NORTH REARDON STREAM RESTORATION

BID NO. TBD

OFFICE OF WATERSHED PROTECTION AND RESTORATION
HARFORD COUNTY, MARYLAND
60% DESIGN PLANS – NOT FOR CONSTRUCTION

PROJECT OVERVIEW:
THE SCOPE OF THIS PROJECT IS THE RESTORATION OF TWO STREAMS, 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 ECOLOGICAL UPLIFT VIA FLOODPLAIN RECONNECTION AND HYPORHEIC EXCHANGE. THE PROJECT CONSISTS OF TWO STREAM SEGMENTS AND WILL EMPLOY A COMBINATION OF NATURAL CHANNEL DESIGN AND FLOODPLAIN/VALLEY RESTORATION TECHNIQUES TO REDUCE STREAM BANK EROSION, NUTRIENT INPUTS, AND IMPROVING ECOLOGICAL AND GEOMORPHIC FUNCTION. 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

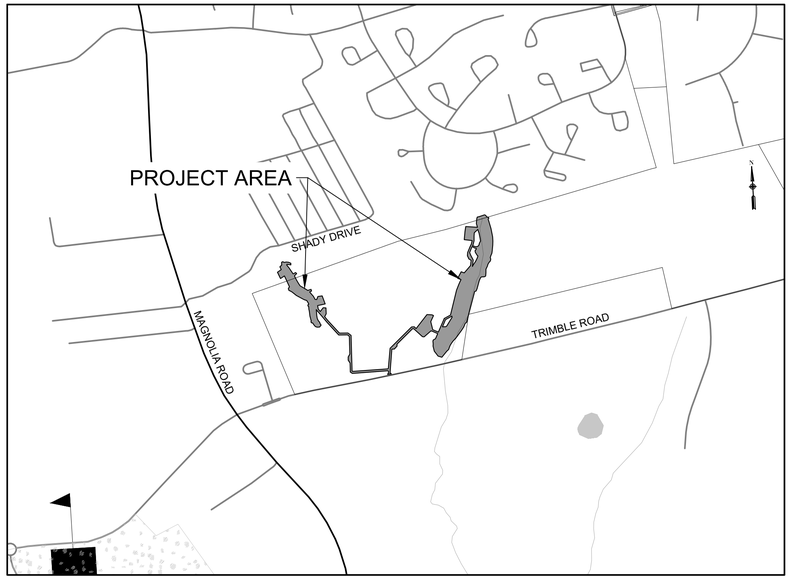
60% DESIGN INDEX OF SHEETS

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 - 29	CS-01 - CS-08	CROSS-SECTION SHEETS
30 - 35	ES-01 - ES-06	EROSION AND SEDIMENT CONTROL PLAN
36	EN-01	EROSION AND SEDIMENT CONTROL NOTES
37 - 38	ED-01 - ED-02	EROSION AND SEDIMENT CONTROL DETAILS
39 - 44	LS-01 - LS-06	LANDSCAPE PLAN
45	LD-01	LANDSCAPE NOTES AND DETAILS
46	MT-01	MAINTENANCE OF TRAFFIC PLAN

STANDARD SYMBOLS

- EX. TRAVERSE POINT
- EX. FENCE
- EX. PROPERTY BOUNDARY
- EX. TREELINE
- EX. TREE
- EX. WATERS OF THE U.S.
- EX. STRUCTURE
- EX. RIPRAP
- EX. EDGE OF PAVEMENT
- EX. 5' MAJOR CONTOUR
- EX. 1' MAJOR CONTOUR
- EX. WETLAND
- EX. WETLAND BUFFER
- EX. 100-YR FLOODPLAIN
- EX. SANITARY SEWER LINE
- EX. STORM DRAIN LINE

SEE PLAN SHEETS FOR PROPOSED FEATURES LEGEND



LOCATION MAP

SCALE 1" = 600'

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

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.

   CONTACT "MISS UTILITY PHONE 1-800-257-7777, 48 HOURS PRIOR TO THE START OF THE WORK. THERE SHOULD BE NO EXCAVATION UNTIL THE LOCATIONS OF UNDERGROUND UTILITIES HAVE BEEN DETERMINED.
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 ADMINISTRATION'S BOOK OF STANDARDS-HIGHWAY AND INCIDENTAL STRUCTURES". 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 IN INTERPRETING THE PLANS ONLY. THESE LINES DO NOT REPRESENT THE OFFICIAL PROPERTY ACQUISITION LINES. FOR OFFICIAL FEE RIGHT-OF-WAY AND EASEMENT INFORMATION, 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 CONFORM TO 2011 MARYLAND STANDARDS AND 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 LOYR LOYOLA R CORS ARP
   N393408.726 W0755914.995 33056.1

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

DEVELOPER'S/LANDOWNER'S CERTIFICATION

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

Signed: _____
Print Name: _____
Date: _____

ENGINEER'S CERTIFICATION

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

Signed: _____
Print Name: Craig A. Lynch
Date: 12/20/2023
P.E. No.: 28371

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.

FIELD VERIFICATION CERTIFICATION

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

_____
PRINTED NAME

_____
SIGNED DATE

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:11443 F:457;MAP 65, GRID 4D, PARCEL 806

Prepared By : CENTURY ENGINEERING, A Kleinfelder Company

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

S/C PLAN # TBD
GP # TBD
Revisions

BILLING NO. XXXXXX

EG-SWMENG- XXXXXX-XXXX #XXXX

PROFESSIONAL CERTIFICATION

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

STATE OF MARYLAND – CRAIG ALLEN LYNCH – NO. 28371 – PROFESSIONAL ENGINEER
#28371 12/21/2023

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

Drawn By : PJB , JLL
Designed By : IPT , PJB
Reviewed By : CAL
Drawing No. GN-01 of GN-01

Scale :
Date : 12 / 23
Sheet No. 01 of 46

BID No.:
HCG DWG ID No.:
SCALE: 1" = 1'-0"

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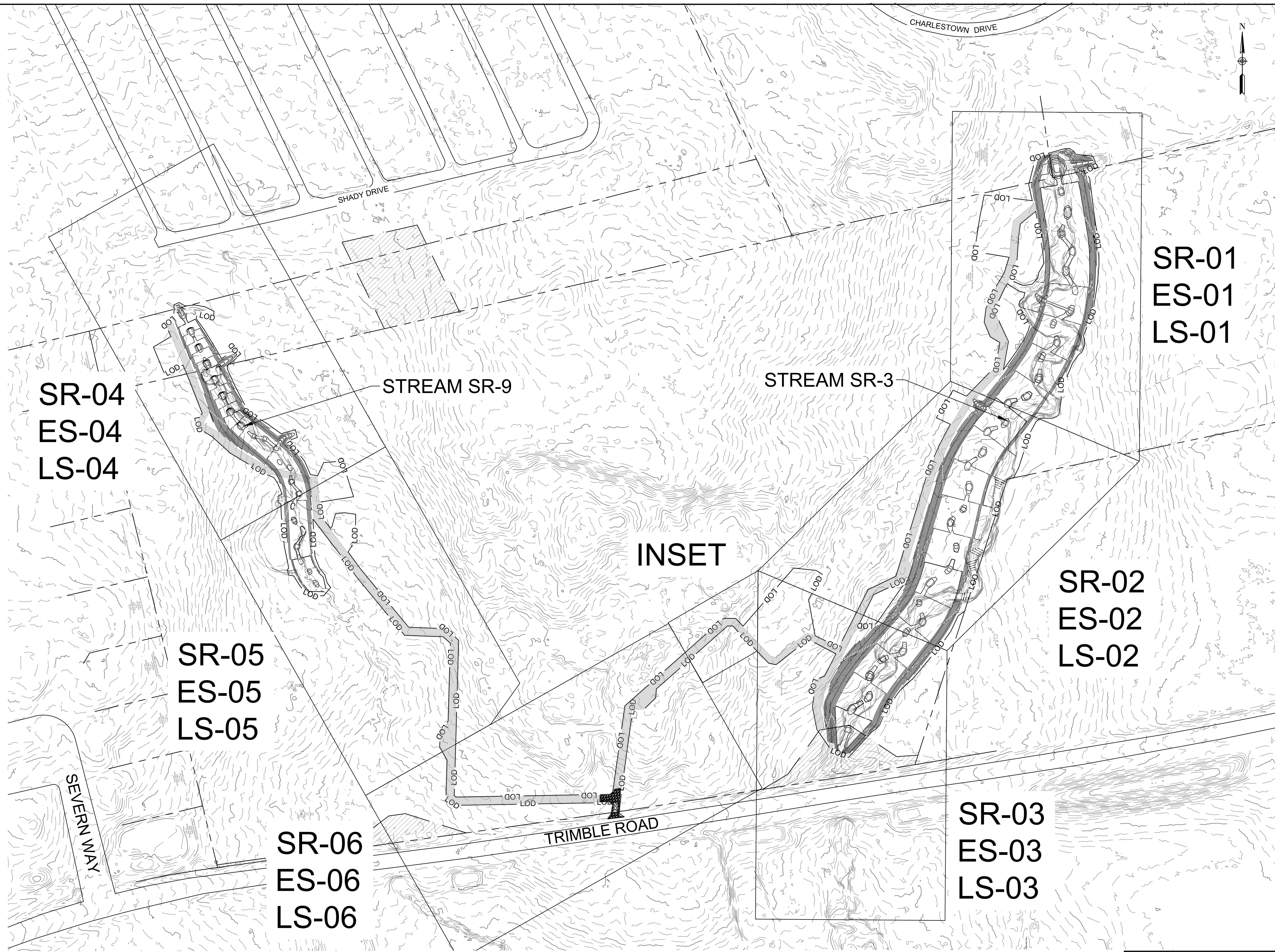

100' 0 100' 200'
ORIGINAL SCALE: 1"=100'

BILLING NO. TBD

EG-SWMENG- TBD

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STATE OF MARYLAND PROFESSIONAL ENGINEER
#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

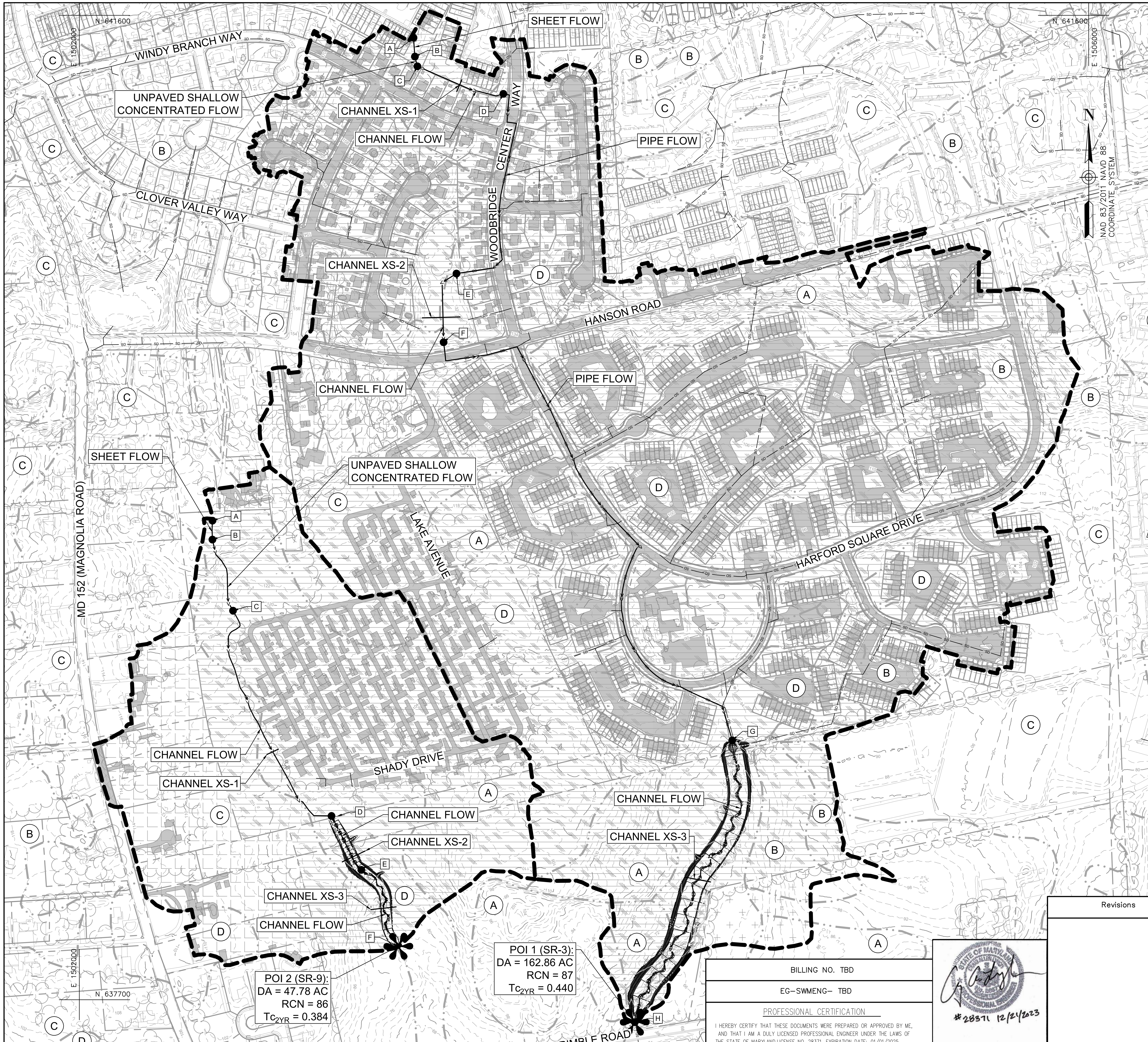
NORTH REARDON STREAM RESTORATION

OVERVIEW SHEET

Drawn By :	PJB , JLL	Scale :	1" = 100'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	OV-01 of OV-01	Sheet No.	02 of 46

BID No.:

HCG DWG ID No.:



LEGEND

- 2' GIS CONTOUR
- ROADWAY/BUILDING OUTLINE
- SOIL BOUNDARY
- PROPERTY LINE
- STORM DRAIN
- TREE LINE
- DRAINAGE DIVIDE
- DRAINAGE STUDY POINT
- FLOW PATH/SEGMENT
- RIGHT-OF-WAY - IMPERVIOUS
- R3/R4 - RES. DISTRICTS $\frac{1}{8}$ AC
- R1 - RES. DISTRICTS $\frac{1}{2}$ AC
- LI - LIGHT INDUSTRIAL DISTRICT
- 1' PROPOSED CONTOUR

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 ($\frac{1}{8}$ AC)	A	30.250	77
RESIDENTIAL DISTRICTS ($\frac{1}{8}$ AC)	B	22.009	85
RESIDENTIAL DISTRICTS ($\frac{1}{8}$ AC)	C	41.349	90
RESIDENTIAL DISTRICTS ($\frac{1}{8}$ 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 ($\frac{1}{8}$ AC)	A	6.477	77
RESIDENTIAL DISTRICTS ($\frac{1}{8}$ AC)	C	8.093	90
RESIDENTIAL DISTRICTS ($\frac{1}{8}$ 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

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) 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

200' 0 200' 400'

ORIGINAL SCALE: 1"=200'

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DRAINAGE AREA MAP
ULTIMATE CONDITIONS

Revisions

BILLING NO. TBD

EG–SWMENG– TBD

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#28371 12/21/2023

Drawn By :	JCG	Scale :	1' = 200'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	DA-01 of DA-01	Sheet No.	03 of 46

HCG DWG ID No.:

BID No.:

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TRAVERSE POINTS

POINT	NORTHING	EASTING	ELEVATION
101	638754.5890	1504579.2691	80.66
102	638515.5565	1504617.4595	73.76
103	638445.7294	1504519.6287	74.98
104	638354.2573	1504621.6371	71.56
105	638265.9360	1504503.9092	71.80
106	638116.1791	1504467.5004	68.61
107	637922.3488	1504458.7009	67.47
108	637851.0545	1504269.3963	67.81
109	637695.3821	1504253.3859	62.07
110	637579.0781	1504197.6758	64.61

40' 0 40' 80'
ORIGINAL SCALE: 1"=40'

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By :	PJB , JLL	Scale :	1" = 40'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	GE-01 of GE-04	Sheet No.	04 of 46

BID No.:

HCG DWG ID No.:

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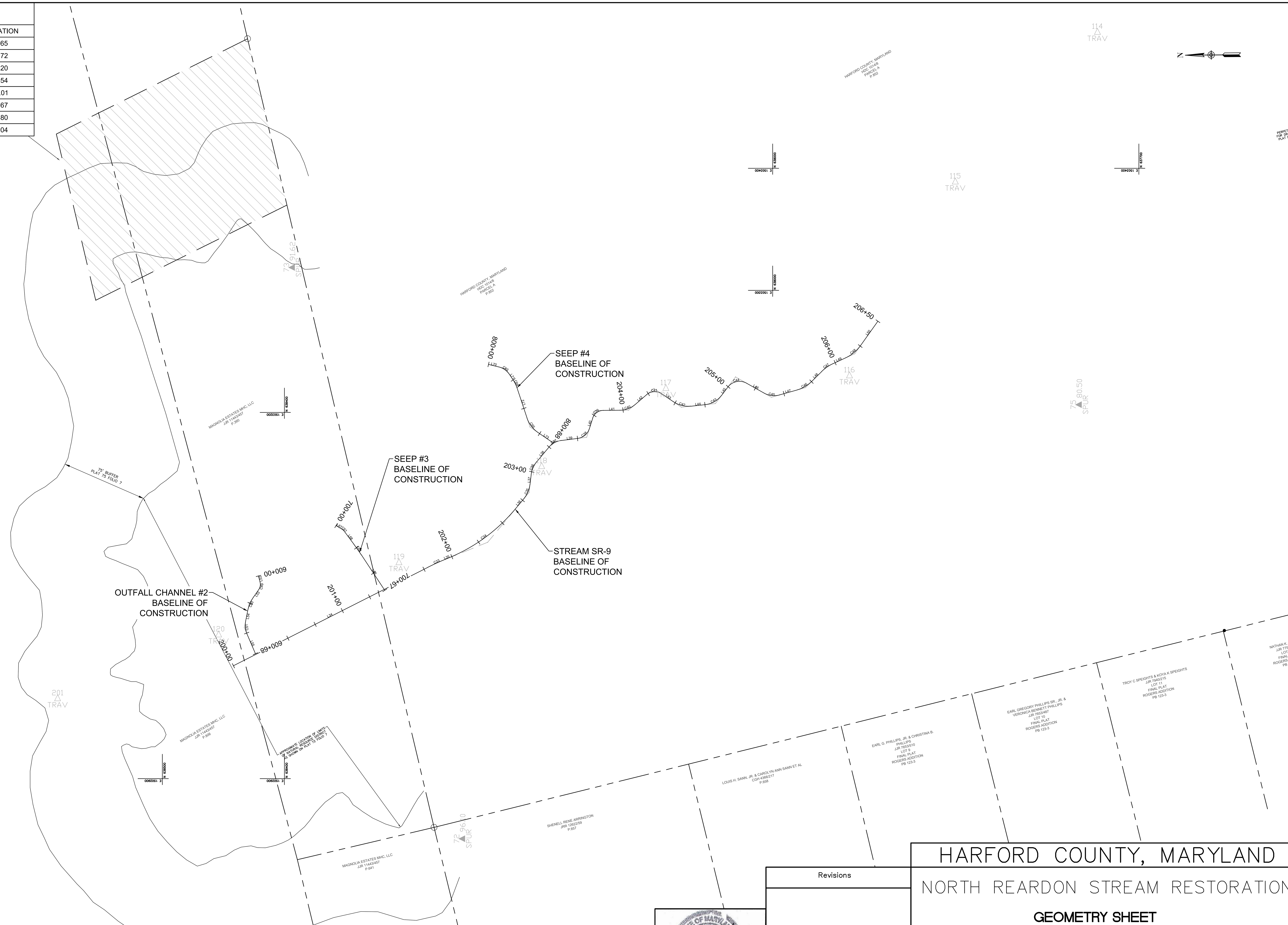
TRAVERSE POINTS

POINT	NORTHING	EASTING	ELEVATION
114	637733.8854	1503511.4565	78.65
115	637850.3775	1503388.8586	75.72
116	637937.0329	1503230.0577	76.20
117	638087.4609	1503219.6226	80.54
118	638189.2259	1503155.6841	82.01
119	638306.1332	1503076.9582	86.67
120	638453.8547	1503017.7435	90.80
201	638585.8005	1502965.4727	97.04



40' 0 40' 80'

ORIGINAL SCALE: 1"=40'

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NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By :	PJB , JLL	Scale :	1" = 40'
Designed By :	IPT , PJB	Date :	12 / 23
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Drawing No.	GE-02 of GE-04	Sheet No.	05 of 46

BID No.:

HCG DWG ID No.:

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SR-3 STREAM ALIGNMENT

POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L1			0+00.00	0+62.03	62.028		S10° 15' 18.45"E	638725.7214,1504584.3204	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				
C2	638618.5903,1504612.0177	1+11.12			24.140	31.104	S00° 26' 23.30"W	638630.3964,1504607.2969	638606.8580,1504607.1162	044° 28' 06.52"	184° 12' 25.60"	12.71	2.50
L3			1+22.55	1+41.75	19.200		S22° 40' 26.56"W	638606.8580,1504607.1162	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	638557.3874,1504614.3771				
C4	638548.4722,1504621.9805	1+90.76			20.676	17.602	S06° 48' 29.30"E	638557.3874,1504614.3771	638538.0175,1504616.6896	067° 18' 09.05"	325° 30' 47.73"	11.72	3.54
L5			1+99.72	2+17.09	17.375		S26° 50' 35.23"W	638538.0175,1504616.6896	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"W	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"W	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	638327.6176,1504561.0977	638306.4634,1504554.5529	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	638291.8706,1504545.2786	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	638275.3663,1504511.1004	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	638243.7312,1504501.6319	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	638223.8456,1504474.4470	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	638208.9389,1504462.5552	638191.7556,1504461.4505				
C16	638180.3000,1504460.7140	6+49.90			21.427	24.107	S29° 08' 29.00"W	638191.7556,1504461.4505	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"W	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	638086.7696,1504427.4283	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	638061.3626,1504406.6385				
C20	638052.1745,1504396.4375	8+04.85			24.063	20.000	S13° 31' 23.07"W	638061.3626,1504406.6385	638039.3527,1504401.3450	068° 56' 05.58"	286° 28' 44.03"	13.73	4.26
L21			8+15.18	8+38.92	23.739		S20° 56' 39.72"E	638039.3527,1504401.3450	638017.1818,1504409.8309				
C21	638007.1845,1504413.6574	8+49.63			20.534	29.429	S00° 57' 20.73"E	638017.1818,1504409.8309	637997.0650,1504410.1665	039° 58' 37.99"	194° 41' 29.62"	10.70	1.89
L33			8+59.45	8+82.21	22.752		S19° 01' 58.26"W	637997.0650,1504410.1665	637975.5573,1504402.7470				
C22	637965.7782,1504399.3736	8+92.55			19.828	28.164	S39° 12' 03.76"W	637975.5573,1504402.7470	637960.5076,1504390.4724	040° 20' 10.99"	203° 26' 10.42"	10.34	1.84
L22			9+02.03	9+21.97	19.934		S59° 22' 09.26"W	637960.5076,1504390.4724	637950.3510,1504373.3195				
C23	637944.1689,1504362.8789	9+34.10			23.653	43.009	S43° 36' 51.73"W	637950.3510,1504373.3195	637933.4416,1504357.2088	031° 30' 35.06"	133° 13' 09.86"	12.13	1.68
L23			9+45.62	9+68.14	22.515		S27° 51' 34.20"W	637933.4416,1504357.2088	637913.5358,1504346.6873				
C24	637906.8289,1504343.1422	9+75.72			14.362	18.039	S05° 03' 02.31"W	637913.5358,1504346.6873	637899.6042,1504345.4560	045° 37' 03.77"	317° 37' 18.14"	7.59	1.53
L24			9+82.50	10+02.17	19.669		S17° 45' 29.57"E	637899.6042,1504345.4560	637880.8728,1504351.4549				
C25	637869.9774,1504354.9443	10+13.61			18.456	12.350	S25° 03' 09.00"W	637880.8728,1504351.4549	637865.6664,1504344.3471	085° 37' 17.15"	463° 56' 00.37"	11.44	4.48
L25			10+20.62	10+36.93	16.304		S67° 51' 47.58"W	637865.6664,1504344.3471	637859.5225,1504329.2445				
C26	637855.4709,1504319.2849	10+47.68			19.018	16.335	S34° 30' 30.60"W	637859.5225,1504329.2445	637844.7209,1504319.0684	066° 42' 33.96"	350° 45' 46.57"	10.75	3.22
L26			10+55.94	10+73.89	17.944		S01° 09' 13.62"W	637844.7209,1504319.0684	637826.7801,1504318.7071				
C27	637815.3896,1504318.4777	10+85.28			19.449	14.888	S38° 34' 39.23"W	637826.7801,1504318.7071	637812.6337,1504307.4232	074° 50' 51.21"	384° 50' 09.72"	11.39	3.86
L27			10+93.34	11+10.79	17.451		S76° 00' 04.83"W	637812.6337,1504307.4232	637808.4123,1504290.4904				
C28	637805.5980,1504279.2019	11+22.42			22.423	34.095	S57° 09' 38.36"W	637808.4123,1504290.4904	637796.4704,1504271.9882	037° 40' 52.93"	168° 02' 44.59"	11.63	1.93
L28			11+33.21	11+50.44	17.227		S38° 19' 11.90"W	637796.4704,1504271.9882	637782.9551,1504261.3068				
C29	637773.9449,1504254.1859	11+61.92			21.889	29.284	S16° 54' 22.20"W	637782.9551,1504261.3068	637762.4960,1504255.0885	042° 49' 39.39"	195° 39' 20.26"	11.48	2.17
L29			11+72.33	11+89.66	17.327		S04° 30' 27.49"E	637762.4960,1504255.0885	637745.2226,1504256.4502				
C30	637733.7070,1504257.3581	12+01.21			20.542	18.010	S28° 10' 04.74"W	637745.2226,1504256.4502	637728.0792,1504247.2704	065° 21' 04.46"	318° 08' 04.05"	11.55	3.39
L30			12+10.20	12+28.26	18.061		S60° 50' 36.97"W	637728.0792,1504247.2704	637719.2801,1504231.4981				
C31	637713.4141,1504220.9833	12+40.30			22.151	22.771	S32° 58' 30.55"W	637719.2801,1504231.4981	637701.4215,1504219.9116	055° 44' 12.85"	251° 37' 13.17"	12.04	2.99
L31			12+50.41	12+69.65	19.241		S05° 06' 24.12"W	637701.4215,1504219.9116	637682.2569,1504218.1989				
C32	637675.0869,1504217.5582	12+76.85			14.319	56.151	S12° 24' 44.08"W	637682.2569,1504218.1989	637668.3103,1504215.1294	014° 36' 39.91"	102° 02' 20.30"	7.20	0.46
L32			12+83.97	13+17.56	33.593		S19° 43' 04.03"W	637668.3103,1504215.1294	637636.6873,1504203.7957				

SR-9 STREAM ALIGNMENT

POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L34			200+00.00	201+78.31	178.307		S26° 51' 28.08"E	638441.7515,1502992.4596	638282.6787,1503073.0146				
C33	638274.8785,1503076.9646	201+87.05			17.475	200.000	S24° 21' 16.65"E	638282.6787,1503073.0146	638266.7634,1503080.2189	005° 00' 22.85"	028° 38' 52.40"	8.74	0.19
L35			201+95.78	201+96.26	0.479		S21° 51' 05.23"E	638266.7634,1503080.2189	638266.3186,1503080.3972				
C34	638233.4912,1503093.5615	202+31.63			69.281	139.692	S36° 03' 34.47"E	638266.3186,1503080.3972	638210.8836,1503120.7613	028° 24' 58.49"	041° 00' 56.85"	35.37	4.41
L36			202+65.54	202+76.81	11.271		S50° 16' 03.72"E	638210.8836,1503120.7613	638203.6793,1503129.4290				
C35	638199.5410,1503134.4078	202+83.29			12.588	21.862	S66° 45' 48.86"E	638203.6793,1503129.4290	638198.7811,1503140.8372	032° 59' 30.29"	262° 04' 45.53"	6.47	0.94
L37			202+89.40	202+97.28	7.876		S83° 15' 34.01"E	638198.7811,1503140.8372	638197.8567,1503148.6588				
C36	638197.1046,1503155.0221	203+03.69			12.454	21.478	S66° 38' 51.81"E	638197.8567,1503148.6588	638192.9889,1503159.9333	033° 13' 24.40"	266° 45' 53.88"	6.41	0.94
L38			203+09.73	203+24.56	14.826		S50° 02' 09.62"E	638192.9889,1503159.9333	638183.4660,1503171.2968				
C37	638179.3439,1503176.2156	203+30.98			12.231	16.345	S28° 35' 57.45"E	638183.4660,1503171.2968	638172.9763,1503177.0158	042° 52' 24.32"	350° 32' 24.36"	6.42	1.21
L39			203+36.79	203+50.29	13.502		S07° 09' 45.29"E	638172.9763,1503177.0158	638159.5796,1503178.6993				
C38	638152.3924,1503179.6025	203+57.53			12.886	11.314	S39° 47' 29.71"E	638159.5796,1503178.6993	638150.2046,1503186.5078	065° 15' 28.84"	506° 24' 53.57"	7.24	2.12
L40			203+63.18	203+72.21	9.029		S72° 25' 14.14"E	638150.2046,1503186.5078	638147.4776,1503195.1152				
C39	638145.4293,1503201.5805	203+78.99			11.736	9.353	S36° 28' 29.20"E	638147.4776,1503195.1152	638138.6476,1503201.6431	071° 53' 29.87"	612° 34' 59.18"	6.78	2.20
L41			203+83.94	203+97.49	13.550		S00° 31' 44.27"E	638138.6476,1503201.6431	638125.0982,1503201.7682				
C40	638118.0440,1503201.8333	204+04.55			13.530	19.365	S20° 32' 43.63"E	638125.0982,1503201.7682	638112.6847,1503206.4206	040° 01' 58.72"	295° 52' 40.91"	7.05	1.24
L42			204+11.02	204+23.46	12.439		S40° 33' 42.99"E	638112.6847,1503206.4206	638103.2350,1503214.5091				
C41	638097.2801,1503219.6062	204+31.30			13.383	10.248	S03° 09' 02.58"E	638103.2350,1503214.5091	638090.8018,1503215.1935	074° 49' 20.81"	559° 05' 25.27"	7.84	2.65
L43			204+36.84	204+48.50	11.653		S34° 15' 37.83"W	638090.8018,1503215.1935	638081.1711,1503208.6336				
C42	638074.7506,1503204.2604	204+56.27			14.889	21.128	S14° 04' 23.67"W	638081.1711,1503208.6336	638067.0264,1503205.0878	040° 22' 28.31"	271° 10' 44.84"	7.77	1.38
L44			204+63.39	204+75.51	12.129		S06° 06' 50.48"E	638067.0264,1503205.0878	638054.9668,1503206.3795				
C43	638046.9270,1503207.2407	204+83.60			15.266	18.732	S29° 27' 40.44"E	638054.9668,1503206.3795	638042.0393,1503213.6820	046° 41' 39.90"	305° 51' 55.23"	8.09	1.67
L45			204+90.78	204+99.58	8.802		S52° 48' 30.39"E	638042.0393,1503213.6820	638036.7184,1503220.6942				
C44	638030.3766,1503229.0518	205+10.07			17.242	12.000	S11° 38' 44.99"E	638036.7184,1503220.6942	638021.2468,1503223.8829	082° 19' 30.79"	477° 27' 53.39"	10.49	3.94
L46			205+16.82	205+32.96	16.131		S29° 31' 00.40"W	638021.2468,1503223.8829	638007.2097,1503215.9357				
C45	638001.0094,1503212.4253	205+40.08			13.501	17.084	S06° 52' 41.51"W	638007.2097,1503215.9357	637994.1522,1503214.3606	045° 16' 37.79"	335° 22' 13.85"	7.13	1.43
L47			205+46.46	205+61.24	14.779		S15° 45' 37.39"E	637994.1522,1503214.3606	637979.9286,1503218.3748				
C46	637973.0713,1503220.3101	205+68.36			13.940	27.348	S30° 21' 48.00"E	637979.9286,1503218.3748	637968.0301,1503225.3454	029° 12' 21.22"	209° 30' 22.64"	7.13	0.91
L48			205+75.18	205+86.42	11.245		S44° 57' 58.61"E	637968.0301,1503225.3454	637960.0743,1503233.2919				
C47	637955.7858,1503237.5753	205+92.48			11.994	33.595	S34° 44' 20.02"E	637960.0743,1503233.2919	637950.2708,1503240.0900	020° 27' 17.18"	170° 32' 54.72"	6.06	0.54
L49			205+98.41	206+09.38	10.961		S24° 30' 41.43"E	637950.2708,1503240.0900	637940.2972,1503244.6376				
C48	637932.7386,1503248.0842	206+17.68			16.233	31.012	S39° 30' 26.94"E	637940.2972,1503244.6376	637927.9149,1503254.8475	029° 59' 31.01"	184° 45' 12.88"	8.31	1.09
L50			206+25.61	206+50.00	24.391		S54° 30' 12.44"E	637927.9149,1503254.8475	637913.7521,1503274.7056				

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BID No.:

HCG DWG ID No.:

SCALE: 1 inch

Revisions

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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

STATE OF MARYLAND — CHRISTOPHER A. LOMAX — No. 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By : PJB , JLL	Scale : N/A
Designed By : IPT , PJB	Date : 12 / 23
Reviewed By : CAL	
Drawing No. GE-03 of GE-04	Sheet No. 06 of 46

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	638478.7962,1504543.0953	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	638478.7962,1504543.0953	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' 24.13"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	638421.2293,1503066.0356	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	638425.1543,1503048.8705	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	638431.6981,1503029.2621	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
L67			700+00.00	700+05.03	5.025		S31° 16' 45.42"W	638357.6594,1503107.2731	638353.3648,1503104.6640				
C61	638351.6779,1503103.6392	700+07.00			3.898	10.073	S42° 21' 55.99"W	638353.3648,1503104.6640	638350.5025,1503102.0536	022° 10' 21.15"	568° 47' 31.43"	1.97	0.19
L68			700+08.92	700+21.47	12.551		S53° 27' 06.57"W	638350.5025,1503102.0536	638343.0284,1503091.9705				
C62	638339.8306,1503087.6566	700+26.84			10.737	200.000	S54° 59' 23.36"W	638343.0284,1503091.9705	638336.8689,1503083.1772	003° 04' 33.58"	028° 38' 52.40"	5.37	0.07
L69			700+32.21	700+66.85	34.637		S56° 31' 40.15"W	638336.8689,1503083.1772	638317.7657,1503054.2849				

SEEP 4 ALIGNMENT

POINT ID	PI	PI	PT	PC	LENGTH	RADIUS	Line/Chord Direction	START POINT	END POINT	DELTA	DEGREE	EXTERNAL TANGENT	EXTERNAL DISTANCE
L70			800+00.00	800+08.58	8.580		S13° 44' 06.76"W	638232.7621,1503239.3219	638224.4280,1503237.2848				
C63	638218.8718,1503235.9268	800+14.30			10.913	14.760	S34° 55' 01.27"W	638224.4280,1503237.2848	638215.6816,1503231.1794	042° 21' 49.02"	388° 10' 43.85"	5.72	1.07
L71			800+19.49	800+24.96	5.465		S56° 05' 55.78"W	638215.6816,1503231.1794	638212.6334,1503226.6434				
C64	638210.6012,1503223.6194	800+28.60			7.242	26.699	S63° 52' 09.86"W	638212.6334,1503226.6434	638209.4536,1503220.1615	015° 32' 28.16"	214° 35' 48.43"	3.64	0.25
L72			800+32.20	800+58.15	25.948		S71° 38' 23.94"W	638209.4536,1503220.1615	638201.2803,1503195.5342				
C65	638198.8008,1503188.0630	800+66.02			15.188	23.416	S53° 03' 30.87"W	638201.2803,1503195.5342	638192.3115,1503183.6069	037° 09' 46.15"	244° 41' 09.58"	7.87	1.29
L73			800+73.34	800+88.46	15.121		S34° 28' 37.79"W	638192.3115,1503183.6069	638179.8466,1503175.0473				

T:\2022\Transportation\221073.003A Harford Co – N Reardon Stream\CADD\pGE-P000_NorthReardon.dwg Dec 21, 2023 7:25am pbaltzer

BID No.:

HCG DWG ID No.:

SCALE : 1 inch

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.

STATE OF MARYLAND PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	GE-04 of GE-04	Sheet No.	07 of 46

NOTES:
1. NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
2. PREFORMED SCOUR POOL UNDERLAIN WITH CLASS II RIPRAP.
3. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
4. SEE SHEET SR-07 FOR STRUCTURE TABLES.

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#28371 12/21/2023

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 :	12 / 23
Reviewed By :	CAL		
Drawing No.	SR-01 of SR-07	Sheet No.	08 of 46

BID No.:

HCG DWG ID No.:

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\SR-P000_NorthReardon.dwg Dec 21, 2023 7:26am pbolitzer


SR-3 FLOODPLAIN RESTORATION
STA. 0+00 - 13+12
NAD 83/2011 NAVD 88 COORDINATE SYSTEM
BARBED WIRE FENCE (IN RUINS)
MARTHA SUE HANSON
JRR 12402/4
P.363
WOODY DEBRIS (WD) DEEMED UNSUITABLE FOR STRUCTURES TO BE SCATTERED IN EXISTING CHANNEL BETWEEN CHANNEL PLUGS
HARFORD COUNTY, MARYLAND
HDC 1014/8
PARCEL A
P.852
STAGING AND STOCKPILE AREA
STAGING AND STOCKPILE AREA
MATCH LINE - SEE SHEET SR-01
MATCH LINE - SEE SHEET SR-03
GCLS#14
GCLS#15
GCLS#16
GCLS#17
GCLS#18
GCLS#19
GCLS#20
GCLS#21
GCLS#22
GCLS#23
GCLS#24
GCLS#25
CP#1
CP#2
CP#3
WDA#5
WDA#6
WDA#7
WHF#4
WHF#5
WHF#6
WHF#7
HRF#3
HRF#4
R#14
R#15
R#16
R#17
R#18
R#19
R#20
R#21
R#22
R#23
R#24
R#25
R#26
SS #4
SEEP #2
500+00
PROPOSED FEATURES LEGEND
LOD — LIMIT OF DISTURBANCE
FP — PROP. 100-YEAR FLOODPLAIN
CHANNEL BASELINE OF CONSTRUCTION
245 — 5' MAJOR CONTOUR
244 — 1' MINOR CONTOUR
LIMIT OF SUBGRADE BED MATERIAL
CLASS I CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
CLASS II CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
WETLAND DEPRESSIONAL AREA (WDA)
HABITAT ROUGHNESS FEATURE (HRF)
ROCK STEP STRUCTURE (RSS)
CLAY CHANNEL BLOCK (CCB)
GRADE CONTROL LOG STRUCTURE (GCLS)
WOODY HABITAT FEATURE (WHF)
WOODY DEBRIS (WD)
CHANNEL PLUG (CP)
TREE TAKE

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.

