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4	SITE PLAN
5	POND AND CHANNEL PROFILE SHEET
6	STORM DRAIN PROFILE AND DETAILS
7	RISER DETAIL SHEET
8	STORMWATER MANAGEMENT DETAILS
9-10	CHANNEL STABILIZATION DETAIL SHEETS
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23	SOIL BORING AND DRIVE TESTS

HOWARD COUNTY

Capital Project #D-1159

Diversified Lane

Principal Spillway Replacement and Channel Stabilization Project

MDE DAM #576

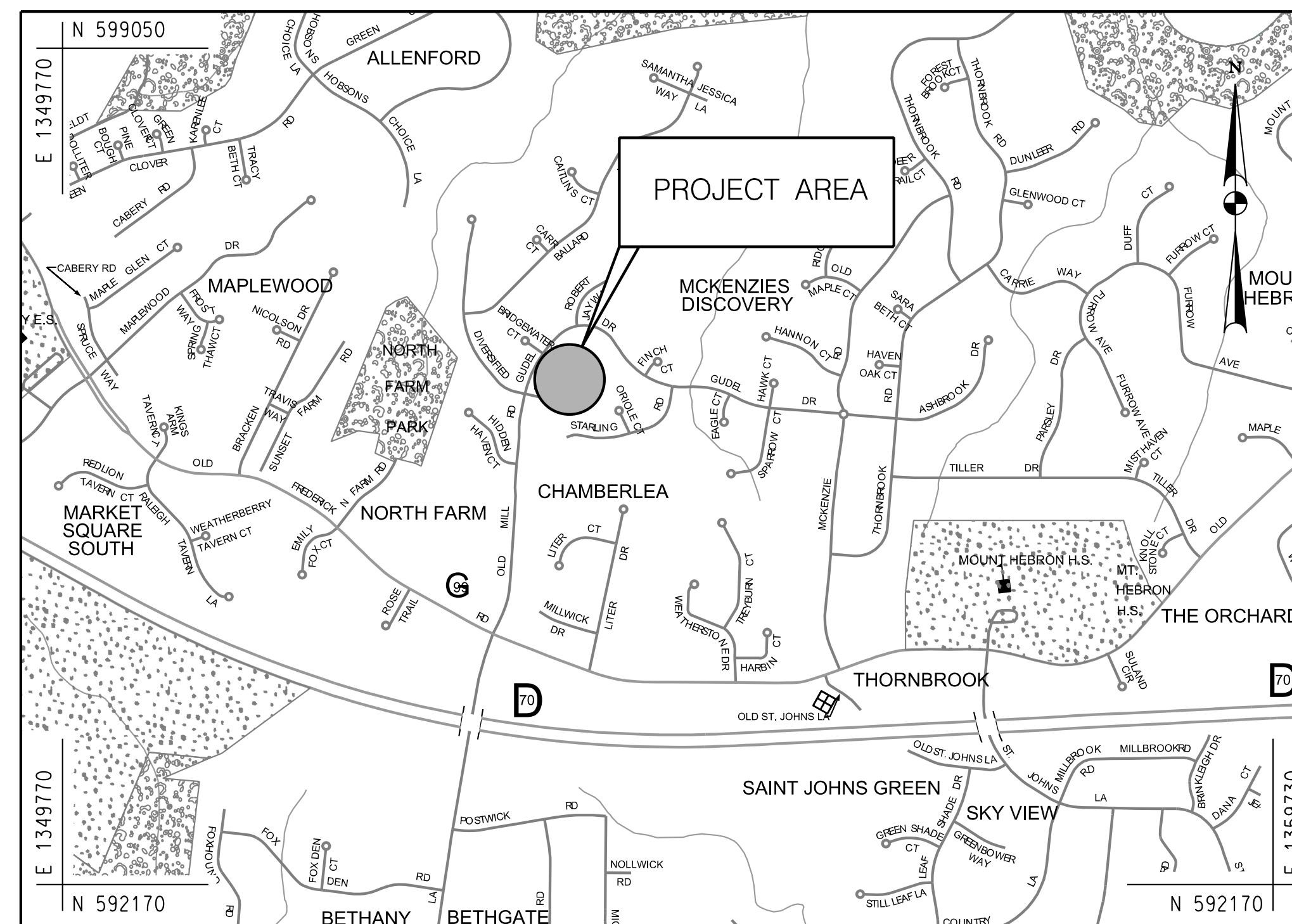
Storm Water Management Division
Bureau Of Environmental Services

GENERAL NOTES

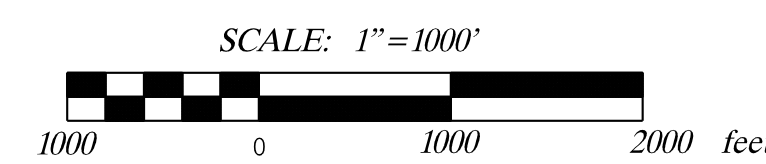
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE.
- THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS /BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AND MDE DAM SAFETY DIVISION AT (410) 537-3655 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK AND SCHEDULE A PRE-CONSTRUCTION MEETING WITH OWNER(S), ENGINEER-IN-CHARGE (EIC), AND CONTRACTOR.
- SURVEY OF THIS SITE WAS PERFORMED BY AB CONSULTANTS, INC - NOVEMBER 2016
- THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. BENCHMARKS SHOWN HEREON WERE PROVIDED BY AB CONSULTANTS, INC.
- WETLANDS AND WATERS OF THE US WERE DELINEATED BY McCORMICK TAYLOR - DECEMBER 2016.
- OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND McCORMICK TAYLOR DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
- THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.
- THE CONTRACTORS SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF 6 INCHES VERTICALLY AND A MINIMUM OF 5 FEET HORIZONTALLY.
- SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY McCORMICK TAYLOR IMMEDIATELY TO RESOLVE THE SITUATION.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
- SITE DEVELOPMENT DETAILS ARE REFERENCED FROM THE AS-BUILT PLANS FOR MARY OAKS, LOTS 1-14 (F-92-052) APPROVED JULY 15, 1996.
- A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (TRACKING NUMBER 201761333)
- PROJECT IMPACTS INCLUDE WORK IN A USE I STREAM. WORK MAY NOT BE CONDUCTED DURING THE PERIOD BETWEEN MARCH 1 AND JUNE 15. THE SITE IS LOCATED WITHIN THE PATAPSCO LOWER NORTH BRANCH WATERSHED WHICH HAS NO TIER II STREAM SEGMENTS REQUIRING THE IMPLEMENTATION OF MARYLAND'S ANTIDEGRADATION POLICY. THE PATAPSCO RIVER WATERSHED HAS BEEN IDENTIFIED AS IMPAIRED AND IS CURRENTLY UNDER A TMDL FOR SEDIMENT, NUTRIENTS, BACTERIA, AND METALS.
- CONTRACTOR SHALL PROVIDE STRUCTURAL SHOP DRAWINGS FOR ALL PRECAST OR PRE-FABRICATED STRUCTURES FOR ENGINEER'S APPROVAL PRIOR TO CONSTRUCTION.

LEGEND

PROPOSED MEDIAN BARRIER	---	---
ELECTRICAL HAND BOX - SIGNALS	---	---
FLOW LINE	---	---
STATE, COUNTY OR CITY LINES	---	---
EXISTING TRAFFIC BARRIER	---	---
PROPOSED FENCE LINE	---	---
EXISTING FENCE LINE	---	---
PROPERTY LINE	---	---
EASEMENT LINE	---	---
EXISTING ROADWAY	---	---
BASE OR SURVEY LINE	---	---
TRAVERSE POINT	---	---
APPROXIMATE LIMITS OF CUT AND/OR FILL	---	---
PROPOSED MAJOR CONTOUR	---	---
PROPOSED MINOR CONTOUR	---	---
LIMIT OF DISTURBANCE	---	---
EXISTING MAJOR CONTOURS	---	---
EXISTING MINOR CONTOURS	---	---
EXISTING PIPE/CULVERT	---	---
EXISTING DROP INLET	---	---
WETLAND	---	---
WATERS OF THE US	---	---
HEDGE /TREE LINE	---	---
BUSH /TREE	---	---
CONIFEROUS TREE	---	---
LIGHT POLE	---	---
SANITARY LINE	---	---
BUSH /TREE TO BE REMOVED	---	---



HORIZONTAL DATUM	NAD 83 /91
VERTICAL DATUM	NAVD 88



DESIGN NARRATIVE

THIS PROJECT, LOCATED IN ELLICOTT CITY, MD, CONSISTS OF THE RETROFIT OF AN EXISTING STORMWATER POND AND ADJACENT STREAM INTO A STEP-POOL SYSTEM DESIGNED TO CAPTURE AND ATTENUATE FLOWS FROM THE 100-YEAR STORM. THE POND WILL BE EXPANDED TO PROVIDE ADDITIONAL STORAGE AND DRAINAGE WILL BE RELEASED VIA A PROPOSED CONCRETE RISER AND 24" RCP PRINCIPAL SPILLWAY PIPE.

NO NEW IMPERVIOUS SURFACES ARE PROPOSED AND THEREFORE NO ADDITIONAL SWM IS REQUIRED. EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED THROUGHOUT THE DURATION OF THE PROJECT.

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. 32013, EXPIRATION DATE: 7/5/2019

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

OWNER'S/DEVELOPER'S CERTIFICATION

I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION PRIOR TO BEGINNING THE PROJECT. I SHALL ENGAGE A MARYLAND REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION, AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.

HOWARD SCD SIGNATURE BLOCK
THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
[Signature]
HOWARD SOIL CONSERVATION DISTRICT
8/23/18
DATE

AS-BUILT CERTIFICATION

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

8-17-18
DATE
MARYLAND REGISTRATION NUMBER 32013
[Signature]
DESIGNER'S SIGNATURE
Amy L. HRIBAR
PRINTED NAME

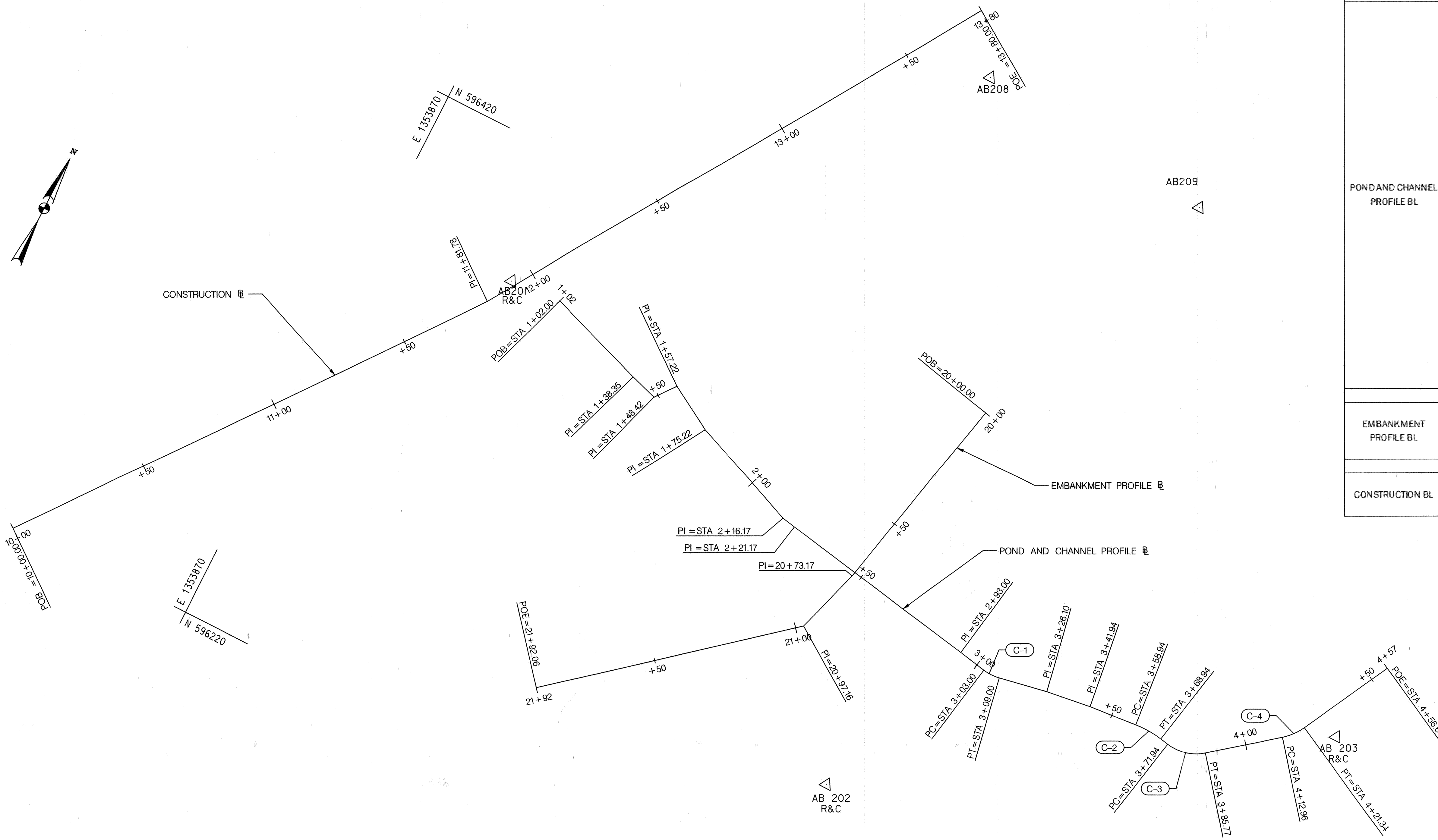
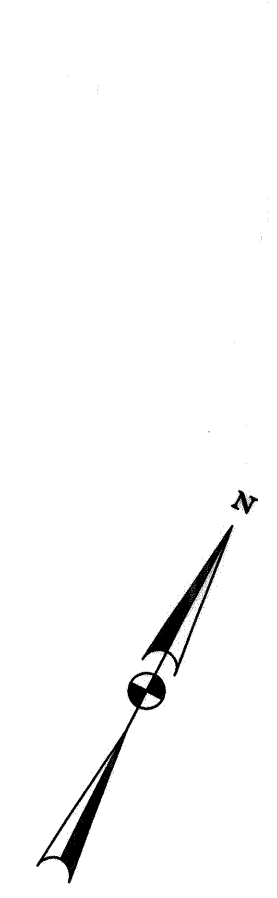
[Signature]
DATE
[Signature]
OWNER/DEVELOPER SIGNATURE
James M. IRIS
PRINTED NAME AND TITLE



Maryland Department of the Environment
Water and Science Administration
Dam Safety Division
[Signature]
V. P. Dalal
Sr. Regulatory & Compliance Engineer
8/23/18
Date
Permit # 18-MR-0005

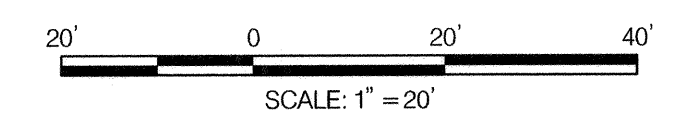
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS 8/21/18 DATE <i>[Signature]</i> CHIEF, STORMWATER MANAGEMENT DIVISION 8/21/18 DATE	McCORMICK TAYLOR 509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400	Howard County MARYLAND Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046-3143 (410) 313-6444	DES: CL /JB	EZS	<input checked="" type="checkbox"/>	AS-BUILT SURVEY	9/17/19
			DRN: MR				
			CHK: AH /LN				
			DATE: 8/17/18	BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576
TITLE SHEET
SCALE AS SHOWN
SHEET 1 OF 23

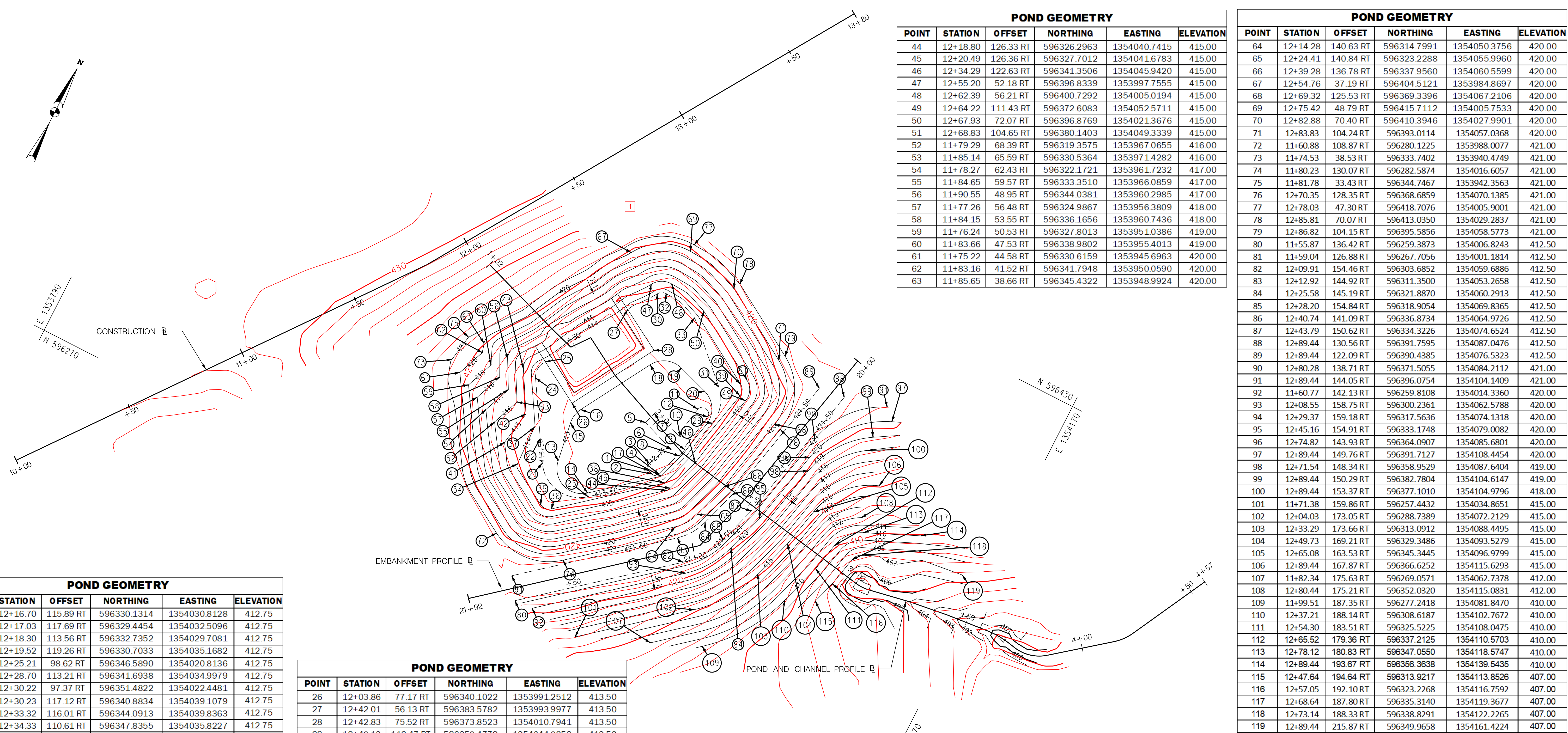


TRAVERSE CONTROL COORDINATES			
POINT	NORTHING	EASTING	ELEVATION
AB 201	596372.9963	1353918.5856	429.60
AB 202	596267.5020	1354094.4785	410.84
AB 203	596362.3698	1354244.0327	400.09
AB 208	596511.1642	1354033.9560	427.08
AB 209	596503.7374	1354118.8364	418.01

POND AND CHANNEL PROFILE BASELINE CURVE DATA								
CURVE NO.	DELTA	Dc	R	T	L	E	CENTER OF CURVE	
							NORTH	EAST
C-1	20° 50' 05.3842"	347° 14' 49.7349"	16.50'	3.03'	6.00'	0.28	596343.8884	1354127.8962
C-2	16° 22' 12.8018"	163° 42' 08.0178"	35.00'	5.03'	10.00'	0.36	596299.8138	1354183.7831
C-3	49° 31' 27.0477"	358° 05' 55.0390"	16.00'	7.38'	13.83'	1.62	596349.3393	1354196.3223
C-4	24° 01' 28.0220"	286° 28' 44.0312"	20.00'	4.26'	8.39'	0.45	596369.4517	1354215.0423



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF ENVIRONMENTAL SERVICES	 McCormick TAYLOR 509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400	 Howard County MARYLAND Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046-3143 (410) 313-6444	 DES: CL /JB DRN: MR CHK: AH /LN DATE: 8/17/18	BY: _____ NO. _____ REVISION _____ DATE _____	DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT HOWARD COUNTY CAPITAL PROJECT #D-1159 HSCD #: EP-17-34 MD DAM NO. 576 GEOMETRY SHEET	SCALE 1" = 20' SHEET 2 OF 23
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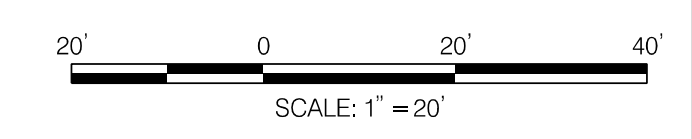
POND GEOMETRY					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
44	12+18.80	126.33 RT	596326.2963	1354040.7415	415.00
45	12+20.49	126.36 RT	596327.7012	1354041.6783	415.00
46	12+34.29	122.63 RT	596341.3506	1354045.9420	415.00
47	12+55.20	52.18 RT	596396.8339	1353997.7555	415.00
48	12+62.39	56.21 RT	596400.7292	1354005.0194	415.00
49	12+64.22	111.43 RT	596372.6083	1354052.5711	415.00
50	12+67.93	72.07 RT	596396.8769	1354021.3676	415.00
51	12+68.83	104.65 RT	596380.1403	1354049.3339	415.00
52	11+79.29	68.39 RT	596319.3575	1353967.0655	416.00
53	11+85.14	65.59 RT	596330.5364	1353971.4282	416.00
54	11+78.27	62.43 RT	596322.1721	1353961.7232	417.00
55	11+84.65	59.57 RT	596333.3510	1353966.0859	417.00
56	11+90.55	48.95 RT	596344.0381	1353960.2985	417.00
57	11+77.26	56.48 RT	596324.9867	1353956.3809	418.00
58	11+84.15	53.55 RT	596336.1656	1353960.7436	418.00
59	11+76.24	50.53 RT	596327.8013	1353951.0386	419.00
60	11+83.66	47.53 RT	596338.9802	1353955.4013	419.00
61	11+75.22	44.58 RT	596330.6159	1353945.6963	420.00
62	11+83.16	41.52 RT	596341.7948	1353950.0590	420.00
63	11+85.65	38.66 RT	596345.4322	1353948.9924	420.00

POND GEOMETRY					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
64	12+14.28	140.63 RT	596314.7991	1354050.3756	420.00
65	12+24.41	140.84 RT	596323.2288	1354055.9960	420.00
66	12+39.28	136.78 RT	596337.9560	1354060.5599	420.00
67	12+54.76	37.19 RT	596404.5121	1353984.8697	420.00
68	12+69.32	125.53 RT	596369.3396	1354067.2106	420.00
69	12+75.42	48.79 RT	596415.7112	1354005.7533	420.00
70	12+82.88	70.40 RT	596410.3946	1354027.9901	420.00
71	12+83.83	104.24 RT	596393.0114	1354057.0368	420.00
72	11+60.88	108.87 RT	596280.1225	1353988.0077	421.00
73	11+74.53	38.53 RT	596333.7402	1353940.4749	421.00
74	11+80.23	130.07 RT	596282.5874	1354016.6057	421.00
75	11+81.78	33.43 RT	596344.7467	1353942.3563	421.00
76	12+70.35	128.35 RT	596368.6859	1354070.1385	421.00
77	12+78.03	47.30 RT	596418.7076	1354005.9001	421.00
78	12+85.81	70.07 RT	596413.0350	1354029.2837	421.00
79	12+86.82	104.15 RT	596395.5856	1354058.5773	421.00
80	11+55.87	136.42 RT	596259.3873	1354006.8243	412.50
81	11+59.04	126.88 RT	596267.7056	1354001.1814	412.50
82	12+09.91	154.46 RT	596303.6852	1354059.6886	412.50
83	12+12.92	144.92 RT	596311.3500	1354053.2658	412.50
84	12+25.58	145.19 RT	596321.8870	1354060.2913	412.50
85	12+28.20	154.84 RT	596318.9054	1354069.8365	412.50
86	12+40.74	141.09 RT	596336.8734	1354064.9726	412.50
87	12+43.79	150.62 RT	596334.3226	1354074.6524	412.50
88	12+89.44	130.56 RT	596391.7595	1354087.0476	412.50
89	12+89.44	122.09 RT	596390.4385	1354076.5323	412.50
90	12+80.28	138.71 RT	596371.5055	1354084.2112	421.00
91	12+89.44	144.05 RT	596396.0754	1354104.1409	421.00
92	11+60.77	142.13 RT	596259.8108	1354014.3360	420.00
93	12+08.55	158.75 RT	596300.2361	1354062.5788	420.00
94	12+29.37	159.18 RT	596317.5636	1354074.1318	420.00
95	12+45.16	154.91 RT	596333.1748	1354079.0082	420.00
96	12+74.82	143.93 RT	596364.0907	1354085.6801	420.00
97	12+89.44	149.76 RT	596391.7127	1354108.4454	420.00
98	12+71.54	148.34 RT	596358.9529	1354087.6404	419.00
99	12+89.44	150.29 RT	596382.7804	1354104.6147	419.00
100	12+89.44	153.37 RT	596377.1010	1354104.9796	418.00
101	11+71.38	159.86 RT	596257.4432	1354034.8651	415.00
102	12+04.03	173.05 RT	596288.7389	1354072.2129	415.00
103	12+33.29	173.66 RT	596313.0912	1354088.4495	415.00
104	12+49.73	169.21 RT	596329.3486	1354093.5279	415.00
105	12+65.08	163.53 RT	596345.3445	1354096.9799	415.00
106	12+89.44	167.87 RT	596366.6252	1354115.6293	415.00
107	11+82.34	175.63 RT	596269.0571	1354062.7378	412.00
108	12+80.44	175.21 RT	596352.0320	1354115.0831	412.00
109	11+99.51	187.35 RT	596277.2418	1354081.8470	410.00
110	12+37.21	188.14 RT	596308.6187	1354102.7672	410.00
111	12+54.30	183.51 RT	596325.5225	1354108.0475	410.00
112	12+65.52	179.36 RT	596337.2125	1354110.5703	410.00
113	12+78.12	180.83 RT	596347.0550	1354118.5747	410.00
114	12+89.44	193.67 RT	596356.3638	1354139.5435	410.00
115	12+47.64	194.64 RT	596313.9217	1354113.8526	407.00
116	12+57.05	192.10 RT	596323.2268	1354116.7592	407.00
117	12+68.64	187.80 RT	596335.3140	1354119.3677	407.00
118	12+73.14	188.33 RT	596338.8291	1354122.2265	407.00
119	12+89.44	215.87 RT	596349.9658	1354161.4224	407.00

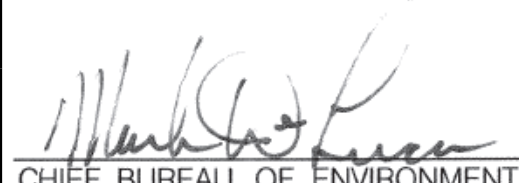
POND GEOMETRY					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
1	12+16.70	115.89 RT	596330.1314	1354030.8128	412.75
2	12+17.03	117.69 RT	596329.4454	1354032.5096	412.75
3	12+18.30	113.56 RT	596332.7352	1354029.7081	412.75
4	12+19.52	119.26 RT	596330.7033	1354035.1682	412.75
5	12+25.21	98.62 RT	596346.5890	1354020.8136	412.75
6	12+28.70	113.21 RT	596341.6938	1354034.9979	412.75
7	12+30.22	97.37 RT	596351.4822	1354022.4481	412.75
8	12+30.23	117.12 RT	596340.8834	1354039.1079	412.75
9	12+33.32	116.01 RT	596344.0913	1354039.8363	412.75
10	12+34.33	110.61 RT	596347.8355	1354035.8227	412.75
11	12+46.01	104.71 RT	596360.8582	1354037.1201	412.75
12	12+47.85	109.36 RT	596359.9153	1354042.0371	412.75
13	11+87.38	94.22 RT	596317.0405	1353996.7799	413.00
14	11+90.99	111.24 RT	596310.9442	1354013.0788	413.00
15	11+99.37	83.60 RT	596332.8602	1353994.2675	413.00
16	12+05.58	81.10 RT	596339.4397	1353995.4898	413.00
17	12+19.77	120.34 RT	596330.3300	1354036.2135	413.00
18	12+38.57	79.71 RT	596368.0128	1354012.0350	413.00
19	12+48.66	87.16 RT	596372.5230	1354023.7460	413.00
20	12+51.98	99.81 RT	596368.5252	1354036.1967	413.00
21	11+81.78	91.86 RT	596313.3053	1353991.6058	413.50
22	11+85.75	82.89 RT	596321.7491	1353986.3483	413.50
23	11+90.45	112.65 RT	596309.7367	1354013.9732	413.50
24	11+96.38	61.09 RT	596342.4271	1353973.6685	413.50
25	12+03.03	57.48 RT	596349.9772	1353974.1973	413.50

POND GEOMETRY					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
26	12+03.86	77.17 RT	596340.1022	1353991.2512	413.50
27	12+42.01	56.13 RT	596383.5782	1353993.9977	413.50
28	12+42.83	75.52 RT	596373.8523	1354010.7941	413.50
29	12+48.13	112.47 RT	596358.4779	1354044.8052	413.50
30	12+55.34	56.68 RT	596394.5304	1354001.6213	413.50
31	12+57.73	101.29 RT	596372.5857	1354040.5346	413.50
32	12+58.48	58.44 RT	596396.2346	1354004.7992	413.50
33	12+63.34	72.58 RT	596392.7396	1354019.3285	413.50
34	11+80.24	87.55 RT	596308.4612	1353982.8581	414.00
35	11+81.71	106.19 RT	596298.2890	1353998.5423	414.00
36	11+81.78	109.62 RT	596298.6834	1354003.1179	414.00
37	11+86.01	77.86 RT	596324.6749	1353982.2425	414.00
38	12+19.70	123.47 RT	596328.5957	1354038.8147	414.00
39	12+63.20	108.61 RT	596373.2621	1354049.6432	414.00
40	12+65.83	104.74 RT	596377.5660	1354047.7934	414.00
41	11+79.37	77.46 RT	596313.8991	1353974.3190	415.00
42	11+85.77	71.58 RT	596327.8456	1353976.8188	415.00
43	11+94.08	55.37 RT	596343.5647	1353967.6147	415.00

AS-BUILT LEGEND
 — AS-BUILT MAJOR CONTOUR
 - - - AS-BUILT MINOR CONTOUR



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND



CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

sr/2/14
 DATE



509 South Exeter Street
 4th Floor
 Baltimore, Maryland 21202
 (410) 662-7400



Storm Water Management Division
 Bureau of Environmental Services
 6751 Columbia Gateway Drive, Suite 514
 Columbia, Maryland 21046-3143
 (410) 313-6444

DES: CL /JB	EZS	1	AS-BUILT SURVEY	9/17/19
DRN: MR				
CHK: AH /LN				
DATE: 8/17/18	BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
 AND CHANNEL STABILIZATION PROJECT
 HOWARD COUNTY CAPITAL PROJECT #D-1159
 HSCD #: EP-17-34
 MD DAM NO. 576

POND GEOMETRY SHEET

SCALE
 1" = 20'

SHEET
 3 OF 23

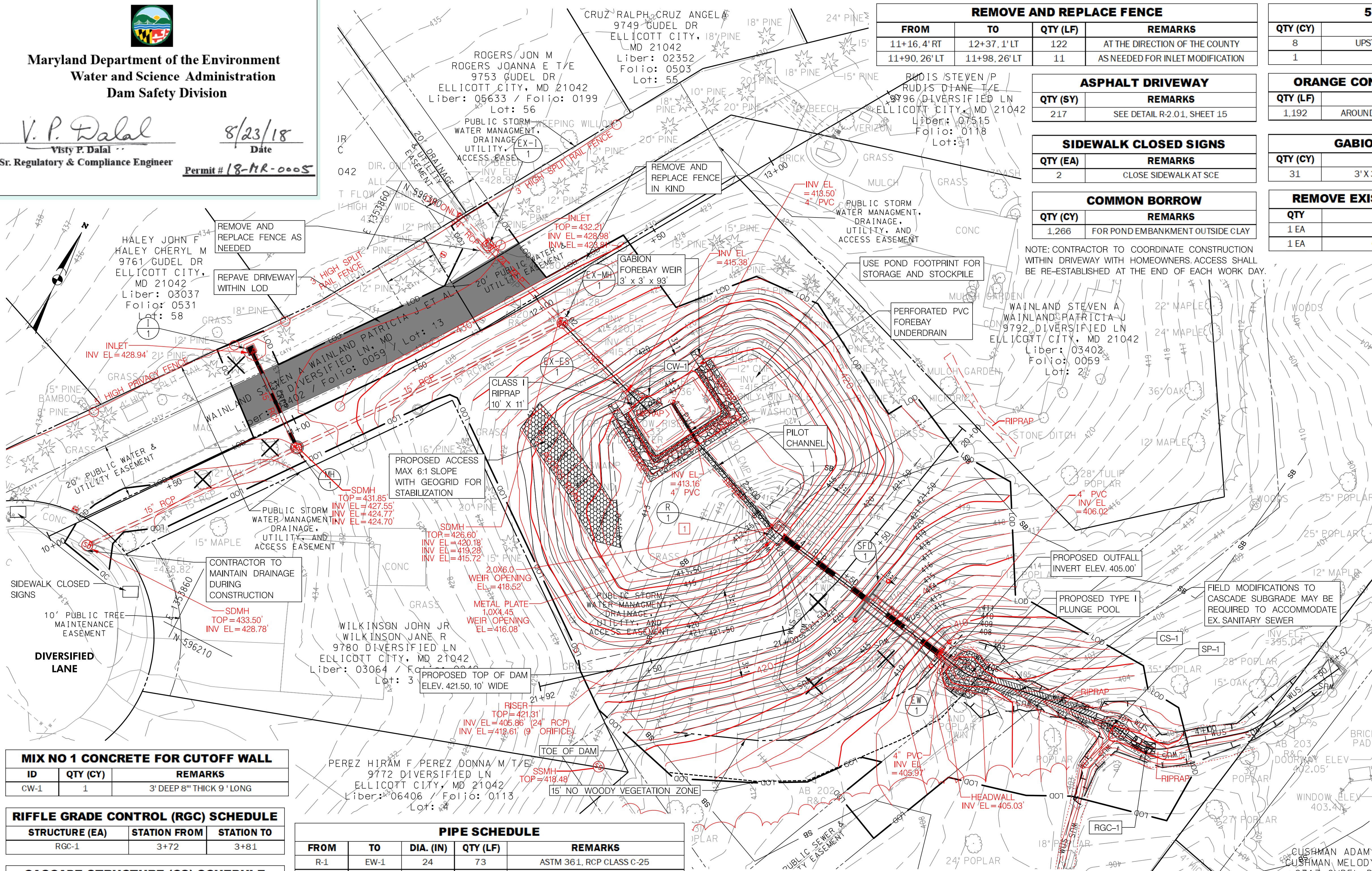
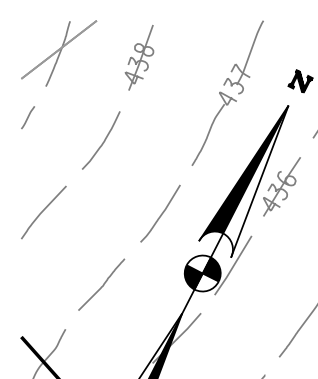


Maryland Department of the Environment
Water and Science Administration
Dam Safety Division

V. P. Dalal
Sr. Regulatory & Compliance Engineer

8/23/18
Date

Permit # 18-NR-0005



MIX NO 1 CONCRETE FOR CUTOFF WALL		
ID	QTY (CY)	REMARKS
CW-1	1	3' DEEP 8" THICK 9' LONG

RIFFLE GRADE CONTROL (RGC) SCHEDULE		
STRUCTURE (EA)	STATION FROM	STATION TO
RGC-1	3+72	3+81

CASCADE STRUCTURE (CS) SCHEDULE		
STRUCTURE (EA)	STATION FROM	STATION TO
CS-1	3+15	3+56

STEP-POOL (SP) SCHEDULE		
STRUCTURE (EA)	STATION FROM	STATION TO
SP-1	STEP-POOL CREST	3+56
	STEP-POOL POOL	3+59
	STEP-POOL CREST	3+69
	STEP-POOL POOL	3+72

PIPE SCHEDULE				
FROM	TO	DIA. (IN)	QTY (LF)	REMARKS
R-1	EW-1	24	73	ASTM 361, RCP CLASS C-25
I-1	MH-1	15	36	RCP, CLASS B-25
INFLOW	FOREBAY	4	18	PERFORATED PVC FOREBAY UNDERDRAIN

CLASS I RIPRAP				
FROM	TO	QTY (SY)	REMARKS	
12+09, 58' RT	12+20, 57' RT	8	FOREBAY INFLOW 19" DEPTH	
12+00, 53' RT	12+44, 52' RT	22	WEIR PROTECTION 19" DEPTH	
12+64, 194' RT	12+73, 206' RT	25	PLUNGE POOL 19" DEPTH	
12+24, 78' RT	12+32, 117' RT	9	FOREBAY TO R-1 PILOT CHANNEL	

DRAINAGE STRUCTURES				
ID	STATION	QTY (EA)	REMARKS	
I-1	10+97, 12' LT	1	YARD INLET, D-4.14. SEE SHEET 6	
EW-1	12+54, 172' RT	1	STD. TYPE "O" FOR 24", DETAIL D-5.4.1, 5.4.2	
R-1	12+25, 100' RT	1	SEE DETAILS, SHEET 7	
SFD-1	12+37, 130' RT	1	SAND FILTER DIAPHRAGM, SEE SHEET 8	
MH-1	10+97, 10' RT	1	PRECAST 4 FT MANHOLE, G-5.12, SEE SHEET 6	
EX-1	11+97, 26' LT	1	EXISTING INLET MODIFICATION, SEE SHEET 6	

REMOVE AND REPLACE FENCE				
FROM	TO	QTY (LF)	REMARKS	
11+16, 4' RT	12+37, 1' LT	122	AT THE DIRECTION OF THE COUNTY	
11+90, 26' LT	11+98, 26' LT	11	AS NEEDED FOR INLET MODIFICATION	

ASPHALT DRIVEWAY	
QTY (SY)	REMARKS
217	SEE DETAIL R-2.0.1, SHEET 15

SIDEWALK CLOSED SIGNS	
QTY (EA)	REMARKS
2	CLOSE SIDEWALK AT SCE

COMMON BORROW	
QTY (CY)	REMARKS
1,266	FOR POND EMBANKMENT OUTSIDE CLAY

NOTE: CONTRACTOR TO COORDINATE CONSTRUCTION WITHIN DRIVEWAY WITH HOMEOWNERS. ACCESS SHALL BE RE-ESTABLISHED AT THE END OF EACH WORK DAY.

57 STONE	
QTY (CY)	REMARKS
8	UPSTREAM FACE OF GABION WALL
1	FOREBAY UNDERDRAIN

ORANGE CONSTRUCTION FENCE	
QTY (LF)	REMARKS
1,192	AROUND ENTIRE LOD AS SHOWN ON PLAN

GABION WEIR WALL	
QTY (CY)	REMARKS
31	3' X 3' X 3' GABION WALL SECTIONS

REMOVE EXISTING STRUCTURES	
QTY	REMARKS
1 EA	CMP RISER
1 EA	CMP PRINCIPAL SPILLWAY

CLAY BACKFILL	
QTY (CY)	REMARKS
350	FOR POND EMBANKMENT

4" TOPSOIL	
QTY (SY)	REMARKS
1,253	FOR GRADED AREAS IN POND

GEOGRID	
QTY (SY)	REMARKS
75	FOR POND ACCESS SLOPE

EXCAVATION	
QTY (CY)	REMARKS
2,280	CLASS 1 EXCAVATION
20	CLASS 5 EXCAVATION

4 INCH PVC SCHEDULE 80			
FROM	TO	QTY (LF)	REMARKS
12+46, 159' RT	12+60, 188' RT	36	SFD-1
12+52, 156' RT	12+63, 188' RT	36	SFD-1
12+41, 160' RT	N/A	12	SFD-1 CLEANOUT
12+56, 154' RT	N/A	12	SFD-1 CLEANOUT
12+59, 189' RT	N/A	3	SFD-1 CLEANOUT
12+65, 187' RT	N/A	3	SFD-1 CLEANOUT

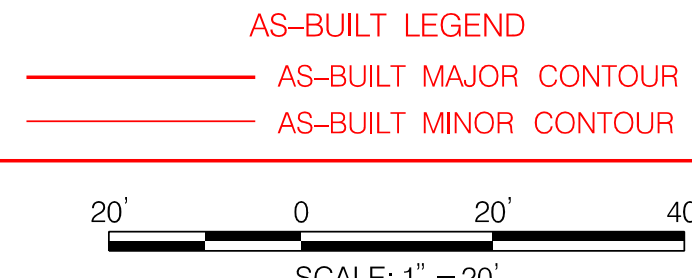
4 INCH PERFORATED PVC SCHEDULE 80			
FROM	TO	QTY (LF)	REMARKS
12+41, 160' RT	12+47, 158' RT	7	SFD-1
12+50, 157' RT	12+56, 154' RT	7	SFD-1

C33 SAND			
FROM	TO	QTY (CY)	REMARKS
12+40, 161' RT	12+57, 153' RT	27	SFD-1

NO. 7 STONE			
FROM	TO	QTY (CY)	REMARKS
12+41, 160' RT	12+63, 188' RT	1	SFD-1

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED SUB MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- WOODS
- PROPERTY LINE
- EASEMENT BOUNDARY
- PROPERTY AND EASEMENT LINE
- WUS - WATERS OF THE US
- TOE OF DAM
- 15' NO WOODY VEGETATION ZONE
- EXISTING SANITARY SEWER
- LOD - LIMIT OF DISTURBANCE
- STREAM BUFFER
- EXISTING 100-YR WSEL
- PROPOSED 100-YR WSEL
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- RIFFLE GRADE CONTROL
- CASCADE STRUCTURE
- STEP-POOL
- PROPOSED ENDWALL
- PROPOSED RISER
- GEOGRID
- PROPOSED RCP
- ASPHALT PATCHING
- NO. 57 STONE
- GABION WEIR WALL
- CLASS I RIPRAP



SCALE: 1" = 20'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Chief, Bureau of Environmental Services

MCCORMICK TAYLOR

509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County
MARYLAND

Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
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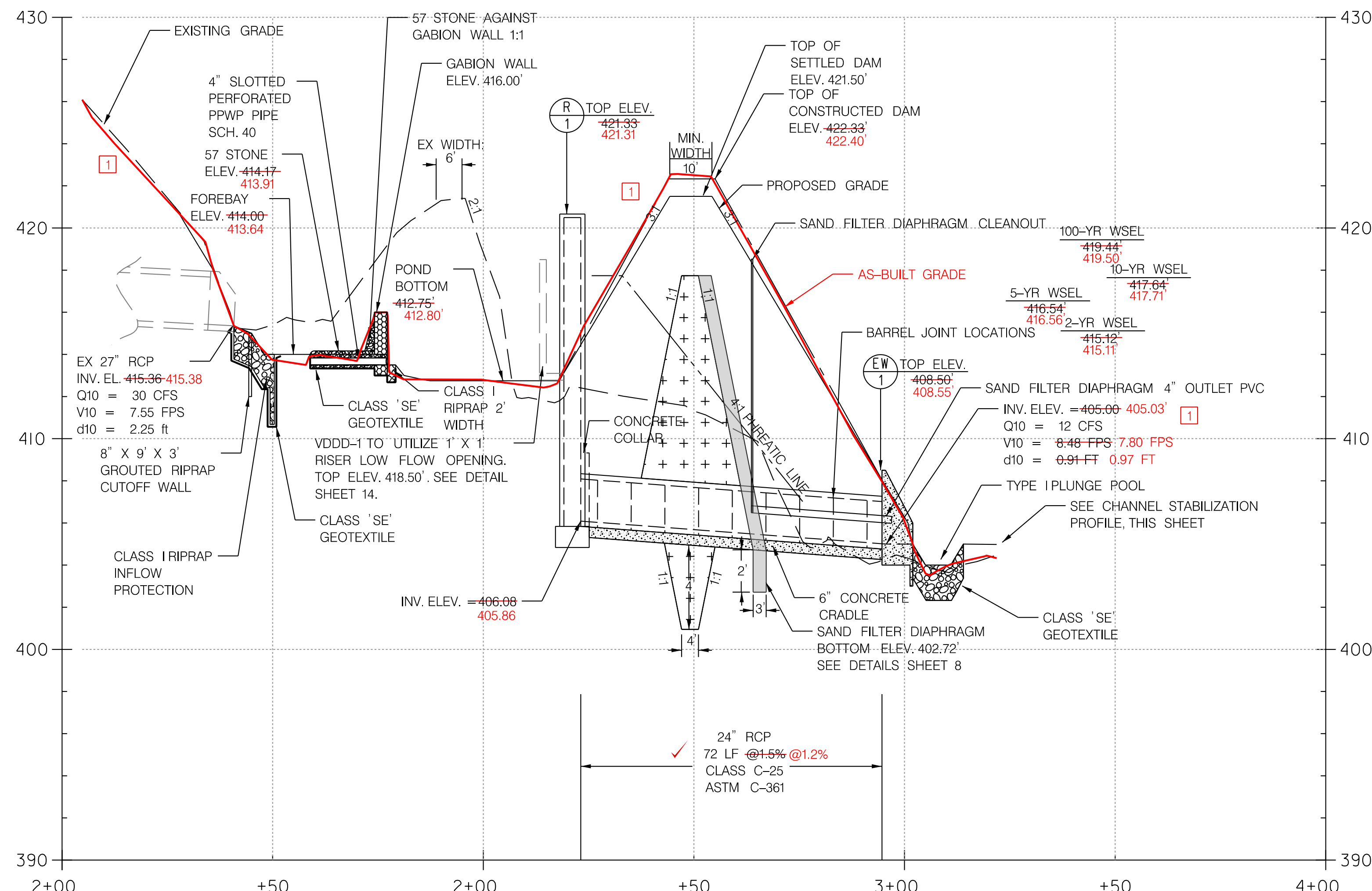


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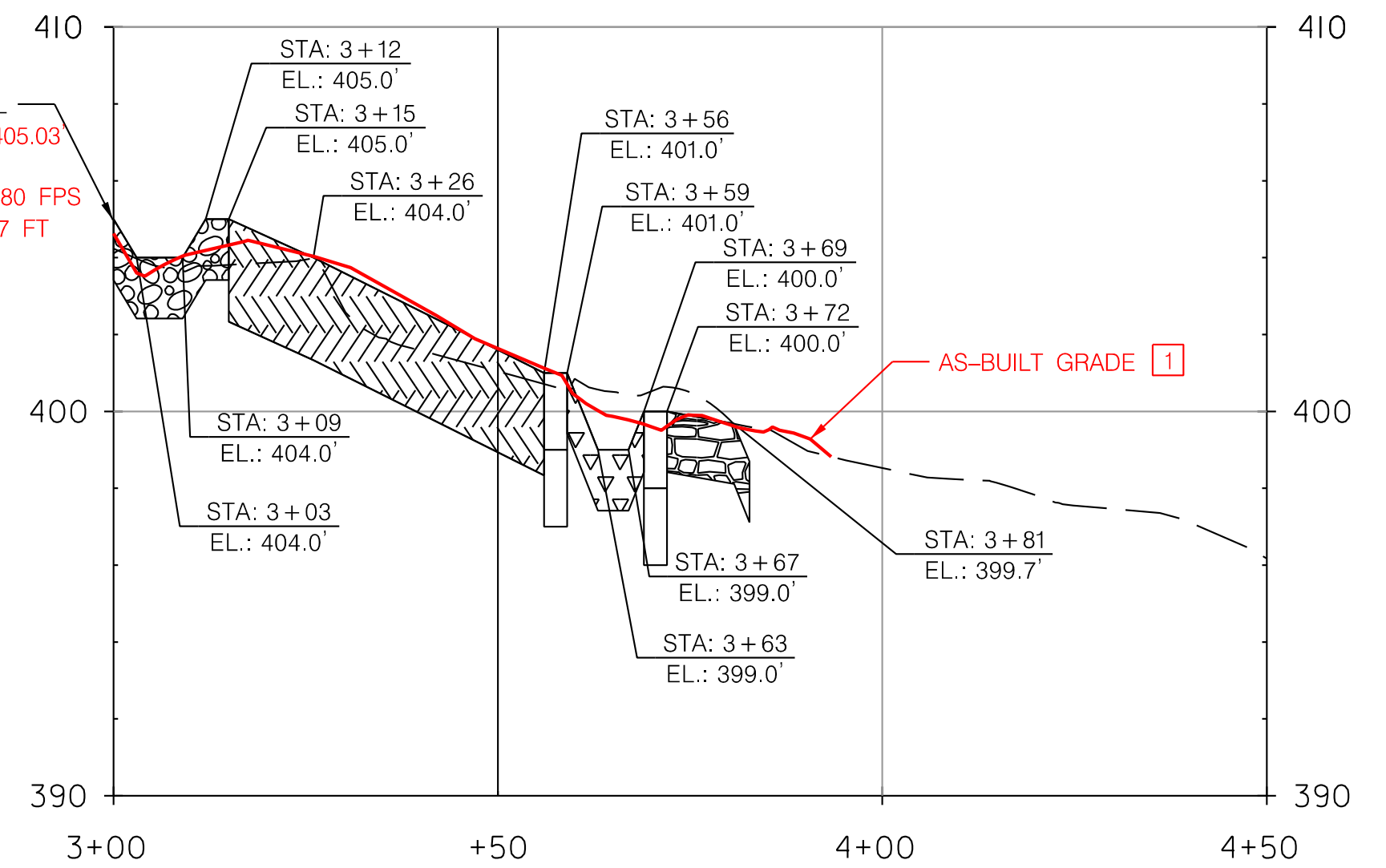
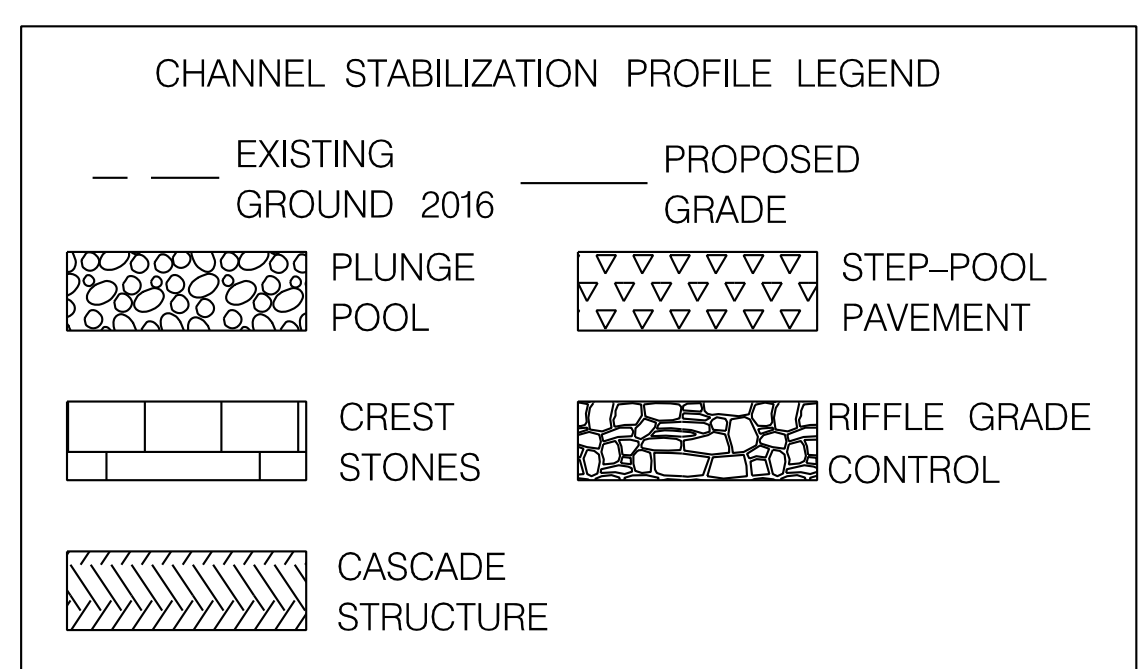
DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

