HOWARD COUNTY

Capital Project #D-1160

Beech Creek Drive
Stormwater Management Retrofit Project

Storm Water Management Division
Bureau Of Environmental Services

INDEX OF SHEETS

LEGEND

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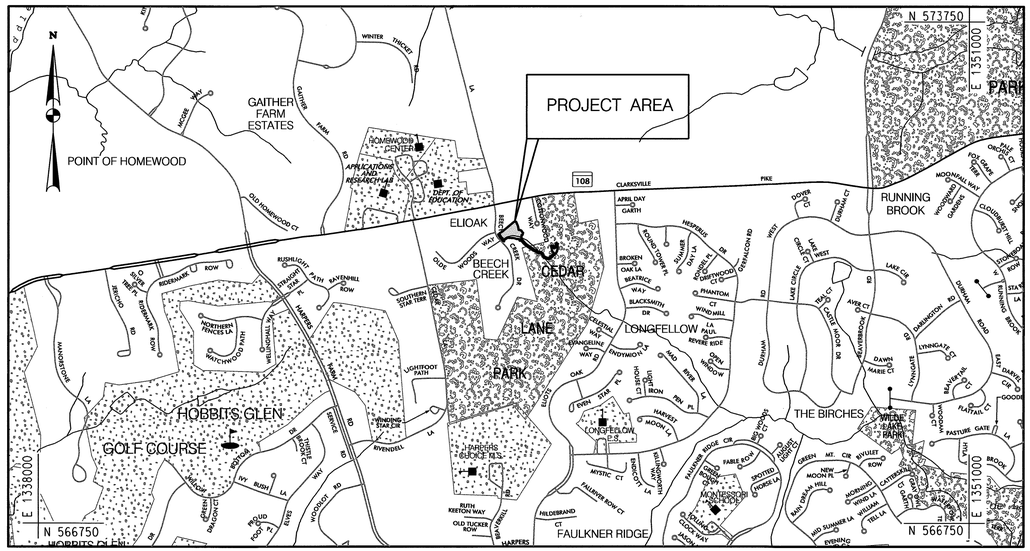


SCALE: 1" = 1000'
1000 0 1000 2000 feet

HORIZONTAL DATUM	NAD 83 /91
VERTICAL DATUM	NAVD 88

PERMITS /APPROVALS			
AGENCY	PERMIT #	DATE APPLIED	DATE APPROVED
MDE JOINT PERMIT APPLICATION	201761452	07 /27 /2017	09 /13 /2017
MDE DAM SAFETY	N/A	N/A	N/A
HOWARD SOIL CONSERVATION DISTRICT	EP–16–23	30% 02 /25 /2016 65% 11 /11 /2016 90% 5 /5 /2017 Final 10 /13 /2017	30% 04 /18 /2016 65% 11 /30 /2016 90% 09 /20 /2017 Final 10 /17 /2017
ROADSIDE TREE PERMIT INDIVIDUAL (RTI)	2017–0918	09 /13 /2017	10 /04 /2017

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MDSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1–800–257–7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE.
3. THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
4. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS /BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT (410) 313–1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
5. SURVEY OF THIS SITE WAS PERFORMED BY AB CONSULTANTS, INC – APRIL 2015
6. 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 MERCADO CONSULTANTS, INC.
7. WETLANDS AND WATERS OF THE US WERE DELINEATED BY McCORMICK TAYLOR – FEB 2015.
8. 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.
9. 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.
10. THE CONTRACTORS SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTORS'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.
11. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY McCORMICK TAYLOR IMMEDIATELY TO RESOLVE THE SITUATION.
12. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
13. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
14. SITE DEVELOPMENT DETAILS ARE REFERENCED FROM THE AS–BUILT PLANS FOR BEECH CREEK (F–85–136).
15. A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (TRACKING NUMBER 201761452)
16. PROJECT IMPACTS INCLUDE WORK IN A USE IV–P STREAM. WORK MAY NOT BE CONDUCTED DURING THE PERIOD BETWEEN MARCH 1 AND MAY 31. THE SITE IS LOCATED WITHIN THE LITTLE PATUXENT RIVER WATERSHED WHICH HAS NO TIER II STREAM SEGMENTS REQUIRING THE IMPLEMENTATION OF MARYLAND'S ANTIDEGRADATION POLICY. HOWEVER, THE LITTLE PATUXENT RIVER WATERSHED HAS BEEN IDENTIFIED AS IMPAIRED AND IS CURRENTLY UNDER TMDL FOR SEDIMENT.
17. OWNERS OF THE PROJECT SITE INCLUDE HOWARD COUNTY DEPT. OF RECREATION AND PARKS.

DEPARTMENT OF RECREATION AND PARKS, HOWARD COUNTY, MD

DIRECTOR OF RECREATION AND PARKS — DATE 10/16/17

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 10/18/17

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

AS–BUILT CERTIFICATION [1]

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

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EORSION 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.