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

BILLING NO. TBD

EG-SWMENG- TBD

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#28371 12/21/2023

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 :	12 / 23
Reviewed By :	CAL		
Drawing No.	SR-02 of SR-07	Sheet No.	09 of 46

BID No.:

HCG DWG ID No.:

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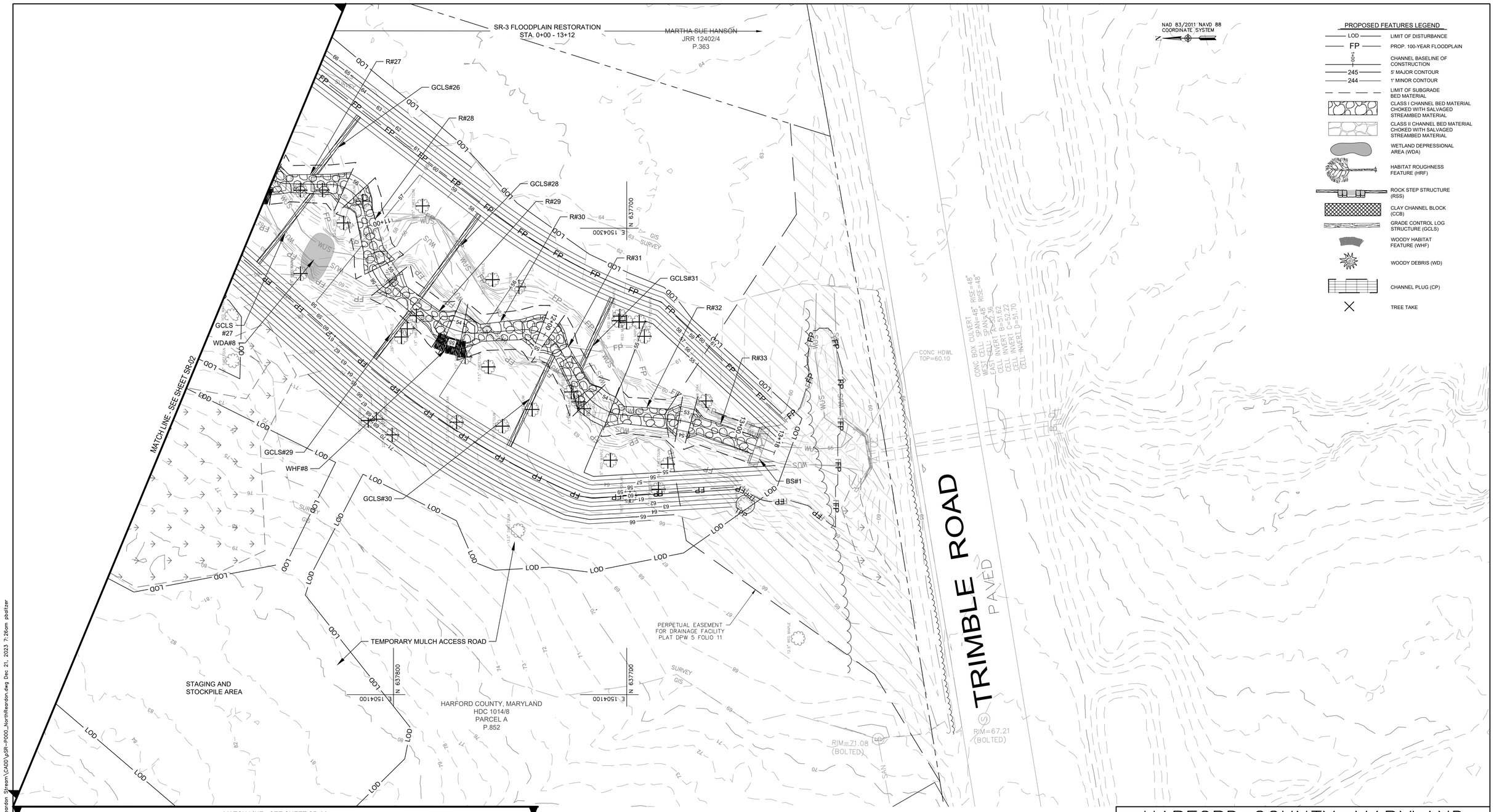

NOTES:
1. NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
2. TEMPORARY MULCH ACCESS ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS.
3. SEE SHEET SR-07 FOR STRUCTURE TABLES.

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

BILLING NO. TBD

EG-SWMENG- TBD

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STATE OF MARYLAND — PHILIP J. BOLTZ — REG. NO. 28371 — PROFESSIONAL ENGINEER
#28371 12/21/2023

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 :	12 / 23
Reviewed By :	CAL		
Drawing No.	SR-03 of SR-07	Sheet No.	10 of 46

BID No.:

HCG DWG ID No.:

SCALE 1 inch

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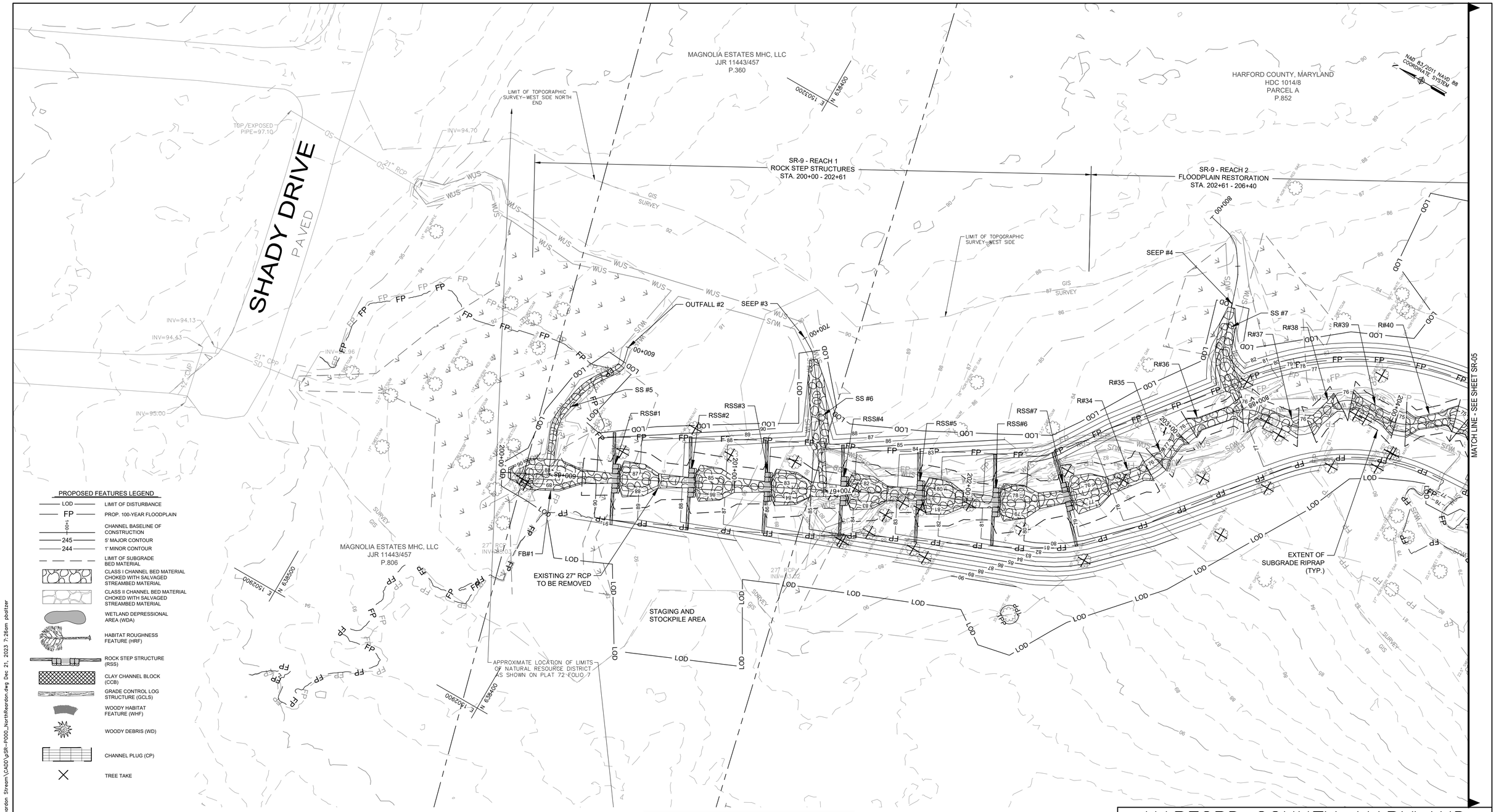

PROPOSED FEATURES LEGEND

- LOD — LIMIT OF DISTURBANCE
- FP — PROP. 100-YEAR FLOODPLAIN
- 1+00 — CHANNEL BASELINE OF CONSTRUCTION
- 245 — 5' MAJOR CONTOUR
- 244 — 1' MINOR CONTOUR
- LIMIT OF SUBGRADE BED MATERIAL
- CLASS I CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
- CLASS II CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
- WETLAND DEPRESSIONAL AREA (WDA)
- HABITAT ROUGHNESS FEATURE (HRF)
- ROCK STEP STRUCTURE (RSS)
- CLAY CHANNEL BLOCK (CCB)
- GRADE CONTROL LOG STRUCTURE (GCLS)
- WOODY HABITAT FEATURE (WHF)
- WOODY DEBRIS (WD)
- CHANNEL PLUG (CP)
- TREE TAKE

20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

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. FOREBAY TO BE UNDERLAIN WITH CLASS II RIPRAP PER PROFILE.
4. SEE SHEET SR-07 FOR STRUCTURE TABLES.

BILLING NO. TBD

EG-SWMENG- TBD

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STATE OF MARYLAND — CHRISTOPHER A. LEWIS — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-9 GRADING PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	SR-04 of SR-07	Sheet No.	11 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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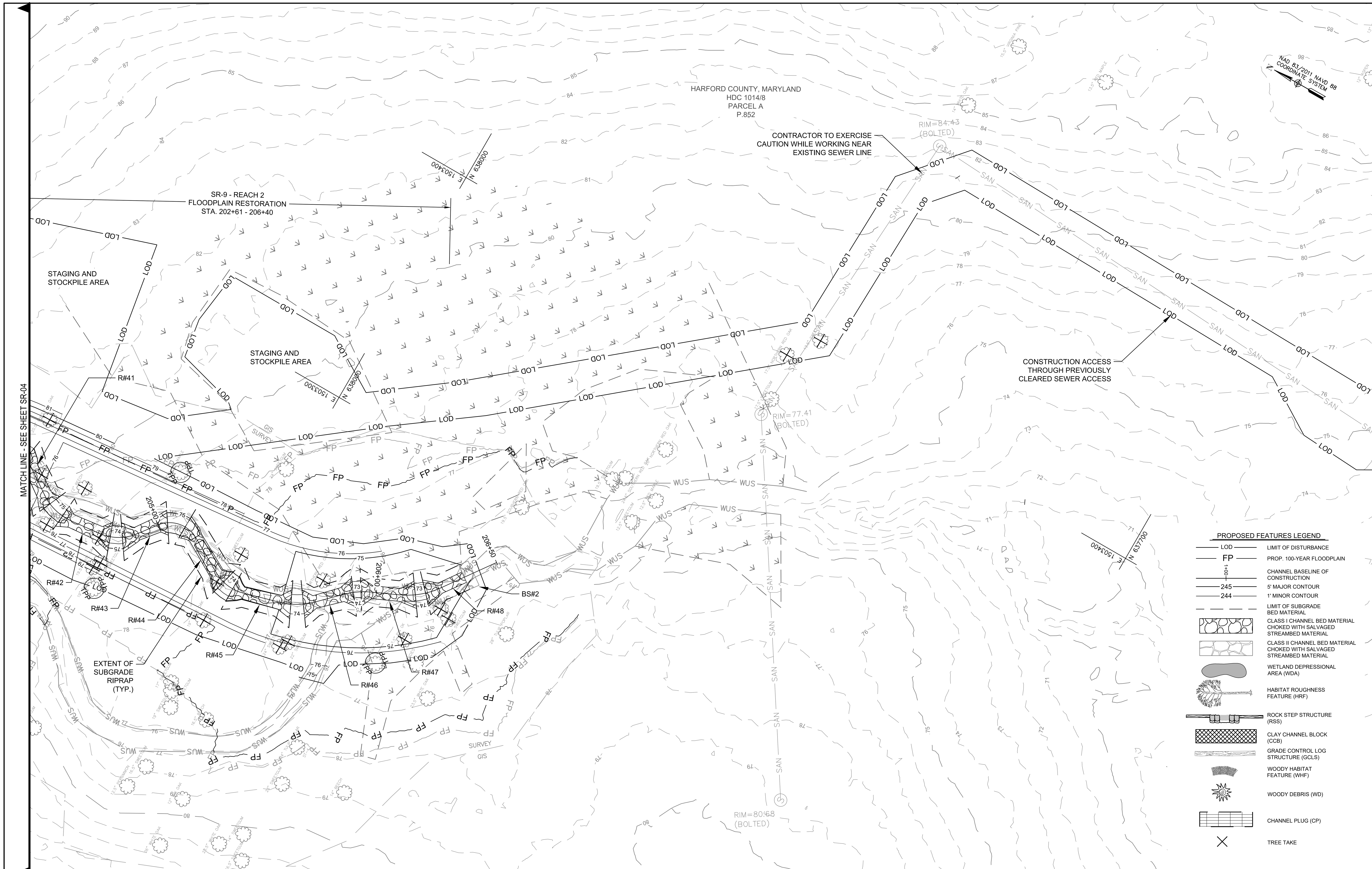
HARFORD COUNTY, MARYLAND
HDC 1014/8
PARCEL A
P.852
NAD 83/2011 NAVD 88 COORDINATE SYSTEM
CONTRACTOR TO EXERCISE CAUTION WHILE WORKING NEAR EXISTING SEWER LINE
RIM=84.43 (BOLTED)
SR-9 - REACH 2 FLOODPLAIN RESTORATION STA. 202+61 - 206+40
STAGING AND STOCKPILE AREA
STAGING AND STOCKPILE AREA
CONSTRUCTION ACCESS THROUGH PREVIOUSLY CLEARED SEWER ACCESS
RIM=77.41 (BOLTED)
RIM=80.68 (BOLTED)
MATCH LINE - SEE SHEET SR-04
MATCH LINE - SEE SHEET SR-06
R#41
R#42
R#43
R#44
R#45
R#46
R#47
R#48
BS#2
EXTENT OF SUBGRADE RIPRAP (TYP.)
PROPOSED FEATURES LEGEND
LOD — LIMIT OF DISTURBANCE
FP — PROP. 100-YEAR FLOODPLAIN
CHANNEL BASELINE OF CONSTRUCTION
245 — 5' MAJOR CONTOUR
244 — 1' MINOR CONTOUR
LIMIT OF SUBGRADE BED MATERIAL
CLASS I CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
CLASS II CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
WETLAND DEPRESSIONAL AREA (WDA)
HABITAT ROUGHNESS FEATURE (HRF)
ROCK STEP STRUCTURE (RSS)
CLAY CHANNEL BLOCK (CCB)
GRADE CONTROL LOG STRUCTURE (GCLS)
WOODY HABITAT FEATURE (WHF)
WOODY DEBRIS (WD)
CHANNEL PLUG (CP)
TREE TAKE

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

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.

BILLING NO. TBD

EG-SWMENG- TBD

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-9 GRADING PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	SR-05 of SR-07	Sheet No.	12 of 46

BID No.:

HCG DWG ID No.:

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MATCH LINE - SEE SHEET SR-05
MATCH LINE - SEE SHEET INSET
PERPETUAL EASEMENT FOR DRAINAGE FACILITY PLAT DFW 5 FOLIO 10
HARFORD COUNTY, MARYLAND
HDC 1014/8
PARCEL A
P.852
NAD 83/2011 NAVD 88 COORDINATE SYSTEM
RIM=71.01 (BOLTED)
RIM=77.48 (BOLTED)
CONSTRUCTION ACCESS THROUGH PREVIOUSLY CLEARED SEWER ACCESS
CONSTRUCTION ACCESS ALONG EXISTING MAINTENANCE TRAIL
PROPOSED ACCESS FROM TRIMBLE ROAD
TRIMBLE ROAD
PAVED
MATCH LINE - SEE THIS SHEET
MATCH LINE - SEE SHEET SR-03
CONSTRUCTION ACCESS ALONG EXISTING MAINTENANCE TRAIL
PROPOSED FEATURES LEGEND
LIMIT OF DISTURBANCE
PROP. 100-YEAR FLOODPLAIN
CHANNEL BASELINE OF CONSTRUCTION
5' MAJOR CONTOUR
1' MINOR CONTOUR
LIMIT OF SUBGRADE BED MATERIAL
CLASS I CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
CLASS II CHANNEL BED MATERIAL CHOKED WITH SALVAGED STREAMBED MATERIAL
WETLAND DEPRESSIONAL AREA (WDA)
HABITAT ROUGHNESS FEATURE (HRF)
ROCK STEP STRUCTURE (RSS)
CLAY CHANNEL BLOCK (CCB)
GRADE CONTROL LOG STRUCTURE (GCLS)
WOODY HABITAT FEATURE (WHF)
WOODY DEBRIS (WD)
CHANNEL PLUG (CP)
TREE TAKE
20' 0 20' 40'
ORIGINAL SCALE: 1"=20'

NOTES:

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

BILLING NO. TBD

EG-SWMENG- TBD

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GRADING PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	SR-06 of SR-07	Sheet No.	13 of 46

BID No.:

HCG DWG ID No.:

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SR-01

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+04.41
3	1+16.75	1+22.55	1+41.75	1+47.75
4	1+55.77	1+60.75	1+79.04	1+87.04
5	1+91.72	1+99.72	2+17.09	2+24.59
6	2+30.15	2+38.15	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	29
2	0+87.11	4.2 R	0+78.21	41.3 R	37
3	1+60.82	3.7 L	1+80.41	37.7 L	34
4	1+64.05	3.6 R	1+99.10	29.4 R	26
5	2+14.66	3.9 L	1+99.10	38.7 L	35
6	2+14.11	4.0 R	2+20.84	32.3 R	28
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	31
9	4+36.62	3.7 L	4+51.17	37.0 L	33
10	4+38.65	3.7 R	4+27.78	33.7 R	30
11	5+14.45	3.5 L	5+01.56	32.3 L	29
12	5+11.35	3.5 R	5+29.51	32.3 R	29
13	5+86.68	3.7 L	5+78.41	33.0 L	29

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

SLOPE STABILIZATION (SS)		
CHANNEL	STA FROM	STA TO
SS #1	300+43.63	300+77.48
SS #2	400+08.94	400+40.80
SS #3	400+56.84	401+19.33

WOODY HABITAT FEATURE (WHF)			
WHF#	STA FROM	STA TO	LENGTH
1	1+84.32	1+93.80	10
2	3+02.26	3+12.60	10
3	4+14.98	4+25.27	10

HABITAT ROUGHNESS FEATURE (HRF)				
HRF#	STA FROM	OFFSET	STA TO	OFFSET
1	400+49.22	6.1 L	400+58.66	23.4 R
2	4+49.70	30.8 R	5+14.29	21.6 R

PRE-FORMED SCOUR POOL (PSP)		
PSP #	STA FROM	STA TO
1	0+01.94	0+49.55

CLAY CHANNEL BLOCK (CCB)						
CCB#	STA FROM	OFFSET	STA TO	OFFSET	LENGTH	DEPTH
1	0+93.52	2.18 L	0+88.63	16.13 R	19	6
2	1+60.06	24.24 R	2+01.95	10.95 R	28	6.5
3	2+34.98	23.52 R	2+45.67	29.94 R	16	7
4	3+92.31	6.71 L	3+98.13	29.98 L	24	7

SR-02

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	29
15	6+64.17	3.7 L	6+54.85	35.1 L	31
16	6+59.90	3.4 R	6+77.39	36.9 R	34
17	7+11.09	4.1 L	7+22.24	35.8L	32
18	7+16.13	4.4 R	6+97.72	38.5 R	34
19	7+85.26	3.6 L	7+70.93	34.6 L	31
20	7+84.81	3.9 R	7+95.59	34.0 R	30
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	48
23	9+20.90	4.3 L	8+98.63	39.4 L	35
24	9+95.74	4.3 L	10+08.30	37.5 L	33
25	9+94.97	4.1 R	9+77.89	24.1 R	20

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

SLOPE STABILIZATION (SS)		
CHANNEL	STA FROM	STA TO
SS #4	500+10.60	500+72.66

WOODY HABITAT FEATURE (WHF)			
WHF#	STA FROM	STA TO	LENGTH
4	5+68.82	5+77.67	10
5	7+64.32	7+69.56	5
6	8+88.12	8+93.37	5
7	10+41.08	10+50.30	10

HABITAT ROUGHNESS FEATURE (HRF)				
HRF#	STA FROM	OFFSET	STA TO	OFFSET
3	7+33.91	27.7 R	7+83.65	26.2 R
4	9+15.98	38.8 L	9+89.44	27.0 L

CHANNEL PLUG (CP)												
CP #	STA OFFSET A	OFFSET	ELEV.	STA OFFSET B	OFFSET	ELEV.	STA OFFSET C	OFFSET	ELEV.	STA OFFSET D	OFFSET	ELEV.
1	---	---	---	---	---	---	6+57.33	57.3 L	66.0'	7+25.60	51.7 L	62.0'
2	8+50.36	43.5 L	60.0'	8+54.30	33.8 L	63.0'	8+61.94	34.2 L	63.0'	8+77.27	40.4 L	59.0'
3	8+97.36	61.6 L	58.0'	8+99.86	52.2 L	61.0'	9+02.84	47.0 L	61.0'	---	---	---

SR-03

CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
27	10+49.11	10+55.94	10+73.89	10+79.89
28	10+85.84	10+93.34	11+10.79	11+18.29
29	11+25.71	11+33.21	11+50.44	11+58.44
30	11+64.33	11+72.33	11+89.66	11+97.66
31	12+02.20	12+10.20	12+28.26	12+34.26
32	12+44.41	12+50.41	12+69.65	12+74.15
33	12+79.47	12+83.97	13+06.43	N/A

GRADE CONTROL LOG STRUCTURE (GCLS)					
GCLS #	STA FROM	OFFSET	STA TO	OFFSET	LENGTH (LF)
26	10+66.95	4.2 L	10+77.59	31.0 L	27
27	10+65.77	4.2 L	10+51.95	35.8 L	32
28	11+40.35	3.9 L	11+38.16	47.2 L	43
29	11+40.90	3.9 R	11+41.38	28.9 R	25
30	12+09.96	3.8 R	12+30.62	39.6 R	36
31	12+20.27	4.0 L	12+06.74	31.1 L	27

WOODY HABITAT FEATURE (WHF)			
WHF#	STA FROM	STA TO	LENGTH
8	11+55.91	11+66.34	10

WETLAND DEPRESSIONAL AREA (WDA)	
WDA #	AREA (SY)
8	22

BED SILL (BS)						
BS#	STA FROM	OFFSET	OFFSET	STA TO	OFFSET	OFFSET
1	13+08.84	8.80 L	8.80 R	13+12.84	8.80 L	8.80 R

SR-04

CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
34	202+55.40	202+61.12	202+76.81	202+79.81
35	202+85.40	202+89.40	202+97.28	203+00.28
36	203+05.73	203+09.73	203+24.56	203+29.06
37	203+32.29	203+36.79	203+50.29	203+54.29
38	203+59.18	203+63.18	203+72.21	203+76.21
39	203+80.94	203+83.94	203+97.49	204+01.99
40	204+06.52	204+11.02	204+23.46	204+27.92

ROCK STEP STRUCTURE (RSS)		
RSS#	WEIR STA.	WEIR ELEV.
1	200+50.03	89.52
2	200+82.66	87.71
3	201+15.30	85.90
4	201+47.94	84.09
5	201+80.57	82.29
6	202+13.21	80.48
7	202+43.88	78.67

SLOPE STABILIZATION (SS)		
CHANNEL	STA FROM	STA TO
SS #5	600+08.50	600+62.63
SS #6	700+16.47	700+63.11
SS #7	800+43.00	800+83.56

FOREBAY (FB)		
FB #	STA FROM	STA TO
1	200+02.96	200+35.02

SR-05

CONSTRUCTED RIFFLE (R)				
R#	GLIDE STA FROM	RIFFLE STA FROM	RIFFLE STA TO	RUN STA TO
41	204+32.34	204+36.84	204+48.50	204+52.50
42	204+59.39	204+63.39	204+75.71	204+80.01
43	204+84.78	204+90.78	204+99.58	205+03.58
44	205+10.82	205+16.82	205+32.96	205+37.46
45	205+41.96	205+46.46	205+61.24	205+65.74
46	205+70.68	205+75.18	205+86.42	205+90.92
47	205+93.91	205+98.41	206+09.38	206+15.38
48	206+19.46	206+25.63	206+37.12	N/A

BED SILL (BS)						
BS#	STA FROM	OFFSET	OFFSET	STA TO	OFFSET	OFFSET
2	206+36.00	5.25 L	5.25 R	206+40.00	5.25 L	5.25 R

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.

STATE OF MARYLAND — PHILIP J. BALTZER — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GRADING PLAN

Drawn By : PJB , JLL

Designed By : IPT , PJB

Reviewed By : CAL

Scale : 1" = 20'

Date : 12 / 23

Drawing No. SR-07 of SR-07

Sheet No. 14 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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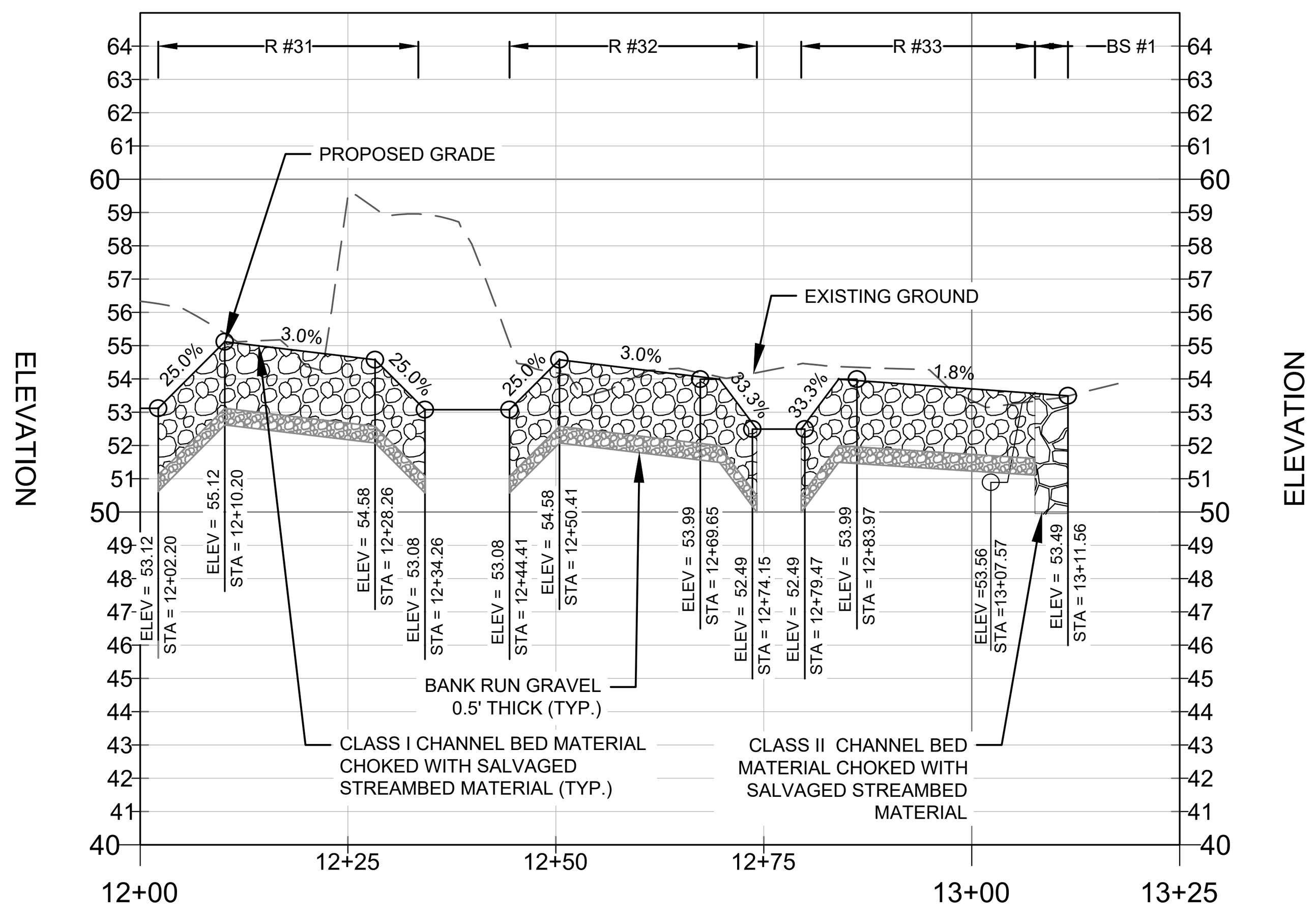
STREAM SR-3 PROFILE



ORIGINAL SCALE: 1"=20'

ORIGINAL SCALE: 1"=5'

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

PROFILE SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	PR-01 of PR-02	Sheet No.	15 of 46

BID No.:

HCG DWG ID No.:

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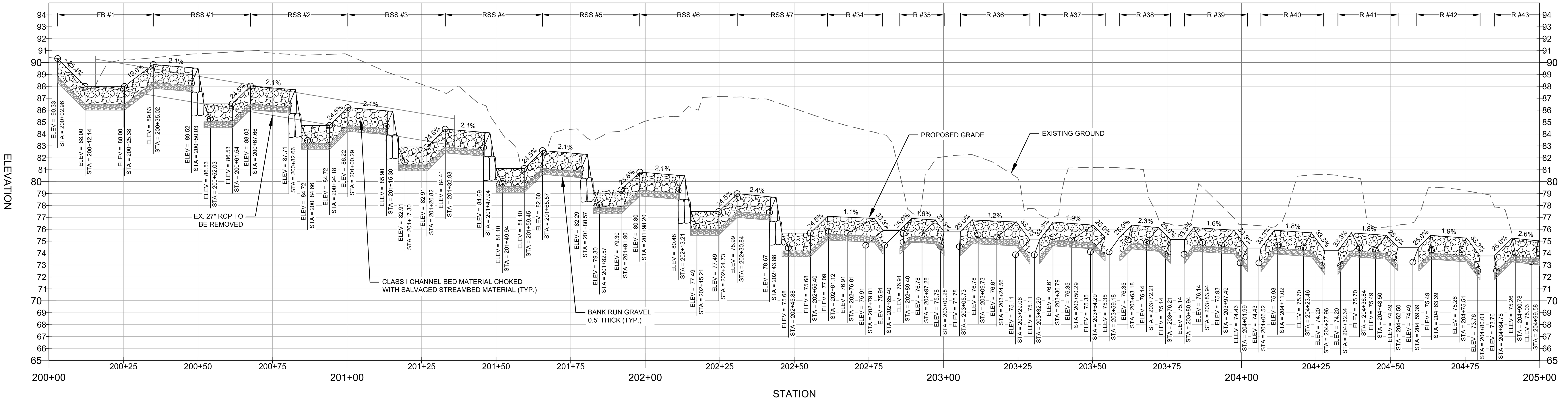
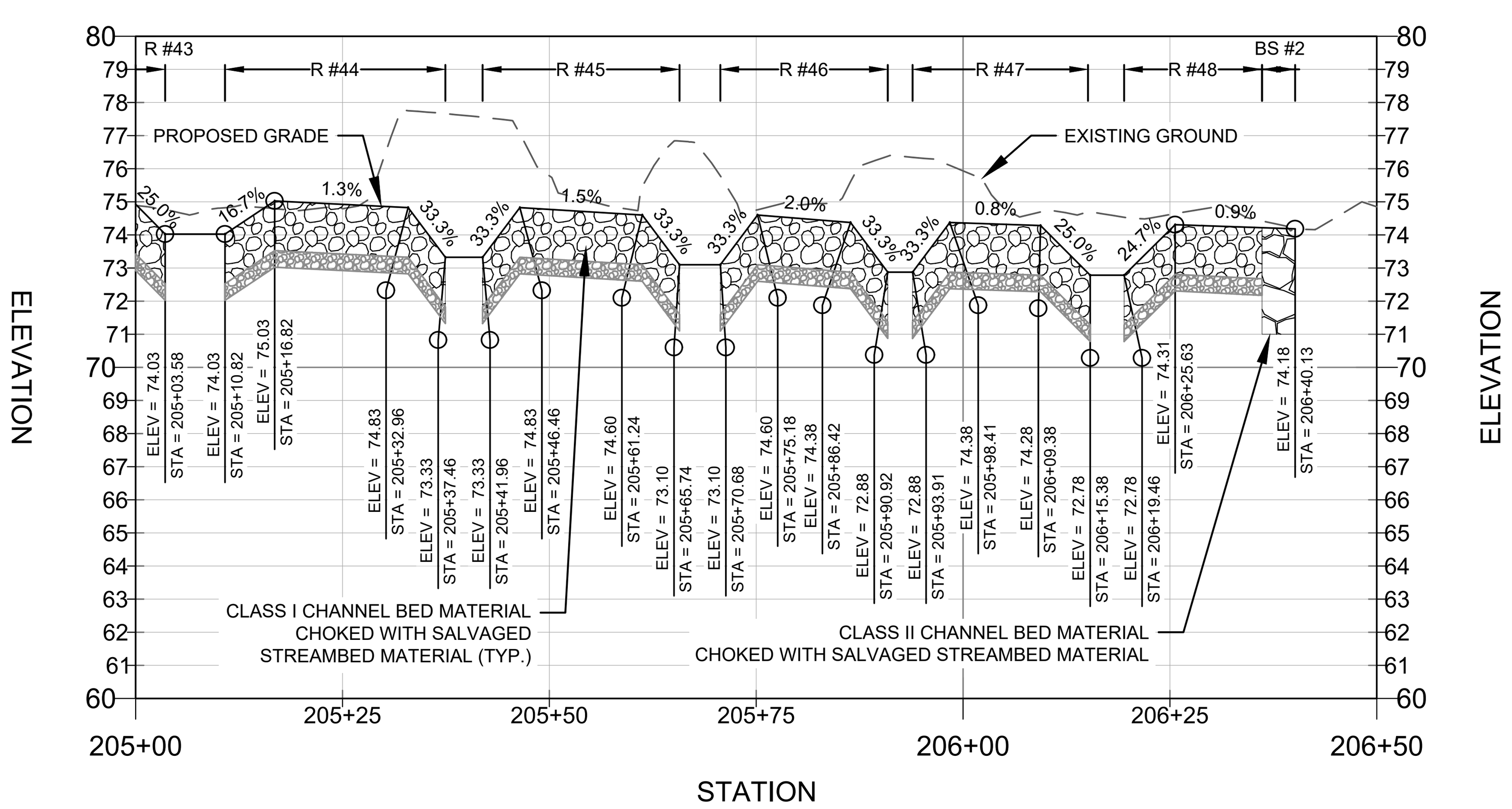
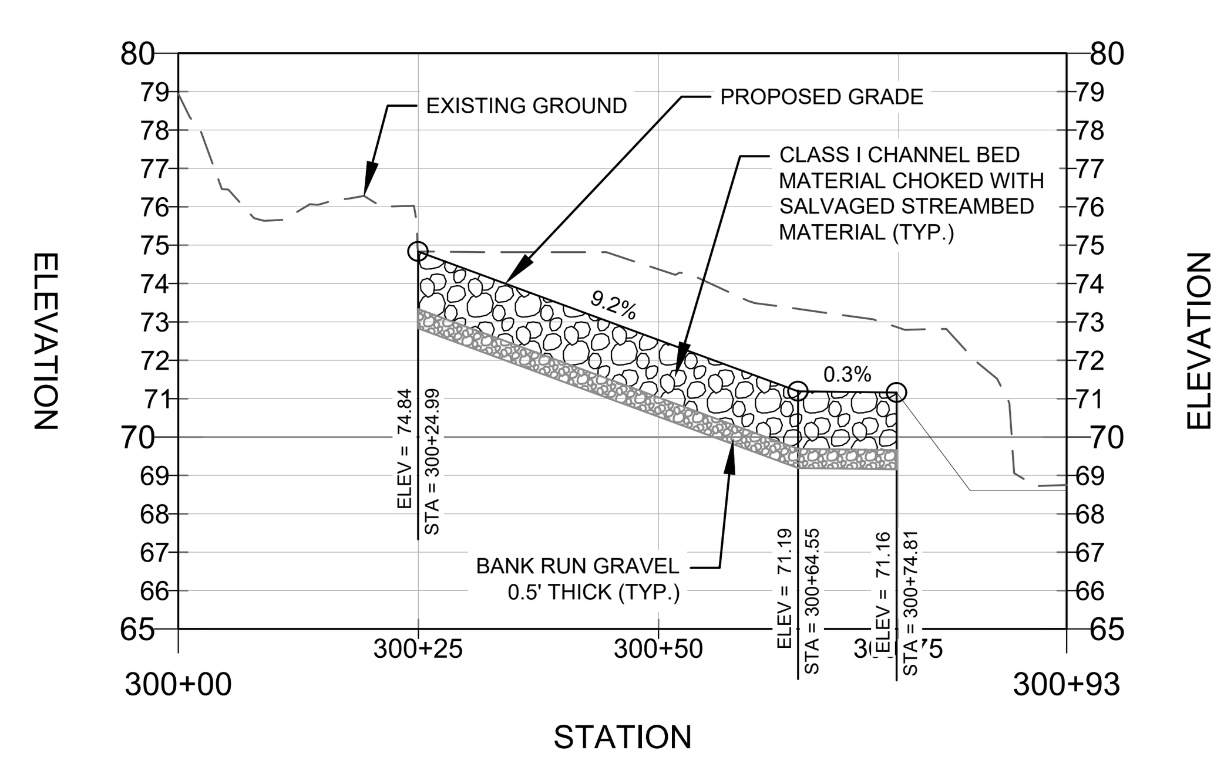
STREAM SR-9 PROFILE



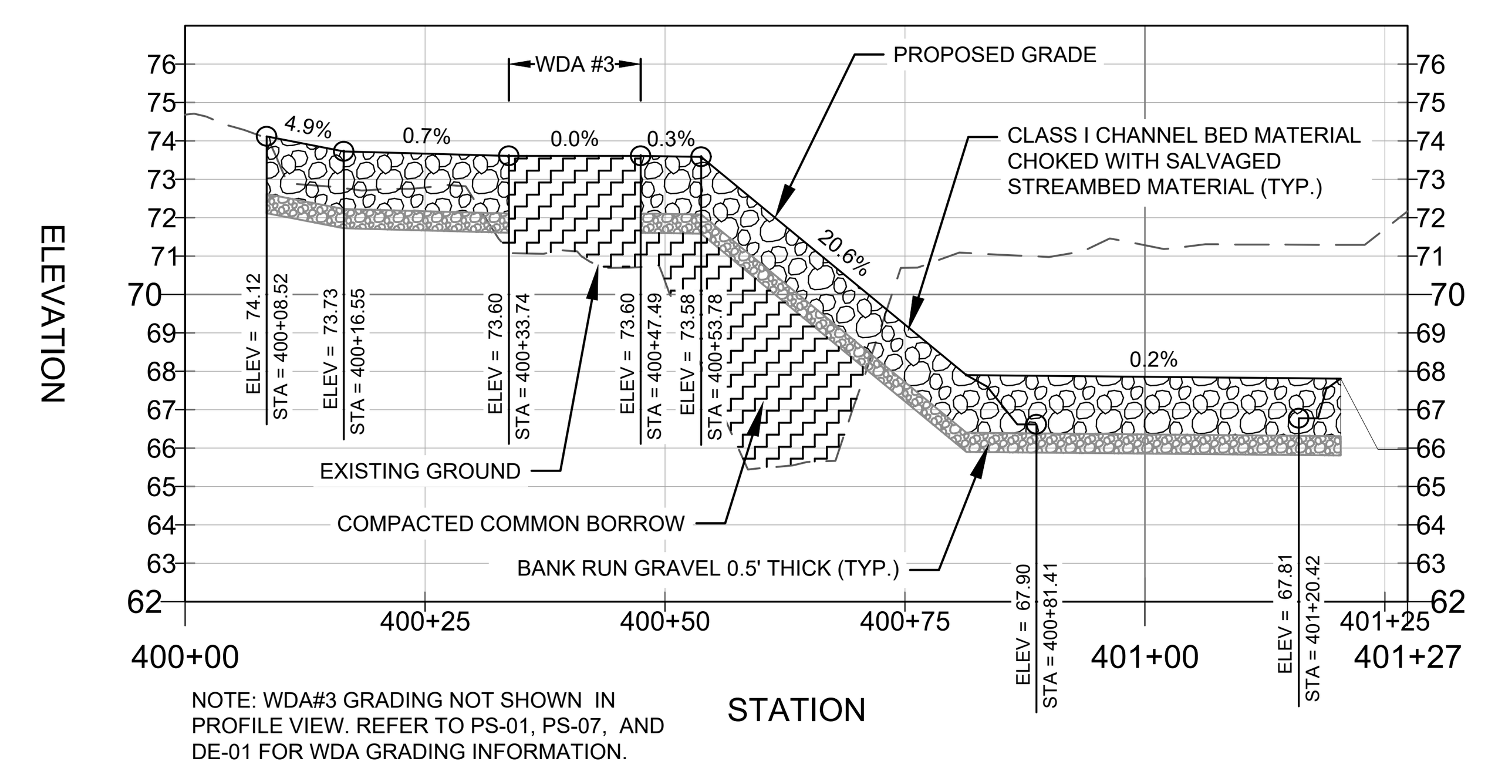
STREAM SR-9 PROFILE CONTINUED



OUTFALL CHANNEL #1

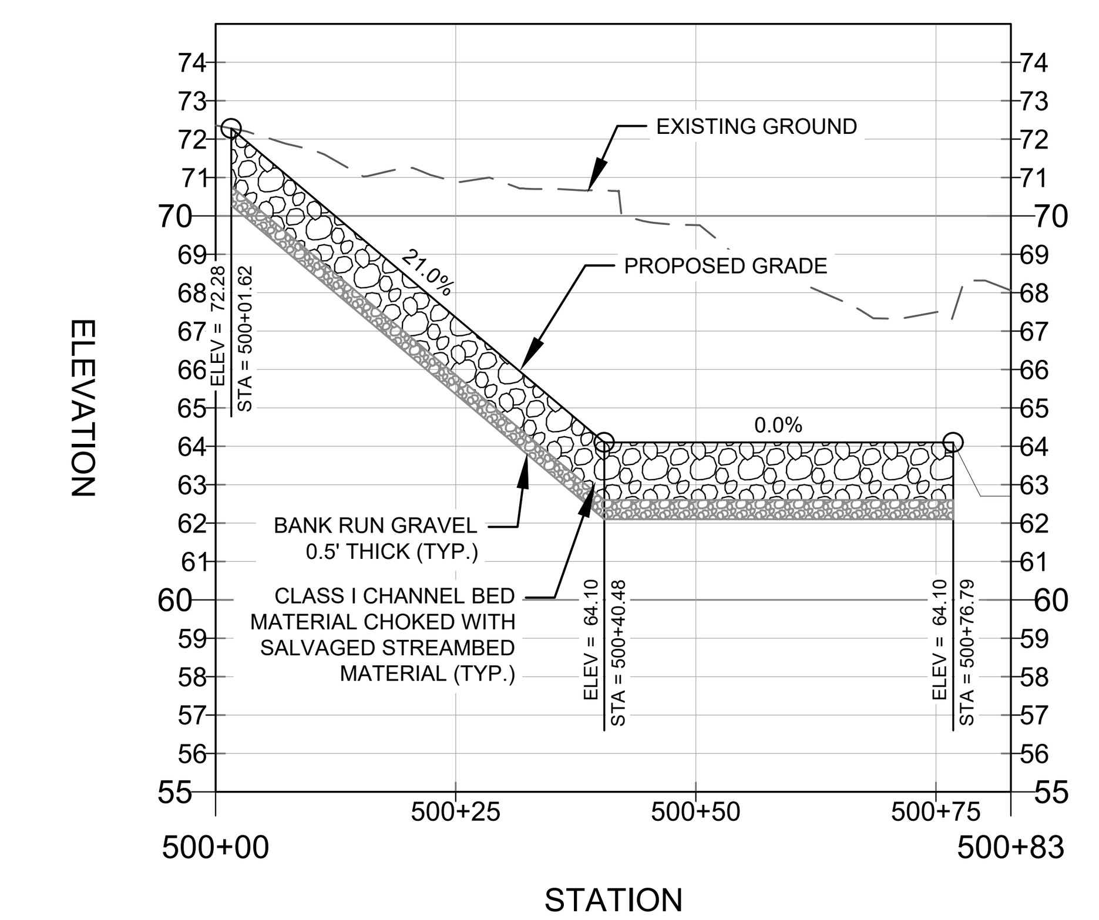


SEEP #1



NOTE: WDA#3 GRADING NOT SHOWN IN PROFILE VIEW. REFER TO PS-01, PS-07, AND DE-01 FOR WDA GRADING INFORMATION.