SITE PLAN

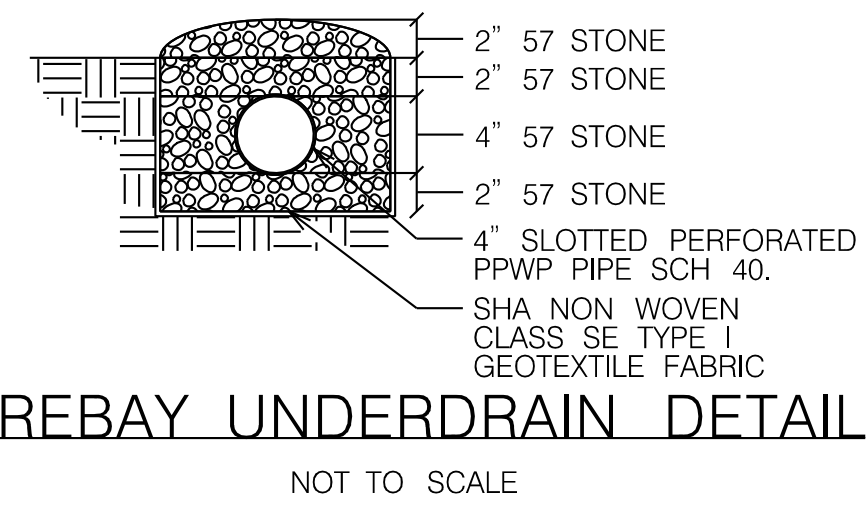
SCALE: 1" = 20'
SHEET: 4 OF 23



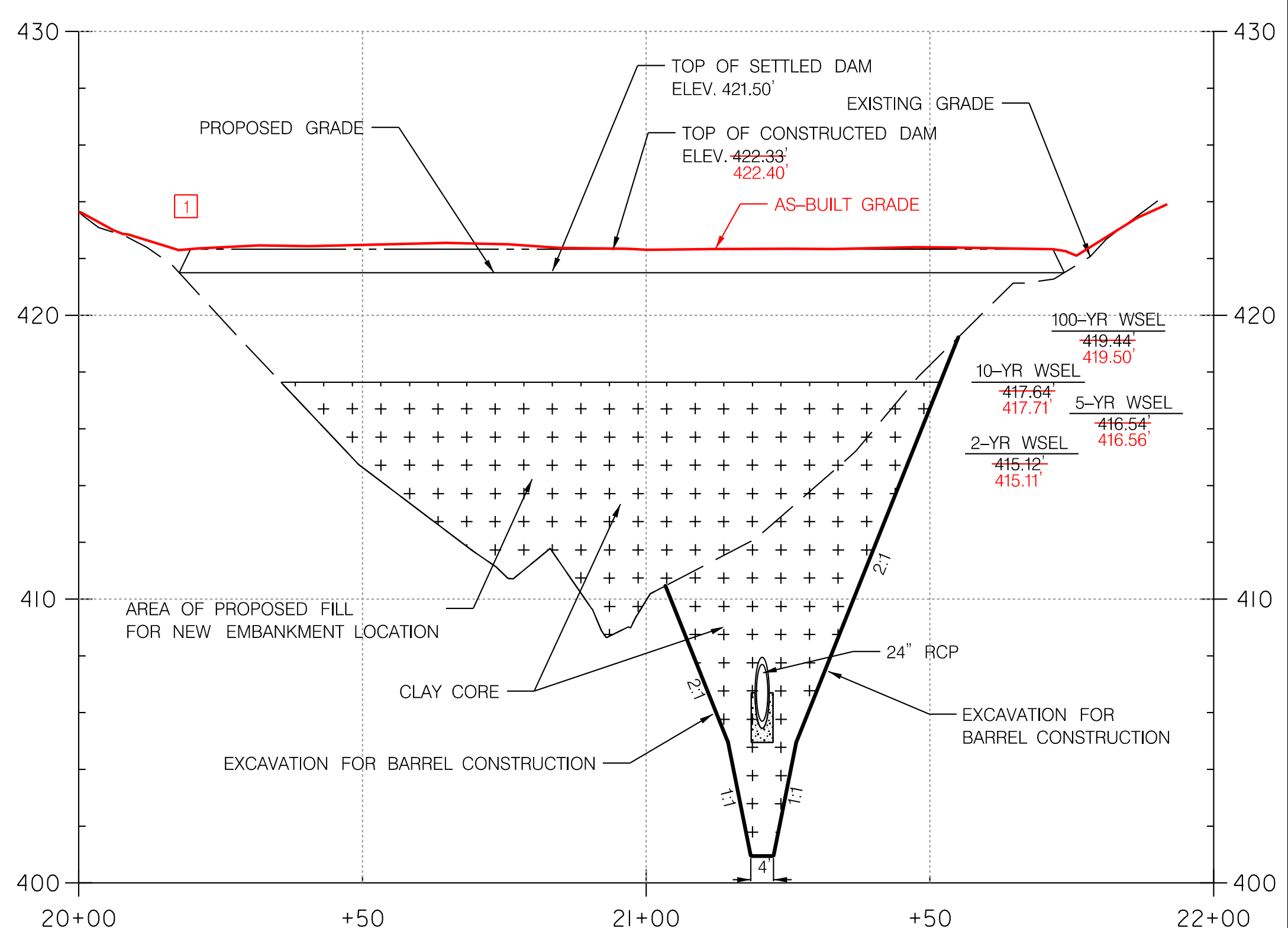
POND PROFILE AND PRINCIPAL SPILLWAY PROFILE
 (STA 1+22 TO STA 4+00)
 HORIZONTAL SCALE: 1" = 20'
 VERTICAL SCALE: 1" = 4'



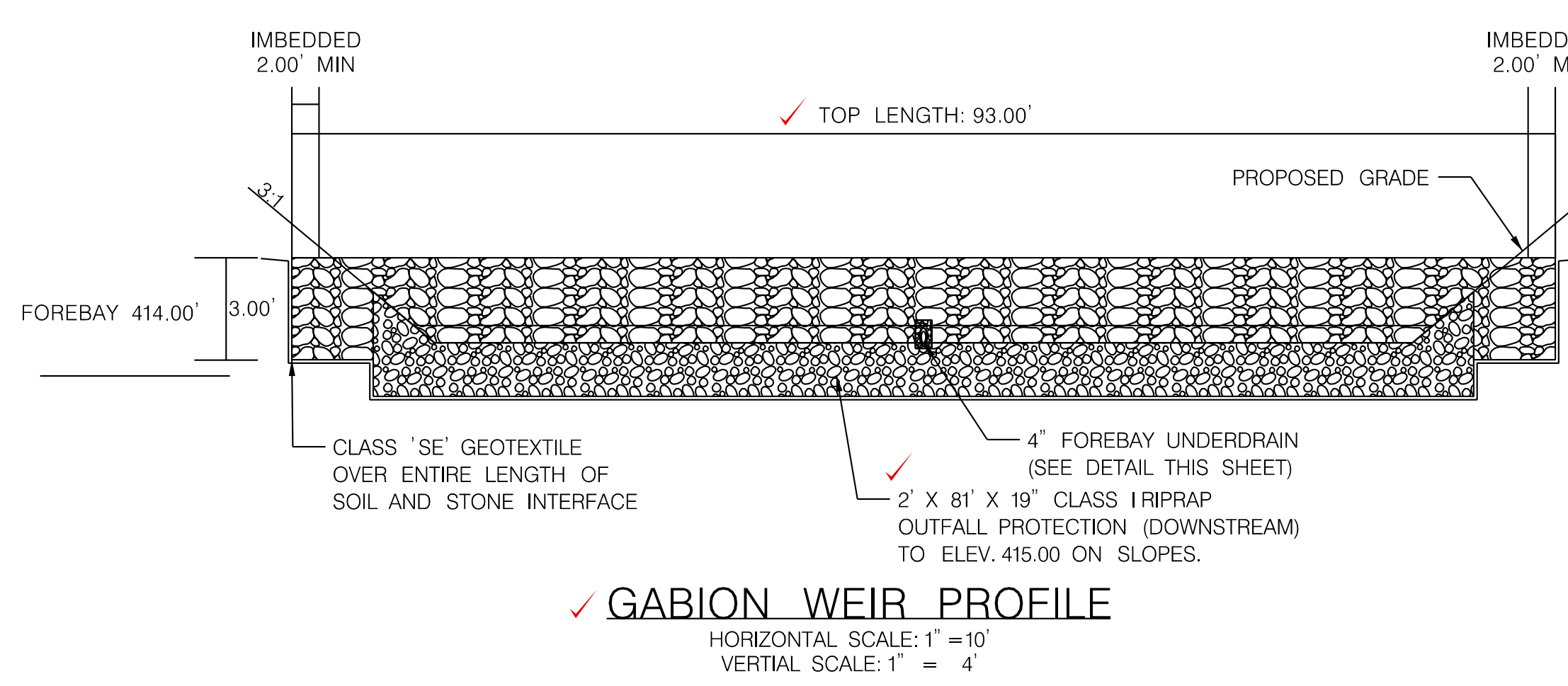
CHANNEL STABILIZATION PROFILE
 HORIZONTAL SCALE: 1" = 20'
 VERTICAL SCALE: 1" = 4'



FOREBAY UNDERDRAIN DETAIL
 NOT TO SCALE



CENTERLINE OF EMBANKMENT PROFILE
 HORIZONTAL SCALE: 1" = 20'
 VERTICAL SCALE: 1" = 4'



GABION WEIR PROFILE
 HORIZONTAL SCALE: 1" = 10'
 VERTICAL SCALE: 1" = 4'

**Maryland Department of the Environment
 Water and Science Administration
 Dam Safety Division**

V. P. Dalal
 V. P. Dalal
 Sr. Regulatory & Compliance Engineer

8/23/18
 Date

Permit # 18-11R-0005

**DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND**

Mark D. ...
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

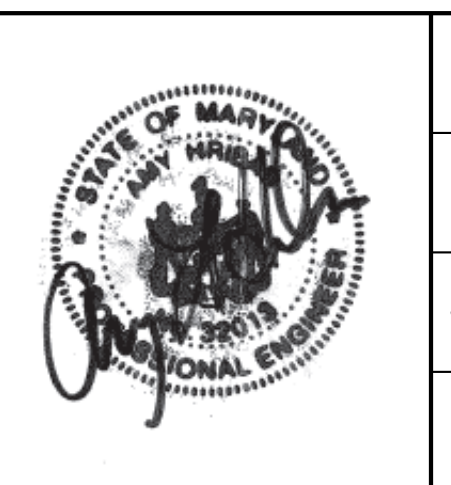
8/22/18
 DATE

McCORMICK TAYLOR

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**Howard County
 MARYLAND**

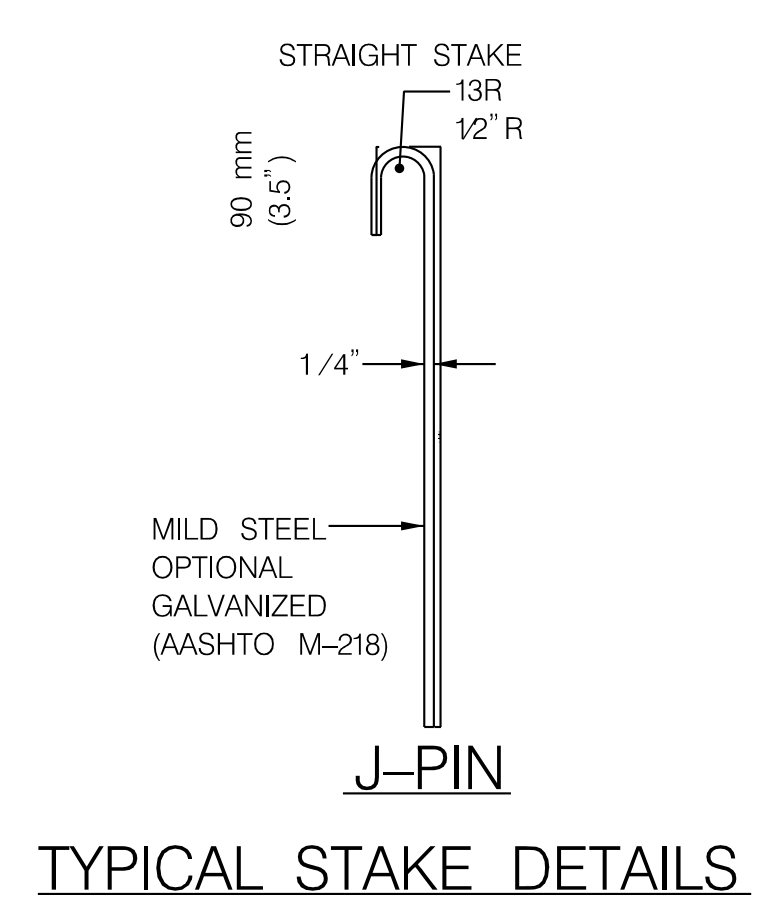
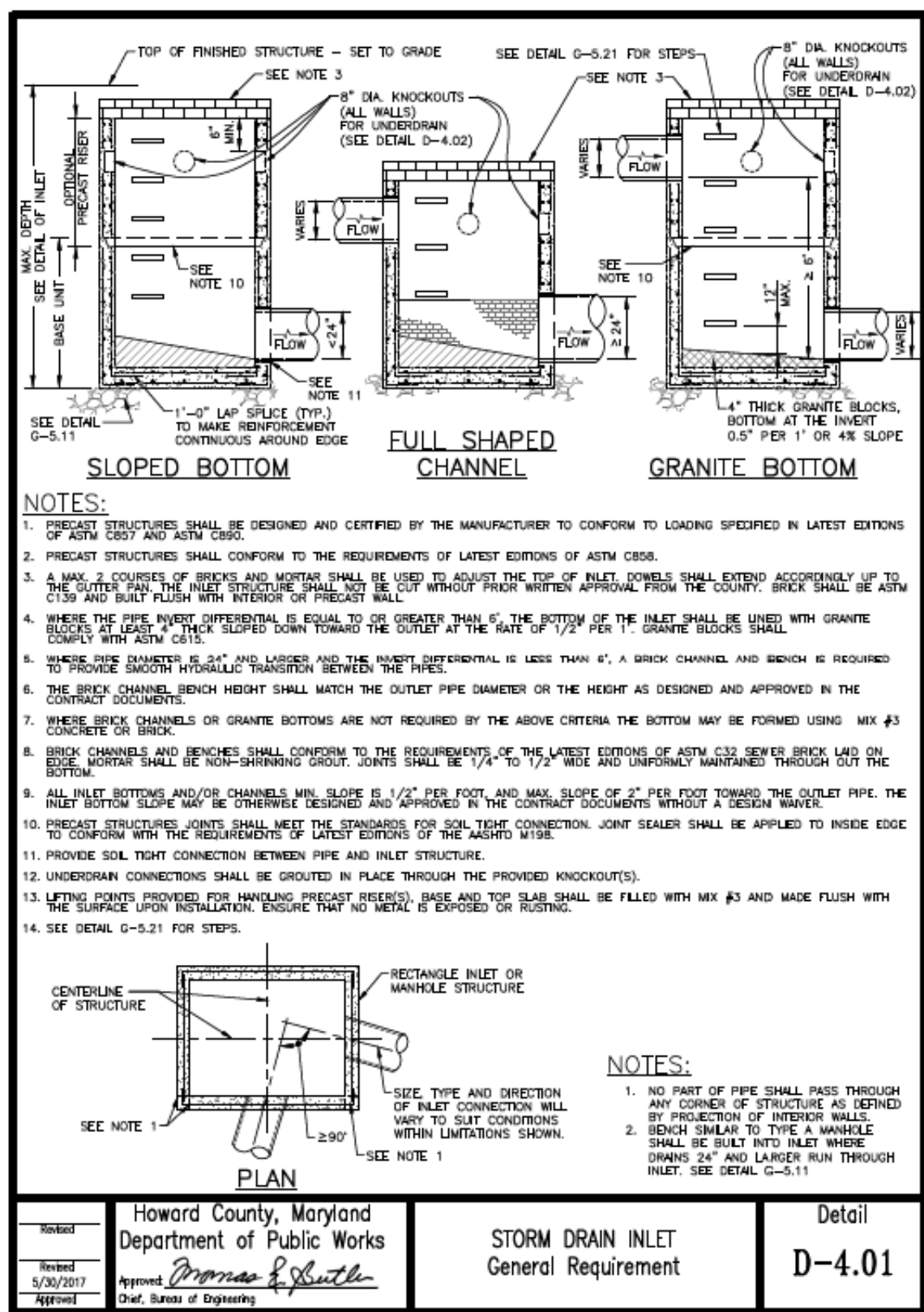
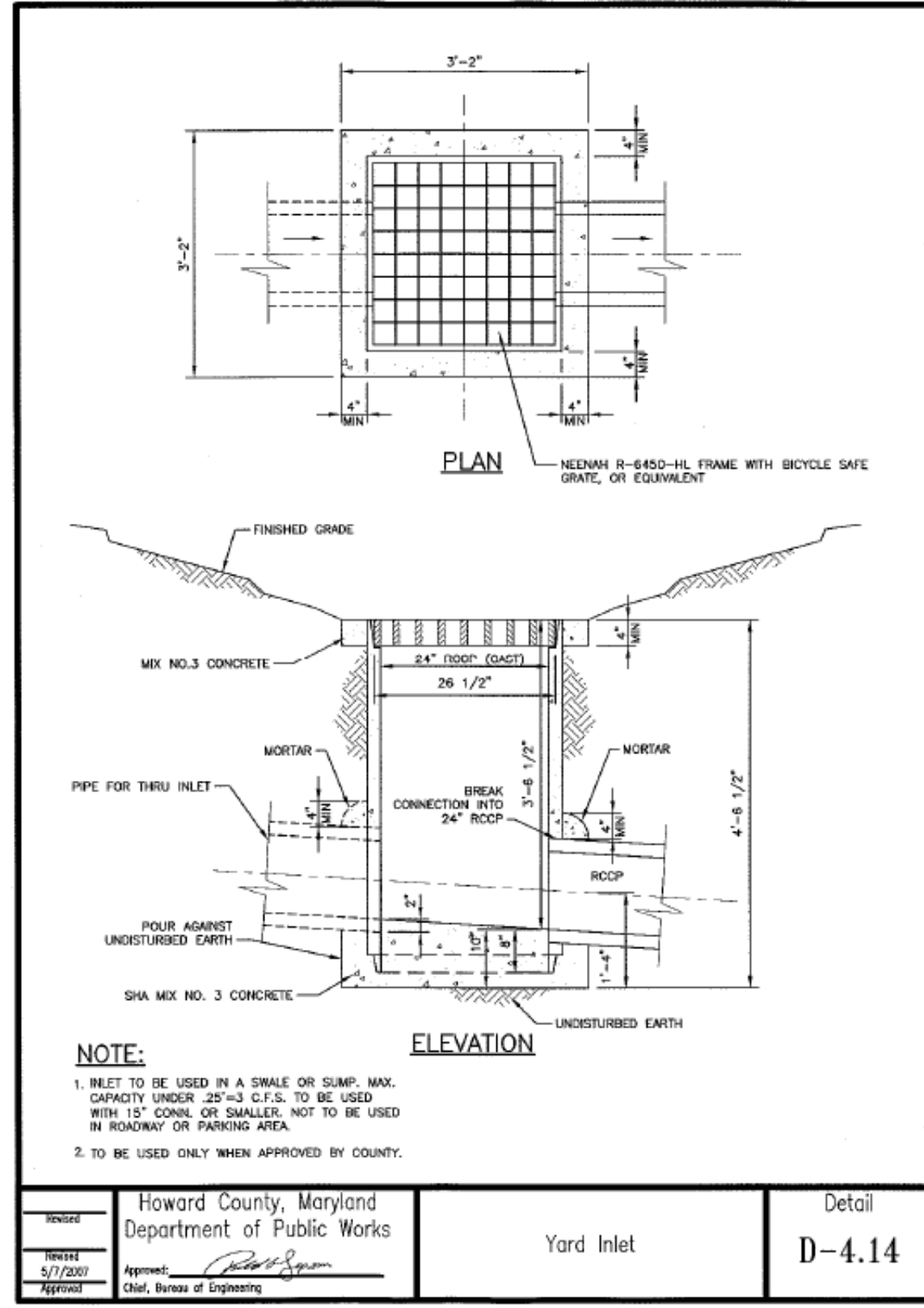
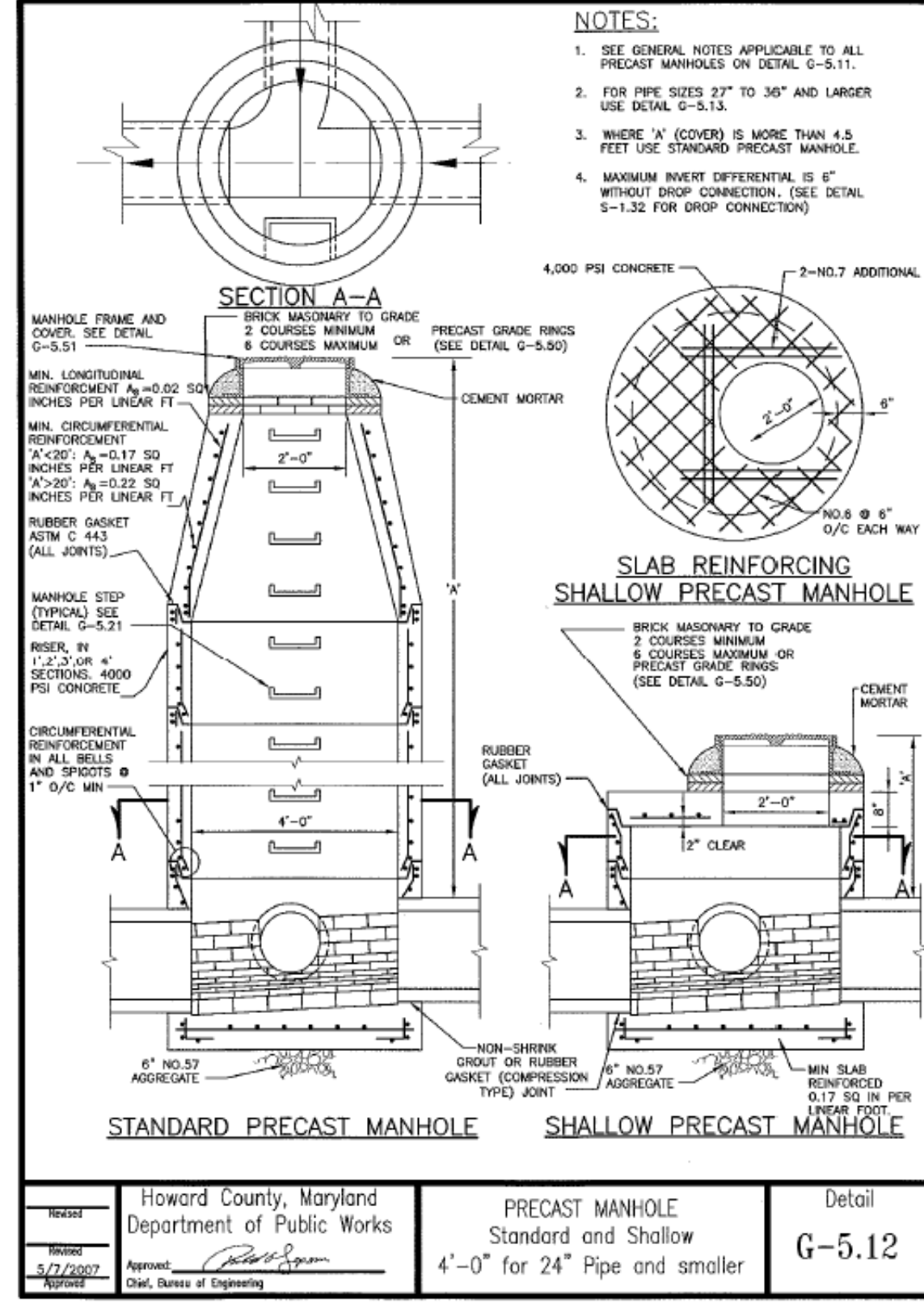
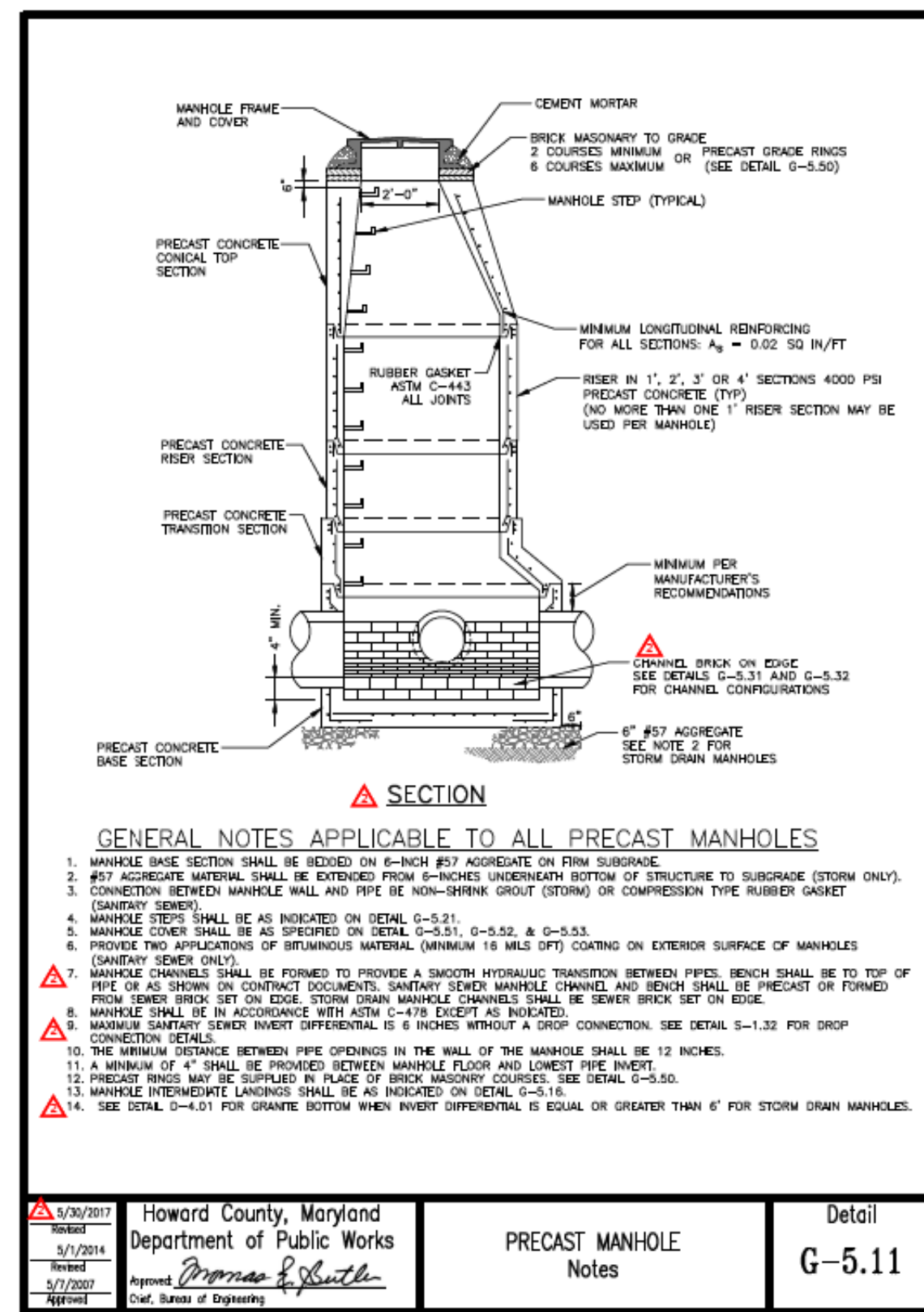
Storm Water Management Division
 Bureau of Environmental Services
 6751 Columbia Gateway Drive, Suite 514
 Columbia, Maryland 21046-3143
 (410) 313-6444



DES: CL /JB	EZS	1	AS-BUILT SURVEY	9/17/19
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**DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
 AND CHANNEL STABILIZATION PROJECT
 HOWARD COUNTY CAPITAL PROJECT #D-1159
 HSCD #: EP-17-34
 MD DAM NO. 576**

POND AND CHANNEL PROFILE SHEET

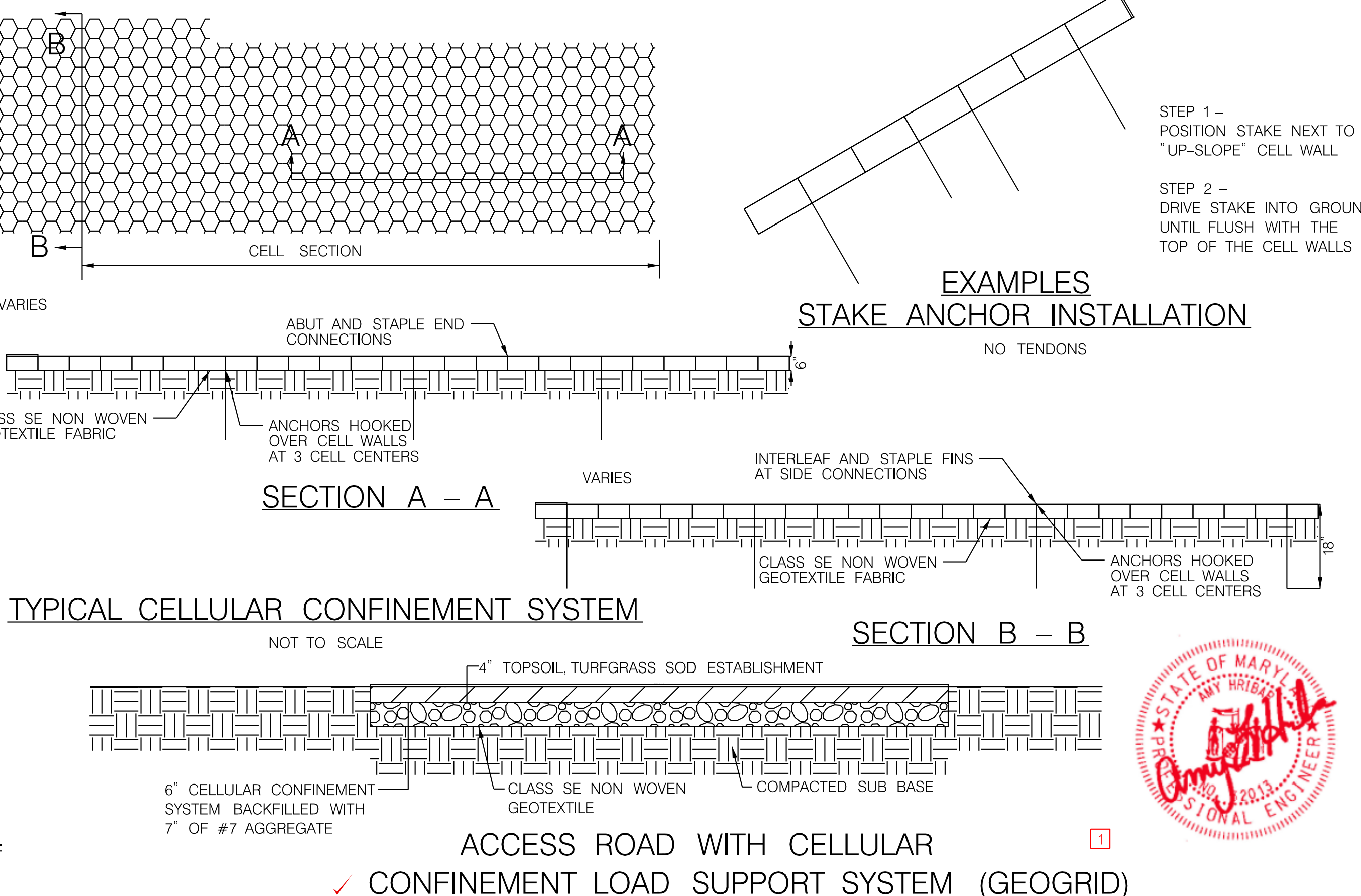
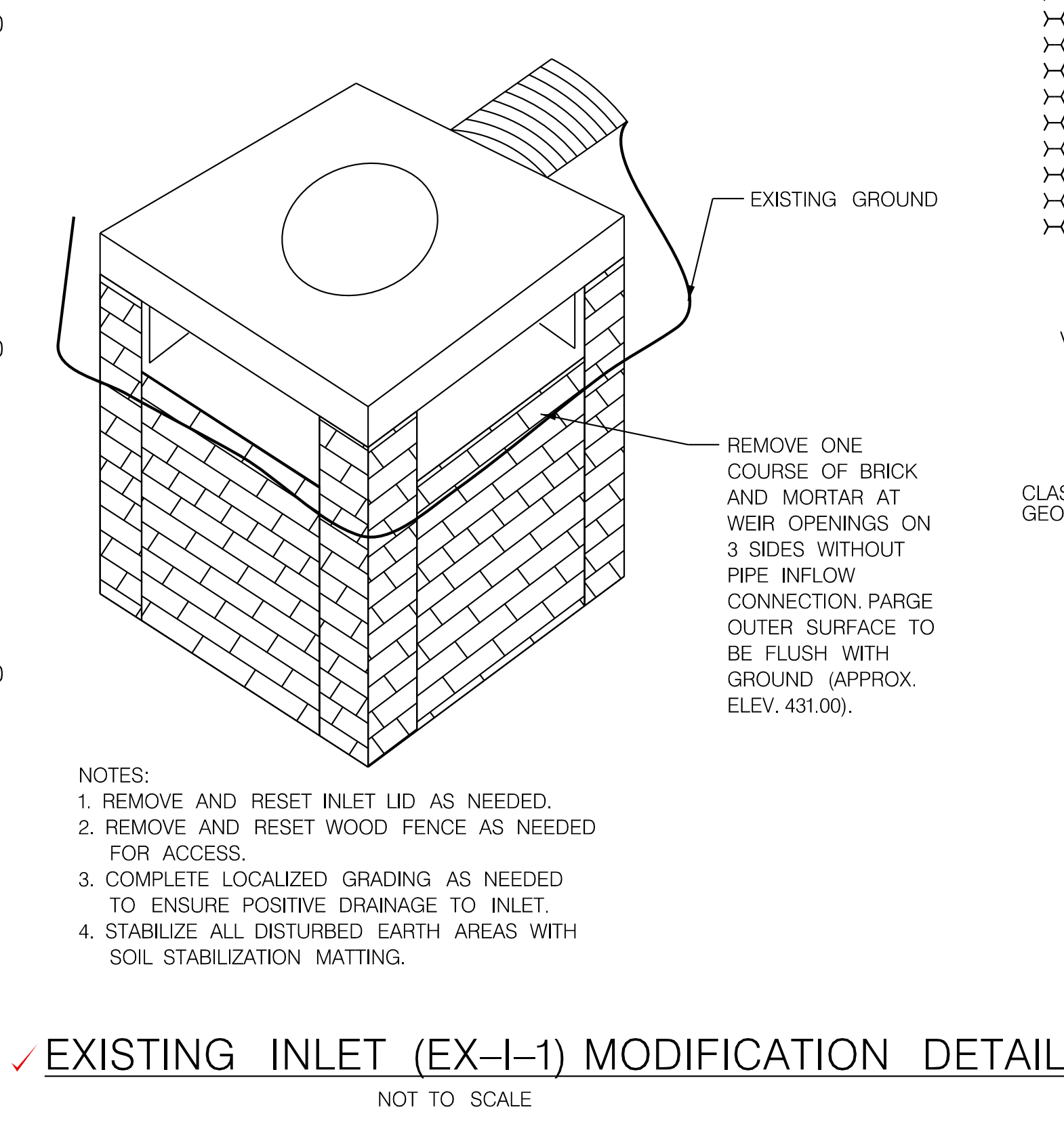
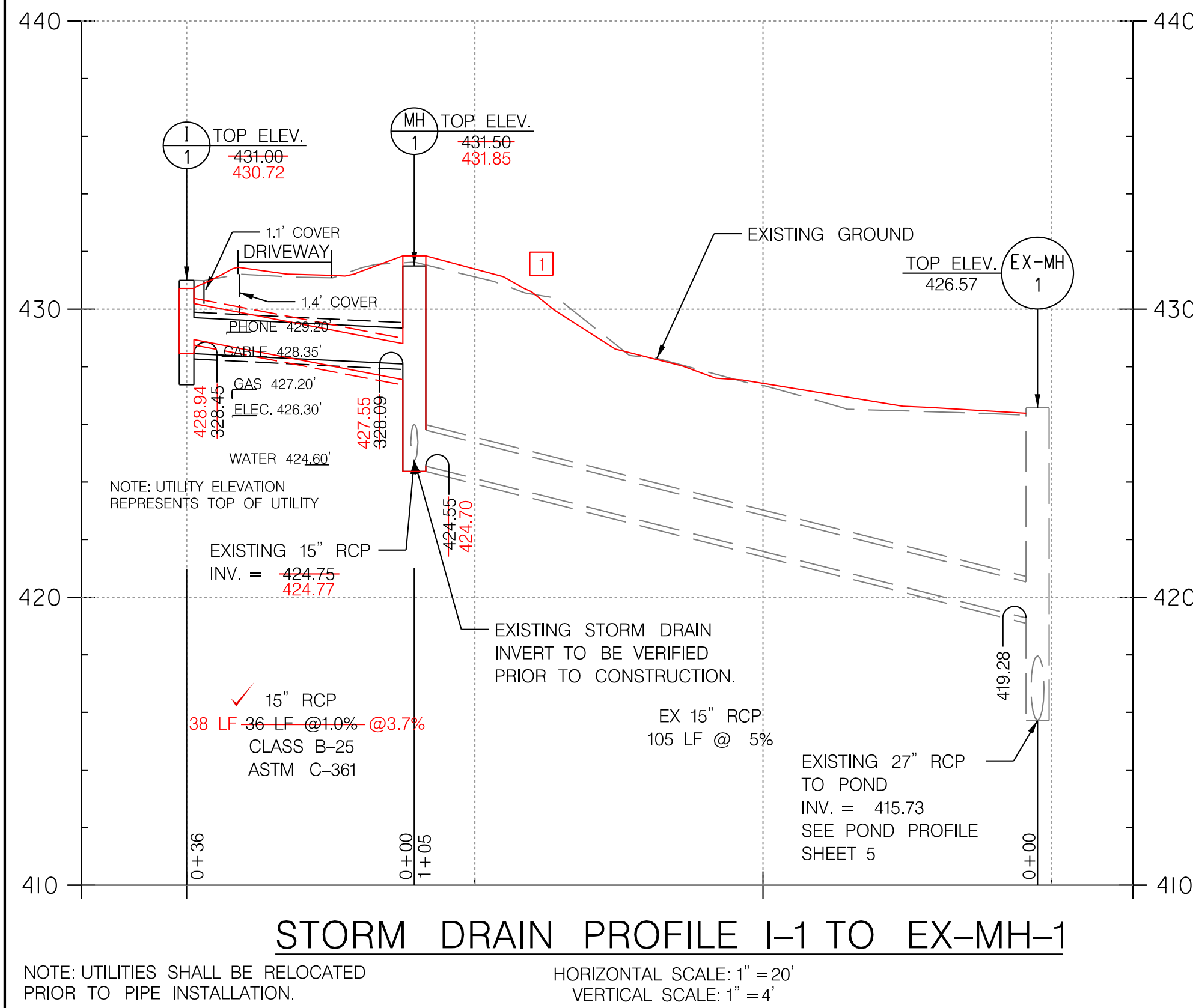


DATE: 5/20/2017 DRAWN: 106284 CHECKED: 5/22/2018 APPROVED: [Signature]	Howard County, Maryland Department of Public Works Project: [Signature]	PRECAST MANHOLE Notes	Detail G-5.11
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DATE: 5/20/2017 DRAWN: 106284 CHECKED: 5/22/2018 APPROVED: [Signature]	Howard County, Maryland Department of Public Works Project: [Signature]	PRECAST MANHOLE Standard and Shallow 4'-0" for 24" Pipe and smaller	Detail G-5.12
---	---	---	------------------

DATE: 5/20/2017 DRAWN: 106284 CHECKED: 5/22/2018 APPROVED: [Signature]	Howard County, Maryland Department of Public Works Project: [Signature]	Yard Inlet	Detail D-4.14
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DATE: 5/20/2017 DRAWN: 106284 CHECKED: 5/22/2018 APPROVED: [Signature]	Howard County, Maryland Department of Public Works Project: [Signature]	STORM DRAIN INLET General Requirement	Detail D-4.01
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

DATE: 8/22/18

McCORMICK TAYLOR
509 South Exeter Street
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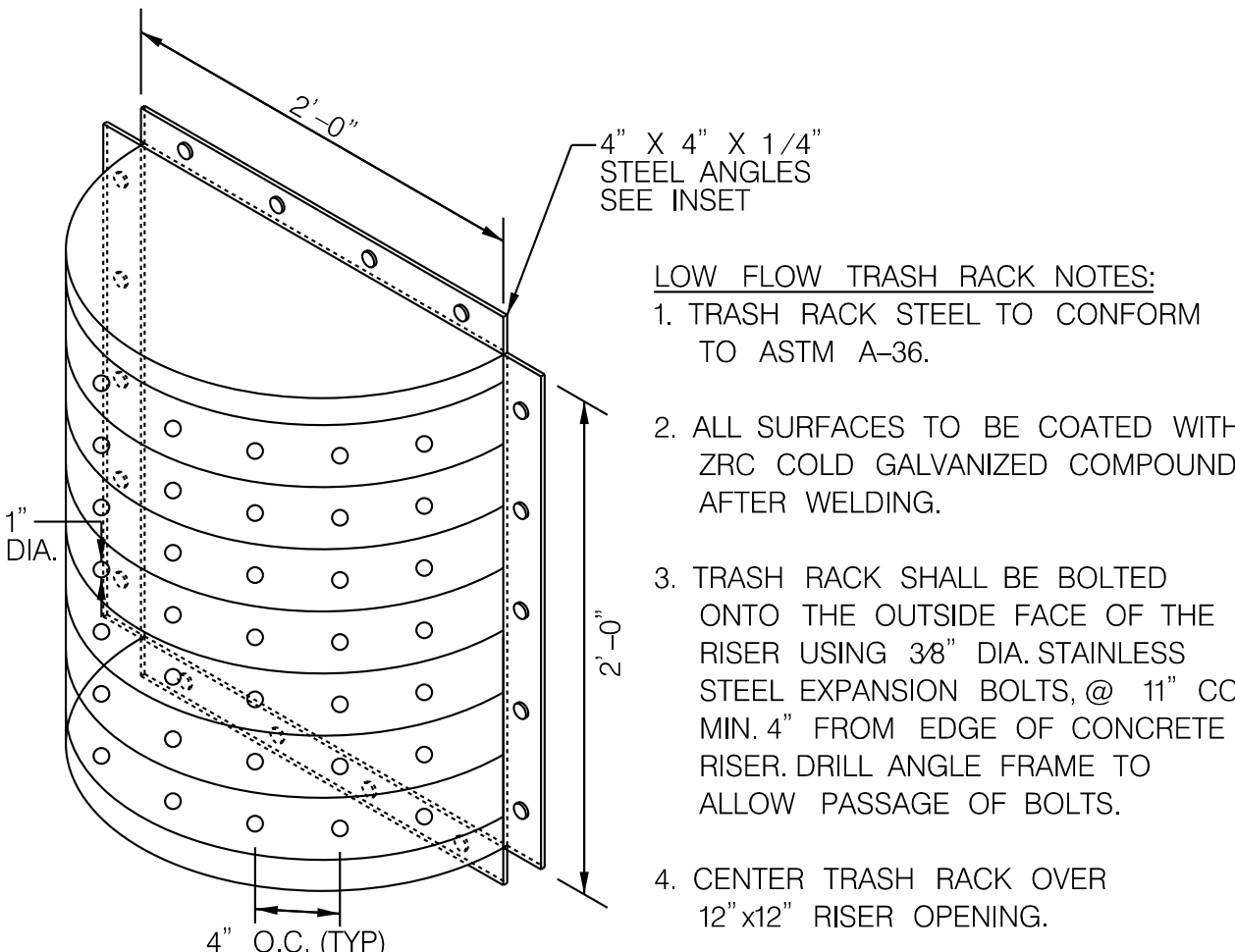
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DRN: MR				
CHK: AH /LN				
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SCALE
AS SHOWN

SHEET
6 OF 23

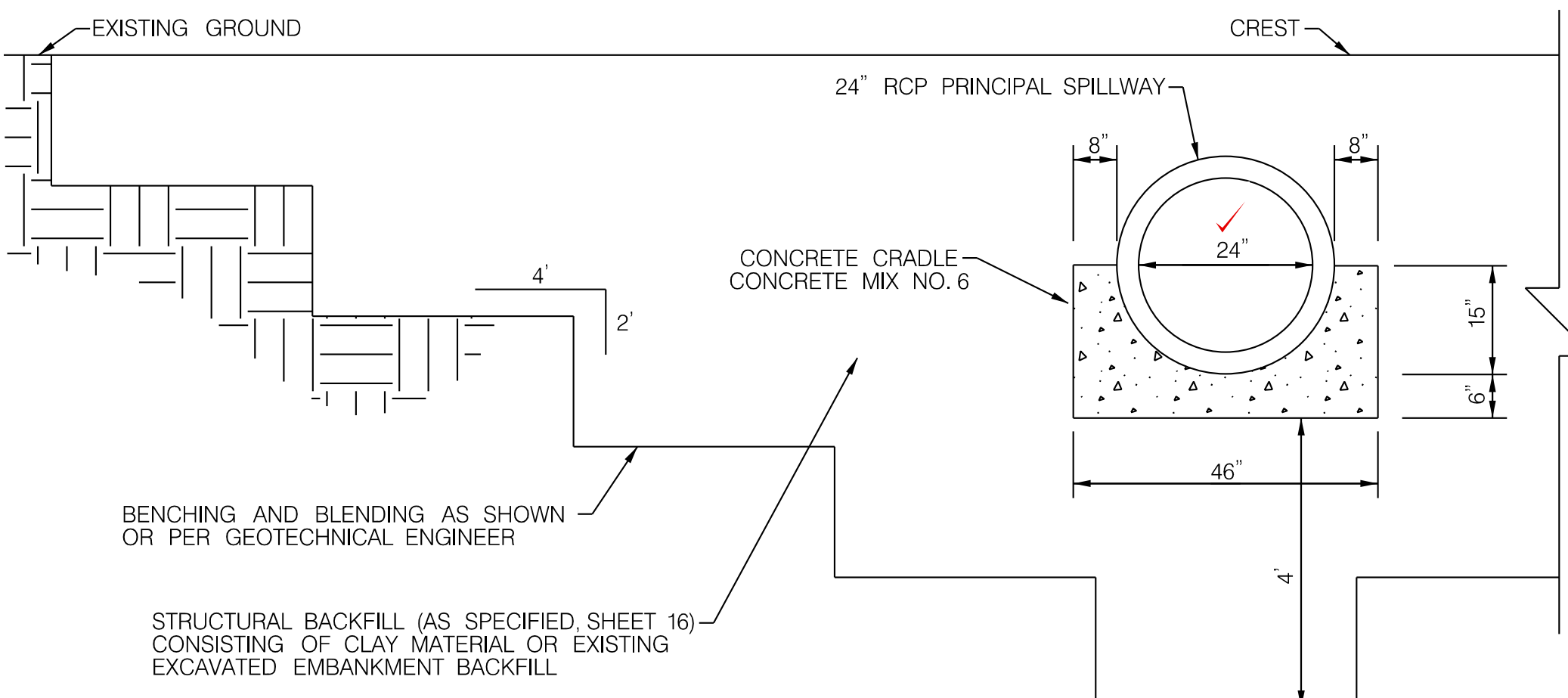
STORM DRAIN PROFILE AND DETAILS

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
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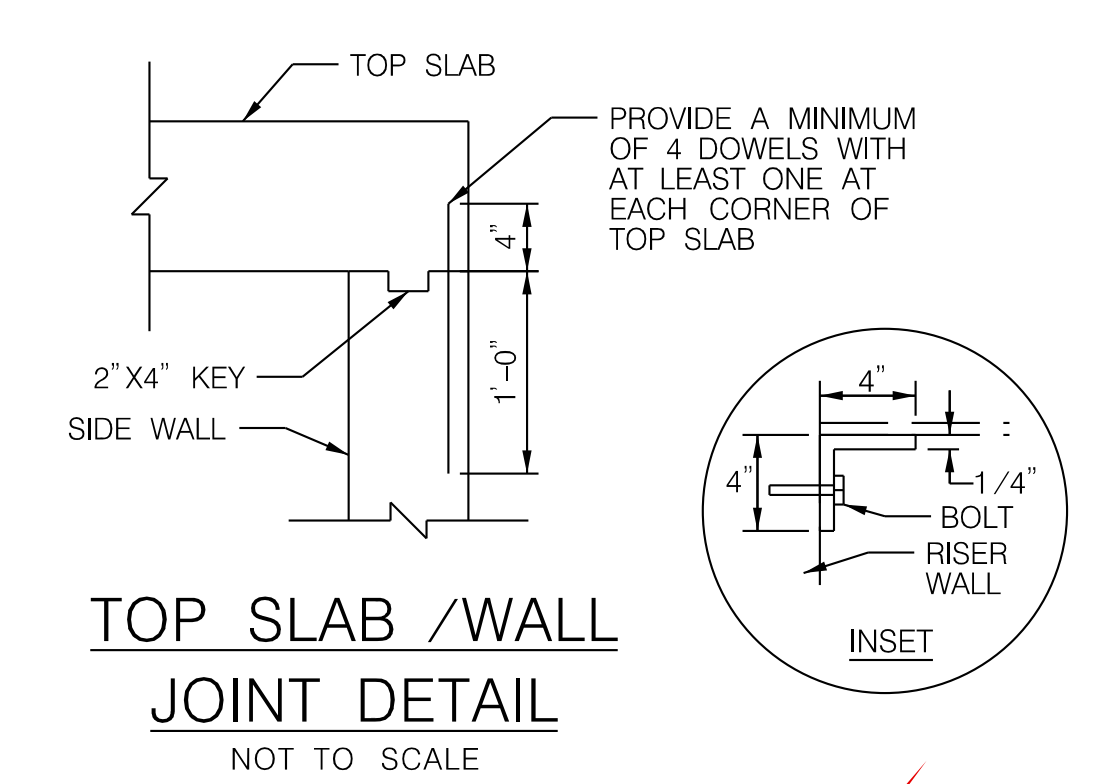


- LOW FLOW TRASH RACK NOTES:**
1. TRASH RACK STEEL TO CONFORM TO ASTM A-36.
 2. ALL SURFACES TO BE COATED WITH ZRC COLD GALVANIZED COMPOUND AFTER WELDING.
 3. TRASH RACK SHALL BE BOLTED ONTO THE OUTSIDE FACE OF THE RISER USING 3/8" DIA. STAINLESS STEEL EXPANSION BOLTS @ 11" CC MIN. 4" FROM EDGE OF CONCRETE RISER. DRILL ANGLE FRAME TO ALLOW PASSAGE OF BOLTS.
 4. CENTER TRASH RACK OVER 12" X 12" RISER OPENING.

