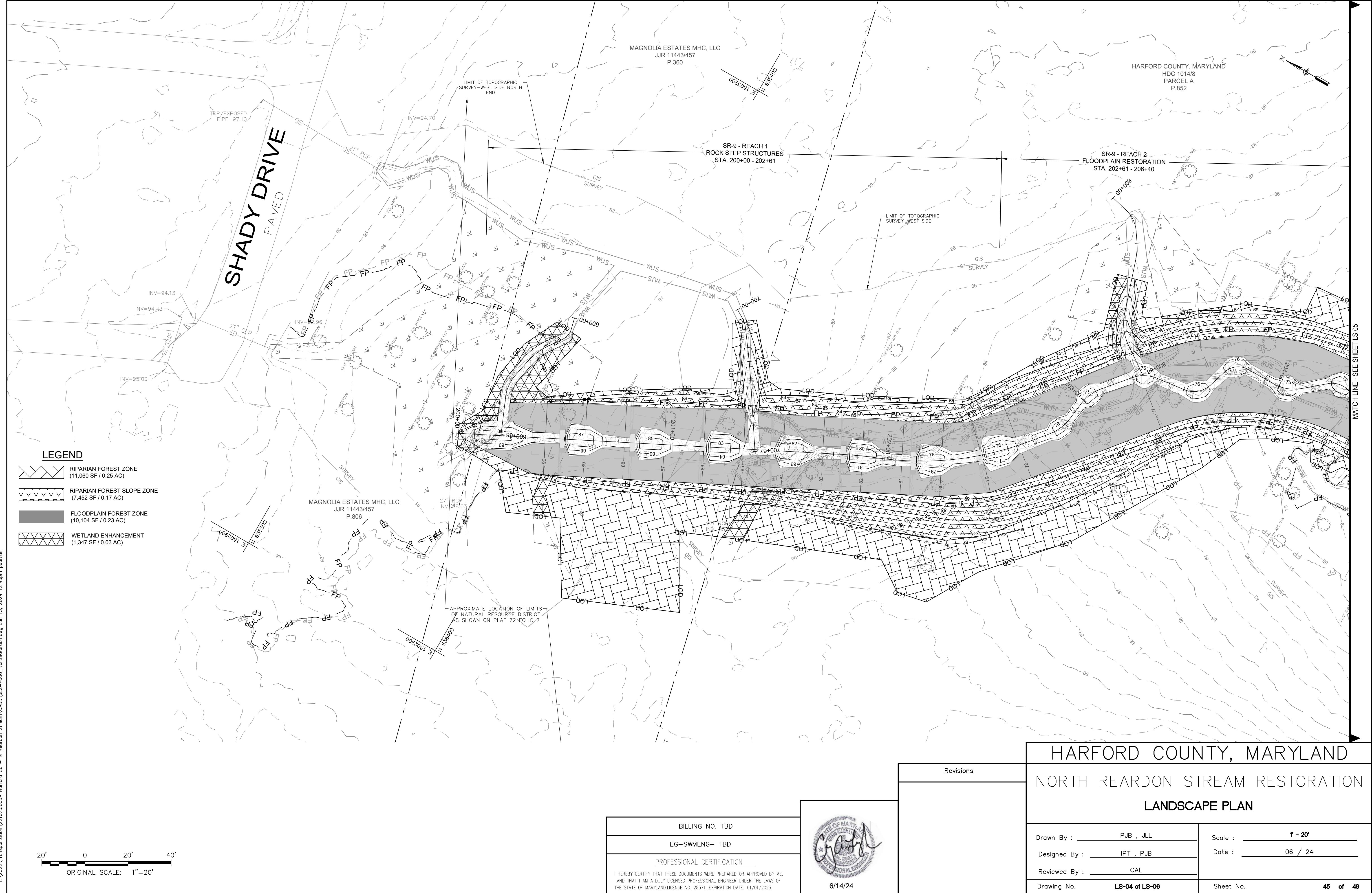


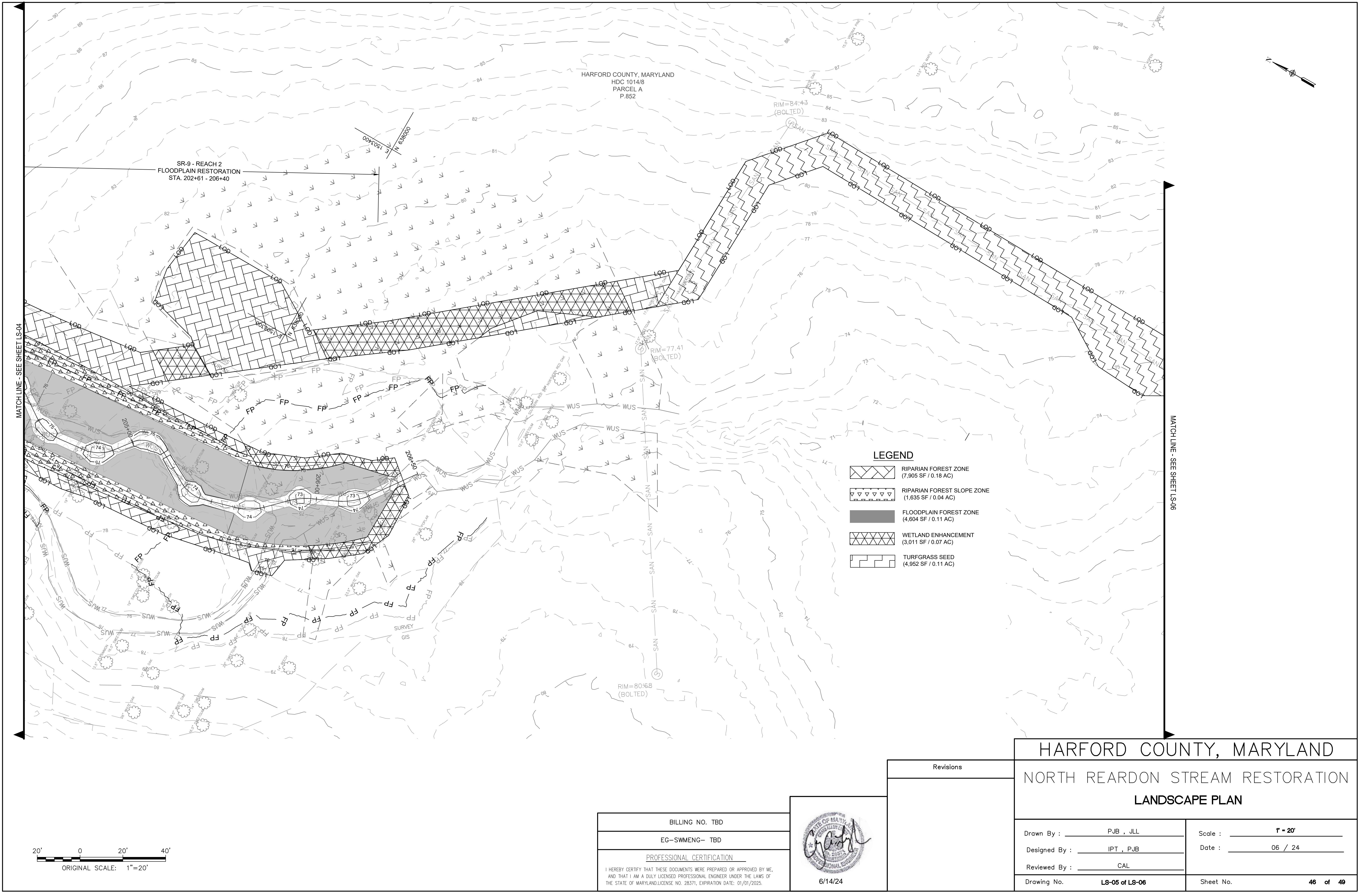
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	BILLING NO. TBD EG-SWMENG- TBD <u>PROFESSIONAL CERTIFICATION</u>
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Revisions	<h1 data-bbox="4902 3569 6142 3594">NORTH REARDON STREAM RESTORATION</h1>		
<h2 data-bbox="5392 3628 5875 3653">LANDSCAPE PLAN</h2>			
<p>Drawn By : PJB , JLL</p> <p>Designed By : IPT , PJB</p> <p>Reviewed By : CAL</p>		<p>Scale : 1" = 20'</p> <p>Date : 06 / 24</p>	
Drawing No.	LS-03 of LS-06		Sheet No.
44 of 49			

BID No.:





MATCH LINE - SEE SHEET LS-

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1

WATSON LINE - OLD SOUTHERN INLET

HARFORD COUNTY, MARYLAND

LANDSCAPE PLAN

BILLING NO. TBD	
EG-SWMENG- TBD	
<u>PROFESSIONAL CERTIFICATION</u>	
<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: 01/01/2025.</p>	
6/14/24	

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: 01/01/2025

 A circular notary seal for the State of Maryland. The outer ring contains the text "NOTARY PUBLIC", "STATE OF MARYLAND", "NOTARIAL SEAL", "NOTARIAL SEAL", and "NOTARIAL SEAL". The inner circle contains the text "NOTARIAL SEAL", "NOTARIAL SEAL", and "NOTARIAL SEAL". A large, handwritten signature is overlaid on the seal.	<p>Revisions</p>
6/14/24	

Drawn By:

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. **LS-06 of LS-06**

1" = 20'

te : 06 / 24

115

Sheet No. 47 of 49

10

1 inch
HCCG DWG ID No.:

A scale bar diagram for a surveying project. It features a horizontal line with tick marks. The left end is labeled '20'' above the line. The center is labeled '0' above the line. The right end is labeled '20'' above the line. Below the line, the text 'ORIGINAL SCALE: 1"=20'' is written.