SEEP #2



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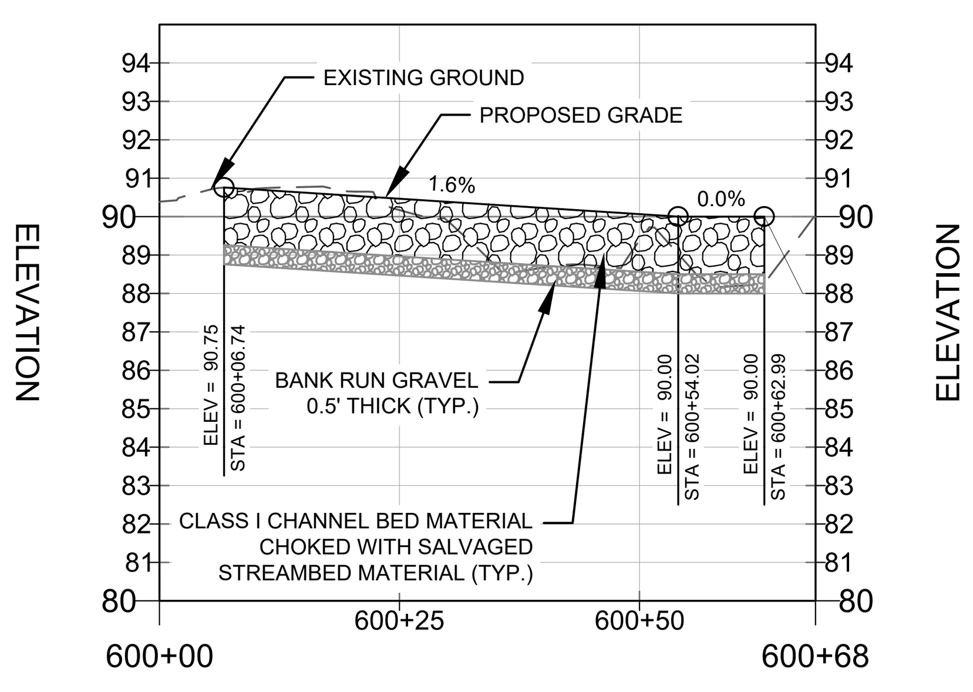
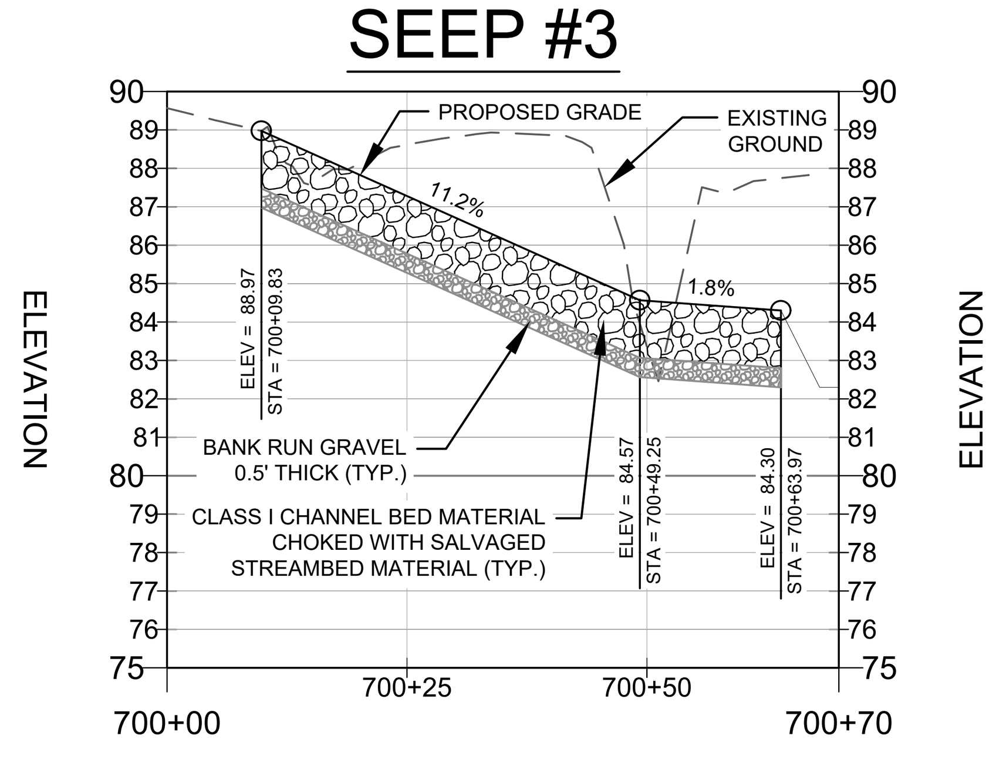


SEEP #3



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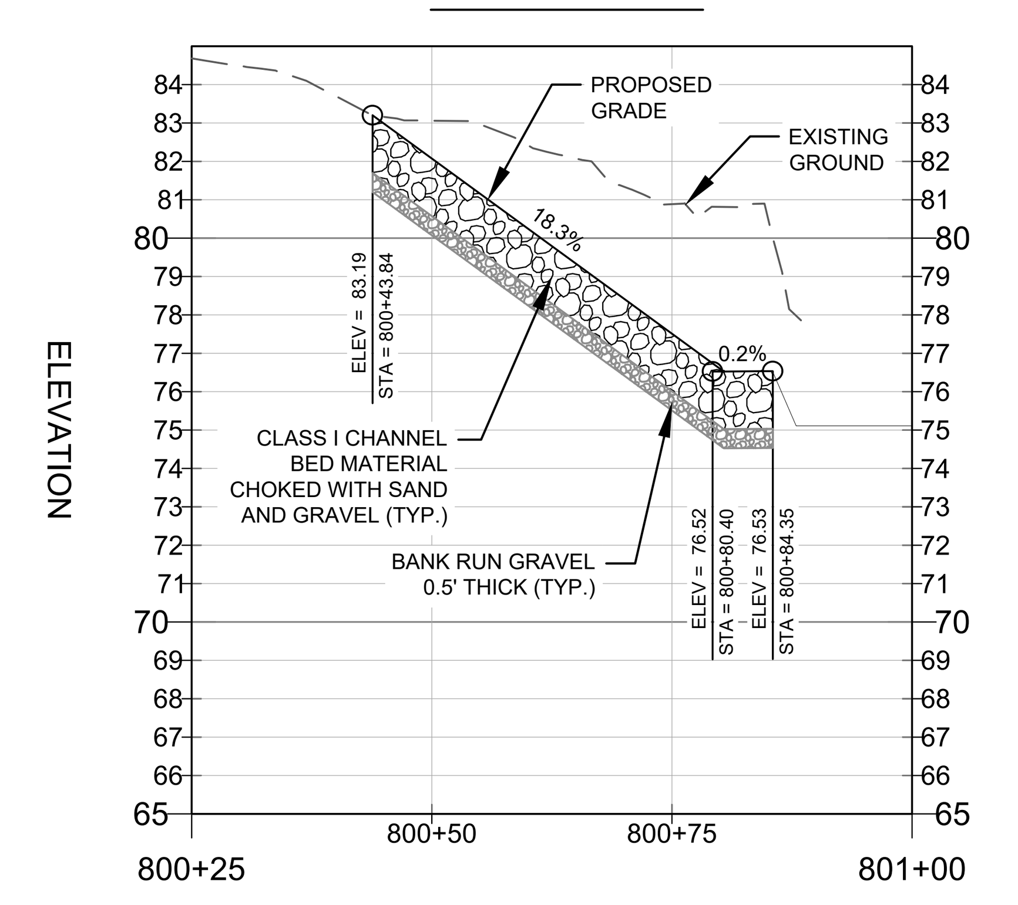

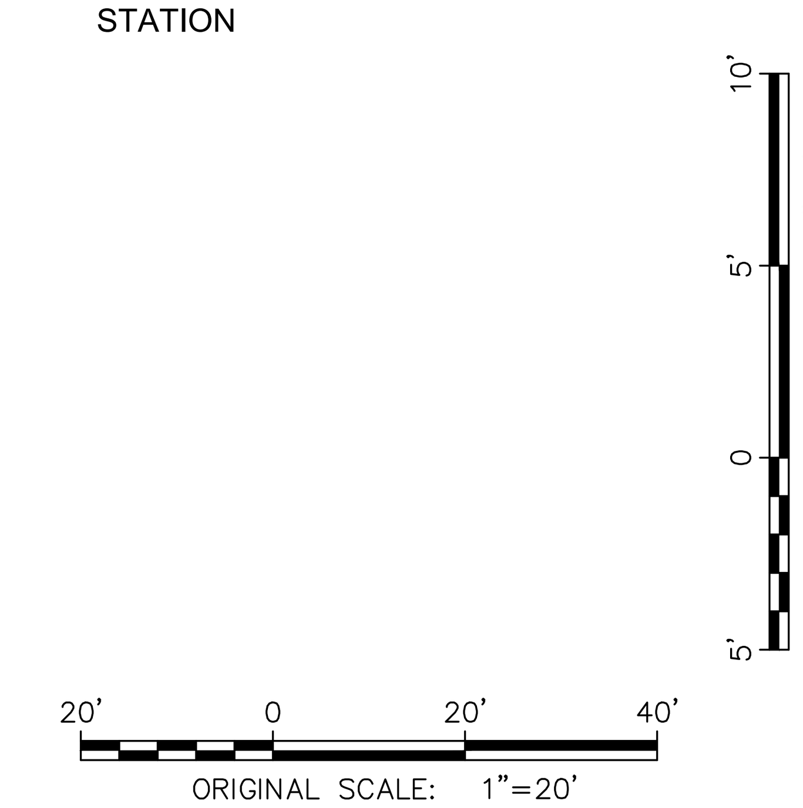

Revisions

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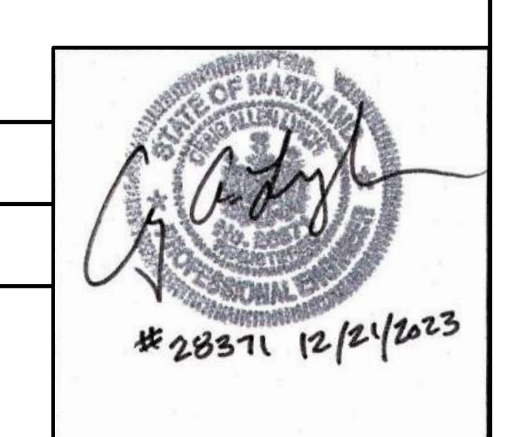

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

PROFILE SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	PR-02 of PR-02	Sheet No.	16 of 46

BID No.:

HCG DWG ID No.:

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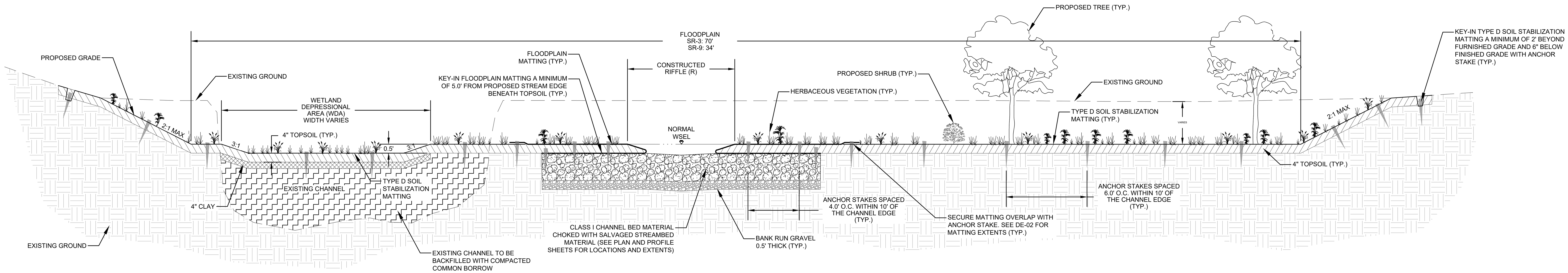
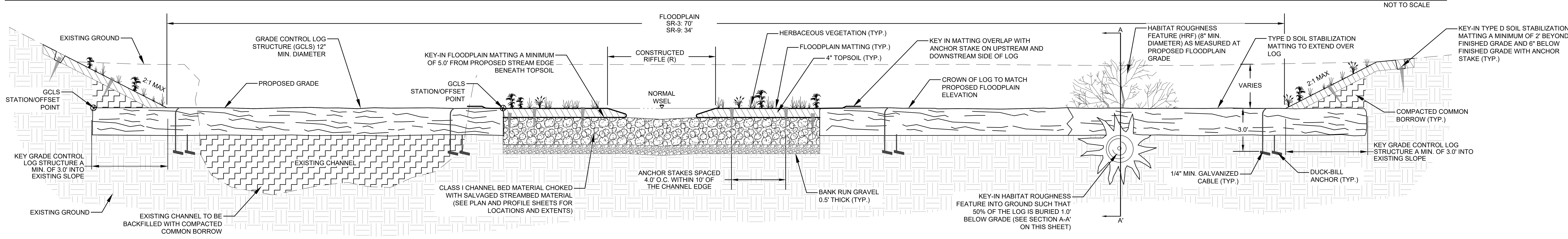
FLOODPLAIN RESTORATION DETAILS - STREAMS SR-3 & SR-9



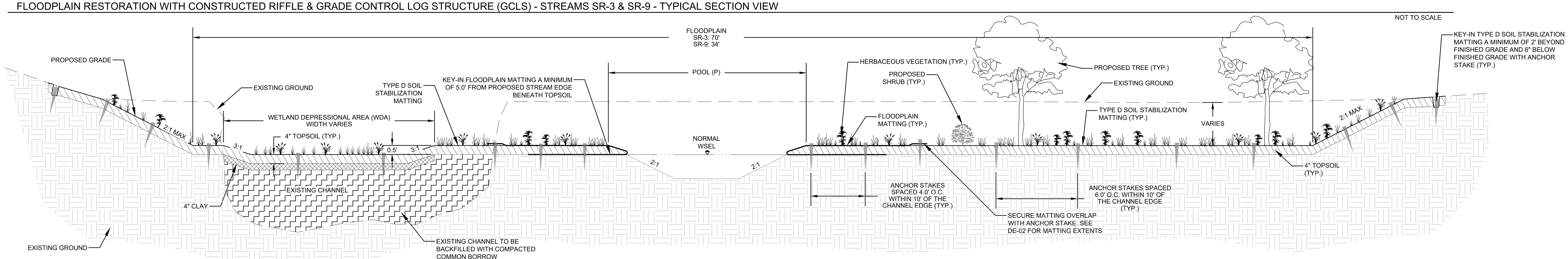
FLOODPLAIN RESTORATION WITH CONSTRUCTED RIFFLE & WETLAND DEPRESSIONAL AREA (WDA) - STREAMS SR-3 & SR-9 - TYPICAL SECTION VIEW

NOT TO SCALE



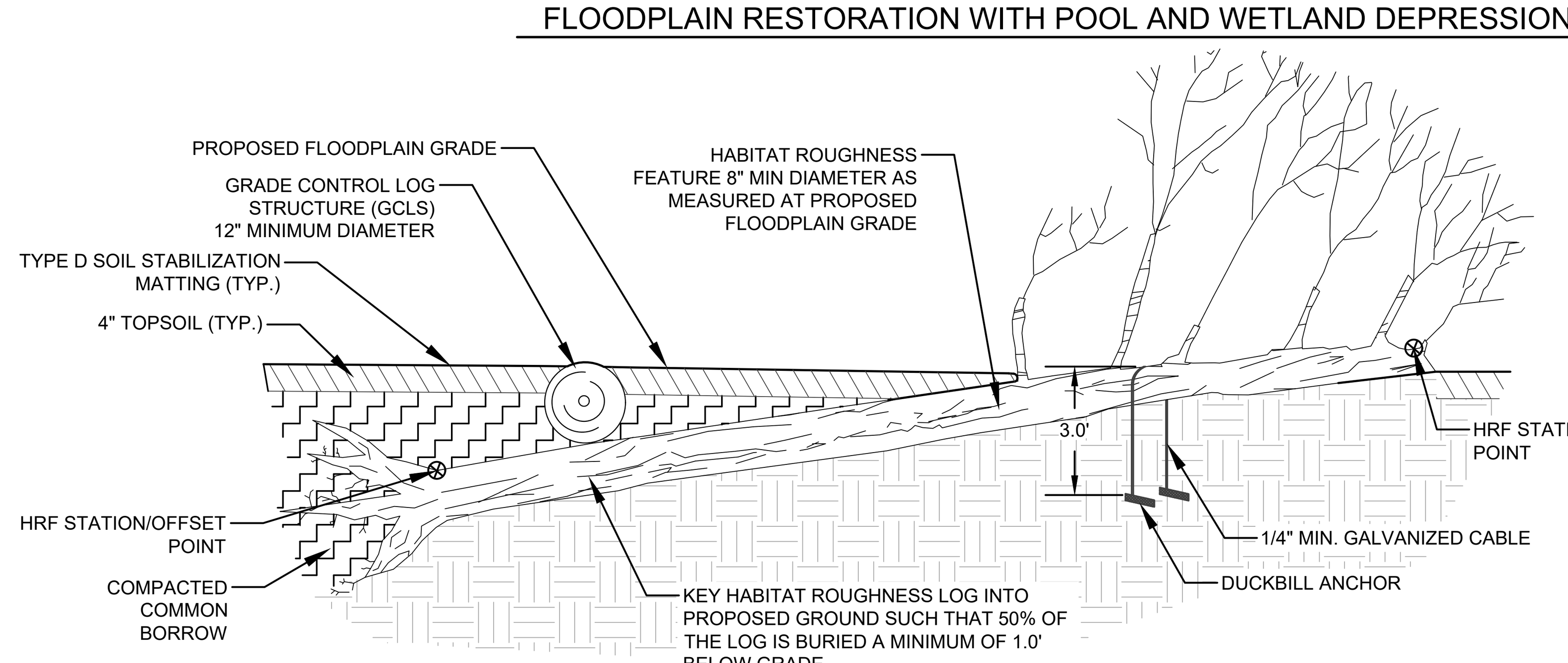
FLOODPLAIN RESTORATION WITH CONSTRUCTED RIFFLE & GRADE CONTROL LOG STRUCTURE (GCLS) - STREAMS SR-3 & SR-9 - TYPICAL SECTION VIEW

NOT TO SCALE



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

NOT TO SCALE



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

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

NOT TO SCALE

NOTES:

1. ANCHOR STAKES SHALL BE SPACED 4.0' O.C. WITHIN 10' OF CHANNEL EDGE, OVER SUBGRADE FURNISHED CHANNEL BED MATERIAL, AND ALONG ALL SEAMS. ANCHOR STAKES SHALL BE SPACED 6.0' O.C. IN ALL OTHER LOCATIONS.
2. WHERE MORE THAN ONE LOG IS NEEDED FOR GRADE CONTROL LOG STRUCTURES, OVERLAP LOGS A MINIMUM OF 3.0' AT OVERLAPPING JOINT.
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.
6. WHEN PLACING CLASS I CHANNEL BED MATERIAL, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SALVAGED STREAMBED MATERIAL SHALL BE WASHED INTO THE CLASS I CHANNEL BED MATERIAL TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED.
7. STATION/OFFSET POINTS REFER TO GRADE CONTROL LOG STRUCTURE AND HABITAT ROUGHNESS FEATURE STRUCTURE TABLES TO BE INCLUDED IN SUBSEQUENT SUBMITTALS AND ARE TO DENOTE THE STRUCTURE ORIENTATION.
8. WETLAND DEPRESSIONAL AREAS (WDA) SHOWN IN PLAN VIEW INDICATE APPROXIMATE SHAPE AND SIZE. CONSTRUCTED WDA'S MUST HAVE AN AREA WITHIN 5 SY OF THAT SPECIFIED IN THE WDA STRUCTURE TABLES (STRUCTURE TABLES TO BE INCLUDED IN SUBSEQUENT SUBMITTALS).
9. SEE SHEET DE-02 FOR RIPRAP AND BANK RUN GRAVEL TABLES

BILLING NO. TBD

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STATE OF MARYLAND — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	DE-01 of DE-05	Sheet No.	17 of 46

BID No.:

HCG DWG ID No.:

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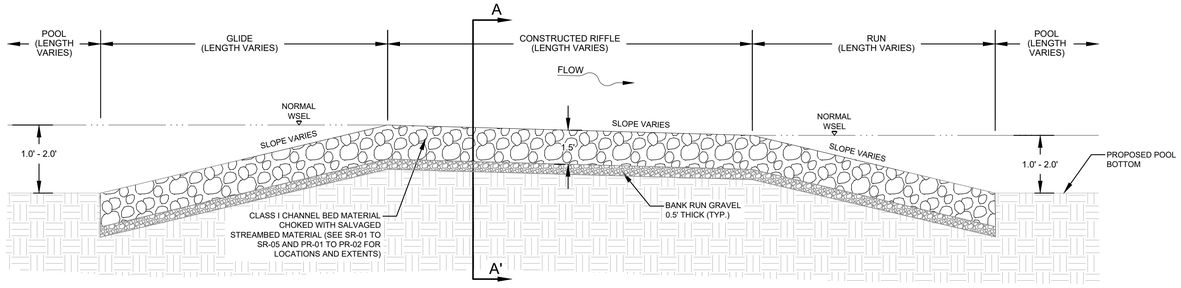
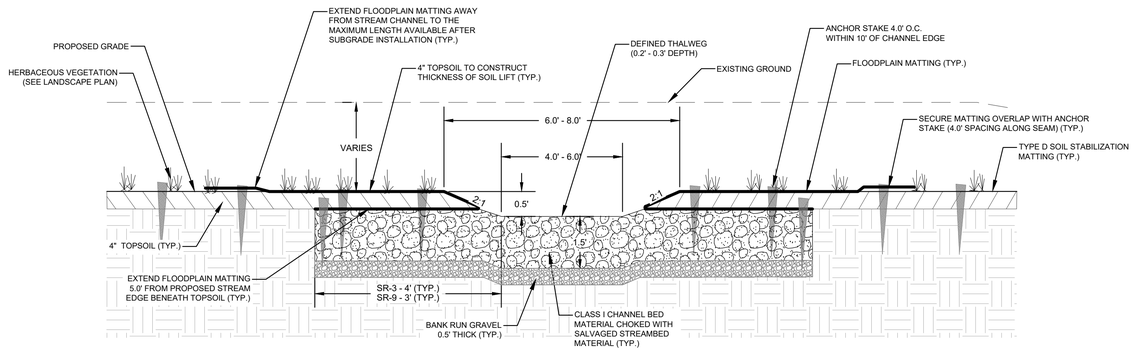


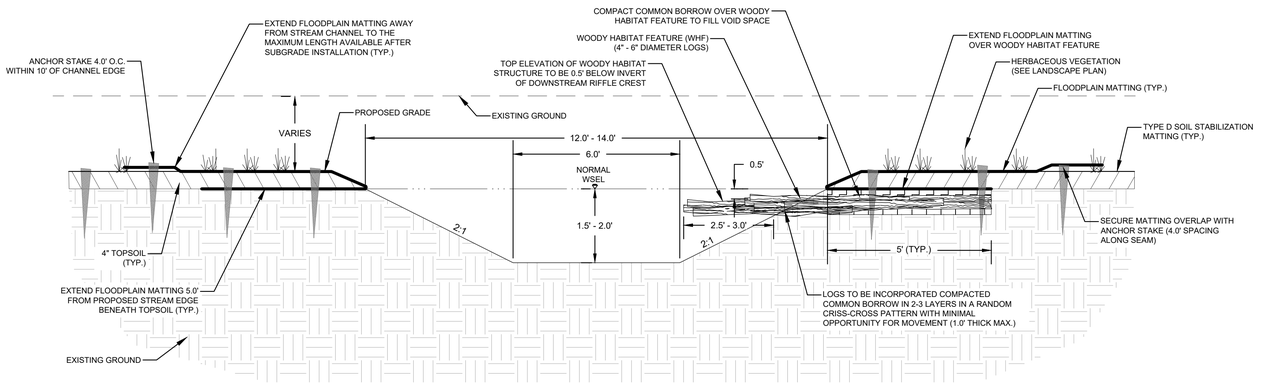
FLOODPLAIN RESTORATION - STREAMS SR-3 & SR-9 - TYPICAL CHANNEL PROFILE

NOT TO SCALE



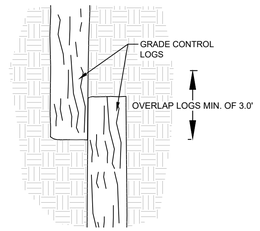
FLOODPLAIN RESTORATION - STREAMS SR-3 & SR-9 - CONSTRUCTED RIFFLE - SECTION A-A'

NOT TO SCALE



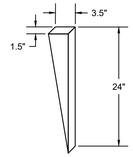
STREAM SR-3 - POOL WITH WOODY HABITAT FEATURE - TYPICAL SECTION

NOT TO SCALE



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.

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
CLASS III	23 IN	34 IN

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

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 oz/SY
Open Area:	50%
Size:	6 ft. wide X 150 ft in length (100 SY per roll)
Flow Velocity:	8 ft./sec.
Life Expectancy:	3 years

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

FLOODPLAIN MATTING SPECIFICATION

Nedia Enterprises, Inc.

Tel: (888) 725-6999
Fax: (571) 223-0202

Technical Specifications for

Nedia KoirWrap™ 1000

Nedia KoirWrap™ 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 fabric 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	
		English Units	Metric Units
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 936 lbs/ft	14.7 x 13.7 kN/m
Maximum 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 6.83 kN/m
Maximum 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 (Recommended)	Flume Test	4.5 psf	215 Pa
Water Velocity (Recommended)	Flume Test	12 ft./sec	3.7 m/sec
Functional Longivity	Observed	3 to 5 years	
Permittivity	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 sy/roll

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The above information is to the best of our knowledge accurate, but it is not intended to be considered a guarantee. Any implied warranty for a particular use or purpose is excluded. Nedia Enterprises, Inc. will not be liable for any type of damage or losses, directly or indirectly for failure of this product. All test results and properties were obtained from independent laboratory testing. If the product does not meet the above properties, and if a written notice is given to Nedia Enterprises, Inc., within seven days of delivery date, the product will be replaced or refunded. 180509

GEOTEXTILE SPECIFICATION

MARYLAND APPLICATION CLASS	TYPE OF GEOTEXTILE	GRAB STRENGTH lb	PUNCTURE STRENGTH lb	PERMITTIVITY sec⁻¹	APPARENT OPENING SIZE, MAX mm	TRAPEZOID TEAR STRENGTH (MD*/**) lb
		D 4632	D 4241	D4491	D 4751	D 4533
SE1	TYPE I	NONWOVEN	160	310	0.50	0.42	55
		WOVEN, MONOFILAMENT	250	495	0.50	0.43	90
	TYPE III	NONWOVEN	160	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
SE2	TYPE I	NONWOVEN	250	450	0.70	0.43	80
		WOVEN, MONOFILAMENT	250	620	0.70	0.43	90
	TYPE III	NONWOVEN	250	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.23	90
	TYPE IIIS	NONWOVEN	250	220	0.10	0.22	80
		WOVEN, MONOFILAMENT	250	370	0.10	0.22	70
SE		NONWOVEN	160	310	0.20	0.30	80
		WOVEN	250	495	0.20	0.30	90
ST		WOVEN	300*	600	0.05	0.15**	110
F		WOVEN	200	450	0.85	0.60	75
F		NONWOVEN	200	450	1.1	0.71	80
		WOVEN, MONOFILAMENT	370	900	0.28	0.71	100

NOTE 1: ALL PROPERTY VALUES IN THE ABOVE TABLE ARE BASED ON MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPLE DIRECTION EXCEPT FOR APPARENT OPENING SIZE.
NOTE 2: THE ULTRAVIOLET STABILITY SHALL BE 50 PERCENT AFTER 500 HRS OF EXPOSURE FOR ALL CLASSES, EXCEPT CLASS F, WHICH SHALL BE 70 PERCENT (D 4355).

*15% ELONGATION FOR SILT FENCE AND MONOFILAMENT WOVEN GEOTEXTILE IN MACHINE DIRECTION
**THIS IS A MINIMUM APPARENT OPENING SIZE, NOT A MAXIMUM.
***MACHINE DIRECTION

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.

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.

STATE OF MARYLAND — CHRISTOPHER A. JOHNSON — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

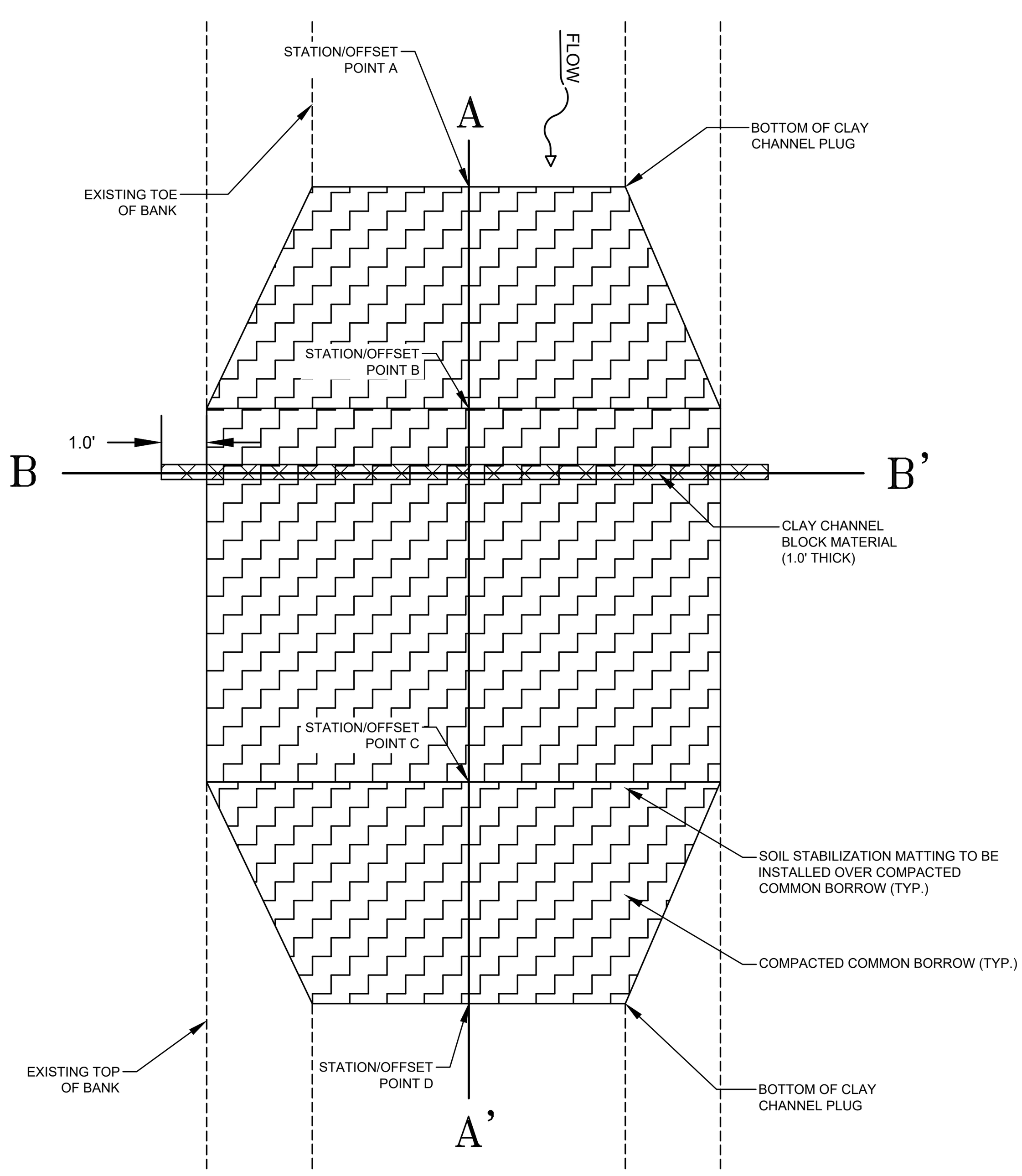
Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	DE-02 of DE-05	Sheet No.	18 of 46

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pbE-P000_NorthReardon.dwg Dec 21, 2023 7:28am pbaltzer

BID No.:

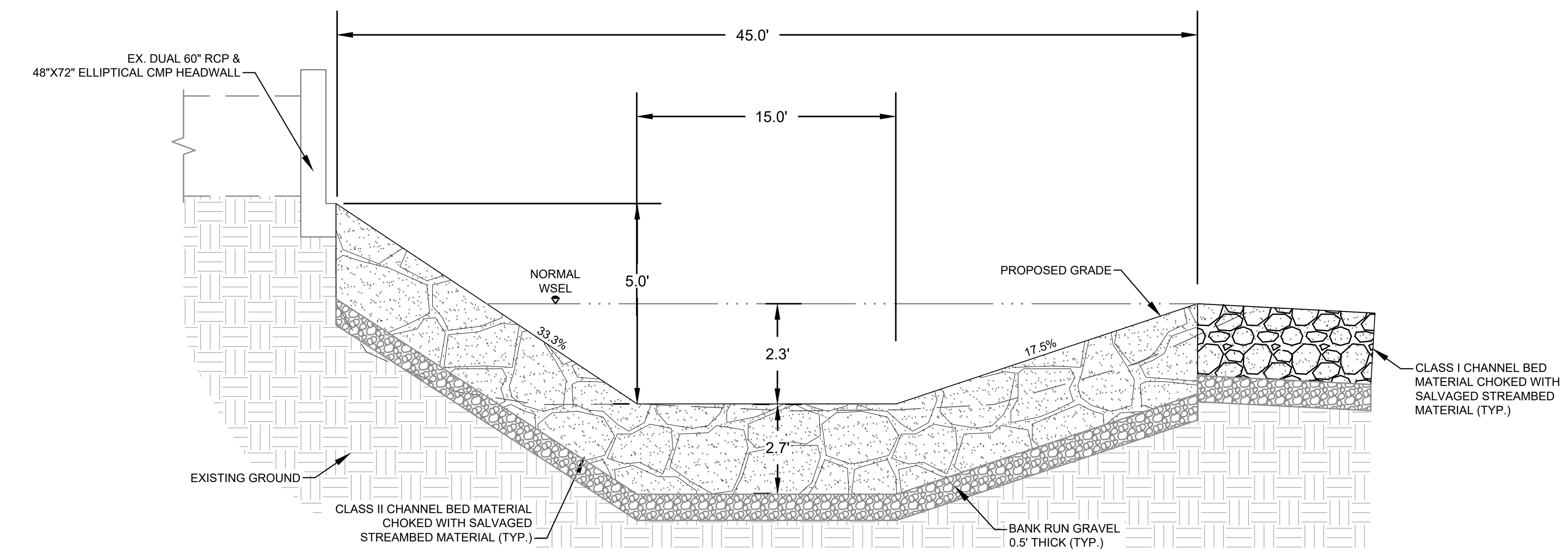
HCG DWG ID No.:

SCALE: 1 inch



CHANNEL PLUG (CP) - PLAN VIEW

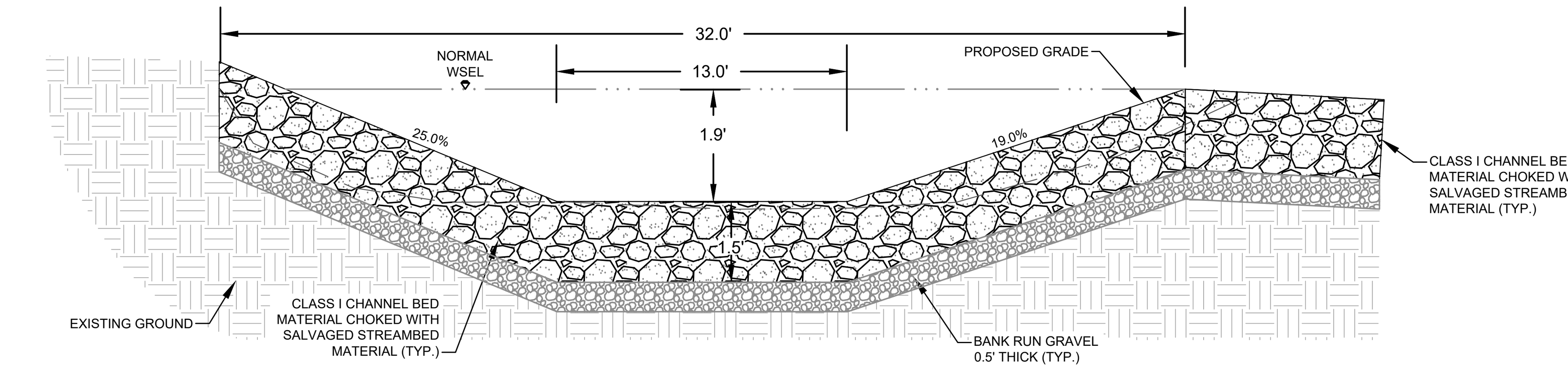
NOT TO SCALE



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 CHANNEL BED MATERIALS BY HYDRAULIC ACTION.