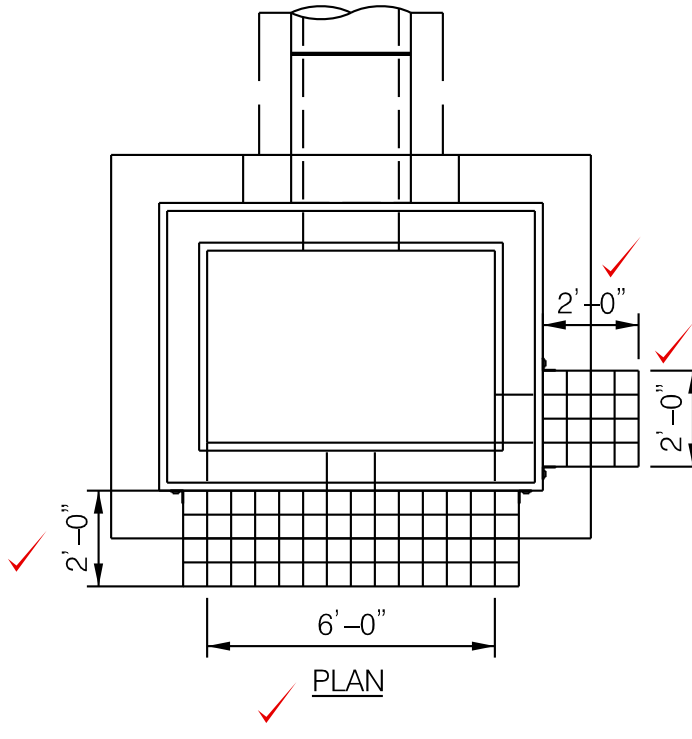
LOW FLOW TRASH RACK DETAIL
NOT TO SCALE



PIPE TRENCH AND CONCRETE CRADLE DETAIL
NOT TO SCALE



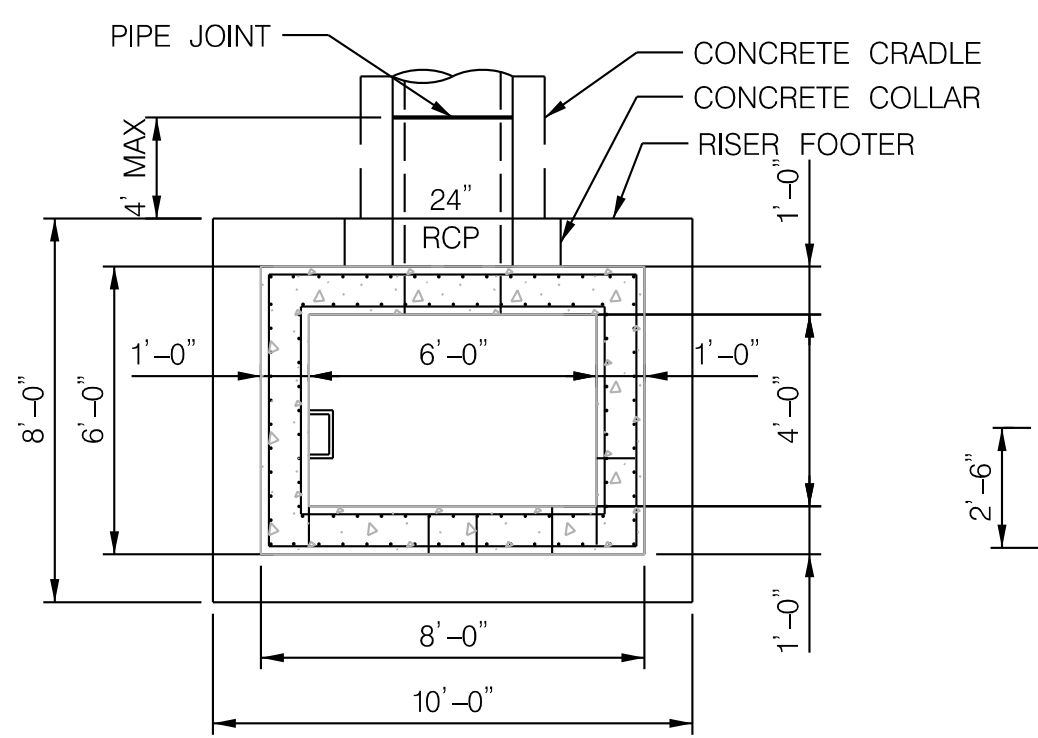
TOP SLAB / WALL JOINT DETAIL
NOT TO SCALE



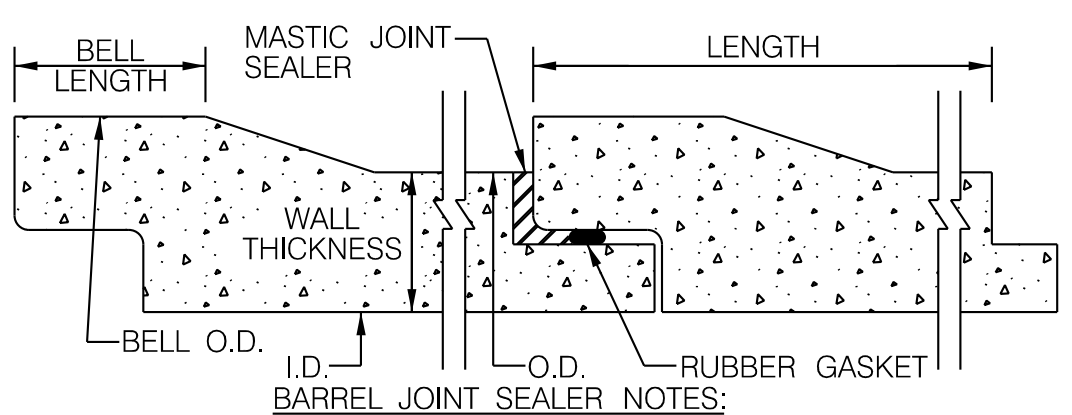
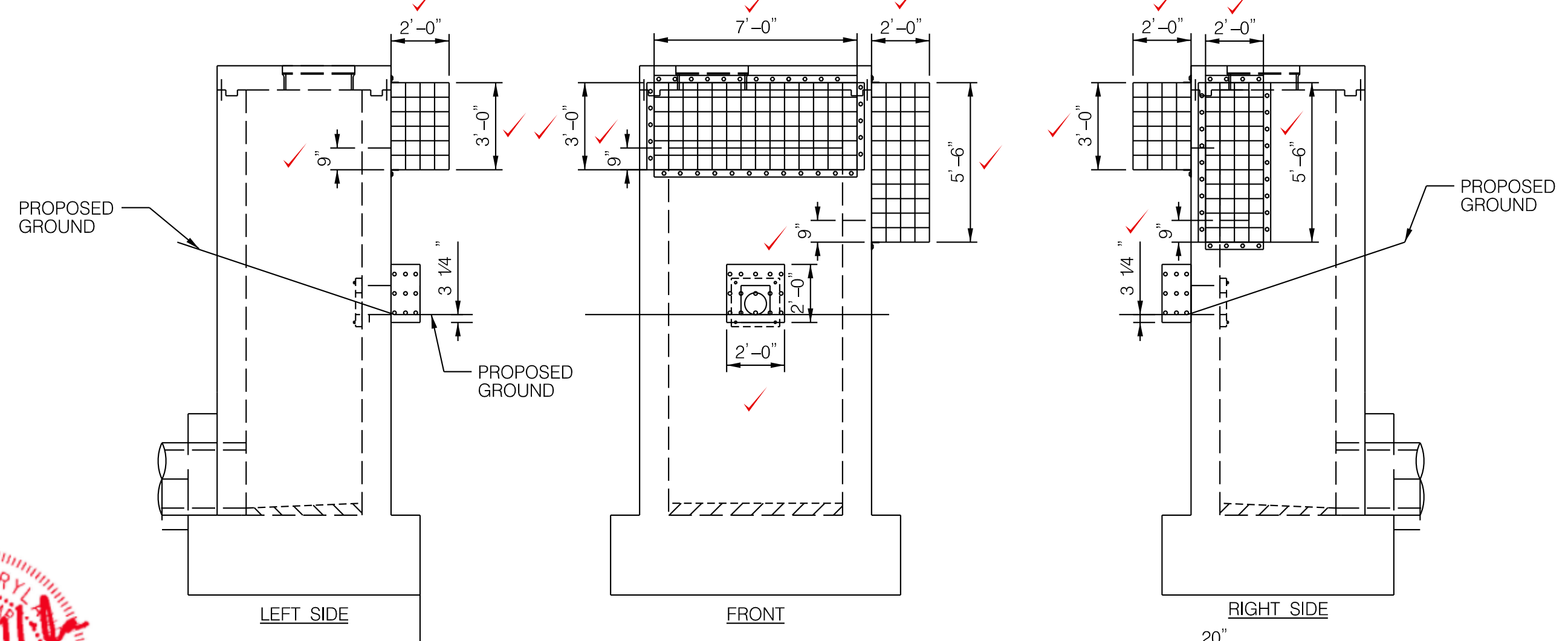
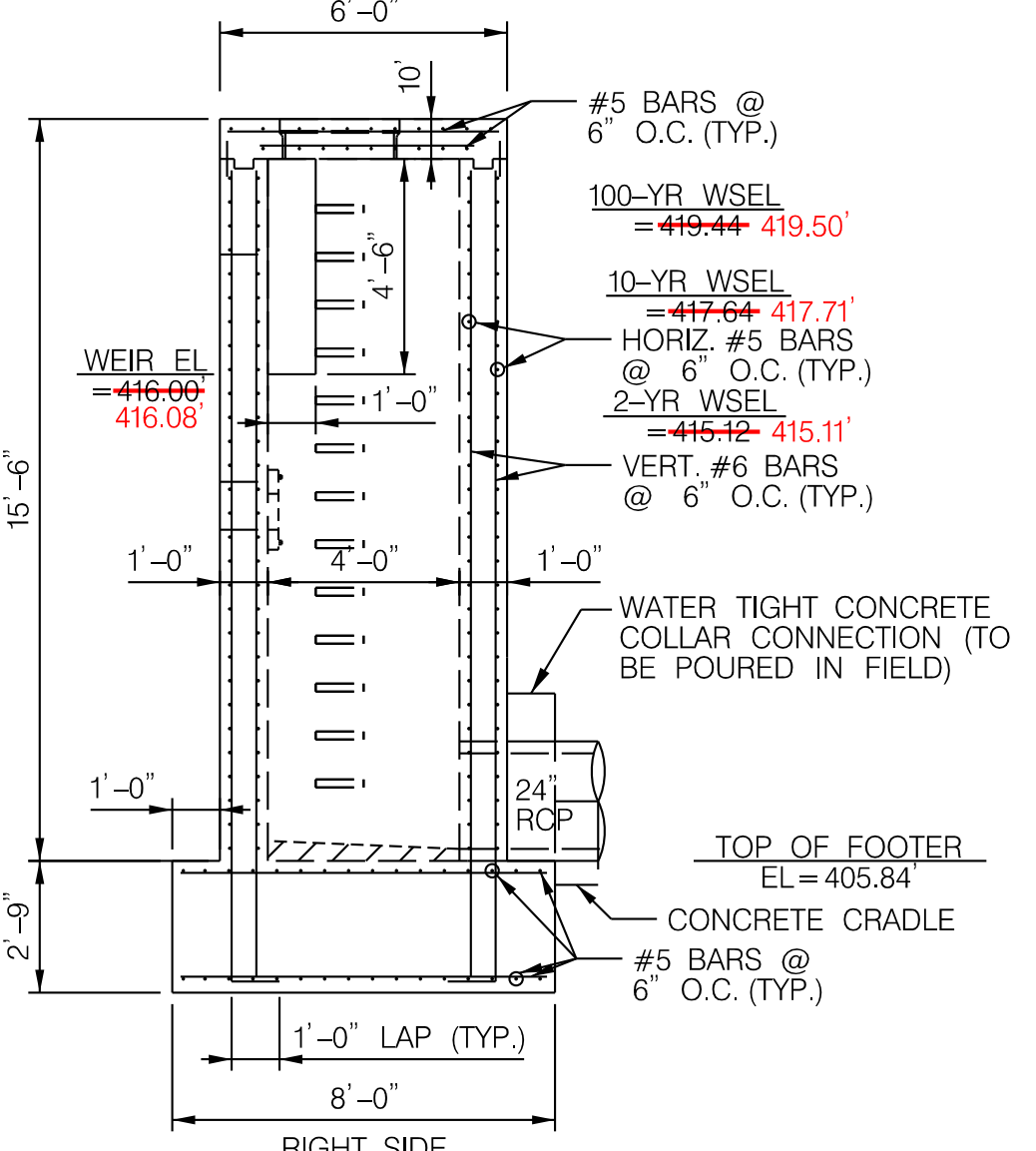
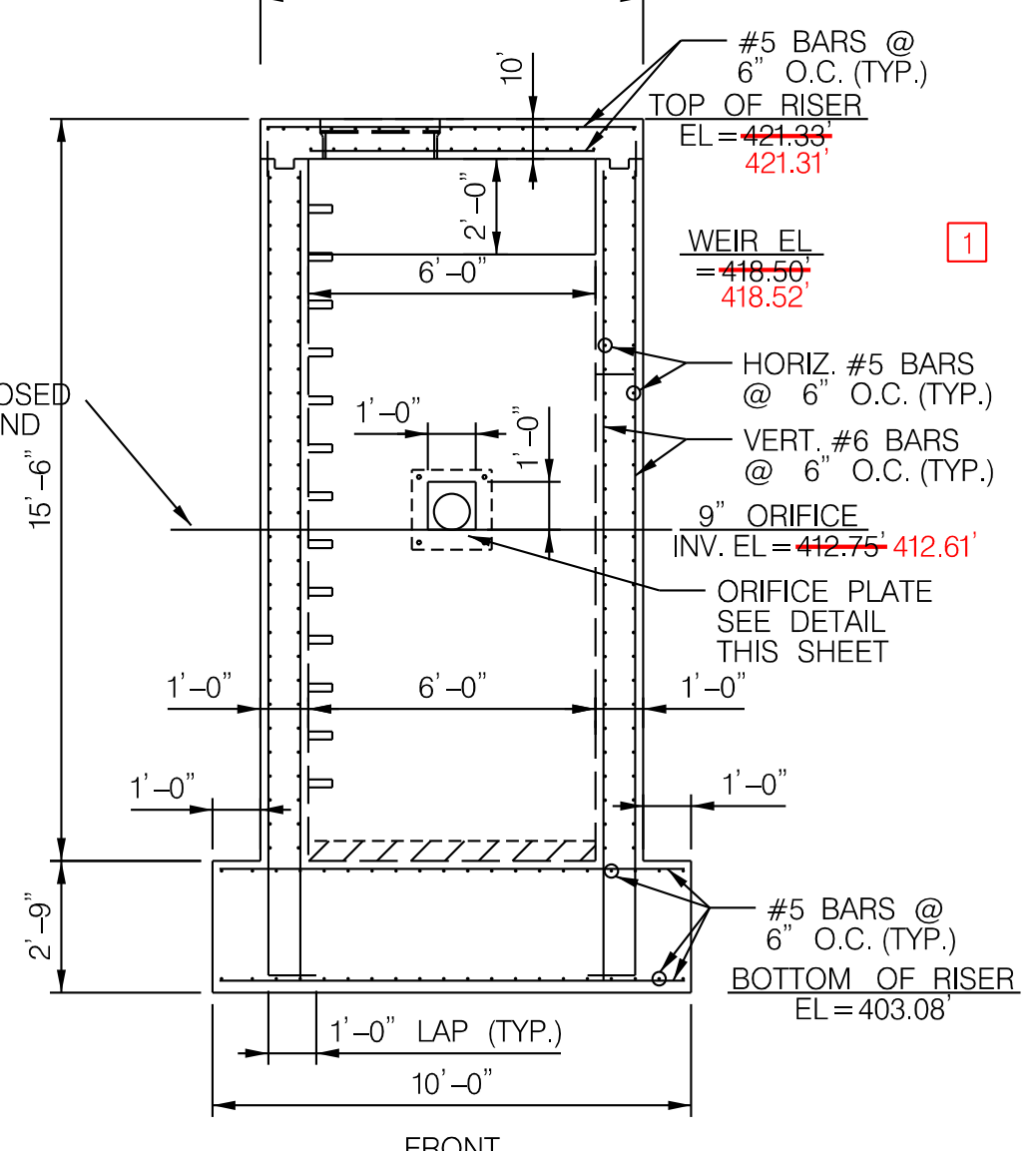
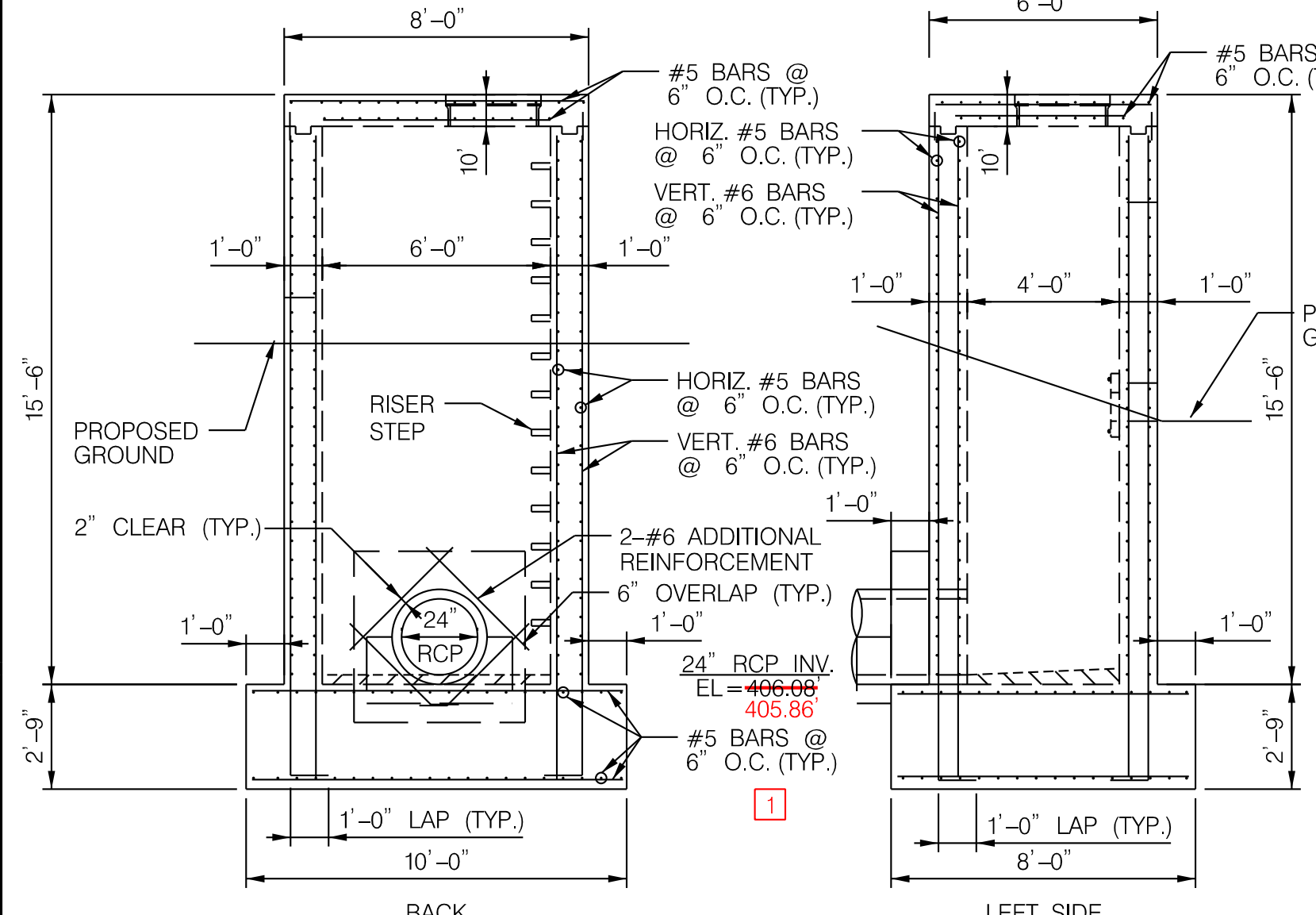
TRASH RACK DETAIL
SCALE: 1" = 4'

- TRASH RACK CONSTRUCTION NOTES:**
1. FRAME SHALL BE CONSTRUCTED OF 4" X 4" X 1/4" STEEL ANGLE WITH THE CORNERS MITRED AND BUTT WELDED.
 2. THE FRAME SHALL BE PAINTED WITH TWO COATS OF COLD GALVANIZED COMPOUND IN "BATTLESHIP GREY".
 3. BARS SHALL BE #6 REBAR AT 6" CC EACH WAY. HOT-DIPPED GALVANIZED AND FILLET WELDED TO THE ANGLE FRAME.
 4. ALL STEEL SHALL BE ASTM A-36.
 5. TRASH RACK SHALL BE BOLTED ONTO THE OUTSIDE FACE OF THE RISER USING 3/8" DIA. STAINLESS STEEL EXPANSION BOLTS @ 11" CC MIN. 4" FROM EDGE OF CONCRETE RISER. DRILL ANGLE FRAME TO ALLOW PASSAGE OF BOLTS.
 6. ENSURE A 1' CLEARANCE BETWEEN TRASH RACK AND DAM EMBANKMENT SLOPE.
 7. TRASH RACK STRUCTURAL SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY MDE DAM SAFETY DIVISION AND THE ENGINEER BEFORE CONSTRUCTION.

- RISER CONSTRUCTION NOTES:**
1. RISER STEPS SHALL FOLLOW DETAIL G-5.21 FOR MANHOLE AND INLET STEPS
 2. SHA MIX NO. 3 CONCRETE SHALL BE USED AND SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITION OF ACI 301 AND ACI 318.
 3. RISER STRUCTURE SHALL BE DESIGNED IN ACCORDANCE TO LOADING SPECIFIED IN LATEST EDITIONS OF ASTM C857 AND ASTM C890.
 4. RISER STRUCTURE SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C858 AND MARYLAND NRCS POND CODE MD-378.
 5. RESILIENT CONNECTORS BETWEEN MANHOLE STRUCTURES, PIPES, AND LATERALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C923.
 6. INVERT SHALL BE APPROVED SHA MIX NO. 3 CONCRETE. INVERT TO SLOPE DOWN TOWARD OUTLET AS SHOWN ON PLAN, OR AS DIRECTED.
 7. REFER TO DETAIL G-2-9 FOR CONCRETE PROJECTION COLLAR.
 8. CONSTRUCT CONCRETE COLLARS TO ENSURE WATERTIGHT SEALS AT RISER AND PIPE CONNECTIONS.
 9. FIRST BARREL JOINT OF CONCRETE PIPE SHALL HAVE A WATERTIGHT CONNECTION AND BE PLACED NO MORE THAN 3' FROM RISER.
 10. RISER SHALL BE A CAST-IN-PLACE, MONOLITHIC STRUCTURE.
 11. REINFORCEMENT SHALL HAVE A MINIMUM 2" COVER FROM ANY SURFACE.
 12. CONTRACTOR TO ENSURE A SUITABLE SUBBASE IS PROVIDED FOR THE RISER. NO GRAVEL SHALL BE USED FOR THE RISER SUBBASE. LEAN CONCRETE IS RECOMMENDED TO IMPROVE SUBBASE STABILITY IF NECESSARY.
 13. THE RISER WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER EACH RISER. THE PAYMENT WILL BE FULL COMPENSATION FOR ALL EXCAVATION, CONCRETE, MASONRY, SPECIAL OR PRECAST UNITS, REINFORCEMENT, LADDER RUNGS, AGGREGATE, UNDERDRAIN, STUBS, FRAMES, GRATES, AND COVERS, GRADE AND SLOPE ADJUSTMENTS, BACKFILL, GASKET, WATERTIGHT SEALS, PROJECTION COLLAR, TRASH RACKS, DRAIN VALVES, VALVE STEMS AND FOR ALL MATERIAL, LABOR, EQUIPMENT TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.



RISER ELEVATION
SCALE: 1" = 2'

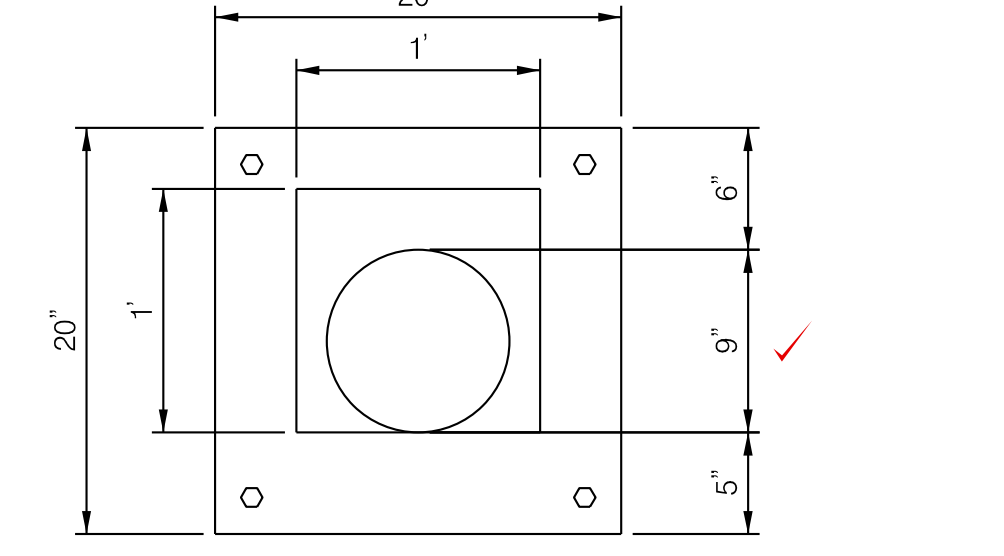


- BARREL JOINT SEALER NOTES:**
1. MASTIC JOINT SEALER TO BE APPLIED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
 2. JOINT SEALER SHOULD HAVE WATERTIGHT CONNECTION.
 3. THE SEALER SHALL BE A MIXTURE OF ASPHALT, MINERAL FILLER, AND PETROLEUM SOLVENTS AND SHALL HAVE ADHESIVE AND COHESIVE PROPERTIES.

THE SEALER SHALL CONFORM TO THE FOLLOWING:

TEST AND METHOD	SPECIFICATION LIMITS
RESIDUES BY EVAPORATION, NONVOLATILE MATTER, D 2939, % MIN.	70
INORGANIC FILLER ON IGNITION, ASH CONTENT, D 2939, %	15-45

BARREL JOINT SEALER DETAIL
NOT TO SCALE



- ORIFICE PLATE NOTES:**
1. 20" X 20" X 1/2" GALVANIZED STEEL ORIFICE PLATE.
 2. ORIFICE PLATE WITH 9" DIAMETER OPENING TO BE BOLTED TO THE INSIDE DOWN STREAM FACE OF CONCRETE RISER USING 1/2" STAINLESS STEEL CONCRETE RISER ANCHORS.

ORIFICE PLATE
NOT TO SCALE

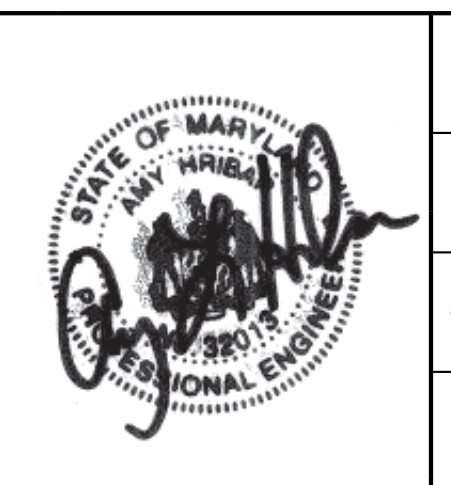
Maryland Department of the Environment
Water and Science Administration
Dam Safety Division

V.P. Dalal
 Sr. Regulatory & Compliance Engineer
 Date: 8/23/18
 Permit # 18-MR-0005

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Chief, Bureau of Environmental Services
 DATE: 8/22/18

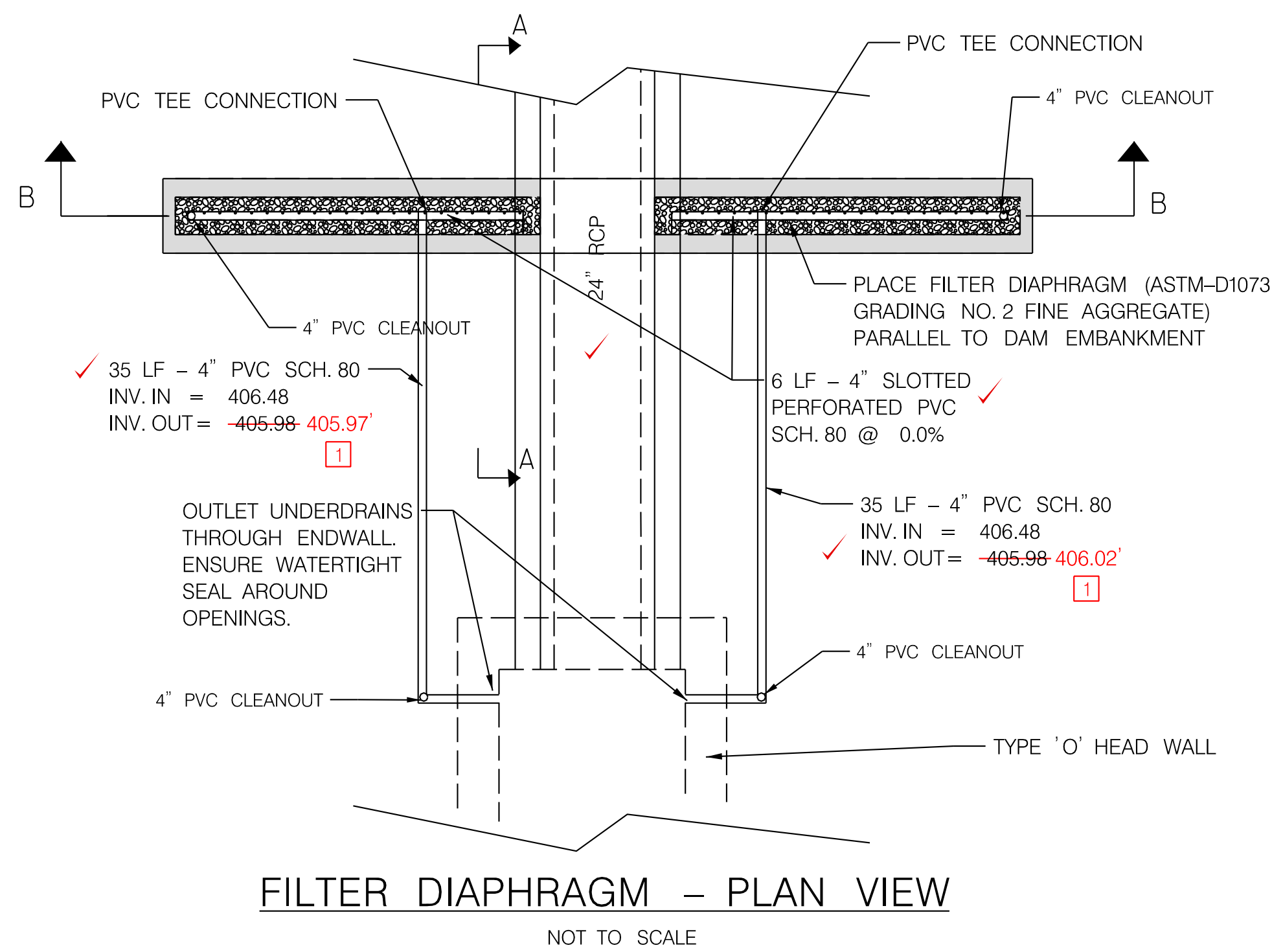
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 MARYLAND
 Storm Water Management Division
 Bureau of Environmental Services
 6751 Columbia Gateway Drive, Suite 514
 Columbia, Maryland 21046-3143
 (410) 313-6444



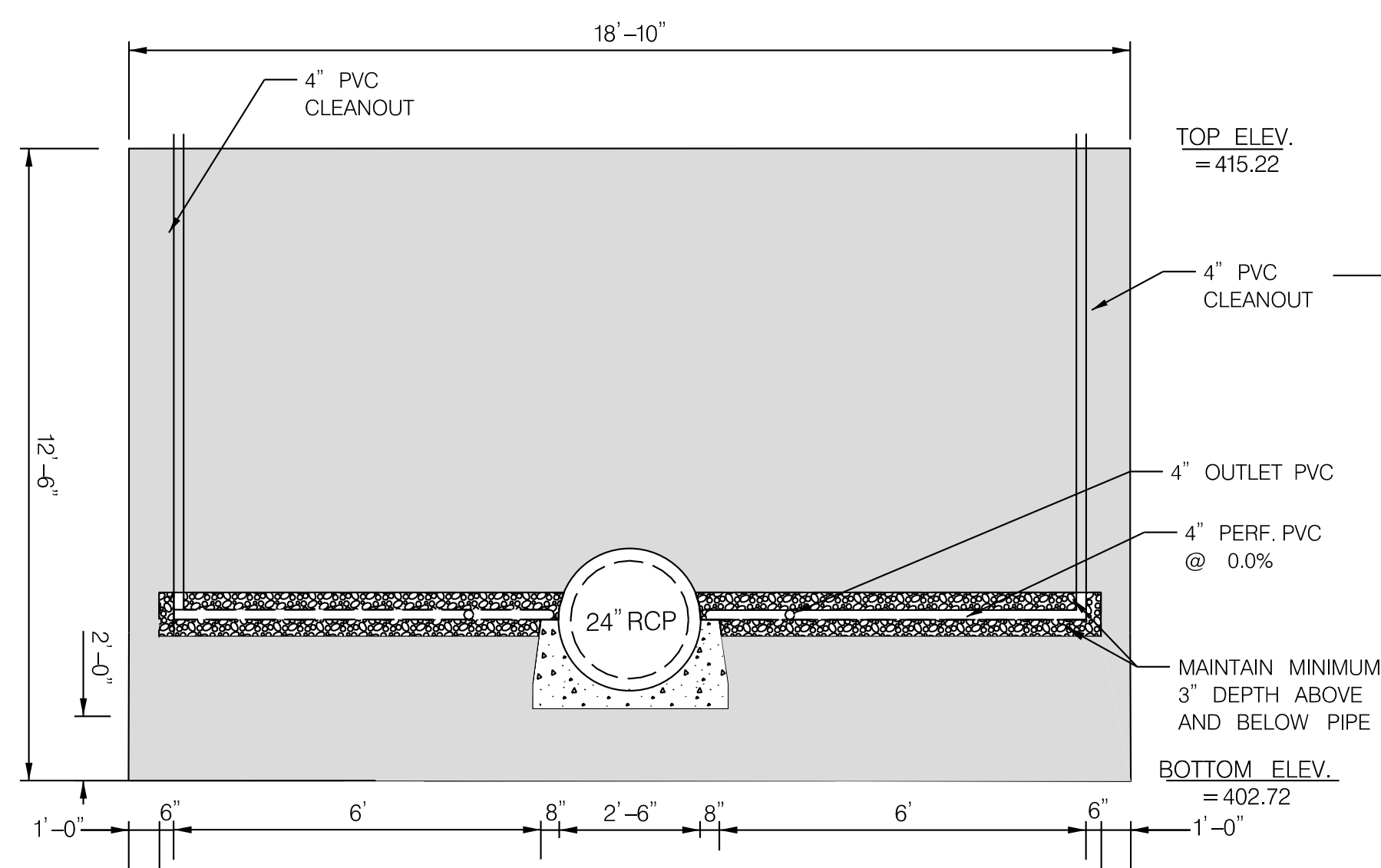
DES: CL /JB	EZS	1	AS-BUILT SURVEY	9/17/19
DRN: MR				
CHK: AH /LN				
DATE: 8/17/18	BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
 HOWARD COUNTY CAPITAL PROJECT #D-1159
 HSCD #: EP-17-34
 MD DAM NO. 576
RISER DETAIL SHEET
 SCALE: AS SHOWN
 SHEET: 7 OF 23



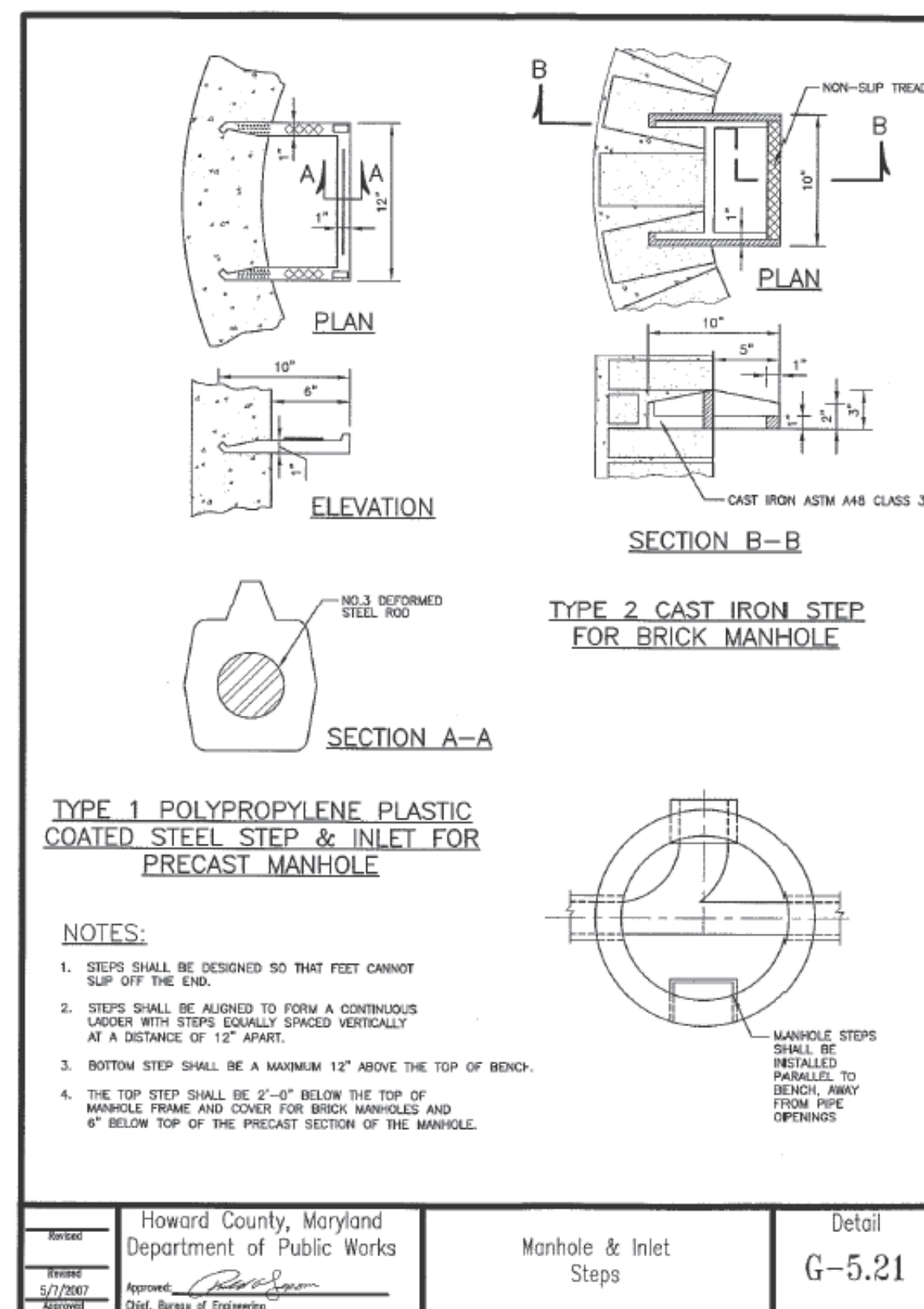
FILTER DIAPHRAGM - PLAN VIEW

NOT TO SCALE

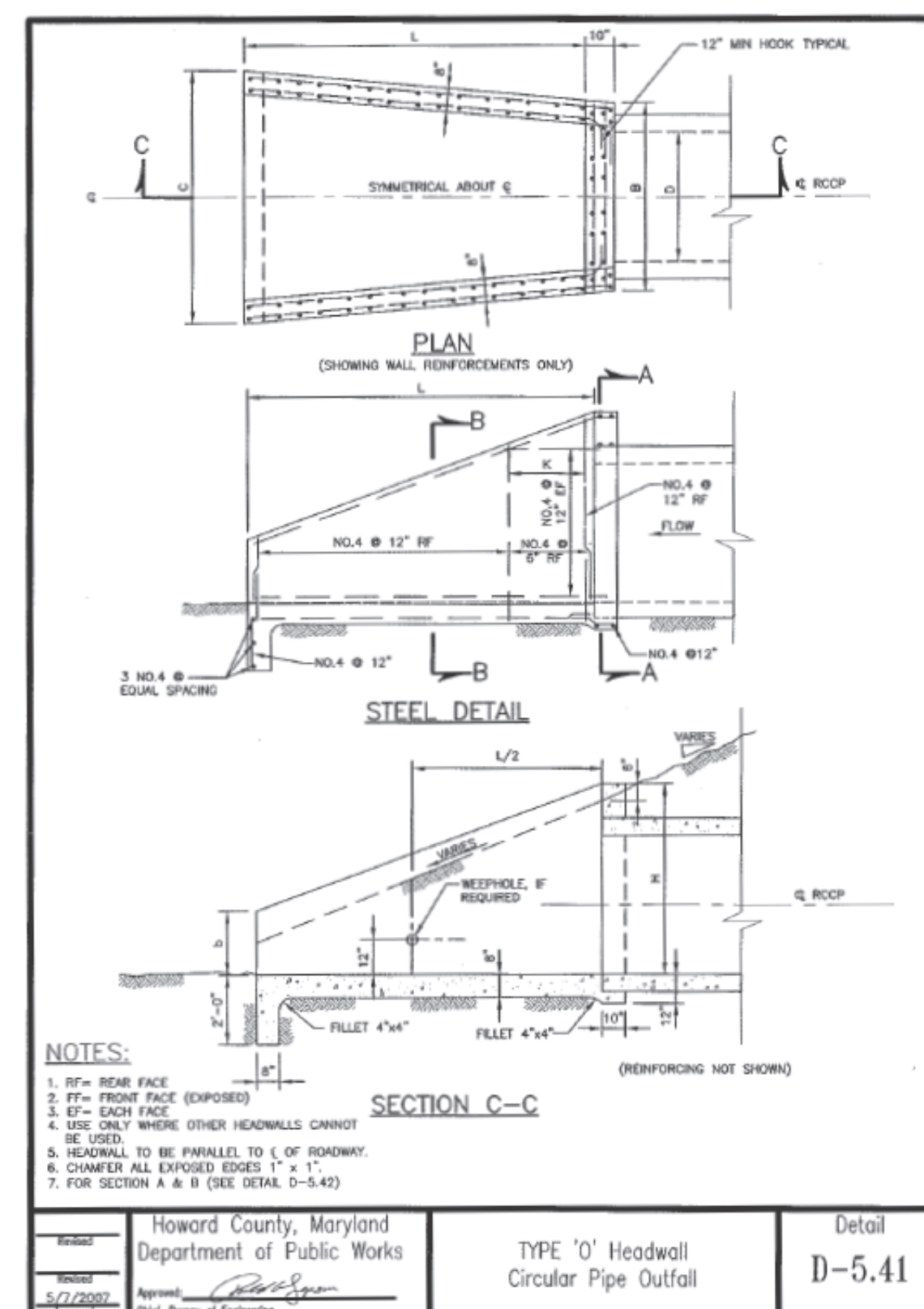


FILTER DIAPHRAGM - SECTION B-B

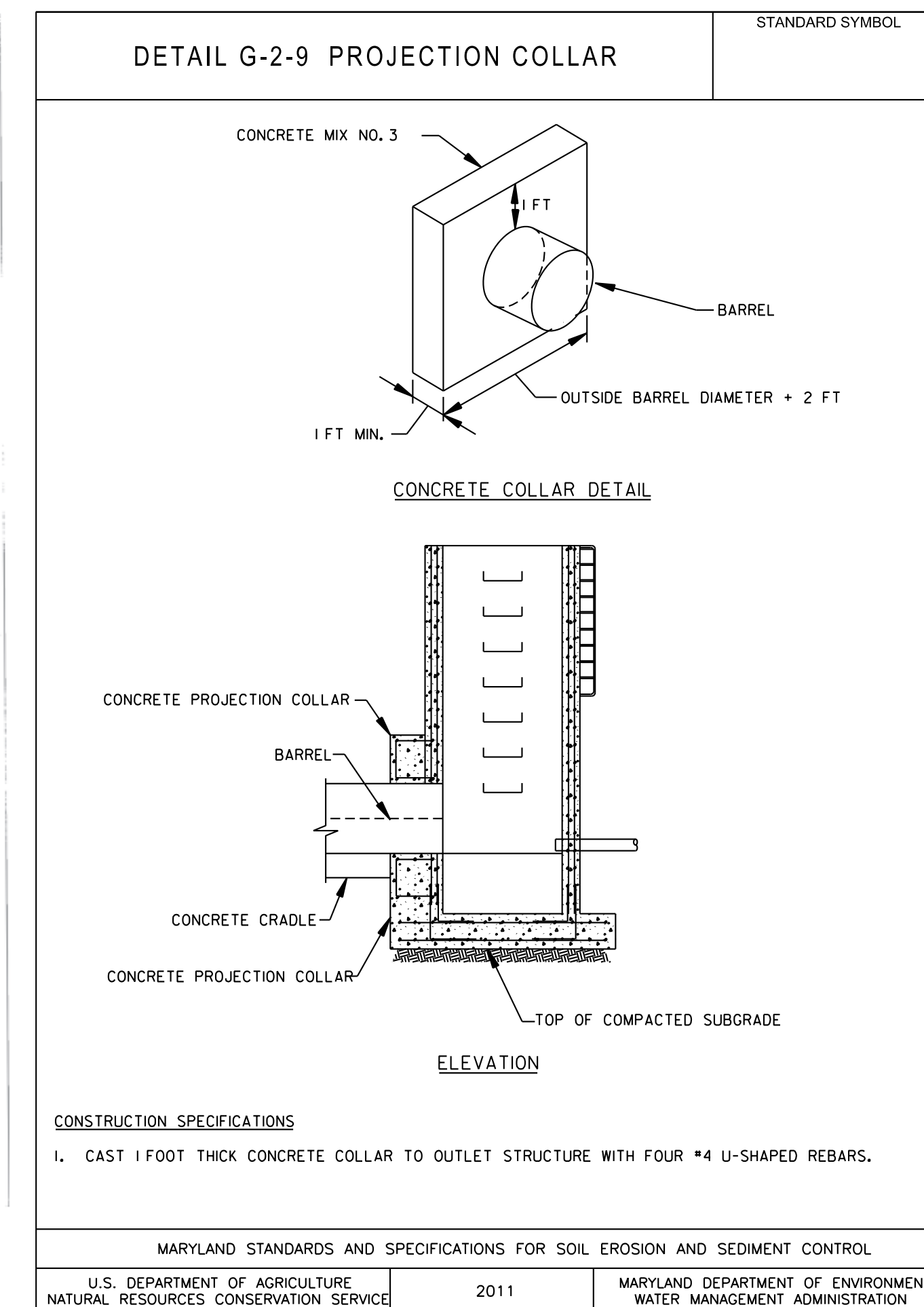
NOT TO SCALE



Project	Howard County, Maryland Department of Public Works	Manhole & Inlet Steps	Detail G-5.21
Revised	1/17/2017		
Approved	[Signature]		

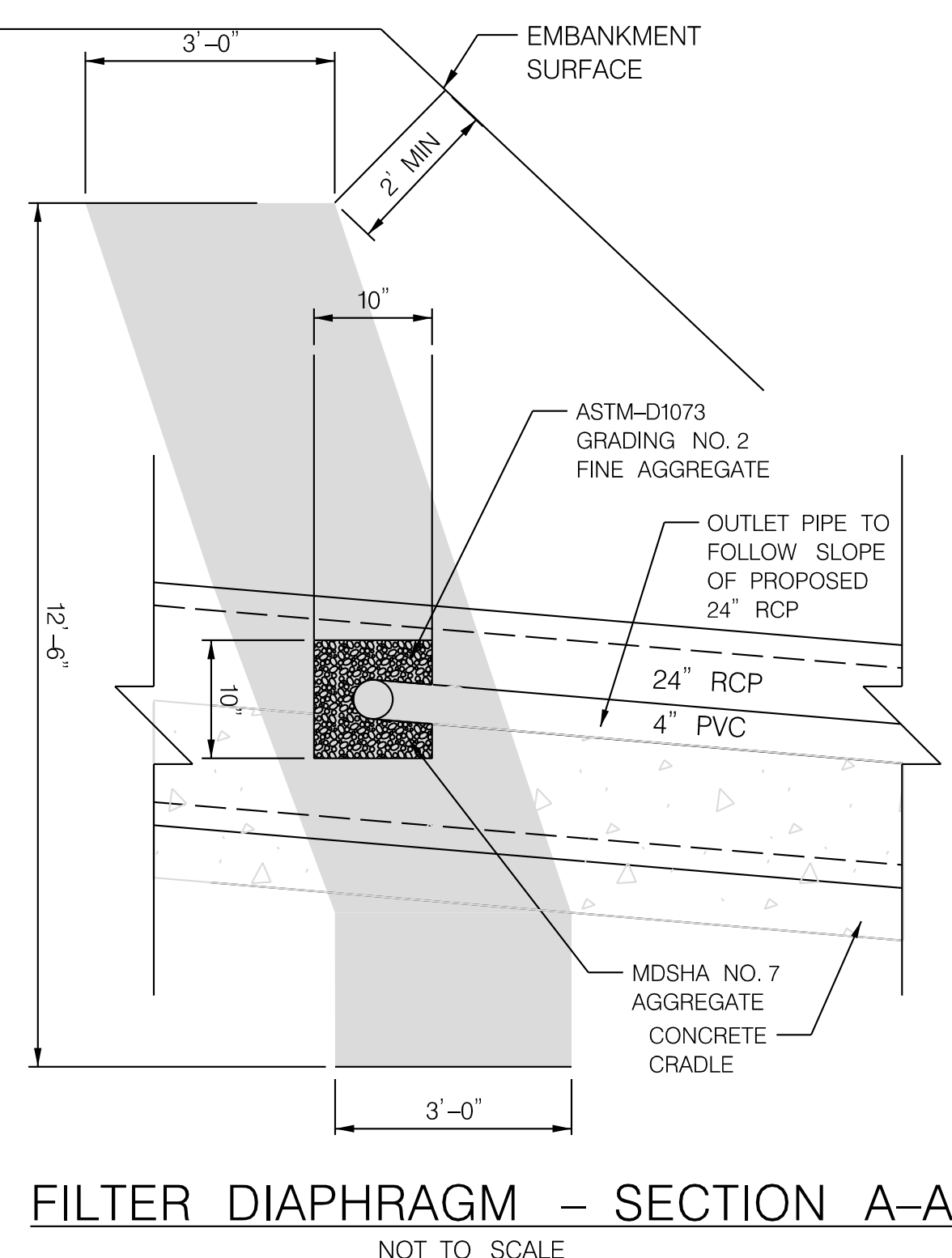


Project	Howard County, Maryland Department of Public Works	Type 'O' Headwall Circular Pipe Outfall	Detail D-5.41
Revised	5/17/2017		
Approved	[Signature]		



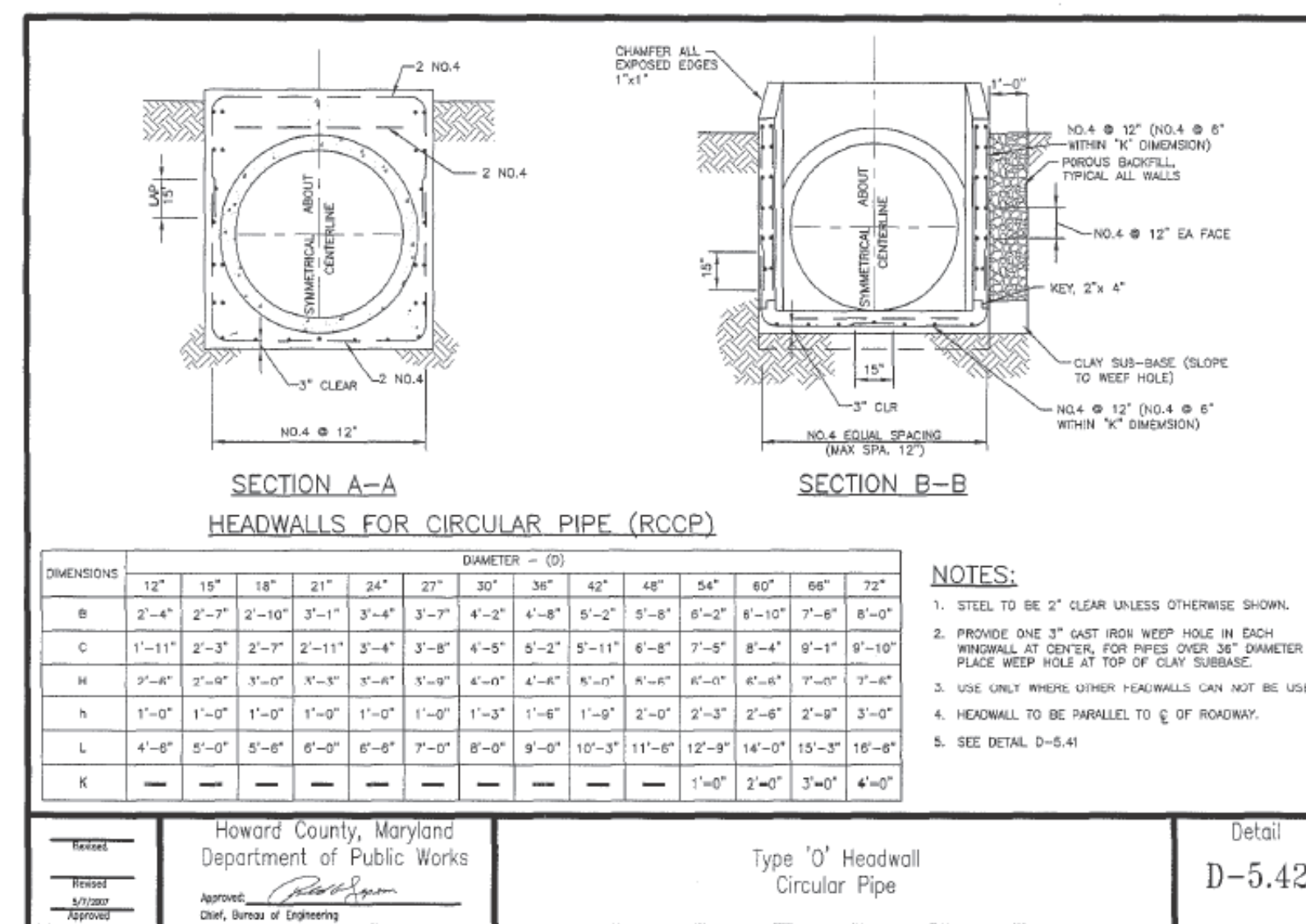
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

- FILTER DIAPHRAGM CONSTRUCTION NOTES:
- ALL MATERIALS FOR FILTER DIAPHRAGM MUST BE APPROVED BY THE ENGINEER AND THE OWNER PRIOR TO DELIVERY TO THE SITE. SAND AND STONE MATERIAL IN THE FILTER DIAPHRAGM SHALL BE IN TESTED BY THE GEOTECHNICAL ENGINEER TO ENSURE COMPLIANCE WITH DESIGN SPECIFICATIONS.
 - FILTER DIAPHRAGM INSTALLATION IS TO BE DONE UNDER THE SUPERVISION OF A PROFESSIONAL GEOTECHNICAL ENGINEER TO BE EMPLOYED BY THE CONTRACTOR.
 - FILTER DIAPHRAGM SHALL BE PLACED IN A MAXIMUM OF 8' DEEP LIFTS.
 - THE SAND WILL NOT REQUIRE COMPACTION BEYOND COMPACTION RESULTING FROM MATERIAL PLACEMENT. EACH LIFT SHALL BE THOROUGHLY WETTED BEFORE PROCEEDING TO THE NEXT LIFT USING APPROXIMATELY 1.2 GALLONS OF POTABLE WATER PER CUBIC FOOT OF MATERIAL.
 - PERFORATED PIPE SHALL BE SCH. 80 PVC WITH 18" WIDE X 2" LONG PERFORATIONS. FOUR PERFORATIONS PER LINEAR FOOT, SPACED EVENLY AROUND THE CIRCUMFERENCE OF THE PIPE.
 - SAND SHALL BE PLACED TO AVOID SEGREGATION OF PARTICLE SIZES AND NO FOREIGN MATERIAL WILL BE ALLOWED TO INTERMIX WITH THE SAND MATERIAL.