10/13/17 — DATE
Amy L. Hribar — DESIGNER'S SIGNATURE
MARYLAND REGISTRATION NUMBER 32013
AMY L. HRIBAR — PRINTED NAME

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.

10.17.17 — DATE
Holger Serrano — OWNER /DEVELOPER SIGNATURE
Holger Serrano Assistant to the Director
PRINTED NAME AND TITLE

[1] STATE OF MARYLAND AMY L. HRIBAR No. 32013 PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 10/17/17
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE 10/13/17

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

[1] STATE OF MARYLAND AMY L. HRIBAR No. 32013 PROFESSIONAL ENGINEER

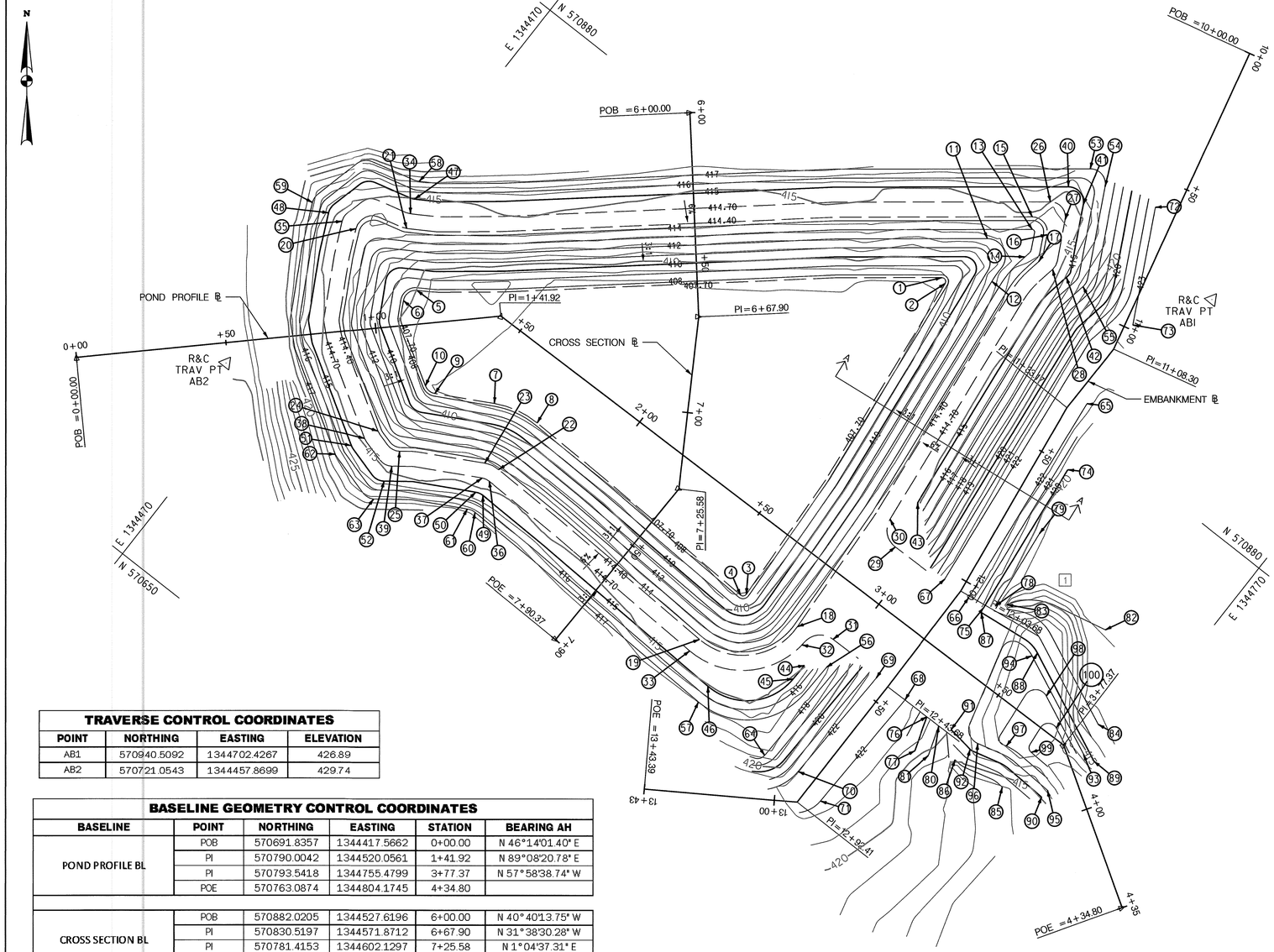
DES: CL
DRN: MR
CHK: AH
DATE: 10/13/17

BY	NO.	REVISION	DATE
CLR	[1]	AS–BUILT SURVEY	8/21/18

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D–1160
HOWARD COUNTY
HSCD #EP–16–23