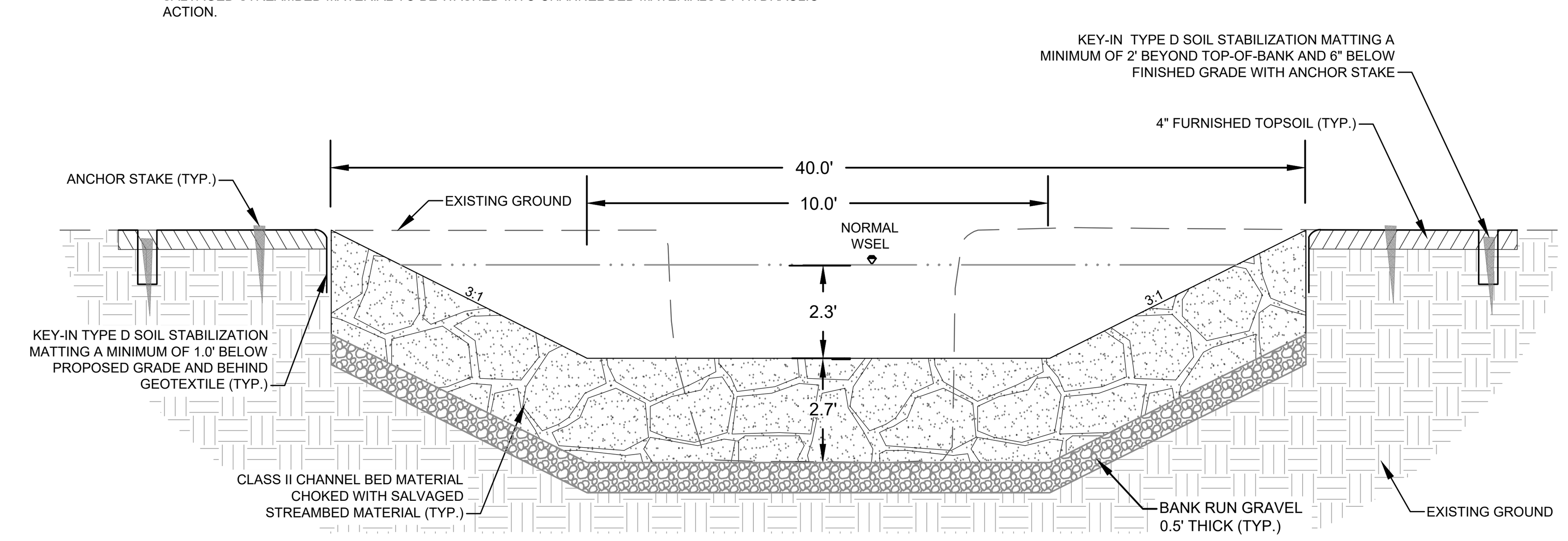
NOT TO SCALE



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 CHANNEL BED MATERIALS BY HYDRAULIC ACTION.

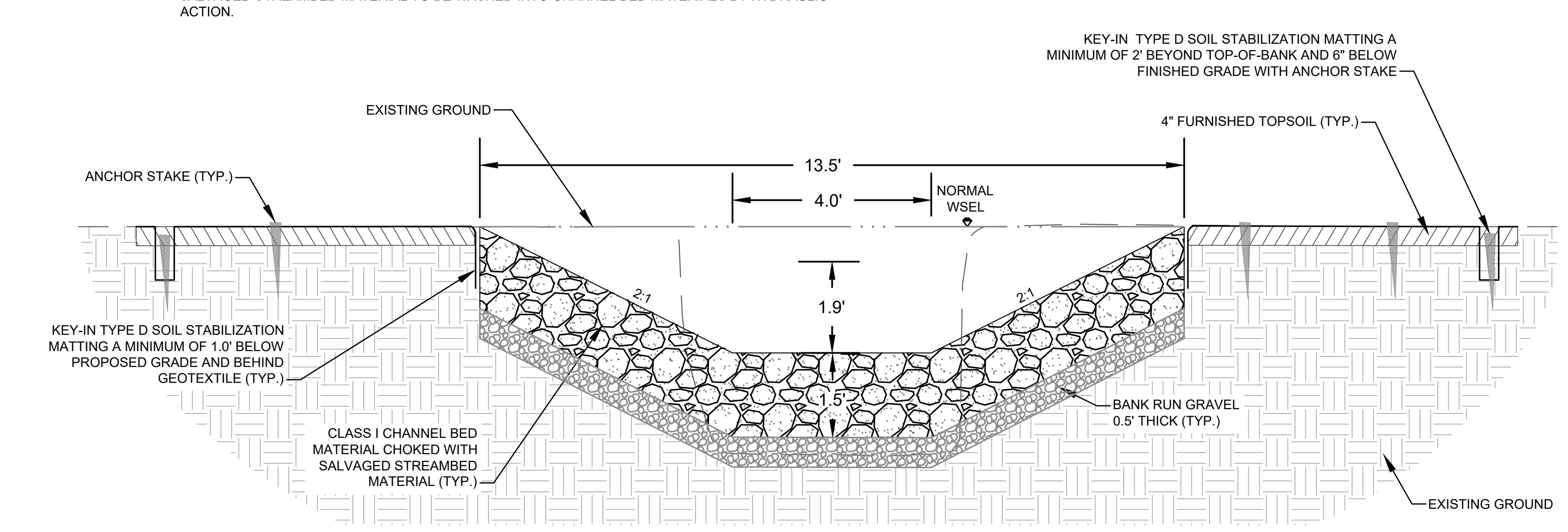
NOT TO SCALE



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

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

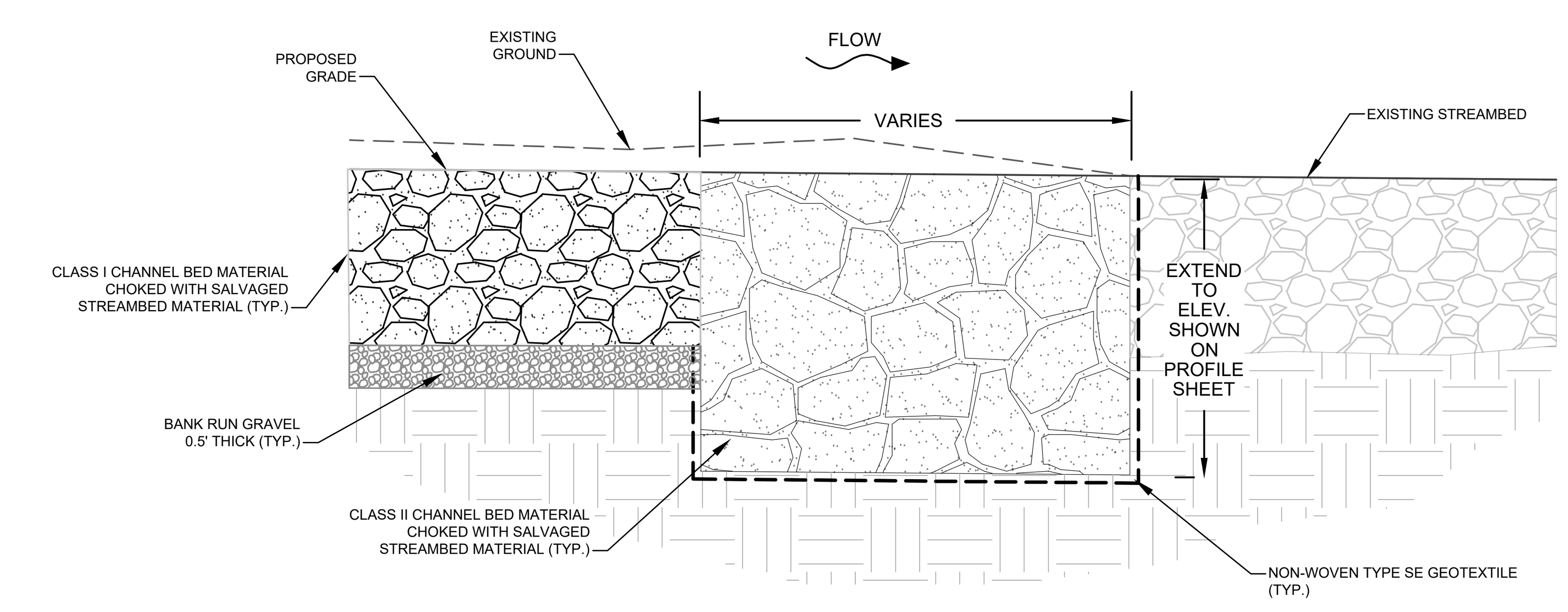
NOT TO SCALE



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 CHANNEL BED MATERIALS BY HYDRAULIC ACTION.

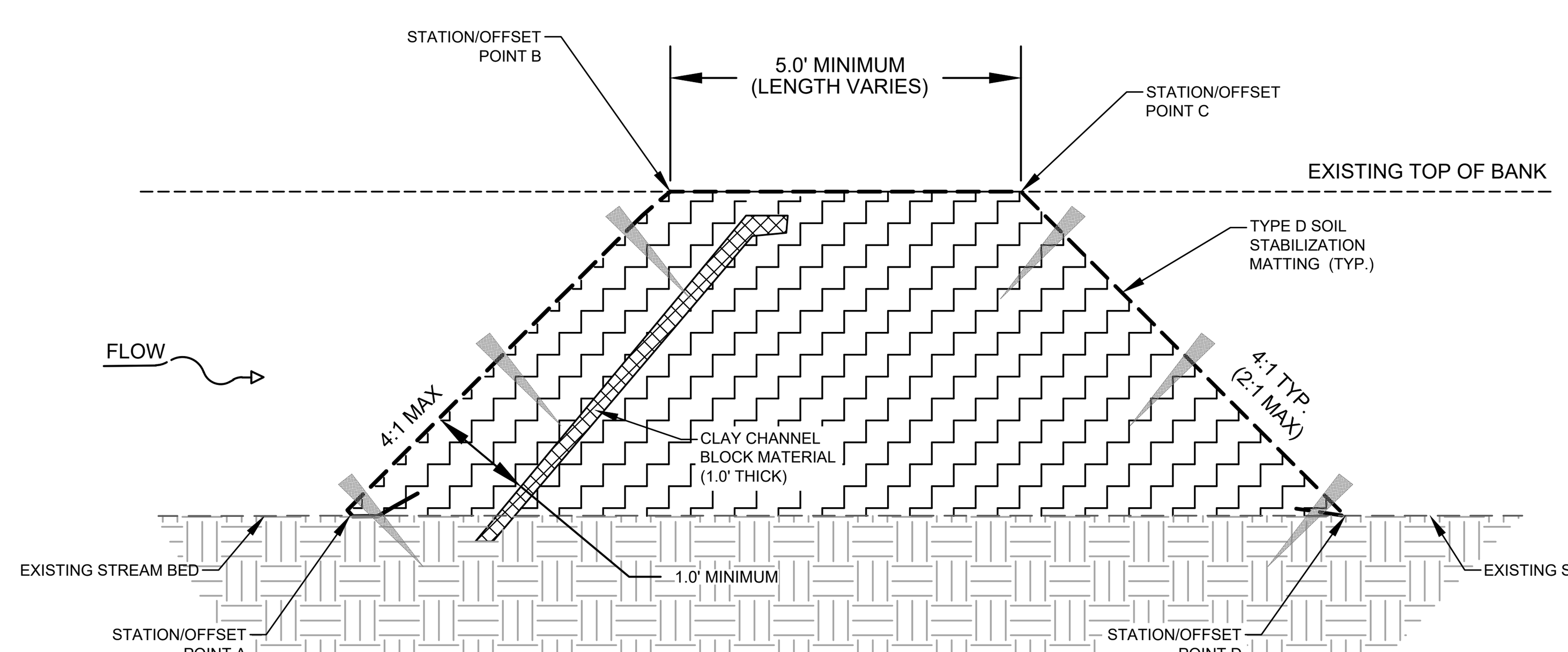
NOT TO SCALE



BED SILL - PROFILE VIEW

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

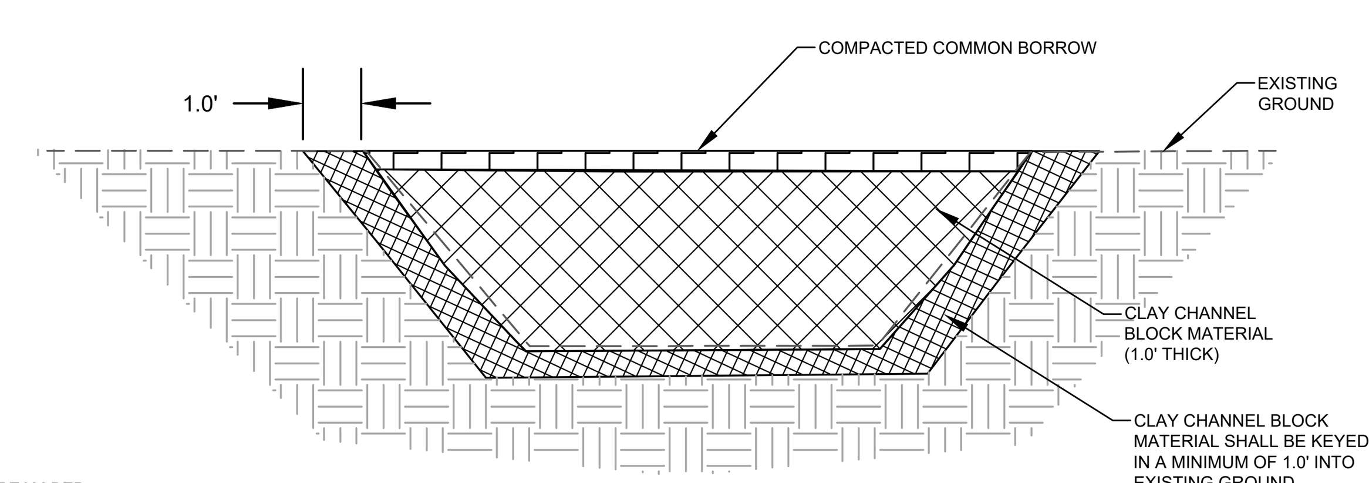
NOT TO SCALE



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 COMPACTED 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 COMPACTED 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 AND CHANNEL BED MATERIAL AS SHOWN.



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

NOT TO SCALE

BILLING NO.	TBD
EG-SWMENG-	TBD

PROFESSIONAL CERTIFICATION

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	DE-03 of DE-05	Sheet No.	19 of 46

BID No.:

HCG DWG ID No.:

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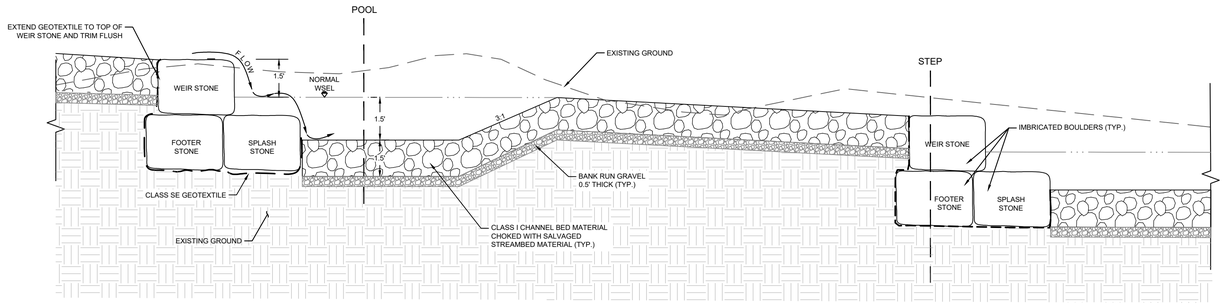
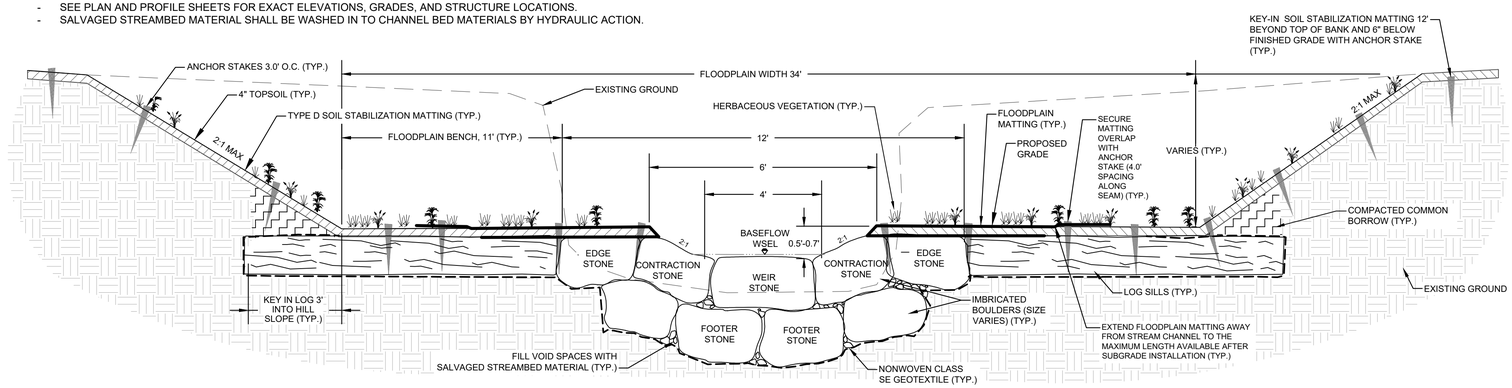


STREAM SR-9 ROCK STEP STRUCTURE (RSS) - PROFILE VIEW A-A'

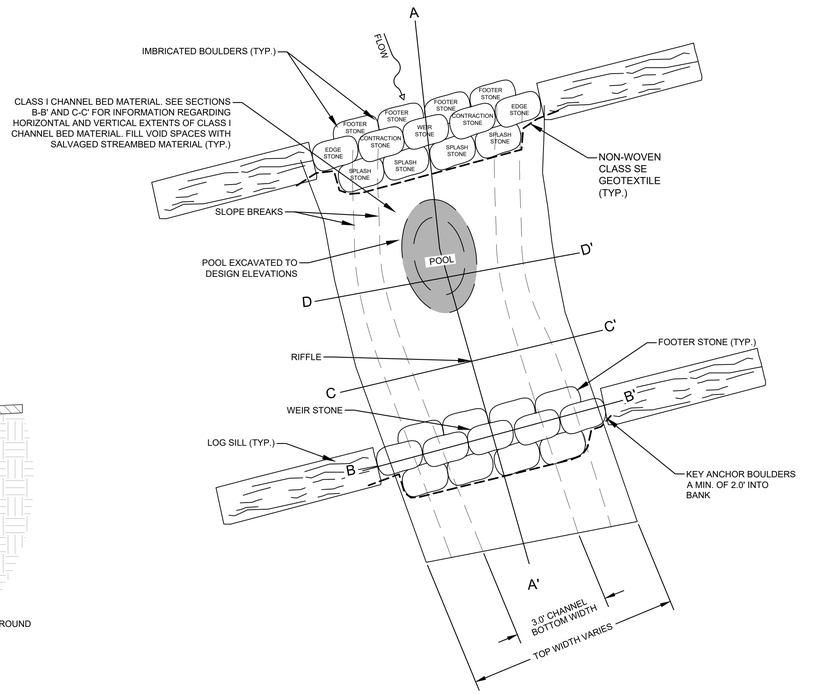
NOT TO SCALE

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



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

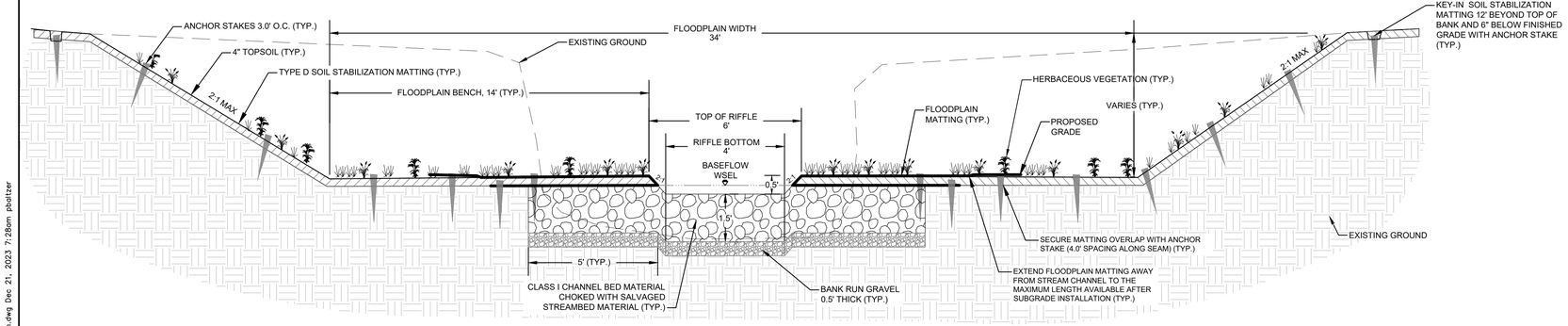
NOT TO SCALE



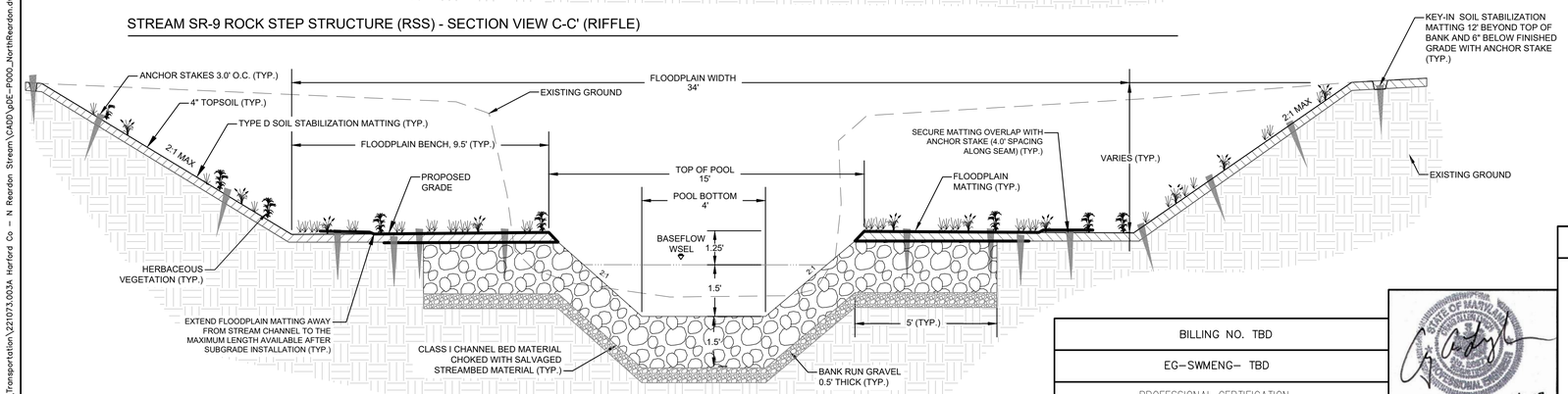
STREAM SR-9 - ROCK STEP STRUCTURES (RSS) - PLAN VIEW

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

NOT TO SCALE

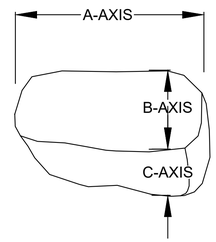


STREAM SR-9 ROCK STEP STRUCTURE (RSS) - SECTION VIEW C-C' (RIFFLE)



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

NOT TO SCALE



IMBRICATED BOULDER DETAIL - TYPICAL DETAIL

NOT TO SCALE

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.	1600 IBS.
MAXIMUM SIZE	4.0 FT.	3.0 FT.	2.0 FT.	3840 IBS.

STONE USED AS CLASS I OR II RIPRAP ANDCLASS III ANGULAR BOULDERS SHALL HAVE A MINIMUM DENSITY GREATER THAN 160 IBS/FT^3 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.

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.

STATE OF MARYLAND — PAUL JOSEPH BOLTZER — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Drawn By : PJB , JLL

Designed By : IPT , PJB

Reviewed By : CAL

Drawing No. DE-04 of DE-05

Scale : N/A

Date : 12 / 23

Sheet No. 20 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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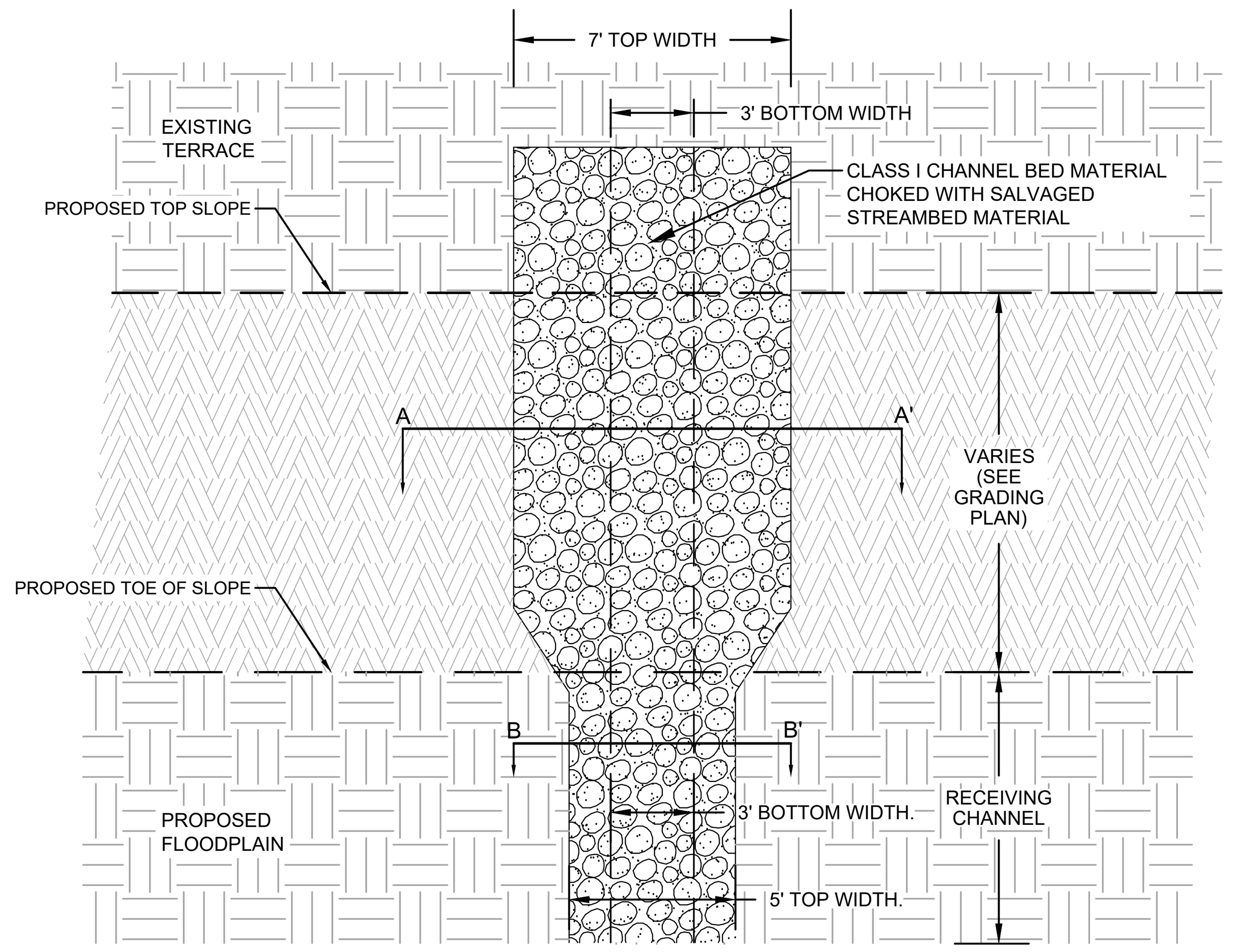
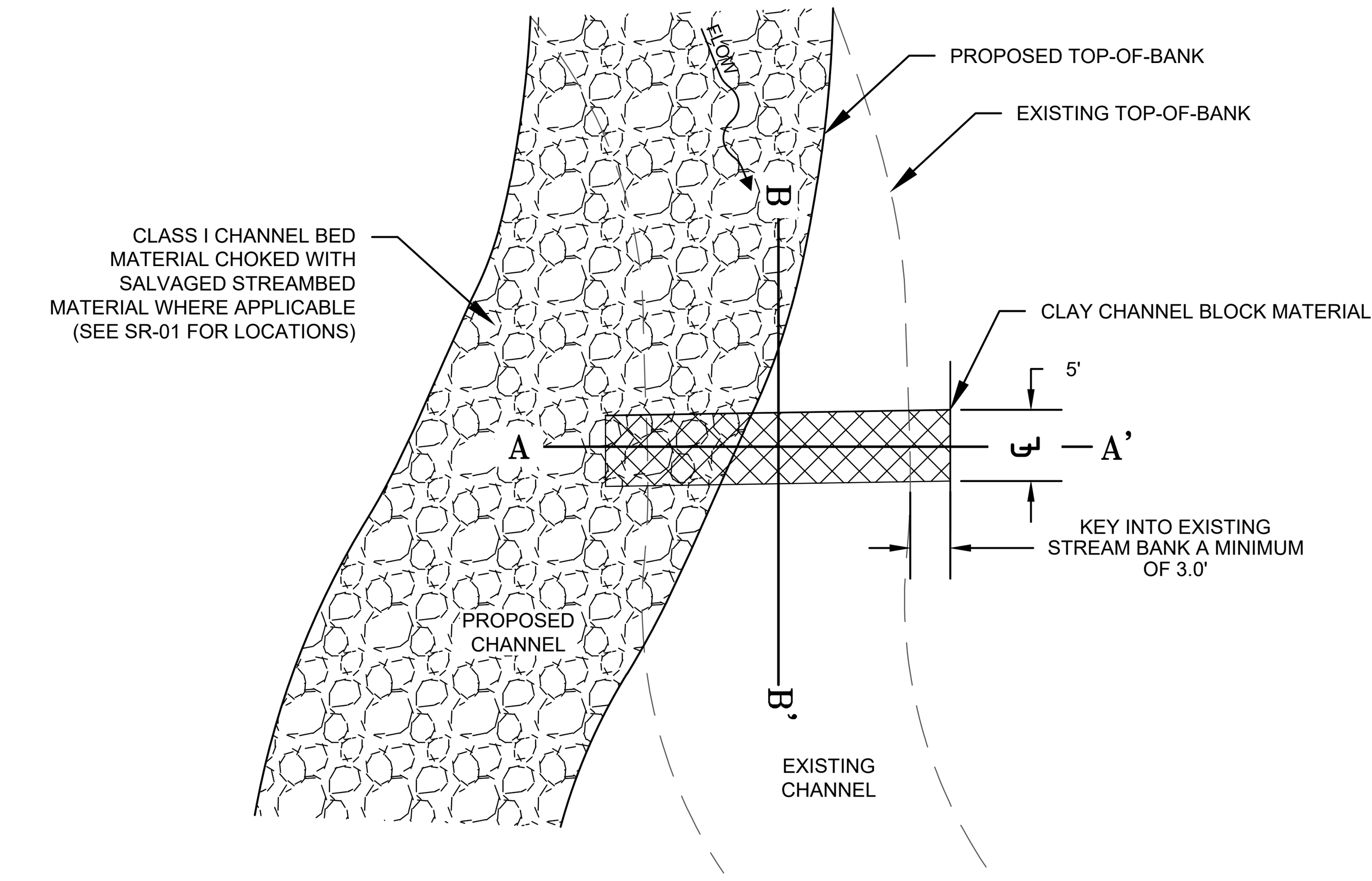


SLOPE STABILIZATION (SS) - PLAN VIEW

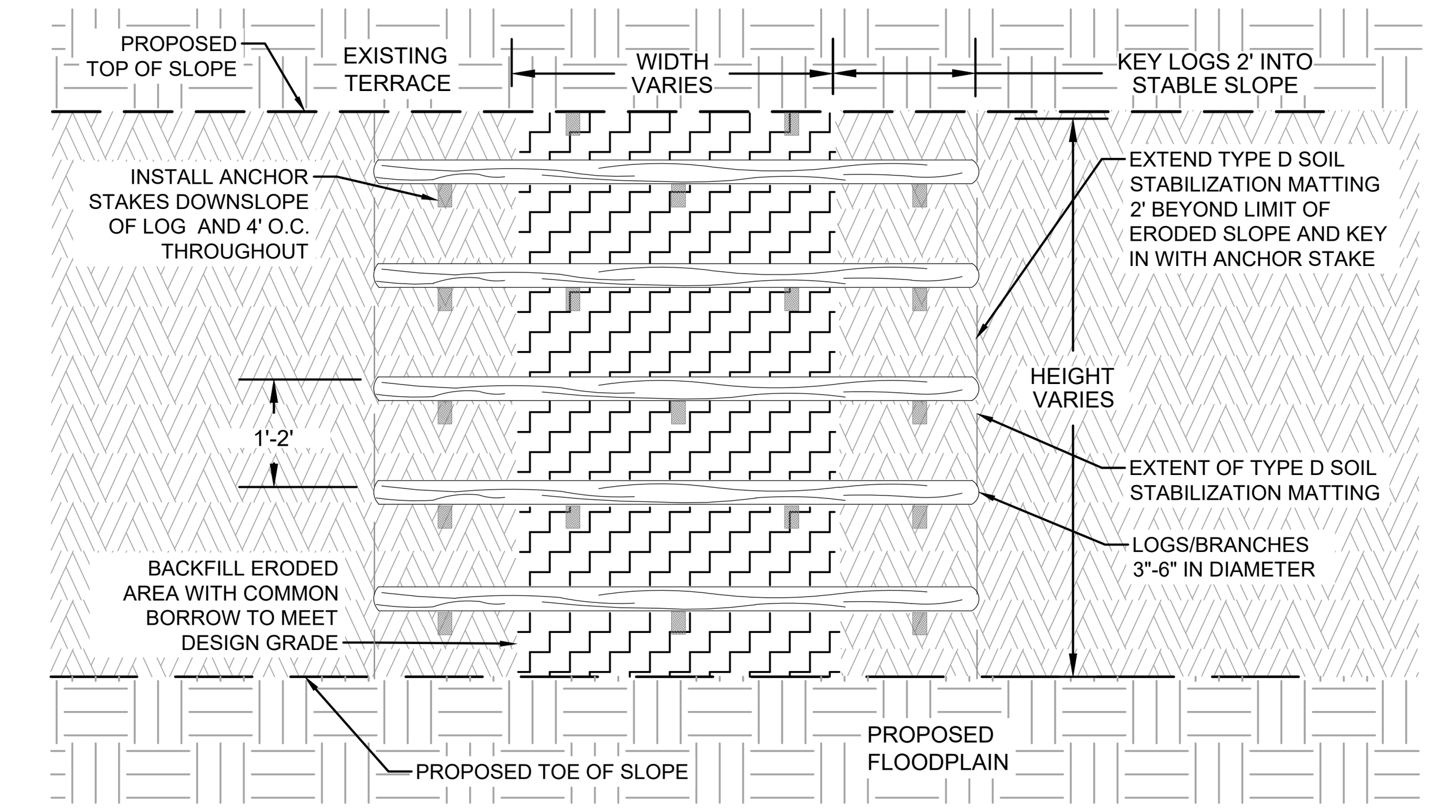
NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) - PLAN VIEW

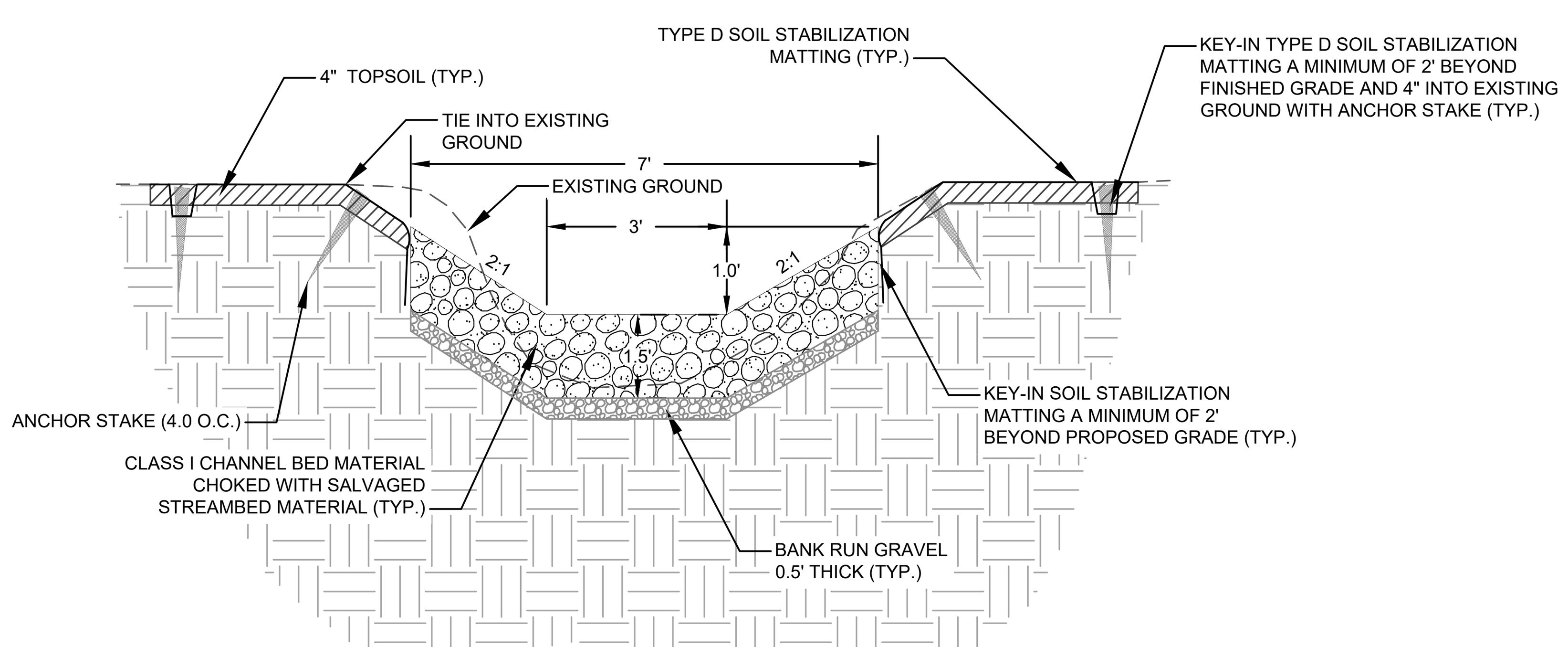
NOTE: SEE CLAY CHANNEL BLOCK CROSS-SECTION DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION REGARDING SUBGRADE CONSTRUCTION.

