NORTH REARDON STREAM RESTORATION

BID NO. TBD

OFFICE OF WATERSHED PROTECTION AND RESTORATION
HARFORD COUNTY, MARYLAND
30% DESIGN PLANS – NOT FOR CONSTRUCTION

PROJECT OVERVIEW:
THE SCOPE OF THIS PROJECT IS THE RESTORATION OF TWO STREAMS, NORTH REARDON BRANCH (SR–3) & AN UNNAMED TRIBUTARY TO NORTH REARDON BRANCH (SR–9), TOTALING APPROXIMATELY 1,950 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 CONNECTION 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 HEADWALL CONSISTING OF A 60" RCP & 48"X72" ELLIPTICAL CMP WHILE SR–9 ORIGINATES UPSTREAM OF A FAILED 24" RCP. BOTH STREAMS ARE ALMOST ENTIRELY LOCATED ON HARFORD COUNTY PARKS PROPERTY; HOWEVER, THE UPSTREAM EXTENT OF BOTH IS LOCATED ON PRIVATE PROPERTIES (SR–3 :THE FIRST HARFORD SQUARE ASSOCIATION, SR–9 : MAGNOLIA ESTATES MHC).

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	422 TONS/YR	409 LBS/YR	89 LBS/YR
SR–9	85 TONS/YR	87 LBS/YR	43 LBS/YR
TOTAL	507 TONS/YR	496 LBS/YR	132 LBS/YR

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

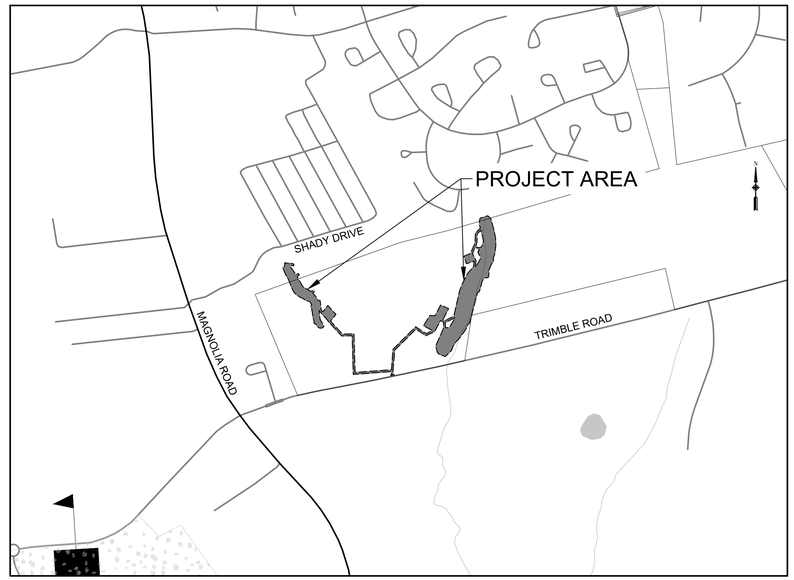
IA CREDIT SUMMARY:

STREAM	DA	IA	PE REQ.	PE PROV.	IA CREDIT
SR–3	162.9 AC	49.9 AC	IN	IN	AC
SR–9	47.8 AC	6.9 AC	IN	IN	AC

IMPERVIOUS ACRE CREDITS CALCULATED USING EQUIVALENT IMPERVIOUS ACRE METHODOLOGY

30% 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	GE-01	GEOMETRY SHEET
5	GE-02	GEOMETRY SHEET
6	GE-03	GEOMETRY SHEET
7	GE-04	GEOMETRY SHEET
8	SR-01	GRADING PLAN
9	SR-02	GRADING PLAN
10	SR-03	GRADING PLAN
11	SR-04	GRADING PLAN
12	SR-05	GRADING PLAN
13	SR-06	GRADING PLAN
14	PR-01	PROFILE SHEET
15	PR-02	PROFILE SHEET
16	DE-01	DETAIL SHEET
17	DE-02	DETAIL SHEET
18	DE-03	DETAIL SHEET
19	DE-04	DETAIL SHEET
20	DE-05	DETAIL SHEET



LOCATION MAP

SCALE 1" = 600'

OVERALL LIMIT OF DISTURBANCE: 245,547 SQ. FT // 5.64 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 2022 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. 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.

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

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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

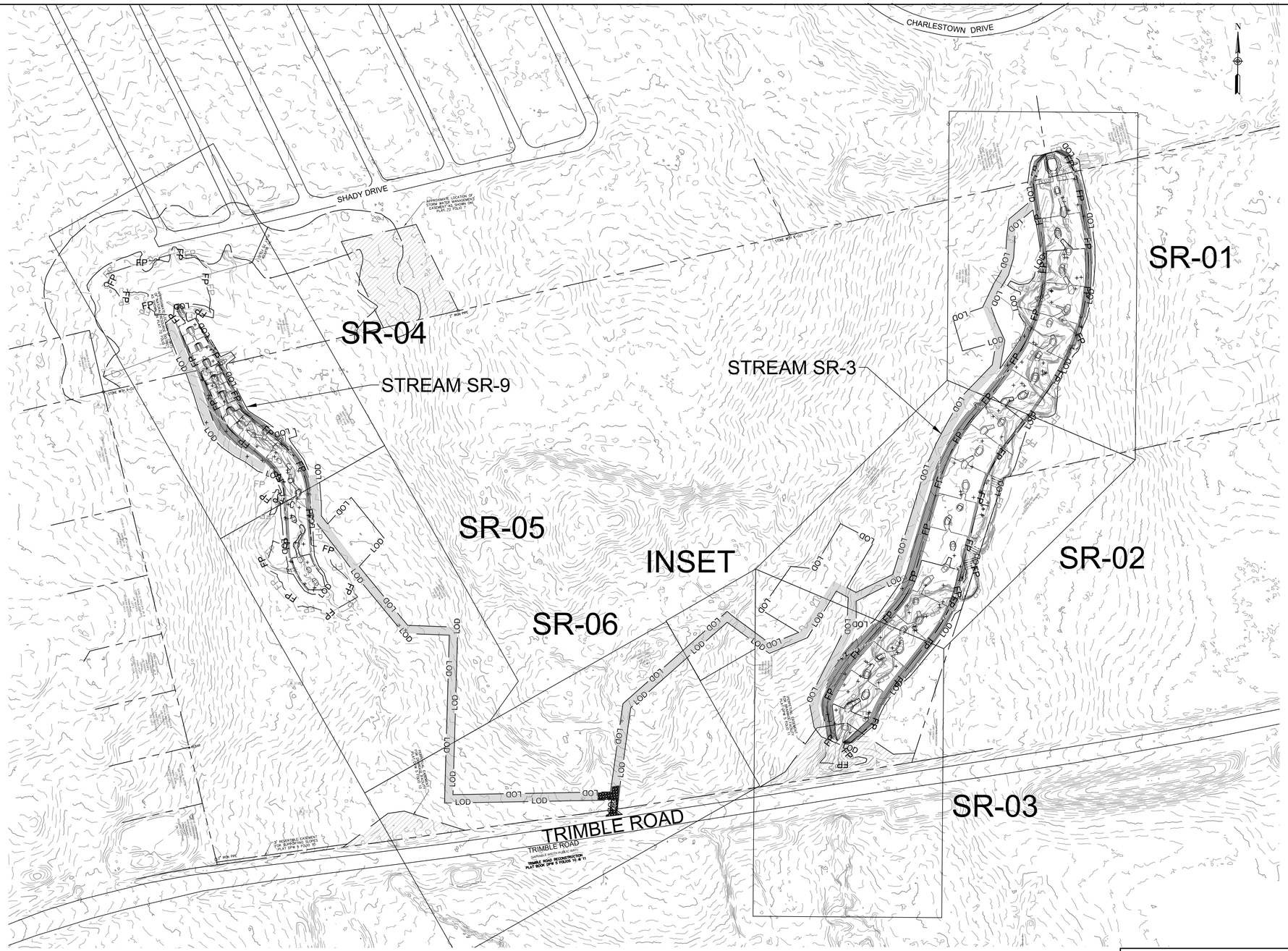
Drawn By :	PJB,JLL	Scale :	
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	GN–01 of GN–01	Sheet No.	01 of 20

BID No.:

HCG DWG ID No.:

SCALE 1" FROM

T:\2022\Transportation\221073.003A Harford Co – N Reardon Stream\CADD\gGN-F000_NorthReardon.dwg Aug 15, 2023 1:44pm lturner



100' 0 100' 200'

ORIGINAL SCALE: 1"=100'

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gOV-P000_NorthReardon.dwg Aug 15, 2023 1:29pm lturner

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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

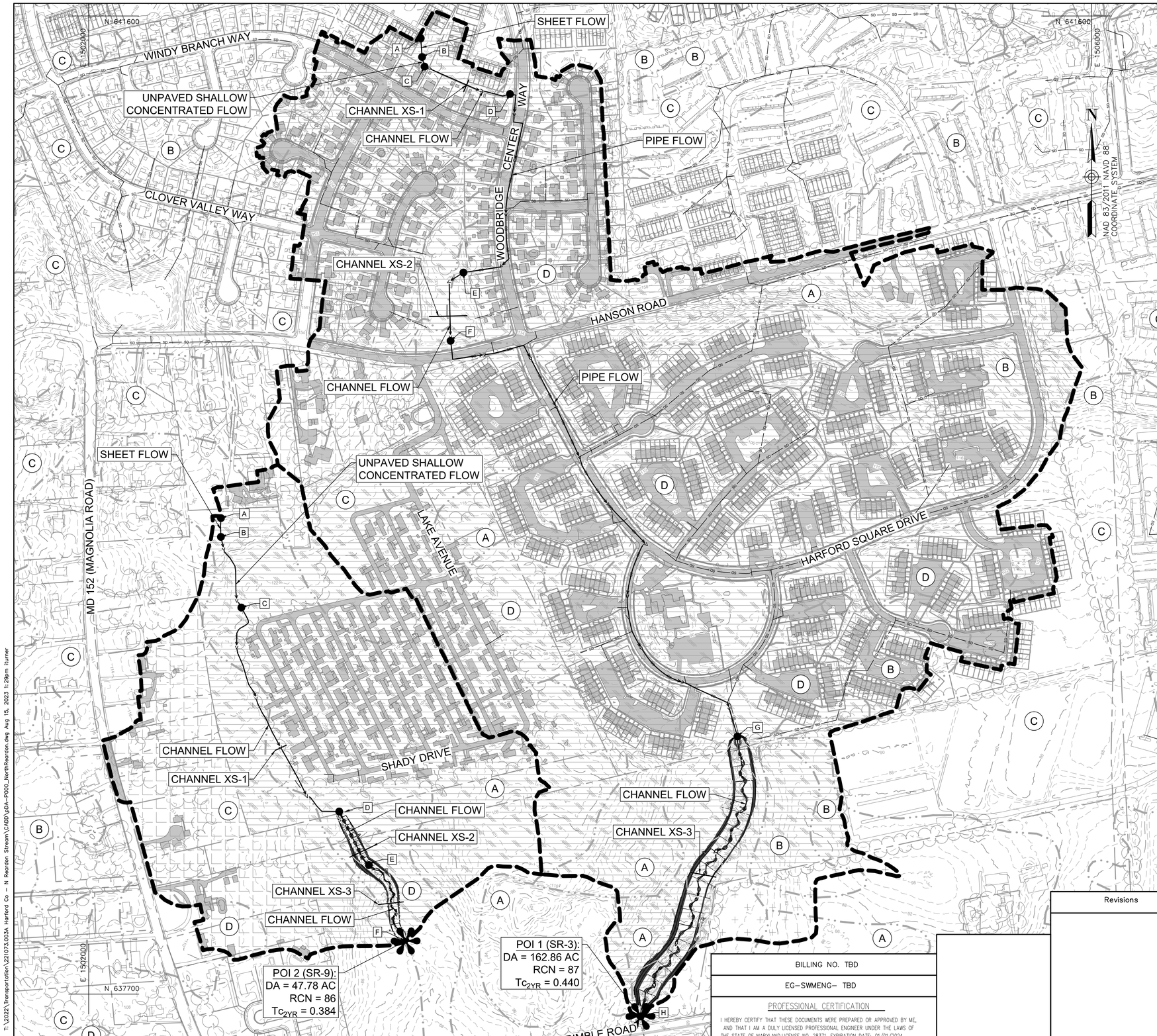
OVERVIEW SHEET

Drawn By :	PJB,JLL	Scale :	1" = 100'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	OV-01 of OV-01	Sheet No.	02 of 20