TITLE SHEET

SCALE: AS SHOWN
SHEET: 1 OF 21



POND CONTROL COORDINATES			
POINT	NORTHING	EASTING	ELEVATION
1	570890.7506	1344627.4334	407.70
2	570889.8840	1344629.5289	407.70
3	570767.7928	1344641.3971	407.70
4	570766.4155	1344640.0466	407.70
5	570779.3687	1344492.7881	407.70
6	570773.9105	1344491.3705	407.70
7	570765.8081	1344536.3606	407.70
8	570769.5098	1344551.5080	407.70
9	570756.1094	1344518.6784	407.70
10	570756.1847	1344514.6034	407.70
11	570910.2377	1344631.3197	412.00
12	570899.9926	1344641.3118	412.00
13	570921.8384	1344641.1933	413.00
14	570913.2004	1344644.9427	413.00
15	570925.1371	1344638.5937	414.40
16	570923.5190	1344646.1234	414.40
17	570914.8029	1344649.4926	414.40
18	570769.7765	1344661.4140	414.40
19	570746.3637	1344638.4548	414.40
20	570782.9664	1344464.1606	414.40
21	570793.4317	1344477.3614	414.40
22	570749.4148	1344551.0593	414.40
23	570748.1850	1344546.0269	414.40
24	570734.5984	1344511.5421	414.40
25	570733.7670	1344521.3108	414.40
26	570932.8011	1344640.2406	414.70
27	570931.1830	1344647.7703	414.70
28	570915.6036	1344654.7128	414.70
29	570810.7430	1344670.6076	414.70
30	570816.9107	1344663.5356	414.70
31	570773.8268	1344673.3360	414.70
32	570765.9587	1344666.3243	414.70
33	570741.3678	1344638.2514	414.70
34	570798.0785	1344475.3627	414.70
35	570781.9832	1344459.0977	414.70
36	570744.4161	1344550.9477	414.70
37	570743.8012	1344548.4315	414.70
38	570729.9584	1344509.5595	414.70
39	570728.2876	1344522.3735	414.70
40	570940.4650	1344641.8875	415.00
41	570938.8469	1344649.4173	415.00
42	570916.4043	1344659.9330	415.00
43	570826.9129	1344667.3750	415.00
44	570761.1015	1344671.2507	415.00
45	570755.2443	1344671.0710	415.00
46	570735.8744	1344650.2665	415.00
47	570802.7253	1344473.3639	415.00
48	570781.4442	1344453.8259	415.00
49	570739.3874	1344552.1766	415.00
50	570738.7725	1344549.6604	415.00

POND CONTROL COORDINATES			
POINT	NORTHING	EASTING	ELEVATION
51	570725.3184	1344507.5769	415.00
52	570722.8083	1344523.4362	415.00
53	570949.6617	1344643.8638	417.00
54	570948.0436	1344651.3936	417.00
55	570917.3652	1344666.1972	417.00
56	570765.1413	1344677.3775	417.00
57	570729.8382	1344651.0316	417.00
58	570808.2962	1344470.9571	417.00
59	570780.8047	1344447.4964	417.00
60	570733.3534	1344553.6342	417.00
61	570732.6225	1344550.9178	417.00
62	570719.7469	1344505.2036	417.00
63	570715.9644	1344524.3595	417.00
64	570729.4846	1344679.2846	418.00
65	570887.6108	1344691.3362	422.00
66	570812.6820	1344700.2980	422.00
67	570812.5508	1344690.2424	422.00
68	570772.7350	1344704.6233	422.00
69	570772.5783	1344692.6128	422.00
70	570732.0928	1344691.3703	422.00
71	570728.9645	1344703.2800	422.00
72	570953.0001	1344668.8018	423.00
73	570917.5611	1344687.1237	423.00
74	570866.3817	1344699.9180	420.00
75	570813.0567	1344706.2959	420.00
76	570772.8558	1344713.8742	420.00
77	570761.4962	1344717.6718	420.00
78	570815.8189	1344708.9869	419.00
79	570843.8655	1344705.6325	419.00
80	570772.9210	1344718.8682	419.00
81	570763.0575	1344722.2150	419.00
82	570832.2361	1344742.6772	418.00
83	570818.5788	1344711.6758	418.00
84	570806.0971	1344760.2752	417.00
85	570770.0110	1344748.0702	417.00
86	570767.4558	1344730.0790	417.00
87	570811.2647	1344706.6443	415.00
88	570812.2468	1344729.6634	415.00
89	570795.5752	1344766.6948	415.00
90	570775.4644	1344760.3914	415.00
91	570774.4640	1344722.8855	415.00
92	570773.2711	1344731.8658	415.00
93	570795.2447	1344762.5569	414.00
94	570810.4231	1344728.8424	414.00
95	570778.4627	1344760.4984	414.00
96	570776.3477	1344732.6578	414.00
97	570781.5174	1344740.6657	413.00
98	570802.8257	1344740.8460	413.00
99	570785.0099	1344748.4312	412.00
100	570796.4877	1344750.0522	412.00