NOT TO SCALE



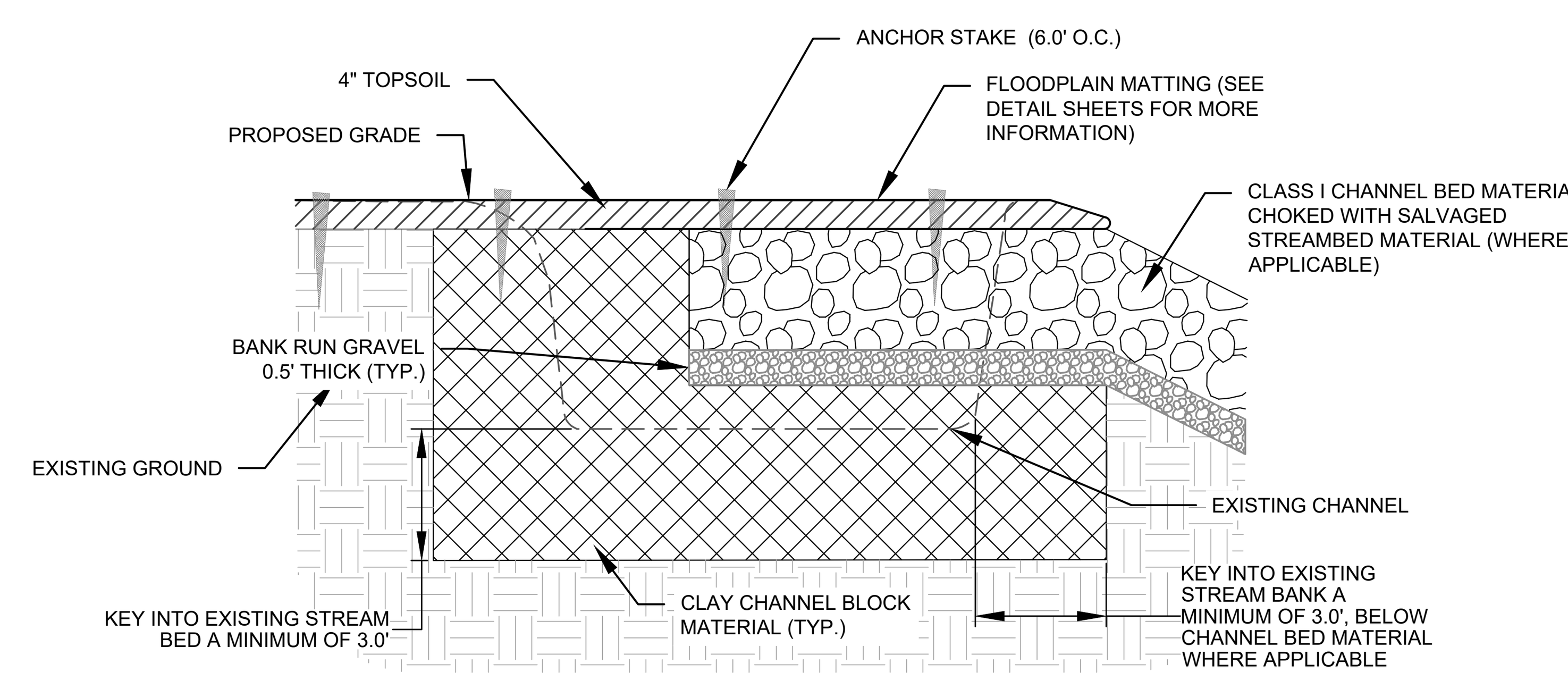
ERODED SLOPE REPAIR - PLAN VIEW

NOT TO SCALE



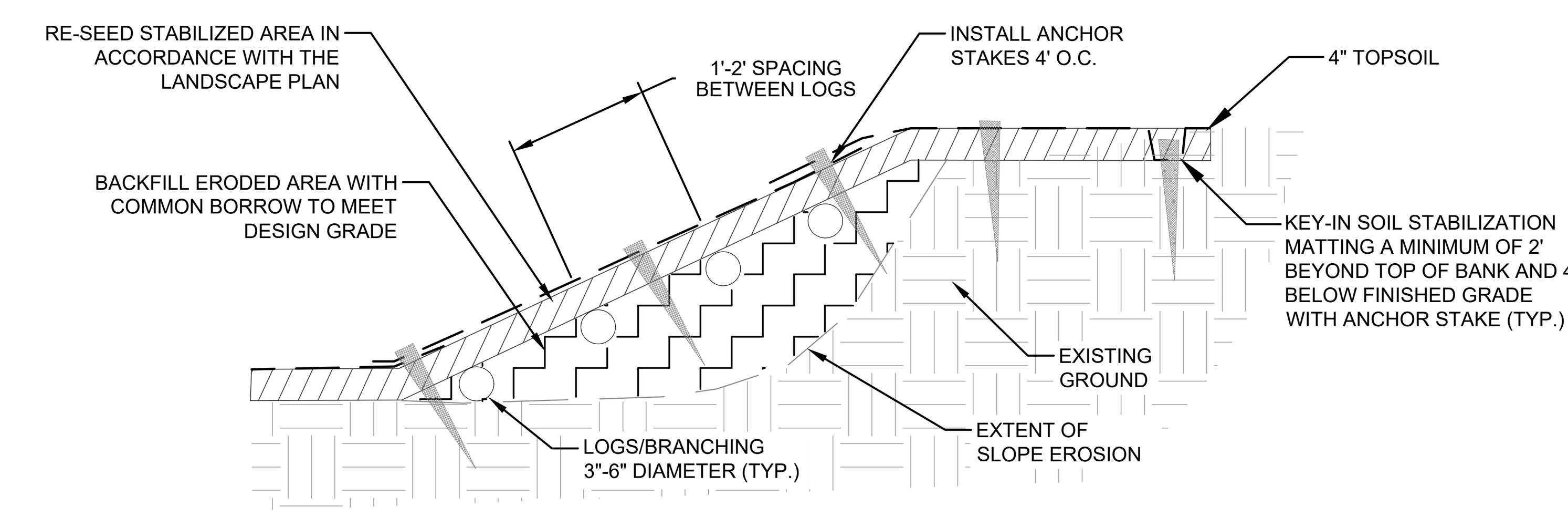
SLOPE STABILIZATION (SS) - SECTION A-A'

NOT TO SCALE



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

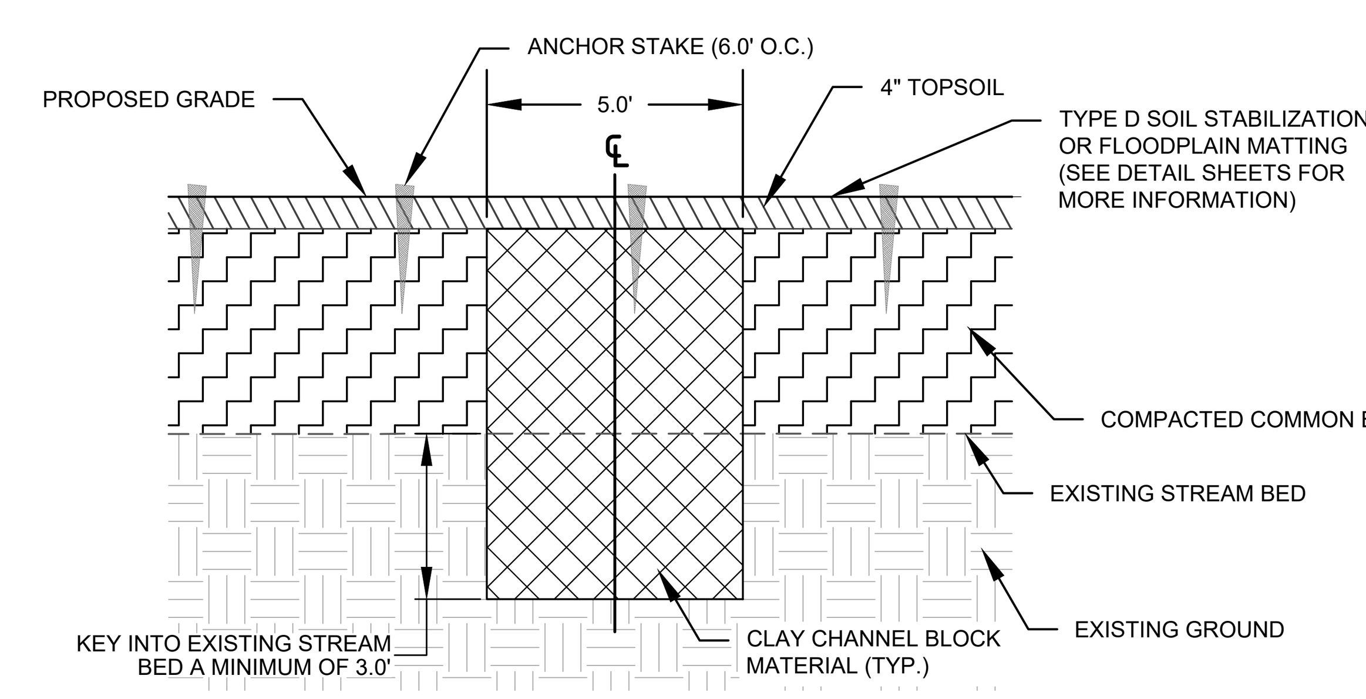
NOT TO SCALE



ERODED SLOPE REPAIR - SECTION VIEW

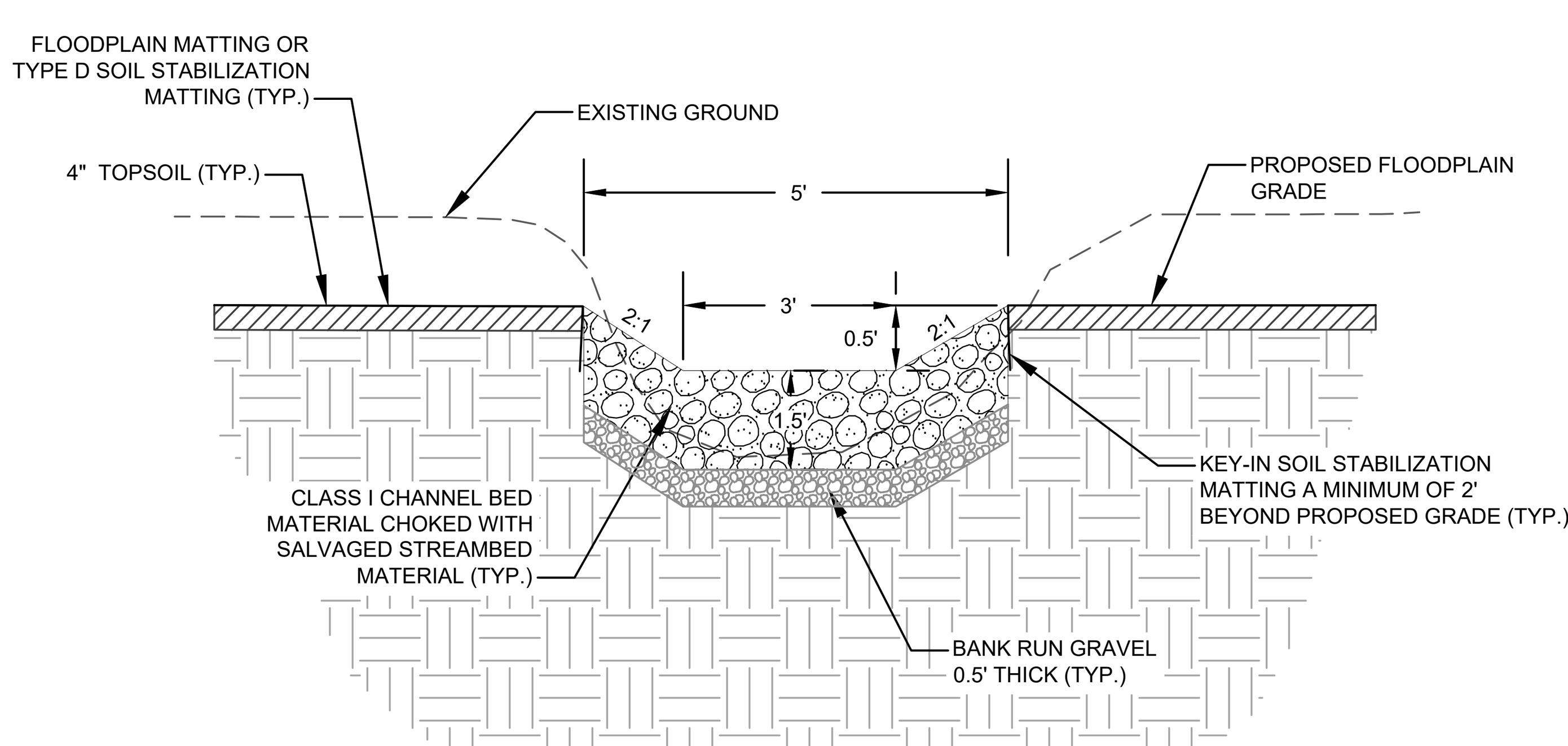
NOT TO SCALE

SLOPE REPAIR NOTE: SLOPES THAT SHOW SIGNS OF INSTABILITY (SLUMPING, EROSION, INCISION, OR HEADCUTS, ETC.) DURING CONSTRUCTION ARE TO BE REPAIRED IN ACCORDANCE WITH THE SLOPE REPAIR DETAIL OR AS DIRECTED BY THE ENGINEER OR COUNTY INSPECTOR.



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

NOT TO SCALE



SLOPE STABILIZATION (SS) - RECEIVING CHANNEL SECTION (B-B')

NOT TO SCALE

NOTES:

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

BILLING NO. TBD

EG–SWMENG– TBD

PROFESSIONAL CERTIFICATION

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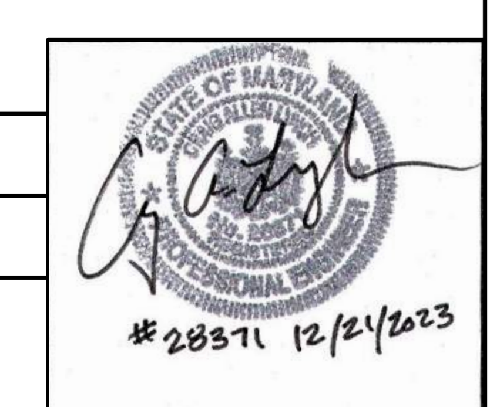

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	DE-05 of DE-05	Sheet No.	21 of 46

BID No.:

HCG DWG ID No.:

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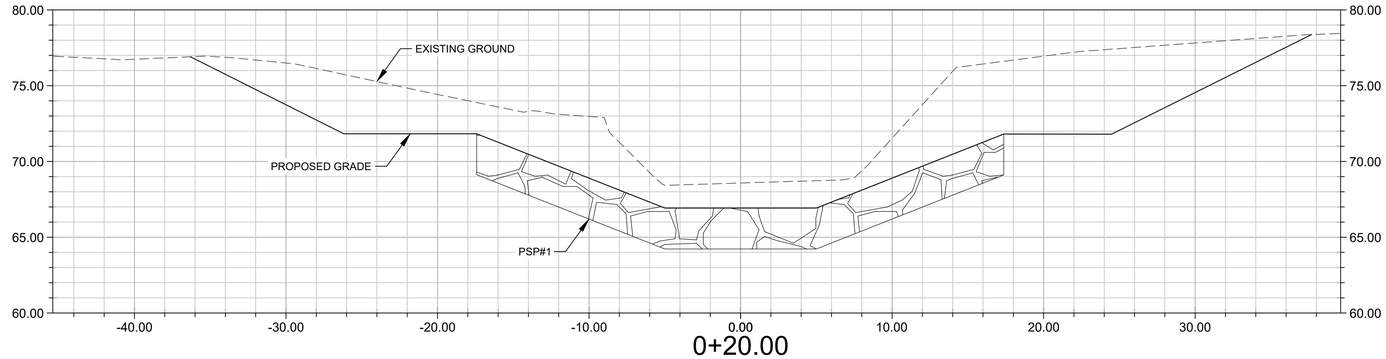
STREAM SR-3 CROSS-SECTIONS



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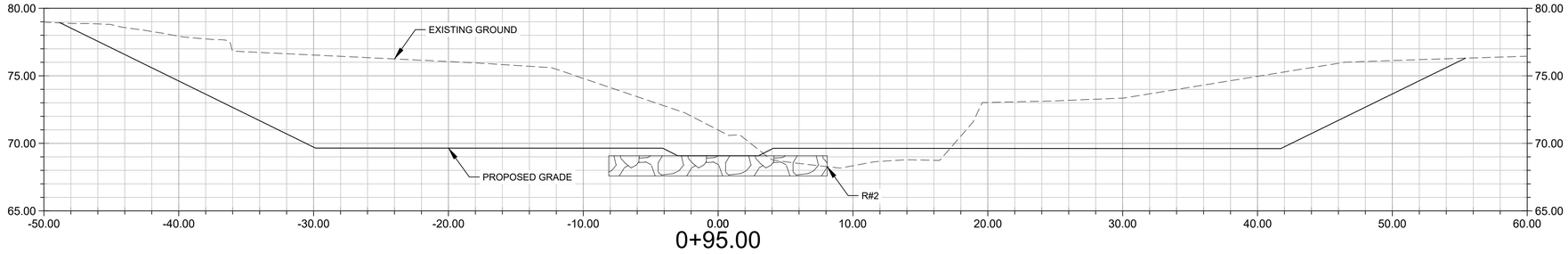

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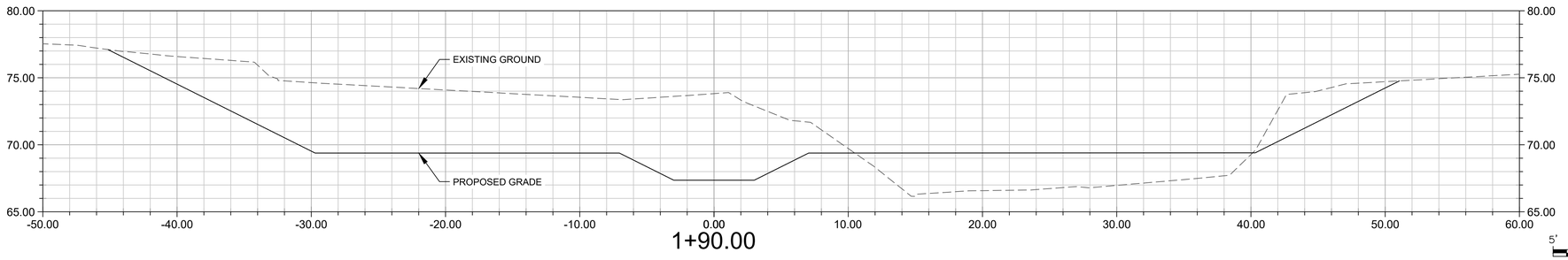

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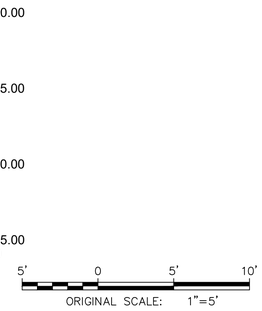

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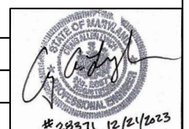

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-01 of CS-08	Sheet No.	22 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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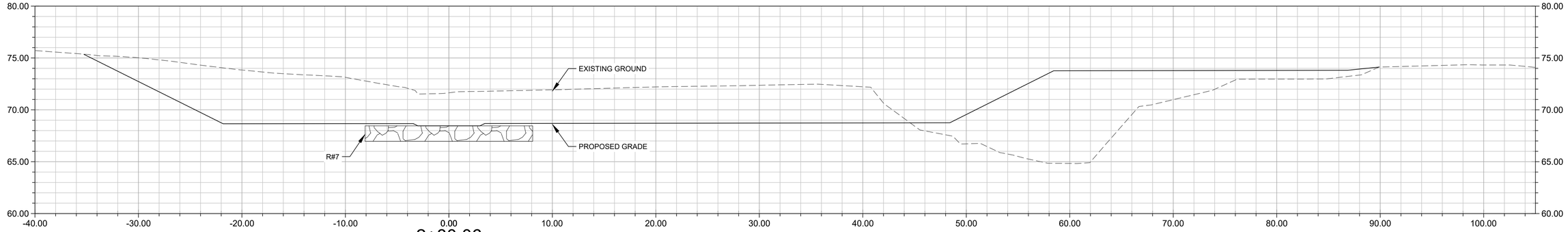
STREAM SR-3 CROSS-SECTIONS



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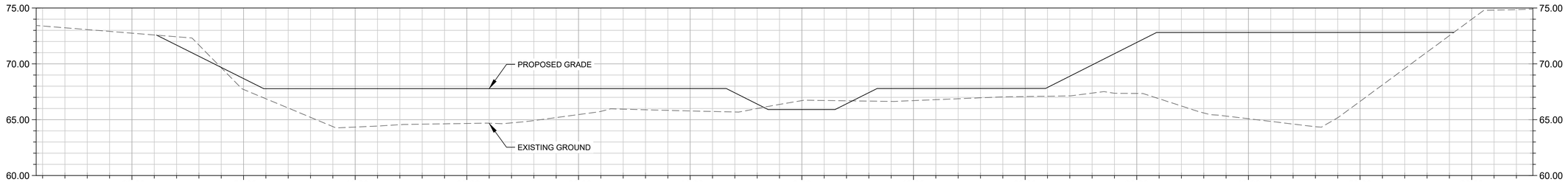

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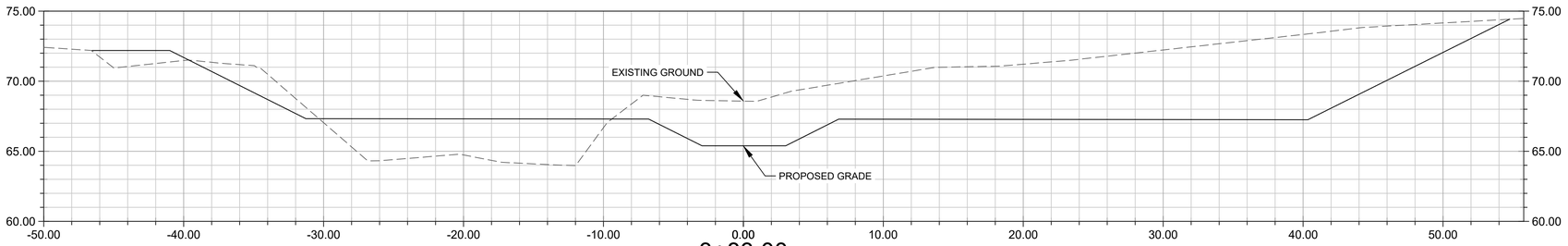

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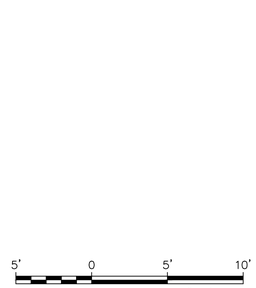


BID No.:

HCG DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CAD\pCS-P000_NorthReardon.dwg Dec 21, 2023 7:30am pbaltzer

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-02 of CS-08	Sheet No.	23 of 46

BILLING NO. TBD

EG-SWMENG- TBD

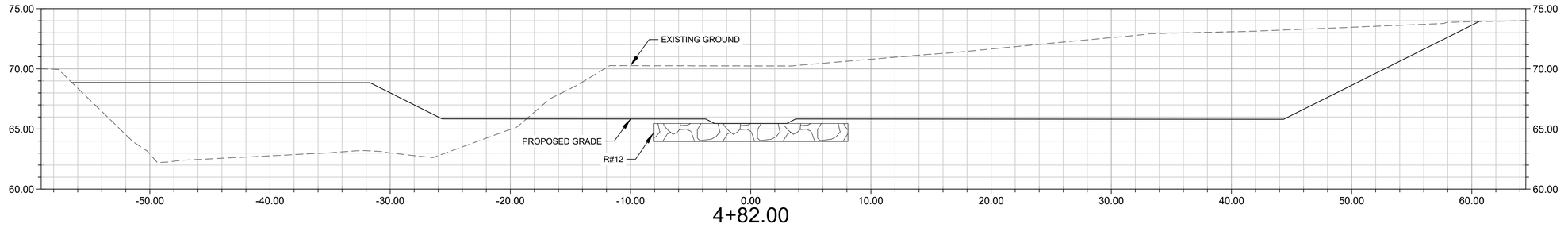
PROFESSIONAL CERTIFICATION

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.

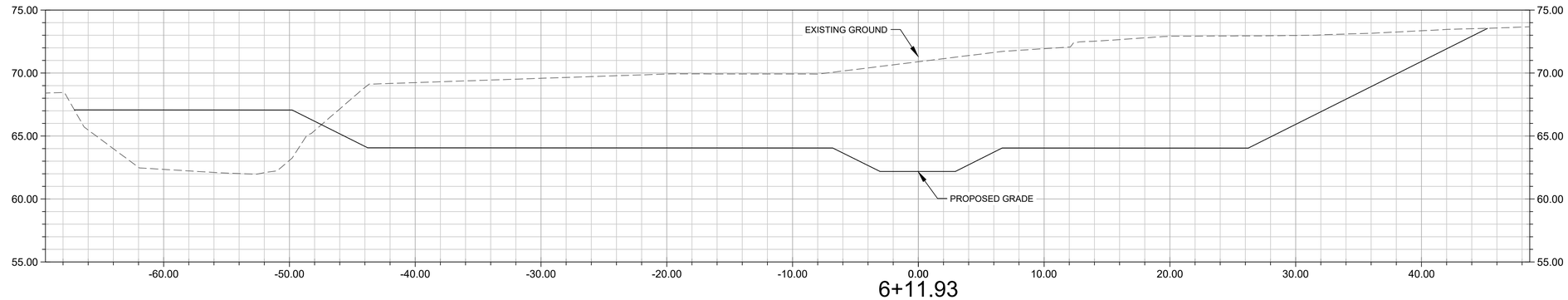
STATE OF MARYLAND — PAUL J. BALTZER — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

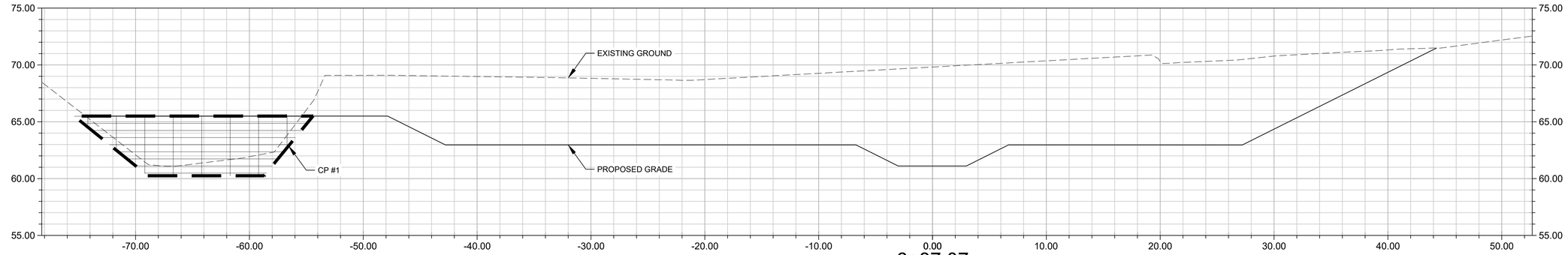
STREAM SR-3 CROSS-SECTIONS



4+82.00



6+11.93



6+87.07

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

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

BILLING NO. TBD

EG-SWMENG- TBD

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STATE OF MARYLAND — PAUL J. BOLTZER — No. 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-03 of CS-08	Sheet No.	24 of 46

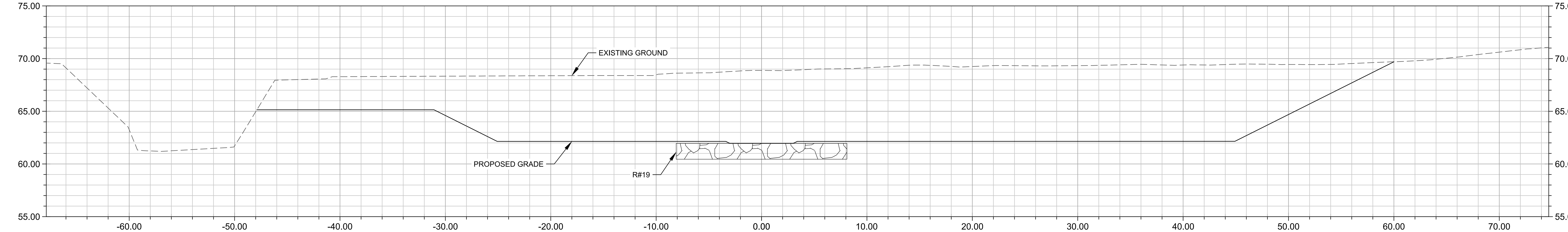
BID No.:

HCG DWG ID No.:

SCALE 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pCS-P000_NorthReardon.dwg Dec 21, 2023 7:30am pboltzer

STREAM SR-3 CROSS-SECTIONS



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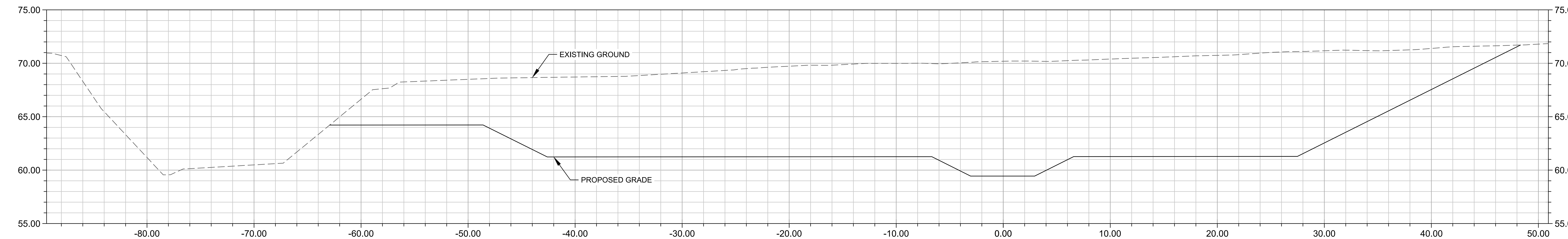

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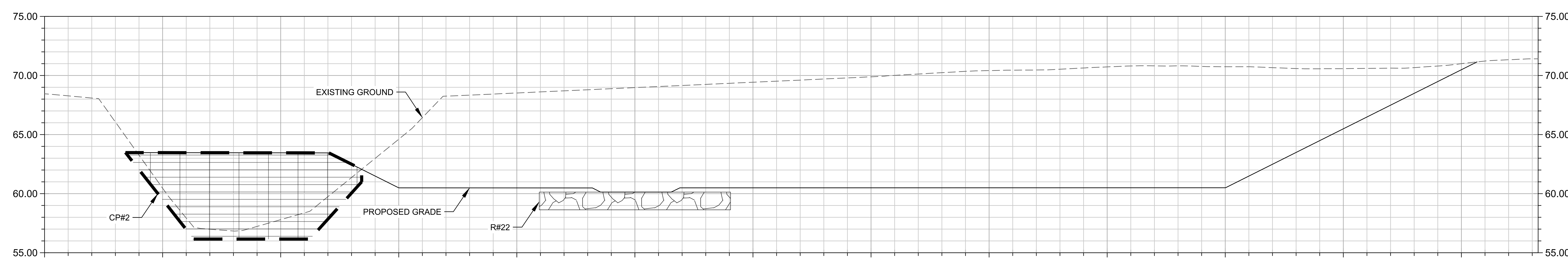

8+57.41

ORIGINAL SCALE: 1"=5'

ORIGINAL SCALE: 1"=5'

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EG–SWMENG– TBD

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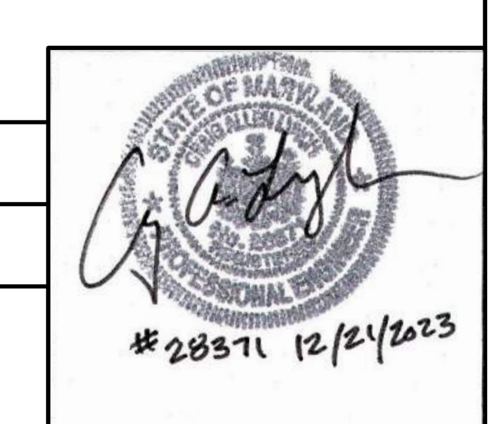


Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

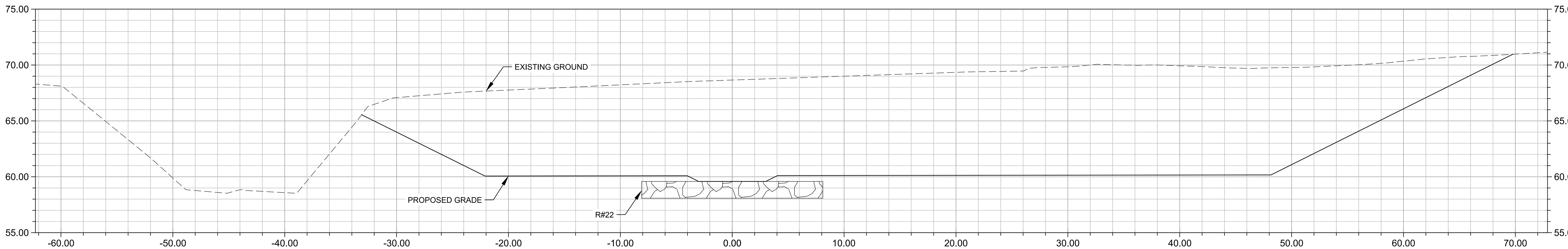
CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-04 of CS-08	Sheet No.	25 of 46

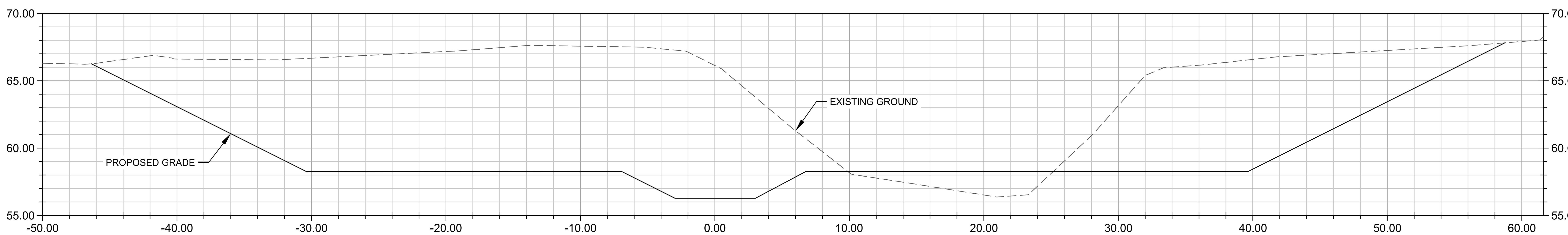
BID No.:

HCG DWG ID No.:

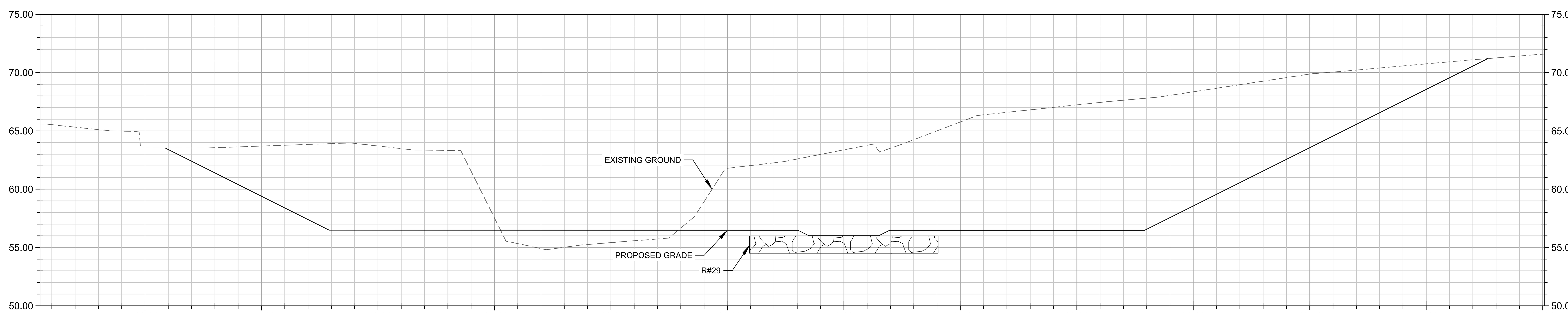
STREAM SR-3 CROSS-SECTIONS



8+82.00



10+14.00



11+40.12

ORIGINAL SCALE: 1"=5'

5' 0 5' 10'

ORIGINAL SCALE: 1"=5'

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BILLING NO. TBD

EG–SWMENG– TBD

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#28371 12/24/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

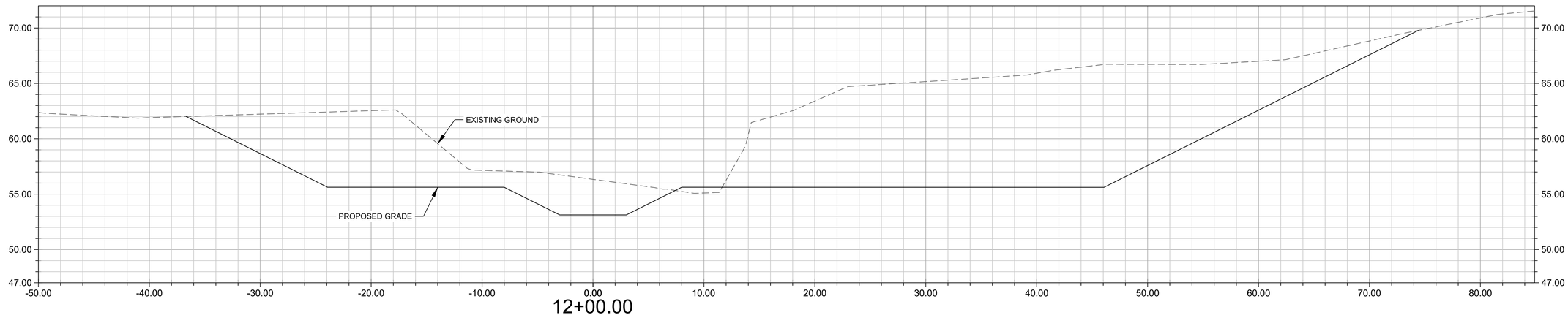
CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-05 of CS-08	Sheet No.	26 of 46