FILTER DIAPHRAGM - SECTION A-A

NOT TO SCALE



Project	Howard County, Maryland Department of Public Works	Type 'O' Headwall Circular Pipe	Detail D-5.42
Revised			
Approved	[Signature]		

**Maryland Department of the Environment
Water and Science Administration
Dam Safety Division**

Visty P. Dalal
Sr. Regulatory & Compliance Engineer

Date _____
Permit # _____

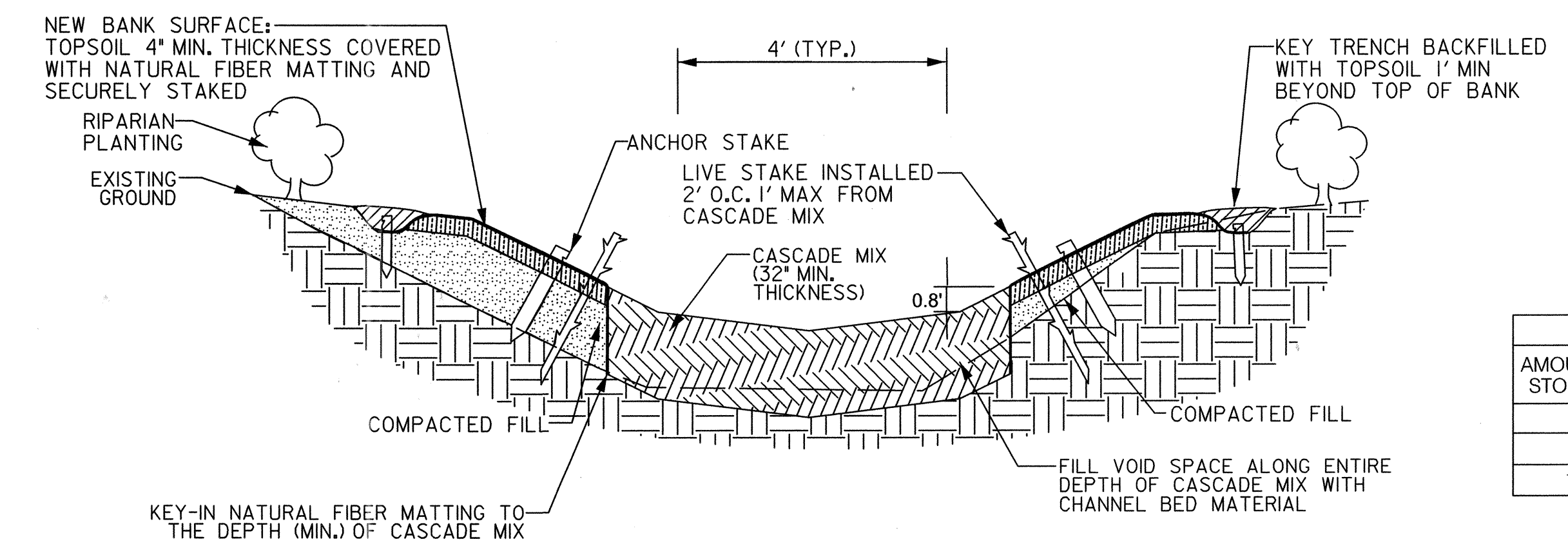
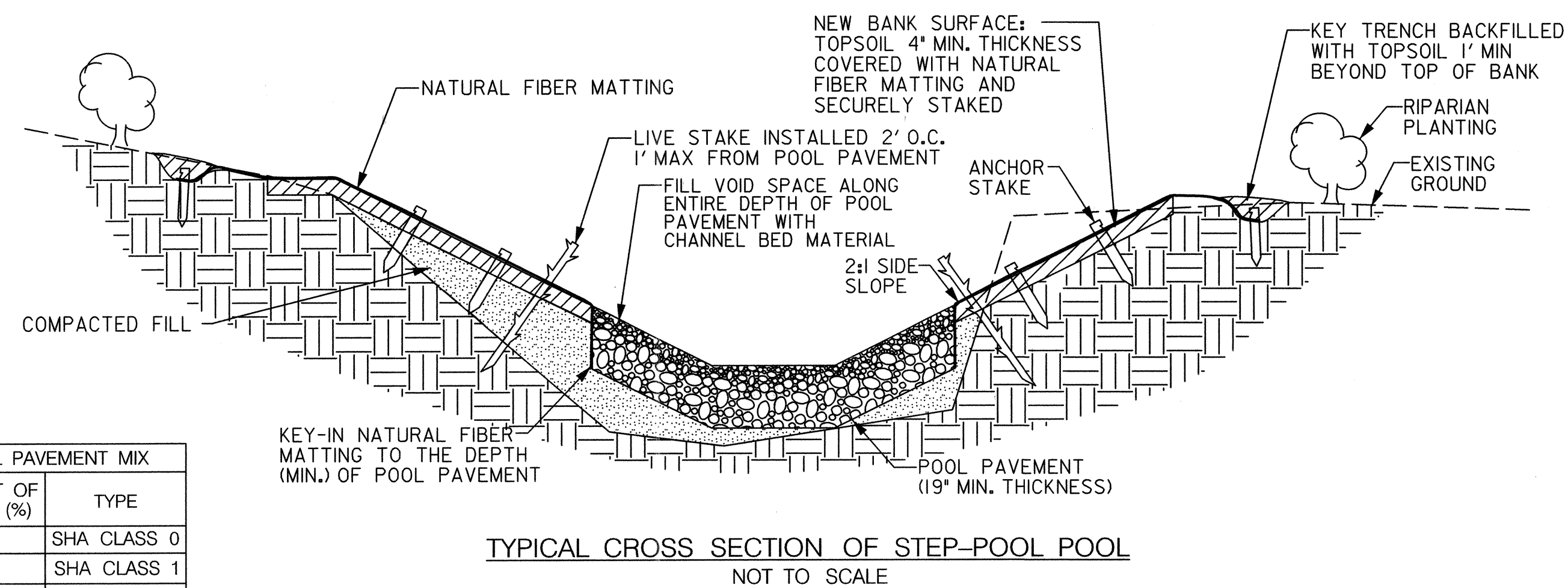
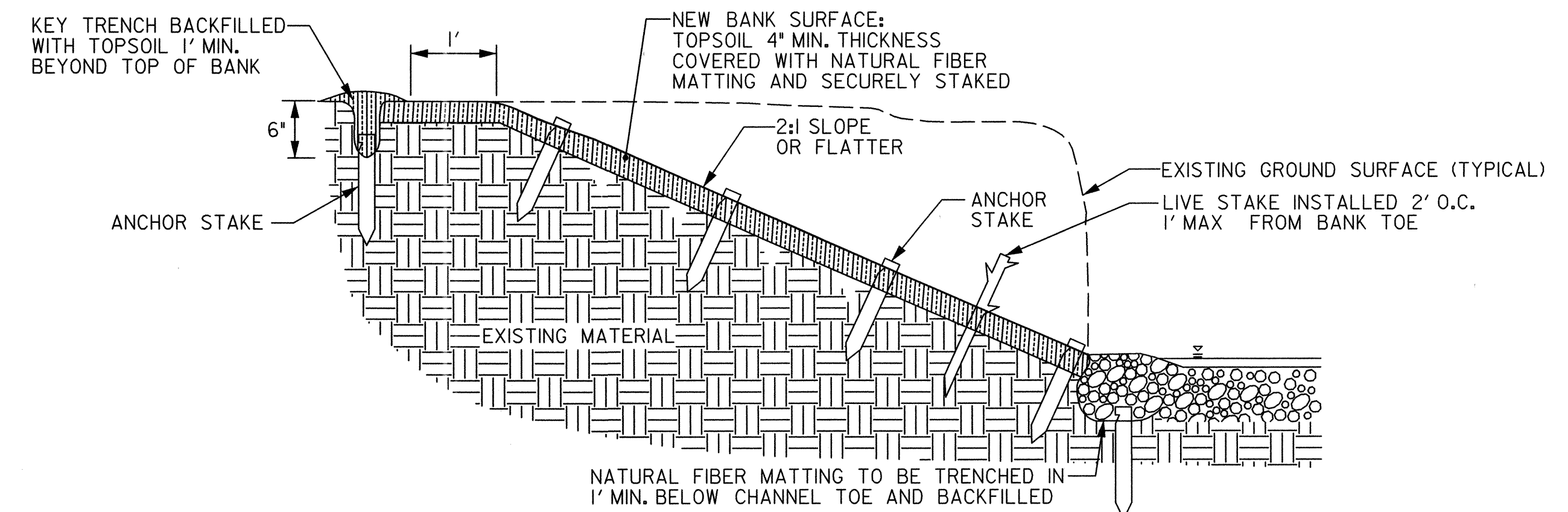
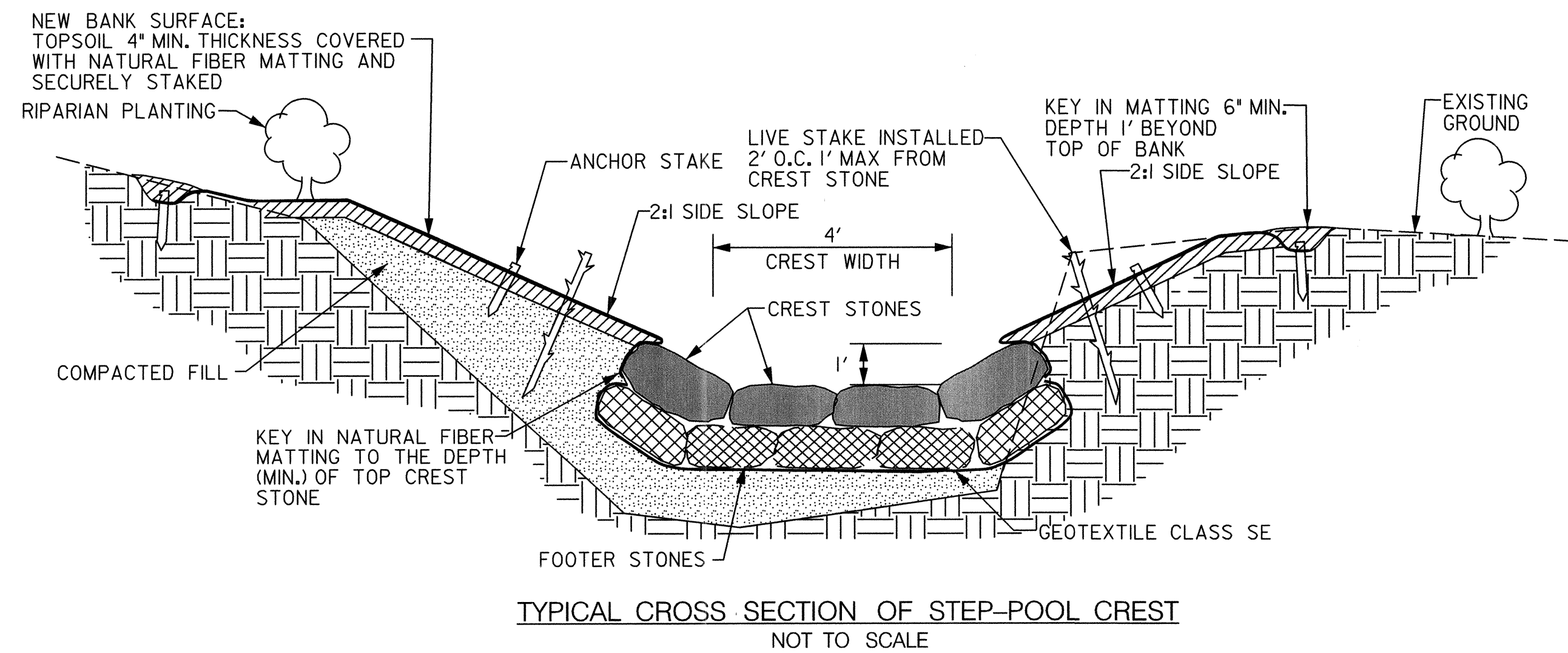
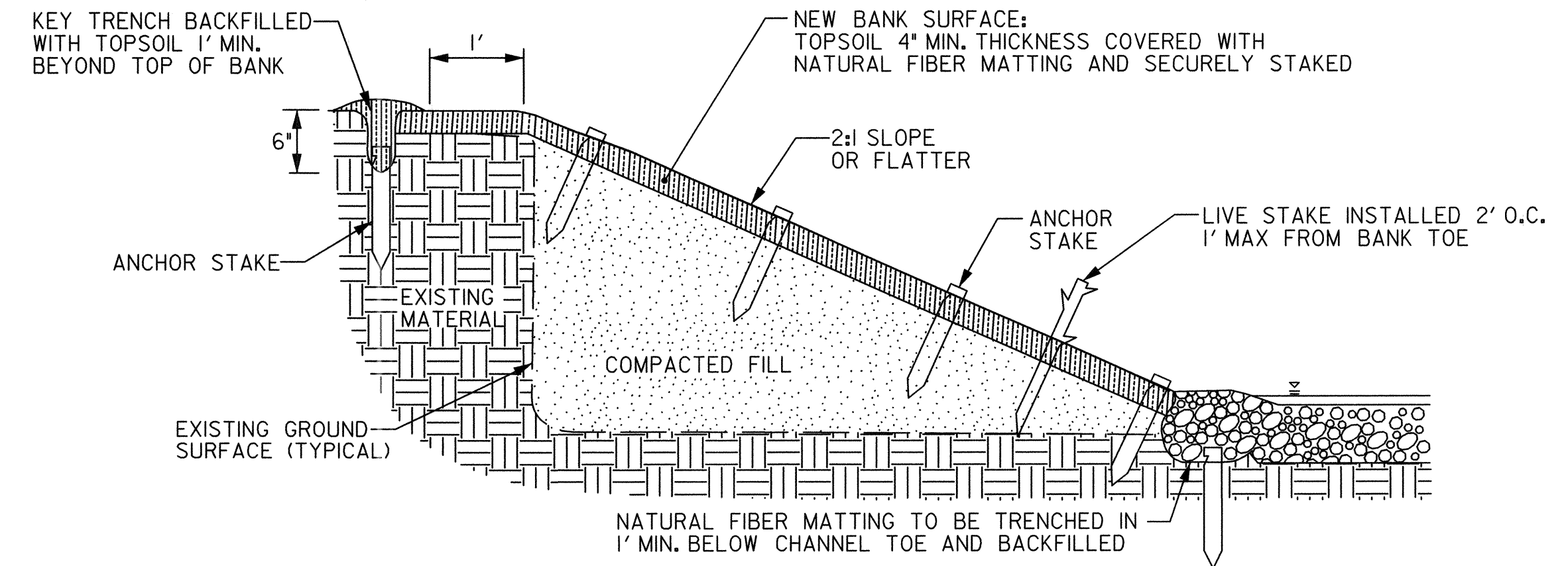
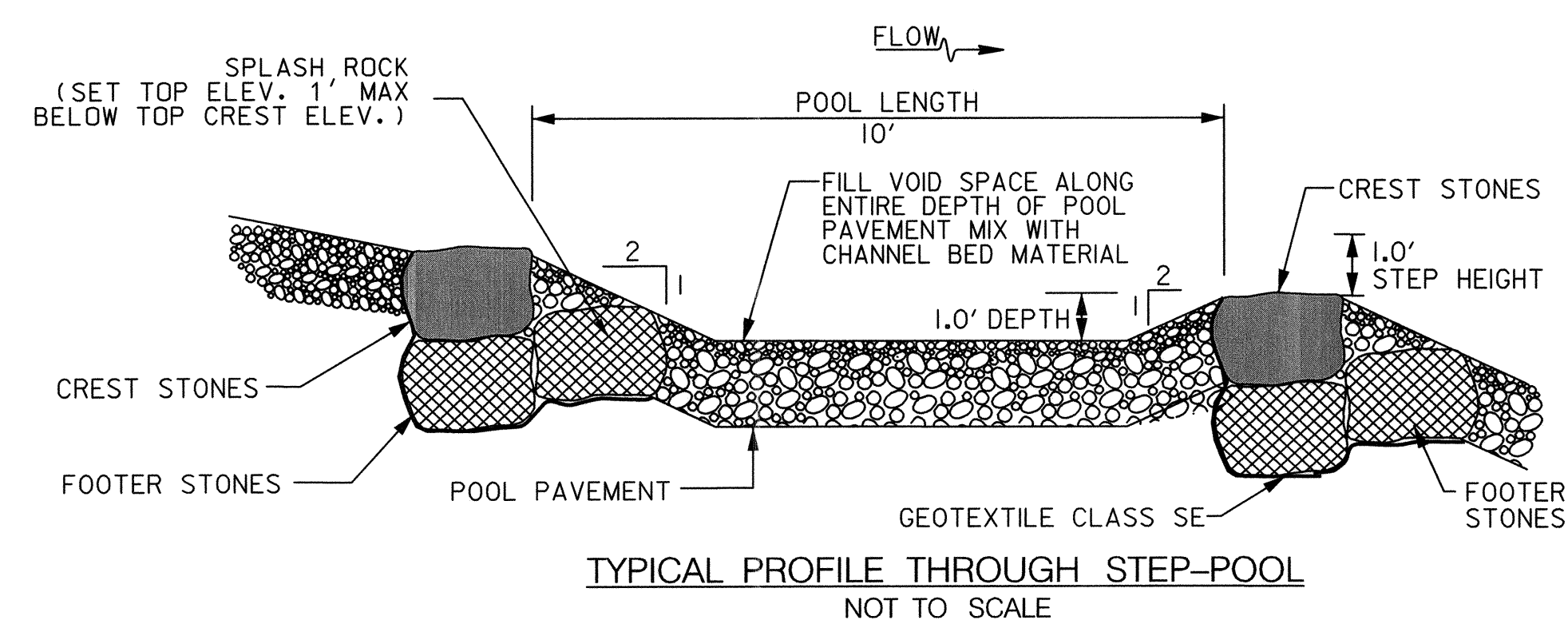


DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND McCORMICK TAYLOR 509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400 8/22/18 DATE	 Howard County MARYLAND Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046-3143 (410) 313-6444	 Visty P. Dalal PROFESSIONAL ENGINEER	DES: CL /JB	EZS	[]	AS-BUILT SURVEY	9/17/19
			DRN: MR				
			CHK: AH /LN				
			DATE: 8/17/18	BY	NO.	REVISION	DATE

**DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT**
HOWARD COUNTY CAPITAL PROJECT #D-1159
 HSCD #: EP-17-34
 MD DAM NO. 576

STORMWATER MANAGEMENT DETAILS

SCALE
AS SHOWN
SHEET
8 OF 23



POOL PAVEMENT MIX	
AMOUNT OF STONE (%)	TYPE
40	SHA CLASS 0
60	SHA CLASS 1
100	TOTAL

10-YEAR DESIGN INFORMATION
 $\tau_c = 2.7 \text{ lb/ft}^2$
 $d_c = 1.9 \text{ ft}$
 $V_c = 6.4 \text{ ft/s}$
 MINIMUM DESIGN SHEAR STRENGTH CREST = 3.6 lb/ft^2
 MINIMUM DESIGN SHEAR STRENGTH POOL = 0.2 lb/ft^2

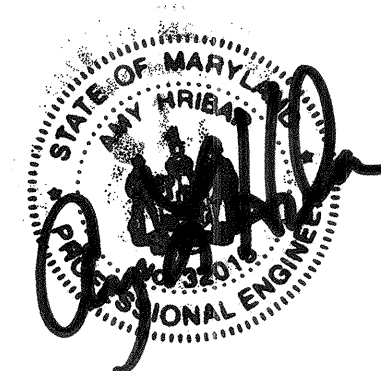
10-YEAR DESIGN INFORMATION
 $\tau_c = 3.0 \text{ lb/ft}^2$
 $d_c = 0.8 \text{ ft}$
 $V_c = 6.8 \text{ ft/s}$
 MINIMUM DESIGN SHEAR STRENGTH = 4.0 lb/ft^2

CASCADE MIX	
AMOUNT OF STONE (%)	TYPE
50	SHA CLASS 1
50	SHA CLASS 2
100	TOTAL

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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MARYLAND
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
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DES: CL /JB				
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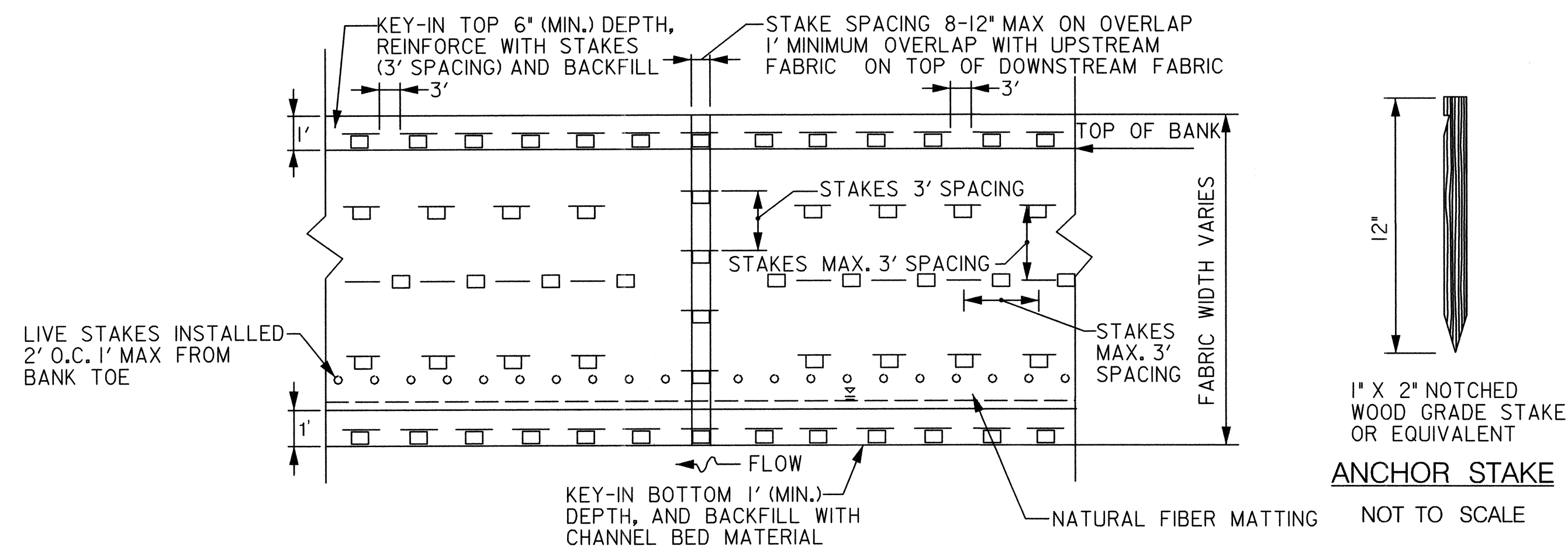
DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

CHANNEL STABILIZATION DETAILS

SCALE
NOT TO SCALE
SHEET
9 OF 23

[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

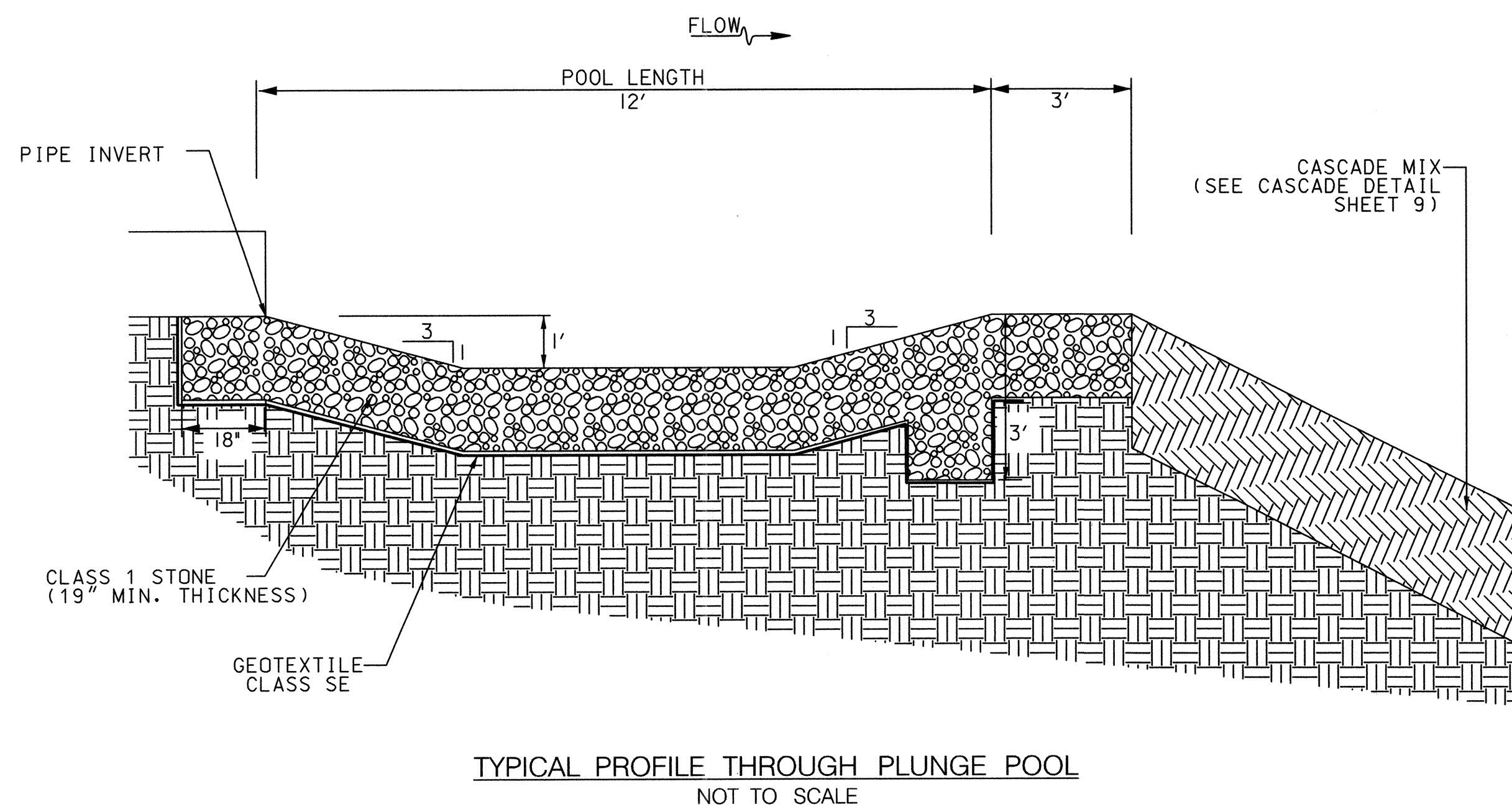
8/22/18
DATE



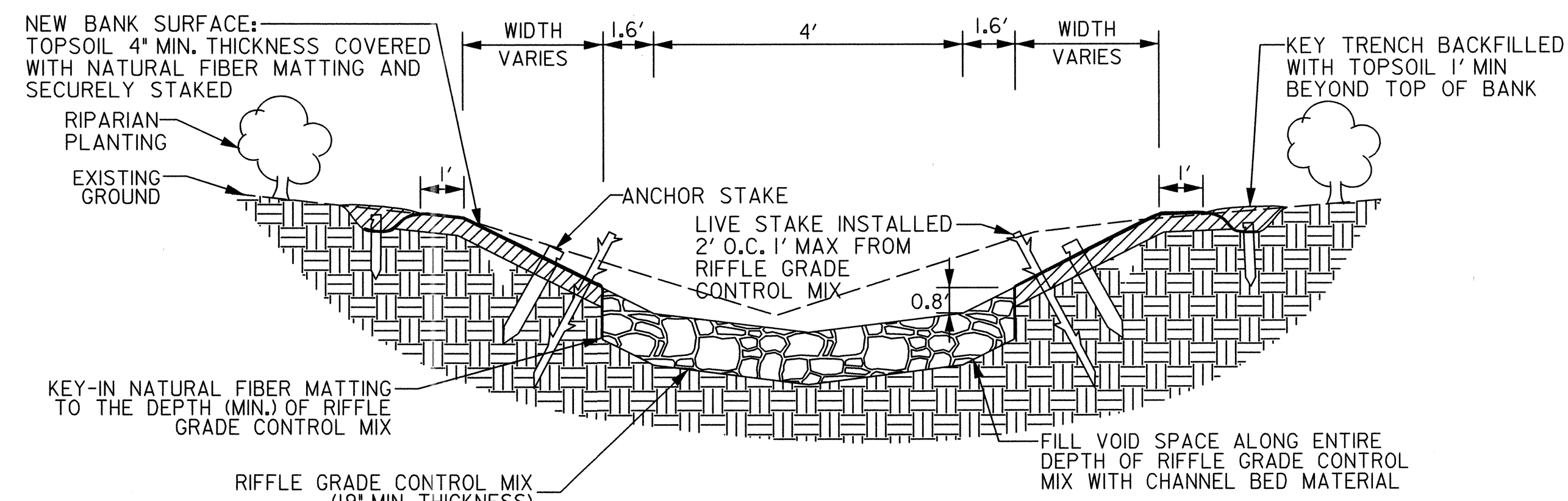
NATURAL FIBER MATTING - PLAN VIEW
NOT TO SCALE

USE NEDIA KOIR MAT 700 TYPE MATTING, ECO MESH CM 700, GEOCOIR DEKOWE 900 TYPE MATTING, OR AN EQUIVALENT MATTING CONSISTING OF MACHINE PRODUCED MATTING MEETING THE FOLLOWING MINIMUM SPECIFICATIONS.

MATERIAL	WOVEN COIR MATTING
THICKNESS	0.3 IN.
WEIGHT	20 OZ/SY
WATER VELOCITY	12 FT/SEC
OPEN AREA	50%
SHEAR	4 PSF



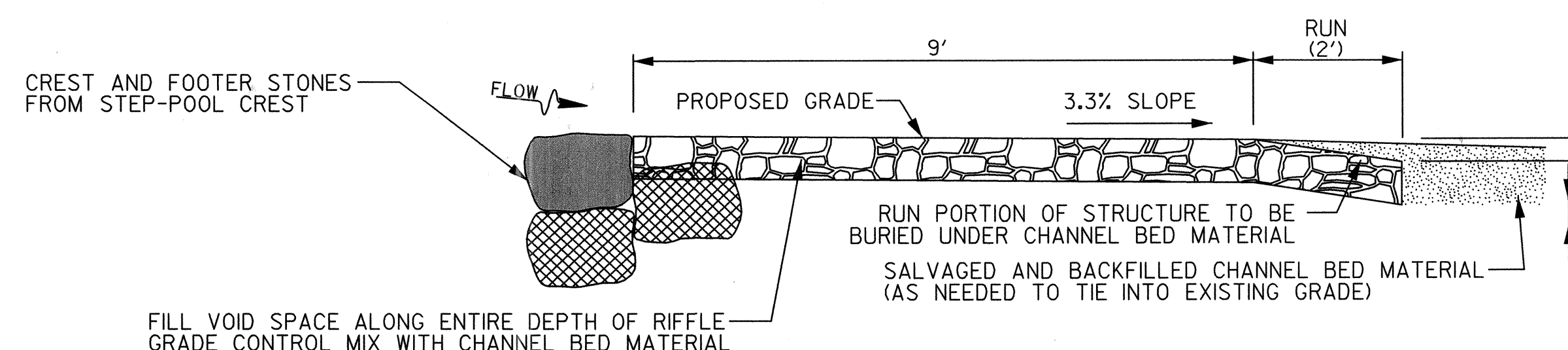
10-YEAR DESIGN INFORMATION
 $\tau_c = 0.2 \text{ lb/ft}^2$
 $d_s = 1.9 \text{ ft}$
 $V_c = 1.9 \text{ ft/s}$
 MINIMUM DESIGN SHEAR STRENGTH = 0.3 lb/ft²



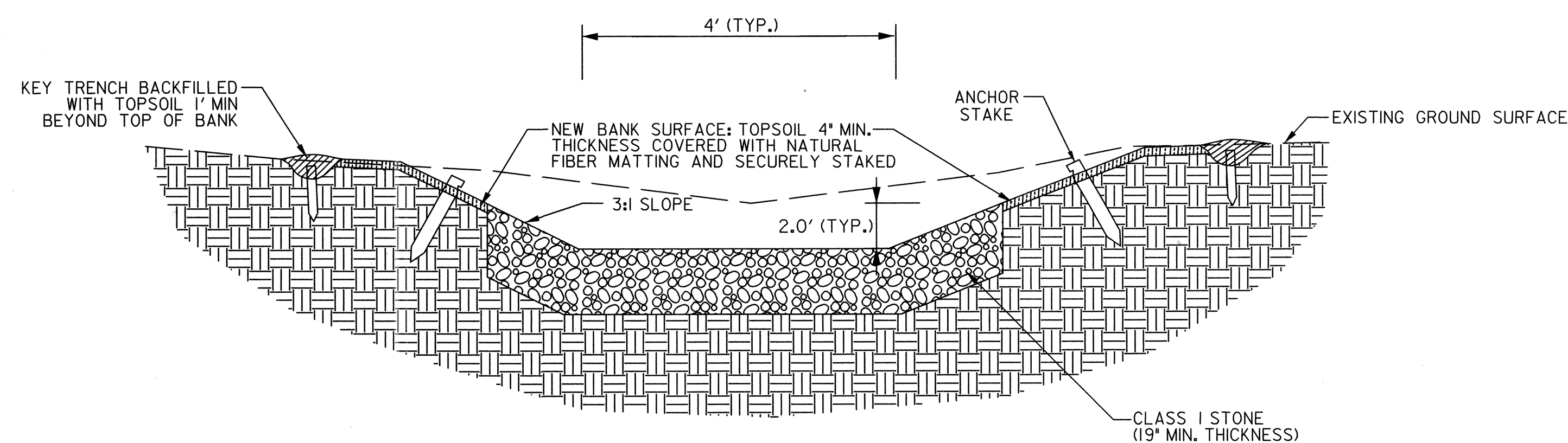
TYPICAL CROSS SECTION RIFFLE GRADE CONTROL (RGC)
NOT TO SCALE

10-YEAR DESIGN INFORMATION
 $\tau_c = 1.2 \text{ lb/ft}^2$
 $d_s = 1.0 \text{ ft}$
 $V_c = 5.1 \text{ ft/s}$
 MINIMUM DESIGN SHEAR STRENGTH = 1.7 lb/ft²

RGC MIX	
AMOUNT OF STONE (%)	TYPE
20	SHA CLASS 0
60	SHA CLASS 1
20	SHA CLASS 2
100	TOTAL



TYPICAL PROFILE RIFFLE GRADE CONTROL (RGC)
NOT TO SCALE



TYPICAL PLUNGE POOL SECTION
NOT TO SCALE

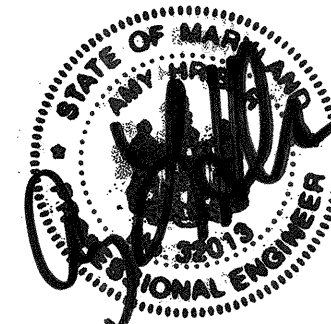
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

McCORMICK TAYLOR

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Howard County
MARYLAND

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BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

CHANNEL STABILIZATION DETAILS

SCALE

NOT TO SCALE

SHEET

10 OF 23

Mark O. ...
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

8/22/18
DATE

MULCH ACCESS PATH			
FROM	TO	QTY (SY)	REMARKS
10+59.1' RT	12+23.197' RT	591	16 FT WIDTH

SAND BAGS				
MIN. TOP HEIGHT	FROM	TO	QTY (LF)	REMARKS
401.50	13+14.268' RT	13+20.255' RT	16	SB-1
406.00	12+53.183' RT	12+68.180' RT	16	SB-2
402.00	12+80.256' RT	12+83.258' RT	4	SB-3
419.00	11+98.43' RT	11+95.91' RT	48	SB-4

DIVERSION FENCE		
FROM	TO	QTY (LF)
11+59.19' RT	11+70.180' RT	162

TYPE 'A' SOIL STABILIZATION MATTING	
QTY (SY)	REMARKS
282	OUTSIDE NATURAL FIBER MATTING. SEE DETAIL SHEET 14

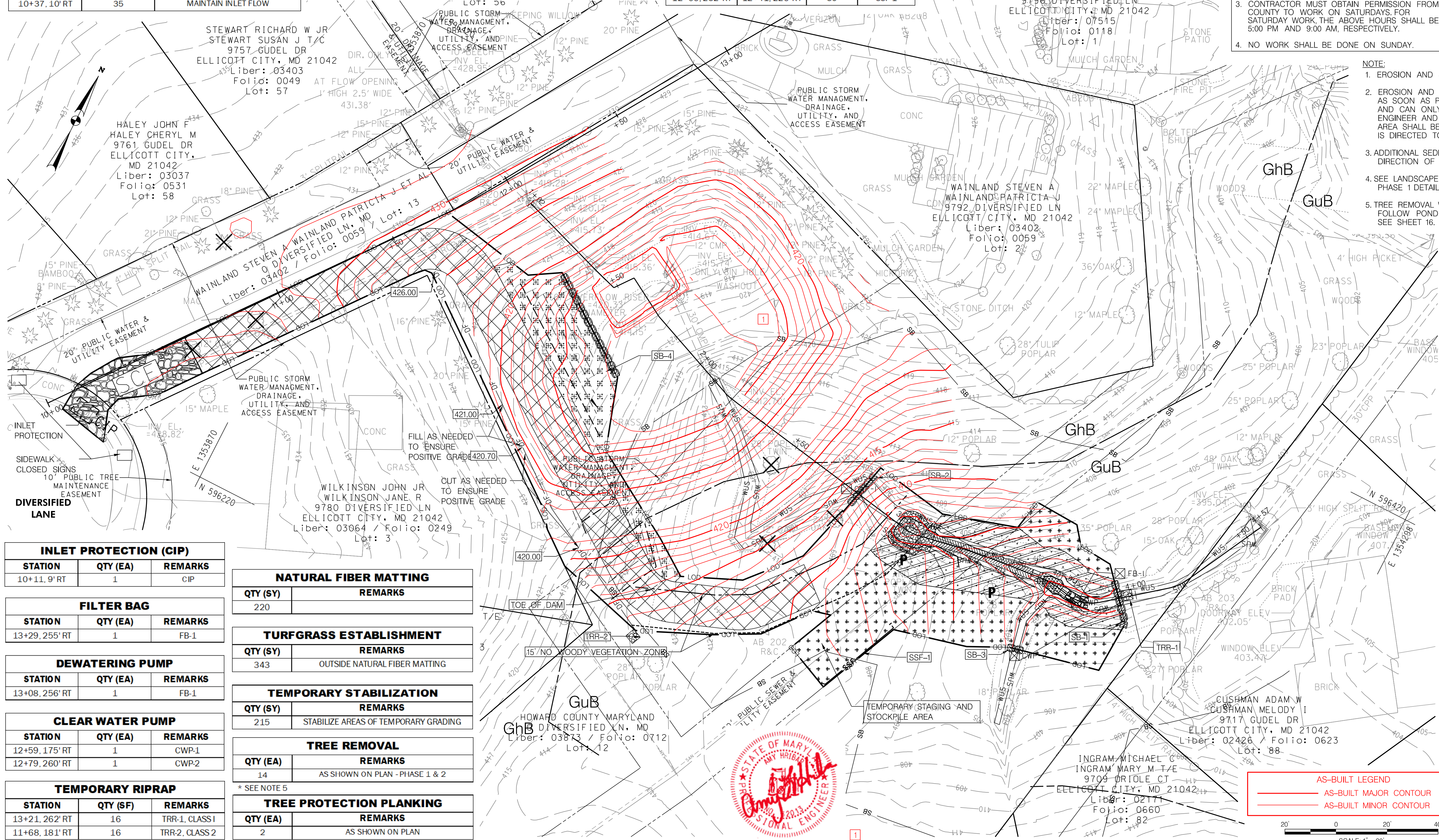
STABILIZED CONSTRUCTION ENTRANCE (SCE)		
STATION	QTY (TON)	REMARKS
10+37.10' RT	35	MAINTAIN INLET FLOW

SUPER SILT FENCE			
FROM	TO	QTY (LF)	REMARKS
12+06.232' RT	12+41.226' RT	39	SSF-1

- TIME RESTRICTION NOTES:
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 - CONSTRUCTION EQUIPMENT SHALL NOT BE STARTED NOR RUN BETWEEN THE HOURS OF 5:00 PM AND 7:00 AM, MONDAY THROUGH FRIDAY.
 - CONTRACTOR MUST OBTAIN PERMISSION FROM COUNTY TO WORK ON SATURDAYS. FOR SATURDAY WORK, THE ABOVE HOURS SHALL BE 5:00 PM AND 9:00 AM, RESPECTIVELY.
 - NO WORK SHALL BE DONE ON SUNDAY.

- STANDARD STABILIZATION NOTE
- FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:
- THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
 - SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITES NOT UNDER ACTIVE GRADING.

- NOTE:
- EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.
 - EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS SOON AS PRACTICABLE FOR EACH PHASE OF CONSTRUCTION AND CAN ONLY BE REMOVED UPON THE APPROVAL OF THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
 - ADDITIONAL SEDIMENT CONTROLS SHALL BE PROVIDED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
 - SEE LANDSCAPE PLAN AND CHANNEL STABILIZATION DETAILS FOR PHASE 1 DETAILS.
 - TREE REMOVAL WITHIN AREA OF PROPOSED EMBANKMENT SHALL FOLLOW POND SPECIFICATIONS FOR CLEARING AND GRUBBING. SEE SHEET 16.



INLET PROTECTION (CIP)		
STATION	QTY (EA)	REMARKS
10+11.9' RT	1	CIP

FILTER BAG		
STATION	QTY (EA)	REMARKS
13+29.255' RT	1	FB-1

DEWATERING PUMP		
STATION	QTY (EA)	REMARKS
13+08.256' RT	1	FB-1

CLEAR WATER PUMP		
STATION	QTY (EA)	REMARKS
12+59.175' RT	1	CWP-1
12+79.260' RT	1	CWP-2

TEMPORARY RIPRAP		
STATION	QTY (SF)	REMARKS
13+21.262' RT	16	TRR-1, CLASS 1
11+68.181' RT	16	TRR-2, CLASS 2

NATURAL FIBER MATTING	
QTY (SY)	REMARKS
220	

TURFGRASS ESTABLISHMENT	
QTY (SY)	REMARKS
343	OUTSIDE NATURAL FIBER MATTING

TEMPORARY STABILIZATION	
QTY (SY)	REMARKS
215	STABILIZE AREAS OF TEMPORARY GRADING

TREE REMOVAL	
QTY (EA)	REMARKS
14	AS SHOWN ON PLAN - PHASE 1 & 2

TREE PROTECTION PLANKING	
QTY (EA)	REMARKS
2	AS SHOWN ON PLAN

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- - - TEMPORARY MAJOR CONTOUR
- - - TEMPORARY MINOR CONTOUR
- - - EXISTING MAJOR CONTOUR
- - - EXISTING MINOR CONTOUR
- PROPERTY LINE
- - - EASEMENT BOUNDARY
- - - PROPERTY AND EASEMENT LINE
- WUS - WATERS OF THE US
- WATS - WATERS OF THE STATE
- - - SOIL BOUNDARY
- LOD - LIMIT OF DISTURBANCE
- WOODS LINE
- CLASS 1 RIPRAP
- TEMPORARY RIPRAP (TRR)
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- SF - SILT FENCE
- P - TREE PROTECTION PLANKING
- CAS - CASCADE STRUCTURE
- RGC - RIFFLE GRADE CONTROL
- SP - STEP-POOL
- SB - SAND BAG DAM
- FB - FILTER BAG
- CWP - CLEAR WATER PUMP
- DWP - DEWATERING PUMP
- SP - SUMP PIT
- SCE - STABILIZED CONSTRUCTION ENTRANCE
- TSM - TEMPORARY SOIL STABILIZATION MATTING
- TGE - TURFGRASS ESTABLISHMENT & TYPE 'A' SOIL STABILIZATION MATTING
- NFM - NATURAL FIBER MATTING
- MAP - MULCH ACCESS PATH

AS-BUILT LEGEND

- AS-BUILT MAJOR CONTOUR
- AS-BUILT MINOR CONTOUR

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Mark DePina
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

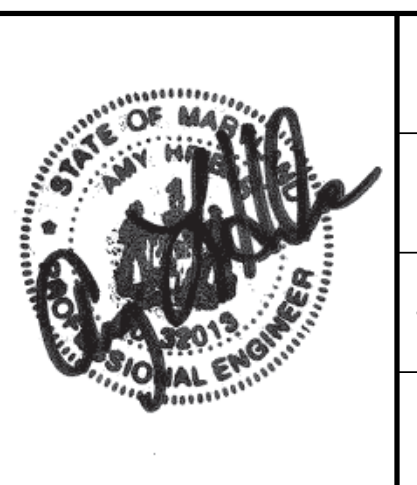
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McCORMICK TAYLOR

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MARYLAND

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DATE: 8/17/18	BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

**EROSION AND SEDIMENT CONTROL PLAN
PHASE 1**

SCALE
1" = 20'
SHEET
11 OF 23

CLEARWATER DIVERSION PIPE, TYPE S					
FROM	TO	LENGTH (FT)	DIA. (IN)	US INVERT	REMARKS
EX-ES-1	SB-6	143	24	415.36	CWD-1

FILTER BAG		
STATION	QTY (EA)	REMARKS
12+18.196 RT	1	FB-2

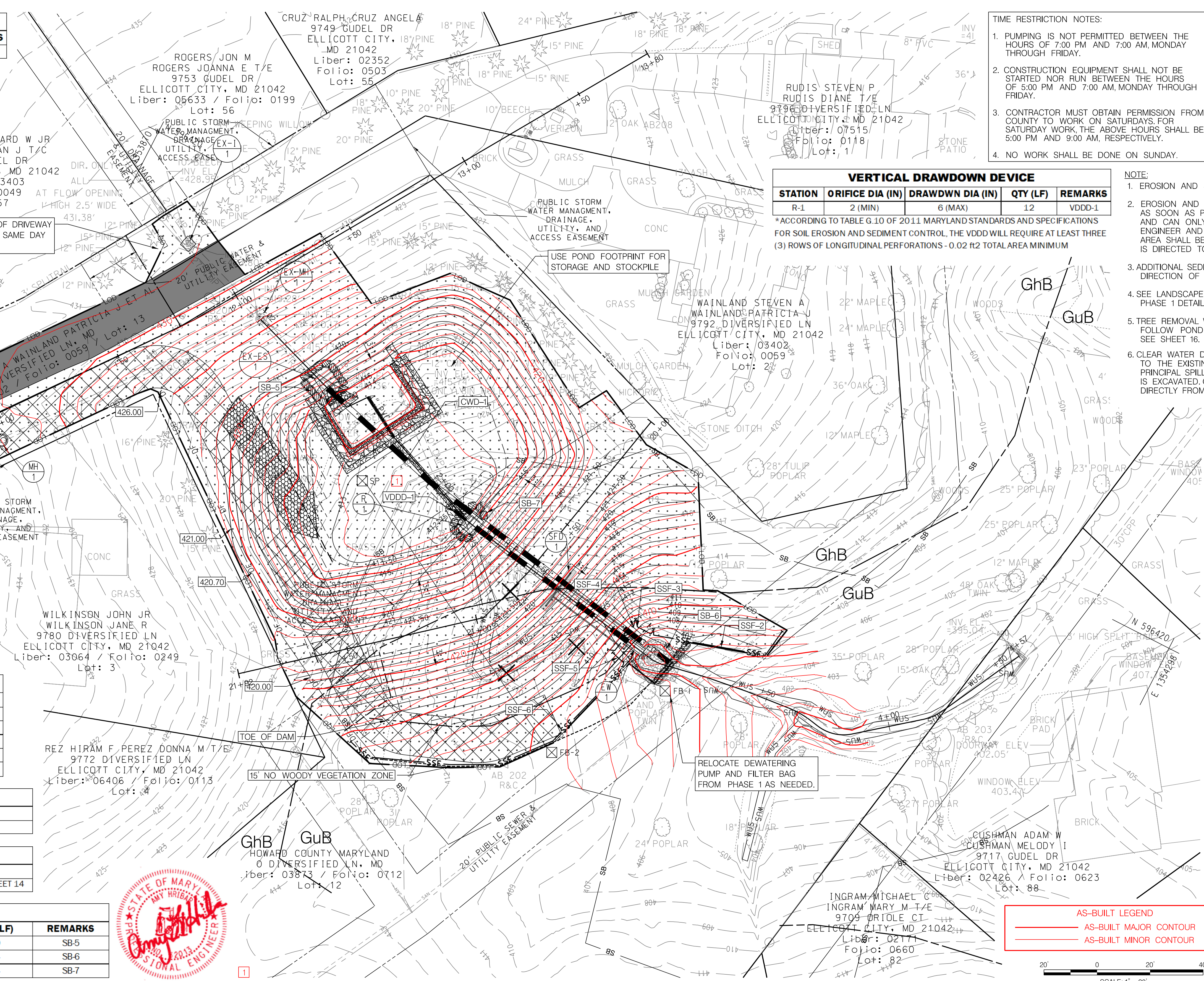
SUMP PIT		
STATION	QTY (EA)	REMARKS
12+06.84' RT	1	SP

SUPER SILT FENCE				
FROM	TO	QTY (LF)	REMARKS	
12+72.188' RT	13+13.214' RT	56	SSF-2	
12+68.182' RT	12+71.189' RT	10	SSF-3	
12+53.186' RT	12+68.181' RT	18	SSF-4	
12+55.195' RT	12+54.188' RT	8	SSF-5	
11+67.169' RT	12+60.192' RT	126	SSF-6	

TURFGRASS ESTABLISHMENT	
QTY (SY)	REMARKS
3312	ON ALL DISTURBED EARTH AREAS

TYPE 'A' SOIL STABILIZATION MATTING	
QTY (SY)	REMARKS
3312	ON ALL DISTURBED EARTH AREAS, SEE DETAIL SHEET 14

SAND BAGS				
MIN. TOP HEIGHT	FROM	TO	QTY (LF)	REMARKS
420.00	12+06.46' RT	12+17.46' RT	50	SB-5
406.00	12+52.183' RT	12+64.178' RT	14	SB-6
418.50	12+37.121' RT	12+31.123' RT	34	SB-7



- TIME RESTRICTION NOTES:
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STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:

A) THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND

B) SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITES NOT UNDER ACTIVE GRADING.