LANDSCAPING NOTES:

GENERAL NOTES -

1. ANY PLANTINGS WITHIN A FOREST RETENTION AREA, AS DESIGNATED ON THE TREE CONSERVATION PLAN AND SHOWN ON THIS PLAN, MUST BE DONE TO AVOID ANY ADVERSE IMPACT ON THE ROOTS OF EXISTING TREES.
2. ALL PLANT MATERIAL WILL BE REINSPECTED FOR SURVIVAL BY THE PLANNING AND CODE ADMINISTRATION ONE YEAR FOLLOWING INSTALLATION. A 10 PERCENT MAINTENANCE BOND WILL BE RETAINED DURING THIS TIME PERIOD.
3. SOIL CONDITIONS MUST BE TESTED, VERIFIED, AND ADJUSTED BY THE LANDSCAPE CONTRACTOR TO INSURE THAT APPROPRIATE SOILS COMPOSITION AND PH LEVELS ARE SUITABLE FOR PLANT MATERIALS SPECIFIED FOR THAT SPECIFIC LOCATION.

PLANT MATERIAL SELECTION -

1. THE CONTRACTOR SHALL FURNISH PLANT MATERIALS IN SIZES AND QUANTITIES SPECIFIED IN THE PLANT SCHEDULES.
2. NURSERY GROWN PLANT MATERIAL SHOULD MEET OR EXCEED THE REQUIREMENTS OF THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION'S (ANLA) 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.
3. ALL PLANTING MATERIAL SHALL BE SOURCED FROM WITHIN 100 MILES OF THE SITE.
4. NO SUBSTITUTIONS SHALL BE MADE WITHOUT THE WRITTEN CONSENT OF THE OWNER AND/OR LANDSCAPE ARCHITECT.
5. 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 -

1. 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.
2. 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 HEELD-COLD STORAGE OR COLLECTED STOCK WILL BE ACCEPTED. PLANTS IN POOR CONDITION SHALL BE REJECTED, REMOVED FROM THE SITE AND REPLACED WITH ACCEPTABLE MATERIALS.

3. 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.
4. THE CONTRACTOR IS REQUIRED TO OBTAIN CLEAN FRESH WATER FOR USE DURING PLANTING OPERATIONS AND THE SUBSEQUENT MAINTENANCE PERIOD.

SITE PREPARATION AND PLANTING -

1. THE SITE AND AREAS IMMEDIATELY ABUTTING (WITHIN 25' OF) THE LOD SHALL BE TREATED FOR INVASIVE SPECIES PRIOR TO THE START OF CONSTRUCTION.
2. TREE PROTECTION FENCING DETAIL CAN BE FOUND WITHIN THE E&S NOTES AND DETAILS PLAN SHEETS.
3. 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.
4. 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 COMPACTION SO AS TO REESTABLISH PROPER GRADE FOR NEW PLANTING AND/OR LAWN AREAS.
5. 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 A MDLSEA CERTIFIED ARBORIST OR HARFORD COUNTY REPRESENTATIVE AS SOON AS FINAL CLEARING HAS BEEN COMPLETED.
6. ROOT PRUNING MAY BE NECESSARY WHERE THE CRITICAL ROOT ZONE IS IMPACTED, AS DETERMINED BY THE PLAN PREPARED OR AN MDLSEA CERTIFIED ARBORIST. PRUNING SHALL BE ALONG THE LOD ADJACENT TO TREE PROTECTION FENCING. A CERTIFIED ARBORIST SHALL SUPERVISE OR CONDUCT ROOT PRUNING.
7. REFER TO THE MDSHA STANDARDS AND SPECIFICATIONS SECTION 710.03.01 PLANTING SEASONS TABLE 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.
8. MOW PLANTING AREA CLOSE TO THE GROUND ONE WEEK (OR LESS) PRIOR TO CONTAINER PLANTING DATE.
9. 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.

10. TO ENSURE TREE SURVIVAL 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 MDSHA 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 EXCESS 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 PLANT AND TO PREVENT EROSION.
- STAKING SHALL BE INSTALLED ON EVERY TREE WITHIN THE STEEP SLOPES PLANTING ZONE PER THE DETAIL ON THIS SHEET.
11. 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
12. INSTALL PLANT MATERIALS PER MDSHA STANDARDS AND SPECIFICATIONS 710.03.09.
13. 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.
14. AFTER INSTALLATION OF PLANTS, THE CONTRACTOR SHALL MONITOR THE SOIL, MOISTURE AND WATER NEEDS OF PLANTS AND SEED AS NECESSARY TO ENSURE SURVIVAL. WATERING PLANTING PITS AND SEDED AREAS SHOULD OCCUR AS SPECIFIED IN MDSHA STANDARDS AND SPECIFICATIONS SECTION 710.03.04(C).