BID No.:

HCG DWG ID No.:

STREAM SR-3 CROSS-SECTIONS



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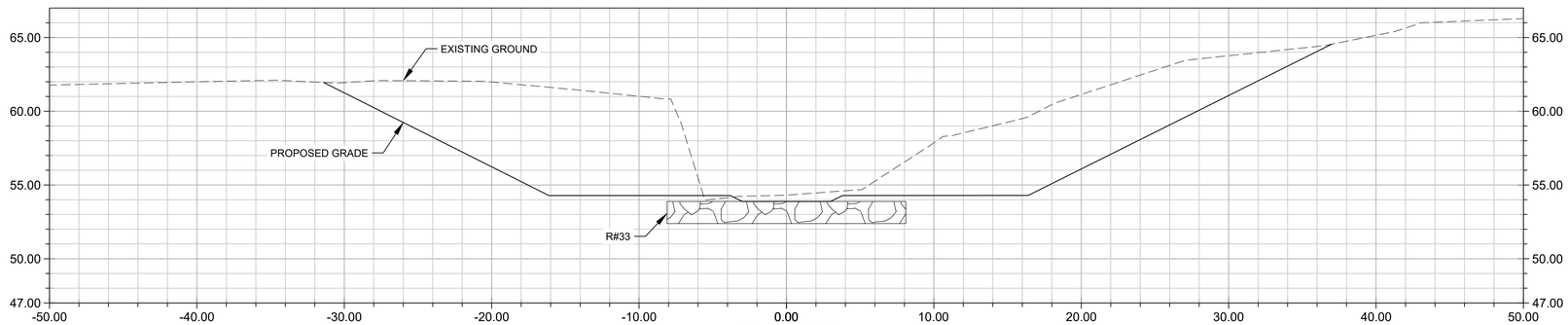
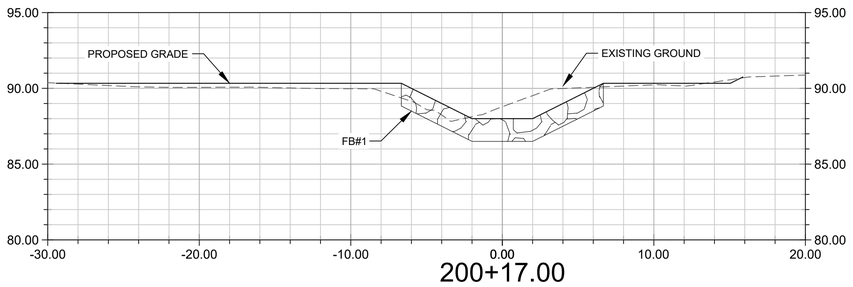


12+90.00

STREAM SR-9 CROSS-SECTIONS



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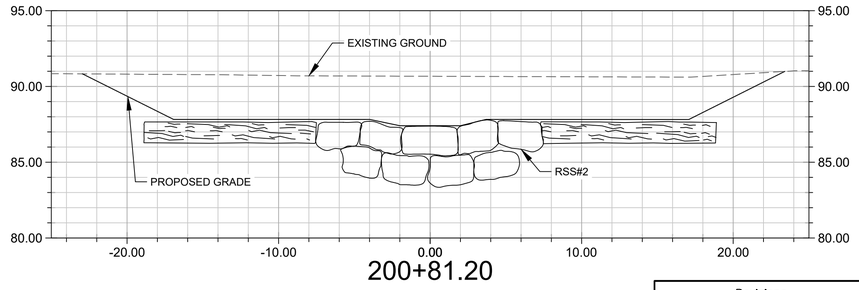

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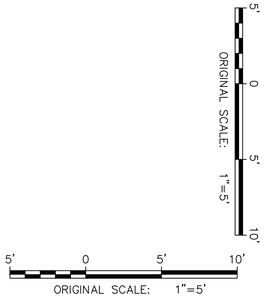

Revisions

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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#28371 12/21/2023

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-06 of CS-08	Sheet No.	27 of 46

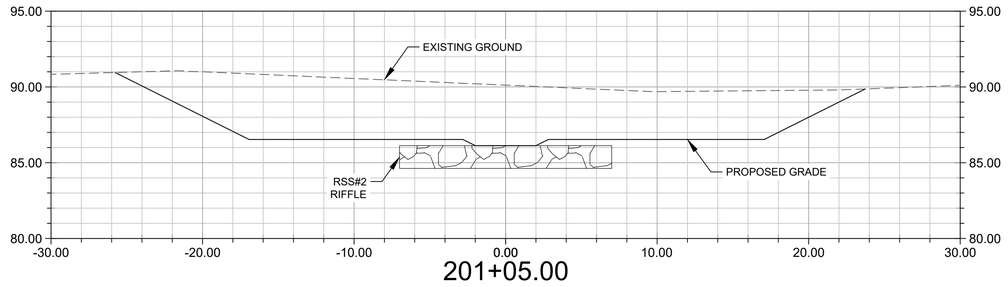
BID No.:

HCG DWG ID No.:

SCALE: 1" min

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pCS-P000_NorthReardon.dwg Dec 21, 2023 7:30am pbaltzer

STREAM SR-9 CROSS-SECTIONS



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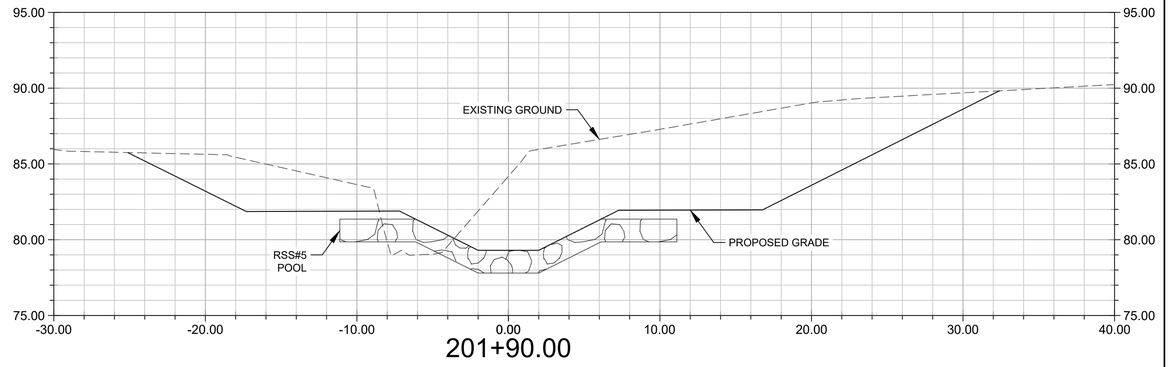
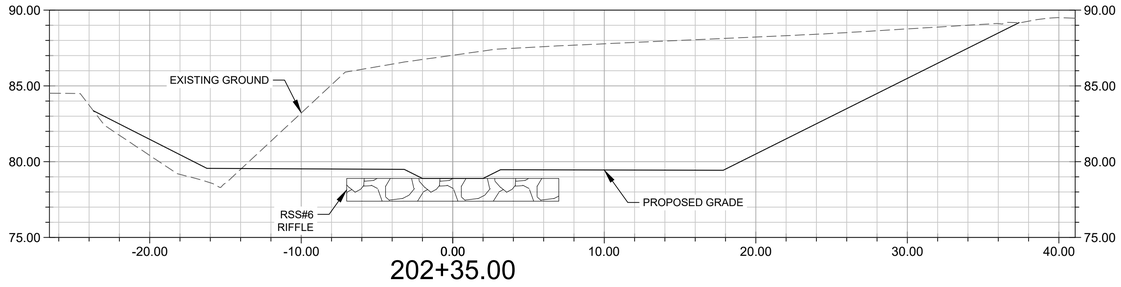


201+90.00



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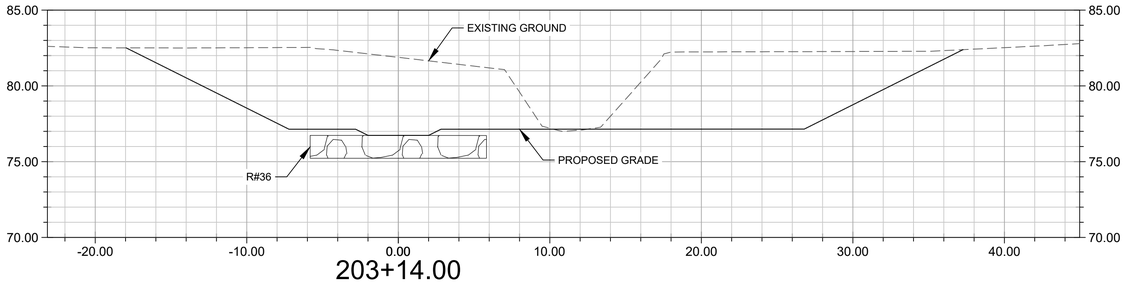
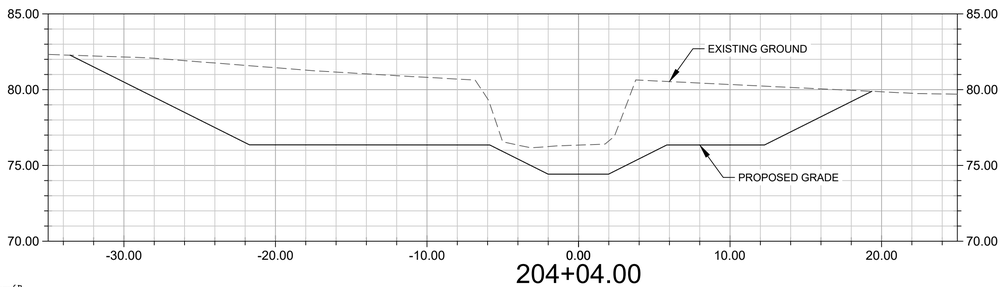
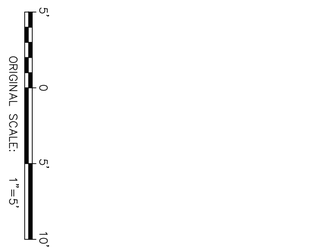


203+14.00



204+04.00



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

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CAD\dgCS-P000_NorthReardon.dwg Dec 21, 2023 7:30am pbeltzer

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.

STATE OF MARYLAND — PATRICK J. BELTZER — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

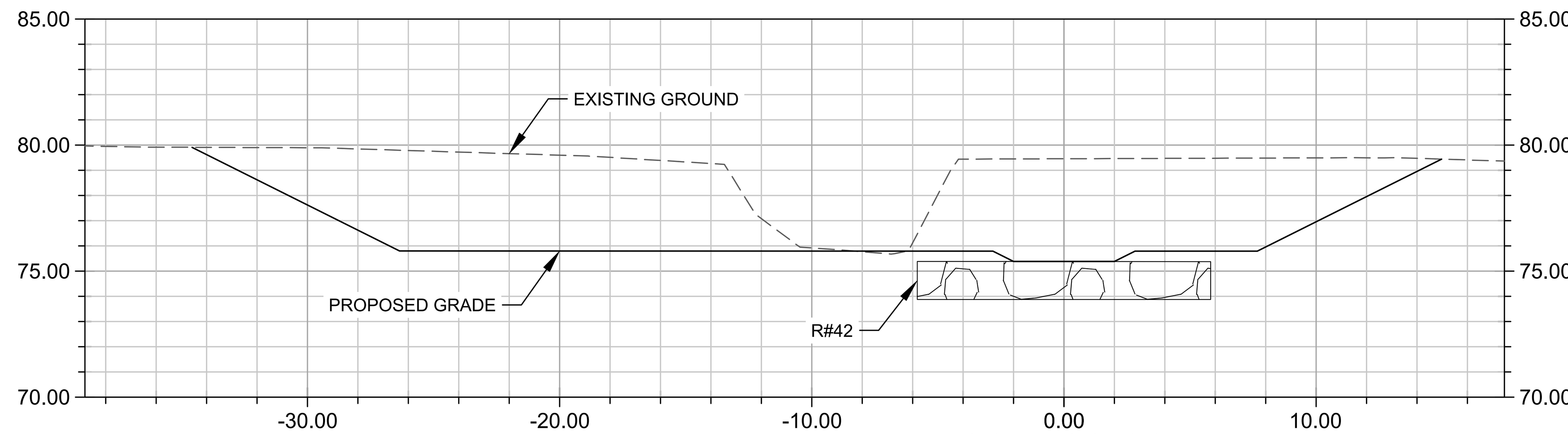
Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-07 of CS-08	Sheet No.	28 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

STREAM SR-9 CROSS-SECTIONS



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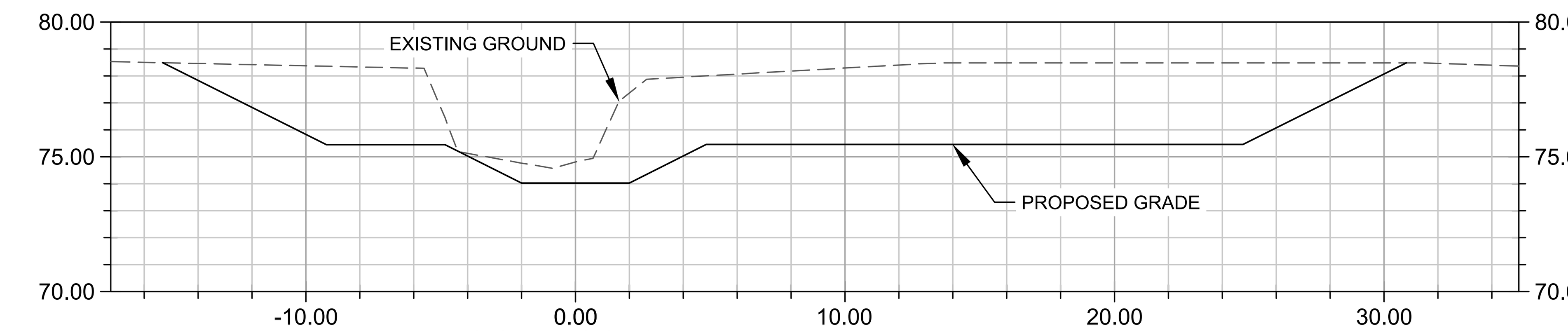
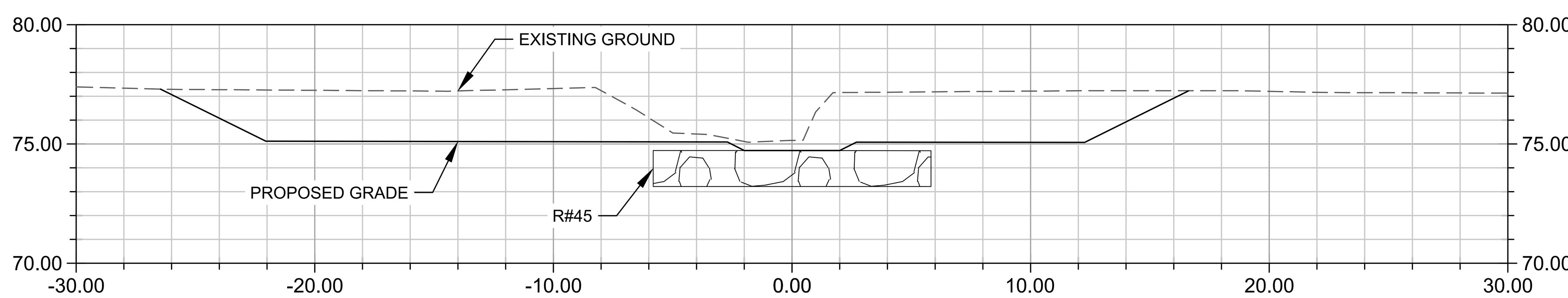


205+10.00



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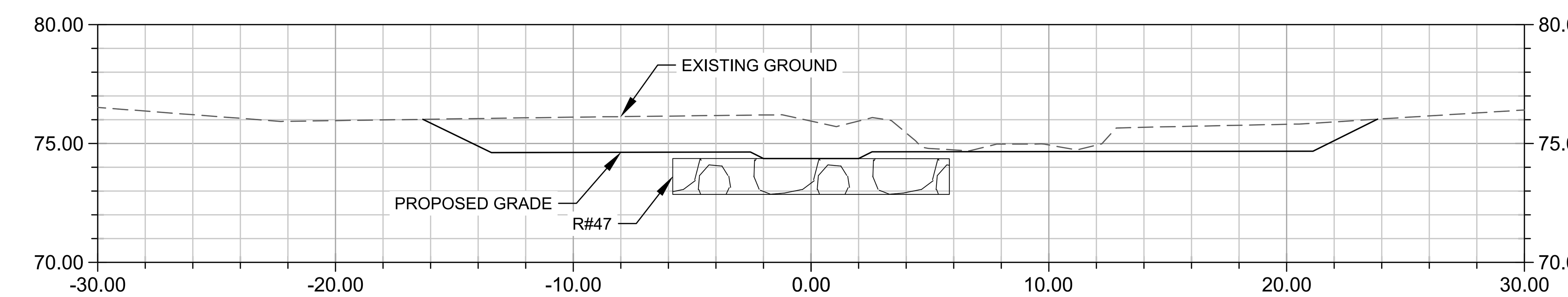

206+00.00

ORIGINAL SCALE: 1"=5'

5' 0 5' 10'

ORIGINAL SCALE: 1"=5'

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BILLING NO. TBD

EG-SWMENG- TBD

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

CROSS-SECTION SHEET

Drawn By :	PJB , JLL	Scale :	AS SHOWN
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	CS-08 of CS-08	Sheet No.	29 of 46

BID No.:

HCG DWG ID No.:

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

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

BILLING NO. TBD

EG–SWMENG– TBD

PROFESSIONAL CERTIFICATION

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ES-01 of ES-06	Sheet No.	30 of 46

BID No.:

HCG DWG ID No.:

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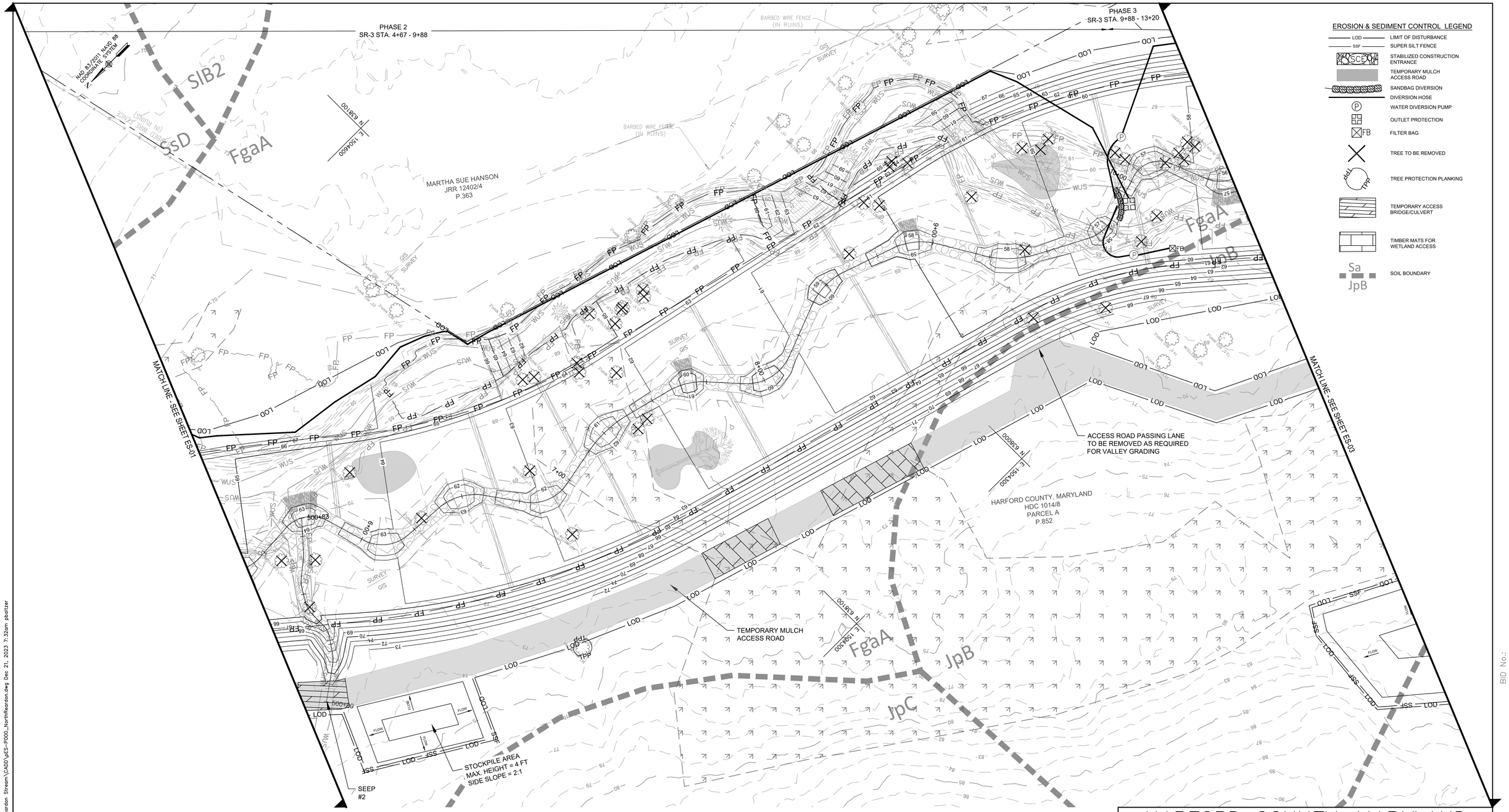

EROSION & SEDIMENT CONTROL LEGEND

- LOD — LIMIT OF DISTURBANCE
- SSF — SUPER SILT FENCE
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY MULCH ACCESS ROAD
- SANDBAG DIVERSION
- DIVERSION HOSE
- P — WATER DIVERSION PUMP
- OUTLET PROTECTION
- FB — FILTER BAG
- TREE TO BE REMOVED
- TPP — TREE PROTECTION PLANKING
- TEMPORARY ACCESS BRIDGE/CULVERT
- TIMBER MATS FOR WETLAND ACCESS
- Sa / JpB — SOIL BOUNDARY

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

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.

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ES-02 of ES-06	Sheet No.	31 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pES-P000_NorthReardon.dwg Dec 21, 2023 7:32am pbaltzer

20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

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

BILLING NO. TBD

EG–SWMENG– TBD

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ES-03 of ES-06	Sheet No.	32 of 46

BID No.:

HCG DWG ID No.:

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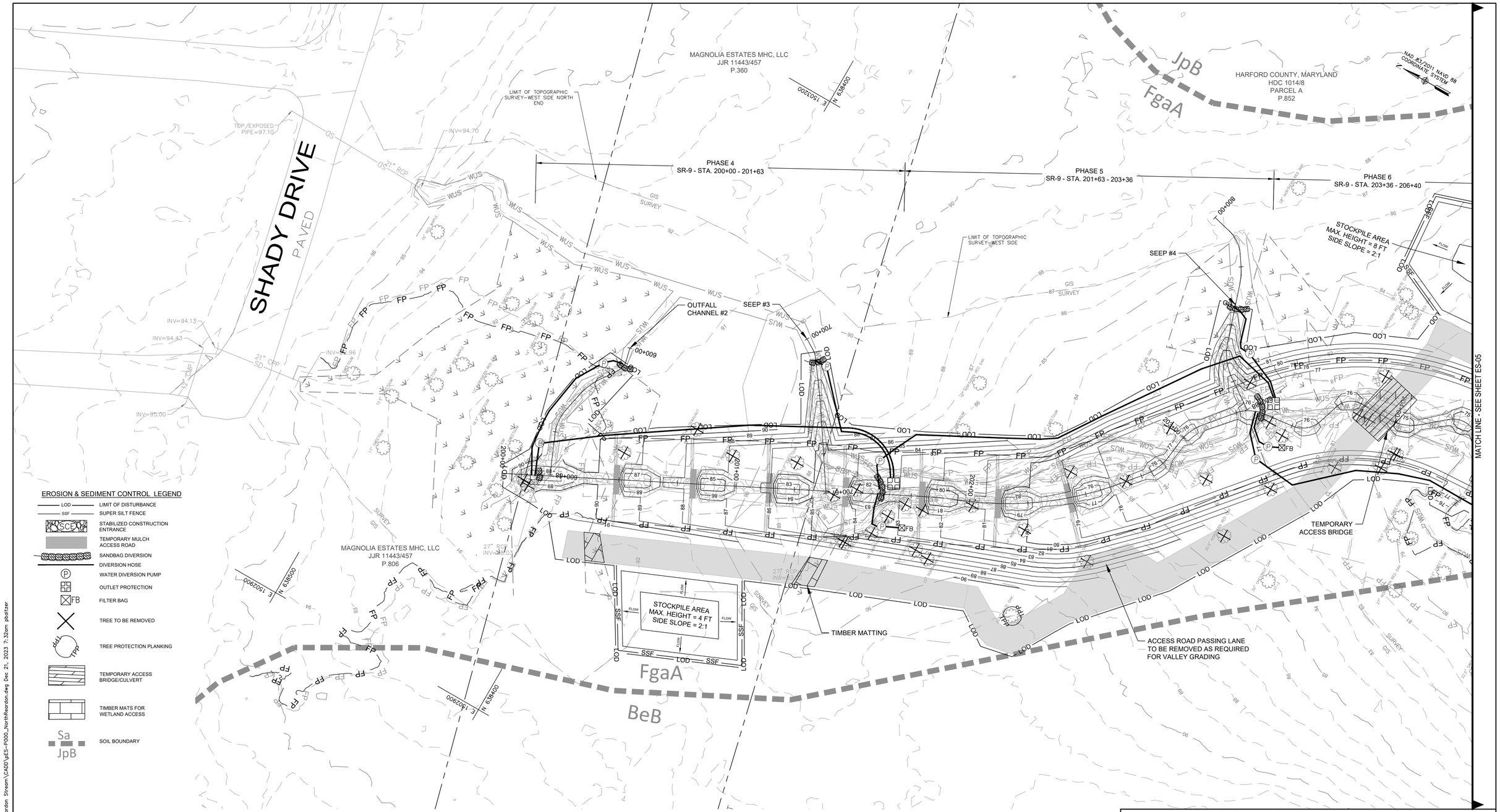

EROSION & SEDIMENT CONTROL LEGEND

- LOD — LIMIT OF DISTURBANCE
- SSF — SUPER SILT FENCE
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY MULCH ACCESS ROAD
- SANDBAG DIVERSION
- DIVERSION HOSE
- P — WATER DIVERSION PUMP
- OUTLET PROTECTION
- FB — FILTER BAG
- TREE TO BE REMOVED
- TPP — TREE PROTECTION PLANKING
- TEMPORARY ACCESS BRIDGE/CULVERT
- TIMBER MATS FOR WETLAND ACCESS
- Sa JpB — SOIL BOUNDARY

20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

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

BILLING NO. TBD

EG-SWMENG- TBD

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ES-04 of ES-06	Sheet No.	33 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1" min

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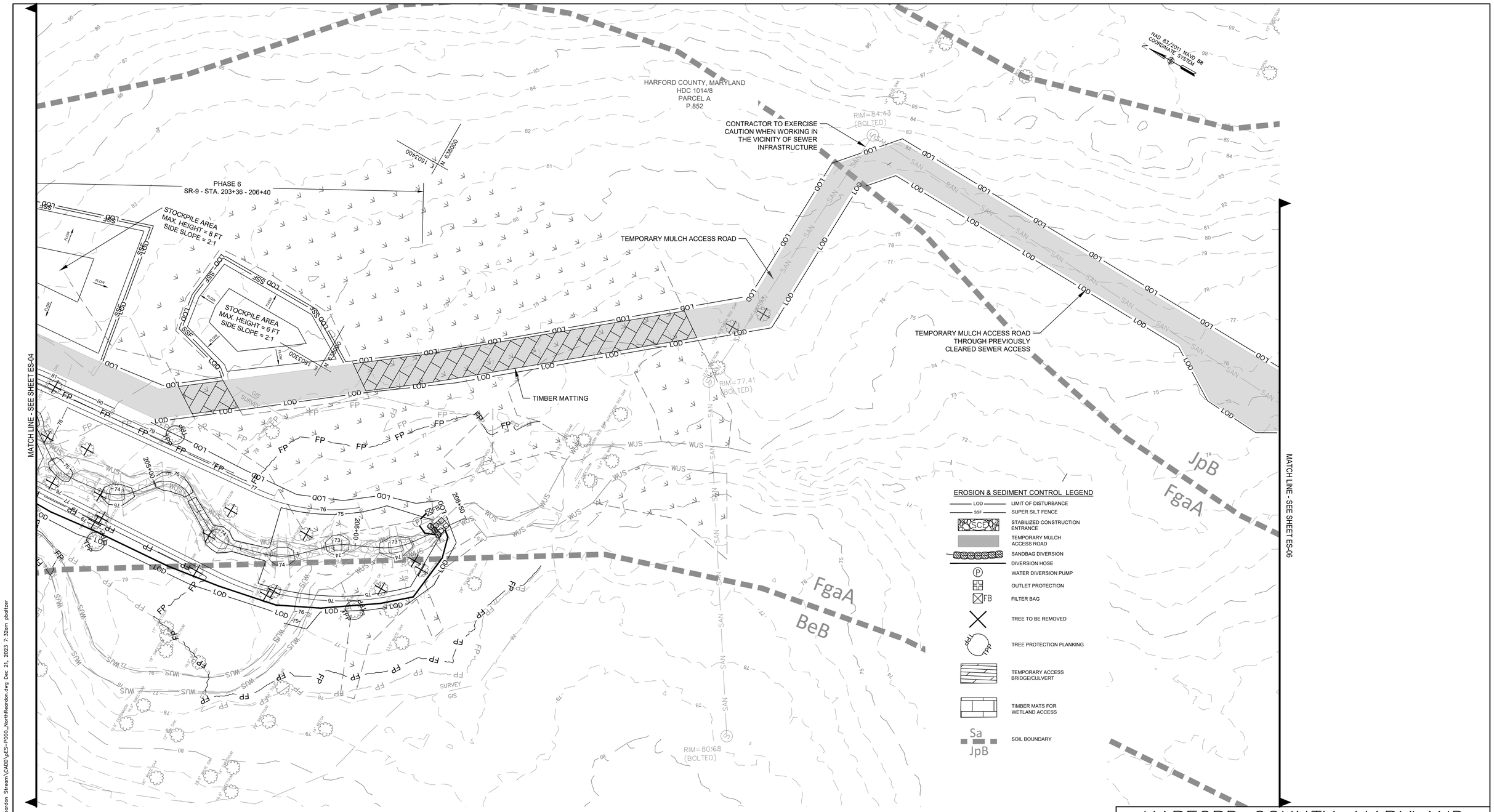

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ES-05 of ES-06	Sheet No.	34 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pES-P000_NorthReardon.dwg Dec 21, 2023 7:32am pbaltzer

MATCH LINE - SEE SHEET ES-05
MATCH LINE - SEE SHEET INSET
PERPETUAL EASEMENT FOR DRAINAGE FACILITY PLAT DFW 5 FOLIO 10
HARFORD COUNTY, MARYLAND
HDC 1014/8
PARCEL A
P.852
NAD 83/2011 NAVD 88 COORDINATE SYSTEM
Sa
JpB
RIM=71.01 (BOLTED)
RIM=77.48 (BOLTED)
TEMPORARY MULCH ACCESS ROAD THROUGH PREVIOUSLY CLEARED SEWER ACCESS
TEMPORARY MULCH ACCESS ROAD ALONG EXISTING MAINTENANCE TRAIL
PROPOSED ACCESS FROM TRIMBLE ROAD
TRIMBLE ROAD
PAVED
SCE
MATCH LINE - SEE THIS SHEET
MATCH LINE - SEE SHEET ES-03
TEMPORARY MULCH ACCESS ROAD ALONG EXISTING MAINTENANCE TRAIL
EROSION & SEDIMENT CONTROL LEGEND
LIMIT OF DISTURBANCE
SUPER SILT FENCE
STABILIZED CONSTRUCTION ENTRANCE
TEMPORARY MULCH ACCESS ROAD
SANDBAG DIVERSION
DIVERSION HOSE
WATER DIVERSION PUMP
OUTLET PROTECTION
FILTER BAG
TREE TO BE REMOVED
TREE PROTECTION PLANKING
TEMPORARY ACCESS BRIDGE/CULVERT
TIMBER MATS FOR WETLAND ACCESS
SOIL BOUNDARY

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

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

T:\2022\Transportation\221073.003A Harford Co – N Reardon Stream\CADD\pES-P000_NorthReardon.dwg Dec 21, 2023 7:32am pbaltzer

BID No.:

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.

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ES-06 of ES-06	Sheet No.	35 of 46

HCG DWG ID No.:

SCALE: 1 inch

HARFORD COUNTY SEDIMENT CONTROL NOTES

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

Revised July 2019

TEMPORARY VEGETATION STABILIZATION NOTES

A) SEEDBED PREPARATION:
Loosen a minimum of three inches along upper soil by discing, raking or other acceptable means.

B) SOIL AMENDMENTS:
Incorporate 436 lbs. per acre of 10-20-20 fertilizer and two (2) tons per acre of lime by discing or other acceptable means.

C) SEEDING: *
FOR PERIODS OF MARCH 1 TO APRIL 30 AND AUGUST 15 TO NOVEMBER 15: Seed with 2.5 bu. per acre of Cereal Rye or 40 lbs. per acre of Annual Ryegrass.

FOR PERIOD OF MAY 1 TO AUGUST 14: Seed with 3 lbs. per acre of Weeping Lovegrass or 30 lbs. per acre of Pearl or Foxtail Millet.

FOR THE PERIOD OF NOVEMBER 16 TO FEBRUARY 28: Protect the site by applying two (2) tons per acre of well anchored straw mulch and seed as soon as possible in the spring.

D) MULCHING SPECIFICATIONS:
Mulch shall be applied to all seeded areas immediately after seeding.

*Apply two (2) tons per acre of straw over all seeded areas. If a mulch anchoring tool is to be used, the rate shall be increased to 2.5 tons per acre.***

Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind and water. The type of mulch anchoring used must comply with the 2011 MARYLAND STANDARD AND SPECIFICATIONS.

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

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

Revised: 9/27/22

PERMANENT VEGETATIVE STABILIZATION NOTES

ALL DISTURBED AREAS, WHICH ARE NOT TO BE PAVED, SHALL BE PERMANENTLY STABILIZED AS FOLLOWS:

A) SEEDBED PREPARATION:
Loosen a minimum of three inches along upper soil by raking, discing, or other acceptable means after spreading four inches of topsoil.

B) SOIL AMENDMENTS:
Incorporate 225 lbs. per acre of 10-20-20 fertilizer and two tons per acre of lime by discing or other acceptable means.

C) SEEDING: *
FOR PERIODS OF MARCH 1 TO MAY 15 AND AUGUST 15 TO OCTOBER 15: Seed with 60 lbs. per acre of Tall Fescue, 40 lbs. per acre of Kentucky Bluegrass, and 20 lbs. per acre of Perennial Ryegrass.

FOR PERIOD OF MAY 16 TO AUGUST 14: Seed with 100 lbs. per acre of Tall Fescue and 3 lbs. per acre of Weeping Lovegrass or 5 lbs. of Pearl or Foxtail Millet.

FOR PERIOD OF OCTOBER 16 TO FEBRUARY 28:
Option 1: Protect the site by applying two (2) tons per acre of well anchored straw mulch and seed as soon as possible in the spring.
*Option 2: Use sod, provided the ground is suitable and thawed; comply with the 2011 **MARYLAND STANDARD AND SPECIFICATION1 addressing "SOD" (pages B.23 & B.24).***

D) MULCHING SPECIFICATIONS:
Mulch shall be applied to all seeded areas immediately after seeding.

Apply two (2) tons per acre of straw over all seeded areas. If a mulch anchoring tool is to be used, the rate shall be increased to 2.5 tons per acre.

*** Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind and water. The type of mulch anchoring used must comply with the 2011 MARYLAND **STANDARD AND SPECIFICATIONS.***

* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE ***2011 MARYLAND STANDARD AND SPECIFICATIONS, B-4-5: "PERMANENT SEEDING",*** *TABLE B-3 (PAGES B.26 TO B.31)*

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

Revised: 9/27/22

SEQUENCE OF CONSTRUCTION

1. 72 HOURS PRIOR TO THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL HAVE ALL LIMIT OF DISTURBANCE (LOD) AND EROSION AND SEDIMENT CONTROL (ESC) DEVICES STAKED OUT IN THE FIELD FOR REVIEW AND APPROVAL BY THE COUNTY. CLEARING LIMITS SHALL BE ROUGH STAKED IN ORDER TO FACILITATE LOCATION FOR TRENCHING AND FENCING INSTALLATION. CONTACT MISS UTILITY AND HARFORD COUNTY TO HAVE ALL UTILITIES MARKED. THIS STREAM HAS BEEN DESIGNATED AS A MARYLAND USE CLASS I AND IS THEREFORE SUBJECT TO STREAM CLOSURE FROM MARCH 1 TO JUNE 15, INCLUSIVE, DURING ANY YEAR. NO IN-STREAM WORK CAN BE PERFORMED DURING THIS PERIOD.
2. PRIOR TO ANY CLEARING, GRADING, OR INSTALLATION OF EROSION SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ON-SITE WITH THE A REPRESENTATIVE FROM HARFORD COUNTY OFFICE OF WATERSHED PROTECTION AND RESTORATION (WPR), DESIGN ENGINEER, AND COUNTY DESIGNATED INSPECTOR.
3. ONLY TREES 12" DBH (DIAMETER AT BREAST HEIGHT) OR GREATER ARE SHOWN ON THE ESC PLANS. CONTRACTOR IS TO CONDUCT A SITE VISIT WITH THE DESIGN ENGINEER AND REPRESENTATIVE FROM WPR TO VERIFY TREES TO BE SAVED AND TREES TO BE REMOVED. IF ANY TREE MARKED TO BE SAVED IS DEAD OR DYING, NOTIFY THE DESIGN ENGINEER PRIOR TO INSTALLATION OF PLANKING.

GENERAL SITE PREPARATION (SR-3)

4. MANUALLY INSTALL HIGH VISIBILITY ORANGE CONSTRUCTION FENCE ALONG THE LIMITS OF DISTURBANCE AND TREE PROTECTION PLANKING (TPP) FOR PHASES 1-3 CONSTRUCTION.
5. CLEAR FOR AND INSTALL THE TEMPORARY MULCH ACCESS ROADS, STABILIZED CONSTRUCTION ENTRANCES, SUPER SILT FENCE, TEMPORARY ACCESS BRIDGE/CULVERTS, AND STOCKPILE AREAS REQUIRED FOR PHASES 1-3 CONSTRUCTION.

PHASE 1

6. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE 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.
7. 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.
8. REMOVE STAGING AND STOCKPILE AREAS ASSOCIATED WITH PHASE 1 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD AS NECESSARY AS CONSTRUCTION PROGRESSES DOWNSTREAM.
9. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 1, PROCEED TO PHASE 2.