VERTICAL DRAWDOWN DEVICE				
STATION	ORIFICE DIA (IN)	DRAWDOWN DIA (IN)	QTY (LF)	REMARKS
R-1	2 (MIN)	6 (MAX)	12	VDDD-1

*ACCORDING TO TABLE G.10 OF 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE VDDD WILL REQUIRE AT LEAST THREE (3) ROWS OF LONGITUDINAL PERFORATIONS - 0.02 ft2 TOTAL AREA MINIMUM

- NOTE:
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 - EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS SOON AS PRACTICABLE FOR EACH PHASE OF CONSTRUCTION AND CAN ONLY BE REMOVED UPON THE APPROVAL OF THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
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 - SEE LANDSCAPE PLAN AND CHANNEL STABILIZATION DETAILS FOR PHASE 1 DETAILS.
 - TREE REMOVAL WITHIN AREA OF PROPOSED EMBANKMENT SHALL FOLLOW POND SPECIFICATIONS FOR CLEARING AND GRUBBING. SEE SHEET 16.
 - CLEAR WATER DIVERSION (CWD) SHALL BE CONVEYED FROM EX-ES-1 TO THE EXISTING PRINCIPAL SPILLWAY PIPE AND FROM THE EXISTING PRINCIPAL SPILLWAY PIPE TO SB-6 UNTIL THE EXISTING EMBANKMENT IS EXCAVATED. ONCE EMBANKMENT IS OPEN, CWD SHALL BE EXTEND DIRECTLY FROM EX-ES-1 THROUGH SB-6.

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT BOUNDARY
- PROPERTY AND EASEMENT LINE
- WUS - WATERS OF THE US
- WATERS OF THE STATE
- SOIL BOUNDARY
- LTD - LIMIT OF DISTURBANCE
- WOODS LINE
- CLASS I RIPRAP
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- DF - DIVERSION FENCE
- SSF - SUPER SILT FENCE
- P - TREE PROTECTION PLANKING
- GEOGRID
- ASPHALT PATCHING
- 24" CLEAR WATER DIVERSION PIPE
- SAND BAG DAM
- FB - FILTER BAG
- CWP - CLEAR WATER PUMP
- DWP - DEWATERING PUMP
- SP - SUMP PIT
- STABILIZED CONSTRUCTION ENTRANCE
- TYPE 'A' SOIL STABILIZATION MATTING
- MULCH ACCESS PATH



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Mark O. [Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

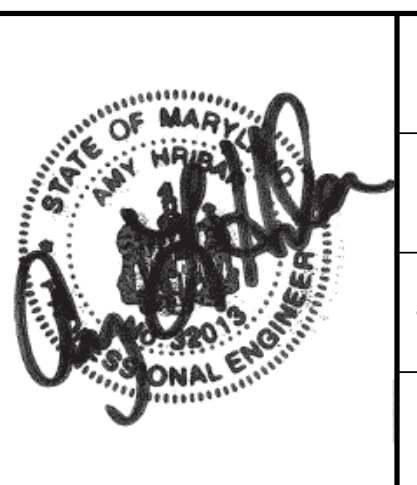
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Columbia, Maryland 21046-3143
(410) 313-6444



DES: CL /JB	EZS	1	AS-BUILT SURVEY	9/17/19
DRN: MR				
CHK: AH /LN				
DATE: 8/17/18	BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

**EROSION AND SEDIMENT CONTROL PLAN
PHASE 2**

SCALE: 1" = 20'
SHEET 12 OF 23

SEQUENCE OF CONSTRUCTION

EROSION AND SEDIMENT CONTROL – GENERAL NOTES

1. EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.
2. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE WITH PERMISSION FROM THE HOWARD COUNTY CID INSPECTOR.
3. OBTAIN GRADING PERMIT AND MDE PERMIT (TRACKING NUMBER 201761333).
4. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) DAYS PRIOR TO THE START OF WORK. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410) 313-1880 A MINIMUM OF 5 DAYS PRIOR TO THE START OF ANY CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY THE HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900, MARYLAND DEPARTMENT OF THE ENVIRONMENT INSPECTOR AT (301) 665-2850, AND MARYLAND DEPARTMENT OF THE ENVIRONMENT DAM SAFETY DIVISION AT (410) 537-3655 FIVE(5) DAYS BEFORE ANY LAND DISTURBING ACTIVITY. (1 DAY)
5. STAKEOUT LOD AS SHOWN ON THE PHASE 1 PLANS AND INSTALL ORANGE CONSTRUCTION FENCE (OCF) AROUND THE PERIMETER OF THE LOD. THIS SHALL BE COMPLETED BY AND INSPECTED AT THE PRE-CONSTRUCTION MEETING. (1 DAY)
6. THE CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION, MDE DAM SAFETY, MDE INSPECTOR, AND THE CONTRACTOR. (1 DAY)

PHASE 1

7. CONSTRUCT THE FOLLOWING PERIMETER CONTROLS AS SHOWN ON THE PLAN: STABILIZED CONSTRUCTION ENTRANCE (SCE), INLET PROTECTION (IPI), MULCH ACCESS, SANDBAGS (SB-6), AND SUPER SILT FENCE (SSF-1). COMPLETE TEMPORARY GRADING FOR MULCH ACCESS PATH AND PLACE TEMPORARY MULCH. CLEAR ONLY THE AREA NEEDED TO INSTALL THE EAS CONTROLS. INSTALL SIDEWALK CLOSED SIGNS. (5 DAYS)
8. INSTALL PUMP AROUND FOR CHANNEL STABILIZATION WORK. COMPLETE CHANNEL STABILIZATION FROM STA. 3+00 TO 3+81. WORKING FROM DOWNSTREAM TO UPSTREAM. GRADE CHANNEL AND INSTALL IN-STREAM STRUCTURES. ONLY DISTURBING WHAT CAN BE STABILIZED AT THE END OF EACH WORK DAY. WORK IN THE CHANNEL MAY NOT BE CONDUCTED FROM MARCH 1 TO MAY 31. (8 DAYS)
9. COMPLETE PHASE 1 SOIL STABILIZATION AS SHOWN ON PLAN WITH NATURAL FIBER MATTING AND TURFGRASS ESTABLISHMENT. INSTALL LANDSCAPING AS SHOWN ON THE LANDSCAPE PLAN. (3 DAYS)

PHASE 2

10. WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR AND A 5-DAY CLEAR WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE, REMOVE PUMP AROUND, SB-1, SB-2, AND SB-3. INSTALL REMAINING CONTROLS AS SHOWN ON THE PLAN: SUMP PIT, FILTER BAG (FB-2), CLEAR WATER DIVERSION PIPE, SUPER SILT FENCE (SSF-2), AND SANDBAG DAM (SB-5, SB-6, SB-7). (3 DAYS)
12. EXCAVATE AND REMOVE RISER, SPILLWAY PIPE, AND END SECTION. CONSTRUCT THE PROPOSED SPILLWAY PIPE, INCLUDING THE ENDWALL (EW-1), SAND FILTER DIAPHRAGM (SFD-1), CONCRETE CRADLE, CLAY CORE, AND RISER (R-1). ADJUST SILT FENCE ABOVE THE ENDWALL AS NEEDED. CONSTRUCT THE EMBANKMENT AT ITS NEW LOCATION. ADJUST THE CLEAR WATER DIVERSION PIPE TO OUTFALL AT OPENINGS IN RISER BY PLACING SANDBAGS WITH SHEETING AROUND ENTRANCE TO RISER TO PROVIDE SECURE AND STABLE CONNECTION. DEWATER FROM THE SUMP PIT TO THE FILTER BAG AS NEEDED. (18 DAYS)
13. COMPLETE POND GRADING, INSTALL RIPRAP AND GABION FOREBAY WEIR, AND POND ACCESS AS SHOWN ON PLANS. ADJUST THE CLEAR WATER DIVERSION PIPE AS NEEDED TO COMPLETE POND GRADING. DEWATER FROM THE SUMP PIT TO THE FILTER BAG AS NEEDED. (10 DAYS)
14. REMOVE TEMPORARY CONSTRUCTION ACCESS TO LOCATION OF MH-1 AND GRADE TO FINAL ELEVATIONS REMOVING ALL RUTS. STABILIZE DISTURBED AREA WITHIN THE POND. (3 DAYS)
15. DURING A 5 DAY DRY WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE, INSTALL 1-1, 15" RCP, AND MH-1. COMPLETE MODIFICATIONS TO EX-1-1. (5 DAYS)
16. REMOVE AND INSTALL FENCE AS DIRECTED BY THE COUNTY. REPAIR ASPHALT DRIVEWAY WITHIN LOD. REMOVE REMAINING PORTION OF TEMPORARY CONSTRUCTION ACCESS AND REMOVE ALL RUTS. INSTALL SOIL STABILIZATION MATTING AS SHOWN ON THE PLAN. (5 DAYS)
17. WHEN AREAS ARE FULLY STABILIZED, AND WITH PERMISSION FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE THE REMAINING SEDIMENT CONTROL DEVICES AND STABILIZE ANY REMAINING DISTURBED AREAS. (1 DAY)

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID), 410-313-1885 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO CID MUST BE GIVEN AT THE FOLLOWING STAGES:
 - A. PRIOR TO THE START OF EARTH DISTURBANCE.
 - B. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER DISTURBANCE OR GRADING.
 - C. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT.
 - D. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES.
- OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1. B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL FOR TOPSOIL (SEC. B-4-2), PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES IF THE GROUND IS FROZEN. INCREMENTAL STABILIZATION (SEC. B-4-1) SPECIFICATIONS SHALL BE ENFORCED IN AREAS WITH >15% OF CUT AND/OR FILL STOCKPILES (SEC. B-4-8) IN EXCESS OF 20' MUST BE BENEATH WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPES, AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOILS STABILIZATION MATTING (SEC. B-4-6).
5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
6. SITE ANALYSIS:

TOTAL AREA OF SITE	0.89 ACRES
AREA DISTURBED	0.89 ACRES
AREA TO BE ROOFED OR PAVED	0.04 ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.85 ACRES
TOTAL CUT	1278 CY
TOTAL FILL	1616 CY

 OFFSITE WASTE/BORROW AREA LOCATION SEE NOTE #17
7. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR. THE SITE AND ALL CONTROLS SHALL BE INSPECTED BY THE CONTRACTOR WEEKLY; AND THE NEXT DAY AFTER EACH RAIN EVENT. A WRITTEN REPORT BY THE CONTRACTOR, MADE AVAILABLE UPON REQUEST IS PART OF EVERY INSPECTION AND SHALL INCLUDE ITEMS LISTED AT HOWARDCSD.ORG.
9. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

10. ANY MAJOR CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE HSCD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY BE ALLOWED BY THE CID PER THE LIST OF HSCD-APPROVED FIELD CHANGES.
11. DISTURBANCE SHALL NOT OCCUR OUTSIDE THE L.O.-D. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE CID. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE CID, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.
12. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE.
13. TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE.
14. ALL SILT FENCE AND SUPER SILT FENCE SHALL BE PLACED ON-THE-CONTOUR, AND BE IMBRICATED AT 25 MINIMUM INTERVALS, WITH LOWER ENDS CURLED UPHILL BY 2' IN ELEVATION.
15. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE): USE I AND IP MARCH 1 - JUNE 15 USE III AND IIIP OCTOBER 1 - APRIL 30 USE IV MARCH 1 - MAY 31
16. A COPY OF THIS PLAN, THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND ASSOCIATED PERMITS SHALL BE ON-SITE AND AVAILABLE WHEN THE SITE IS ACTIVE.
17. OFFSITE WASTE / BORROW SITE SHALL HAVE AN APPROVED SEDIMENT CONTROL PLAN AND PERMIT.

B-4-2 SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

- SOIL PREPARATION
 - TEMPORARY STABILIZATION
 - SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENEED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER MUST BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
 - APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
 - INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 - PERMANENT STABILIZATION
 - A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
 - SOIL PH BETWEEN 6.0 AND 7.0.
 - SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
 - SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
 - SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
 - SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 - APPLICATION OF FERTILIZER OR TOPSOIL IS REQUIRED IF ONE OF THE ABOVE CONDITIONS IS NOT MET.
 - GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.
 - APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
 - MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE. REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.
- TOPSOILING
 - TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.
 - TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
 - TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
 - THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
 - THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
 - THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
 - THE SOIL IS SO ACIDIC THAT LIMESTONE IS NOT FEASIBLE.
 - AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
 - TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
 - TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 INCH IN DIAMETER.
 - TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
 - TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
- TOPSOIL APPLICATION
 - EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
 - UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
 - TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
- SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
 - SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
 - FERTILIZERS ARE TO BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
 - LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
 - LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 - WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4-4 TEMPORARY STABILIZATION

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	HARDINESS ZONE (FROM FIGURE B.3)		FERTILIZER RATE (10-20-20)		LIME RATE
					6B	SEE BELOW	N	P ₂ O ₅	
	ANNUAL RYEGRASS	40	MAR. 1 TO MAY 15; AUG. 1 TO OCT 15	0.5			436 LB/AC (10 LB/ 1000 SF)		2 TON/AC (90 LB/ 1000 SF)
	FOXTAIL MILLET	30	MAY 16 TO JULY 31	0.5					

B-4-3 SEEDING AND MULCHING

- SEEDING
 - SPECIFICATIONS
 - ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
 - MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
 - INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
 - SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
 - DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
 - INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
 - APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDING AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
 - DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
 - CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
 - APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
 - HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
 - IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P₂O₅ (PHOSPHORUS), 200 POUNDS PER ACRE; K₂O (POTASSIUM), 200 POUNDS PER ACRE.
 - LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). LIME WHEN HYDROSEEDING.
 - MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
 - WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.
- MULCHING
 - MULCH MATERIALS (IN ORDER OF PREFERENCE)
 - STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
 - WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
 - WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMITY OF SPREAD SLURRY.
 - WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
 - WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS MIXTURE. THE MULCH MATERIAL MUST FORM A FILTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
 - WCFM MATERIALS MUST NOT CONTAIN CHEMICALS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
 - WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS. DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
 - APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
 - WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 2 TO 4 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED.
 - WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
 - WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
 - ANCHORING
 - PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
 - A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
 - WOOD CELLULOSE FIBER MULCH MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
 - SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSEET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUIPMENT MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
 - LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

B-4-5 PERMANENT STABILIZATION

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	HARDINESS ZONE (FROM FIGURE B.3)			FERTILIZER RATE (10-20-20)			LIME RATE
					6B	1		N	P ₂ O ₅	K ₂ O	
	SWITCH GRASS	10	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15	1/4-1/2 IN.				45 LB/AC (1.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	2 TON/AC (90 LB/ 1000 SF)
1	CREeping RED FESCUE	15	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15	1/4-1/2 IN.				45 LB/AC (1.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	2 TON/AC (90 LB/ 1000 SF)
	PARTRIDGE PEA	4	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15	1/4-1/2 IN.							

NOTE: MAY 16 TO JUNE 15 ARE ADDITIONAL PLANTING DATES DURING WHICH SUPPLEMENTAL WATERING MAY BE NEEDED TO ENSURE PLANT ESTABLISHMENT

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	HARDINESS ZONE (FROM FIGURE B.3)			FERTILIZER RATE (10-20-20)			LIME RATE
					6B	6		N	P ₂ O ₅	K ₂ O	
	TALL FESCUE	40	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.				45 LB/AC (1.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	2 TON/AC (90 LB/ 1000 SF)
6	PERENNIAL RYEGRASS	25	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.				45 LB/AC (1.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	90 LB/AC (2.0 LB/ 1000 SF)	2 TON/AC (90 LB/ 1000 SF)
	WHITE CLOVER	5	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.							

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

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Baltimore, Maryland 21202
(410) 662-7400

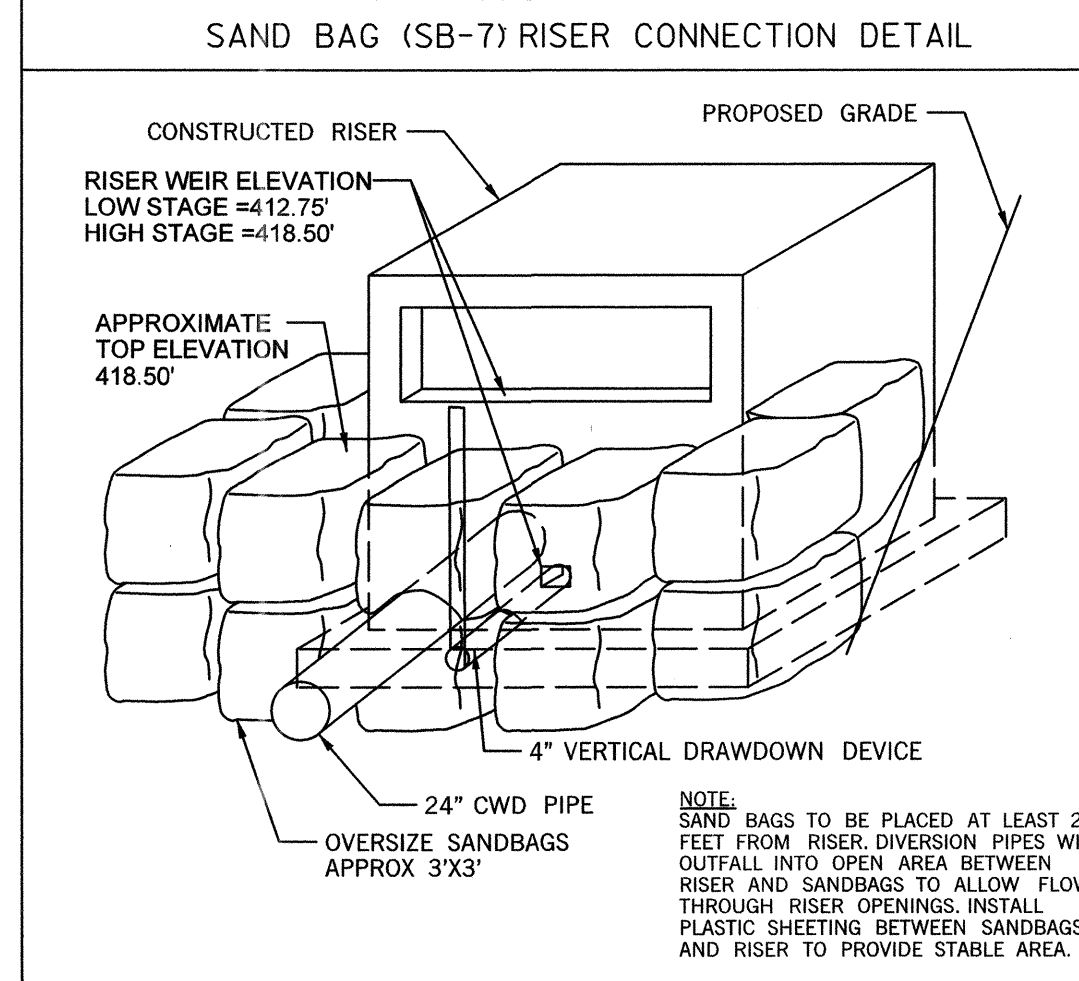
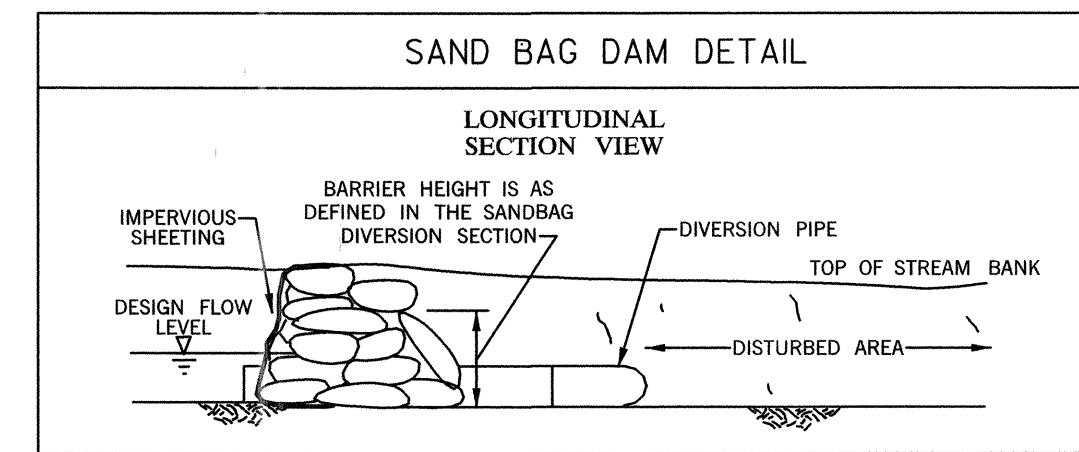
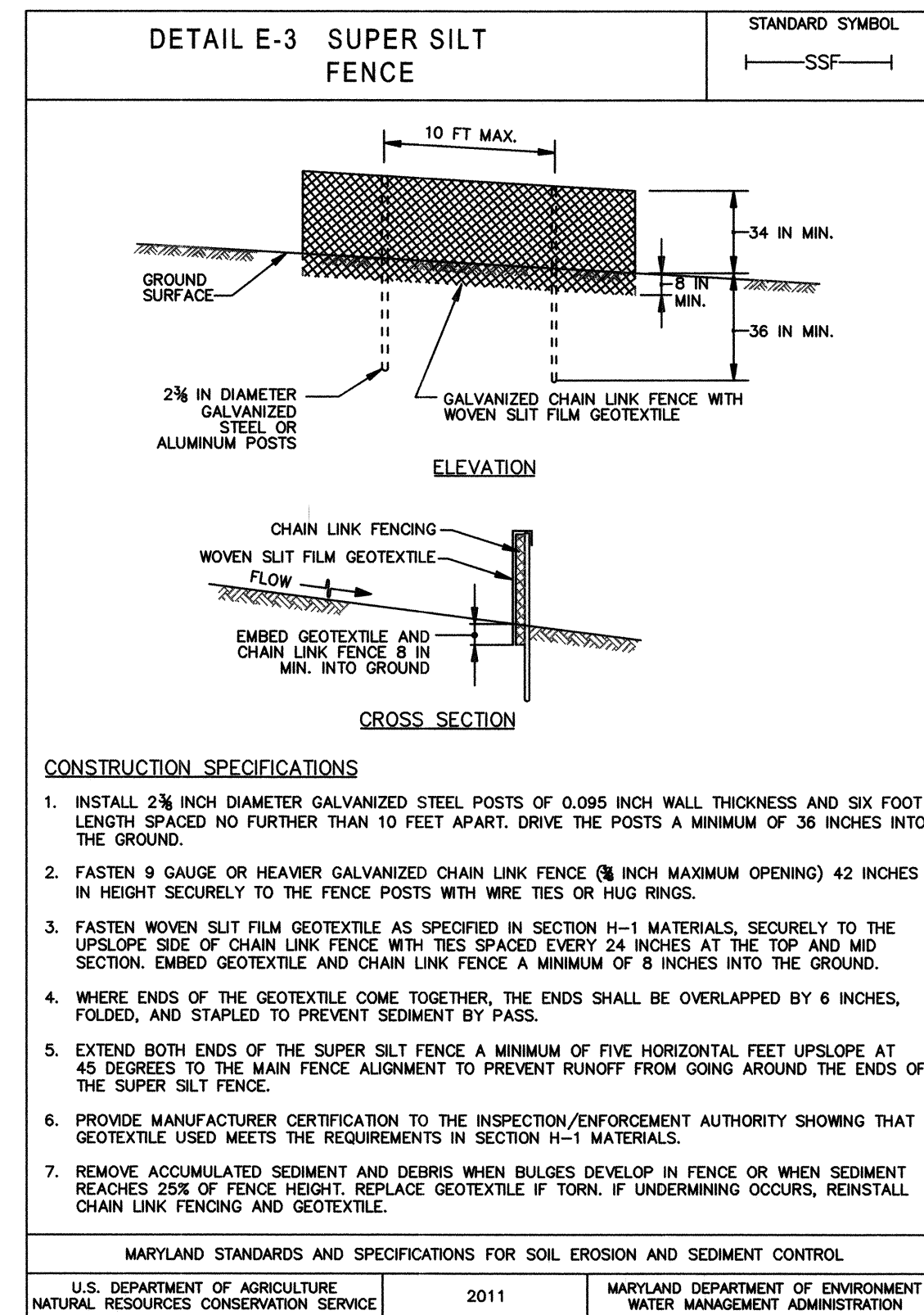
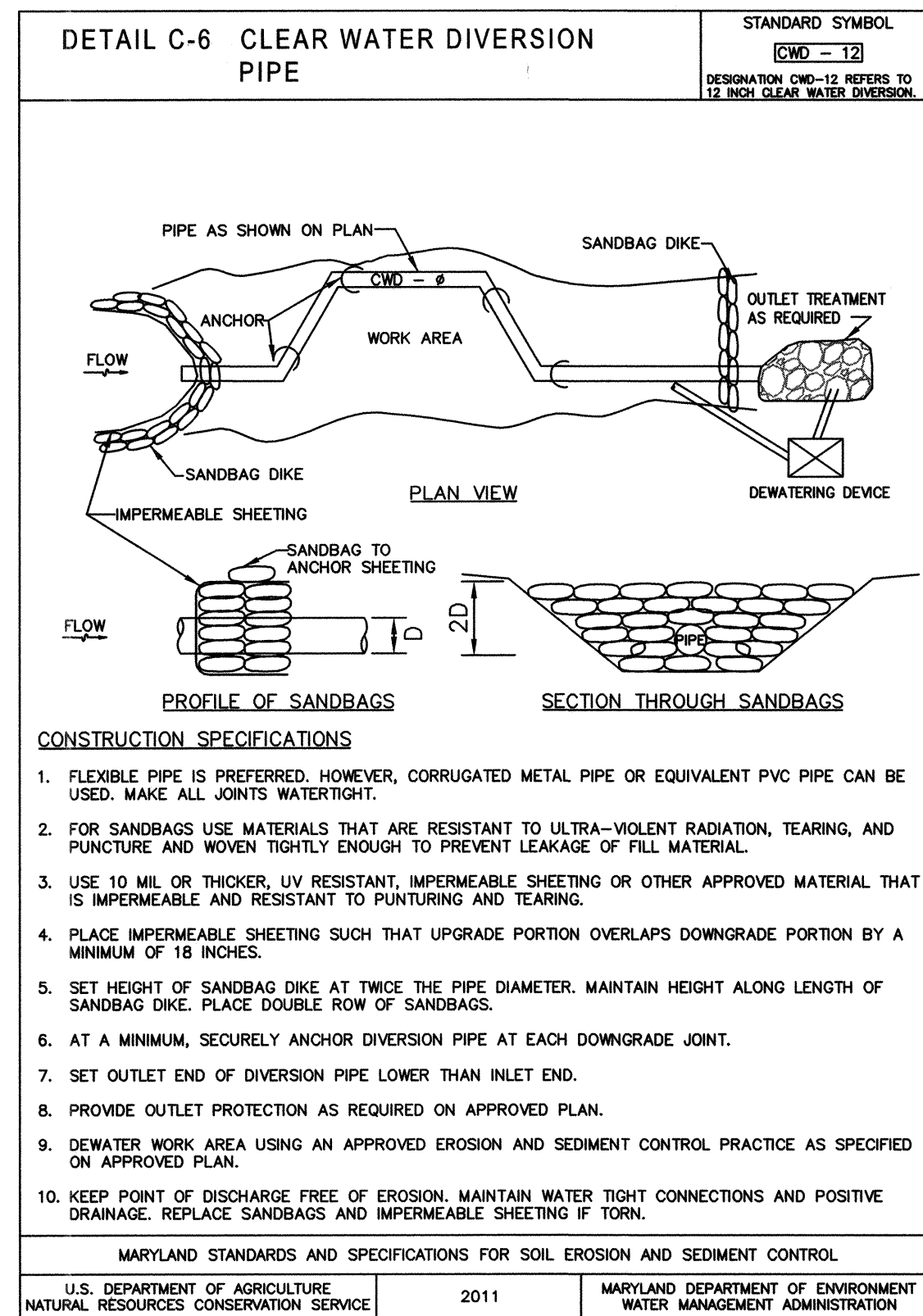
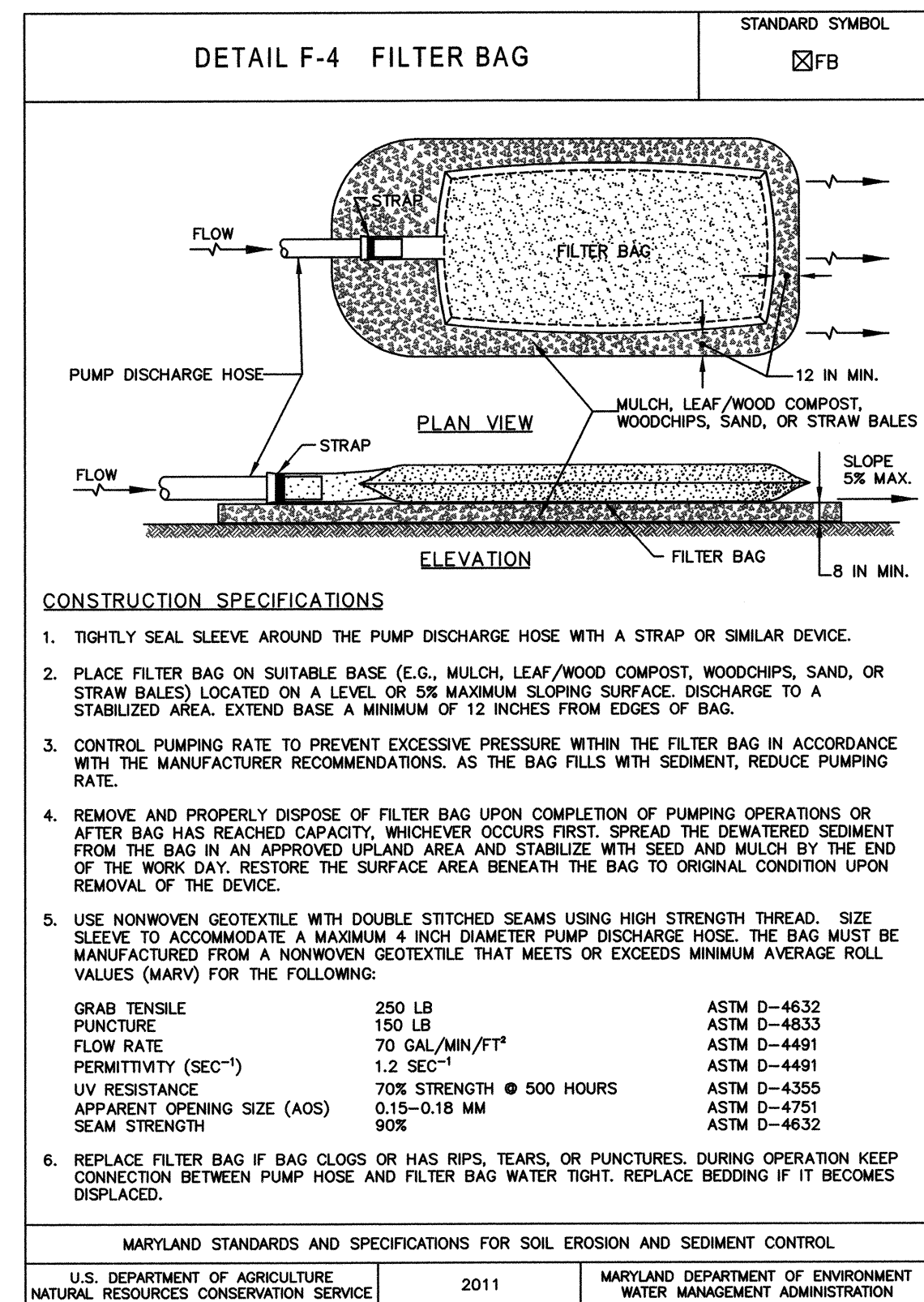
Howard County
MARYLAND
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444

DES: CL /JB					
DRN: MR					
CHK: AH /LN					
DATE: 8 /17 /18					
BY	NO.	REVISION	DATE		

**DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576**

EROSION AND SEDIMENT CONTROL NOTES

SCALE
NOT TO SCALE
SHEET
13 OF 23



B-44 STANDARDS AND SPECIFICATIONS

FOR STOCKPILE AREA

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

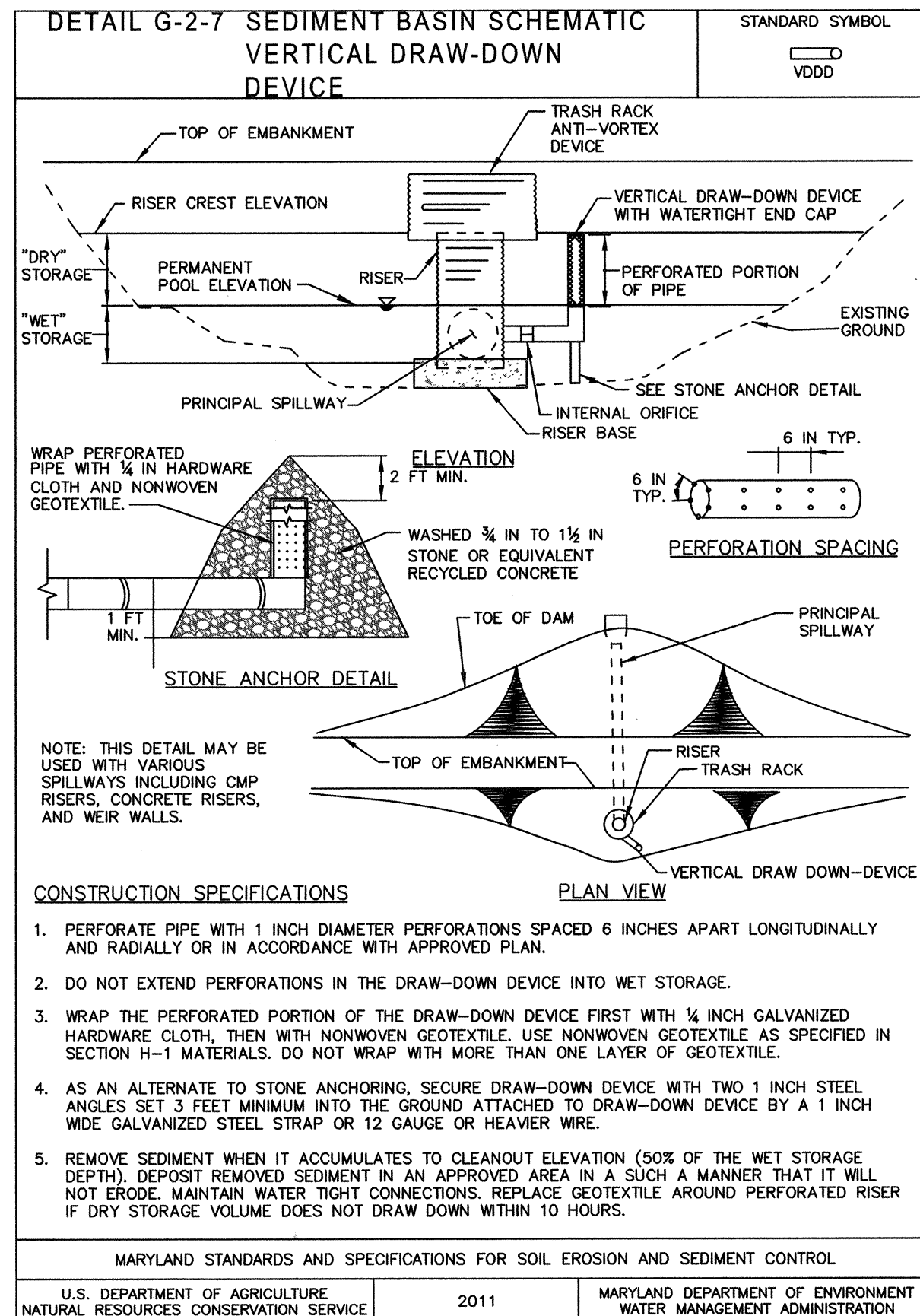
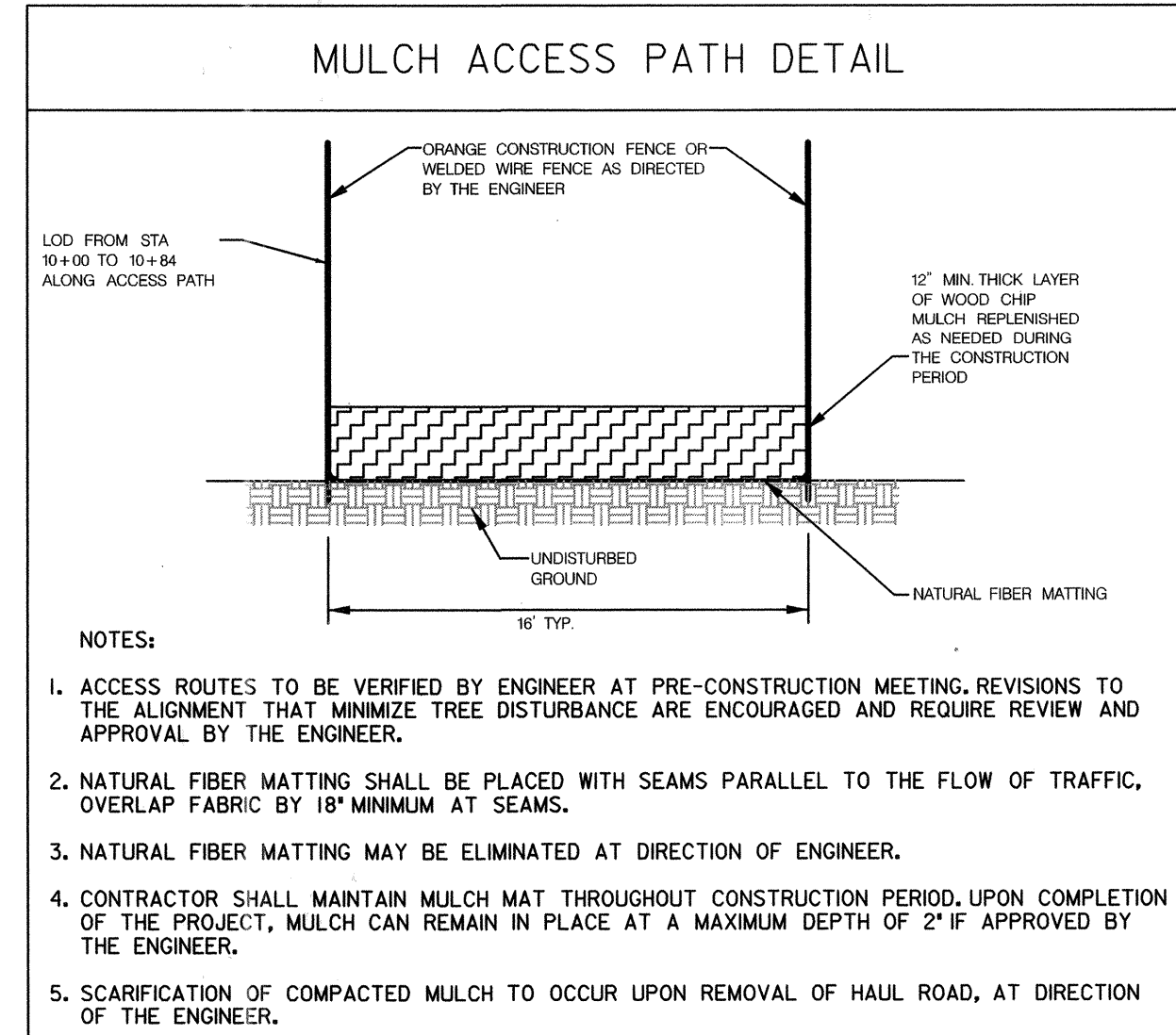
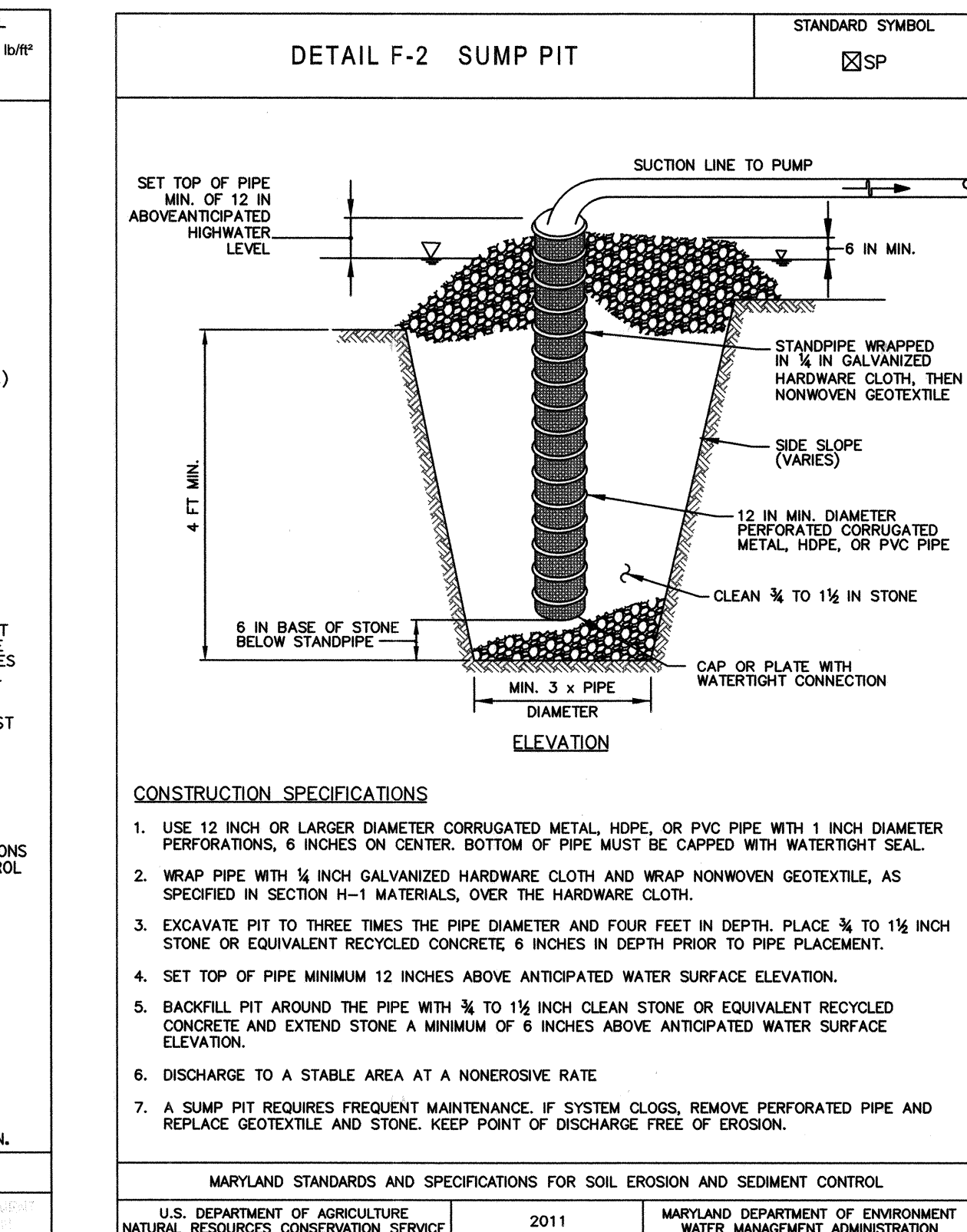
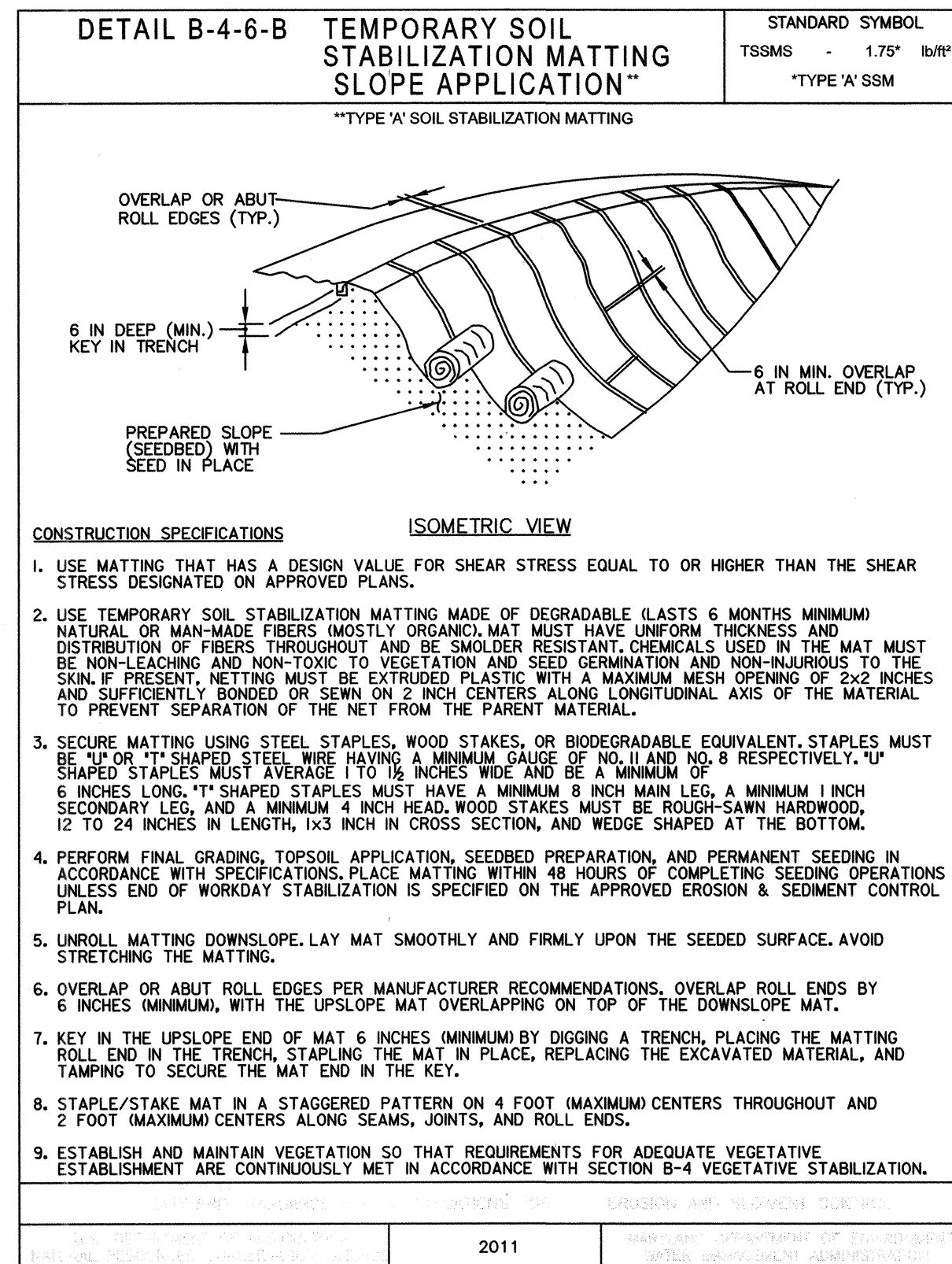
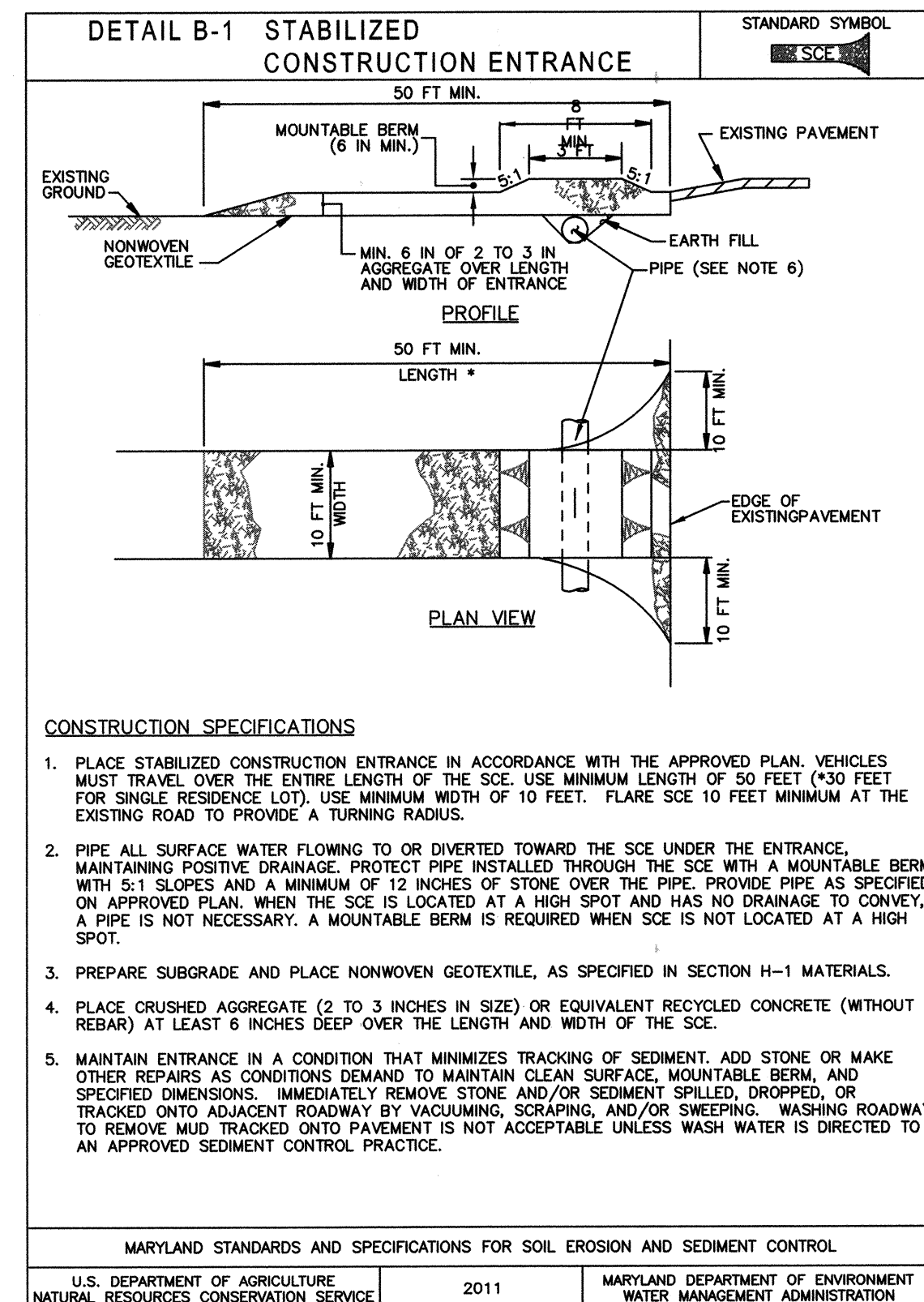
Amount:
To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

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

- Criteria:**
- The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
 - 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-4-1 Increased Stabilization and Standard B-4-4 Temporary Stabilization.
 - Runoff from the stockpile area must drain to a suitable sediment control practice.
 - Access to the stockpile area from the upslope side.
 - Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary scale or diversion fence. Provisions must be made for discharge of concentrated flow in a non-erosive manner.
 - Where runoff concentrates along the toe of the stockpile hill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
 - Stockpiles must be stabilized in accordance with the 3:7 day stabilization requirement as well as Standard B-4-1 Increased Stabilization and Standard B-4-4 Temporary Stabilization.
 - If the stockpile is located on an incision surface, a liner should be provided behind the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impervious sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetation Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than 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 Lead Grading.



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

DATE

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Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
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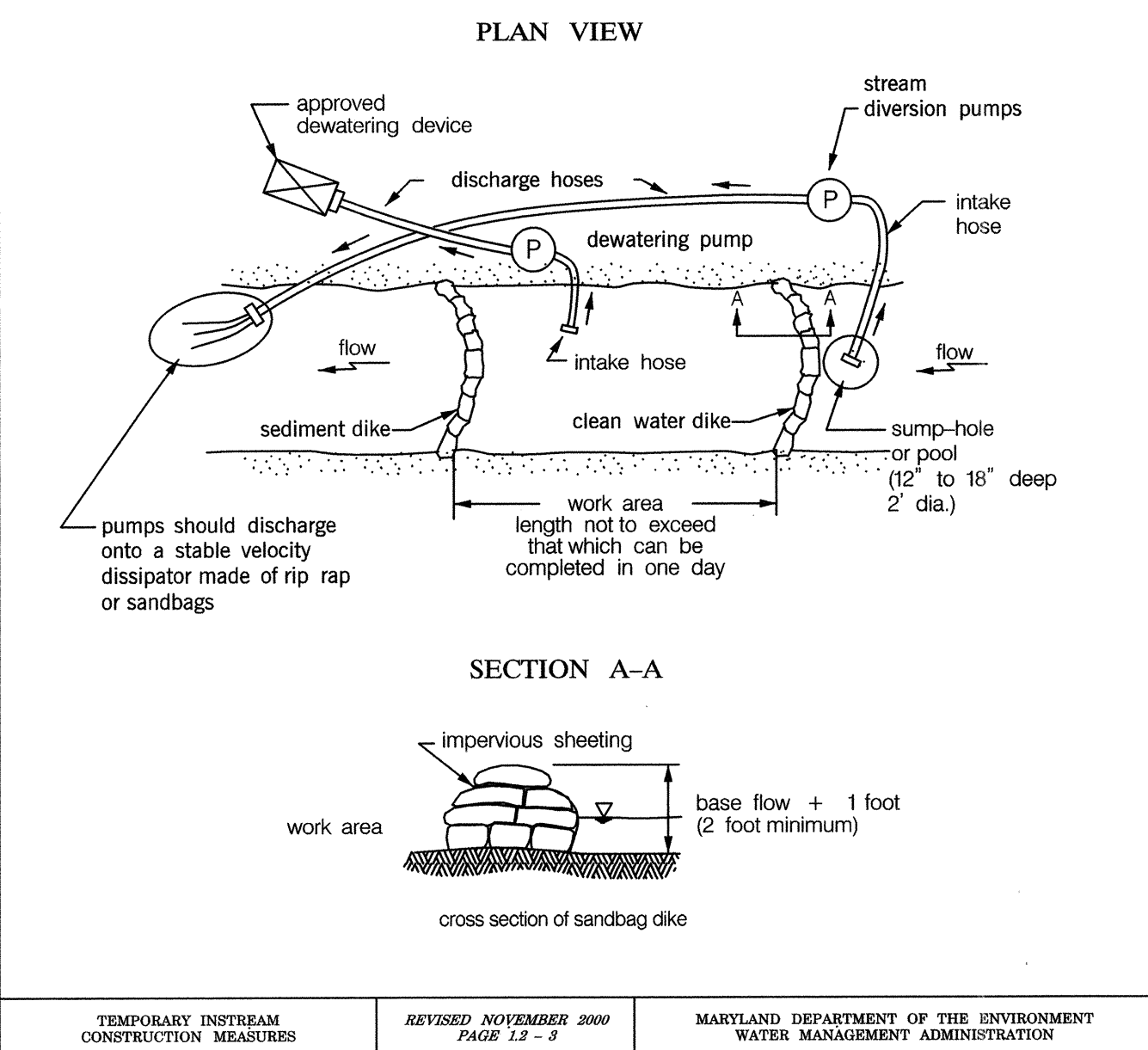
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DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

EROSION AND SEDIMENT CONTROL DETAIL SHEET

SCALE: NOT TO SCALE
SHEET: 14 OF 23

Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP-AROUND PRACTICE



Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP-AROUND PRACTICE

DESCRIPTION
The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction areas.