BID No.:

HCG DWG ID No.:

SCALE: 1:1 (100)



LEGEND

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

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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DRAINAGE AREA MAP
ULTIMATE CONDITIONS

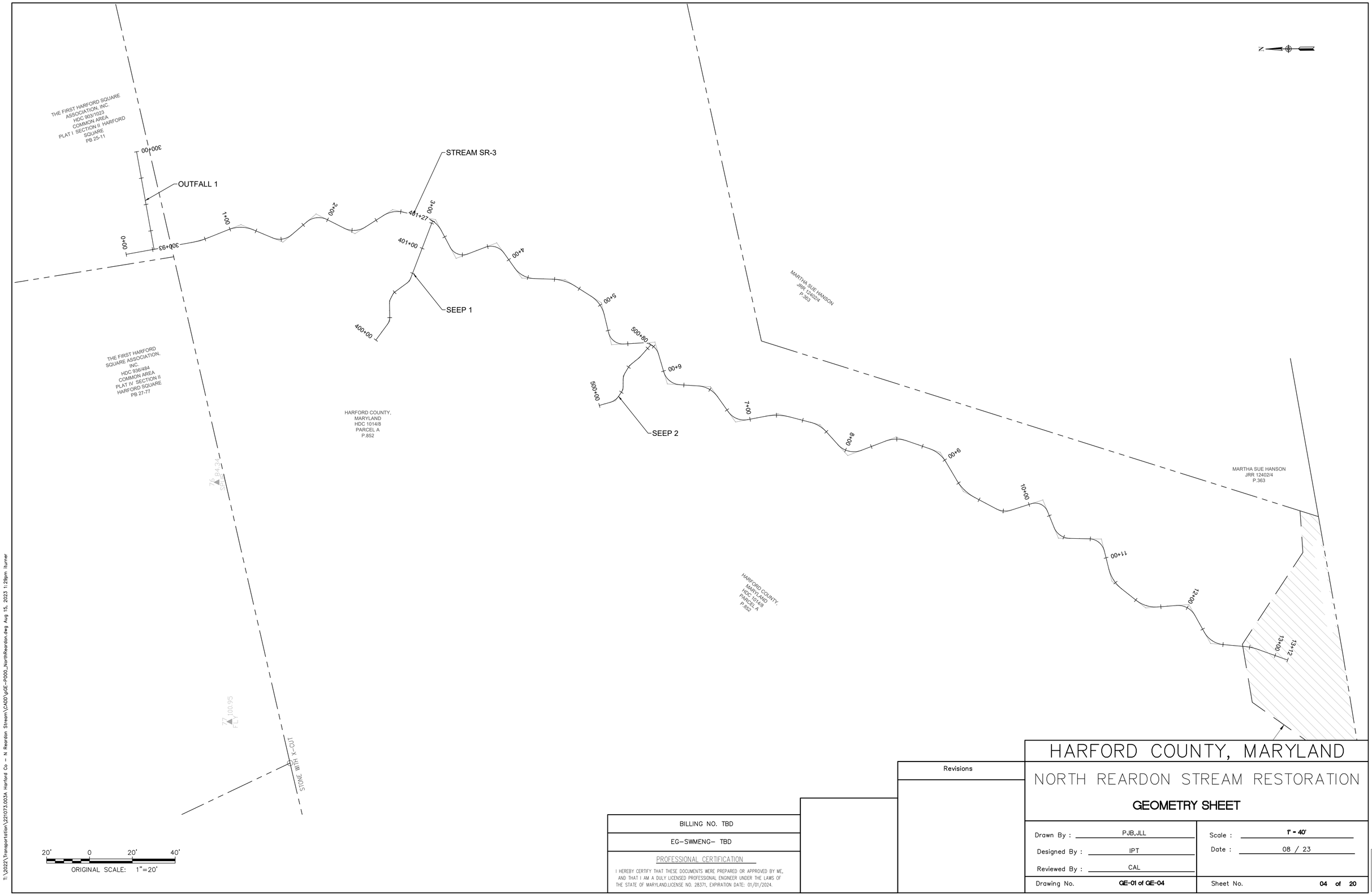
Drawn By :	JCG	Scale :	1" = 200'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	DA-01 of DA-01	Sheet No.	03 of 20

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gDA-P000_NorthReardon.dwg Aug 15, 2023 1:29pm lturner



T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pGE-P000_NorthReardon.dwg Aug 15, 2023 1:29pm lturner

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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

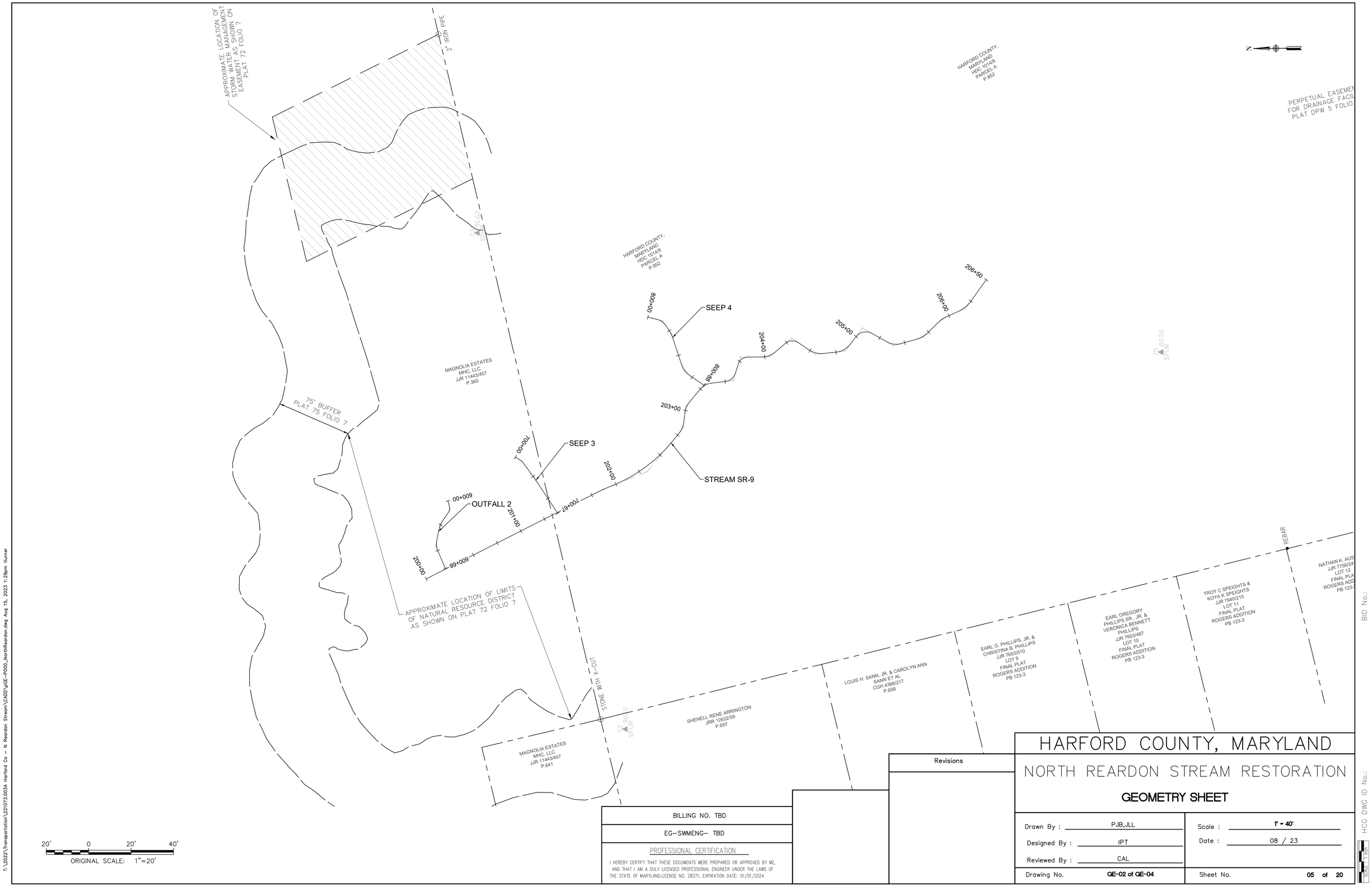
GEOMETRY SHEET

Drawn By :	PJB,JLL	Scale :	1" = 40'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	GE-01 of GE-04	Sheet No.	04 of 20

BID No.:

HCG DWG ID No.:

SCALE: 1 inch



T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pGE-P000_NorthReardon.dwg Aug 15, 2023 1:29pm iturner

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By : PJB,JLL	Scale : 1" = 40'
Designed By : IPT	Date : 08 / 23
Reviewed By : CAL	
Drawing No. GE-02 of GE-04	Sheet No. 05 of 20

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: 01/01/2024.