TRAVERSE CONTROL COORDINATES			
POINT	NORTHING	EASTING	ELEVATION
AB1	570940.5092	1344702.4267	426.89
AB2	570721.0543	1344457.8699	429.74

BASELINE GEOMETRY CONTROL COORDINATES					
BASELINE	POINT	NORTHING	EASTING	STATION	BEARING AH
POND PROFILE BL	POB	570691.8357	1344417.5662	0+00.00	N 46°14'01.40" E
	PI	570790.0042	1344520.0561	1+41.92	N 89°08'20.78" E
	PI	570793.5418	1344755.4799	3+77.37	N 57°58'38.74" W
	POE	570763.0874	1344804.1745	4+34.80	
CROSS SECTION BL	POB	570882.0205	1344527.6196	6+00.00	N 40°40'13.75" W
	PI	570830.5197	1344571.8712	6+67.90	N 31°38'30.28" W
	PI	570781.4153	1344602.1297	7+25.58	N 1°04'37.31" E
	POE	570716.6374	1344600.9119	7+90.37	
EMBANKMENT BL	POB	571012.5972	1344661.7139	10+00.00	N 13°33'09.43" W
	PI	570907.3138	1344687.0925	11+08.30	N 0°23'57.50" E
	PI	570882.4393	1344686.9191	11+33.17	N 8°07'04.19" W
	PI	570812.6373	1344696.8756	12+03.68	N 0°44'51.81" W
	PI	570772.6407	1344697.3975	12+43.68	N 0°00'52.32" W
	PI	570723.9120	1344697.4099	12+92.41	N 56°39'17.79" E
	POE	570695.8912	1344654.8254	13+43.39	

[1] POND CONTROL COORDINATES AND BASELINES ARE NOT EVALUATED IN AS-BUILT CONDITIONS

[1]

STATE OF MARYLAND — AMY HRITZ — No. 32013 — PROFESSIONAL ENGINEER

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 10/16/17 — 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

STATE OF MARYLAND — AMY HRITZ — No. 32013 — PROFESSIONAL ENGINEER

DES: CL
DRN: MR
CHK: AH
DATE: 10/13/17

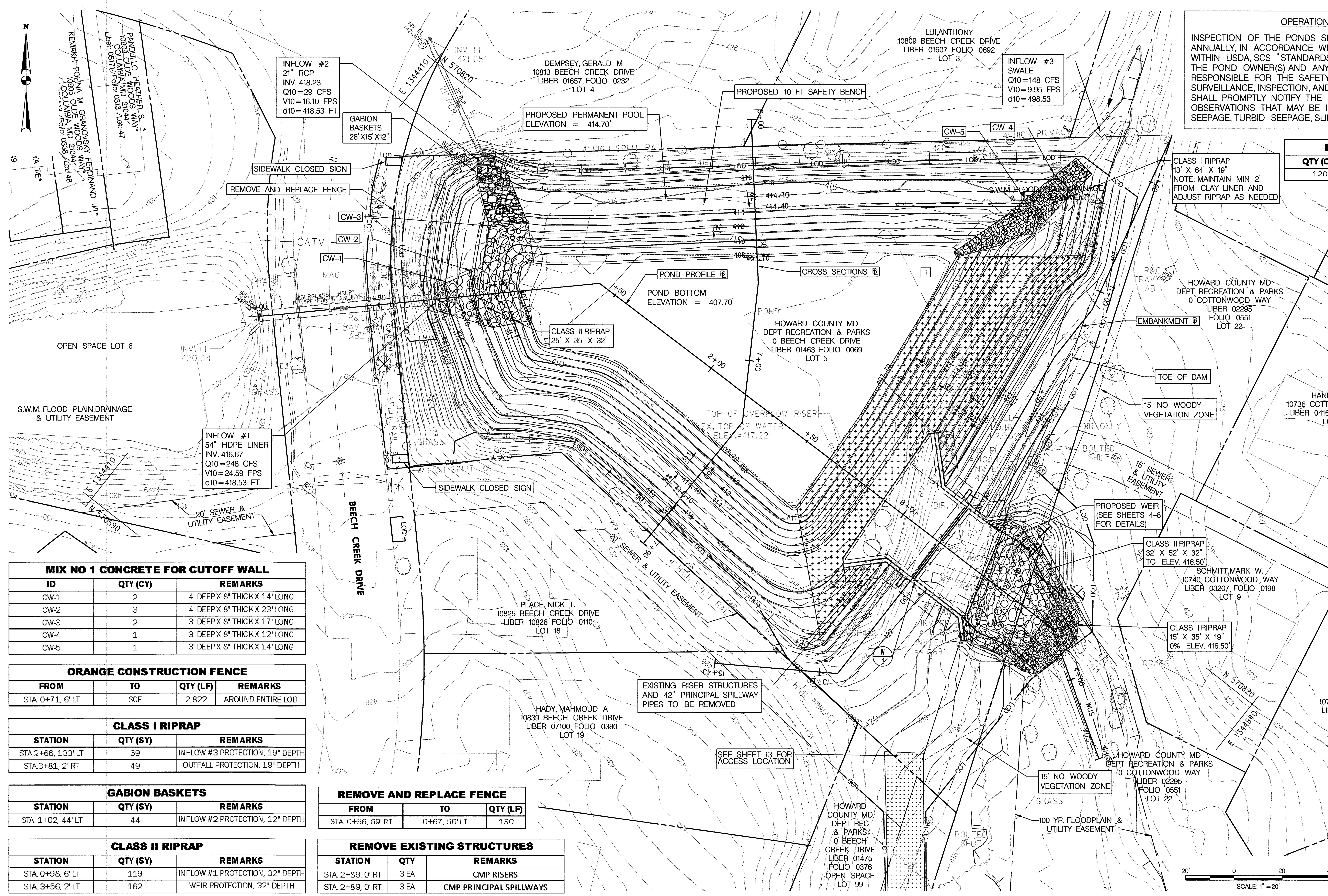
BY	NO.	REVISION	DATE
CLR	[1]	AS-BUILT SURVEY	8/21/18