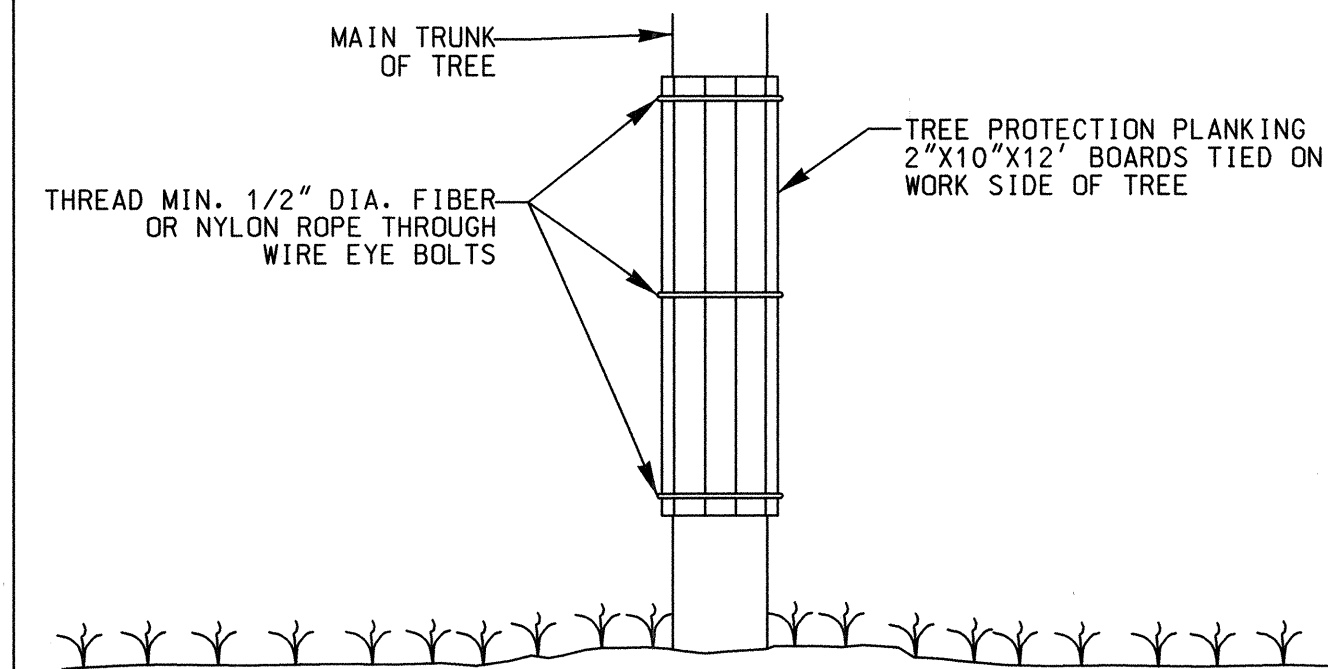
IMPLEMENTATION SEQUENCE
Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary assessments and/or right-of-way have been completed. 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 a limit of disturbance prior to the pre-construction meeting as they may be reviewed. The permittees 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 erosion flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipator 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 shoring, 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 should 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 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 dissipator used for the main stream 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. Then 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 to 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.

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

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 THE NONTIDAL WETLAND, 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 THE NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOILA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
USE 1. 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.

TREE PROTECTION PLANKING DETAIL



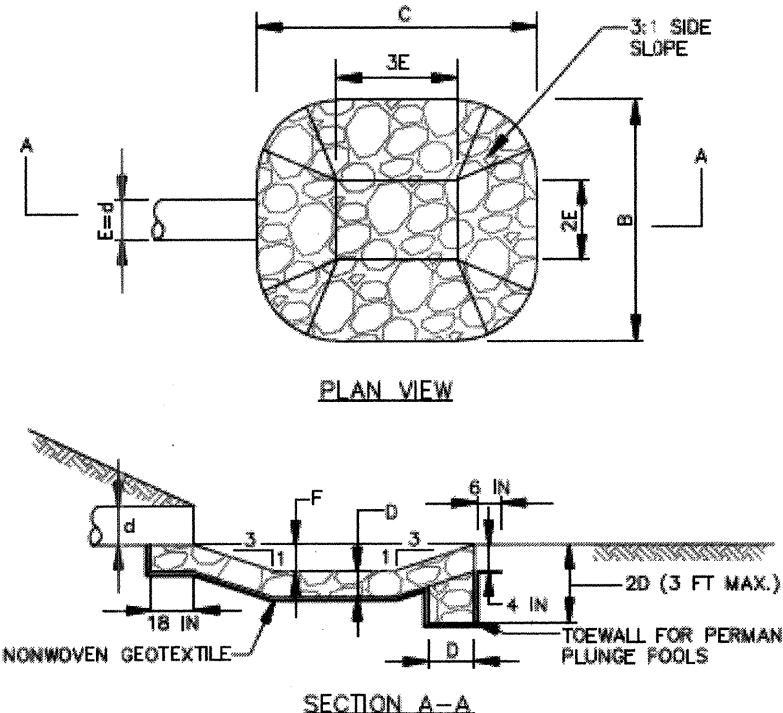
NOTES:

1. FOR TREE PROTECTION PLANKING, TIE WITH 1/2" DIAMETER ROPE (FIBER OR NYLON), SUFFICIENT 2"x10"x12" BOARDS AROUND MAIN TRUNK OF TREE TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION. IN THE EVENT THAT 2"x10"x12" BOARDS ARE TOO LARGE FOR A TREE, 2"x10"x6", 2"x10"x8" OR 2"x10"x10" BOARDS MAY BE USED AS DIRECTED BY THE ENGINEER.

IN-CHANNEL PUMPING NOTES

1. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. REFER TO THE DETAILS AND SPECIFICATIONS FOR MWC 1.2; PUMP-AROUND PRACTICE INCLUDED ON THE PLANS.
2. THE CONTRACTOR SHALL USE A PUMP AND DIVERSION HOSES TO ACCOMMODATE THE FLOWS ANTICIPATED DURING CONSTRUCTION IN THE CHANNEL SECTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING A CONSTRUCTION PHASE DEWATERING SYSTEM, INCLUDING A TEMPORARY SYSTEM OF PUMPS, DRAINAGE DITCHES AND SANDBAG/STONE DIVERSIONS, AS REQUIRED TO REMOVE WATER FROM ANY SOURCE, INCLUDING GROUND WATER, AND MAINTAIN WORKABLE, DRY CONDITIONS IN THE WORK AREA.
4. THE CONTRACTOR SHALL NOTE THAT THE WATERWAY LOCATED WITHIN THE PROJECT LIMITS IS CLASSIFIED AS USE 1 WATER. INSTREAM WORK IS PROHIBITED MARCH 1 THROUGH JUNE 15, INCLUSIVE DURING ANY YEAR.

DETAIL D-4-2 PLUNGE POOL



CONSTRUCTION SPECIFICATIONS:

1. USE SPECIFIED CLASS OF RIPRAP.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.
3. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.
5. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

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

NOTE: PAVEMENT DETAIL FOR ASPHALT DRIVEWAY REPAIR

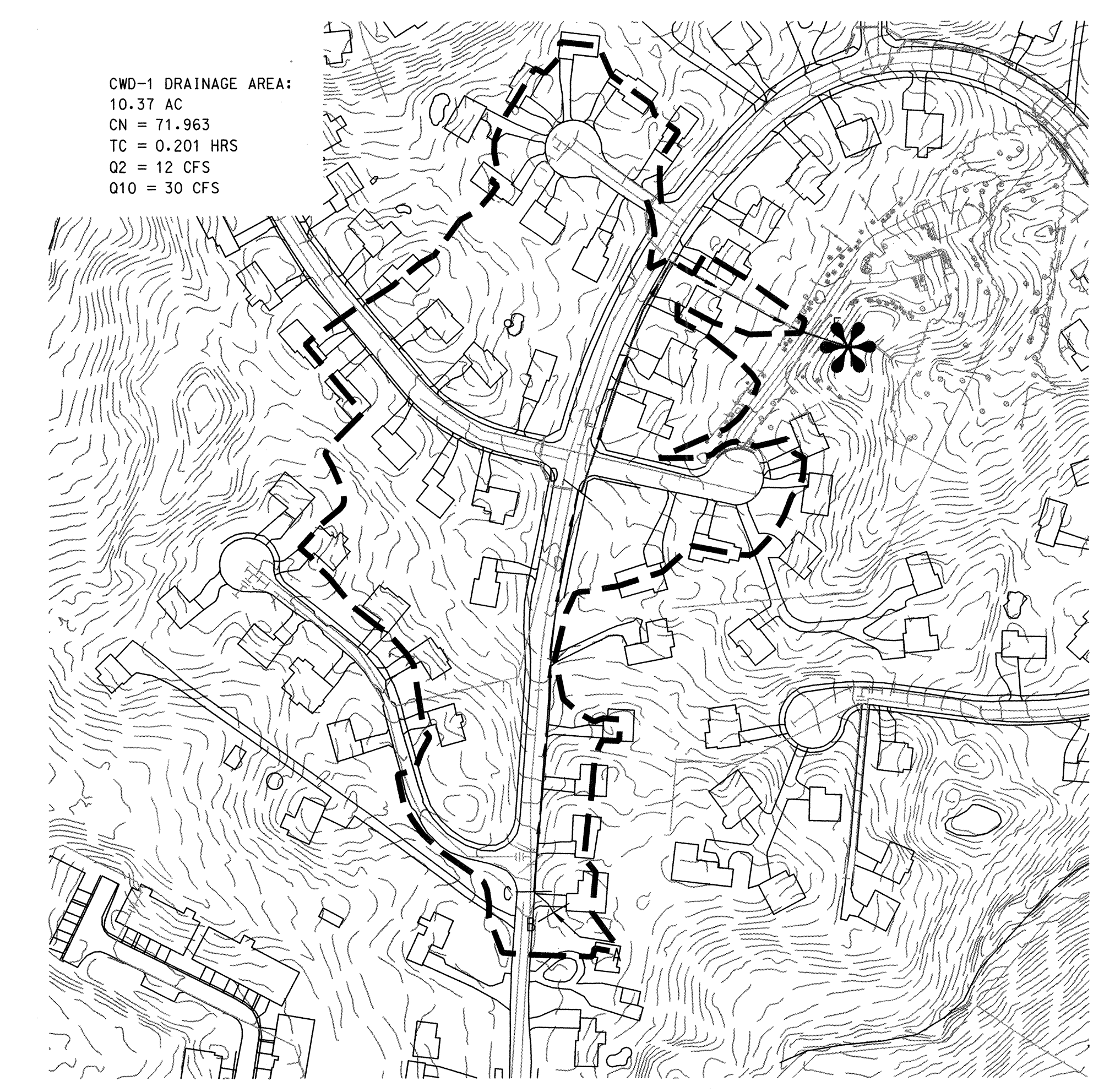
SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATED (CBR)						
		3 TO <5	5 TO <7	7	7.5 TO <9	9 TO <11	11 TO <15	
P-1	PARKING DRIVE ALLEYS RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 2 HEAVY TRUCKS PER DAY	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE (MA)	NA	NA	NA	NA	NA	NA
		SUPERPAVE ASPHALT MIX BASE 19.0 MM PG 64-22S, LEVEL 1 (ESAL)	8.5	7.0	5.0	4.0	4.0	4.0
		GRADED AGGREGATE BASE (GAB)	2.0	2.0	2.0	2.0	2.0	2.0
P-2	PARKING DRIVE ALLEYS RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 12 HEAVY TRUCKS PER DAY LOCAL ROADS ACCESS PLACE, ACCESS STREET CUL-DE-SAC NON-RESIDENTIAL	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 9.5 MM PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	
		SUPERPAVE ASPHALT MIX BASE 19.0 MM PG 64-22S, LEVEL 1 (ESAL)	2.0	2.0	2.0	2.0	2.0	
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	
P-3	PARKING DRIVE ALLEYS RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 12 HEAVY TRUCKS PER DAY LOCAL ROADS ACCESS PLACE, ACCESS STREET CUL-DE-SAC NON-RESIDENTIAL	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 9.5 MM PG 64-22S, LEVEL 1 (ESAL)	1.0	1.0	1.0	1.0	1.0	
		SUPERPAVE ASPHALT MIX BASE 19.0 MM PG 64-22S, LEVEL 1 (ESAL)	3.0	3.0	3.0	4.5	3.0	
		GRADED AGGREGATE BASE (GAB)	10.0	8.0	3.0	8.0	6.0	
P-4	MINOR COLLECTORS NON-RESIDENTIAL MAJOR COLLECTORS	SUPERPAVE ASPHALT MIX FINAL SURFACE 12.5 MM PG 64-22S, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 12.5 MM PG 64-22S, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	
		SUPERPAVE ASPHALT MIX BASE 19.0 MM PG 64-22S, LEVEL 2 (LOW ESAL)	4.0	4.0	3.0	6.0	5.0	
		GRADED AGGREGATE BASE (GAB)	13.0	7.0	4.0	8.0	6.0	

NOTES

1. HEAVY TRUCKS ARE DEFINED AS THOSE WITH SIX (6) WHEELS OR MORE INCLUDING GARbage TRUCKS.
2. SUPERPAVE ASPHALT MIX LAYERS SHALL BE PLACED IN APPROPRIATE COMPACTED LIFT THICKNESSES: 1.5" MIN. TO 4.0" MAX., 1.25" MIN. TO 3.0" MAX., AND 0.5" MIN. TO 2.0" MAX.
3. GRADED AGGREGATE BASE (GAB) SHALL BE PLACED AND COMPACTED IN 4" MAX. COMPACTED THICKNESS LAYERS.
4. THE INTERMEDIATE SURFACE COURSE LAYER MUST BE PLACED WITHIN 2 WEEKS OF PLACEMENT OF BASE COURSE AND IS REQUIRED PRIOR TO SUBSTANTIAL COMPLETION OF INSPECTION AND SIGN OFF.
5. IN LIEU OF PLACING THE INTERMEDIATE SURFACE COURSE LAYER FOR COMMERCIAL/INDUSTRIAL ENTRANCE AREAS WITHIN THE COUNTY RIGHT-OF-WAY THESE ALTERNATE LAYERS ARE NOT REQUIRED. THE THICKNESS OF THE INTERMEDIATE PAVEMENT LAYER CAN BE ADDED TO THE REQUIRED THICKNESS OF THE BASE ASPHALT LAYER.
6. THE CONSTRUCTION ENGINEER SHALL SHOW THE PAVING SECTION, ROAD CLASSIFICATION AND CBR VALUE FOR EACH ROADWAY.

Howard County, Maryland
Department of Public Works
PAVING SECTIONS
P-1 to P-4
Detail
R-2.01

CWD-1 DRAINAGE AREA:
10.37 AC
CN = 71.963
TC = 0.201 HRS
Q2 = 12 CFS
Q10 = 30 CFS



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County
MARYLAND
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444



DES: CL /JB					
DRN: MR					
CHK: AH /LN					
DATE: 8/17/18	BY: NO.	REVISION	DATE		

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576
EROSION AND SEDIMENT CONTROL DETAIL SHEET

SCALE
NOT TO SCALE
SHEET
15 OF 23

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
DATE: 8/22/18

A. GENERAL

THE WORK WILL BE PERFORMED IN COORDINATION WITH AND UNDER THE OVERSIGHT OF THE ENGINEER-IN-CHARGE (EIC) DESIGNATED BY THE OWNER AND APPROVED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER AND SCIENCE ADMINISTRATION DAM SAFETY DIVISION (MDE), ANY DEVIATION FROM THE APPROVED PLANS FOR ANY REASON MUST BE APPROVED BY THE EIC AND MADE BEFORE PROCEEDING WITH THOSE DEVIATIONS FROM THE APPROVED PLANS.

THE CONTRACTOR SHALL PERFORM THE WORK IN ACCORDANCE WITH ALL REQUIRED PERMITS. THE WORK IS NOT CONSIDERED COMPLETE UNTIL THE EIC, OWNER AND MDE HAVE COMPLETED FINAL INSPECTION OF THE PROJECT AND THE AS-BUILT PLANS HAVE BEEN APPROVED BY MDE.

THE CONTRACTOR SHALL ENSURE THE QUALITY OF WORK BY EMPLOYING QUALIFIED, EXPERIENCED PERSONNEL TRAINED IN DAM CONSTRUCTION. THE CONTRACTOR WILL PROVIDE ALL NECESSARY MANAGEMENT, SUPERVISION, PERSONNEL, LABOR, TOOLS, MATERIALS, AND EQUIPMENT NECESSARY FOR ALL ASPECTS OF CONSTRUCTION.

THE EIC SHALL SUPERVISE AND INSPECT CONSTRUCTION TO ENSURE IT IS COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE EIC MAY DESIGNATE OTHER INDIVIDUALS TO SUPERVISE AND INSPECT CONSTRUCTION AS APPROPRIATE FOR THE TYPE OF CONSTRUCTION BEING COMPLETED. THE EIC IS RESPONSIBLE FOR THE ACCURACY AND QUALITY OF THE WORK PERFORMED BY OTHER APPOINTED INDIVIDUALS ON THE PROJECT. FOR THE PURPOSES OF THESE SPECIFICATIONS, THOSE INDIVIDUALS MAY INCLUDE THE FOLLOWING:

- GEOTECHNICAL ENGINEER - THE GEOTECHNICAL ENGINEER MUST BE A MARYLAND LICENSED PROFESSIONAL ENGINEER EXPERIENCED IN GEOTECHNICAL ENGINEERING, DAM ENGINEERING, AND DAM CONSTRUCTION. THE GEOTECHNICAL ENGINEER MAY APPOINT INSPECTORS ACTING UNDER RESPONSIBLE CHARGE OF THAT ENGINEER TO COMPLETE INSPECTION AND TESTING OF CONSTRUCTION.
- INSPECTOR - THE INSPECTOR IS AN ENGINEERING TECHNICIAN APPOINTED BY AND ACTING UNDER RESPONSIBLE CHARGE OF THE GEOTECHNICAL ENGINEER OR EIC TO COMPLETE INSPECTION AND TESTING OF CONSTRUCTION AS REQUIRED BY THE CONTRACT DOCUMENTS.

FOR THE PURPOSES OF THESE SPECIFICATIONS, REFERENCES TO THE EIC UNDER THE SUPERVISION AND INSPECTION SECTION OF EACH SPECIFICATION MAY REFER TO EITHER THE EIC, GEOTECHNICAL ENGINEER, OR INSPECTOR.

B. REFERENCED STANDARDS AND SPECIFICATIONS

THE FOLLOWING SPECIFICATIONS, INCLUDING ADDENDA, AMENDMENTS AND ERRATA, FORM A PART OF THIS SPECIFICATION TO THE EXTENT REQUIRED BY THE REFERENCES THERETO. THE CONTRACTOR MUST ADHERE TO ANY NEWER VERSIONS OF THE REFERENCED STANDARDS AND SPECIFICATIONS. THE LIST BELOW IS THE MOST FREQUENTLY USED STANDARDS THAT ARE REFERENCED BUT OTHER REFERENCES MAY BE REFERENCED IN THE STANDARD SPECIFICATIONS.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO), WASHINGTON D.C. <HTTP://WWW.TRANSPORTATION.ORG>, REFERENCED AS "AASHTO".

AMERICAN CONCRETE INSTITUTE (ACI), FARMINGTON HILLS, MICHIGAN. <HTTP://WWW.CONCRETE.ORG/GENERAL/HOME.ASP>, REFERENCED AS "ACI".

- ACI 318-11 - "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
- ACI 308-06 - "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES AND COMMENTARY".
- ACI SP-06-04 - "ACI DETAILING MANUAL". THIS STANDARD REPLACED ACI 315-92.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), "TREE CARE OPERATIONS: STANDARD PRACTICES FOR TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE", WASHINGTON, D.C. 2008. REFERENCED AS STANDARD A300.

AMERICAN PUBLIC HEALTH ASSOCIATION (APHA), AMERICAN WATER WORKS ASSOCIATION (AWWA), AND WATER ENVIRONMENT FEDERATION (WEF), "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER", WASHINGTON D.C. 2012, 20th EDITION. <HTTP://WWW.STANDARDMETHODS.ORG>. REFERENCED AS "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER".

AMERICAN SOCIETY OF TESTING AND MATERIALS INTERNATIONAL, STANDARDS WORLDWIDE, WEST CONSHOHOCKEN, PA. <HTTP://WWW.ASTM.ORG/STANDARDINDEX.SHTML>, REFERENCED AS "ASTM".

CONCRETE REINFORCING STEEL INSTITUTE (CRSI), SCHAUMBURG, ILLINOIS. <HTTP://WWW.CRSI.ORG>. REFERENCED AS "CRSI".

INTERNATIONAL CODE COUNCIL (ICC), INTERNATIONAL BUILDING CODE (IBC), WASHINGTON D.C. <HTTP://WWW.ICCSAFE.ORG>. REFERENCED AS "INTERNATIONAL BUILDING CODE".

MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE), WATER MANAGEMENT ADMINISTRATION IN ASSOCIATION WITH SOIL CONSERVATION SERVICE AND STATE SOIL CONSERVATION COMMITTEE, "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", BALTIMORE, MARYLAND, 2011. REFERENCED AS "MDE SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL".

MARYLAND DEPARTMENT OF ENVIRONMENT, WATER RESOURCES ADMINISTRATION, "MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION", BALTIMORE, MARYLAND, NOVEMBER 2000 REVISION. REFERENCED AS "MDE CONSTRUCTION GUIDELINES".

MARYLAND DEPARTMENT OF TRANSPORTATION (MDOT), STATE HIGHWAY ADMINISTRATION (MSHA), HANOVER, MARYLAND. <HTTP://WWW.ROADS.MARYLAND.GOV/HOME.ASPX>. AS REVISED ON MSHA WEBSITE. REFERENCED AS "MSHA".

"BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES", REFERENCED AS "MSHA STANDARD DETAILS". "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS", LATEST EDITION. REFERENCED AS "MSHA STANDARD SPECIFICATIONS" OR "MSHA".

UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), "CONFINED SPACES STANDARD, 2004", WASHINGTON D.C. <HTTP://WWW.OSHA.GOV>.

C. SPECIFICATIONS/SCOPE OF WORK

WHERE APPLICABLE, ITEMS ARE CROSS-REFERENCED TO, AND INCORPORATE, INFORMATION AND REQUIREMENTS PROVIDED IN THE PART III - TECHNICAL RESOURCES AND STATE HIGHWAY ADMINISTRATION (MSHA) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, LATEST EDITION AND THE MSHA BOOK OF STANDARDS, LATEST REVISION.

THE LINK TO THE SPECIFICATIONS DOCUMENT IS: HTTPS://POLICYMANUAL.MDOT.MARYLAND.GOV/MEDIA/WIKI/INDEX.PHP?TITLE=2017_STANDARD_SPECIFICATIONS_FOR_CONSTRUCTION_AND_MATERIALS

NOTES:

1. PART I (GENERAL PROVISIONS) AND PART II (TERMS AND CONDITIONS) OF THE MSHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DO NOT APPLY TO, AND ARE NOT INCORPORATED INTO THESE SPECIFICATIONS.
2. ANY REFERENCES IN MSHA PART III - TECHNICAL REQUIREMENTS TO THE "ADMINISTRATION" OR "MSHA" SHALL BE INTERPRETED AS REFERRING TO THE OWNER.
3. ANY REFERENCES IN MSHA PART III - TECHNICAL REQUIREMENTS TO THE "ENGINEER" SHALL BE INTERPRETED AS REFERRING TO THE EIC.
4. ANY REFERENCE TO "CONTRACT DOCUMENTS" IN THE SPECIFICATIONS SHALL BE INTERPRETED AS REFERRING TO APPROVED PERMITS.
5. THE REFERENCED MSHA SECTIONS AND SUBSECTIONS APPLY UNLESS NOTED OTHERWISE ELSEWHERE IN THE CONTRACT DOCUMENTS. IN CASE OF CONFLICT BETWEEN MSHA SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS, THE REQUIREMENTS OF THE OTHER CONTRACT DOCUMENTS SHALL APPLY.

CLEARING AND GRUBBING

COMPLY WITH SUBSECTION 101.01 OF MSHA OF THESE SPECIFICATIONS UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THIS WORK CONSISTS OF CLEARING AND GRUBBING WITHIN THE LIMITS SPECIFIED IN THE CONTRACT DOCUMENTS. CLEARING INCLUDES REMOVING AND DISPOSING OF ALL TREES, BRUSH, SHRUBS, VEGETATION, ROTTEN WOOD, RUBBISH, FENCES AND STRUCTURES IN CONSTRUCTION AREA FOR REMOVAL AND DISPOSAL, AND TRIMMING AND DISPOSAL OF TREE LIMBS THAT INTERFERE WITH PERFORMANCE OF THE WORK. GRUBBING COVERS REMOVAL AND DISPOSAL OF ALL STUMPS, ROOTS, STUBS, BRUSH AND DEBRIS WITHIN LIMITS OF DISTURBANCES SPECIFIED IN THE CONTRACT DOCUMENTS. WOODY VEGETATION WITHIN 15-FEET OF THE DAMS EMBANKMENT AND APPURTENANT WORKS MUST BE REMOVED IF PRESENT.

PROVIDE PROTECTION FOR TREES DESIGNATED TO BE PROTECTED PER THE CONTRACT DOCUMENTS.

MATERIALS:

NOT APPLICABLE

SUBMITTALS:

NOT APPLICABLE

CONSTRUCTION:

COMPLY WITH SUBSECTION 101.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

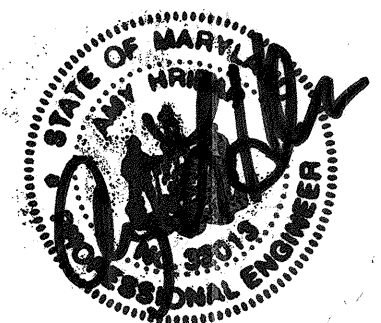
1. VEGETATION: THE CONTRACTOR MUST MARK (DO NOT USE PAINT) THE CLEARING LIMITS INCLUDING ANY TREES, SHRUBBERY, AND PLANTS THAT ARE TO BE REMOVED, AS WELL AS THOSE THAT ARE TO REMAIN AND BE PROTECTED, PRIOR TO WORK. THE OWNER AND OTHER APPROPRIATE REGULATORY AGENCIES MUST REVIEW AND APPROVE THE CLEARING LIMITS. THE CONTRACTOR MUST PROTECT THE GROUND FROM ANY DAMAGE. BRANCHES AND EXPOSED ROOTS OF TREES OVERHANGING AND INTERFERING WITH THE WORK MUST NOT BE CUT WITHOUT THE OWNER'S PRIOR APPROVAL. ALL TRIMMING MUST BE DONE UNDER THE FIELD SUPERVISION OF A LICENSED ARBORIST OR TREE EXPERT LICENSED BY THE STATE OF MARYLAND AND FURNISHED BY THE CONTRACTOR. INCLUDING TRIMMING OF TREES BY THE CONTRACTOR FOR ANY OTHER REASON. TRIMMING AND/OR REPAIR OF CUTS AND SCARS MUST BE PROPERLY PLANNED (REFERENCED STANDARDS: AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), "AMERICAN NATIONAL STANDARD FOR PRUNING.")
2. GRUBBING:
 - a. ALL EMBEDDED STUMPS AND ROOTS MUST BE REMOVED TO A DEPTH OF NOT LESS THAN 3 FEET BELOW THE SUBGRADE OR SLOPE SURFACES. DEPRESSIONS MADE BELOW THE SUBGRADE OR SLOPE SURFACES BY REMOVAL OF STUMPS MUST BE REFILLED WITH SOIL OR AS SPECIFIED ON CONTRACT DOCUMENTS.
 - b. IN THE AREA OF A DAM EMBANKMENT, ALL EMBEDDED STUMPS AND ROOTS MUST BE COMPLETELY REMOVED ON THE EMBANKMENT OR BENEATH THE EMBANKMENT SUBGRADE. DEPRESSIONS MADE BELOW THE SUBGRADE OR EMBANKMENT SURFACES BY REMOVAL OF STUMPS MUST BE REFILLED WITH MATERIALS SUITABLE FOR DAM EMBANKMENT CONSTRUCTION, AND COMPACTED PER REQUIREMENTS IN THESE SPECIFICATIONS. THE EMBANKMENT MATERIAL MUST BE OVERLAIN WITH 6" OF TOP SOIL, SEEDING, AND MULCHED. THE FINAL GRADE MUST MATCH THE ADJACENT GRADES.
 - c. DISPOSAL: UNLESS DESIGNATED FOR REUSE ON THE CONTRACT DOCUMENTS, MATERIAL AND DEBRIS COLLECTED BECAUSE OF THE CLEARING AND GRUBBING OPERATION IS THE PROPERTY OF THE CONTRACTOR AND MUST BE DISPOSED OF IN ACCORDANCE WITH THE LOCAL AND STATE REGULATIONS. NO BURNING WILL BE PERMITTED WITHIN THE WORK SITE OR ON COUNTY PROPERTIES.
3. FALLEN AND STORM-DAMAGED TREES: REMOVAL OF ALL FALLEN AND/OR STORM-DAMAGED TREES, REGARDLESS OF SIZE, SHALL BE CLEARED AND REMOVED PER THIS CLEARING AND GRUBBING SECTION.

CONSTRUCTION:

COMPLY WITH SUBSECTION 101.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

1. VEGETATION: THE CONTRACTOR MUST MARK (DO NOT USE PAINT) THE CLEARING LIMITS INCLUDING ANY TREES, SHRUBBERY, AND PLANTS THAT ARE TO BE REMOVED, AS WELL AS THOSE THAT ARE TO REMAIN AND BE PROTECTED, PRIOR TO WORK. THE OWNER AND OTHER APPROPRIATE REGULATORY AGENCIES MUST REVIEW AND APPROVE THE CLEARING LIMITS. THE CONTRACTOR MUST PROTECT THE GROUND FROM ANY DAMAGE. BRANCHES AND EXPOSED ROOTS OF TREES OVERHANGING AND INTERFERING WITH THE WORK MUST NOT BE CUT WITHOUT THE OWNER'S PRIOR APPROVAL. ALL TRIMMING MUST BE DONE UNDER THE FIELD SUPERVISION OF A LICENSED ARBORIST OR TREE EXPERT LICENSED BY THE STATE OF MARYLAND AND FURNISHED BY THE CONTRACTOR. INCLUDING TRIMMING OF TREES BY THE CONTRACTOR FOR ANY OTHER REASON. TRIMMING AND/OR REPAIR OF CUTS AND SCARS MUST BE PROPERLY PLANNED (REFERENCED STANDARDS: AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), "AMERICAN NATIONAL STANDARD FOR PRUNING.")
2. GRUBBING:
 - a. ALL EMBEDDED STUMPS AND ROOTS MUST BE REMOVED TO A DEPTH OF NOT LESS THAN 3 FEET BELOW THE SUBGRADE OR SLOPE SURFACES. DEPRESSIONS MADE BELOW THE SUBGRADE OR SLOPE SURFACES BY REMOVAL OF STUMPS MUST BE REFILLED WITH SOIL OR AS SPECIFIED ON CONTRACT DOCUMENTS.
 - b. IN THE AREA OF A DAM EMBANKMENT, ALL EMBEDDED STUMPS AND ROOTS MUST BE COMPLETELY REMOVED ON THE EMBANKMENT OR BENEATH THE EMBANKMENT SUBGRADE. DEPRESSIONS MADE BELOW THE SUBGRADE OR EMBANKMENT SURFACES BY REMOVAL OF STUMPS MUST BE REFILLED WITH MATERIALS SUITABLE FOR DAM EMBANKMENT CONSTRUCTION, AND COMPACTED PER REQUIREMENTS IN THESE SPECIFICATIONS. THE EMBANKMENT MATERIAL MUST BE OVERLAIN WITH 6" OF TOP SOIL, SEEDING, AND MULCHED. THE FINAL GRADE MUST MATCH THE ADJACENT GRADES.
 - c. DISPOSAL: UNLESS DESIGNATED FOR REUSE ON THE CONTRACT DOCUMENTS, MATERIAL AND DEBRIS COLLECTED BECAUSE OF THE CLEARING AND GRUBBING OPERATION IS THE PROPERTY OF THE CONTRACTOR AND MUST BE DISPOSED OF IN ACCORDANCE WITH THE LOCAL AND STATE REGULATIONS. NO BURNING WILL BE PERMITTED WITHIN THE WORK SITE OR ON COUNTY PROPERTIES.
3. FALLEN AND STORM-DAMAGED TREES: REMOVAL OF ALL FALLEN AND/OR STORM-DAMAGED TREES, REGARDLESS OF SIZE, SHALL BE CLEARED AND REMOVED PER THIS CLEARING AND GRUBBING SECTION.

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**



509 South Exeter Street
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(410) 662-7400

Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
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SUPERVISION AND INSPECTION:

COMPLY WITH SUBSECTION 102.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

REMOVAL AND DISPOSAL OF EXISTING STRUCTURES

COMPLY WITH SUBSECTION 102.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

MATERIALS:

NOT APPLICABLE

SUBMITTALS:

NOT APPLICABLE

CONSTRUCTION:

COMPLY WITH SUBSECTION 201.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

1. EXCAVATION CONSISTS OF CUTTING, REMOVING, STOCKPILING AND GRADING OF MATERIAL ENCOUNTERED WHEN ESTABLISHING REQUIRED GRADE ELEVATIONS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS THAT ARE NOT CLASSIFIED ROCK EXCAVATION, POND DREDGING OR UNAUTHORIZED EXCAVATION.
2. UNAUTHORIZED EXCAVATION CONSISTS OF SITE GRADING THAT EXTENDS BEYOND THE SPECIFIED BOTTOM ELEVATIONS OR HORIZONTAL LIMITS WITHOUT THE DIRECTION OF THE OWNER. ALL REMEDIAL WORK TO CORRECT UNAUTHORIZED EXCAVATION, INCLUDING BACKFILLING AND COMPACTING WITH EARTH OR GRAVEL, LEAN CONCRETE FILL OR ANY OTHER MATERIAL TO BRING ELEVATIONS TO GRADE AS SPECIFIED AND TO THE SATISFACTION OF THE OWNER.
3. THE EIC MUST BE CONTACTED, AND WORK IN THAT AREA MUST BE STOPPED, IF UNSUITABLE BEARING MATERIALS, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, ARE ENCOUNTERED AT REQUIRED ELEVATIONS. ANY ADDITIONAL WORK MUST BE AUTHORIZED BY THE EIC AND THE OWNER BEFORE WORK CONTINUES INCLUDING DEEPER EXCAVATION AND PLACEMENT OF SUITABLE REPLACEMENT MATERIAL. EXCAVATING UNSUITABLE MATERIAL SOLELY TO FACILITATE PERFORMANCE OF OTHER WORK SHALL BE CONSIDERED CONTRACT "MEANS AND METHODS".

THE EIC MUST INSPECT THE LIMITS OF REMOVAL OF EXISTING STRUCTURES FOLLOWING REMOVAL TO ENSURE THAT THEY COMPLY WITH THE CONTRACT DOCUMENTS.

CONSTRUCTION STAKEOUT

DESCRIPTION: COMPLY WITH SUBSECTION 107.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THIS WORK CONSISTS OF PROVIDING A CONSTRUCTION LAYOUT (STAKEOUT) PERFORMED BY PERSONNEL ACTING UNDER RESPONSIBLE CHARGE OF A PROFESSIONAL LAND SURVEYOR CURRENTLY REGISTERED IN THE STATE OF MARYLAND.

NOTE: THE CONTRACTOR MUST USE COMPETENT PERSONNEL AND APPROPRIATE EQUIPMENT FOR ALL WORK REQUIRED TO SET AND MAINTAIN THE ELEVATIONS AND DIMENSIONS AS SPECIFIED IN THE CONTRACT DOCUMENTS. IF ANY DISCREPANCIES BETWEEN PLAN AND FIELD CONDITIONS ARE FOUND, THE CONTRACTOR MUST RESOLVE ANY NEEDED FIELD ADJUSTMENTS WITH THE EIC AND OWNER BEFORE STARTING CONSTRUCTION.

MATERIALS:

COMPLY WITH SUBSECTION 107.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THE SURVEYOR MUST USE MARKER MATERIALS THAT CAN BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION. DEMARCATION OF WETLANDS USING SHA NETLAND TAPE AS DESCRIBED IN SECTION 107.03.09 IS NOT REQUIRED UNLESS SPECIFICALLY CALLED FOR ON CONTRACT DOCUMENTS.

SUBMITTALS:

PRIOR TO CONSTRUCTION OF STRUCTURES, CONDUIT, EARTHWORK, OR OTHER INSTALLATIONS, THE CONTRACTOR SHALL SUBMIT TAKEOUT CUT/FILL SHEETS TO THE EIC FOR REVIEW AND APPROVAL. TAKEOUT SHEETS FOR LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL DEVICE, AND LANDSCAPE TAKEOUT ARE NOT REQUIRED TO BE SUBMITTED. THE TAKEOUT CUT/FILL SHEETS SHALL INCLUDE A PLAN SHOWING THE LOCATION AND IDENTIFICATION OF ALL STAKE/SHUBS AND A TABLE SHOWING:

1. STAKE/HUB IDENTIFICATION
2. SURVEYED ELEVATION
3. PROPOSED ELEVATION
4. BASELINE CUT/FILL DEPTH
5. OFFSETS OR OTHER PERTINENT NOTES CONCERNING THE STAKE/HUB POINT.

CONSTRUCTION:

COMPLY WITH SUBSECTION 107.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE CONTRACTOR MUST HAVE THE LICENSED SURVEYOR PROVIDE THE FOLLOWING:

1. PROJECT LAYOUT: THE CONTRACTOR'S SURVEYOR SHALL ACCURATELY LOCATE THE WORK HORIZONTALLY AND VERTICALLY TO ENSURE THAT THE WORK IS PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. BASELINE TAKEOUT
 - a. THE SURVEYOR MUST TAKEOUT ALL CONSTRUCTION BASELINES WITH THE MAXIMUM SPACING OF STATIONS (STAKES, NAILS, CROSSES, ETC.) OF 100 FEET UNLESS CLOSER STAKEOUTS ARE SPECIFIED IN THE CONTRACT DOCUMENTS.
 - 3. SITE TAKEOUT
 - a. THE CONTRACTOR MUST PERFORM A SURVEYED STAKE OUT OF ANY ALIGNMENT CENTERLINES (E.G., EMBANKMENTS) AND STRUCTURE LOCATIONS.
 - b. THE CONTRACTOR SHALL MAINTAIN ALIGNMENT CENTERLINE STAKE OUT SURVEY MARKERS SUCH THAT THE EIC CAN RECORD THE STATION AND ELEVATION OF EACH COMPACTION TEST WITHIN +/- 1-FOOT HORIZONTAL ACCURACY AND +/-0.25-FOOT VERTICAL ACCURACY.

4. AS-BUILT SURVEY

a. AN AS-BUILT SURVEY OF THE COMPLETED SUBSURFACE WORK SHALL BE PERFORMED AND SHALL INCLUDE BUT NOT LIMITED TO: HORIZONTAL, DIMENSIONS, GRADING LIMITS, ELEVATIONS, SLOPES, TYPES, LENGTH, HEIGHT OF FEATURES NOT ABLE TO BE SURVEYED AFTER PROJECT COMPLETION. DOCUMENTATION OF THIS SURVEY INCLUDING RED-LINE PLANS, NOTES, DIMENSIONS, ETC. MUST BE PROVIDED TO THE EIC UPON COMPLETION OF THE PROJECT.

5. CONTROL MARKERS: THE CONTRACTOR MUST PRESERVE THE CENTER LINE AND BENCH MARKS SET BY THE SURVEYOR. WHEN THE CENTER LINE AND BENCH MARKS ARE DISTURBED OR DESTROYED, THEY MUST BE REPLACED BY THE CONTRACTOR.

6. CONTROL STAKES: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

7. UTILITIES: WHEN APPLICABLE, THE CONTRACTOR MUST FURNISH TO THE UTILITY COMPANIES OR AGENCIES WORKING WITHIN THE LIMITS OF THE PROJECT, REFERENCE INFORMATION RELATED TO CONTROL POINTS, ALIGNMENT AND GRADE DATA. THESE MUST BE FURNISHED PROMPTLY UPON REQUEST, SO THAT THE UTILITY COMPANIES MAY PROPERLY LOCATE AND COORDINATE THEIR WORK RELATED TO THE PROJECT.

8. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

9. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

10. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

11. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

12. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

13. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATIONS) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.

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33. CONTROL POINTS: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN

PIPE CONDUITS

DESCRIPTION:
COMPLY WITH SUBSECTION 303.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS SECTION INCLUDES THE REQUIREMENTS TO INSTALL AND/OR RECONSTRUCT TEMPORARY AND PERMANENT PIPING SYSTEMS TO THE LIMITS INDICATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THIS WORK INCLUDES TRENCH EXCAVATION FOR INSTALLATION OF PIPE, INCLUDING WHEN THE TRENCH EXCAVATION REQUIRES SHORING.

MATERIALS:
COMPLY WITH SUBSECTION 303.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. BEDDING SECTION SHALL BE REVISED AS FOLLOWS:

BEDDING: ALL CONCRETE PIPE CONDUITS SHALL BE FIRMLY AND UNIFORMLY BEDDED IN CONCRETE CRADLES MEETING DIMENSIONS SHOWN ON THE CONTRACT DOCUMENTS. CONCRETE CRADLE MATERIAL SHALL MEET SUBSECTION 902.10 OF MSHA MIX NO. 3. REINFORCEMENT OF THE CRADLE SHALL BE PROVIDED AS SPECIFIED BY THE CONTRACT DOCUMENTS. ALL OTHER CONDUITS SHALL BE FIRMLY AND UNIFORMLY BEDDED IN EARTH FILL MATERIALS MEETING THE MATERIAL REQUIREMENTS OF THE PLACEMENT OF EARTH FILL MATERIALS AT DAMS SECTION OF THESE SPECIFICATIONS.

ALL PIPE CONDUITS SHALL HAVE A MANUFACTURER'S STAMP INDICATING THE SIZE AND CLASS OF THE PIPE ON EACH LENGTH OF PIPE CONDUIT INSTALLED. STAMPS ON REINFORCED CONCRETE PIPES SHALL BE LOCATED ON THE INSIDE WALL OF THE PIPE.

REINFORCED CONCRETE PIPE ASSOCIATED WITH DAM EMBANKMENTS AND SPILLWAYS MUST BE WATER TIGHT AND MEET ASTM C381 STANDARDS UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THESE PIPES MUST HAVE BELL AND SPIGOT JOINTS WITH O-RING RUBBER GASKETS.

HEAVY DUTY CORRUGATED BLACK POLYETHYLENE PIPE (HDPE), SLOTTED OR SOLID MUST MEET THE REQUIREMENTS OF AASHTO M252 TYPE S FOR DIAMETERS OF THREE INCHES THROUGH 10 INCHES AND AASHTO M294 TYPE S FOR DIAMETERS OF 12 INCHES THROUGH 60 INCHES. ALL PIPE MUST HAVE A SMOOTH WALLED INTERIOR.

DIP DUCTILE IRON PIPE (DIP) MUST MEET AWWA C150 AND C151 AND FOLLOW SPECIAL THICKNESS CLASS MINIMUM CLASS 51 FOR FOUR (4) INCH THROUGH 54-INCH DIAMETERS. DIP MUST INCLUDE RESTRAINING JOINTS IF LOCATED WITHIN A DAM EMBANKMENT. DIP FITTINGS SHALL BE EITHER DUCTILE IRON BELL, MECHANICAL, OR FISH-ON JOINT UNLESS NOTED OTHERWISE ON THE CONTRACT DOCUMENTS. FITTINGS SHALL MEET AWWA C110 OR AWWA C153 AND AWWA C111. FLANGED FITTINGS WHERE NOTED ON THE CONTRACT DOCUMENTS SHALL MEET AWWA C110. BOLTS, NUTS, AND STUDS FOR FLANGES SHALL BE 304 STAINLESS STEEL.

POLYVINYL CHLORIDE (PVC) PLASTIC PIPE MUST MEET THE REQUIREMENTS OF ASTM D1785 FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS. PVC CONDUITS MUST MEET THE REQUIREMENTS OF ASTM D2466 (SCHEDULE 40) OR D2467 (SCHEDULE 80) FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS.

SUBMITTALS:
PRIOR TO INSTALLATION OF PIPE CONDUITS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING:

- 1. MANUFACTURER'S CERTIFICATION THAT PIPE MEETS THE APPROPRIATE MATERIAL SPECIFICATION (E.G. AWWA C301, ASTM C361, ETC.). THIS SHALL INCLUDE THE SIZE, MATERIAL, AND SPECIFICATION FOR EACH TYPE OF PIPE USED IN THE PROJECT.
- 2. MIX DESIGN OF CEMENTitious BEDDING MATERIALS (E.G. CONCRETE OR CRADLES).
- 3. SUPPLIER'S STEEL DRAWING OF REINFORCEMENT FOR CRADLE (IF REQUIRED BY CONTRACT DOCUMENTS) INDICATING ALL REINFORCEMENT TO BE USED INCLUDING:
 - a. BAR SIZE AND LENGTHS
 - b. BEND TYPES AND DIMENSIONS
 - c. QUANTITIES OF ALL REINFORCEMENT MATERIALS

CONSTRUCTION:
COMPLY WITH SUBSECTION 303.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. VERTICAL TRENCHING IS NOT ALLOWED. ALL EXCAVATIONS FOR PIPE CONDUITS SHALL COMPLY WITH CONSTRUCTION SECTION 4 OF THE EARTH EXCAVATION SECTION OF THESE SPECIFICATIONS.

REINFORCED CONCRETE PIPE INSTALLATION IN DAM EMBANKMENTS MUST MEET THE MANUFACTURER'S RECOMMENDATION AND MUST BE LAID IN A CONCRETE BED ONLY AFTER THE ENTIRE CONDUIT IS BELLED AND ALL JOINTS SEALED. BELL AND SPIGOT JOINTS SHALL BE INSTALLED WITH THE BELL END UPSTREAM. PIPE CONDUIT SHALL BE INSTALLED FROM DOWNSTREAM TO UPSTREAM. MECHANICAL, PIPE PULLERS OR COME-ALONG DEVICES MUST BE UTILIZED TO BRING THE PIPE JOINTS INTO THE "HOME" POSITION. ALL BACKFILL BEAR PIPE CONDUITS AND IN OTHER CRITICAL AREAS IDENTIFIED ON THE CONTRACT DOCUMENTS WILL BE COMPACTED TO 95% OF THE LABORATORY MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 OR AASHTO T-99. REINFORCED CONCRETE PIPE INSTALLED IN A DAM EMBANKMENT AND ASSOCIATED WITH A CONCRETE STRUCTURE MUST BE INSTALLED PRIOR TO CONSTRUCTION OF THE STRUCTURE WITH THE STRUCTURE THEN CAST AROUND THE PIPE. THE FIRST DOWNSTREAM JOINT OF THE PIPE SHALL BE NO LESS THAN TWO (2) FEET BUT NO MORE THAN FOUR (4) FEET FROM THE OUTSIDE FACE OF THE STRUCTURE WALL.

DUCTILE IRON PIPE CONSTRUCTION SHALL BE IN ACCORDANCE WITH MSHA 303.03 (ALTHOUGH NOT SPECIFIED IN MSHA 303). DUCTILE IRON PIPE INSTALLED IN A DAM EMBANKMENT AND ASSOCIATED WITH A CONCRETE STRUCTURE MUST BE INSTALLED PRIOR TO CONSTRUCTION OF THE STRUCTURE WITH THE STRUCTURE THEN CAST AROUND THE PIPE. THIS INSTALLATION REQUIRES BENTONITE WATER STOP TO BE INSTALLED AROUND THE PIPE TO WORK AS A GASKET TO ENSURE WATER TIGHT CONNECTION.

HDPE AND PVC PIPE MUST CONFORM WITH MSHA 303.

ALL TEMPORARY PIPES MUST BE REMOVED AT THE END OF THE PROJECT.

SUPERVISION AND INSPECTION:

1. ALL PIPE CONDUITS MUST BE INSTALLED UNDER SUPERVISION OF THE EIC. THE EIC WILL MUST INSPECT THE PIPE CONDUIT INSTALLATION PRIOR TO BACKFILL TO ENSURE THE CONDUIT INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ALL JOINTS ARE PROPERLY SEATED, AND THAT THERE IS NO DAMAGE TO THE INSTALLED PIPE.

2. CONCRETE CRADLES MUST BE INSTALLED UNDER SUPERVISION OF THE EIC. REINFORCEMENT FOR CRADLES MUST BE INSPECTED BY THE EIC PRIOR TO CLOSING FORMWORK. DURING CONSTRUCTION, THE CONCRETE SHALL BE TESTED IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 902.10.08. THE EIC MUST ALSO MAKE TEST CYLINDERS FOR ALL CONCRETE POURS FOR CRADLES. SEVEN-DAY (LAB CURED) AND 28-DAY (LAB CURED AND FIELD CURED) TESTS MUST BE CONDUCTED. FOR EACH DAY THAT CONCRETE IS POURED ON A PROJECT SITE, A MINIMUM OF EIGHT TEST CYLINDERS MUST BE MADE FOR EACH MIX DESIGN TO BE TESTED AT AN ACCREDITED LABORATORY FOR EVERY 50 CUBIC YARDS OF CONCRETE PLACED OR FRACTION THEREOF. SIX (6) TEST CYLINDERS MUST BE CURED UNDER THE LABORATORY CONDITIONS (TWO (2) FOR SEVEN (7) DAYS, TWO (2) FOR 28 DAYS, TWO (2) FOR 56 DAYS) AND TWO (2) CYLINDERS MUST BE CURED UNDER FIELD CONDITIONS (FOR 28 DAYS). THE OWNER OR EIC MAY REQUIRE AN EQUAL NUMBER OF TEST CYLINDERS CURED UNDER THE JOB CONDITIONS. THE TEST RESULTS MUST BE MADE AVAILABLE WITHIN SEVEN DAYS OF EACH COMPLETED TEST. IF THE CONTRACTOR FAILS TO MEET THE CONTRACTUAL REQUIREMENTS, THE OWNER HAS THE RIGHT TO REQUIRE ADDITIONAL TESTS OR REJECT THE CONCRETE.

- 3. THE EIC WILL BE REQUIRED TO PRODUCE WRITTEN REPORTS SUMMARIZING CONCRETE PLACEMENT AND INCLUDING:
 - a. DATE/TIME OF PLACEMENT
 - b. WEATHER CONDITIONS
 - c. LOCATION OF PLACEMENT
 - d. CONCRETE SUPPLIER
 - e. ESTIMATED QUANTITY OF CONCRETE PLACED
 - f. CONCRETE SLUMP
 - g. CONCRETE AIR PERCENTAGE
 - h. CONCRETE TEMPERATURE
 - i. NUMBER OF CYLINDERS MADE
 - j. SPECIAL MEASURES TAKEN BY CONTRACTOR TO PROTECT CONCRETE (E.G. HOT WEATHER OR COLD WEATHER MEASURES)
 - k. CONCRETE DELIVERY TICKETS
 - l. PHOTOS OF CONCRETE PLACEMENT

MISCELLANEOUS STRUCTURES

DESCRIPTION:
COMPLY WITH SUBSECTION 305.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS WORK INCLUDES EXCAVATION FOR INSTALLATION OF UNDERGROUND STRUCTURES, INCLUDING WHEN THE EXCAVATION REQUIRES SHORING.