MAINTENANCE -

16. UPON COMPLETION OF INSTALLATION, THE PLANTING AREA IS TO BE MAINTAINED FOR A 2 YEAR PERIOD. AN 85% SURVIVAL RATE 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% SURVIVAL RATE AS REQUIRED BY HARFORD COUNTY.

17. 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
18. INSTALL PLANT MATERIALS PER MDSHA STANDARDS AND SPECIFICATIONS 710.03.09.
19. 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.
20. AFTER INSTALLATION OF PLANTS, THE CONTRACTOR SHALL MONITOR THE SOIL, MOISTURE AND WATER NEEDS OF PLANTS AND SEED AS NECESSARY TO ENSURE SURVIVAL. WATERING PLANTING PITS AND SEDED AREAS SHOULD OCCUR AS SPECIFIED IN MDSHA STANDARDS AND SPECIFICATIONS SECTION 710.03.04(C).

21. MAINTENANCE -
 - 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% SURVIVAL RATE AS REQUIRED BY HARFORD COUNTY.

22. MAINTENANCE -
 - 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% SURVIVAL RATE AS REQUIRED BY HARFORD COUNTY.

Riparian Forest Seed Mix* (75,308 SF / 1.73 AC)					
Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)	
Sorghastrum nutans	Indiangrass, New England	39.70%	15.88	27.47	
Elymus virginicus	Virginia wildrye	20.00%	8.00	13.84	
Panicum virgatum	Switchgrass	18.00%	7.20	12.46	
Panicum rigidulum	Redtop panicgrass	10.00%	4.00	6.92	
Chamaecrista fasciata	Partridge pea	3.00%	1.20	2.08	
Rudbeckia hirta	Blackeyed Susan	3.00%	1.20	2.08	
Helianthus annuus	Narrowleaf sunflower	2.00%	0.80	1.38	
Asclepias incarnata	Swamp milkweed	1.00%	0.40	0.69	
Vernonia noveboracensis	New York ironweed	0.90%	0.36	0.62	
Eupatorium perfoliatum	Boneset	0.80%	0.32	0.55	
Helemium autumnale	Common sneezeweed	0.80%	0.32	0.55	
Solidago rugosa	Wrinkleleaf goldenrod	0.80%	0.32	0.55	
			Total:	69.20	

Riparian Forested Slope Seed Mix* (42,885 SF / 0.98 AC)					
Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)	
Sorghastrum nutans	Indiangrass, New England	31.00%	18.60	32.18	
Lolium multiflorum	Annual Ryegrass	20.00%	12.00	20.76	
Andropogon gerardii	Big bluestem	14.00%	8.40	14.53	
Elymus virginicus	Virginia wildrye	10.00%	6.00	10.38	
Elymus canadensis	Canada wildrye	7.00%	4.20	7.27	
Agrostis perennans	Autumn bentgrass	4.00%	2.40	4.15	
Panicum virgatum	Switchgrass	4.00%	2.40	4.15	
Panicum clandestinum	Deerongue	3.00%	1.80	3.11	
Echinacea purpurea	Purple coneflower	1.50%	0.90	1.56	
Chamaecrista fasciata	Partridge pea	1.30%	0.78	1.35	
Helianthus annuus	Oxeye sunflower	1.20%	0.72	1.25	
Coreopsis lanceolata	Lanceleaf coreopsis	1.00%	0.60	1.04	
Rudbeckia hirta	Blackeyed Susan	1.00%	0.60	1.04	
Asclepias syriaca	Common milkweed	0.40%	0.24	0.42	
Solidago rugosa	Wrinkleleaf goldenrod	0.30%	0.18	0.31	
Aster pilosus	Heath aster	0.30%	0.18	0.31	
			Total:	103.80	

Floodplain Forest Seed Mix* (79,297 SF / 1.82 AC)					
Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)	
Elymus riparius	Riverbank wildrye	28.00%	11.20	20.38	
Andropogon gerardii	Big bluestem	20.00%	8.00	14.56	
Panicum clandestinum	Deerongue	10.00%	4.00	7.28	
Carex lunculata	Shallow sedge	10.00%	4.00	7.28	
Carex vulpinoidea	Fox sedge	10.00%	4.00	7.28	
Carex scoparia	Blunt brome sedge	8.00%	3.20	5.82	
Panicum virgatum	Switchgrass	4.00%	1.60	2.91	
Juncus effusus	Soft rush	2.00%	0.80	1.46	
Asclepias incarnata	Swamp milkweed	2.00%	0.80	1.46	