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

GEOMETRY SHEET

SCALE: 1" = 20'

SHEET: 2 OF 21



OPERATION, MAINTENANCE AND INSPECTION

INSPECTION OF THE PONDS SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

EMBANKMENT CLAY CORE BACKFILL

QTY (CY)	REMARKS
120	SEE NOTE SHEET 10

GEOSYNTHETIC CLAY LINER

QTY (SY)	REMARKS
788	UPSTREAM FACE OF EMBANKMENT

WEIR WALL

QTY (EA)	REMARKS
1	SEE SHEETS 4-8

EXCAVATION

QTY (CY)	REMARKS
4,197	TOTAL EXCAVATION

MIX NO 1 CONCRETE FOR CUTOFF WALL

ID	QTY (CY)	REMARKS
CW-1	2	4' DEEP X 8" THICK X 14' LONG
CW-2	3	4' DEEP X 8" THICK X 23' LONG
CW-3	2	3' DEEP X 8" THICK X 17' LONG
CW-4	1	3' DEEP X 8" THICK X 12' LONG
CW-5	1	3' DEEP X 8" THICK X 14' LONG

ORANGE CONSTRUCTION FENCE

FROM	TO	QTY (LF)	REMARKS
STA. 0+71, 6' LT	SCE	2,822	AROUND ENTIRE LOD

CLASS I RIPRAP

STATION	QTY (SY)	REMARKS
STA.2+66, 133' LT	69	INFLOW #3 PROTECTION, 19" DEPTH
STA.3+81, 2' RT	49	OUTFALL PROTECTION, 19" DEPTH

GABION BASKETS

STATION	QTY (SY)	REMARKS
STA. 1+02, 44' LT	44	INFLOW #2 PROTECTION, 12" DEPTH

CLASS II RIPRAP

STATION	QTY (SY)	REMARKS
STA. 0+98, 6' LT	119	INFLOW #1 PROTECTION, 32" DEPTH
STA. 3+56, 2' LT	162	WEIR PROTECTION, 32" DEPTH

REMOVE AND REPLACE FENCE

FROM	TO	QTY (LF)
STA. 0+56, 69' RT	0+67, 60' LT	130

REMOVE EXISTING STRUCTURES

STATION	QTY	REMARKS
STA. 2+89, 0' RT	3 EA	CMP RISERS
STA. 2+89, 0' RT	3 EA	CMP PRINCIPAL SPILLWAYS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 10/16/17 DATE