MATERIALS:
COMPLY WITH SUBSECTION 305.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

REINFORCED CONCRETE PIPE AND END SECTIONS ASSOCIATED WITH STORM DRAINS MUST MEET THE APPLICABLE MSHA STANDARD SPECIFICATIONS PROVIDED IN SECTION 905. END SECTIONS MUST CONFORM WITH MSHA 305 AND THE CONTRACT DOCUMENTS.

CORRUGATED METAL PIPE END SECTIONS MUST MEET THE REQUIREMENTS OF MSHA STANDARD SPECIFICATIONS SECTION 905.

MANHOLE FRAMES, COVERS, AND STEPS MUST BE PROVIDED IN ACCORDANCE WITH CONSTRUCTION DOCUMENTS. WHERE MATERIALS ARE TRAFFIC BEARING, THEY MUST BE DESIGNED TO WITHSTAND H-20 LOADS. MANHOLES STEPS MUST BE POLYPROPYLENE ENCAPSULATED MANUFACTURED AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

SUBMITTALS:

PRIOR TO FABRICATION, THE CONTRACTOR MUST SUBMIT TO THE EIC AND OBTAIN APPROVAL OF SHOP DRAWINGS FOR EACH STRUCTURE TO BE FABRICATED PRIOR TO INSTALLATION. THE SHOP DRAWING MUST INCLUDE:

- 1. IDENTIFICATION OF THE STRUCTURE (MATCHING NOTATION FOR THE STRUCTURE SHOWN ON THE CONTRACT DOCUMENTS)
- 2. DETAILED DRAWINGS SHOWING ALL DIMENSIONS, THICKNESSES, PROJECTION DISTANCES, APPURTENANCES, AND REINFORCEMENT (BAR SIZE, SPACING, AND BENDS) FOR THE STRUCTURE.
- 3. DETAILED CALCULATIONS SUPPORTING THE DESIGN OF THE STRUCTURE INCLUDING STABILITY ANALYSIS (BUOYANCY, OVERTURNING, AND SLIDING) AND REINFORCEMENT SIZING.
- 4. THE SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A MARYLAND-LICENSED PROFESSIONAL ENGINEER.

CONSTRUCTION:
COMPLY WITH SUBSECTION 305.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SHEETING, SHORING, AND BRACING IS NOT PERMITTED FOR STRUCTURE INSTALLATION IN DAM EMBANKMENTS. THE EMBANKMENT MUST BE EXCAVATED TO SAFE, STABLE SLOPES (2-HORIZONTAL-TO-1-VERTICAL MINIMUM) FOR STRUCTURE INSTALLATION.

SUPERVISION AND INSPECTION:
PRIOR TO INSTALLATION, THE EIC MUST INSPECT THE STRUCTURE FOR DAMAGE AND TO ENSURE THAT IT MATCHES THE APPROVED SHOP DRAWINGS. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE STRUCTURE WITHOUT APPROVAL OF THE EIC. THE EIC MUST ALSO INSPECT THE STRUCTURE AFTER INSTALLATION AND PRIOR TO BACKFILL TO ENSURE PROPER JOINT CONNECTIONS TO ADJACENT CONDUITS, AND TO ENSURE THAT THE STRUCTURE WAS NOT DAMAGED DURING INSTALLATION. THE CONTRACTOR MAY NOT PROCEED WITH BACKFILLING THE STRUCTURE WITHOUT APPROVAL OF THE EIC.

DRAINS

DESCRIPTION:
COMPLY WITH SUBSECTION 306.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

MATERIALS:
COMPLY WITH SUBSECTION 306.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. POLYVINYL CHLORIDE (PVC) PLASTIC PIPE MUST MEET THE REQUIREMENTS OF ASTM D1785 FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS. PVC FITTINGS MUST MEET THE REQUIREMENTS OF ASTM D2466 (SCHEDULE 40) OR D2467 (SCHEDULE 80) FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS. NO GEOTEXTILES ARE PERMITTED WITHIN DAM EMBANKMENTS OR DRAIN FEATURES UNLESS SPECIFICALLY NOTED IN THE CONTRACT DOCUMENTS.

EXCEPT FOR CLEANOUT FITTINGS AND AS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS, ALL BENDS IN DRAINS INTERNAL TO THE DAM EMBANKMENT SHALL BE 22.5 DEGREES.

UNLESS NOTED OTHERWISE, PERFORATED PIPES USED FOR DRAINS MUST HAVE 3/8" INCH DIAMETER PERFORATIONS SPACED AT 4 INCHES ON CENTER EVERY 40 DEGREES AROUND THE PIPE. FOR SLOTTED PIPE USED FOR DRAINS, THE SLOT WIDTH MUST BE 1/8-INCH. SLOT LENGTH 1.19 INCHES, 4 SLOTS PER ROW, AND 4 SLOTS PER LINEAR FOOT.

DRAIN CLEANOUT CAPS MUST BE WATER TIGHT SCREW TYPE LID. THE PIPE MUST HAVE A PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING CAP. THE SCREW TOP LID MUST BE A "PANELLA" TYPE (OR OWNER-APPROVED EQUAL). CLEANOUT CAPS MUST BE INSTALLED FLUSH WITH FINISHED GRADE.

SUBMITTALS:

PRIOR TO INSTALLATION OF PIPE CONDUITS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING:

- 1. MANUFACTURER'S CERTIFICATION THAT PIPE AND FITTINGS (BENDS, Y'S, ETC.) MEET THE APPROPRIATE MATERIAL SPECIFICATION (E.G. AWWA C100, AWWA C200, ETC.). THIS SHALL INCLUDE THE SIZE, MATERIAL, AND SPECIFICATION FOR EACH TYPE OF PIPE USED IN THE PROJECT.
- 2. SUPPLIER SAMPLE SHEET FOR DRAIN CLEANOUT CAPS

CONSTRUCTION:
COMPLY WITH SUBSECTION 306.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SUPERVISION AND INSPECTION:
PRIOR TO INSTALLATION UNDER SUPERVISION OF THE EIC, THE EIC WILL MUST INSPECT THE DRAIN CONDUIT INSTALLATION PRIOR TO BACKFILL TO ENSURE THE CONDUIT INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ALL JOINTS ARE PROPERLY SEATED, BONDED OR MECHANICALLY ATTACHED, AND THAT THERE IS NO DAMAGE TO THE INSTALLED PIPE.

RIPRAP SLOPE AND CHANNEL PROTECTION

DESCRIPTION:
COMPLY WITH SUBSECTION 312.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS SECTION INCLUDES THE REQUIREMENTS FOR THE PROVISION AND INSTALLATION OF RIP-RAP FOR CHANNEL AND SLOPE STABILIZATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

MATERIALS:

COMPLY WITH SUBSECTION 312.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE MATERIAL FOR RIP-RAP SLOPE AND CHANNEL PROTECTION MUST CONFORM TO THE REQUIREMENTS OF MSHA STANDARD SPECIFICATIONS LISTED BELOW UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS:

A	AGGREGATE FILTER BLANKET (GRADED AGGREGATE SUB-BASE)	901, TABLE 901A
B	STONE (ROCK)	901.02
C	GEOTEXTILE, CLASS AS SPECIFIED	921.09

LOCALLY HARVESTED RIPRAP: WHEN THE CONTRACTOR AND THE EIC JOINTLY DETERMINE THAT LOCAL ROCK MEETS THE ABOVE-SPECIFIED REQUIREMENTS, THE ROCK MAY BE USED TO CONSTRUCT PROJECT INSTALLATIONS PER THE CONTRACT DOCUMENTS. THE ROCK MUST BE OF THE SAME SPECIFICATION AS THE ROCK SPECIFIED IN THE CONTRACT DOCUMENTS. THE ROCK MUST ADHERE TO ALL REQUIREMENTS STATED IN THIS SECTION (INCLUDING FILTER CLOTH).

SUBMITTALS:

PRIOR TO INSTALLATION OF RIPRAP SLOPE AND CHANNEL PROTECTION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING:

- 1. RIPRAP STONE INCLUDING:
 - a. GRADATION
 - b. CERTIFICATION THAT THE RIPRAP MEETS THE CLASS(S) SPECIFIED IN THE CONTRACT DOCUMENTS
- 2. AGGREGATE FILTER BLANKET INCLUDING:
 - a. GRADATION
 - b. CERTIFICATION THAT THE AGGREGATE MEETS THE GRADATION SPECIFIED IN THE CONTRACT DOCUMENTS
- 3. GEOTEXTILE SUPPLIER'S MATERIAL SPECIFICATION SHEET
 - a. MATERIAL SPECIFICATION SHEET MUST INCLUDE VALUES FOR ALL PARAMETERS NOTED IN SECTION 919.01 OF MSHA

CONSTRUCTION:
COMPLY WITH SUBSECTION 312.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

EXCAVATION MUST CONFORM TO THE LINES AND GRADES SPECIFIED IN THE CONTRACT DOCUMENTS. THE SUBGRADE MUST BE SMOOTH AND FIRM, FREE FROM PROTRUDING OBJECTS THAT WOULD DAMAGE THE GEOTEXTILE.

GEOTEXTILE FILTER CLOTH: UNLESS SPECIFIED OTHERWISE BY CONTRACT DOCUMENTS, THE GEOTEXTILE MUST BE PLACED ON THE PREPARED SUBGRADE WITH THE ADJACENT EDGES OVERLAPPING A MINIMUM OF 2 FEET (0.6M). GEOTEXTILE TORN OR DAMAGED MUST BE REPLACED OR REPAIRED.

AGGREGATE FILTER BLANKET (GRADED AGGREGATE SUB-BASE): WHEN AGGREGATE FILTER BLANKET IS SPECIFIED IN LIEU OF GEOTEXTILE, IT MUST CONFORM TO THE LINES AND GRADES SPECIFIED IN THE CONTRACT DOCUMENTS.

INSTALLATION OF RIP-RAP APRONS MUST BE IN ACCORDANCE WITH MSHA SECTION 312. INSTALLATION OF RIP-RAP IN STACKED CONFIGURATIONS MUST BE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION MUST BE FOLLOWED UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS.

BACKFILL: ANY EXCAVATION VOIDS EXISTING ALONG THE EDGES OF THE COMPLETED SLOPE AND CHANNEL PROTECTION MUST BE COMPLETELY BACKFILLED.

SUPERVISION AND INSPECTION:
THE EIC WILL MUST INSPECT THE RIPRAP SLOPE AND CHANNEL PROTECTION INSTALLATION TO ENSURE THE INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ROCK IS PLACED AT UNIFORM DEPTHS AND MEETS THE MINIMUM REQUIRED DEPTH, AND THAT THERE IS NO DAMAGE TO THE GEOTEXTILE IF INSTALLED.

GABIONS:

DESCRIPTION:
COMPLY WITH SUBSECTION 313.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS WORK CONSISTS OF PROTECTING SLOPES AND CHANNELS WITH STONE FILLED WIRE BASKETS AS SPECIFIED IN THE CONTRACT DOCUMENTS.

MATERIALS:
COMPLY WITH SUBSECTION 313.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

GABION WIRE BASKETS MUST BE PVC-COATED OR GALVANIZED AND MUST BE IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTIONS 313 AND 906.01. STONE MATERIAL USED TO FILL GABION BASKETS MUST CONFORM TO THE QUALITY AND SIZE SPECIFIED IN MSHA STANDARD SPECIFICATIONS SECTION 911.05, AND MANUFACTURER'S RECOMMENDATIONS. GEOTEXTILE SHALL CONFORM TO MSHA STANDARD SPECIFICATIONS SECTION 919.

SUBMITTALS:

PRIOR TO INSTALLATION OF GABIONS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING:

- 1. GABION STONE INCLUDING:
 - a. GRADATION
 - b. CERTIFICATION THAT THE STONE MEETS THE SPECIFICATION IN THE CONTRACT DOCUMENTS
- 2. WIRE BASKET SUPPLIER'S MATERIAL SPECIFICATION SHEET
 - a. MATERIAL SPECIFICATION SHEET SHALL INCLUDE CONFIRMATION THAT THE WIRE BASKET WIRE, TIES, AND CONNECTING WIRE HAVE A MINIMUM TENSILE STRENGTH OF 60,000 PSI
 - b. FASTENERS, IF SUBSTITUTED FOR WIRE TIES ARE STAINLESS STEEL INTERLOCKING AND MEET ASTM A313 AND MAINTAIN CLOSED AND LOCKED POSITION WHEN EXPOSED TO A CORROSIVE ENVIRONMENT
 - c. GALVANIZED COATING MEETS ASTM A123 AND GALVANIZATION RATE IS 0.8 OZ/SF MINIMUM
 - d. PVC COATING MEETS MSMT 508 AND EXHIBITS NO WEIGHT LOSS.
- 3. GEOTEXTILE SUPPLIER'S MATERIAL SPECIFICATION SHEET
 - a. MATERIAL SPECIFICATION SHEET MUST INCLUDE VALUES FOR ALL PARAMETERS NOTED IN SECTION 919.01 OF MSHA

CONSTRUCTION:
COMPLY WITH SUBSECTION 313.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

EXCAVATION MUST CONFORM TO THE LINES AND GRADES SPECIFIED IN THE CONTRACT DOCUMENTS. THE SUBGRADE MUST BE SMOOTH AND FIRM, FREE FROM PROTRUDING OBJECTS THAT WOULD DAMAGE THE GEOTEXTILE, AND CONSTRUCTED IN A MANNER ACCEPTABLE TO THE OWNER. THE INSTALLATION OF THE GABIONS FILLED WITH STONE MUST BE IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTIONS 313. THE WORK WILL REQUIRE MANUAL ADJUSTMENT OF STONE WITHIN THE BASKETS.

GABIONS SHALL BE CAREFULLY FILLED WITH ROCK BY MACHINE OR HAND METHODS TO ENSURE ALIGNMENT, AVOID BULGES, AND PROVIDE A COMPACT MASS THAT MINIMIZES VOIDS. MACHINE PLACEMENT REQUIRES SUPPLEMENTING WITH HAND WORK TO ENSURE THE DESIRED RESULTS. THE CELLS IN ANY ROW SHALL BE FILLED IN STAGES SO THAT THE DEPTH OF ROCK PLACED IN ANY ONE CELL DOES NOT EXCEED THE DEPTH OF ROCK IN ANY ADJOINING CELL BY MORE THAN 12 INCHES. ALONG THE EXPOSED FACES, THE OUTER LAYER OF STONE SHALL BE CAREFULLY PLACED AND ARRANGED BY HAND TO ENSURE A NEAT, COMPACT PLACEMENT WITH A UNIFORM APPEARANCE. THE LAST LAYER OF ROCK SHALL BE UNIFORMLY LEVELED TO THE TOP EDGES OF THE GABIONS.

SUPERVISION AND INSPECTION:
THE EIC MUST INSPECT THE GABION INSTALLATION TO ENSURE THE INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ROCK IS PLACED AS SPECIFIED IN THIS SECTION, THAT THE WIRE BASKETS ARE PROPERLY CLOSED, TIED, AND FASTENED, AND THAT THERE IS NO DAMAGE TO THE GEOTEXTILE, WIRE BASKETS, OR TIES.

STRUCTURE EXCAVATION

DESCRIPTION:
EXCAVATE FOR INSTALLATION OF RISERS, INTAKE TOWERS, RETAINING WALLS (E.G. HEAD WALLS, END WALLS, WING WALLS), WEIR WALLS. THIS EXCAVATION INCLUDES EXCAVATION DONE SOLELY TO FACILITATE INSTALLATION OF THE STRUCTURE AND IS ABOVE AND BEYOND EXCAVATION REQUIRED TO INSTALL CONDUITS OR MAKE OTHER MODIFICATIONS TO THE DAM COVERED UNDER THE EARTH EXCAVATION SPECIFICATION SECTION.

MATERIALS:
COMPLY WITH SUBSECTION 402.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. CRUSHER RUN AGGREGATE CR-8 SHALL NOT BE USED AS BACKFILL MATERIAL AROUND STRUCTURES.

SUBMITTALS:

NOT APPLICABLE

CONSTRUCTION:
COMPLY WITH SUBSECTION 402.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

WHERE STRUCTURES ARE LOCATED WITHIN DAM EMBANKMENT, SHEETING, SHORING, AND BRACING IS NOT PERMITTED. THE EMBANKMENT MUST BE EXCAVATED TO SAFE, STABLE SLOPES (2-HORIZONTAL-TO-1-VERTICAL MINIMUM) FOR CONDUIT INSTALLATION.

BACKFILL OF THE FOOTING FOUNDATION SHALL BE DONE WITH EARTH FILL MEETING THE REQUIREMENTS SPECIFIED IN THE PLACEMENT OF EARTH FILL MATERIALS AT DAMS SECTION OF THESE SPECIFICATIONS, OR SUB FOUNDATION CONCRETE. AGGREGATE INCLUDING CRUSHER RUN AGGREGATE CR-8 IS NOT PERMITTED A BACKFILL MATERIAL. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 90% OF THE LABORATORY MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT BETWEEN 2% AND 4% OF THE LABORATORY OPTIMUM PER ASTM D698 OR AASHTO T-99.

SUPERVISION AND INSPECTION:
ALL EXCAVATIONS SHALL BE SUPERVISED AND INSPECTED BY THE EIC. ALL ROCK EXCAVATIONS, ROCK SURFACE CLEANING, AND ROCK SURFACE PREPARATION SHALL BE SUPERVISED BY AN ENGINEERING GEOLOGIST. EIC SHALL ISSUE WRITTEN REPORTS FOR EACH EXCAVATION INDICATING:

- 1. DATE OF INSPECTION
- 2. EXCAVATION INTENT (E.G. FOR STRUCTURE, FOR CONDUIT, ETC.)
- 3. APPROXIMATE LOCATION (BASE LINE STATION, OFFSET, AND BOTTOM ELEVATION) OF THE EXCAVATION
- 4. AREA OF THE EXCAVATION
- 5. VISUAL OBSERVATIONS OF THE EXCAVATION INCLUDING GROUND SURFACE CONDITION, ANY CLEANING, DELETERIOUS MATERIAL REMOVAL, AND/OR SURFACE PREPARATION COMPLETED.
- 6. PHOTOS OF THE EXCAVATION
- 7. SIZES OF THE EXCAVATION GEOMETRY (HORIZONTAL AND VERTICAL), NOTING DIMENSIONS, SIDE SLOPES, AND DEPTH

FOR STRUCTURE EXCAVATION BACKFILL, THE EIC SHALL PERFORM COMPACTION TESTS FOR ASTM D6988 OR ASTM D1530 (NUCLEAR METHOD) OR ASTM D1556 OR AASHTO T191 (GAMMA METHOD). TEST FREQUENCY SHALL BE A MINIMUM OF ONE PER 2,000 SF BUT NOT LESS THAN ONE PER LIFT OF MATERIAL. THE EIC RESERVES THE RIGHT TO TEST AT MORE FREQUENT INTERVALS.

THE EIC WILL PREPARE AND MAKE AVAILABLE WRITTEN REPORTS DOCUMENTING THE FOLLOWING:

- 1. VERIFICATION OF EACH FOOTING SUBGRADE INCLUDING BEARING TESTS AS APPLICABLE
- 2. COMPACTION TEST RESULTS:
 - a. TEST DATE
 - b. GAUGE SERIAL NUMBER
 - c. STATION/OFFSET LOCATION
 - d. ELEVATION
 - e. DEPTH OF TEST (THROUGH LIFT)
 - f. WET DENSITY
 - g. MOISTURE COUNT
 - h. MOISTURE CONTENT
 - i. DRY DENSITY
 - j. MAXIMUM DRY DENSITY (FROM APPROVED SUBMITTAL)
 - k. OPTIMUM MOISTURE CONTENT (FROM APPROVED SUBMITTAL)
 - l. % COMPACTION REQUIRED (FROM CONTRACT DOCUMENTS)
 - m. % COMPACTION OBTAINED
 - n. ANY RELEVANT REMARKS (FAILURE, "RE-TEST", ETC.)

PORTLAND CEMENT CONCRETE STRUCTURES

DESCRIPTION:
COMPLY WITH SUBSECTION 420.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE PURPOSE OF THIS SPECIFICATION IS TO OBTAIN A DENSE AND DURABLE CONCRETE HAVING THE SPECIFIED STRENGTH AND OTHER CHARACTERISTICS TO RESIST ENVIRONMENTAL STRESSES TO ENSURE A WATER TIGHT CONSTRUCTION IN ACCORDANCE WITH ACI 309. THE EIC MAY INSPECT AND REJECT ANY CONCRETE STRUCTURE THAT IS POOR IN QUALITY FOR REASONS INCLUDING BUT NOT LIMITED TO: EXPOSED REINFORCING STEEL, MISALIGNED FEATURES, POOR CONSOLIDATION OF CONCRETE ("HONEYCOMBING", "ROCK POCKETS", ETC.), UNACCEPTABLE JOINTS, SPALLS, CRACKS, DAMAGES OR POOR WORKMANSHIP. CONCRETE DELIVERY AND PLACEMENT SHALL BE SCHEDULED SO THAT EACH LAYER IS PLACED WHILE THE PRECEDING ONE IS STILL PLASTIC TO AVOID COLD JOINTS. COLD JOINTS RESULTING FROM UNTIMELY CONCRETE PLACEMENT SHALL BE CONSIDERED DEFECTIVE WORK AND SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER.

WORK INCLUDES CONSTRUCTING CONCRETE STRUCTURES SUCH AS RISERS, HEADWALLS, WEIRS, OUTLET STRUCTURES, FOUNDATIONS, SLABS, UNDERGROUND VAULTS, MANHOLES, PIPE CRADLES, AND ANY OTHER CONCRETE STRUCTURES ON THE CONTRACT DOCUMENTS. THE WORK ALSO INCLUDES FURNISHING, FORMING, TRANSPORTING, MIXING, PLACING, CURING, AND FINISHING OF PORTLAND CEMENT CONCRETE AND PROTECTING THE COVER AS CALLED FOR IN THE CONTRACT DOCUMENTS. PRE-CAST UNITS MAY NOT BE SUBSTITUTED FOR CAST IN-PLACE CONCRETE WITHOUT PRIOR WRITTEN AUTHORIZATION OF THE OWNER, THE EIC, AND APPROVAL BY MDE, AS APPLICABLE.

UNREINFORCED NON-STRUCTURAL CONCRETE MAY BE FORMED OR UNFORMED, AND IS USED IN CONSTRUCTION OF PIPE CRADLES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

SUBMITTALS:

PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING SUBMITTALS:

- 1. SHOP DRAWINGS:
 - a. SEE REINFORCEMENT STEEL SECTION OF THESE SPECIFICATIONS
- 2. DESIGN MIX CERTIFICATION:
 - a. PRIOR TO PLACING CONCRETE, SUBMIT DESIGN MIXES FOR EACH CLASS AND TYPE OF CONCRETE, CERTIFYING THAT PROPOSED CONCRETE INGREDIENTS AND PROPORTIONS WILL RESULT IN CONCRETE MIX MEETING SPECIFIED REQUIREMENTS.
 - b. INCLUDE FOR EACH CLASS AND TYPE OF CONCRETE, AS MANY MIX DESIGNS AS THERE ARE COMBINATIONS OF DIFFERENT INGREDIENTS OR TYPE OF INGREDIENTS ANTICIPATED TO COVER REQUIREMENTS OF THE WORK.
 - c. ESTABLISH MIX DESIGNS THROUGH AN ACCREDITED LABORATORY. DESIGN CONCRETE MIX FOR PROTECTION AGAINST ALKALI-SILICA REACTIVITY (ASR). ASR MUST BE TESTED PER ASTM C1567 WITH 14-DAY MORTAR BAR EXPANSION NOT EXCEEDING 0.08%. DOCUMENTATION OF ASR MITIGATION MUST BE INCLUDED WITH THE CONCRETE MIX DESIGN SUBMITTAL INCLUDING TEST RESULTS.

- 3. CAST IN PLACE INSTALLATION DOCUMENTATION: PROPOSED METHODS FOR CONTROLLING CONCRETE TEMPERATURE AND PLANS FOR PLACING CONCRETE CONSIDERING SUN, HEAT, WIND, AMBIENT AIR TEMPERATURE OR OTHER LIMITATIONS OF FACILITIES THAT WILL PREVENT PROPER FINISHING OR CURING. FOLLOW ACI 309 FOR "HOT WEATHER CONCRETING" AND/OR ACI 308 FOR "COLD WEATHER CONCRETING" AS APPLICABLE.
- 4. POURED CONCRETE CERTIFICATIONS
 - a. SUBMIT WITH MIX DESIGN, LABORATORY TEST REPORTS AND MILL OR MANUFACTURER'S CERTIFICATES VERIFYING THAT INGREDIENTS CONFORM TO SPECIFIED REQUIREMENTS. USE INGREDIENTS IN DESIGN MIX WHICH ARE REPRESENTATIVE SAMPLES OF MATERIALS TO BE USED IN THE WORK.
 - b. SUBMIT TEST RESULTS WHENEVER THE AGGREGATES, CEMENT OR OTHER ADDITIVES TO BE USED IN THE CONCRETE COME FROM A DIFFERENT LOT, SOURCE, OTHER AREA OF QUARRY, DIFFERENT QUARRY OR FROM OTHER THAN THE REPRESENTATIVE STOCK PILES OR BATCH FROM WHICH THE ORIGINAL MATERIAL WAS TESTED AND APPROVED.
 - c. IF THE SOURCE, BRAND OR CHARACTERISTIC PROPERTIES OF INGREDIENTS NEED TO BE REVISED DURING THE TERM OF THE CONTRACT, SUBMIT REVISED LABORATORY-MIX REPORT IN ACCORDANCE WITH PROCEDURES SPECIFIED FOR ORIGINAL MIX DESIGN.
- 5. CONCRETE BATCH TICKETS: BEFORE UNLOADING AT THE SITE, SUBMIT CERTIFICATION OR DELIVERY TICKET FROM CONCRETE SUPPLIER WITH EACH BATCH DELIVERED TO THE SITE BEARING THE FOLLOWING INFORMATION:
 - a. NAME OF SUPPLIER
 - b. NAME OF BATCHING PLANT AND LOCATION
 - c. SERIES NUMBER OF TICKET
 - d. DATE
 - e. TRUCK NUMBER
 - f. SPECIFIC JOB DESIGNATION: CONTRACT NUMBER AND LOCATION
 - g. VOLUME OF CONCRETE IN CUBIC YARDS
 - h. CLASS AND TYPE OF CONCRETE
 - i. TIME LOADED
 - j. TYPE AND BRAND OF CEMENT
 - k. WEIGHT OF CEMENT AND FLY ASH OR GROUND-IRON BLAST-FURNACE SLAG.
 - l. MAXIMUM SIZE OF AGGREGATES
 - m. WEIGHTS OF COARSE AND FINE AGGREGATES
 - n. MAXIMUM AMOUNT OF WATER TO BE ADDED AND AMOUNT OF WATER ADDED AT THE SITE
 - o. KIND AND QUANTITY OF ADMIXTURES - ADMIXTURES CONTAINING CALCIUM CHLORIDE MUST NOT BE ALLOWED
- 6. PRECAST CONCRETE CERTIFICATION:
 - a. MANUFACTURER'S CERTIFICATES.
 - b. MILL TESTS ON EACH BATCH SHOWING CHEMICAL AND PHYSICAL ANALYSES PERFORMED IN ACCORDANCE WITH ASTM A615, AS MODIFIED BY ACI 319.

MATERIALS:
COMPLY WITH SUBSECTION 420.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

- CONCRETE CODES, REGULATIONS, REFERENCED STANDARDS AND SPECIFICATIONS:
 - 1. INTERNATIONAL BUILDING CODE, LATEST EDITION
 - 2. AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE," ACI 318-02
 - 3. AMERICAN CONCRETE INSTITUTE, "ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES," ACI 308/308R-01
 - 4. DETAIL AND DETAILING OF CONCRETE REINFORCEMENT ACI 309-02
 - 5. MSHA "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS," LATEST EDITION, SECTIONS 420, 902, 908, 909, 911, 913, 915, 917, AND 921.
 - 6. AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)

CONCRETE STRUCTURE MATERIAL SPECIFICATIONS:

- 1. BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI 318, MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE, ACI 315.
- 2. MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION "STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS," LATEST EDITION, SECTION 421, 902, AND 908.
- 3. CRSI: MANUAL OF STANDARD PRACTICE AND RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS.
- 4. AASHTO: STANDARD SPECIFICATION FOR HIGHWAY BRIDGES.
- 5. ASTM: A62, A185, A615

CONCRETE MATERIALS:
1. AS A MINIMUM, THE MATERIALS FOR STRUCTURAL CAST IN PLACE CONCRETE MUST BE PROVIDED IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 420.02.

CONCRETE JOINTS: WHERE REQUIRED, CONCRETE JOINTS MUST BE INSTALLED TO INCLUDE WATER STOPS TO ENSURE A WATER-TIGHT STRUCTURE. COMMONLY USED WATER STOPS INCLUDE RUBBER, PVC, AND BENTONITE. TYPE AND SIZE OF THE WATER STOPS AND ACCOMMODATIONS FOR NEARBY REINFORCEMENT MUST BE PER CONTRACT DOCUMENTS. PVC WATER STOPS MUST BE AT LEAST SIX (6) INCHES WIDE, MEET MSHA STANDARD SPECIFICATIONS SECTION 911.09, AND MUST BE SUPPORTED AND CENTERED ON THE JOINT. PVC WATER STOP CAN BE FIELD SPliced BY USING THE ELECTRIC SPlicing IRON OR BY USING FITTINGS TO ASSURE CONTINUITY. SWELL TYPE BENTONITE WATER STOPS MUST BE PLACED TO ENSURE A MINIMUM OF TWO (2) INCHES OF CONCRETE COVER. SWELL TYPE BENTONITE WATER STOPS SHALL ONLY BE USED IN THE FOLLOWING CASES:

- 1. AROUND A CONDUIT PENETRATION THROUGH A CONCRETE STRUCTURE WHERE THE CONDUIT MATERIAL IS NOT CONCRETE (E.G. DUCTILE IRON PIPE, PVC PIPE, ETC.)
- 2. AT A JOINT BETWEEN EXISTING PRE-CONSTRUCTION CONCRETE AND FRESHLY PLACED CONCRETE. THIS APPLICATION TYPICALLY OCCURS DURING REPAIRS OR MODIFICATIONS TO AN EXISTING CONCRETE STRUCTURE.
- 3. OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.

SUPERVISION AND INSPECTION
INSTALLATION SHALL BE COMPLETED UNDER SUPERVISION OF THE EIC. THE EIC MUST BE PRESENT AND COMPLETE OBSERVATION AND TESTING FOR THE FOLLOWING:

1. PRIOR TO ANY INSTALLATION OF A CONCRETE STRUCTURE OR CONVEYANCE PIPING, THE SUB-GRADE MUST BE TESTED AND APPROVED BY THE EIC. REFER TO THE SUBGRADE PREPARATION SECTION OF THESE SPECIFICATIONS FOR MORE INFORMATION.
2. THE OWNER AND EIC MUST BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF CONCRETE PLACEMENT. FORM WORK MUST BE APPROVED FOR LINES AND GRADES BY EIC PRIOR TO PLACING CONCRETE. CONCRETE MUST BE POURED ONLY IN THE PRESENCE OF THE EIC DURING CONSTRUCTION AND THE CONCRETE SHALL BE TESTED IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 902.10.08. THE EIC MUST ALSO MAKE TEST CYLINDERS IN ACCORDANCE WITH ASTM C31 OR AASHTO T23 FOR ALL CONCRETE POURS FOR CRADLES, SEVEN-DAY (LAB CURED) AND 28-DAY (LAB CURED AND FIELD CURED) TESTS MUST BE CONDUCTED IN ACCORDANCE WITH ASTM C39 OR AASHTO T22. FOR EACH DAY THAT CONCRETE IS POURED ON A PROJECT SITE, A MINIMUM OF EIGHT TEST CYLINDERS MUST BE MADE FOR EACH MIX DESIGN TO BE TESTED AT AN ACCREDITED LABORATORY FOR EVERY 50 CUBIC YARDS OF CONCRETE PLACED OR FRACTION THEREOF. SIX (6) TEST CYLINDERS MUST BE CURED UNDER THE LABORATORY CONDITIONS (TWO (2) FOR SEVEN (7) DAYS, TWO (2) FOR 28 DAYS, TWO (2) FOR 56 DAYS) AND TWO (2) CYLINDERS MUST BE CURED UNDER FIELD CONDITIONS (FOR 28 DAYS). THE OWNER OR EIC MAY REQUIRE AN EQUAL NUMBER OF TEST CYLINDERS CURED UNDER THE JOB CONDITIONS. THE TEST RESULTS MUST BE MADE AVAILABLE WITHIN SEVEN DAYS OF EACH COMPLETED TEST. IF THE CONCRETE FAILS TO MEET THE CONTRACTUAL REQUIREMENTS, THE OWNER HAS THE RIGHT TO REQUIRE ADDITIONAL TESTING OR REJECT THE CONCRETE.
3. THE EIC WILL BE REQUIRED TO PRODUCE WRITTEN REPORTS SUMMARIZING CONCRETE PLACEMENT AND INCLUDING:
 - a. DATE/TIME OF PLACEMENT
 - b. WEATHER CONDITIONS
 - c. LOCATION OF PLACEMENT
 - d. CONCRETE SUPPLIER
 - e. ESTIMATED QUANTITY OF CONCRETE PLACED
 - f. CONCRETE SLUMP (ASTM C172/C143 OR AASHTO R607/119)
 - g. CONCRETE AIR CONTENT (ASTM C172/T173 OR C231 OR AASHTO R607/T152 OR T199)
 - h. CONCRETE TEMPERATURE (ASTM C172/C104 OR AASHTO R607/T309)
 - i. NUMBER OF CYLINDERS MADE (ASTM C39/ASTM C31 OR AASHTO T23/T22)
 - j. SPECIAL MEASURES TAKEN BY CONTRACTOR TO PROTECT CONCRETE (E.G. HOT WEATHER OR COLD WEATHER MEASURES)
 - k. CONCRETE DELIVERY TICKETS
 - l. PHOTOS OF CONCRETE PLACEMENT

REINFORCEMENT STEEL
DESCRIPTION:
COMPLY WITH SUBSECTION 421.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SUBMITTALS:
1. DETAIL REINFORCING IN ACCORDANCE WITH ACI DETAILING MANUAL.
2. BAR LISTS SHOWING THE INDIVIDUAL WEIGHT OF EACH BAR, TOTAL WEIGHT OF EACH BAR SIZE AND TOTAL WEIGHT OF BARS ON LIST. BASE CALCULATED WEIGHTS ON THEORETICAL UNIT WEIGHTS SHOWN IN ASTM A615, TABLE 1.
3. REPRODUCTION OF THE REINFORCEMENT PLAN DRAWINGS IS NOT ACCEPTABLE.

MATERIALS:
COMPLY WITH SUBSECTION 421.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

CONSTRUCTION:
COMPLY WITH SUBSECTION 421.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

REINFORCEMENT PRODUCT DELIVERY, STORAGE, AND HANDLING:
1. SHIP REINFORCING STEEL IN BUNDLES LIMITED TO ONE SIZE AND LENGTH.
2. TAG EACH BUNDLE AT MILL WITH WATERPROOF TAG SHOWING NAME OF MILL, HEAT NUMBER, GRADE AND SIZE OF BARS AND IDENTIFYING NUMBER.
3. PROTECT REINFORCING STEEL AND WIRE FABRIC FROM DAMAGE; FOREIGN MATTER SUCH AS DIRT, OIL AND GREASE; AND RUST CAUSING CONDITIONS.

REINFORCEMENT MATERIALS INSTALLATION:
1. ALL REINFORCEMENT STEEL MUST BE NEW BILLET STEEL TO CONFORM TO ASTM A615 GRADE 60, AND MSHA STANDARD SPECIFICATIONS SECTION 421.02 TO 421.03 EXCEPT AS MODIFIED HEREIN.
2. CONCRETE PROTECTION FOR REINFORCEMENT: REINFORCEMENT MUST BE PROTECTED BY THE THICKNESS OF THE CONCRETE INDICATED IN THE CONTRACT DOCUMENTS. WHERE NOT OTHERWISE SHOWN, THE THICKNESS OF CONCRETE OVER THE REINFORCEMENT MUST BE AS FOLLOWS:

- a. WHERE CONCRETE IS DEPOSITED AGAINST THE GROUND WITHOUT THE USE OF FORMS, THE CONTRACTOR MUST PROVIDE NOT LESS THAN THREE (3) INCHES OF CONCRETE COVER.
- b. WHERE CONCRETE IS EXPOSED TO WEATHER OR GROUND BUT PLACED IN FORMS, THE CONTRACTOR MUST PROVIDE TWO (2) INCHES OF CONCRETE COVER OVER ALL REINFORCING STEEL.

3. STEEL REINFORCING: ALL STEEL REINFORCING MUST BE NEW BILLET STEEL TO CONFORM TO ASTM A 615 GRADE 60 UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS.
4. CONCRETE JOINTS: WHERE REQUIRED, CONCRETE JOINTS, INCLUDING WATER STOPS, MUST BE INSTALLED TO ENSURE WATER-TIGHT STRUCTURE. SUBMITTALS INDICATING SPECIFIC TYPE AND SIZE OF THE WATER STOPS AND ACCOMMODATIONS FOR NEARBY REINFORCEMENT MUST BE APPROVED BY THE EIC PRIOR TO INSTALLATION.

ALLOWABLE TOLERANCES: CUT AND BEND REINFORCING STEEL TO CONFORM TO DIMENSIONS SHOWN WITHIN THE FOLLOWING TOLERANCES:
1. SHEARED LENGTH: PLUS OR MINUS ONE INCH
2. ALL OTHER BENDS: PLUS OR MINUS ONE INCH

SUPERVISION AND INSPECTION:
REINFORCING MUST BE INSPECTED IN THE FORMS AND APPROVED BY THE EIC BEFORE ANY CONCRETE IS PLACED. WATER STOPS ARE TO BE INSTALLED AS SPECIFIED, AND INSPECTED PRIOR TO CONCRETE PLACEMENT. THE EIC SHALL INSPECT THE BAR TYPE, BAR SIZES, BAR SPACING, CLEARANCE TO FORMS, WATER STOP LOCATION, TYPE, AND DIMENSIONS. THE EIC SHALL COMPLETE A WRITTEN REPORT NOTING THE FOLLOWING:

1. DATE OF INSPECTION
2. STRUCTURE/PORTION OF STRUCTURE INSPECTED (E.G. 'EW-1 FOOTING')
3. INSPECTED ITEMS: (REINFORCEMENT, WATER STOP)
4. FINDINGS
5. REPAIR/REVISION RECOMMENDATIONS MADE TO THE CONTRACTOR
6. PERTINENT PHOTOS OF THE INSPECTION

METAL STRUCTURES
DESCRIPTION:
COMPLY WITH SUBSECTION 430.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

WORK INCLUDES FABRICATING, FURNISHING, GALVANIZING AND INSTALLING LADDERS, ACCESS HATCHES AND TRASH-RACKS IN RISER STRUCTURES, ORIFICE PLATES, AND OTHER MISCELLANEOUS METAL ITEMS, AND ALL ACCESSORIES AS SHOWN IN THE CONTRACT DOCUMENTS.

MATERIALS:
COMPLY WITH SUBSECTION 430.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

UNLESS STATED OTHERWISE, ALL STEEL MUST MEET THE REQUIREMENTS OF ASTM A-36, AND BE GALVANIZED IN ACCORDANCE WITH ASTM A-153 AND FABRICATED AS SHOWN IN THE CONTRACT DOCUMENTS. ALL COMPONENTS OF EACH INSTALLATION MUST BE FULLY WELDED AS ONE-PIECE AND GALVANIZED AFTER FABRICATION.

SUBMITTALS:
PRIOR TO FABRICATION OF METAL STRUCTURES, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF SHOP DRAWINGS OR MANUFACTURER'S DETAIL SHEETS. FOR ITEMS THAT MUST BE CUSTOM FABRICATED SUCH AS LADDERS, CATWALKS, TRASH RACKS, ETC., THE SHOP DRAWING SHALL INCLUDE THE FOLLOWING:

1. SPECIFICATIONS FOR ALL MATERIALS TO BE USED IN THE FABRICATION
2. ALL DIMENSIONS REQUIRED FOR FABRICATION
3. FINISHES FOR THE FABRICATION (E.G. HOT DIP GALVANIZER)
4. IN-FIELD CONSTRUCTION ITEM SPECIFICATIONS SUCH AS BOLTS, SCREWS, TIES, CAULK, ETC.
5. HIGHLIGHT ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS

FOR ITEMS THAT DO NOT HAVE TO BE FABRICATED SUCH AS MANHOLE COVERS, VAULT DOORS, ETC., THE MANUFACTURER'S DETAIL SHEET MUST INCLUDE:

1. NAME, MODEL, AND MANUFACTURER'S IDENTIFICATION NUMBER OF THE ITEM
2. ALL DIMENSIONS OF THE ITEM
3. SPECIFICATION FOR THE MATERIALS USED IN THE ITEM
4. SPECIFICATIONS FOR FINISHES USED IN THE ITEM

REPRODUCTION OF DETAILS PROVIDED OR REFERENCED IN THE CONTRACT DOCUMENTS IS NOT ACCEPTABLE AND WILL BE REJECTED.

CONSTRUCTION:
COMPLY WITH SUBSECTION 430.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

CODES, REGULATIONS, REFERENCE STANDARDS AND SPECIFICATIONS:
- OSHA REGULATIONS (LADDERS FOR RISER STRUCTURES AND RAILINGS)
- MSHA STANDARD SPECIFICATIONS SECTIONS 430 AND 461

BOLTS AND EXPANSION BOLT MATERIALS: EXPANSION ANCHOR BOLTS USED FOR ANCHORING THE LADDERS, HATCHES, SECURITY BARS AND PLATES TO EXISTING CONCRETE STRUCTURE MUST BE "WIK-BOLT" AS MANUFACTURED BY HILTI, INC., OR EQUIVALENT AS APPROVED BY THE EIC. ALL BOLTS OR EXPANSION BOLTS MUST BE A304 STAINLESS STEEL.

BAR TYPE TRASH RACK MUST INCLUDE TRASH RACKS MADE FROM SMOOTH STEEL BARS WELDED TO A STEEL FRAME AND MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS.

EXPANDED STEEL GRATE LOW FLOW TRASH RACK MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS.

LADDERS AND HAND RAILS FOR RISER STRUCTURES MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS AND MUST BE ERECTED PLUMB. LADDER RUNGS MUST BE SPACED AT 12" MAXIMUM ON CENTER, UNLESS NOTED OTHERWISE.

ORIFICE PLATES MUST BE 1/2" THICK. APPLY A BEAD OF SILICON AROUND PERIMETER OF PLATE AND AROUND ALL BOLT HOLES.

HOOD TYPE CORRUGATED METAL TRASH RACKS AND ANTI-VORTEX DEVICES MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS.

SUPERVISION AND INSPECTION:
THE EIC WILL MUST INSPECT ALL METAL STRUCTURE INSTALLATIONS TO ENSURE THE INSTALLATION MEETS THE INTENTION OF THE CONTRACT DOCUMENTS, THAT THE INSTALLATION CONNECTIONS TO STRUCTURES ARE NOT LOOSE AND ARE PROPERLY SEALED, AND THAT ALL MECHANICAL INSTALLATIONS SUCH AS VAULT DOORS, LIDS, ETC. FUNCTION PROPERLY.

METAL RAILING
DESCRIPTION:
COMPLY WITH SUBSECTION 461.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

MATERIALS:
COMPLY WITH SUBSECTION 461.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SUBMITTALS:
PRIOR TO FABRICATION OF METAL RAILINGS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF SHOP DRAWINGS. THE SHOP DRAWING SHALL INCLUDE THE FOLLOWING:

1. SPECIFICATIONS FOR ALL MATERIALS TO BE USED IN THE FABRICATION
2. ALL DIMENSIONS REQUIRED FOR FABRICATION
3. FINISHES FOR THE FABRICATION (E.G. POWDER COATING)
4. IN-FIELD CONSTRUCTION ITEM SPECIFICATIONS SUCH AS BOLTS, SCREWS, TIES, CAULK, ETC.
5. HIGHLIGHT ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS

REPRODUCTION OF DETAILS PROVIDED OR REFERENCED IN THE CONTRACT DOCUMENTS IS NOT ACCEPTABLE AND WILL BE REJECTED.

CONSTRUCTION:
COMPLY WITH SUBSECTION 461.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SUPERVISION AND INSPECTION:
THE EIC WILL MUST INSPECT ALL METAL RAILING INSTALLATIONS TO ENSURE THE INSTALLATION MEETS THE INTENTION OF THE CONTRACT DOCUMENTS AND THAT THE INSTALLATION CONNECTIONS TO STRUCTURES ARE NOT LOOSE AND ARE PROPERLY SEALED.

WORKING DRAWINGS
DESCRIPTION:
COMPLY WITH SUBSECTION 499.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

MATERIALS:
COMPLY WITH SUBSECTION 499.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SUBMITTALS:
NOT APPLICABLE

CONSTRUCTION:
COMPLY WITH SUBSECTION 499.03 OF MSHA, UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS, EXCEPT IN SUBSECTIONS 499.03.03 AND 499.03.04, REPLACE "DIRECTOR - OFFICE OF STRUCTURES" WITH "OWNER" AND REMOVE "DISTRICT ENGINEER".

SUPERVISION AND INSPECTION:
NOT APPLICABLE. SEE THE FOLLOWING SECTIONS FOR SUBMITTAL REQUIREMENTS:
1. REINFORCEMENT STEEL
2. METAL STRUCTURES
3. METAL RAILING

AGGREGATES
IN ADDITION TO CONFORMANCE WITH MSHA SECTION 901 (TABLES 901 A AND B), AGGREGATE MUST CONFORM TO THE FOLLOWING ASTM/AASHTO GRADATION TABLE (M 43). WASHED AGGREGATE MUST ALSO CONFORM TO ASTM C-33.

AGGREGATE: AASHTO M 43 (INCHES)															
SIZE NUMBER	NOMINAL SIZE SQUARE OPENINGS (1)	AMOUNTS FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS), PERCENTAGE BY WEIGHT													
		4	3/4	3	2 1/2	2	1 1/2	1	3/4	3/8	No. 4	No. 8	No. 16	No. 30	No. 60
1	3/4 to 1 1/2	100	90 to 100	25 to 60		0 to 15									
2	3/8 to 3/4	100	90 to 100	35 to 70	0 to 15										
24	3/4 to 3/8	100	90 to 100	25 to 60	0 to 10	0 to 5									
3	2 to 1	100	90 to 100	35 to 70	0 to 15	0 to 5									
357	2 to No. 4	100	95 to 100	35 to 70	10 to 20	0 to 5									
4	1 1/2 to 3/4	100	90 to 100	20 to 55	0 to 15	0 to 5									
407	1 1/2 to No. 4	100	90 to 100	35 to 70	10 to 20	0 to 5									
5	1 to 3/4	100	90 to 100	20 to 55	0 to 10	0 to 5									
56	1 to No. 30	100	90 to 100	40 to 75	15 to 25	0 to 15	0 to 5								
57	1 to No. 4	100	95 to 100	25 to 60	0 to 15	0 to 10	0 to 5								
8	3/4 to 3/8	100	90 to 100	20 to 55	0 to 15	0 to 5									
87	3/4 to No. 4	100	90 to 100	20 to 55	0 to 10	0 to 5									
88	3/4 to No. 8	100	90 to 100	30 to 65	5 to 25	0 to 10	0 to 5								
7	3/4 to No. 4	100	90 to 100	40 to 70	0 to 15	0 to 5									
78	3/4 to No. 8	100	90 to 100	40 to 75	5 to 25	0 to 10	0 to 5								
8	3/8 to No. 8	100	85 to 100	10 to 30	0 to 10	0 to 5									
89	3/8 to No. 16	100	90 to 100	20 to 55	5 to 20	0 to 10	0 to 5								
9	No. 4 to No. 16	100	85 to 100	10 to 40	0 to 10	0 to 5									
10	No. 4 to 9 (2)	100	85 to 100											10 to 30	

(1) 1/8 INCHES, EXCEPT WHERE OTHERWISE INDICATED. NUMBERED SIEVES ARE THOSE OF U.S. STANDARD SIEVE SERIES.
(2) SCREENINGS, WHERE STANDARD SIZES OF COARSE AGGREGATE DESIGNATED BY TWO OR THREE DIGIT NUMBERS ARE SPECIFIED, THE SPECIFIED GRADATION MAY BE OBTAINED BY COMBINING THE APPROPRIATE SINGLE SIEVE STANDARD SIZES AGGREGATES BY A SUITABLE PROPORTIONING DEVICE WHICH HAS A SEPARATE COMPARTMENT FOR EACH COARSE AGGREGATE COMBINED. BLENDING MUST BE DONE AS DIRECTED BY THE LABORATORY.

GEOTEXTILES
GEOTEXTILE FILTER FABRIC (NON-WOVEN): IN ADDITION TO CONFORMANCE WITH MSHA SUBSECTION 919, NON-WOVEN GEOTEXTILE FILTER FABRIC MUST CONFORM TO CLASS C PER TABLE H-24-1 IN THE MDE '2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL'. THE FABRIC MUST HAVE MINIMUM GRAB STRENGTH OF 200 POUNDS AND MINIMUM PUNCTURE STRENGTH OF 80 POUNDS. NOTE: THIS ITEM WILL NOT BE PAID WHEN FABRIC IS INCIDENTAL TO OTHER WORK (E.G., RIPRAP). ALL GEOTEXTILES SHALL BE STORED UNDER COVER PER MANUFACTURER'S SPECIFICATIONS UNTIL INSTALLATION. GEOTEXTILE SHALL BE COMPLETELY COVERED WITH BACKFILL, AGGREGATE, RIPRAP, OR OTHER MATERIAL AFTER INSTALLATION.

SEEPAGE CONTROL FILTER
DESCRIPTION:
SEEPAGE CONTROL FILTERS (E.G. FILTER DIAPHRAGMS, CHIMNEY FILTERS, BLANKET DRAINS, TOE DRAINS) ARE USED TO CONTROL SEEPAGE IN THE DAM EMBANKMENTS. A FILTER IS A CRITICAL FEATURE WITHIN THE DAM, AND MUST BE CONSTRUCTED ACCORDING TO SPECIFICATIONS. FILTERS ARE GENERALLY LOCATED INSIDE OF THE DAM'S EMBANKMENT DOWNSTREAM OF THE DAM AXIS.

MATERIALS:
THE SIZE AND EXTENT OF THE SEEPAGE CONTROL MEASURES AND ANY PIPING NECESSARY MUST BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
FINE AGGREGATE MEDIA: FINE AGGREGATE MEDIA MUST MEET THE SIEVE REQUIREMENTS OF THE FINE AGGREGATE MEDIA REFERENCE NOTED IN THE CONTRACT DOCUMENTS. FINE AGGREGATE MUST BE CLEAN WASHED FINE AGGREGATE. LIMESTONE BASED PRODUCTS, MANUFACTURED SAND AND STONE DUST ARE NOT ACCEPTABLE.
COARSE AGGREGATE MEDIA: COARSE AGGREGATE MATERIAL MUST MEET THE GRADATION REFERENCE NOTED IN THE CONTRACT DOCUMENTS. COARSE AGGREGATE MUST BE CLEAN WASHED COARSE AGGREGATE. LIMESTONE BASED PRODUCTS ARE NOT ACCEPTABLE.
PIPE CONDUIT AND FITTINGS: PER DRAINS SECTION.