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+12.42	28.448		S19° 43' 04.03"W	637668.3103,1504215.1294	637641.5308,1504205.5316				

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			69.261	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				

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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By : PJB,JLL

Designed By : IPT

Reviewed By : CAL

Scale : N/A

Date : 08 / 23

Drawing No. GE-03 of GE-04

Sheet No. 06 of 20

BID No.:

HCG DWG ID No.:

SCALE : 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pGE-P000_NorthReardon.dwg Aug 15, 2023 1:29pm tturner

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+10.60	10.599		S15° 55' 43.01"E	638284.0266,1504443.2382	638273.8341,1504446.1471				
C56	638268.9591,1504447.5384	500+15.67			9.733	14.091	S35° 42' 58.87"E	638273.8341,1504446.1471	638266.0880,1504451.7166	039° 34' 31.72"	406° 36' 51.56"	5.07	0.88
L62			500+20.33	500+24.82	4.492		S55° 30' 14.73"E	638266.0880,1504451.7166	638263.5442,1504455.4184				
C57	638261.8342,1504457.9068	500+27.84			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+30.68	500+36.52	5.834		S89° 44' 57.74"E	638261.8210,1504460.9261	638261.7955,1504466.7602				
C58	638261.7785,1504470.6495	500+40.41			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+44.11	500+48.60	4.487		S59° 09' 50.52"E	638259.7849,1504473.9891	638257.4848,1504477.8420				
C59	638255.9515,1504480.4105	500+51.59			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+54.52	500+62.32	7.805		S38° 45' 06.39"E	638253.6186,1504482.2830	638247.5314,1504487.1688				
C60	638246.6159,1504487.9036	500+63.49			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+64.66	500+79.58	14.913		S48° 13' 01.50"E	638245.8336,1504488.7790	638235.8966,1504499.8996				

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				

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 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				

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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GEOMETRY SHEET

Drawn By : PJB,JLL

Designed By : IPT

Reviewed By : CAL

Scale : N/A

Date : 08 / 23

Drawing No. GE-04 of GE-04

Sheet No. 07 of 20

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pGE-P000_NorthReardon.dwg Aug 15, 2023 1:29pm lturner

THE FIRST HARFORD SQUARE ASSOCIATION, INC.
HDC 903/1023
COMMON AREA
PLAT I SECTION II HARFORD SQUARE
PB 25-11

END OF 18" CMP
INV=74.91

CONC DITCH (IN RUINS)

BARBED WIRE FENCE (IN RUINS)

PREFORMED SCOUR POOL SEE NOTE 2 BELOW

RIFFLE GRADE CONTROL STRUCTURE

GRADE CONTROL LOG STRUCTURE

LIMIT OF TOPOGRAPHIC SURVEY–EAST SIDE

WETLAND DEPRESSIONAL AREA

WOODY HABITAT FEATURE

ARMORED POOL

CLAY CHANNEL BLOCK

OUTFALL 1

FLOW

CONC HDWL
TOP=76.72
INV A=73.48
INV B=72.90

48"X72" CMPA

60" RCP

CONC APRON

SEEP 1

STREAM SR-3 CENTERLINE

PROPOSED HAUL ROAD

THE FIRST HARFORD SQUARE ASSOCIATION, INC.
HDC 936/484
COMMON AREA
PLAT IV SECTION II
HARFORD SQUARE
PB 27-77

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

STAGING AND STOCKPILE AREA

HABITAT ROUGHNESS FEATURE

MATCH LINE - SEE SHEET SR-02

PROPOSED FEATURES LEGEND

LOD	LIMIT OF DISTURBANCE
FP	PROP. 100-YEAR FLOODPLAIN
	CHANNEL BASELINE OF CONSTRUCTION
245	5' MAJOR CONTOUR
	1' MINOR CONTOUR
	LIMIT OF SUBGRADE BED MATERIAL
	CLASS I CHANNEL BED MATERIAL
	CLASS II CHANNEL BED MATERIAL
	RIFFLE GRADE CONTROL (RGC) WITH KEYSTONE BOULDERS
	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. PREFORMED SCOUR POOL UNDERLAIN WITH CLASS II RIPRAP
3. PROPOSED HAUL 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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-3 GRADING PLAN

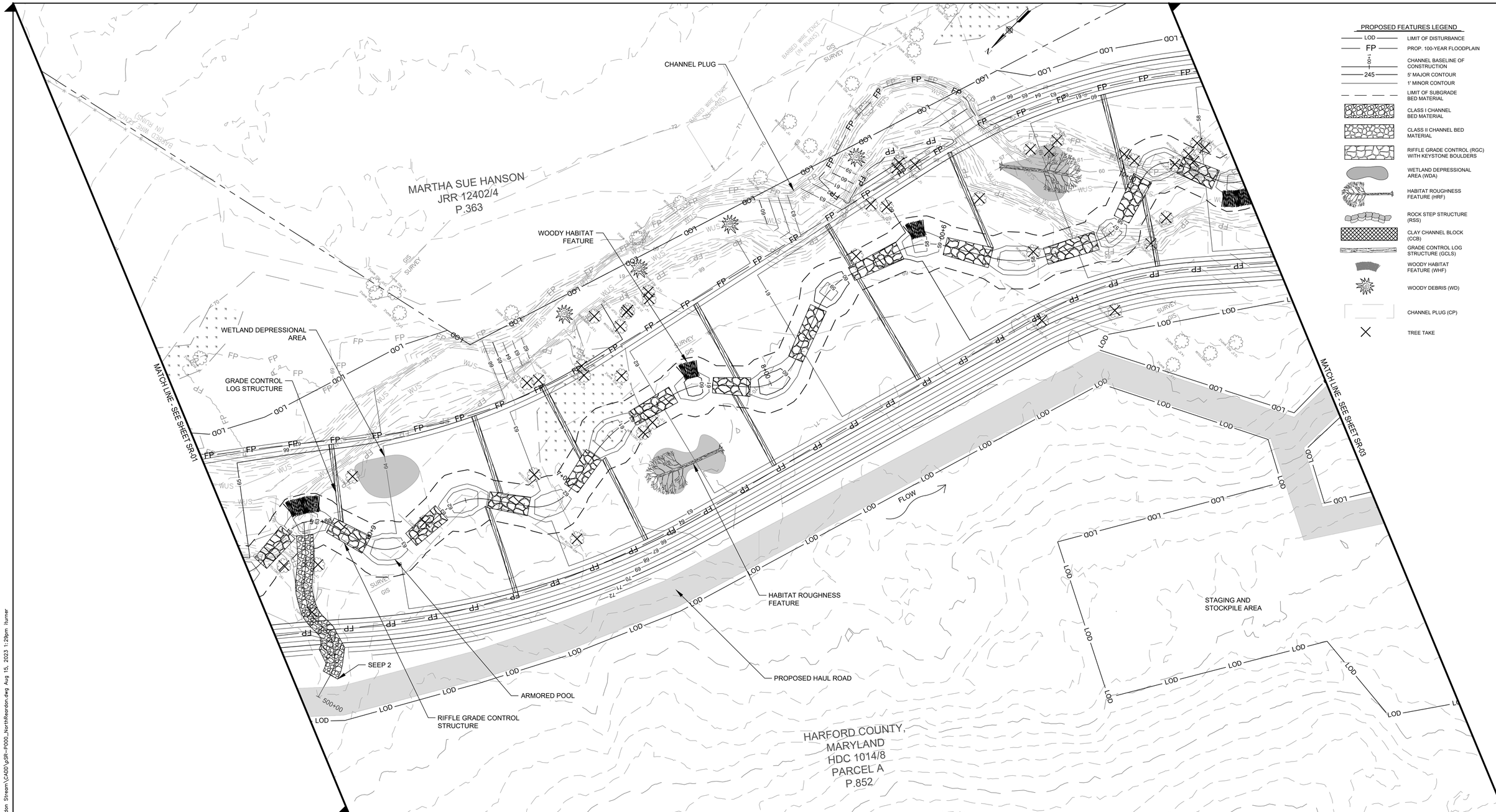
Drawn By :	PJB,JLL	Scale :	1" = 20'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	SR-01 of SR-06	Sheet No.	08 of 20

BID No.:

HCC DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gSR-P000_NorthReardon.dwg Aug 15, 2023 1:29pm llurner



NOTES:
1. NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
2. PROPOSED HAUL 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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-3 GRADING PLAN

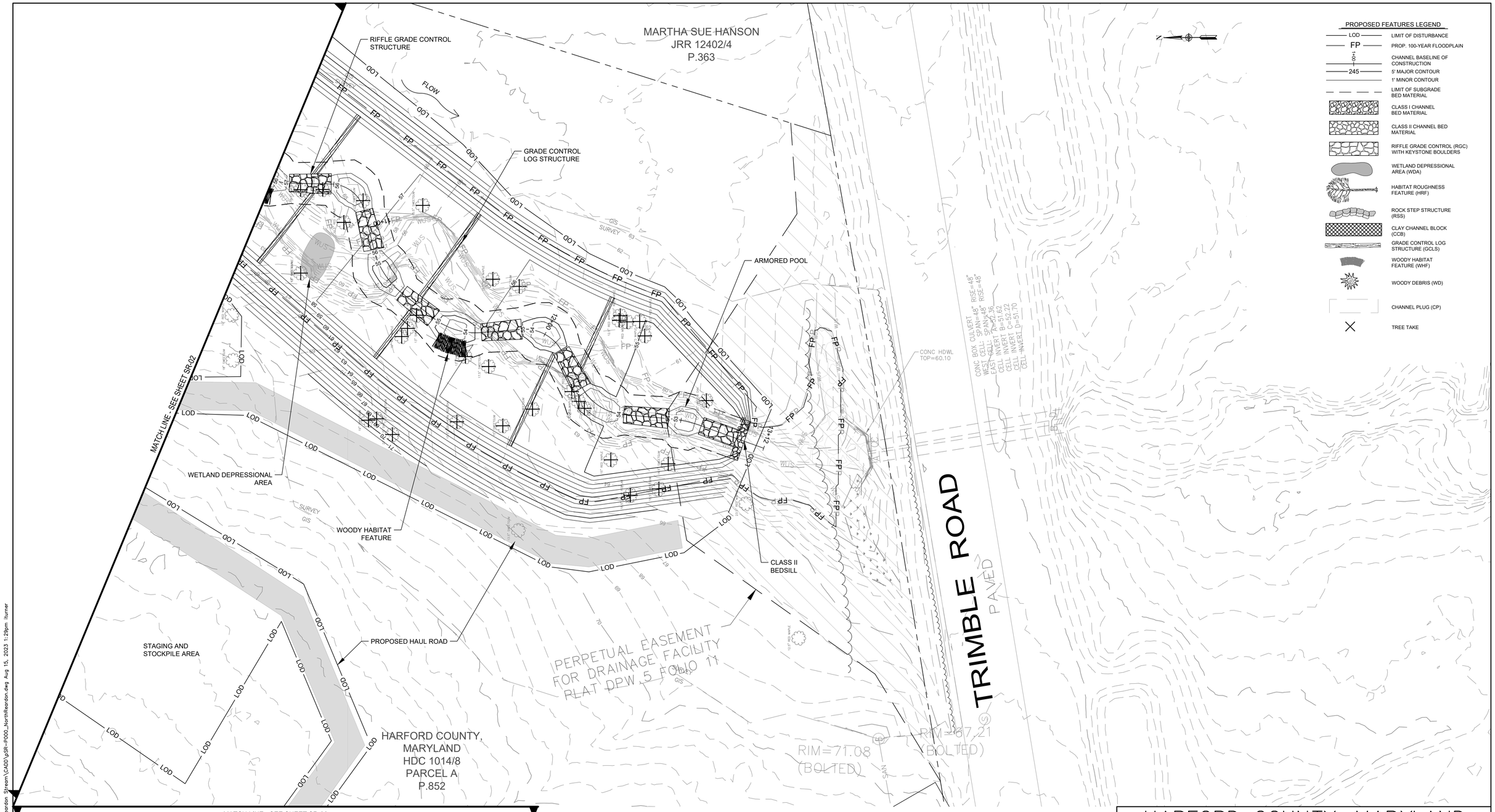
Drawn By :	PJB,JLL	Scale :	1" = 20'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	SR-02 of SR-06	Sheet No.	09 of 20