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

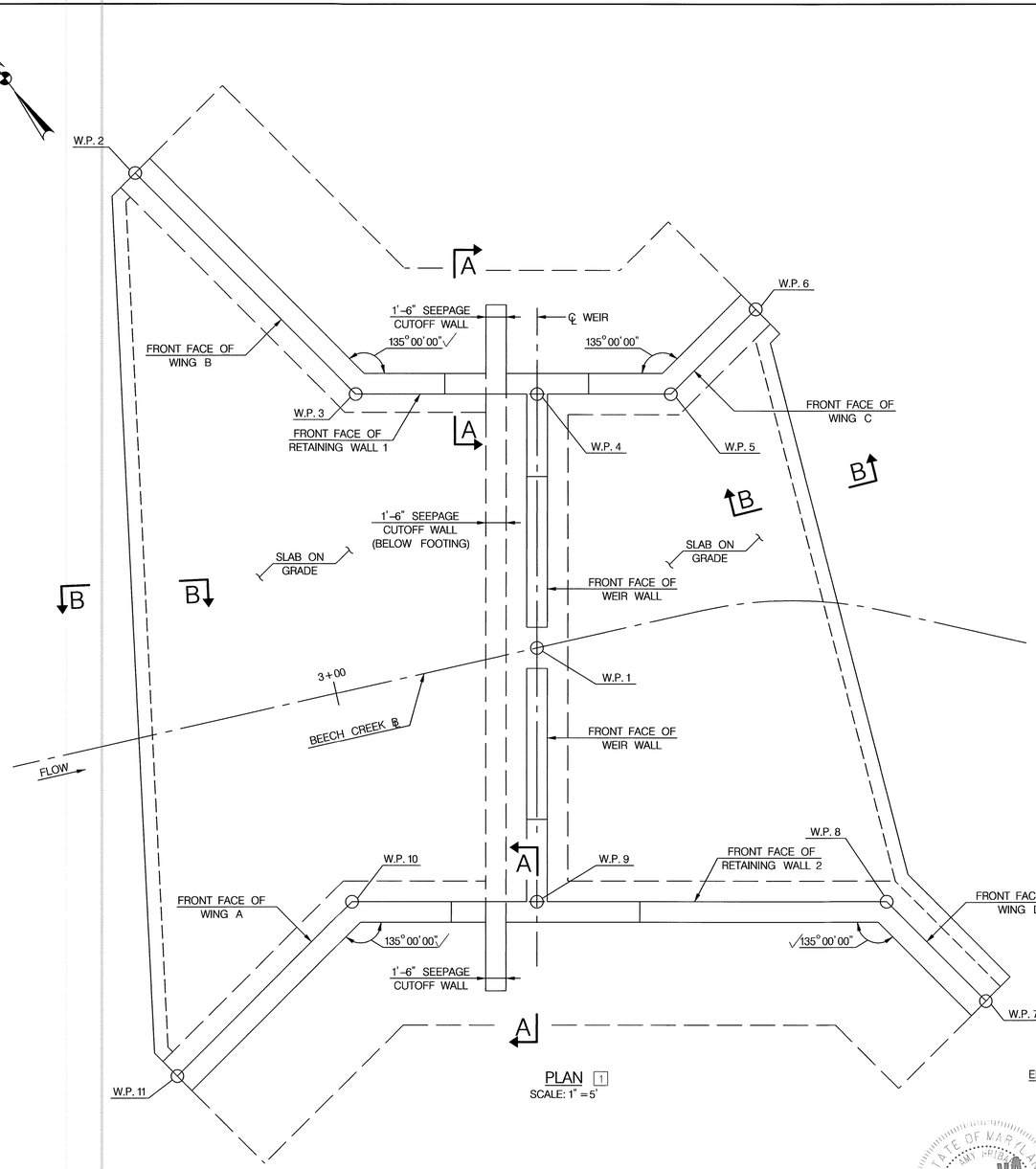
Howard County
MARYLAND
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444

DES: CL	CLR	1	AS-BUILT SURVEY	3/23/18
DRN: MR				
CHK: AH				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

SITE PLAN

SCALE 1" = 20'



PLAN [1]
SCALE: 1" = 5'

WORKING POINTS DATA				
W.P. NO.	STATION	OFFSET	NORTHING	EASTING
1	3+15.02	0.00'	570792.6390	1344697.1365
2	2+94.08	40.23' LT	570826.8399	1344667.3510
3	3+06.20	20.98' LT	570810.9645	1344683.6463
4	3+19.12	18.04' LT	570811.1375	1344696.8951
5	3+28.17	15.90' LT	570811.2647	1344706.6443
6	3+32.44	21.29' LT	570817.5321	1344712.7502
7	3+54.31	26.11' RT	570767.3207	1344730.2176
8	3+45.63	20.64' RT	570774.4734	1344722.8758
9	3+10.93	18.04' RT	570774.1406	1344697.3780
10	2+97.76	15.05' RT	570773.9644	1344683.8791
11	2+82.53	24.64' RT	570761.0715	1344671.3184

WORKING POINT NOTES:
1. COORDINATES PRESENTED TO FOUR DECIMAL PLACES OF A FOOT ARE FOR COMPUTATIONAL PURPOSES ONLY AND DO NOT IMPLY ACCURACY BEYOND TWO DECIMAL PLACES.

[1] WORKING POINTS ARE NOT EVALUATED IN AS-BUILT CONDITIONS

GENERAL NOTES: ✓

GENERAL:
1. PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH THE REQUIREMENTS OF MARYLAND STATE HIGHWAY ADMINISTRATION'S STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS.