PHASE 2

10. 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.
11. 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.
12. REMOVE STAGING AND STOCKPILE AREAS ASSOCIATED WITH PHASE 2 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD AS NECESSARY AS CONSTRUCTION PROGRESSES DOWNSTREAM.
13. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 2, PROCEED TO PHASE 3.

PHASE 3

14. 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.
15. CONSTRUCT THE STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 9+88 TO 13+20, WORKING FROM UPSTREAM TO DOWNSTREAM ON REARDON BRANCH (SR-3).
16. 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.
17. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING.
18. 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.

GENERAL SITE PREPARATION (SR-9)

19. MANUALLY INSTALL HIGH VISIBILITY ORANGE CONSTRUCTION FENCE ALONG THE LIMITS OF DISTURBANCE AND TREE PROTECTION PLANKING (TPP) FOR PHASES 4-6 CONSTRUCTION.
20. CLEAR FOR AND INSTALL THE TEMPORARY MULCH ACCESS ROADS, SUPER SILT FENCE, TEMPORARY ACCESS BRIDGE, AND STOCKPILE AREAS REQUIRED FOR PHASES 4-6 CONSTRUCTION.

PHASE 4

21. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE 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.
22. 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.
23. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 4, PROCEED TO PHASE 5.

PHASE 5

24. INSTALL SANDBAG DIKES AND PUMP AROUND PRACTICE 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.
25. CONSTRUCT THE ROCK STEP STRUCTURES, STREAM CHANNEL, AND ASSOCIATED FLOODPLAIN BETWEEN STATIONS 201+63 TO 203+36, WORKING FROM UPSTREAM TO DOWNSTREAM ALONG THE UNT TO REARDON BRANCH (SR-9). AS CONSTRUCTION PROGRESSES, CONSTRUCT THE SEEP# 4 CHANNEL.
26. 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.
27. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, STABILIZATION MATTING. UPON COMPLETION AND STABILIZATION OF PHASE 5, PROCEED TO PHASE 6.

PHASE 6

28. 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.
29. 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).
30. UPON COMPLETION OF THE STREAM AND FLOODPLAIN CONSTRUCTION, REMOVE MAIN STAGING AND STOCKPILE AREAS ASSOCIATED WITH PHASES 4-6 CONSTRUCTION. REMOVE TEMPORARY MULCH ACCESS ROAD ASSOCIATED WITH PHASE 6 CONSTRUCTION.
31. PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, STABILIZATION MATTING.
32. 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

33. 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.
34. COMPLETE FINAL PERMANENT VEGETATIVE STABILIZATION AND PLANTING OF SITE PER THE LANDSCAPE PLAN.
35. CONDUCT A PUNCH LIST WALK-THROUGH WITH THE COUNTY PROJECT MANAGER, THE DESIGN ENGINEER, AND THE COUNTY INSPECTOR.
36. CORRECT ANY OUTSTANDING ITEMS FOLLOWING THE PUNCH LIST WALK-THROUGH.
37. WITH WRITTEN APPROVAL FROM THE COUNTY INSPECTOR, DESIGN ENGINEER, AND COUNTY PROJECT MANAGER, REMOVE ANY REMAINING SEDIMENT CONTROL DEVICES.

SEQUENCE OF CONSTRUCTION GENERAL NOTES:

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

CLEARING & GRUBBING NOTE:

FOR BID/COST ESTIMATE PREPARATION, THE CONTRACTOR IS TO ASSUME ALL TREES WITHIN THE LIMIT OF DISTURBANCE WILL BE REMOVED AS PART OF CLEARING AND GRUBBING. PRIOR TO CONSTRUCTION, A MEETING SHALL BE HELD ON-SITE WITH THE CONTRACTOR, REPRESENTATIVE OF DOE, AND THE ENGINEER TO DETERMINE TREES TO BE SAVED.

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

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

DEVELOPER'S/LANDOWNER'S CERTIFICATION

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

Signed: ____________________
Print Name: ____________________
Date: ____________________

Site Analysis:	
Total Site Area	249,213 SF / 5.72 AC
Total disturbed Area	249,213 SF / 5.72 AC
Area to be paved	0 SF / 0.0 AC
Area to be stabilized	249,213 SF / 5.72 AC
Cut	21,739 CY
Fill	2,083 CY
Topsoil	5,259 CY

NPDES ID PT. N: 637525.2431 E: 1503795.7598

ENGINEER'S CERTIFICATION

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

Signed:
Print Name: Craig A. Lynch
Date: 12/20/2023
P.E. No.: 28371

B-3 STANDARDS AND SPECIFICATIONS FOR LAND GRADING

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

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

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

Design Criteria

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

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

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

   Protect the face of all graded slopes from surface runoff until they are stabilized.

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

   Protect the face of the slope by special erosion control materials to include, but not be limited to, approved vegetative stabilization practices, riprap or other approved stabilization methods.
5. Serrated slope as shown in Detail B-3-2. The steepest allowable slope for ripable rock is 1.5:1. For non rock surfaces, the slopes are to be 2:1 or flatter. These steps will weather and act to hold moisture, lime, fertilizer and seed thus producing a much quicker and longer lived vegetative cover and better slope stabilization.
6. Subsurface drainage provisions. Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.
7. Proximity to adjacent property. Slopes must not be created close to property lines without adequate protection against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.
8. Quality of fill material. Fill material must be free of brush, rubbish, logs, stumps, building debris, and other objectionable material. Do not place frozen materials in the fill nor place the fill material on a frozen foundation.
9. Stabilization. Stabilize all disturbed areas structurally or vegetatively in compliance with Section B-4 Standards and Specifications for Stabilization Practices.

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

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

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

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

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

Design Criteria

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

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

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.

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL NOTES

Drawn By : PJB , JLL
Designed By : IPT , PJB
Reviewed By : CAL
Scale : N/A
Date : 12 / 23
Drawing No. EN-01 of EN-01
Sheet No. 36 of 46

BID No.:

HCG DWG ID No.:

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):

1. 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.
2. The contractor should notify the Maryland Department of the Environment or WMA 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.
3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
4. 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.
5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA 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.
6. 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.
7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
8. 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).
9. 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.
10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
11. 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.
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2000

GEOTEXTILE

MARYLAND APPLICATION CLASS		TYPE OF GEOTEXTILE	GRAB STRENGTH lb	PUNCTURE STRENGTH LB	PERMITTIVITY sec^{-1}	APPARENT OPENING SIZE, MAX mm	TRAPEZOID TEAR STRENGTH (MD***) lb
			D 4632	D 6241	D 4491	D 4751	D 4533
SD	TYPE I	NONWOVEN	160	310	0.50	0.43	55
		WOVEN, MONOFILAMENT	250	495	0.50	0.43	90
	TYPE II	NONWOVEN	160	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
PE	TYPE I	NONWOVEN	200	430	0.70	0.43	80
		WOVEN, MONOFILAMENT	250	620	0.70	0.43	90
	TYPE II	NONWOVEN	200	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
	TYPE III	NONWOVEN	200	220	0.10	0.22	40
		WOVEN, MONOFILAMENT	250	370	0.10	0.22	70
SE		NONWOVEN	160	310	0.20	0.30	80
		WOVEN	250	495	0.20	0.30	90
ST		WOVEN	300*	600	0.05	0.15**	110
F		WOVEN	200	450	0.05	0.60	75
E		NONWOVEN	200	450	1.10	0.21	80
		WOVEN, MONFILAMENT	370	900	0.28	0.21	100

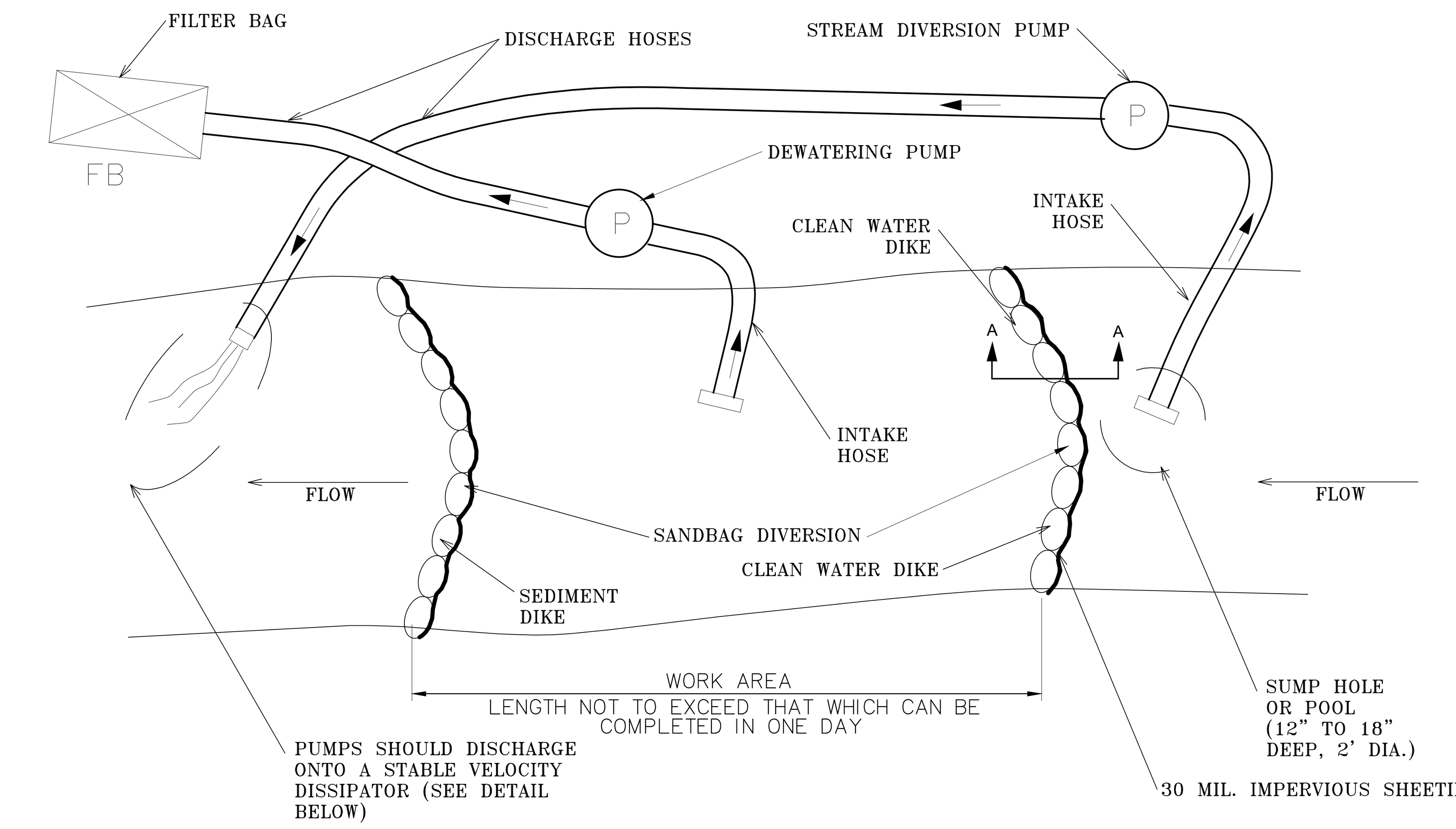
NOTE 1: ALL PROPERTY VALUES IN THE GEOTEXTILE TABLE ARE BASED ON MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPLE DIRECTION EXCEPT FOR APPARENT OPENING SIZE.
NOTE 2: THE ULTRAVIOLET STABILITY SHALL BE 50 PERCENT AFTER 500 HRS OF EXPOSURE FOR ALL CLASSES, EXCEPT CLASS F, WHICH SHALL BE 70 PERCENT (D 4355).

*15% ELONGATION FOR SILT FENCE AND MONOFILAMENT WOVEN GEOTEXTILE IN MACHINE DIRECTION
**THIS IS A MINIMUM APPARENT OPENING SIZE, NOT A MAXIMUM.
***MACHINE DIRECTION

TABLE H.2: STONE SIZE

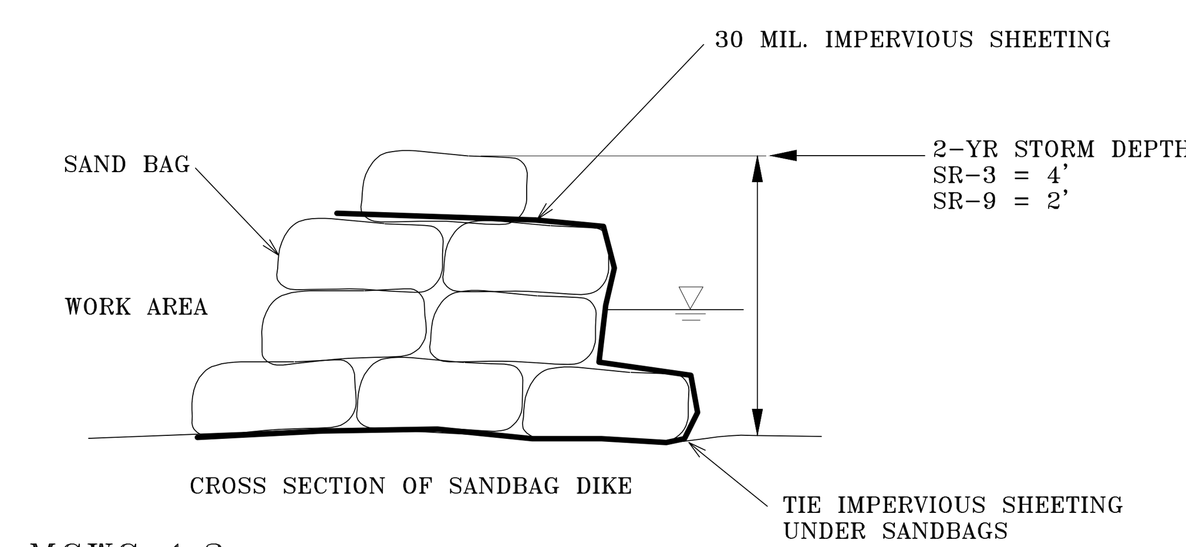
TYPE	SIZE RANGE	d50	d100	AASHTO	MIDSIZE WEIGHT[3]
NUMBER 57[1]	3/8 TO 1 1/2 in	1/2 in	1 1/2 in	M-43	N/A
NUMBER 1	2 to 3 in	2 1/2 in	3 in	M-43	N/A
RIPRAP[2] (CLASS 0)	4 to 7 in	5 1/2 in	7 in	N/A	N/A
CLASS I	N/A	9 1/2 in	15 in	N/A	40 lb
CLASS II	N/A	16 in	24 in	N/A	200 lb
CLASS III	N/A	23 in	34 in	N/A	600 lb

[1]This classification is to be used on the upstream face of stone outlets and check dams.
[2]This classification is to be used for gabions.
[3]Optimum gradation is 50 percent of the stone being above and 50 percent below the midsize.



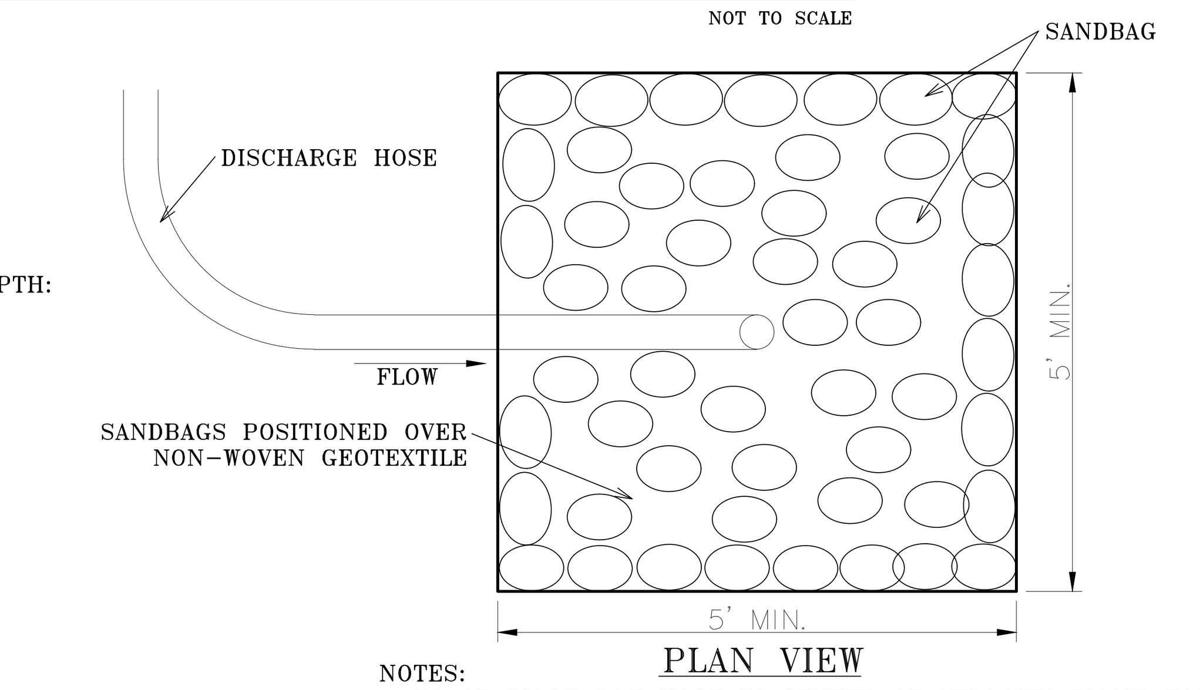
SANDBAG DIVERSION, WITH PUMP AROUND PLAN VIEW

NOT TO SCALE



MGWC 1.2
SANDBAG DIVERSION, WITH PUMP AROUND PRACTICE–SECTION A–A

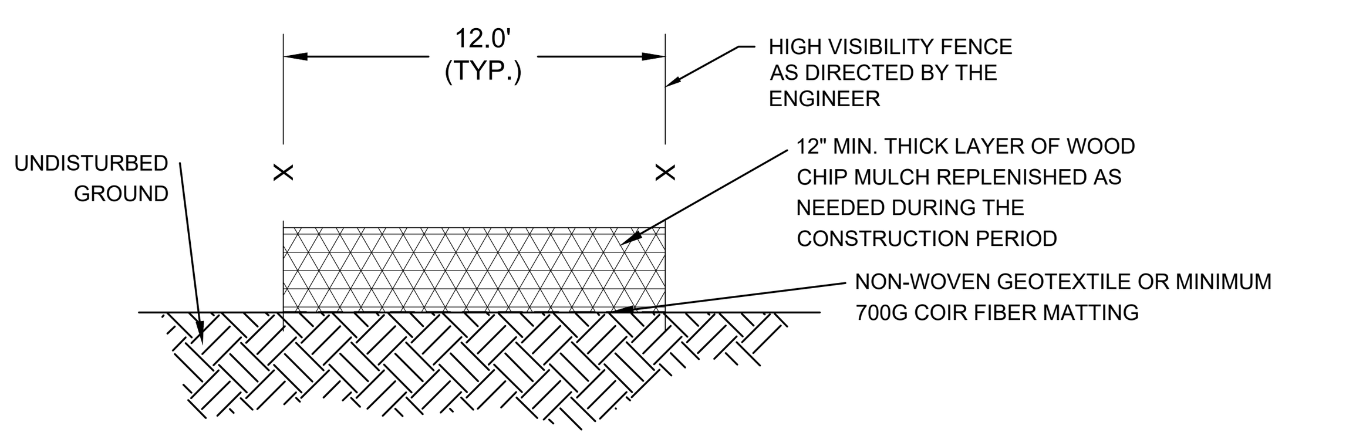
NOT TO SCALE



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

VELOCITY DISSIPATOR

NOT TO SCALE

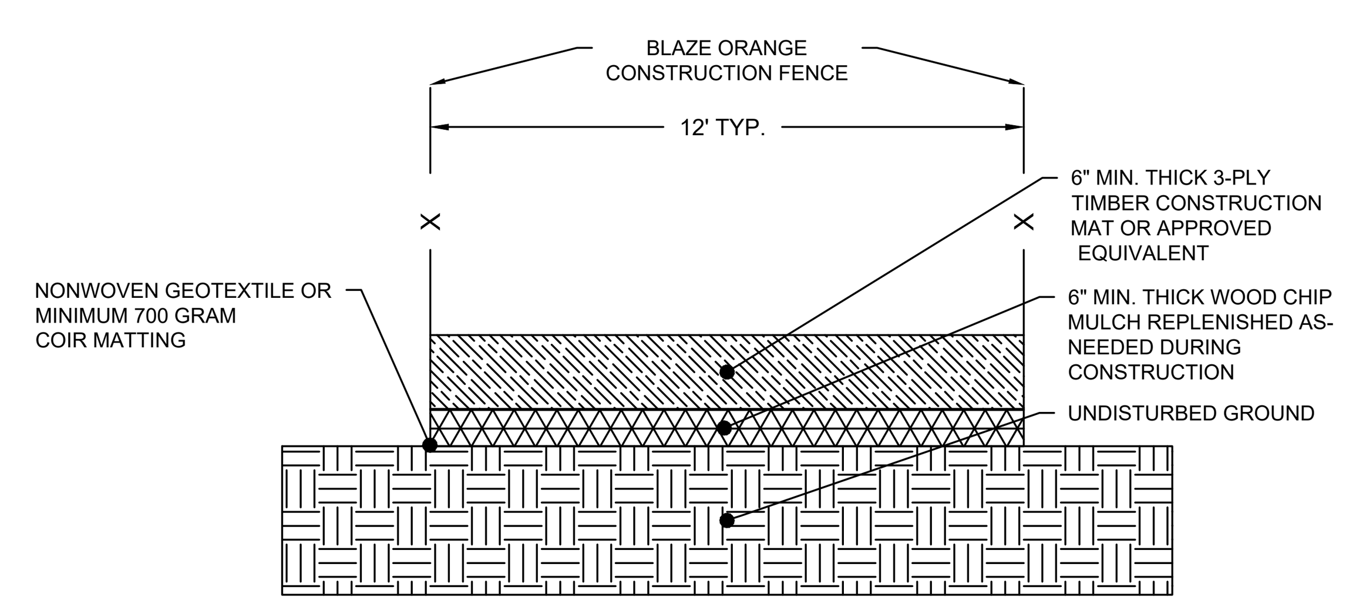


MULCH ACCESS PATH DETAIL

NOT TO SCALE

MULCH ACCESS PATH DETAIL NOTES:

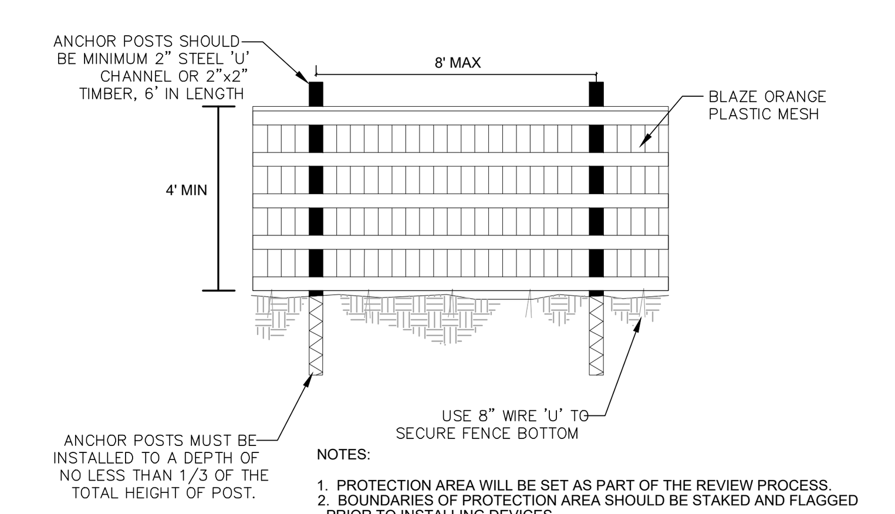
1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. MINOR ADJUSTMENTS TO THE ALIGNMENT THAT MINIMIZES TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR.
2. AS FIELD CONDITIONS WARRANT, ADDITIONAL WOOD CHIP MULCH (EXCEEDING 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.
4. 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 MANOR WHICH ENSURES PROPOSED GRADES ARE MET AND MAINTAINED, WITHOUT DISTURBANCE TO FINAL SEEDING AND PLANTING OF THE SITE.
5. 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.
6. 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.
7. MINIMUM 700-GRAM COIR FIBER MATTING COULD BE USED IN LIEU OF NON-WOVEN GEOTEXTILE.
8. NONWOVEN GEOTEXTILE SHALL BE PLACED WITH THE SEAMS PARALLEL TO THE FLOW OF TRAFFIC. OVERLAP MATTING 18-INCH MINIMUM AT SEAMS.
9. 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.



NOTES:
1. TIMBER MATS TO BE INSTALLED AS NEEDED AS SHOWN ON THE APPROVED PLAN AND OVER CRITICAL ROOT ZONES OF TREES, IN WETLANDS, WETLAND BUFFERS, AND OVER SANITARY PIPES AT THE DIRECTION OF THE ENGINEER.
2. 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.
3. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND INSPECTORS.
4. 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.
5. MATS SHALL BE INSPECTED FREQUENTLY AND MAINTAINED OR REPLACED AS NECESSARY TO ENSURE PROPER FUNCTION.
6. INDIVIDUAL MATS SHALL BE SECURELY CONSTRUCTED WITH INDIVIDUAL COMPONENT LAYERS BOLTED, CABLED OR OTHERWISE SECURELY FASTENED.
7. TIMBER MATS SHALL EITHER BE NEW OR POWER WASHED PRIOR TO ARRIVING ON SITE IF PREVIOUSLY USED.
8. MINIMUM 700-GRAM COIR FIBER MATTING COULD BE USED IN LIEU OF NON-WOVEN GEOTEXTILE.

TEMPORARY TIMBER MATTING AND MULCH ACCESS ROUTE DETAIL

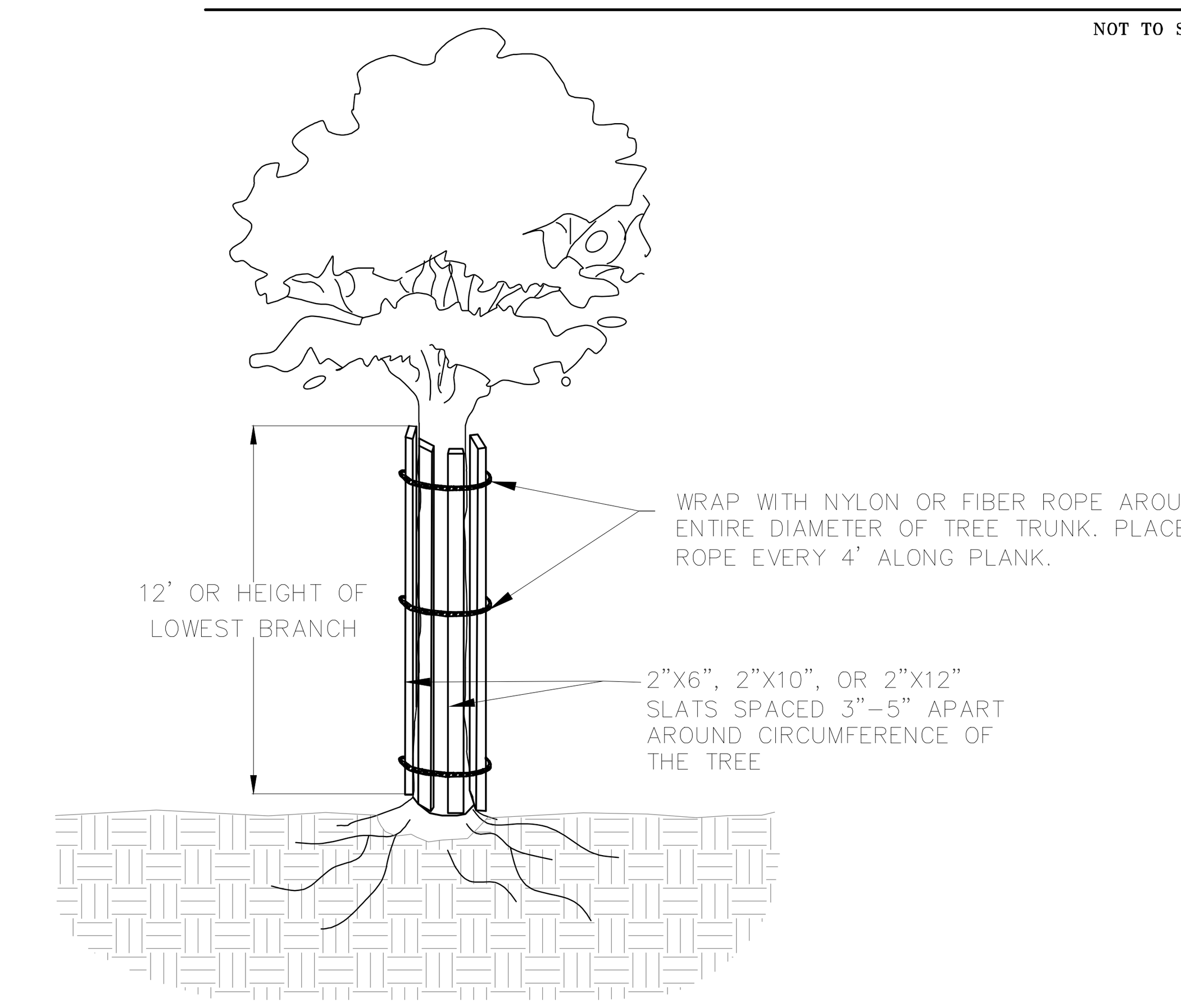
NOT TO SCALE



NOTES:
1. PROTECTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
2. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
3. AVOID DAMAGE TO CRITICAL ROOT ZONES. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING.
4. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

BLAZE ORANGE PLASTIC FENCE

NOT TO SCALE



TREE PROTECTION PLANKING (TPP) DETAIL

Not To Scale

NOTES: 1.) Protective planking shall be erected prior to clearing, grading or construction begins. Protective measures shall remain in place for the duration of construction.
2.) 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

Revisions

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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

#28371 12/21/2023

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ED-01 of ED-02	Sheet No.	37 of 46

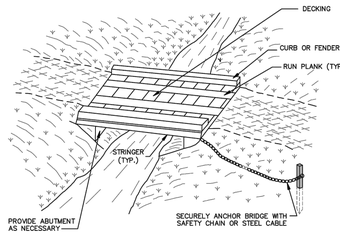
BID No.:

HCG DWG ID No.:

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pEN-P000_NorthReardon.dwg Dec 21, 2023 7:33am pbolizer

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



LOCATION PLAN

NOTE: TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND\OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

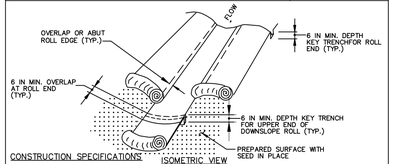
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: TSSMC – 2.0 lb/ft² (MINIMUM)



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

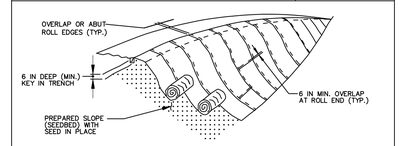
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY–IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: TSSMS – 2.0 lb/ft²



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

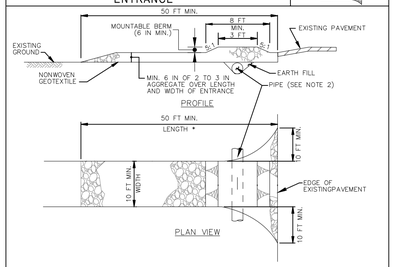
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

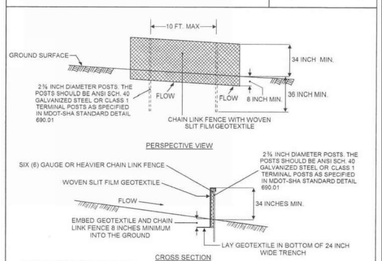
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*50 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND REQUIRED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND,/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

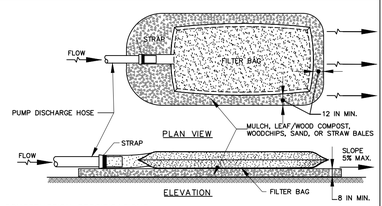
1. INSTALL 2½ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 6 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2¼ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND. LAY THE GEOTEXTILE IN THE BOTTOM OF THE 24 INCH WIDE TRENCH.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BYPASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE UPHILL A MINIMUM OF 3 VERTICAL FEET TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURERS CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H - 1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF THE FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
MODIFIED FOR USE IN BALTIMORE COUNTY

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	MODIFIED - 2012	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-4 FILTER BAG

☒FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D–4632
PUNCTURE	150 LB	ASTM D–4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D–4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D–4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D–4355
APPARENT OPENING SIZE (AOS)	0.15–0.18 MM	ASTM D–4751
SEAM STRENGTH	90%	ASTM D–4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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.

STATE OF MARYLAND — JOHN LOYD — 28371 — PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

EROSION AND SEDIMENT CONTROL DETAILS

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	ED-02 of ED-02	Sheet No.	38 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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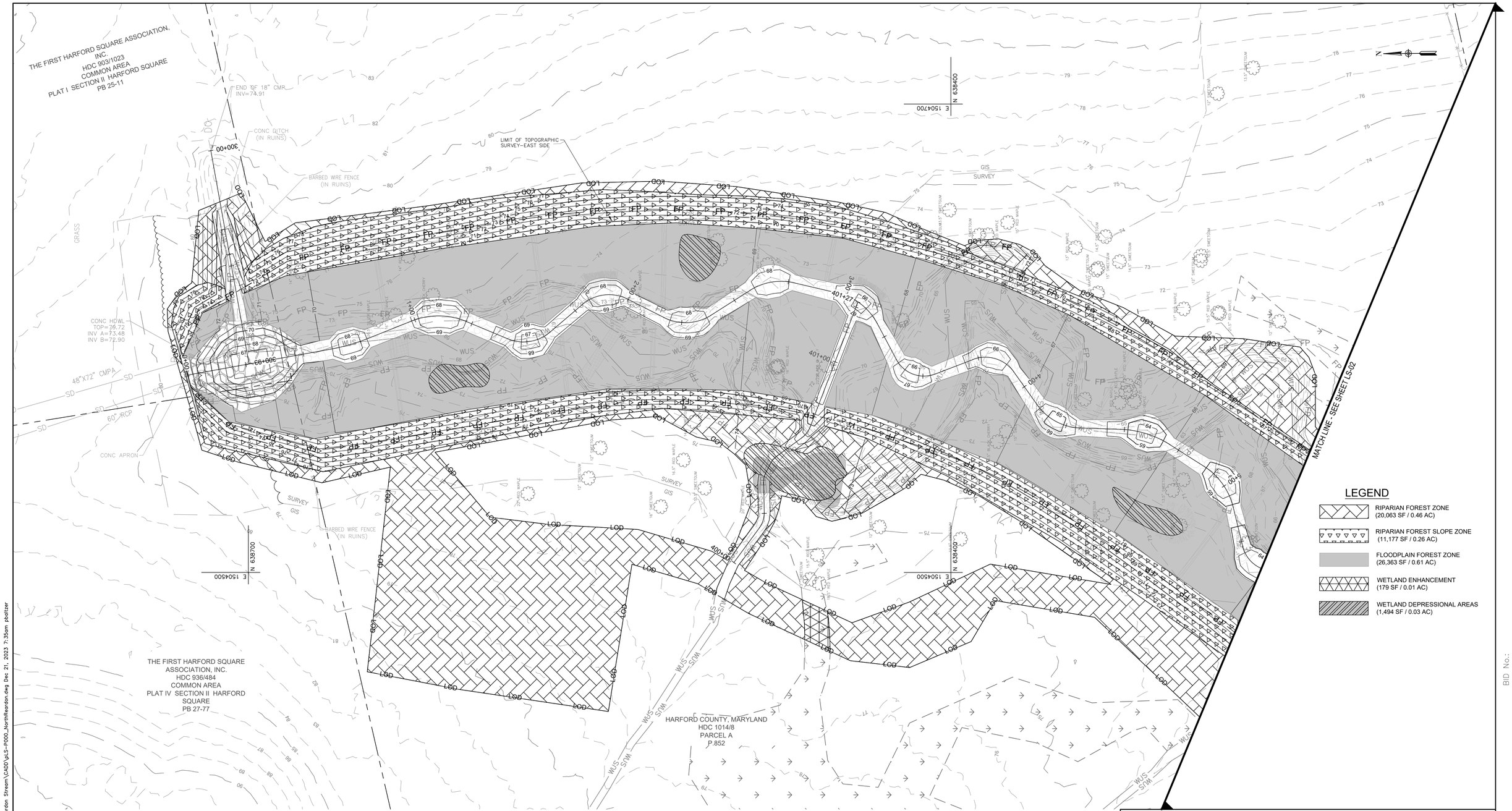

20' 0 20' 40'
ORIGINAL SCALE: 1"=20'

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pLS-P000_NorthReardon.dwg Dec 21, 2023 7:35am pbaltzer

BID No.:

HCG DWG ID No.:

SCALE: 1" inch

Revisions

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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STATE OF MARYLAND
#28371 12/21/2023

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

LANDSCAPE PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LS-01 of LS-06	Sheet No.	39 of 46

20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

T:\2022\Transportation\221073.003A Harford Co – N Reardon Stream\CADD\pLS-P000_NorthReardon.dwg Dec 21, 2023 7:35am pbaltzer

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

LANDSCAPE PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LS-02 of LS-06	Sheet No.	40 of 46

BID No.:

HCG DWG ID No.:

MATCH LINE - SEE SHEET LS-06

20' 0 20' 40'

ORIGINAL SCALE: 1"=20'

BILLING NO. TBD

EG–SWMENG– TBD

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#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

LANDSCAPE PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LS-03 of LS-06	Sheet No.	41 of 46

BID No.:

HCG DWG ID No.:

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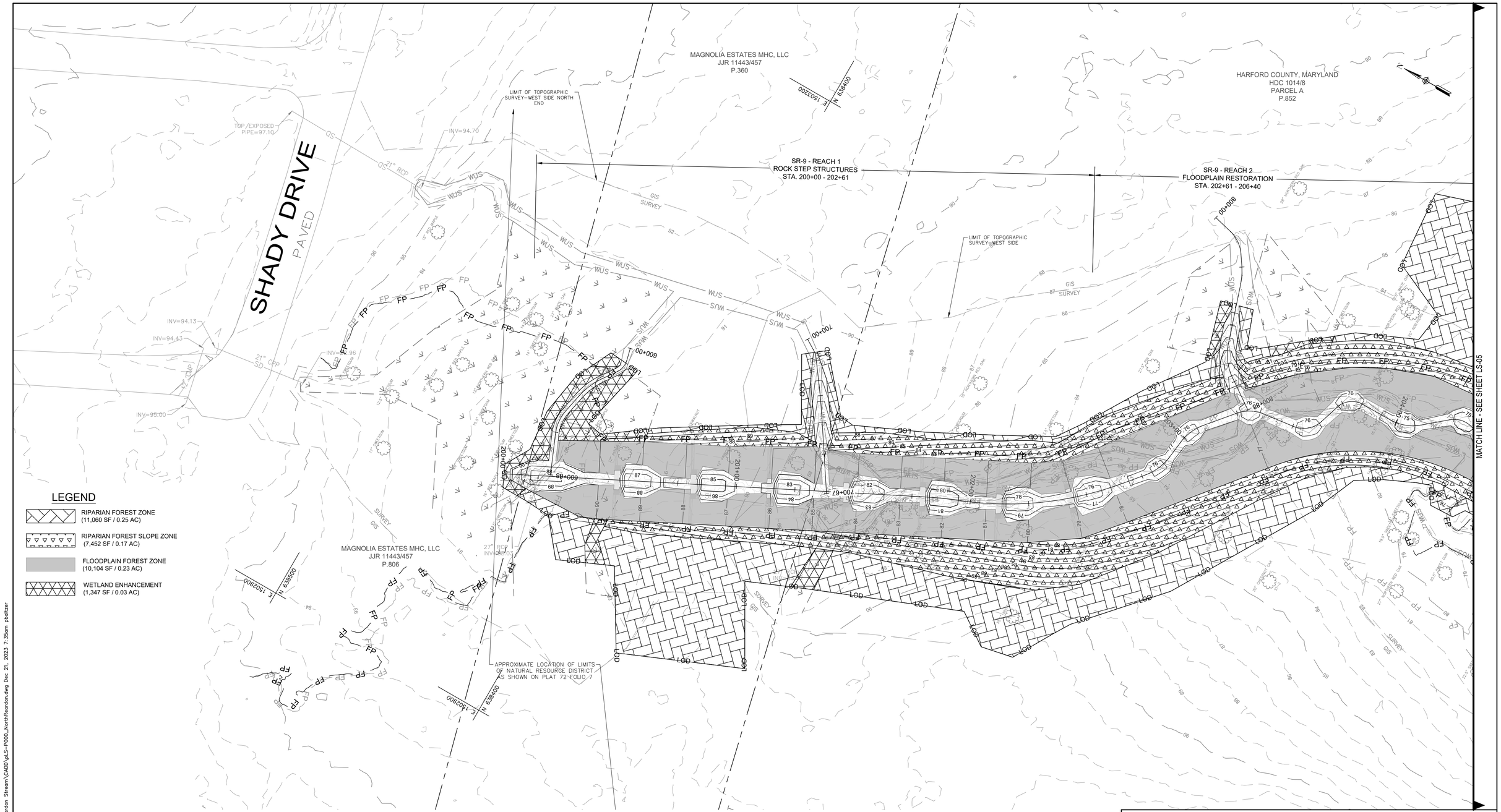

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BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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STATE OF MARYLAND
PHILIP J. BELTZER
28371
PROFESSIONAL ENGINEER

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

LANDSCAPE PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LS-04 of LS-06	Sheet No.	42 of 46

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.