BID No.:

HCG DWG ID No.:

SCALE 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pSR-P000_NorthReardon.dwg Aug 15, 2023 1:29pm lturner



NOTES:
1. NOT ALL PROPOSED STONE IS SHOWN IN PLAN VIEW. SEE PROFILE AND DETAIL SHEET FOR ADDITIONAL INFORMATION REGARDING PROPOSED STONE EXTENTS.
2. PROPOSED HAUL 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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-3 GRADING PLAN

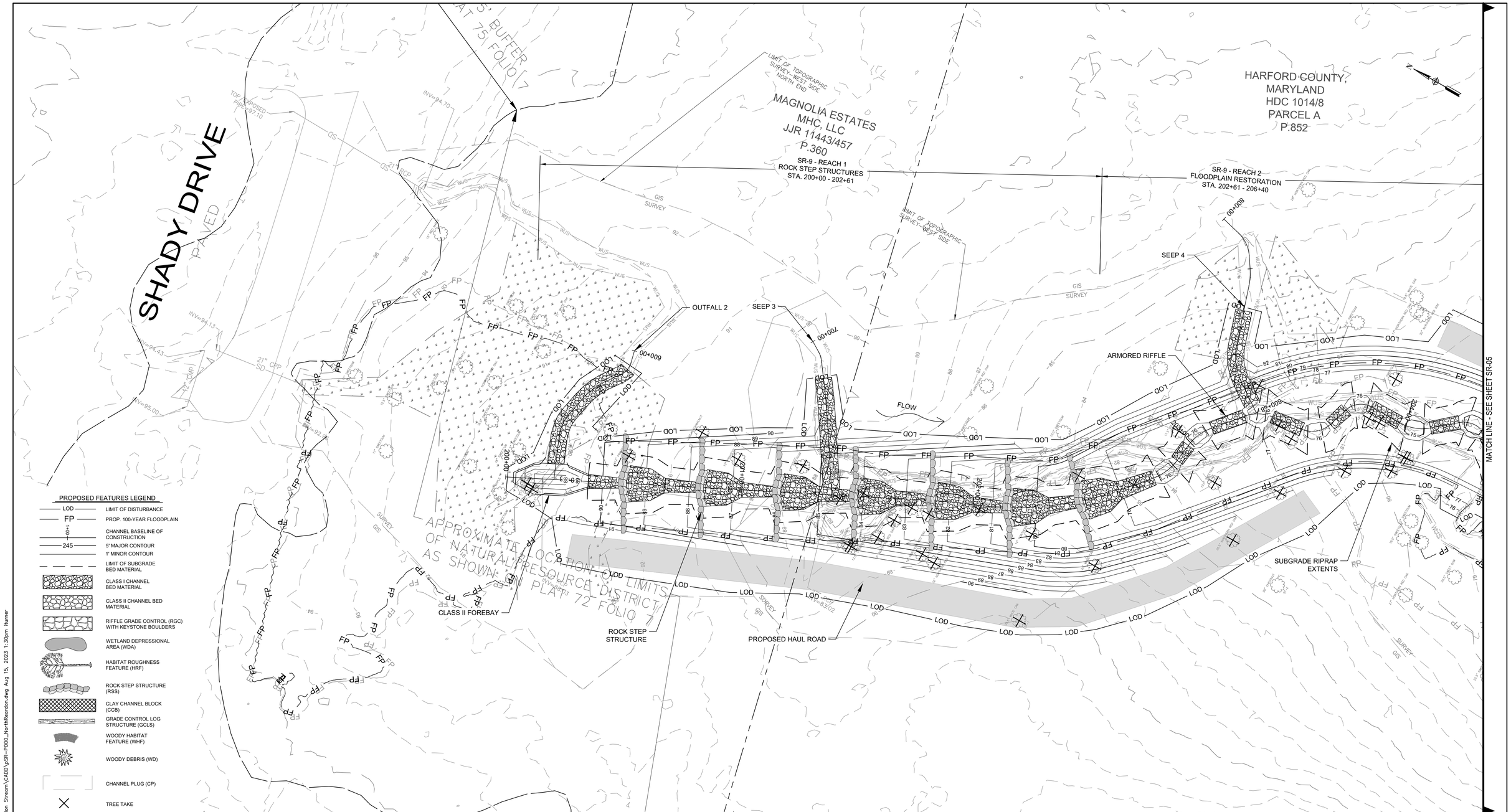
Drawn By :	PJB,JLL	Scale :	1" = 20'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	SR-03 of SR-06	Sheet No.	10 of 20

BID No.:

HCG DWG ID No.:

SCALE: 1" INCH

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gSR-P000_NorthReardon.dwg Aug 15, 2023 1:29pm lturner



PROPOSED FEATURES LEGEND

- LOD — LIMIT OF DISTURBANCE
- FP — PROP. 100-YEAR FLOODPLAIN
- 00+00 — CHANNEL BASELINE OF CONSTRUCTION
- 245 — 5' MAJOR CONTOUR
- 1' MINOR CONTOUR
- LIMIT OF SUBGRADE BED MATERIAL
- CLASS I CHANNEL BED MATERIAL
- CLASS II CHANNEL BED MATERIAL
- RIFFLE GRADE CONTROL (RGC) WITH KEYSTONE BOULDERS
- 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. PROPOSED HAUL ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS
3. FOREBAY TO BE UNDERLAIN WITH CLASS II RIPRAP PER PROFILE

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.LICENSE NO. 28371, EXPIRATION DATE: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-9 GRADING PLAN

Drawn By :	PJB,JLL	Scale :	1" = 20'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	SR-04 of SR-06	Sheet No.	11 of 20

BID No.:

HCC DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gSR-P000_NorthReardon.dwg Aug 15, 2023 1:30pm ltumer

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

SR-9 - REACH 2
FLOODPLAIN RESTORATION
STA. 202+61 - 206+40

STAGING AND
STOCKPILE AREA

PROPOSED HAUL ROAD

PROPOSED HAUL ROAD
THROUGH PREVIOUSLY
CLEARED SEWER ACCESS

FLOW

ARMORED RIFFLE

SUBGRADE RIPRAP
EXTENTS

RIM=84.15
(BOLTED)

RIM=77.44
(BOLTED)

RIM=80.68
(BOLTED)

MATCH LINE - SEE SHEET SR-04

MATCH LINE - SEE SHEET SR-06

PROPOSED FEATURES LEGEND

LOD	LIMIT OF DISTURBANCE
FP	PROP. 100-YEAR FLOODPLAIN
1+00	CHANNEL BASELINE OF CONSTRUCTION
245	5' MAJOR CONTOUR
	1' MINOR CONTOUR
	LIMIT OF SUBGRADE BED MATERIAL
	CLASS I CHANNEL BED MATERIAL
	CLASS II CHANNEL BED MATERIAL
	RIFFLE GRADE CONTROL (RGC) WITH KEYSTONE BOULDERS
	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. PROPOSED HAUL ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS

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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

STREAM SR-9 GRADING PLAN

Drawn By :	PJB,JLL	Scale :	1" = 20'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	SR-05 of SR-06	Sheet No.	12 of 20

BID No.:

HCG DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gSR-P000_NorthReardon.dwg Aug 15, 2023 1:30pm llurner

MATCH LINE - SEE SHEET SR-05

MATCH LINE - SEE SHEET INSET

MATCH LINE - SEE THIS SHEET

MATCH LINE - SEE SHEET SR-03

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

PROPOSED HAUL ROAD
THROUGH PREVIOUSLY
CLEARED SEWER ACCESS

PROPOSED HAUL ROAD
ALONG EXISTING
MAINTENANCE TRAIL

PROPOSED ACCESS
FROM TRIMBLE ROAD

PROPOSED HAUL ROAD
ALONG EXISTING
MAINTENANCE TRAIL

TRIMBLE ROAD
PAVED

RIM=71.01
(BOLTED)

RIM=77.48
(BOLTED)

TUAL EASEMENT
DRAINAGE FACILITY
DW 5 FOLIO 10

PROPOSED FEATURES LEGEND

- LOD — LIMIT OF DISTURBANCE
- FP — PROP. 100-YEAR FLOODPLAIN
- 0+14 — CHANNEL BASELINE OF CONSTRUCTION
- 245 — 5' MAJOR CONTOUR
- 1' MINOR CONTOUR
- LIMIT OF SUBGRADE BED MATERIAL
- CLASS I CHANNEL BED MATERIAL
- CLASS II CHANNEL BED MATERIAL
- RIFFLE GRADE CONTROL (RGC) WITH KEYSTONE BOULDERS
- 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. PROPOSED HAUL ROADS TO BE FIELD LOCATED TO AVOID NATURAL RESOURCE IMPACTS

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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

GRADING PLAN

Drawn By :	PJB,JLL	Scale :	1" = 20'
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	SR-06 of SR-06	Sheet No.	13 of 20

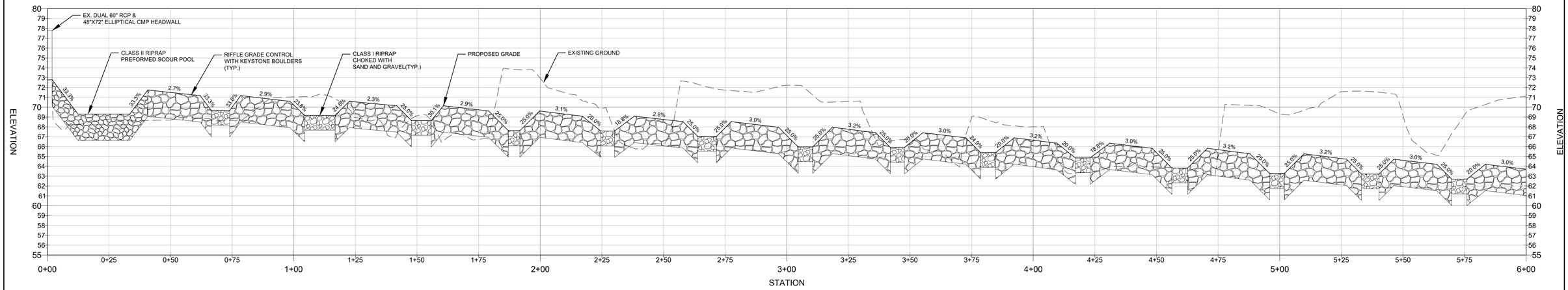
BID No.:

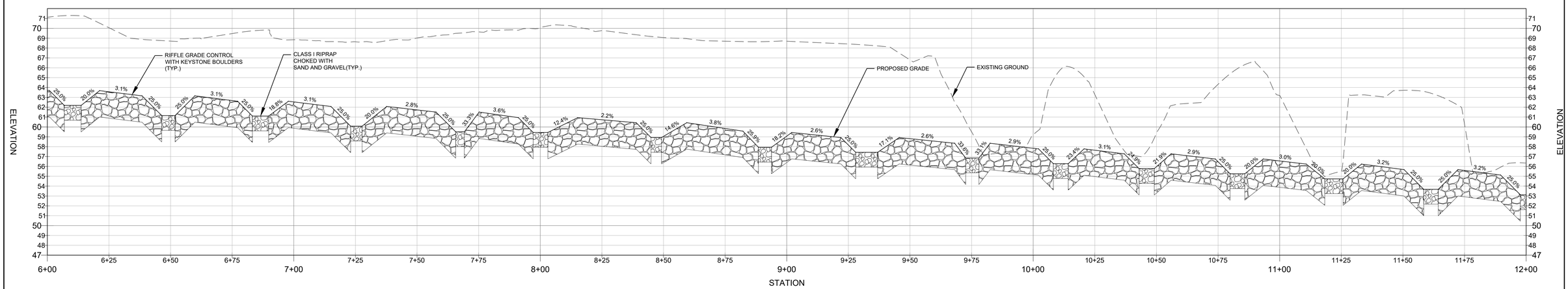
HCG DWG ID No.:

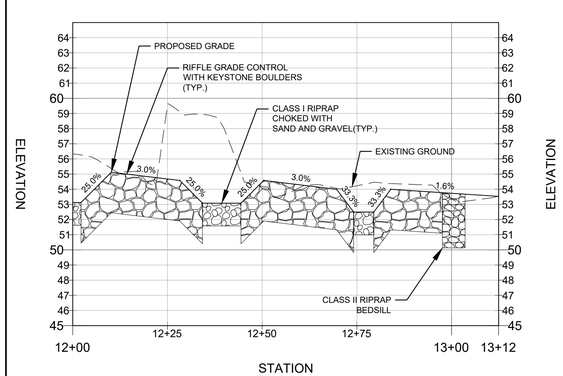
SCALE: 1" INCH

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\gSR-P000_NorthReardon.dwg Aug 15, 2023 1:30pm lturner

STREAM SR-3 PROFILE







T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pPR-P000_NorthReardon.dwg Aug 15, 2023 1:30pm iturner

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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

PROFILE SHEET

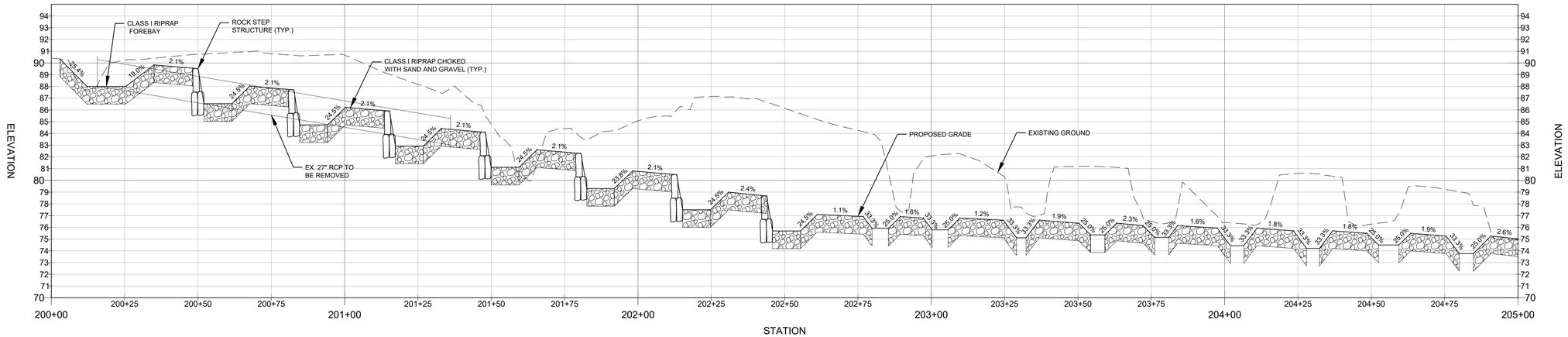
Drawn By :	PJB,JLL	Scale :	AS SHOWN
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	PR-01 of PR-02	Sheet No.	14 of 20

BID No.:

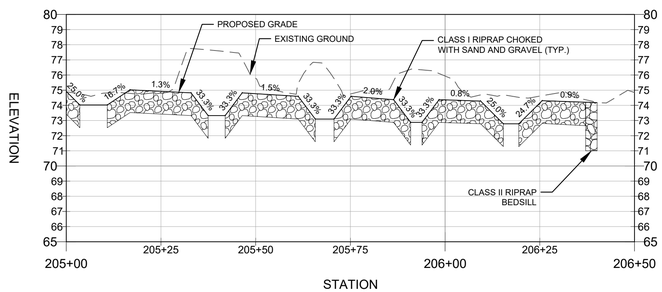
HCG DWG ID No.:

SCALE : 1 inch

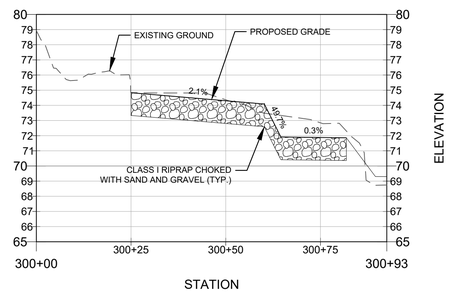
STREAM SR-9 PROFILE



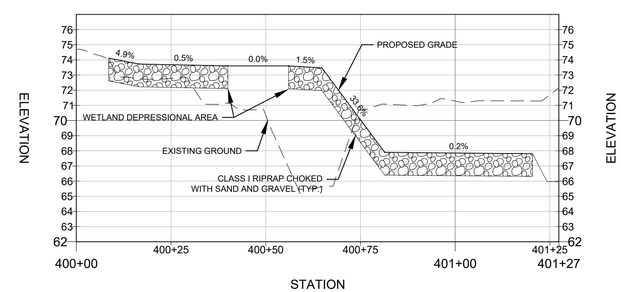
STREAM SR-9 PROFILE CONTINUED



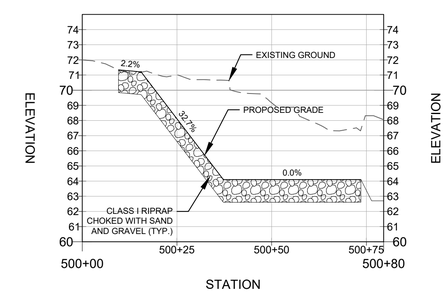
OUTFALL 1



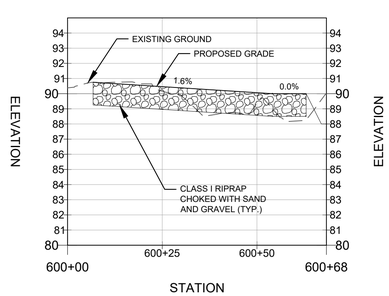
SEEP 1



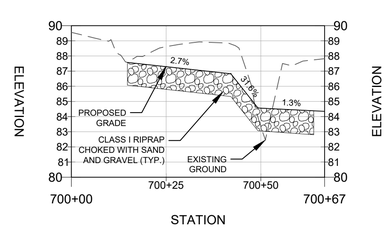
SEEP 2



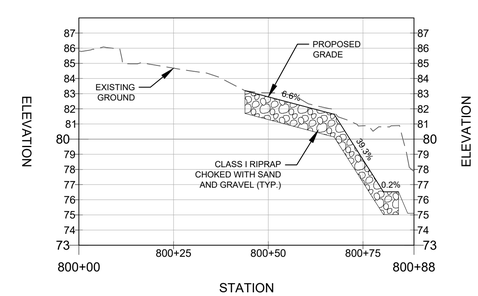
OUTFALL 2



SEEP 3



SEEP 4



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: 01/01/2024.

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

PROFILE SHEET

Drawn By :	PJB,JLL	Scale :	AS SHOWN
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	PR-02 of PR-02	Sheet No.	15 of 20

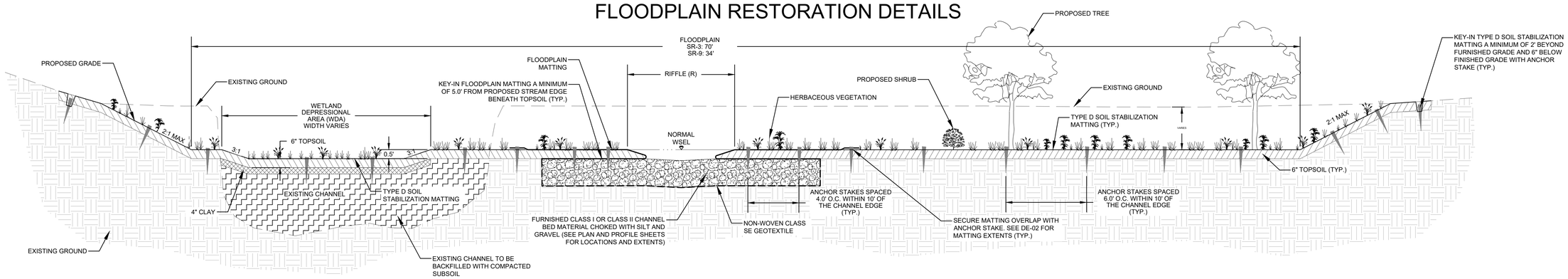
BID No.:

HCG DWG ID No.:

SCALE: 1 inch

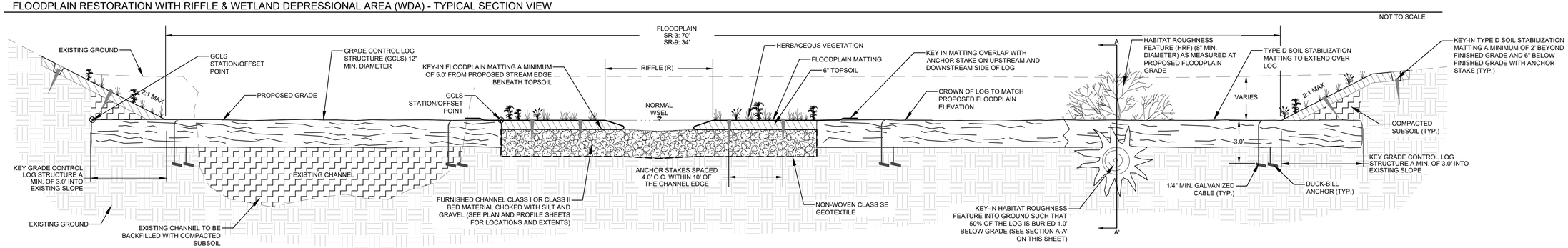
T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pPR-P000_NorthReardon.dwg Aug 15, 2023 1:30pm lturner