2. WEIR, RETAINING WALLS, AND SLAB ON GRADE SHALL ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, W ACEL OR EQUIVALENT) CERTIFIED SOILS TECHNICIAN.

3. THE REQUIRED BEARING PRESSURE BENEATH THE FOOTING OF THE WALLS SHALL BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION MUST BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION.

4. THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ON-SITE SOILS TECHNICIAN. EACH EIGHT INCH LIFT MUST BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.

5. BEFORE BEGINNING EXCAVATION, DIVERT ALL SURFACE WATER BY THE USE OF TEMPORARY SWALES OR OTHER MEANS. DO NOT ALLOW SURFACE WATER TO POND BEHIND THE WALLS DURING CONSTRUCTION.

6. DEWATER THE EXCAVATION IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN. CONDUCT IN ACCORDANCE WITH ALL APPLICABLE REGULATORY REQUIREMENTS. REMOVE SEDIMENT PRIOR TO DISCHARGE.

DESIGN SPECIFICATIONS:
1. DESIGN IS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SEVENTH EDITION, 2014, AND HOWARD COUNTY DESIGN MANUAL, VOLUME III, CHAPTER 3.

2. US ARMY CORPS OF ENGINEERS ENGINEERING MANUAL, EM 1110-2-2502, RETAINING AND FLOOD WALLS, DATED SEPTEMBER 1989.

3. US ARMY CORPS OF ENGINEERS ENGINEERING MANUAL, EM 1110-2-2100, STABILITY ANALYSIS OF CONCRETE STRUCTURES, DATED DECEMBER 2005.

DESIGN LIVE LOAD:
1. RETAINING WALL: DESIGN LIVE LOAD IS 2'-0" LIVE LOAD SURCHARGE LOADING.

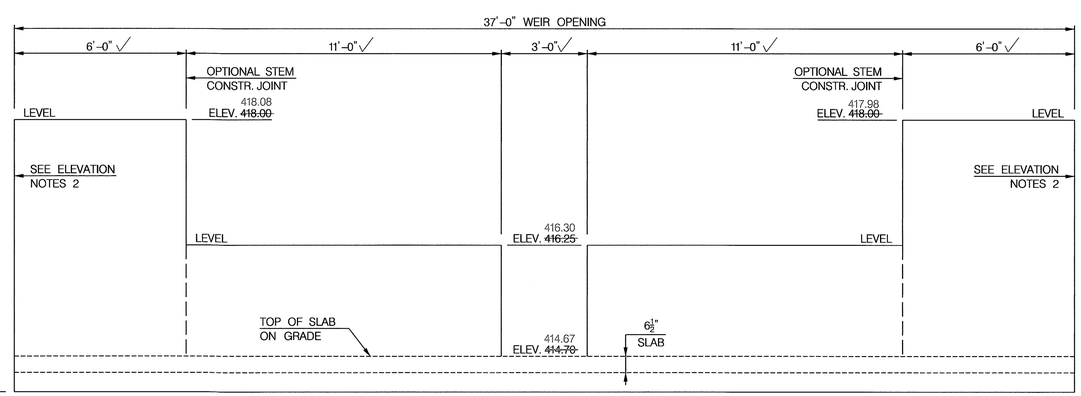
2. WINGWALL: DESIGN LIVE LOAD IS 1'-0" LIVE LOAD SURCHARGE LOADING.

CONCRETE:
1. ALL STRUCTURE CONCRETE SHALL BE MIX NO. 3 (3500 PSI).

2. REINFORCING STEEL SHALL BE DEFORMED, GRADE 60 BARS CONFORMING TO ASTM A615. ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH ASTM A775. TOUCH UP SCRATCHED OR DAMAGED EPOXY COATING IN THE FIELD PRIOR TO CLOSING UP FORM WORK AND PLACING CONCRETE. ALL FORM WORK, REINFORCING STEEL, AND INSERTS WILL BE CHECKED AND APPROVED PRIOR TO CONCRETE PLACEMENT.

3. MINIMUM COVER FOR ANY REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED, WITH THE EXCEPTION OF BARS AT THE BOTTOM AND SIDES OF ALL FOOTINGS, WHICH SHALL HAVE 3" MINIMUM COVER.

4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.



WEIR ELEVATION [1]
(LOOKING STATIONS AHEAD)
HORIZONTAL SCALE: 1" = 2.5'
VERTICAL SCALE: 1" = 1'

ELEVATION NOTES: ✓
1. WEIR FOOTING, SLAB SUBBASE, AND RETAINING WALLS NOT SHOWN FOR CLARITY.