SUBMITTALS:
PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF MANUFACTURER'S CERTIFICATIONS THAT THE FINE AND COARSE AGGREGATE MEDIA MEET THE SPECIFICATIONS AND GRADATIONS REQUIRED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION:
INSTALLATION MUST BE IN ACCORDANCE WITH THE REQUIREMENTS STATED IN THE CONTRACT DOCUMENTS AND AS FOLLOWS:

1. PLACE AGGREGATE UNIFORM EIGHT (8)-INCH LOOSE LIFTS (MEASURED BEFORE COMPACTION).
2. WET EACH LIFT THOROUGHLY WITH POTABLE WATER PRIOR TO COMPACTION.
3. COMPACT WITH A MINIMUM OF TWO (2) PASSES OF A VIBRATORY PLATE COMPACTOR WEIGHING AT LEAST 160 POUNDS. THE COMPACTOR SHALL HAVE A MINIMUM CENTRIFUGAL FORCE OF 2,450 POUNDS AT A VIBRATING FREQUENCY OF NO LESS THAN 5,500 CYCLES PER MINUTE OR BY A MINIMUM OF TWO PASSES OF A VIBRATORY SMOOTH WHEELER ROLLER WEIGHT NO LESS THAN 325 POUNDS WITH A CENTRIFUGAL FORCE OF 2,250 POUNDS AT A VIBRATING FREQUENCY OF NO LESS THAN 4,500 CYCLES PER MINUTE.
4. PLACE AGGREGATE TO AVOID SEGREGATION OF PARTICLE SIZES AND TO ENSURE CONTINUITY AND INTEGRITY OF ALL ZONES.
5. TAKE PROPER MEASURES TO PREVENT CONTAMINATION OF THE FILTER MEDIA BY ADJACENT SOILS, LITTER, CONSTRUCTION DEBRIS, OR OTHER MATERIAL. CONTAMINATED AREAS MUST BE REMOVED AND REPLACED.
6. ANY DAMAGE TO THE FOUNDATION SURFACE OR THE TRENCH SIDES OR BOTTOM DURING PLACEMENT SHALL BE REPAIRED BEFORE PLACEMENT OF THE SAND MEDIA CONTINUES.
7. THE UPPER SURFACE OF THE FILTER ZONE CONSTRUCTED CONCURRENTLY WITH ADJACENT FILL ZONES SHALL BE MAINTAINED AT A MINIMUM ELEVATION OF ONE (1) FOOT ABOVE THE UPPER SURFACE OF ADJACENT FILL.
8. THE FILTER DIAPHRAGM (TOE DRAINS) SHALL OUTLET AT THE PRINCIPAL SPILLWAY OUTLET AND EXTEND A MINIMUM OF TWO (2) INCHES BEYOND THE END OF ANY SUPPORT WALL.

SUPERVISION AND INSPECTION
1. INSTALLATION SHALL BE COMPLETED UNDER SUPERVISION BY THE EIC.
2. THE EIC SHALL CONFIRM THE VALIDITY OF THE MATERIAL DELIVERED TO THE SITE BOTH BY VISUAL-MANUAL CLASSIFICATION OF THE MATERIAL AND BY COLLECTING AND REVIEWING THE MATERIAL TICKET FOR EACH LOAD OF MATERIAL DELIVERED AND CONFIRMS THAT IT MEETS THE SPECIFICATION IN THE CONTRACT DOCUMENTS. ONE SIEVE ANALYSIS IN ACCORDANCE WITH ASTM C136 OR AASHTO T27 SHALL BE PERFORMED FOR EVERY 500 CY OF MATERIAL INSTALLED WITH ONE TEST REQUIRED PER INSTALLATION PER MATERIAL.

3. THE EIC SHALL CONFIRM THAT ALL STEPS OF THE PROCESS DETAILED IN THE CONSTRUCTION SECTION ARE FOLLOWED FOR EACH LIFT.
4. THE EIC SHALL MANUALLY INSPECT THE WETTED FINE AGGREGATE BY SAMPLING THE INSTALLED FINE AGGREGATE A MINIMUM OF ONCE PER LIFT OF MATERIAL INSTALLED.

DESCRIPTION:
COMPLY WITH SUBSECTION 499.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

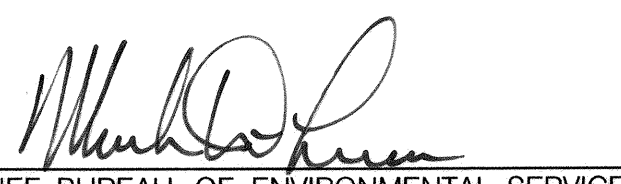
MATERIALS:
COMPLY WITH SUBSECTION 499.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SUBMITTALS:
NOT APPLICABLE

CONSTRUCTION:
COMPLY WITH SUBSECTION 499.03 OF MSHA, UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS, EXCEPT IN SUBSECTIONS 499.03.03 AND 499.03.04, REPLACE "DIRECTOR - OFFICE OF STRUCTURES" WITH "OWNER" AND REMOVE "DISTRICT ENGINEER".

SUPERVISION AND INSPECTION:
NOT APPLICABLE. SEE THE FOLLOWING SECTIONS FOR SUBMITTAL REQUIREMENTS:
1. REINFORCEMENT STEEL
2. METAL STRUCTURES
3. METAL RAILING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND




CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

DATE: 8/22/18



509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400



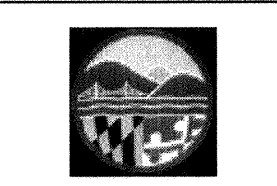
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444

DES: CL /JB															
DRN: MR															
CHK: AH /LN															
DATE: 8/17/18															
	BY	NO.				REVISION							DATE		

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

POND CONSTRUCTION SPECIFICATIONS
SHEET 3

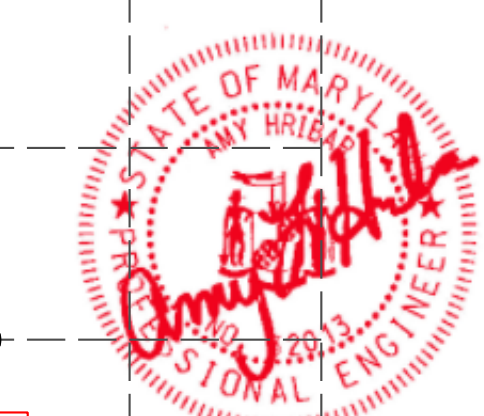
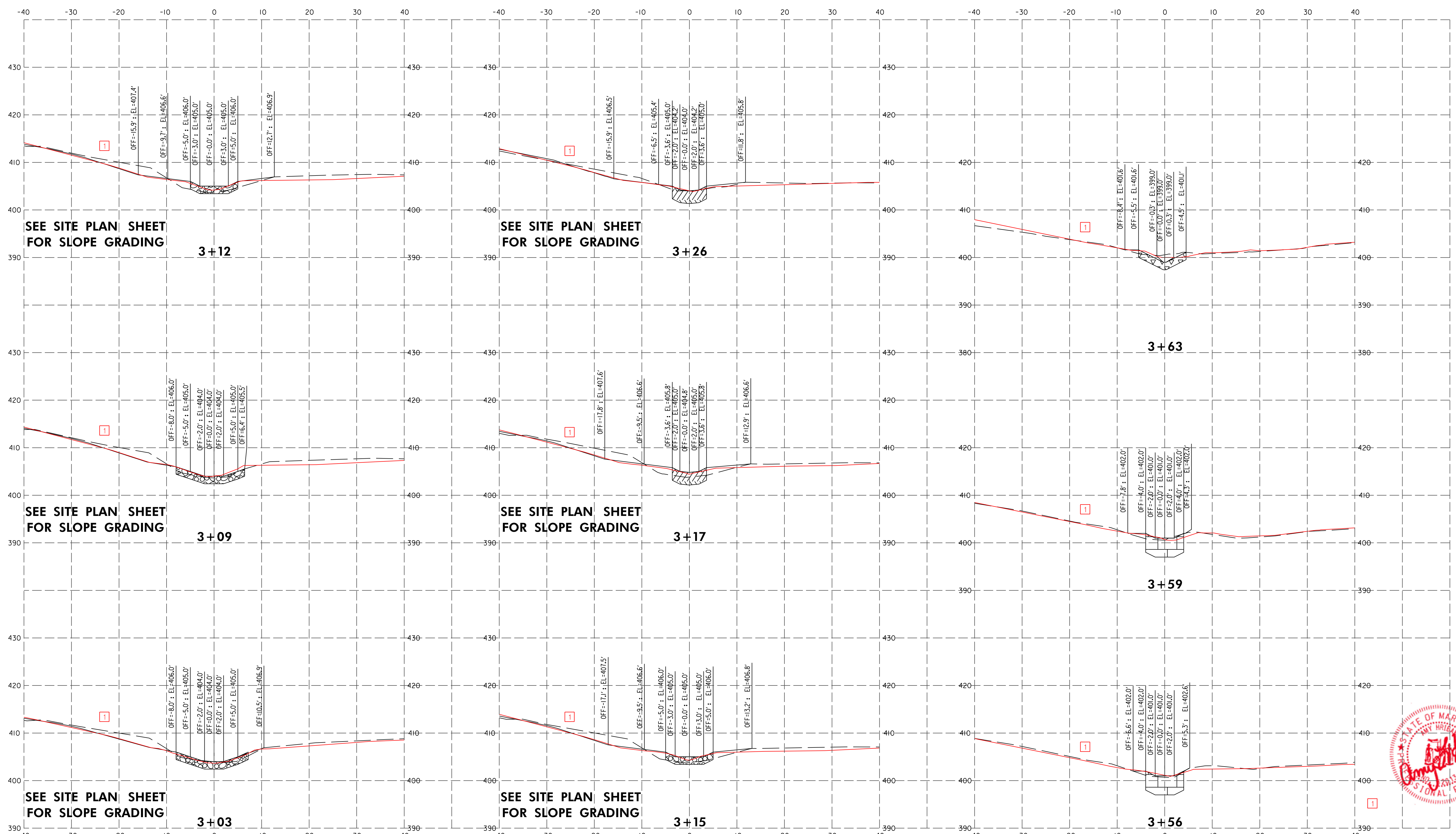
SCALE: NOT TO SCALE
SHEET: 18 OF 23



Maryland Department of the Environment
Water and Science Administration
Dam Safety Division

V. P. Dalal
Visty P. Dalal
Sr. Regulatory & Compliance Engineer

8/23/18
Date
Permit # 18-MK-0005



SCALE
HORIZONTAL: 1"=10' VERTICAL: 1"= 10'

- EXISTING GROUND 2016
- PROPOSED GRADE
- PLUNGE POOL
- STEP-POOL PAVEMENT
- CREST STONES
- RIFFLE GRADE CONTROL
- CASCADE STRUCTURE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Michael D. Lee
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

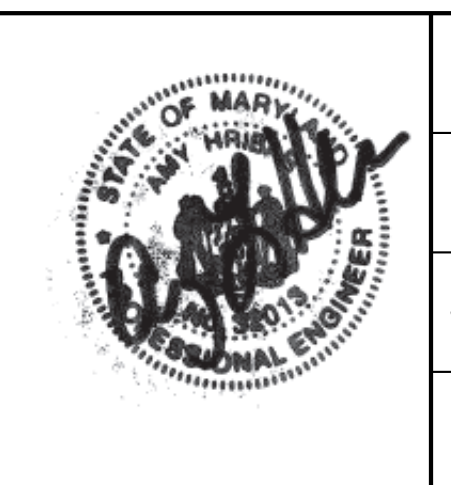
8/22/18 DATE

MCCORMICK TAYLOR

509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County
MARYLAND

Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444



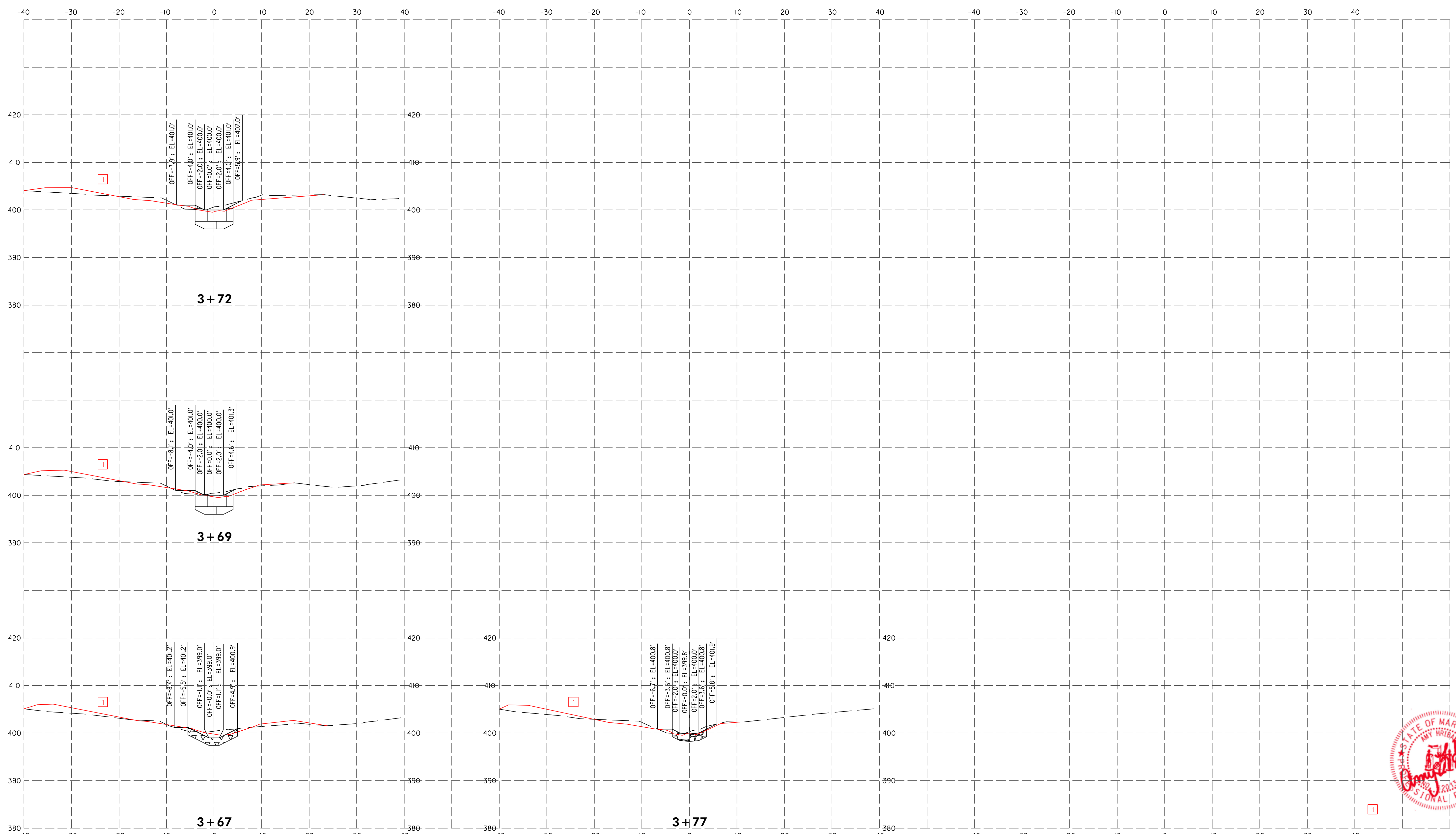
DES: CL /JB	EZS	1	AS-BUILT SURVEY	9/17/19
DRN: MR				
CHK: AH /LN				
DATE: 8/17/18	BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

CHANNEL CROSS SECTIONS

SCALE
AS SHOWN

SHEET
19 OF 23



SCALE
HORIZONTAL: 1"=10' VERTICAL: 1"= 10'

— EXISTING GROUND 2016 — PROPOSED GRADE
 PLUNGE POOL
 STEP-POOL PAVEMENT
 CREST STONES
 RIFFLE GRADE CONTROL
 CASCADE STRUCTURE

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 DATE: 8/22/18

McCORMICK TAYLOR
 509 South Exeter Street
 4th Floor
 Baltimore, Maryland 21202
 (410) 662-7400

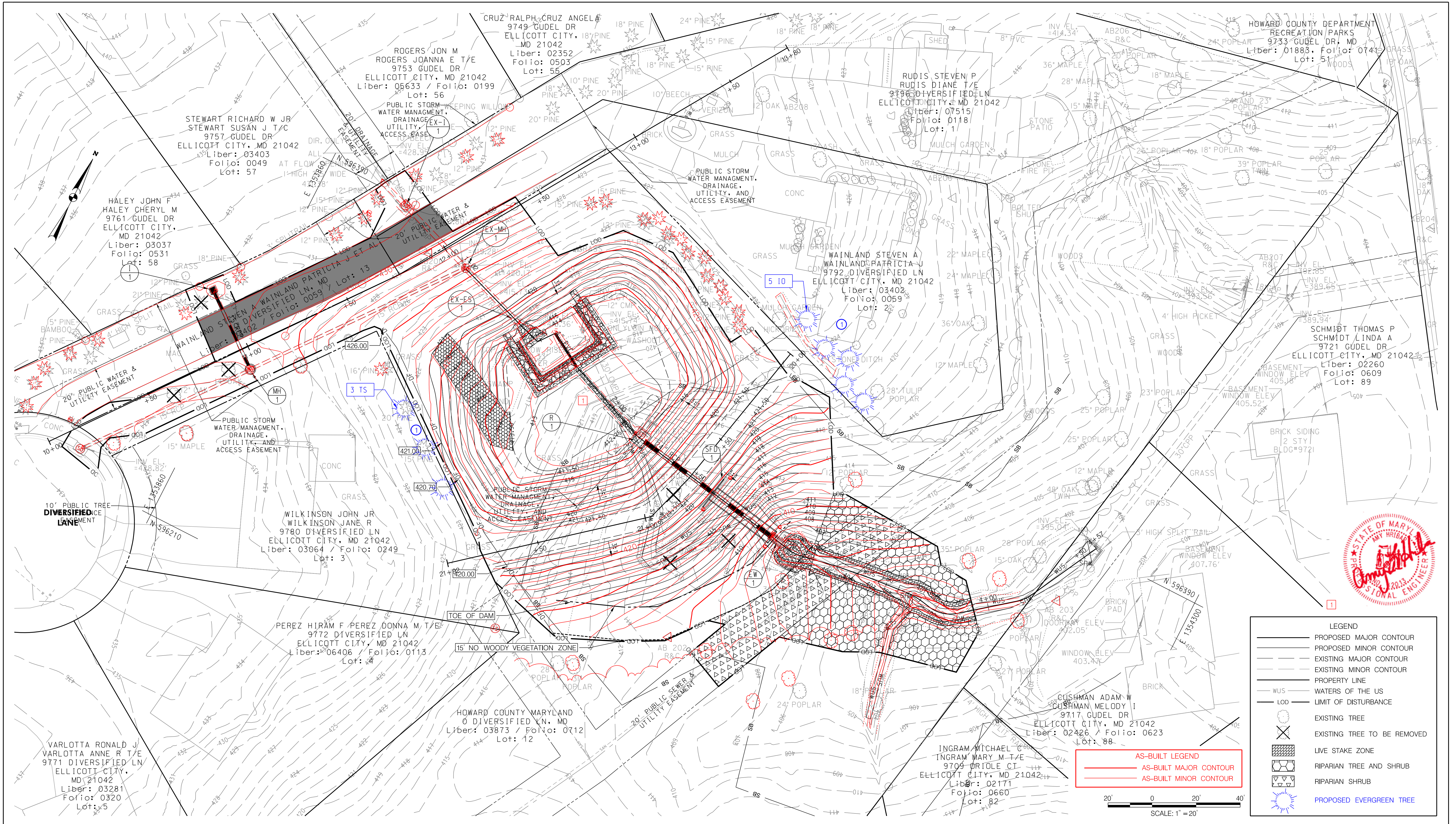
Howard County
 MARYLAND
 Storm Water Management Division
 Bureau of Environmental Services
 6751 Columbia Gateway Drive, Suite 514
 Columbia, Maryland 21046-3143
 (410) 313-6444



DES: CL /JB	EZS	1	AS-BUILT SURVEY	9/17/19
DRN: MR				
CHK: AH /LN				
DATE: 8/17/18	BY	NO.	REVISION	DATE

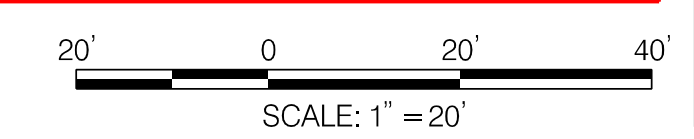
DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
 HOWARD COUNTY CAPITAL PROJECT #D-1159
 HSCD #: EP-17-34
 MD DAM NO. 576
CHANNEL CROSS SECTIONS

SCALE AS SHOWN
 SHEET 20 OF 23



LEGEND	
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPERTY LINE
	WATERS OF THE US
	LIMIT OF DISTURBANCE
	EXISTING TREE
	EXISTING TREE TO BE REMOVED
	LIVE STAKE ZONE
	RIPARIAN TREE AND SHRUB
	RIPARIAN SHRUB
	PROPOSED EVERGREEN TREE

AS-BUILT LEGEND	
	AS-BUILT MAJOR CONTOUR
	AS-BUILT MINOR CONTOUR



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

[Signature] DATE

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County
MARYLAND
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444



DES:	CL / JB	EZS	①	LANDSCAPING REVISION	7/30/19
DRN:	MR	EZS	①	AS-BUILT SURVEY	9/17/19
CHK:	AH / LN				
DATE:	8/17/18	BY	NO.	REVISION	DATE

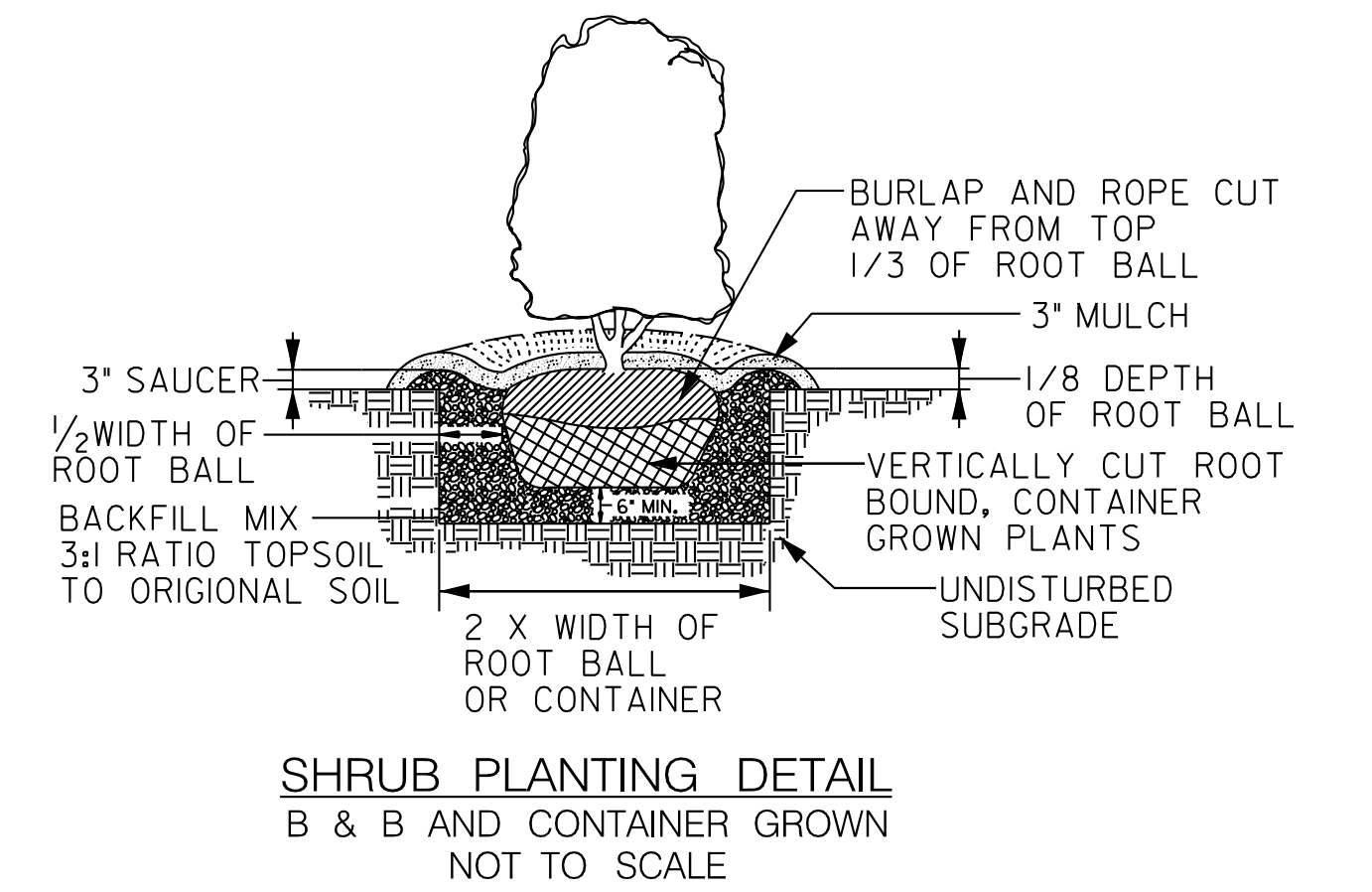
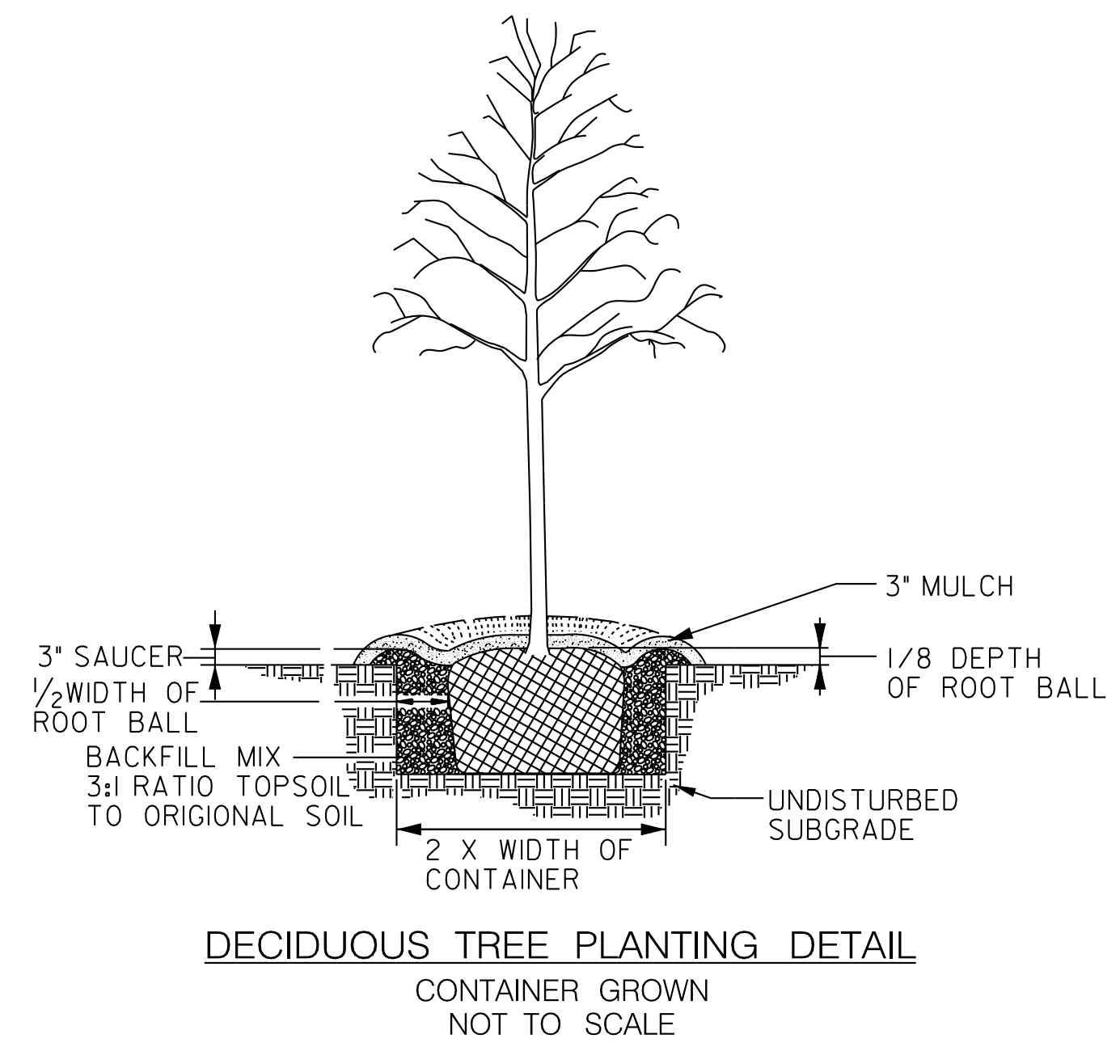
DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

LANDSCAPE PLAN

SCALE
1" = 20'
SHEET
21 OF 23

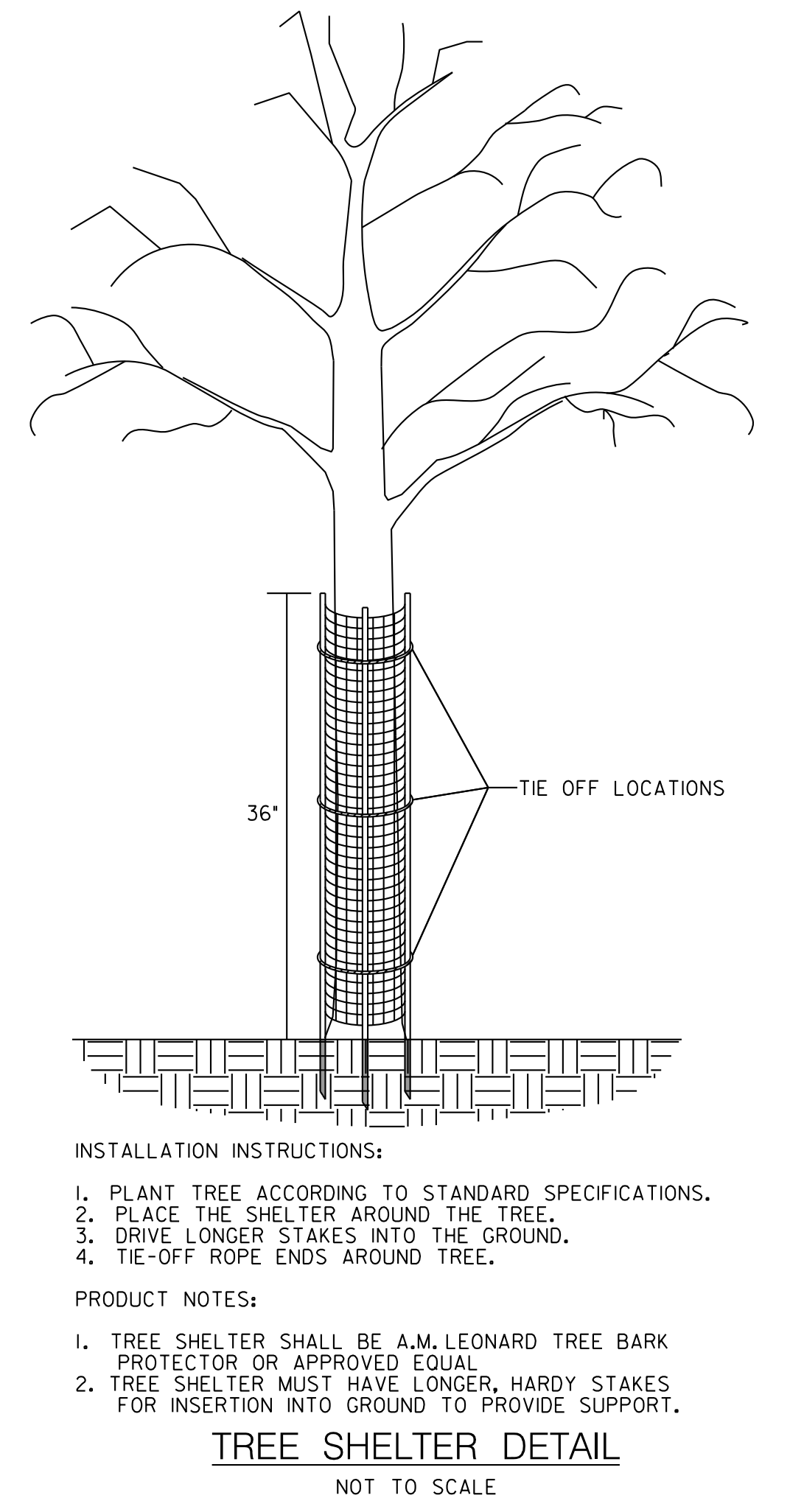
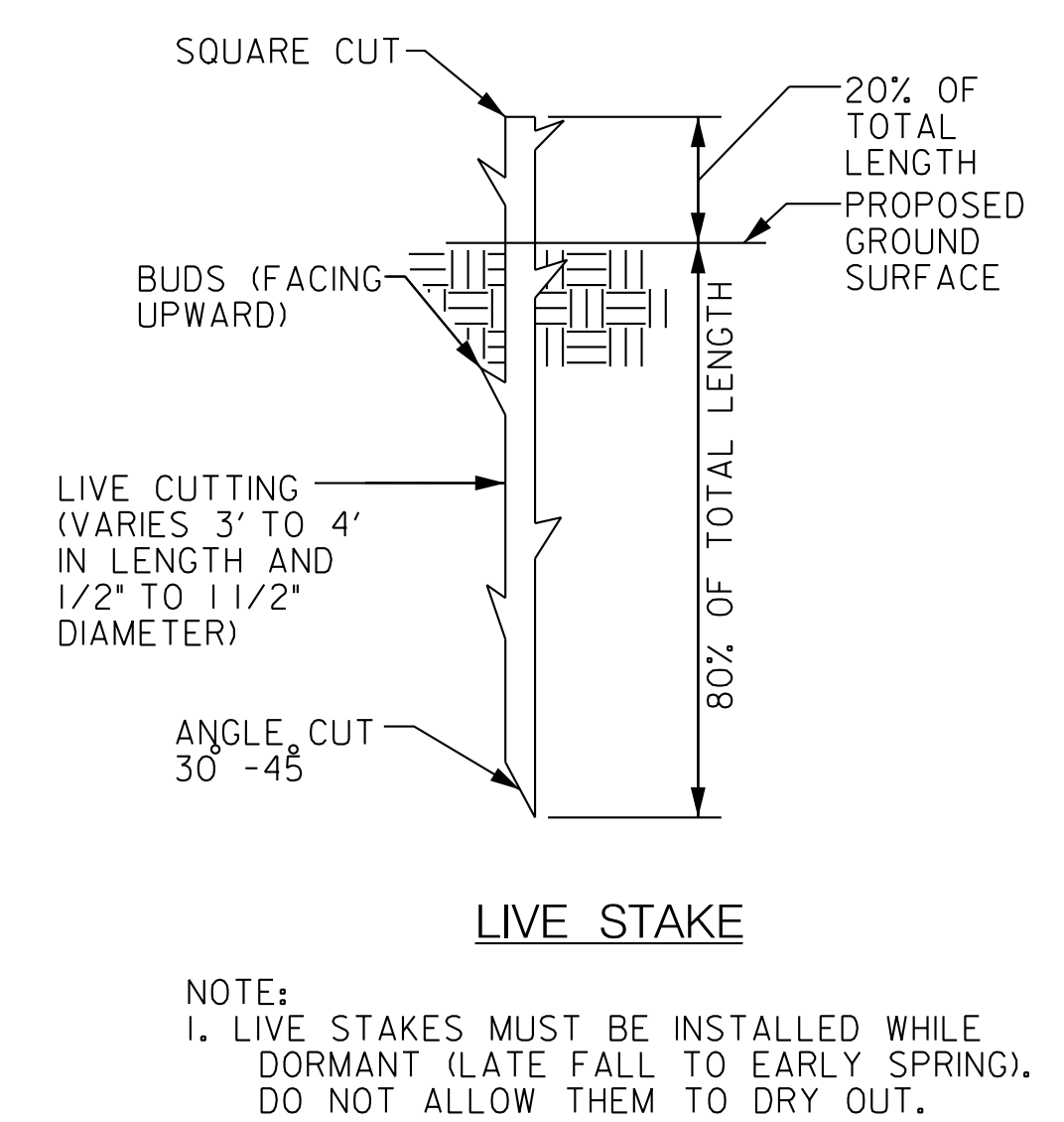
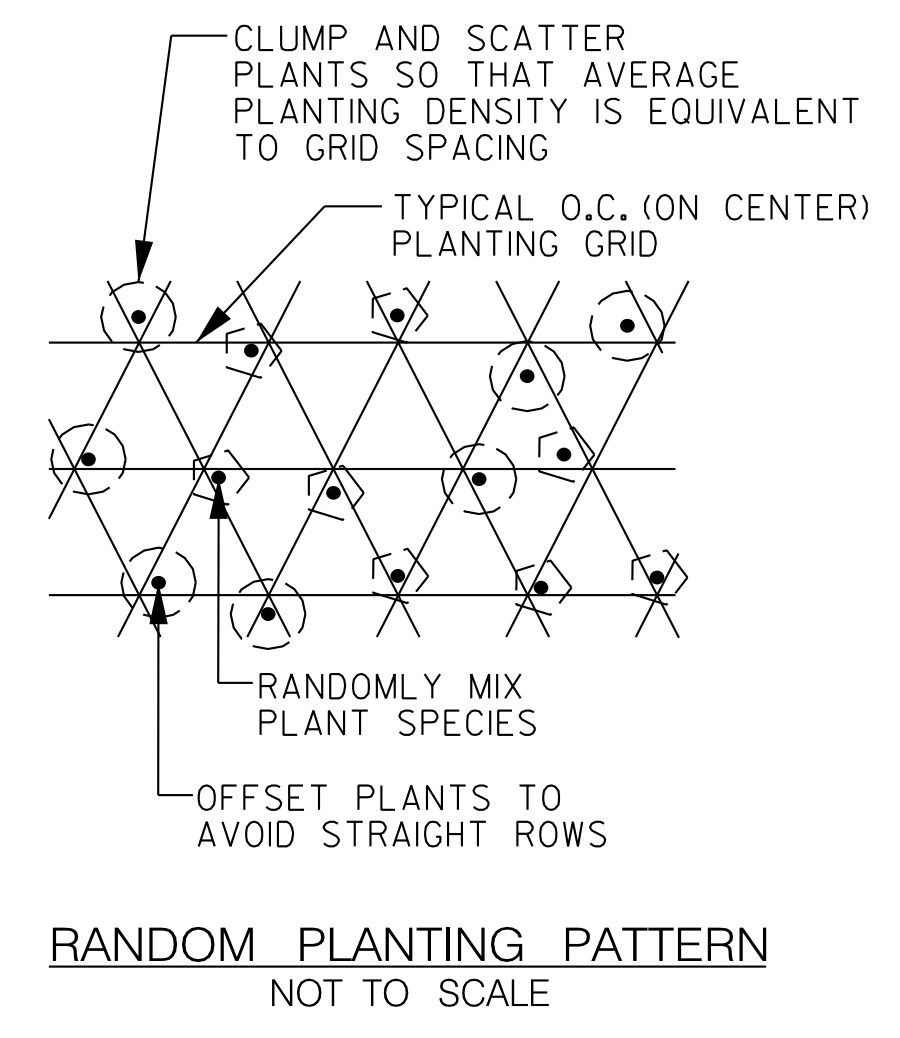
Planting Schedule					
Zone	Botanical Name	Common Name	Size	Comment	Quantity
Live Stake	<i>Comus amomum</i>	Silky Dogwood	3'-4' Live Stake	Plant 2' O. C.	27
Live Stake	<i>Viburnum dentatum</i>	Southern Arrowwood	3'-4' Live Stake	Plant 2' O. C.	27
Live Stake	<i>Salix nigra</i>	Black Willow	3'-4' Live Stake	Plant 2' O. C.	27
Riparian Tree & Shrub	<i>Cercis canadensis</i>	Eastern Redbud	5' HT, 3 GAL Cont.	Plant 12' O.C.	3
Riparian Tree & Shrub	<i>Quercus alba</i>	White Oak	5' HT, 3 GAL Cont.	Plant 12' O.C.	3
Riparian Tree & Shrub	<i>Platanus occidentalis</i>	American Sycamore	5' HT, 3 GAL Cont.	Plant 12' O.C.	3
Riparian Tree & Shrub	<i>Acer saccharum</i>	Sugar Maple	5' HT, 3 GAL Cont.	Plant 12' O.C.	3
Riparian Tree & Shrub	<i>Amelanchier arborea</i>	Serviceberry	2' HT, 3 GAL Cont.	Plant 8' O.C.	7
Riparian Tree & Shrub	<i>Comus amomum</i>	Silky Dogwood	2' HT, 3 GAL Cont.	Plant 8' O.C.	7
Riparian Tree & Shrub	<i>Lindera benzoin</i>	Spice Bush	2' HT, 3 GAL Cont.	Plant 8' O.C.	7
Riparian Shrub	<i>Amelanchier arborea</i>	Serviceberry	2' HT, 3 GAL Cont.	Plant 8' O.C.	11
Riparian Shrub	<i>Comus amomum</i>	Silky Dogwood	2' HT, 3 GAL Cont.	Plant 8' O.C.	11
Riparian Shrub	<i>Lindera benzoin</i>	Spice Bush	2' HT, 3 GAL Cont.	Plant 8' O.C.	11

Riparian Seed Mix					
Zone	Botanical Name	Common Name	Percent Mix	Seeding Rate	Quantity (lbs.)
Streambank, Riparian	<i>Elymus virginicus</i>	Virginia Wildrye	5	30 lbs per acre	
Streambank, Riparian	<i>Agrostis alba</i>	Redtop	5	30 lbs per acre	
Streambank, Riparian	<i>Poa compressa</i>	Canada Bluegrass	5	30 lbs per acre	
Streambank, Riparian	<i>Festuca arundinacea</i>	Trident tall Fescue	10	30 lbs per acre	
Streambank, Riparian	<i>Sorghastrum nutans</i>	Indian Grass	5	30 lbs per acre	
Streambank, Riparian	<i>Lolium multiflorum</i>	Annual Ryegrass	25	30 lbs per acre	
Streambank, Riparian	<i>Elymus sp.</i>	Saint Perennial Ryegrass	20	30 lbs per acre	
Streambank, Riparian	<i>Festuca rubra</i>	Creeping Red Fescue	25	30 lbs per acre	
TOTAL MIX					3.4



①

Additional Planting Schedule					
EVERGREEN TREES					
Symbol	Botanical Name	Common Name	Size	Spacing	Quantity
TS	<i>Thuja standishii plicata</i>	Giant Arborvitae 'Green Giant'	5'-6' HT, B&B	12' O. C.	3
IO	<i>Ilex opaca</i>	American Holly	5'-6' HT, B&B	12' O. C.	5



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

M. D. [Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
8/22/18 DATE

MCCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County
MARYLAND
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444

DES: CL /JB	EZS	①	LANDSCAPING REVISION	7/30/19
	EZS	①	AS-BUILT SURVEY	9/17/19
DRN: MR				
CHK: AH /LN				
DATE: 8/17/18	BY	NO.	REVISION	DATE

SCALE
AS SHOWN
SHEET
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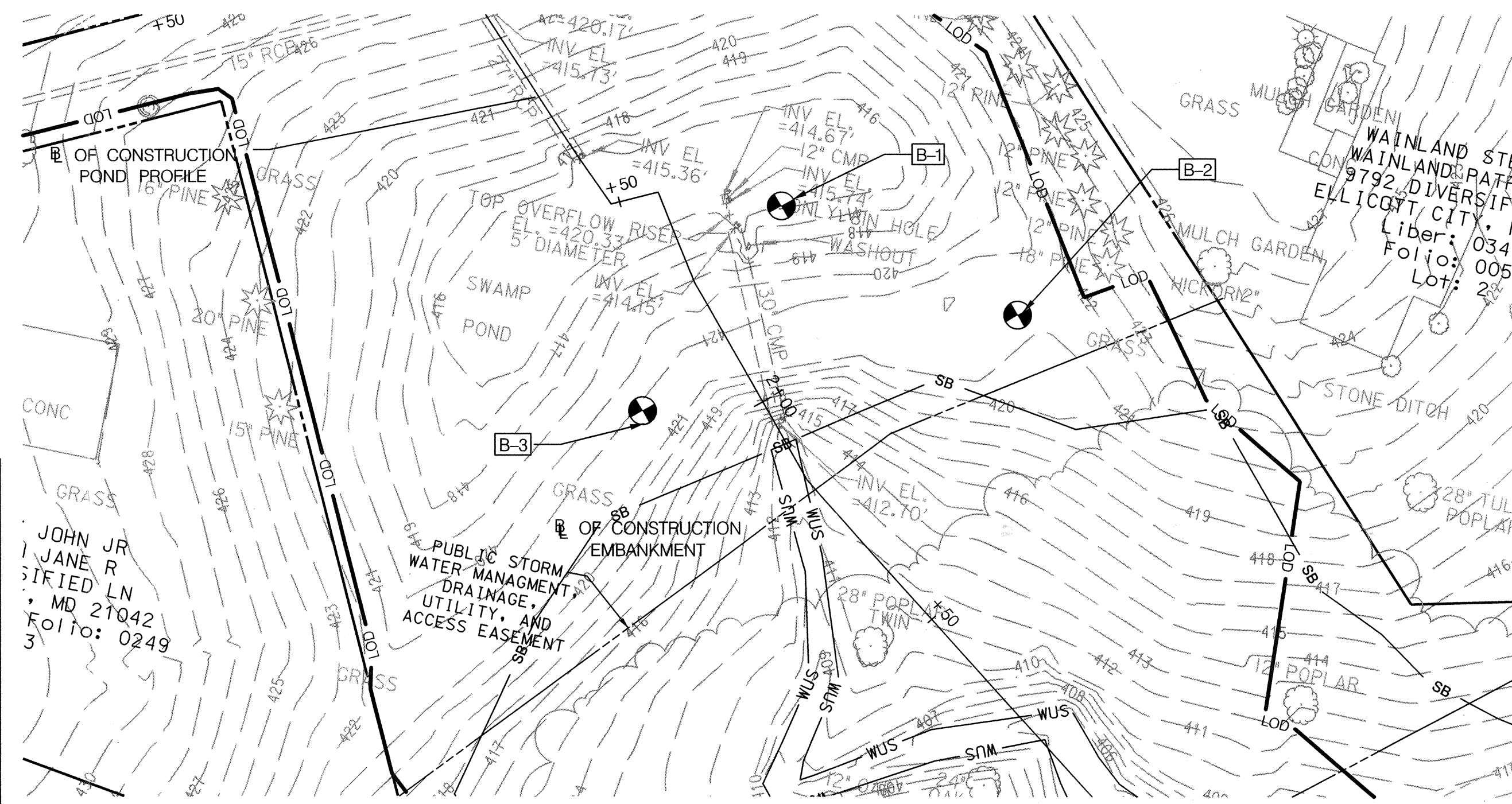
LANDSCAPE DETAILS

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

Project No. 2013055.84		LOG OF BOREHOLE B-1		Sheet 1 of 1	
CLIENT: McCormick Taylor, Inc.		PROJECT: Diversified Lane SWM			
ARCHITECT/ENGINEER:		SITE: Maryland Howard County			
		SAMPLES		TESTS	
SURFACE ELEV.: 417.0 RL		DEPTH (FT)			
0.3' Topsoil		BLOWBARS			
Medium dense gray and brown SILTY SAND (SM) with gravel and mica (F#)		NUMBER			
3.5' Medium dense yellowish brown SILTY SAND (SM) with gravel		TYPE			
6.0' Dense brown and gray SILTY SAND (SM) with rock fragments, quartz (Possible Decomposed Rock)		MOISTURE (%)			
10.0' End of boring @ 10 ft		DRY DENSITY (PCF)			
Borehole was backfilled with bentonite and sugar cutting mixture after 24 hour water reading		% PASSING #20			
		% PASSING #40			
		% PASSING #60			
		% PASSING #100			
		REMARKS/ADDITIONAL DATA			
WATER LEVEL OBSERVATIONS		AB Consultants, Inc.		STARTED: 11/14/16	
WL Dry @ 0 hr		9450 Annapolis Road		FINISHED: 11/14/16	
WL Dry, caved in 5.5 ft @ 0 hr		Lanham, MD 20706		DRILL CO.: Recon	
WL Dry, caved in 5.5 ft @ 24 hr		Phone: 301-306-3091		DRILLER: D-50 ATV	
		Fax: 301-306-3092		DRIER: WR	
		ASSIST DRIER:		APPROVED:	
		LOGGED BY:			

Project No. 2013055.84		LOG OF BOREHOLE B-2		Sheet 1 of 1	
CLIENT: McCormick Taylor, Inc.		PROJECT: Diversified Lane SWM			
ARCHITECT/ENGINEER:		SITE: Maryland Howard County			
		SAMPLES		TESTS	
SURFACE ELEV.: 421.0 RL		DEPTH (FT)			
0.3' Topsoil		BLOWBARS			
Looks to medium dense brown SILTY SAND (SM) with gravel and trace of clay (F#)		NUMBER			
8.5' Medium dense brown and gray SILTY SAND (SM) with quartz and mica		TYPE			
13.0' Dense to very dense dark brown and gray SILTY SAND (SM) with rock fragments (Possible Decomposed Rock)		MOISTURE (%)			
25.0' End of boring @ 25 ft		DRY DENSITY (PCF)			
Borehole was backfilled with bentonite and sugar cutting mixture after 24 hour water reading		% PASSING #20			
		% PASSING #40			
		% PASSING #60			
		% PASSING #100			
		REMARKS/ADDITIONAL DATA			
WATER LEVEL OBSERVATIONS		AB Consultants, Inc.		STARTED: 11/14/16	
WL Dry @ 0 hr		9450 Annapolis Road		FINISHED: 11/14/16	
WL Dry, caved in 9 ft @ 0 hr		Lanham, MD 20706		DRILL CO.: Recon	
WL Dry, caved in 9 ft @ 24 hr		Phone: 301-306-3091		DRILLER: D-50 ATV	
		Fax: 301-306-3092		DRIER: WR	
		ASSIST DRIER:		APPROVED:	
		LOGGED BY:			

Project No. 2013055.84		LOG OF BOREHOLE B-3		Sheet 1 of 1	
CLIENT: McCormick Taylor, Inc.		PROJECT: Diversified Lane SWM			
ARCHITECT/ENGINEER:		SITE: Maryland Howard County			
		SAMPLES		TESTS	
SURFACE ELEV.: 421.0 RL		DEPTH (FT)			
0.3' Topsoil		BLOWBARS			
Stiff reddish brown and yellowish brown FINE SANDY CLAY (CL) with mica and trace of gravel (F#)		NUMBER			
3.0' Medium dense light brown SILTY SAND (SM) with gravel, mica and trace of clay (F#)		TYPE			
6.0' Firm dark brown and reddish brown FINE SANDY CLAY (CL) with gravel (F#)		MOISTURE (%)			
13.0' Very dense brown and gray SILTY SAND (SM) with rock fragments (Possible Decomposed Rock)		DRY DENSITY (PCF)			
25.0' End of boring @ 25 ft		% PASSING #20			
Borehole was backfilled with bentonite and sugar cutting mixture after 24 hour water reading		% PASSING #40			
		% PASSING #60			
		% PASSING #100			
		REMARKS/ADDITIONAL DATA			
WATER LEVEL OBSERVATIONS		AB Consultants, Inc.		STARTED: 11/14/16	
WL Dry @ 0 hr		9450 Annapolis Road		FINISHED: 11/14/16	
WL Dry, caved in 9 ft @ 0 hr		Lanham, MD 20706		DRILL CO.: Recon	
WL Dry, caved in 9 ft @ 24 hr		Phone: 301-306-3091		DRILLER: D-50 ATV	
		Fax: 301-306-3092		DRIER: WR	
		ASSIST DRIER:		APPROVED:	
		LOGGED BY:			



BORINGS AND DRIVE TESTS LOCATION PLAN

SCALE: 1" = 20'

NOTES:

1. THE BORINGS WERE TAKEN IN NOVEMBER, 2016 BY AB CONSULTANTS. THE LOCATIONS OF THE BORINGS ARE APPROXIMATE
2. THE SOIL SYMBOLS REFLECT ONLY THE MAJOR SOIL CONSTITUENT, FOR MORE COMPLETE SOIL CHARACTERISTIC REFER TO THE SOIL DESCRIPTIVE TEXT.
3. THE FIELD BORING LOGS RECORD SAMPLE SPOON RECOVERY. THE LOGS ARE AVAILABLE UPON REQUEST.
4. N = BLOWS ON A 2 INCH OD SAMPLING SPOON BY 140 LB. DRIVE-WEIGHT FALLING 30 INCHES. THE BLOWS REQUIRED TO ADVANCE THE SAMPLING SPOON TO A SPECIFIED DISTANCE ARE REPORTED AS THE PENETRATING RESISTANCE VALUES.
5. BORINGS AND SAMPLINGS CONFORM TO AASHTO DESIGNATIONS T-206 AND T-306.

Maryland Department of the Environment
Water and Science Administration
Dam Safety Division

V. P. Dalal
Sr. Regulatory & Compliance Engineer

08/23/18
Date

Permit # 18-MR-0005

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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MARYLAND
Storm Water Management Division
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6751 Columbia Gateway Drive, Suite 514
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DES: CL / JB
DRN: MR
CHK: AH / LN
DATE: 8/17/18

BY	NO.	REVISION	DATE

DIVERSIFIED LANE PRINCIPAL SPILLWAY REPLACEMENT
AND CHANNEL STABILIZATION PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-34
MD DAM NO. 576

SOIL BORING AND DRIVE TESTS

SCALE
AS SHOWN
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