FLOODPLAIN RESTORATION DETAILS



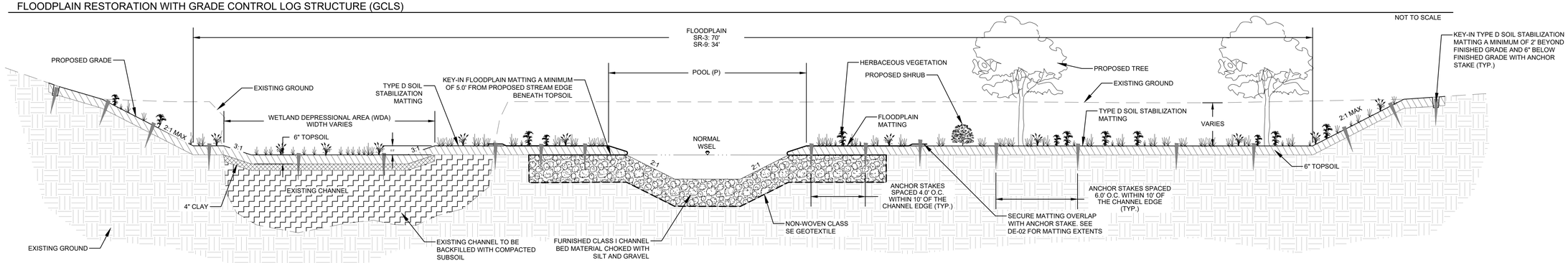
FLOODPLAIN RESTORATION WITH RIFFLE & WETLAND DEPRESSIONAL AREA (WDA) - TYPICAL SECTION VIEW

NOT TO SCALE



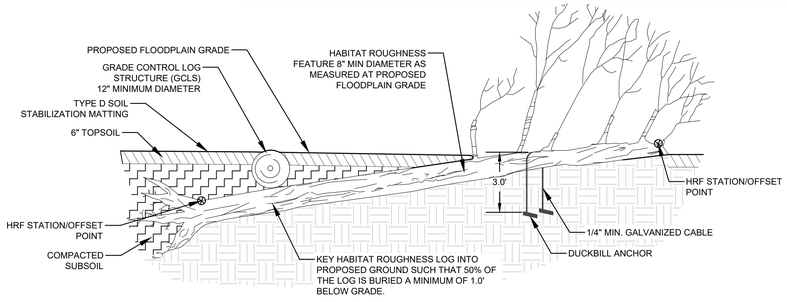
FLOODPLAIN RESTORATION WITH GRADE CONTROL LOG STRUCTURE (GCLS)

NOT TO SCALE



FLOODPLAIN RESTORATION WITH POOL AND WETLAND DEPRESSIONAL AREA (WDA)

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 FURNISHED CHANNEL BED MATERIAL, SMALL AND LARGE STONES MUST BE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SILT AND GRAVEL SHALL BE WASHED 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.
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).

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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

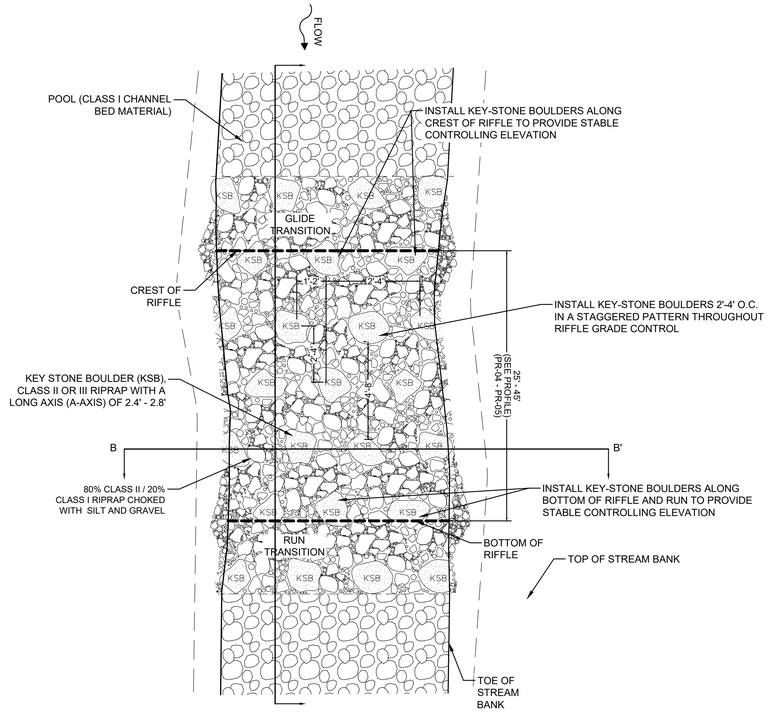
Drawn By :	PJB,JLL	Scale :	N/A
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	DE-01 of DE-05	Sheet No.	16 of 20

BID No.:

HCG DWG ID No.:

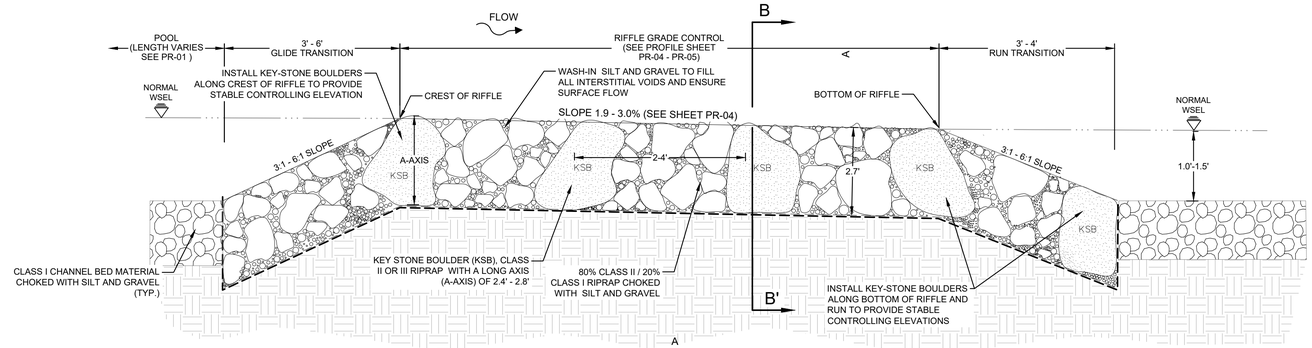
SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pDE-P000_NorthReardon.dwg Aug 15, 2023 1:30pm lturner



RIFFLE GRADE CONTROL (RGC) WITH FLOODPLAIN BENCH - STREAM SR-3 - PLAN VIEW

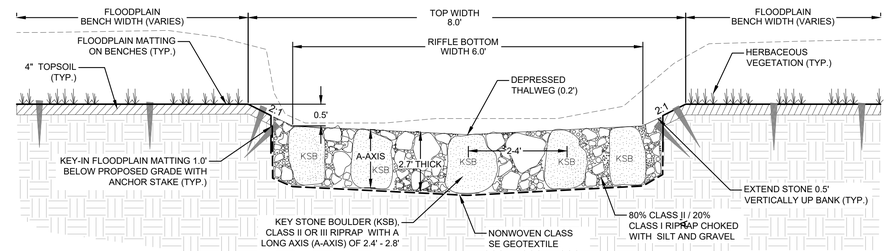
NOT TO SCALE



RIFFLE GRADE CONTROL (RGC) WITH FLOODPLAIN BENCH - STREAM SR-3 - PROFILE A-A'

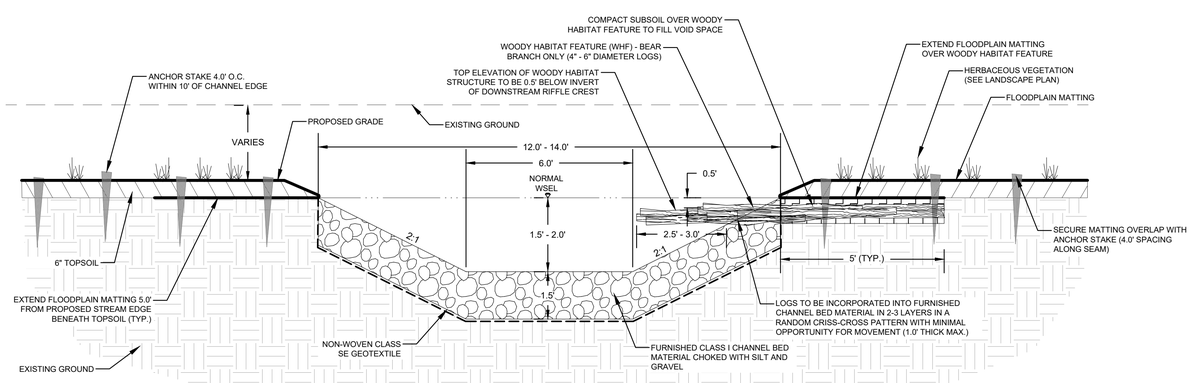
KEY-STONE BOULDER NOTE: KEY-STONE BOULDERS CAN BE EITHER CLASS II OR III RIPRAP AS LONG AS THE LENGTH OF THE LONG AXIS (A-AXIS) IS 2.4' - 2.8'

NOT TO SCALE



RIFFLE GRADE CONTROL (RGC) WITH FLOODPLAIN BENCH- STREAM SR-3 - SECTION B-B'

NOT TO SCALE



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

NOT TO SCALE

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.LICENSE NO. 28371, EXPIRATION DATE: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

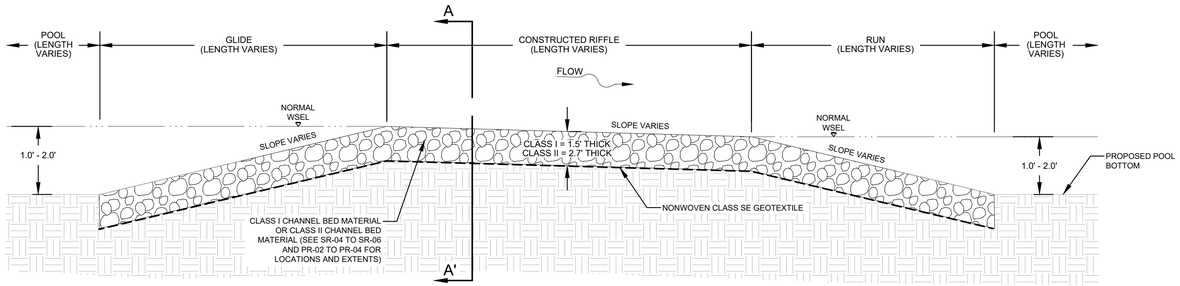
Drawn By :	PJB,JLL	Scale :	N/A
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	DE-02 of DE-05	Sheet No.	17 of 20

BID No.:

HCG DWG ID No.:

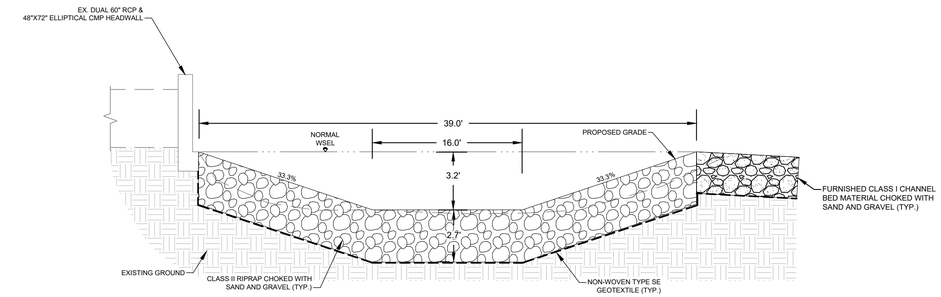
SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pDE-P000_NorthReardon.dwg Aug 15, 2023 1:30pm lturner



SR-9 FLOODPLAIN RESTORATION REACH - TYPICAL CHANNEL PROFILE

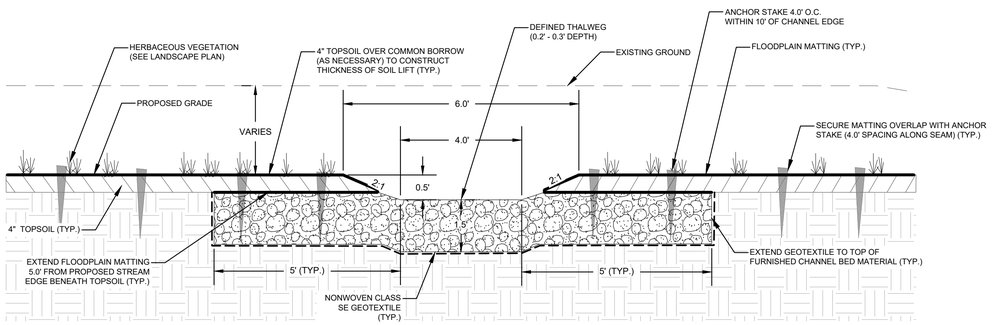
NOT TO SCALE



PREFORMED SCOUR POOL (PSP) - TYPICAL DETAIL - PROFILE VIEW

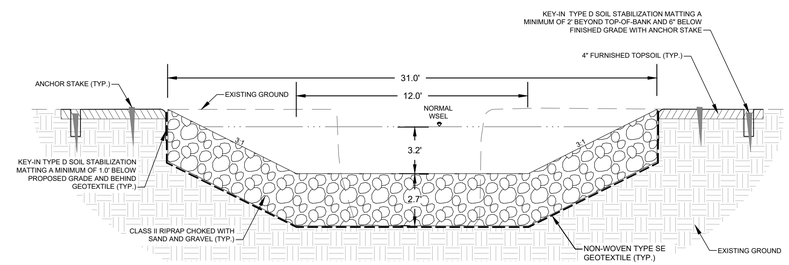
NOTE: SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS

NOT TO SCALE



SR-9 FLOODPLAIN RESTORATION REACH - CONSTRUCTED RIFFLE - SECTION A-A'

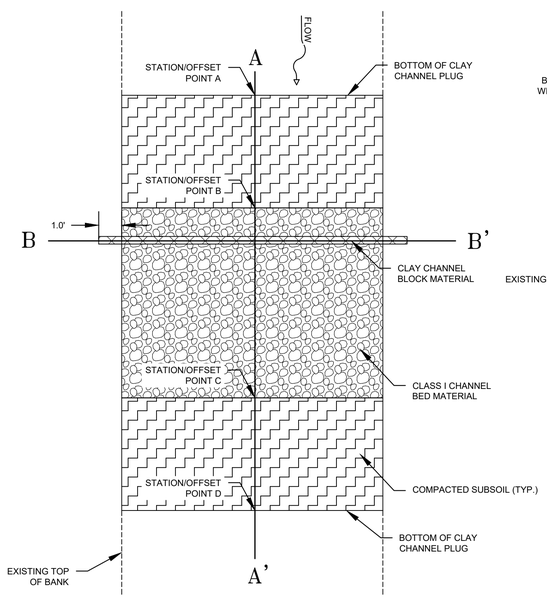
NOT TO SCALE



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

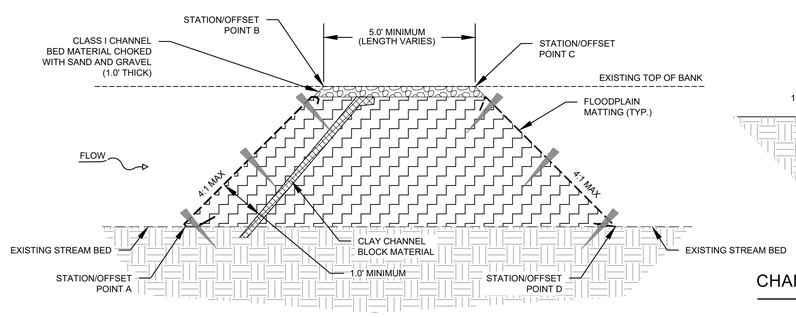
NOTE: SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS

NOT TO SCALE



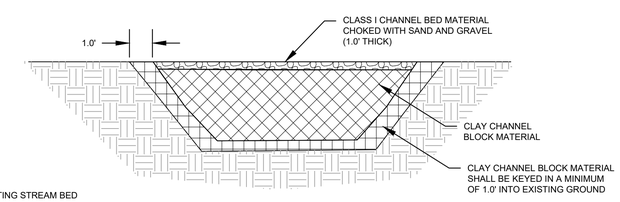
CHANNEL PLUG (CP) - PLAN VIEW

NOT TO SCALE



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

NOT TO SCALE



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

NOT TO SCALE

CHANNEL PLUG SEQUENCE OF CONSTRUCTION::

1) THE EXISTING CHANNEL SHALL BE FILLED WITH ON-SITE COMPACTED COMMON BORROW.
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.
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.

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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

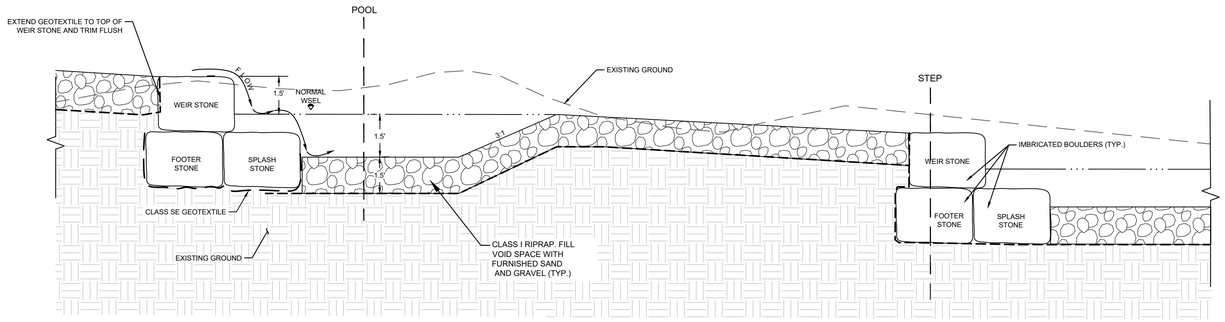
Drawn By :	PJB,JLL	Scale :	N/A
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	DE-03 of DE-05	Sheet No.	18 of 20

BID No.:

HCG DWG ID No.:

SCALE : 1 inch

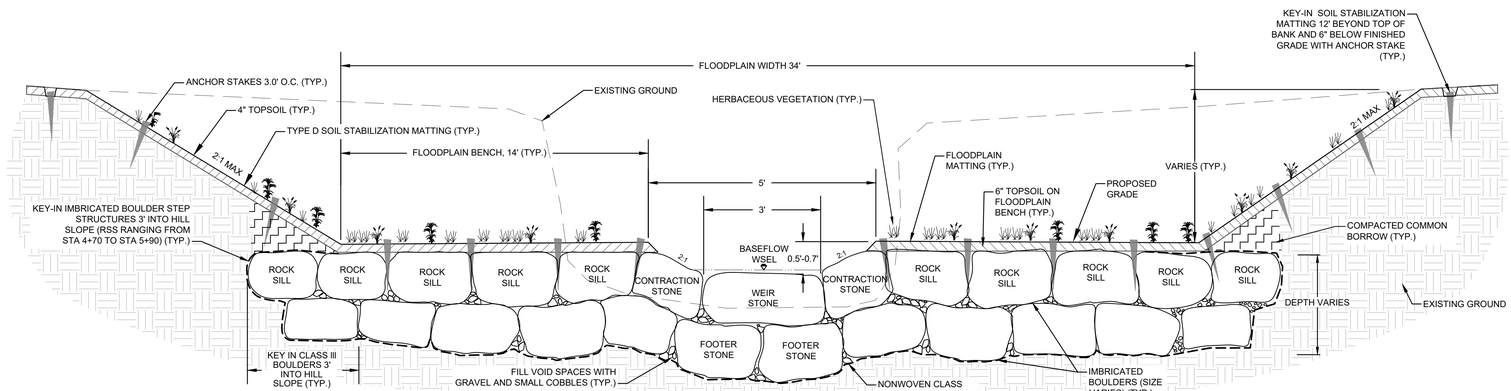
T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\pDE-P000_NorthReardon.dwg Aug 15, 2023 1:30pm lturner



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

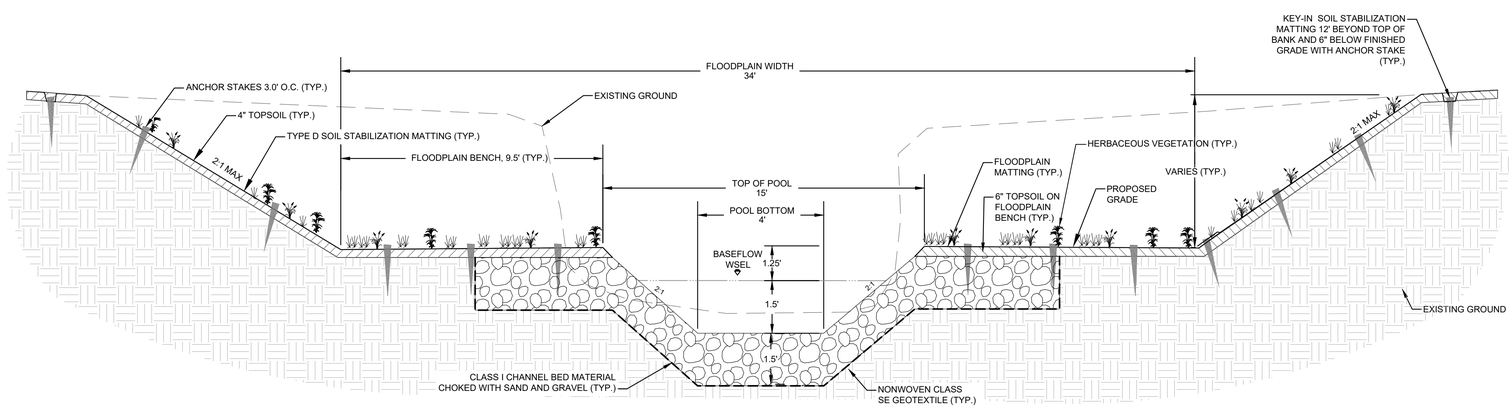
NOT TO SCALE

NOTES:
- SEE PLAN AND PROFILE SHEETS FOR EXACT ELEVATIONS, GRADES, AND STRUCTURE LOCATIONS.
- FURNISHED SAND AND GRAVEL SHALL BE WASHED IN TO FURNISHED BED MATERIALS BY HYDRAULIC ACTION.