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

LANDSCAPE PLAN

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LS-05 of LS-06	Sheet No.	43 of 46

BID No.:

HCG DWG ID No.:

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HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

LANDSCAPE PLAN

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

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#28371 12/21/2023

Revisions

Drawn By :	PJB , JLL	Scale :	1" = 20'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LS-06 of LS-06	Sheet No.	44 of 46

BID No.:

HCG DWG ID No.:

LANDSCAPING NOTES:

GENERAL NOTES -

1. NURSERY GROWN PLANT MATERIAL SHOULD MEET OR EXCEED THE REQUIREMENTS OF THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION'S' (A.N.L.A.) LATEST EDITION OF "AMERICAN STANDARD NURSERY STOCK" (ANSI Z60.1) SPECIFICATIONS, PARTICULARLY REGARDING THE SIZE, GROWTH, SIZE OF THE ROOT BALL, AND DENSITY OF BRANCH STRUCTURE.

2. 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.

3. 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.

4. 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' (A.N.L.A.) LATEST EDITION OF "AMERICAN STANDARD NURSERY STOCK" (ANSI Z60.1) SPECIFICATIONS, PARTICULARLY REGARDING THE SIZE, GROWTH, SIZE OF THE ROOT BALL, AND DENSITY OF BRANCH STRUCTURE.

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 HEELED-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 COMPACTED 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 AN MDLTE/ISA 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 PREPARER OR AN MDLTE/ISA 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 SURVIVABILITY ALONG STEEP SLOPES THE FOLLOWING MEASURES WILL BE TAKEN:
- THE ROOT COLLAR SHALL BE PLACED SLIGHTLY ABOVE GRADE TO PREVENT ROOTS FROM CIRCLING.
- EARTHGROW OR A SIMILAR COMPOST SHALL BE USED WITHIN PLANTING PITS TO ENHANCE ORGANIC MATTER CONTENT WITHIN THE PLANTING PIT. PREPARE PLANTING PITS PER DETAILS AS SHOWN 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 ECESS SOIL SHALL BE PLACED DOWNSLOPE OF THE PLANTING PIT TO EXTEND THE SHELF TO ENSURE DOWNSLOPE ROOTS WILL REMAIN BURIED. A SMALL BERM SHOULD BE FORMED AT THE DOWNSLOPE PORTION OF THIS NEWLY FORMED TERRACE TO RETAIN WATER FOR THE PLAN AND TO PREVENT EROSION.
- 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 SURVIVABILITY. WATERING PLANTING PITS AND SEEDED 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:

a. ANY PLANT MATERIAL SHOWING SIGNS OF DISTRESS ARE TO BE REPLACED IMMEDIATELY BY THE CONTRACTOR.

b. 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.

c. ALL MAN-MADE MATERIALS SHALL BE REMOVED FROM THE SITE WHICH WOULD IMPACT THE ESTABLISHMENT OF THE PLANTED MATERIALS.

d. THOROUGHLY WATER PLANTED MATERIAL ONCE WEEKLY OR AS NEEDED DURING THE GROWING SEASON.

e. 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.

f. 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	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 fasciculata	Partridge pea	3.00%	1.20	2.08
Rudbeckia hirta	Blackeyed Susan	3.00%	1.20	2.08
Helianthus angustifolius	Narrowlead 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
Helenium autumnale	Common sneezeweed	0.80%	0.32	0.55
Solidago rugosa	Wrinkleleaf goldenrod	0.80%	0.32	0.55
			Totol:	**69.20**

**Ernst Seed MD Coastal Plain Riparian Mix (ERNMX-732) or similar*

Total Application Rate of 40 lbs/AC

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, New England 2 E	Indiangrass, New Englan	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	Deertongue	3.00%	1.80	3.11
Echinacea purpurea	Purple coneflower	1.50%	0.90	1.56
Chamaecrista fasciculata	Partridge pea	1.30%	0.78	1.35
Heliopsis helianthoides	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
			Totol:	**103.80**

**Ernst Seed Native Steep Slope Mix (ERNMX-181) or similar*

Total Application Rate of 60 lbs/AC

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	Deertongue	10.00%	4.00	7.28
Carex lurida	Shallow sedge	10.00%	4.00	7.28
Carex vulpinaidea	Fox sedge	10.00%	4.00	7.28
Carex scoparia	Blunt broom 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
Eupatorium perfoliatum	Common boneset	2.00%	0.80	1.46
Vernania noveboracensis	New York ironweed	2.00%	0.80	1.46
Heliopsis helianthoides	Oxeye sunflower	2.00%	0.80	1.46
			Totol:	**72.80**

**Ernst Seed Floodplain Riparian Mix (ERNMX-154) or similar*

Total Application Rate of 40 lbs/AC

Wetland Enhancement Seed Mix* (9,319 SF / 0.21 AC)

Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)
Carex lurida	Lurid sedge	22.20%	4.44	0.93
Carex vulpinoidea	Fox sedge	20.00%	4.00	0.84
Elymus virginicus	Virginia wildrye	20.00%	4.00	0.84
Panicum clandestinum	Deertongue	13.80%	2.76	0.58
Carex scoparia	Blunt broom sedge	13.60%	2.72	0.57
Juncus effusus	Soft rush	3.00%	0.60	0.13
Leersia oryzoides	Rice cutgrass	2.00%	0.40	0.08
Carex crinita	Fringed sedge	1.00%	0.20	0.04
Carex intumescens	Star sedge	1.00%	0.20	0.04
Carex stipata	Awl sedge	1.00%	0.20	0.04
Glyceria striata	Fowl mannagrass	1.00%	0.20	0.04
Juncus tenuis	Path rush	0.50%	0.10	0.02
Carex stricta	Tussock sedge	0.30%	0.06	0.01
Scirpus atrovirens	Green bulrush	0.30%	0.06	0.01
Scirpus cyperinus	Woolgrass	0.30%	0.06	0.01
			Total:	**4.20**

**Ernst Seed OBL-FACW Perennial Food & Cover Wetland Mix (ERNMX-120) or similar*

Total Application Rate of 20 lbs/AC

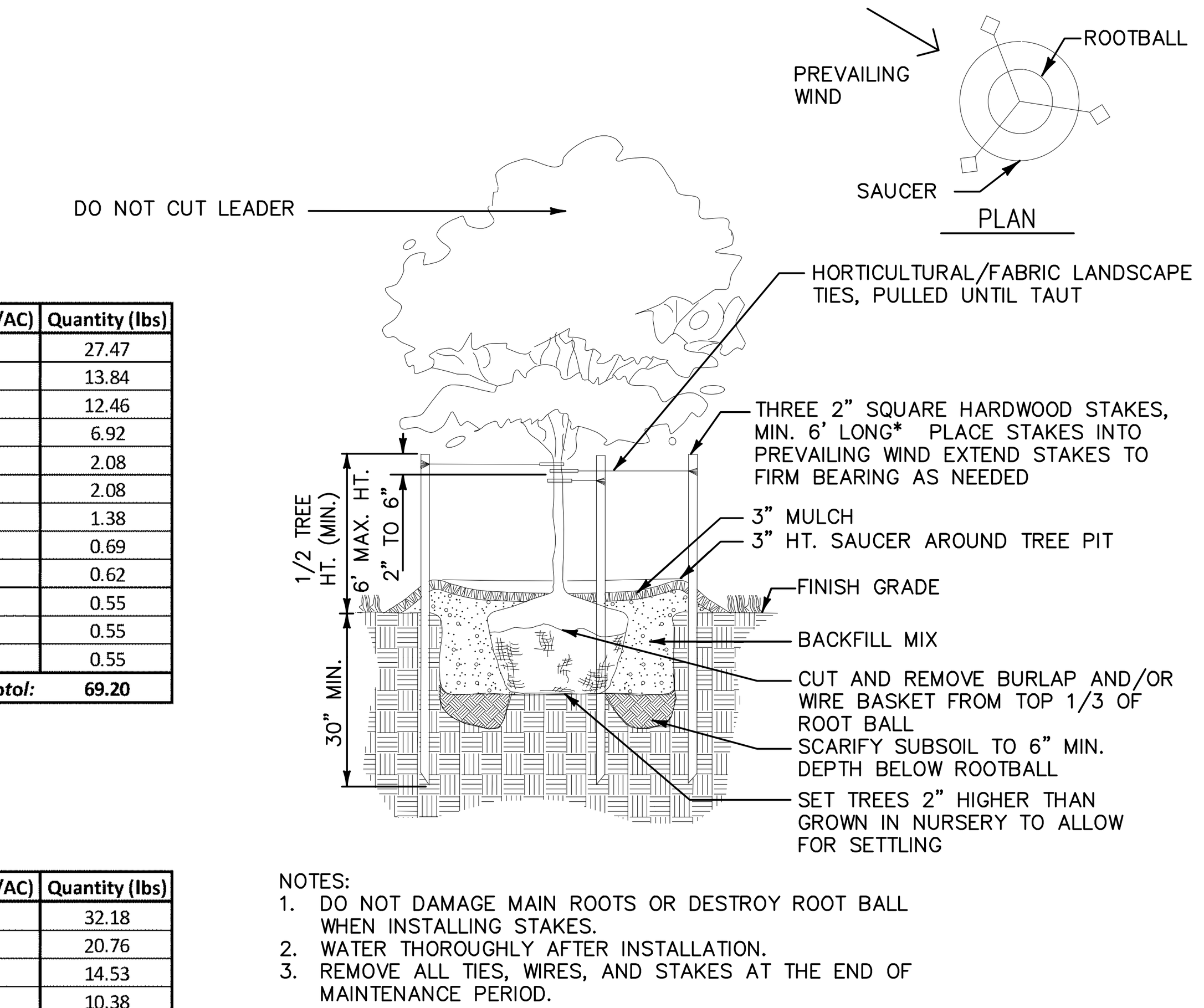
Turfgrass Seed Mix (18,534 SF / 0.43 AC)

Seed Mix	**Quantity (lbs)**
SHA Turfgrass Seed Mix 920.06.07 (a)	42.0

Total Application Rate of 200 lbs/AC or 4.6 lbs per 1,000 SF

Seeding Notes:

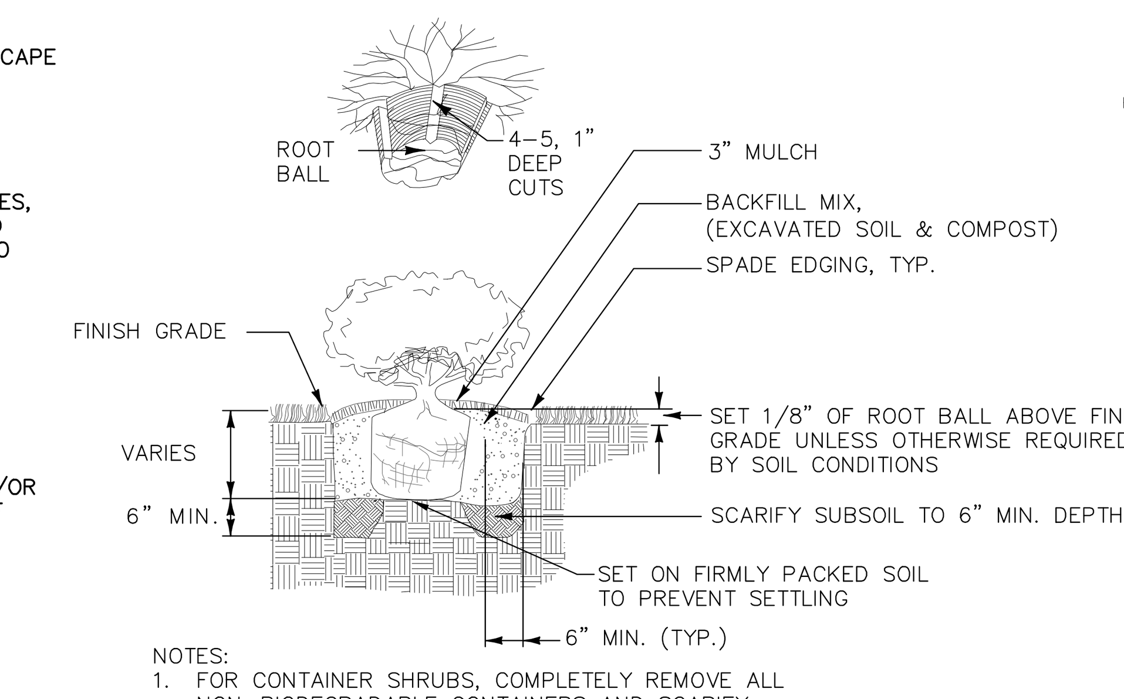
1. Riparian and Floodplain seed mixes to be applied with 50lbs/ac of perennial ryegrass *(Lolium perenne)* and 60lbs/ac of hard fescue *(Festuco trochyphyllo)* during the periods of March 1 to May 15 and August 1 to October 15 or foxtail millet *(Setorio italico)* if during May 16 to July 31.



NOTES:
1. DO NOT DAMAGE MAIN ROOTS OR DESTROY ROOT BALL WHEN INSTALLING STAKES.
2. WATER THOROUGHLY AFTER INSTALLATION.
3. REMOVE ALL TIES, WIRES, AND STAKES AT THE END OF MAINTENANCE PERIOD.

DECIDUOUS TREE STAKING DETAIL

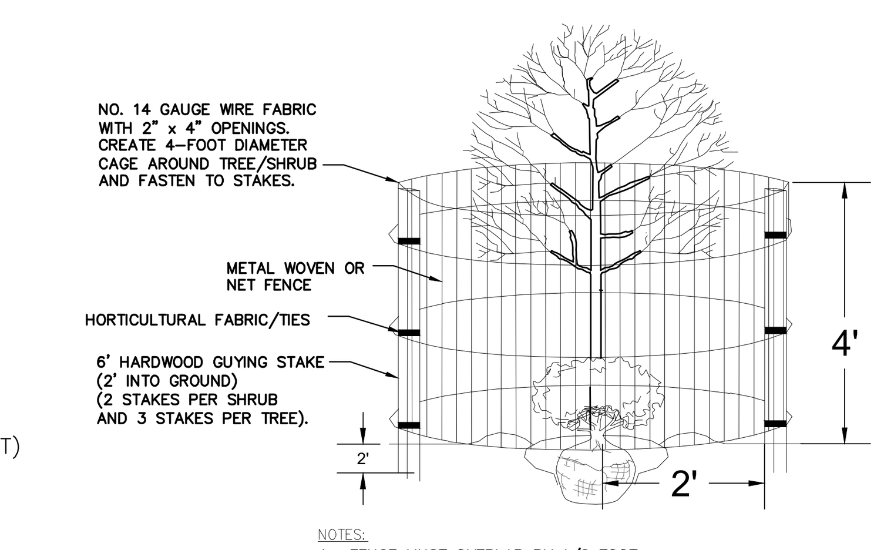
Not To Scale



NOTES:
1. FOR CONTAINER SHRUBS, COMPLETELY REMOVE ALL NON–BIODEGRADABLE CONTAINERS AND SCARIFY ROOTBALL BY USING A SHARP BLADE AND MAKING 4 TO 5 ONE INCH CUTS THE LENGTH OF THE ROOTBALL.
2. FOR B&B SHRUBS, CUT AND REMOVE BURLAP FROM TOP 1/3 OF ROOTBALL.

SHRUB PLANTING

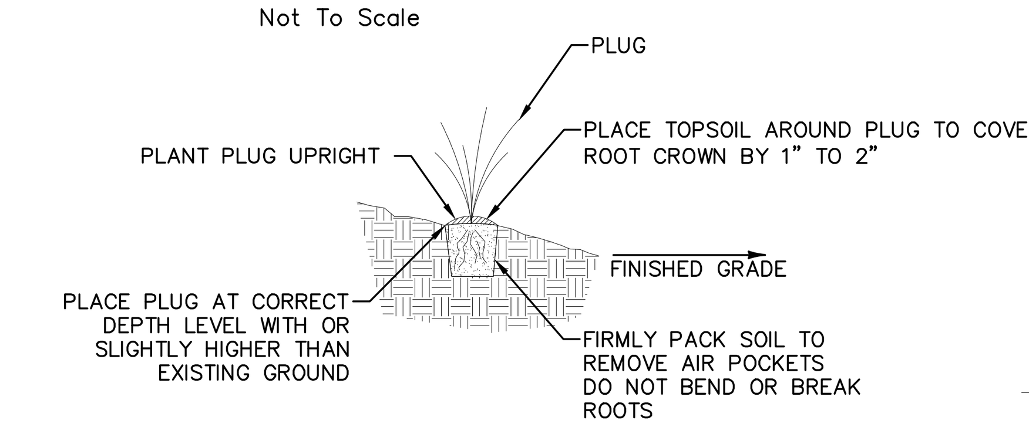
Not To Scale

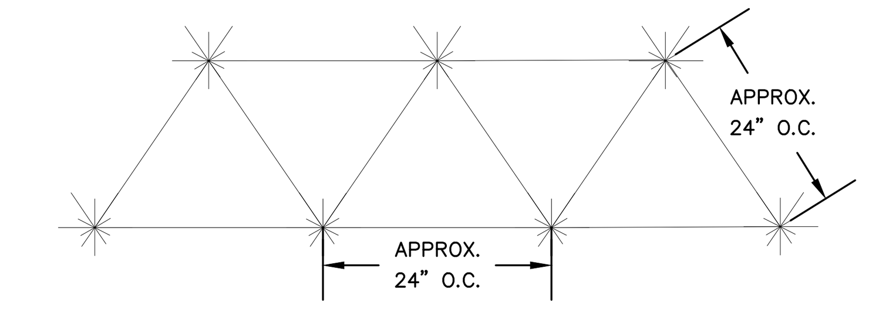


NOTES:
1. FENCE MUST OVERLAP BY 1/2 FOOT.
2. ENSURE BOTTOM OF CAGE IS FLUSH WITH THE GROUND TO PREVENT UPLIFT BY DEER.
3. HEIGHT OF SHELTER SHALL BE 4' UNLESS HEIGHT AND PROTECTION WIDTH INTERFERE WITH PLANT STRUCTURE AND GROWTH. MODIFICATIONS SHALL BE MADE AT THE DISCRETION OF THE CONTRACTOR TO AVOID PLANT DAMAGE.
4. DEER PROTECTION CAGES TO BE INSTALLED AROUND ALL PLANTED DECIDUOUS TREES AND SHRUBS.
5. CAGE SHALL BE FASTENED TO STAKE WITH TWO (MIN.) 11–INCH RELEASABLE CABLE TIES ONE AT TOP AND ONE 6" (MIN.) ABOVE THE GROUND.
6. DO NOT DAMAGE TREE DURING INSTALLATION.
7. CAGES TO BE REMOVED AT DIRECTION OF THE OWNER AND/OR LANDSCAPE ARCHITECT AT THE END OF THE MAINTENANCE PERIOD OR UPON OWNER APPROVAL.
8. CAGE STAKES MAY BE USED FOR COMBINED CAGE AND TREE STAKING PURPOSES.

WOODY MATERIAL PROTECTION CAGE

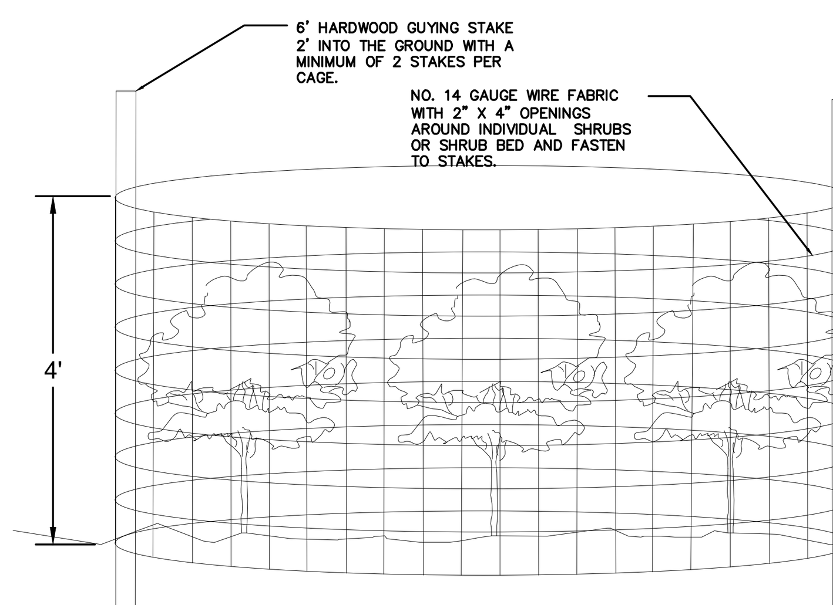
Not To Scale





2" PERENNIAL PLUG DETAIL

Not To Scale



NOTES:
1. THIS DETAIL IS TO BE USED FOR INDIVIDUAL SHRUBS AND SHRUB BEDS. .
2. HEIGHT OF CAGE SHALL BE 4 FEET MINIMUM WITH A MAXIMUM DIAMETER OF 10 FEET.
3. CAGE SHALL BE FASTENED TO STAKE WITH 3 (MIN.) TWIST TIE EVENLY SPACED WITH A 6" (MIN.) ABOVE THE GROUND.
4. CAGE SHALL SURROUND ALL SHRUBS WITH A 1 FOOT SPACING FROM THE OUTSIDE OF THE PLANT.
5. STAKES SHALL BE PLACED AT A MAXIMUM 5 FOOT SPACING.
6. CAGES TO BE REMOVED AT DIRECTION OF THE CLIENT/PROPERTY OWNER.
7. HARDWOOD MULCH SHALL BE PLACED TO 2–3 INCH DEPTH WITHIN FENCING.
8. CAGES TO BE USED ON SHRUB CLUSTERS WITHIN THE RIPARIAN FOREST ZONE ONLY TO AVOID DEBRIS ACCUMULATION WITHIN THE FLOODPLAIN.
9. REMOVE ALL TIES, WIRES, AND STAKES AT THE END OF MAINTENANCE PERIOD.

DEER PROTECTION

Not To Scale

Riparian Forest Plantings (118,193 SF / 2.71 AC)

Species	Common Name	Layer	Size	Type	Spacing	Quantity
Acer rubrum	Red maple	Canopy tree	6'-8' Height	#7 Container	20' O.C.	60
Celtis occidentolis	Hackberry	Canopy tree	6'-8' Height	#7 Container	20' O.C.	60
Quercus palustris	Pin oak	Canopy tree	6'-8' Height	#7 Container	20' O.C.	60
Liriodendron tulipifera	Tuliptree	Canopy tree	6'-8' Height	#7 Container	20' O.C.	60
Nyssa sylvatica	Blackgum	Canopy tree	6'-8' Height	#7 Container	20' O.C.	60
					Tatal:	**300**
Carpinus caroliniana	American hornbeam	Understory tree	S' Height	#5 Container	12'-14' O.C.	70
Magnolia virginiano	Sweetbay magnolia	Understory tree	4' Height	#7 Container	12'-14' O.C.	70
Juniperus virginiana	Eastern red cedar	Understory tree	4' Height	#7 Container	12'-14' O.C.	70
					Total:	**210**
Ilex verticillato	Common winterberry	Shrub	2'-3' Height	#5 Container	6'-8' O.C.	121
Cornus omomum	Silky dogwood	Shrub	2'-3' Height	#5 Container	6'-8' O.C.	121
Viburnum dentatum	Southern arrowwood	Shrub	2'-3' Height	#5 Container	6'-8' O.C.	121
Lindero benzoin	Spicebush	Shrub	2'-3' Height	#5 Container	6'-8' O.C.	121
					Tatal:	**482**

Nate: *Assume 100% canopy, 20% understory, and 20% understory coverage.*
Shrubs to be plonted in clusters of 5-7 per species.
Concentrate Juniperus virginiana in areas of steep slopes.

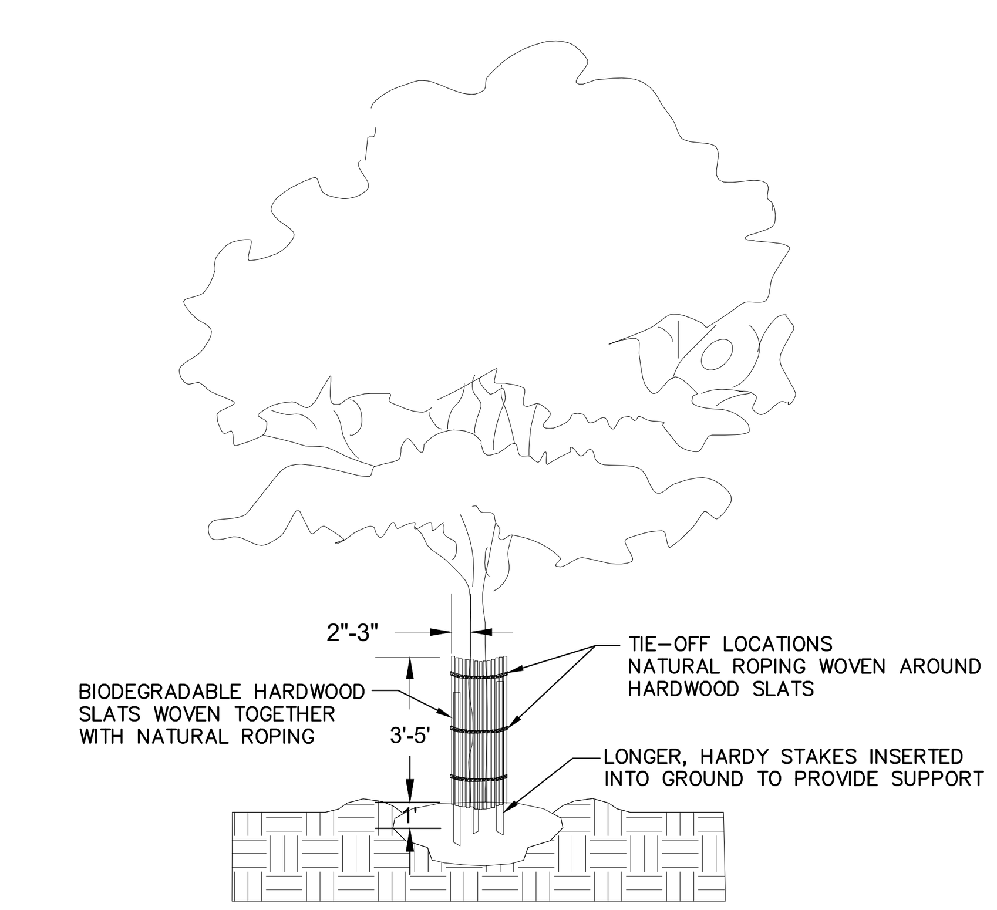
Floodplain Forest Plantings (79,297 SF / 1.82 AC)

Species	Common Name	Layer	Size	Type	Spacing	Quantity
Platanus occidentalis	Sweetbay magnolia	Canopy Tree	6'-8' Height	#7 Container	30' O.C.	18
Liquidambar styraciflua	Sweetgum	Canopy Tree	6'-8' Height	#7 Container	30' O.C.	18
*Betula nigra**	River birch	Canopy Tree	6'-8' Height	#7 Container	30' O.C.	18
Quercus phellos	Willow oak	Canopy Tree	6'-8' Height	#7 Container	30' O.C.	18
Quercus bicolor	Swamp white oak	Canopy Tree	6'-8' Height	#7 Container	30' O.C.	18
					Totol:	**89**
Cornus amomum	Silky dogwood	Shrub	2'-3' Height	#2 Container	10' O.C.	40
Sambucus nigra	Black elderberry	Shrub	2'-3' Height	#2 Container	10' O.C.	40
Alnus serrulata	Smooth alder	Shrub	2'-3' Height	#2 Container	10' O.C.	40
Lindera benzoin	Spicebush	Shrub	2'-3' Height	#2 Container	10' O.C.	40
					Totol:	**158**

Wetland Depressional Areas (2,885 SF / 0.07 AC)

Species	Common Name	Size/Type	Spacing	Quantity
Iris versicolor	Blue flag	DP-50 Plug	3' O.C.	75
Carex crinita	Long hair sedge	DP-50 Plug	3' O.C.	75
Elymus riparius	Riverbank wild-rye	DP-50 Plug	3' O.C.	75
Panicum virgatum	Switchgrass	DP-50 Plug	3' O.C.	75
Carex stricta	Tussock sedge	DP-50 Plug	3' O.C.	75
Verbena hastata	Swamp verbena	DP-50 Plug	3' O.C.	75
			Total:	**450**

Note: *Intermingle drifts of 50 - 75 plonts per species.*



BIODEGRADABLE TREE SHELTER

Not To Scale

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

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.

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

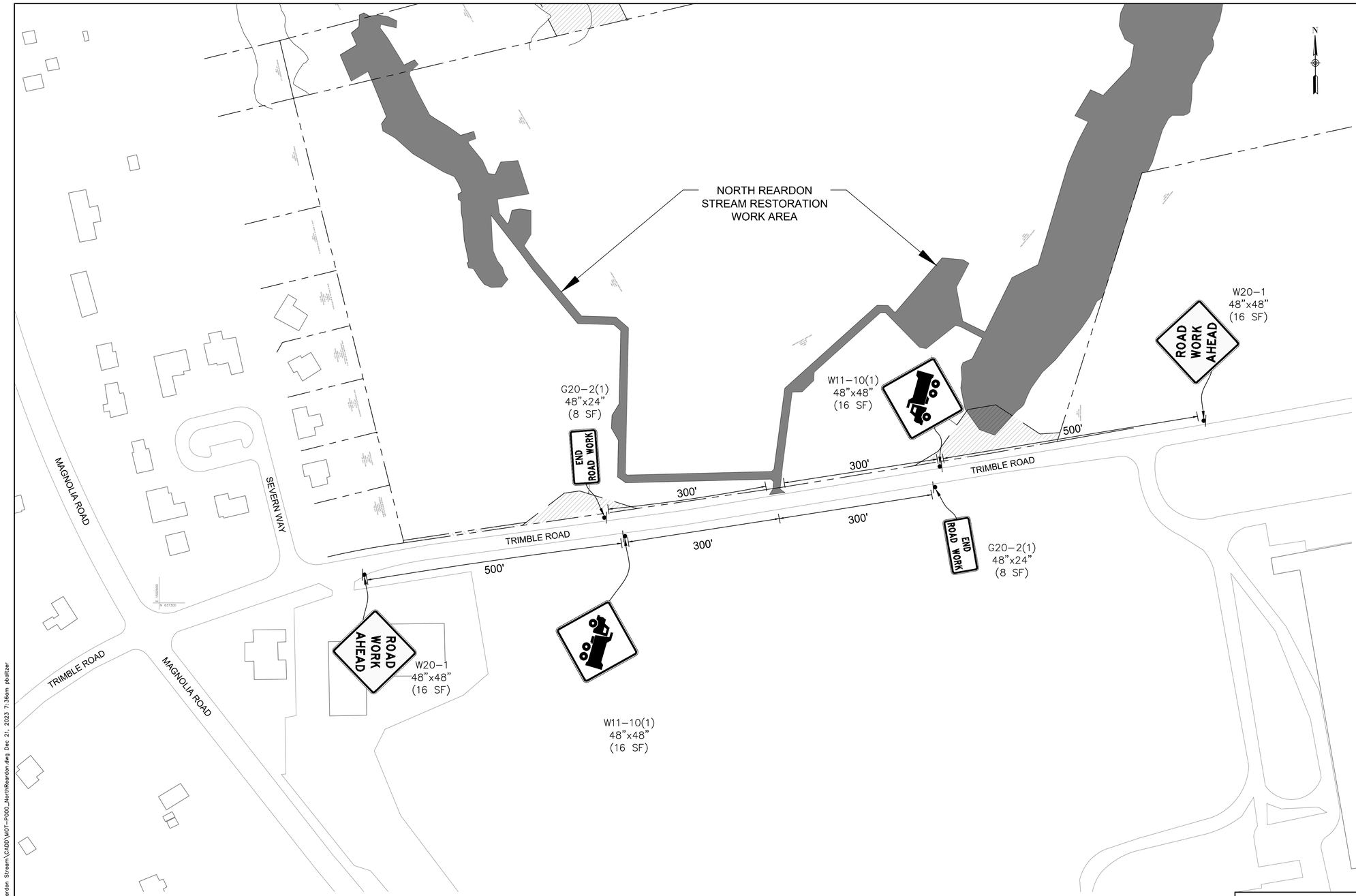
NORTH REARDON STREAM RESTORATION

LANDSCAPE NOTES AND DETAILS

Drawn By :	PJB , JLL	Scale :	N/A
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	LD-01 of LD-01	Sheet No.	45 of 46

BID No.:

HCG DWG ID No.:



CONSTRUCTION SEQUENCE

1. INSTALL MAINTENANCE OF TRAFFIC MEASURES AND DEVICES ALONG TRIMBLE ROAD AS SHOWN ON THIS SHEET.
2. ARRANGE PRE-CONSTRUCTION MEETING WITH HARFORD COUNTY OFFICE OF WATERSHED PROTECTION AND RESTORATION AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
3. INSTALL SEDIMENT CONTROL MEASURES FOR WORK AREA.
4. CONSTRUCT IMPROVEMENTS.
5. AT THE END OF EACH WORKING DAY REMOVE TRAFFIC CONTROL DEVICES.

MAINTENANCE OF TRAFFIC NOTES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN PEDESTRIAN AND VEHICULAR TRAFFIC SAFETY ADEQUATELY AND CONTINUOUSLY ON ALL PORTION OF EXISTING FACILITIES AFFECTED BY THE WORK. IN ADDITION TO EXISTING FACILITIES UNDERGOING IMPROVEMENT, THIS RESPONSIBILITY ALSO EXTENDS TO CROSSROADS, APPROACHES, CROSSOVERS AND ENTRANCE AFFECTED OR MADE NECESSARY BY THE WORK.
2. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN ALL NECESSARY BARRICADES, SUITABLE AND SUFFICIENT LIGHTS, DANGER SIGNALS, SIGNS AND OTHER TRAFFIC CONTROL DEVICES, AND THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION OF THE WORK AND THE SAFETY OF THE PUBLIC.
3. THE CONTRACTOR SHALL ERECT WARNING SIGNS, IN ADVANCE, AT ANY PLACE ON THE PROJECT WHERE OPERATORS MAY INTERFERE WITH THE USE OF THE FACILITY BY VEHICULAR TRAFFIC AND AT ALL OTHER POINTS WHERE THE NEW WORK CROSSES OR COINCIDES WITH AN EXISTING ROADWAY OR TRAFFIC LANE(S). SUCH WARNING SIGNS SHALL BE CONSTRUCTED AND ERECTED IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS". SIGNS MUST BE FRESHLY PAINTED BEFORE BEING PLACED ON ANY PROJECT. NO WORK MAY BEGIN OR BE DONE UNLESS AN ADEQUATE NUMBER OF SIGNS OF THE PROPER CATEGORY ARE IN PLACE.
4. WHERE THE CONTRACTORS'S SEQUENCE OF OPERATIONS RESULTS IN GRADE DIFFERENTIAL WHICH WOULD BE HAZARDOUS TO VEHICULAR TRAFFIC, THE CONTRACTOR, AT THE DIRECTION OF THE DIRECTOR, SHALL PROVIDE SUITABLE BARRIERS TO THE EXTENT DETERMINED BY THE DIRECTOR.
5. CONTRACTOR SHALL ADHERE TO ALL CONSTRUCTION TIME RESTRICTIONS AS DICTATED BY HARFORD COUNTY.
6. ALL MOT ACTIVITIES SHALL ADHERE TO THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION (SHA) "BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES". PAVEMENT MARKINGS, DRUMSAND OTHER ITEMS USED FOR MOT SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES AND STANDARDS PROVIDED IN CATEGORY "1" OF THE BOOK OF STANDARDS, MD 104.00-01 THRU MD 104.06-24, AND THE 2011 EDITION OF THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES(MDMUTCD).
7. LONGITUDINAL DISTANCES AND LOCATIONS OF ALL TEMPORARY ADVANCE WARNING SIGNS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS, AS APPROVED BY THE ENGINEER, TO AVOID CONFLICTS WITH PERMANENT SIGNS AND DRIVEWAYS, AND TO AVOID RESTRICTING INTERSECTION SIGHT DISTANCE PER THE LATEST EDITION OFTHE AASHTO PUBLICATION: "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS".
8. SIGNS USED FOR TEMPORARY TRAFFIC CONTROL THAT ARE NOT APPLICABLE FOR A PARTICULAR CONSTRUCTION PHASE SHALL BE REMOVED OR COMPLETELY COVERED WITH A NON-TRANSPARENT MATERIAL.
9. PERMANENT PAVEMENT MARKINGS THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE DISCRETION OF THE ENGINEER.
10. AT THE COMPLETION OF THE WORK DAY, THE CONTRACTOR SHALL OPEN CLOSED LANES AND MAINTAIN THE EXISTING TRAVEL LANES.
11. NO CONSTRUCTION VEHICLES SHALL ENTER RESIDENTIAL STREETS OR ROADWAYS ADJACENT TO THE WORK ZONE.
12. CONSTRUCTION EQUIPMENT AND MATERIALS SHALL BE STORED OFF THE TRAVEL LANES AT ALL TIMES OR AT A LOCATION APPROVED BY THE ENGINEER.

LEGEND

- PROJECT AREA
- EDGE OF ROAD
- BUILDING
- PROPERTY BOUNDARY
- SIGN LOCATION

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.

#28371 12/21/2023

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

MAINTENANCE OF TRAFFIC PLAN

Drawn By :	PJB , JLL	Scale :	1" = 100'
Designed By :	IPT , PJB	Date :	12 / 23
Reviewed By :	CAL		
Drawing No.	MT-01 OF MT-01	Sheet No.	46 of 46

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

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