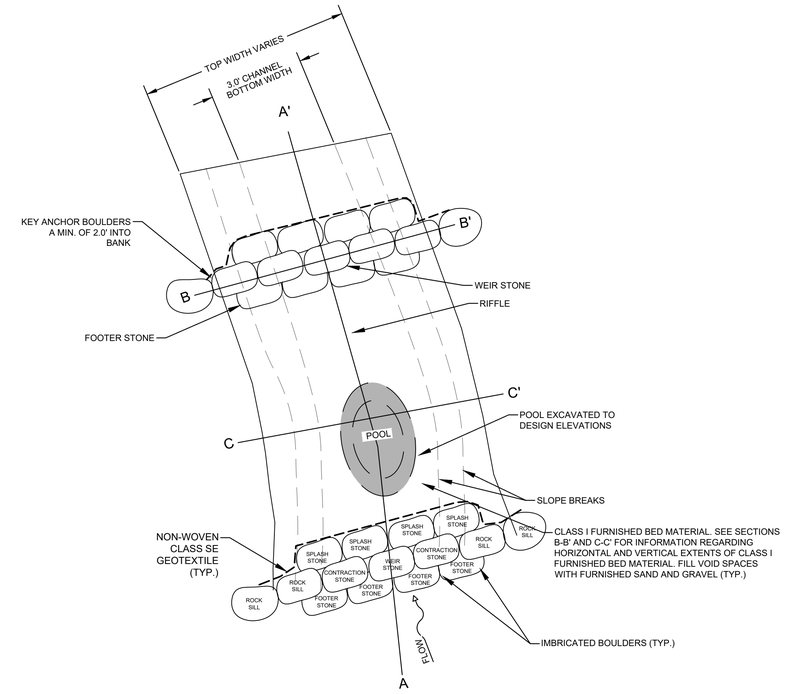
STREAM SR-9 ROCK STEP STRUCTURE (RSS) - SECTION VIEW B-B' (STEP)

NOT TO SCALE



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

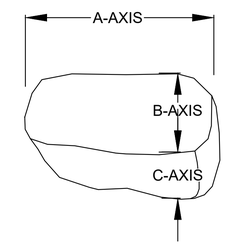
NOT TO SCALE



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



IMBRICATED BOULDER DETAIL - TYPICAL DETAIL

NOT TO SCALE

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

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: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Drawn By : PJB,JLL

Designed By : IPT

Reviewed By : CAL

Scale : N/A

Date : 08 / 23

Drawing No. DE-04 of DE-05

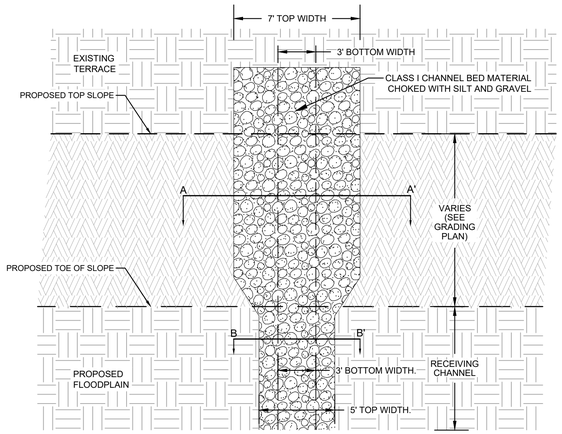
Sheet No. 19 of 20

BID No.:

HCG DWG ID No.:

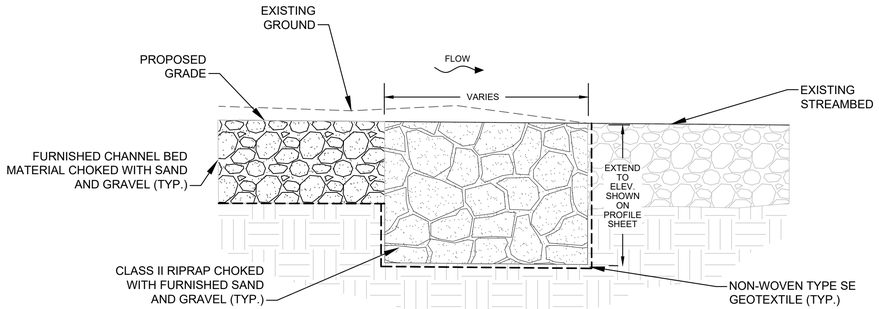
SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CADD\phE-PH00_NorthReardon.dwg Aug 15, 2023 1:30pm lturner



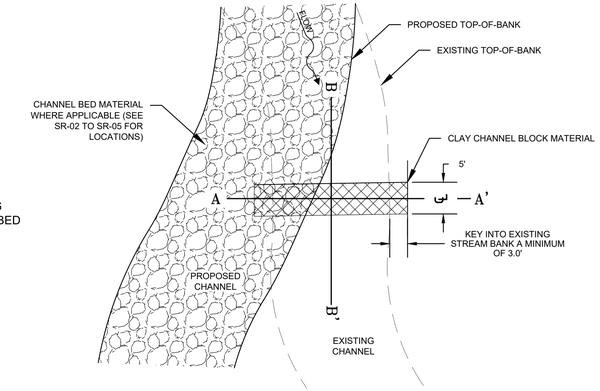
RIPRAP SLOPE STABILIZATION - PLAN VIEW

NOT TO SCALE



CLASS II RIPRAP BED SILL - PROFILE VIEW

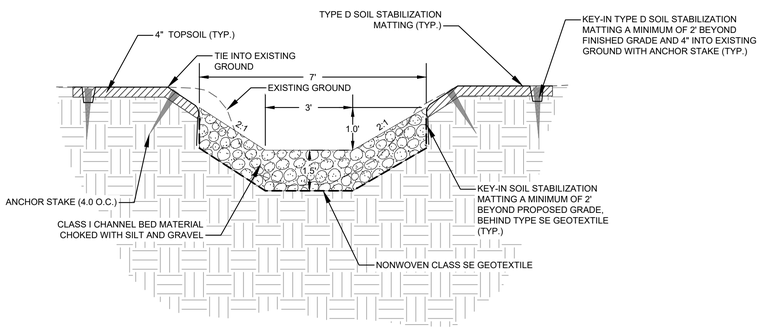
NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) - PLAN VIEW

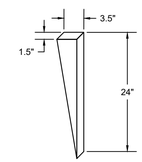
NOT TO SCALE

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



RIPRAP SLOPE STABILIZATION - SECTION A-A'

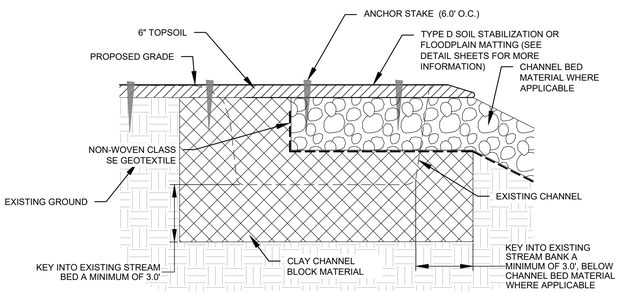
NOT TO SCALE



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.



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

NOT TO SCALE

NOTES:

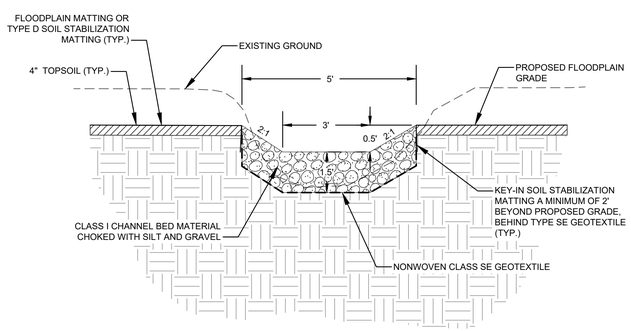
1. ALL TYPICAL SECTIONS ARE AS VIEWED FACING DOWNSTREAM
2. ANCHOR STAKES SHALL BE SPACED 4.0' O.C. WITHIN 10' OF CHANNEL EDGE, OVER SUBGRADE FURNISHED CHANNEL BED MATERIAL, AND ALONG ALL SEAMS. ANCHOR STAKES SHALL BE SPACED 6.0' O.C. IN ALL OTHER LOCATIONS.
3. SEEDING MUST OCCUR PRIOR TO PLACEMENT OF 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. SILT AND GRAVEL 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.

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 6241	D4491	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	1.1	0.21	80
		WOVEN, MONOFILAMENT	370	900	0.28	0.21	100

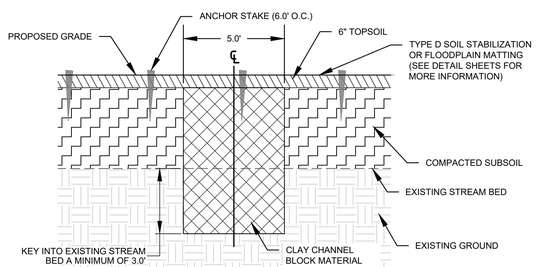
NOTE 1: ALL PROPERTY VALUES IN THE ABOVE TABLE ARE BASED ON MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPLE DIRECTION EXCEPT FOR APPARENT OPENING SIZE.
NOTE 2: THE ULTRAVIOLET STABILITY SHALL BE 50 PERCENT AFTER 500 HRS OF EXPOSURE FOR ALL CLASSES, EXCEPT CLASS F, WHICH SHALL BE 70 PERCENT (D 4355).

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



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

NOT TO SCALE



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

NOT TO SCALE

BILLING NO. TBD

EG-SWMENG- TBD

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.LICENSE NO. 28371, EXPIRATION DATE: 01/01/2024.

Revisions

HARFORD COUNTY, MARYLAND

NORTH REARDON STREAM RESTORATION

DETAIL SHEET

Drawn By :	PJB,JLL	Scale :	N/A
Designed By :	IPT	Date :	08 / 23
Reviewed By :	CAL		
Drawing No.	DE-05 of DE-05	Sheet No.	20 of 20

BID No.:

HCC DWG ID No.:

SCALE: 1 inch

T:\2022\Transportation\221073.003A Harford Co - N Reardon Stream\CAD3\pDE-PD00_NorthReardon.dwg Aug 15, 2023 1:30pm flurner