2. POUR WEIR WALL MONOLITHICALLY WITH RETAINING WALL. CONTRACTOR MAY POUR WEIR WALL AND RETAINING WALL AS SEPARATE POURS, AS LONG AS WATER TIGHTNESS IS MAINTAINED THROUGH THE INSTALLATION OF WATERSTOPS AND JOINT SEALERS. FOR STEM CONTRACTION JOINT DETAIL, SEE SHEET 8.

NOTES: ✓
1. FOR FOOTING PLAN AND WEIR WALL TYPICAL SECTION, SEE SHEET 5.
2. FOR SLAB PLAN, SEE SHEET 6.
3. FOR RETAINING WALL ELEVATIONS, SEE SHEET 7.
4. FOR RETAINING WALL TYPICAL SECTION, WING WALL TYPICAL SECTION, SECTION A-A, SECTION B-B, SEE SHEET 8.

[1]

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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

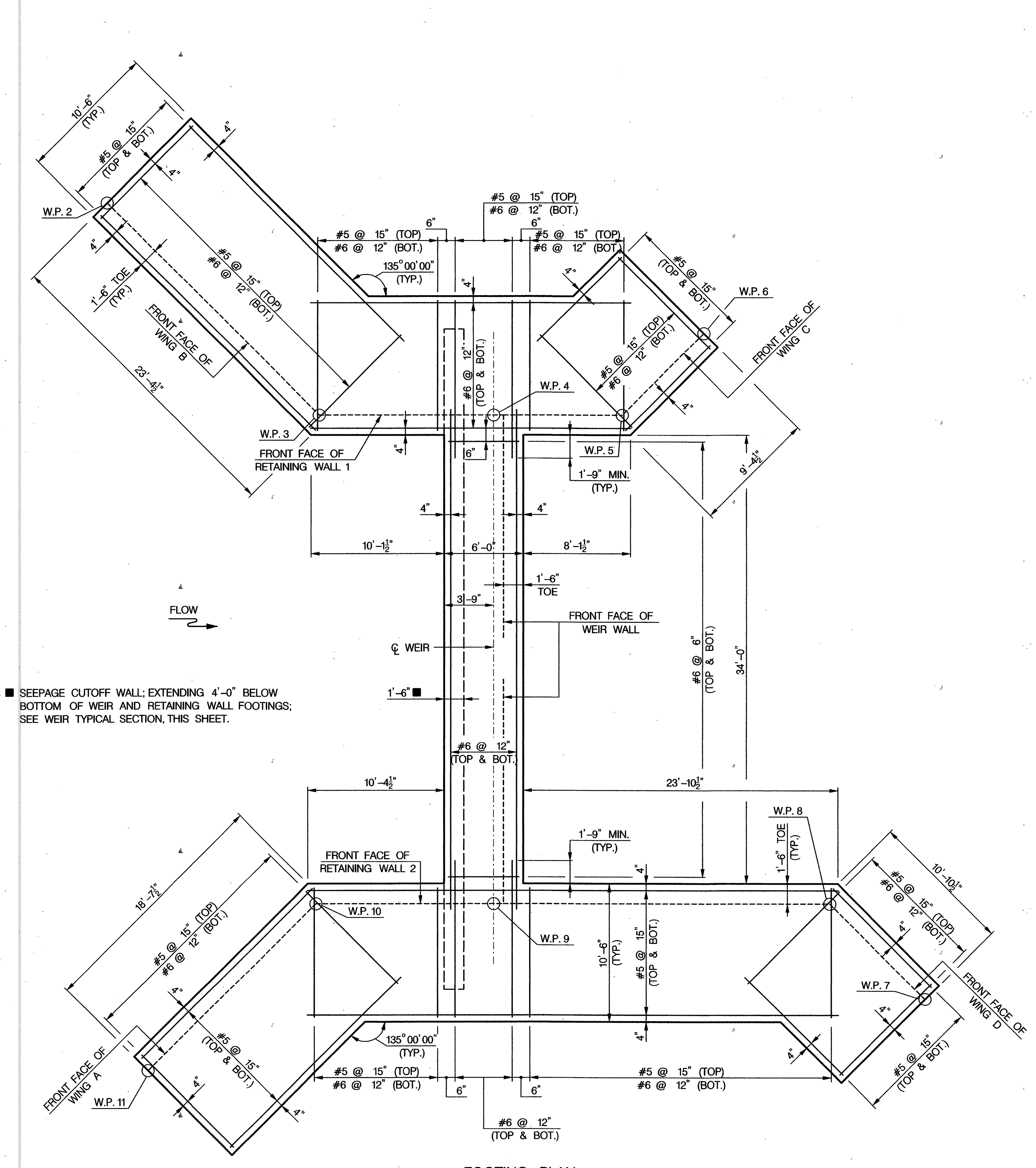
DES: CL	CLR	[1]	AS-BUILT SURVEY	3/23/18
DRN: MR				
CHK: AH				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

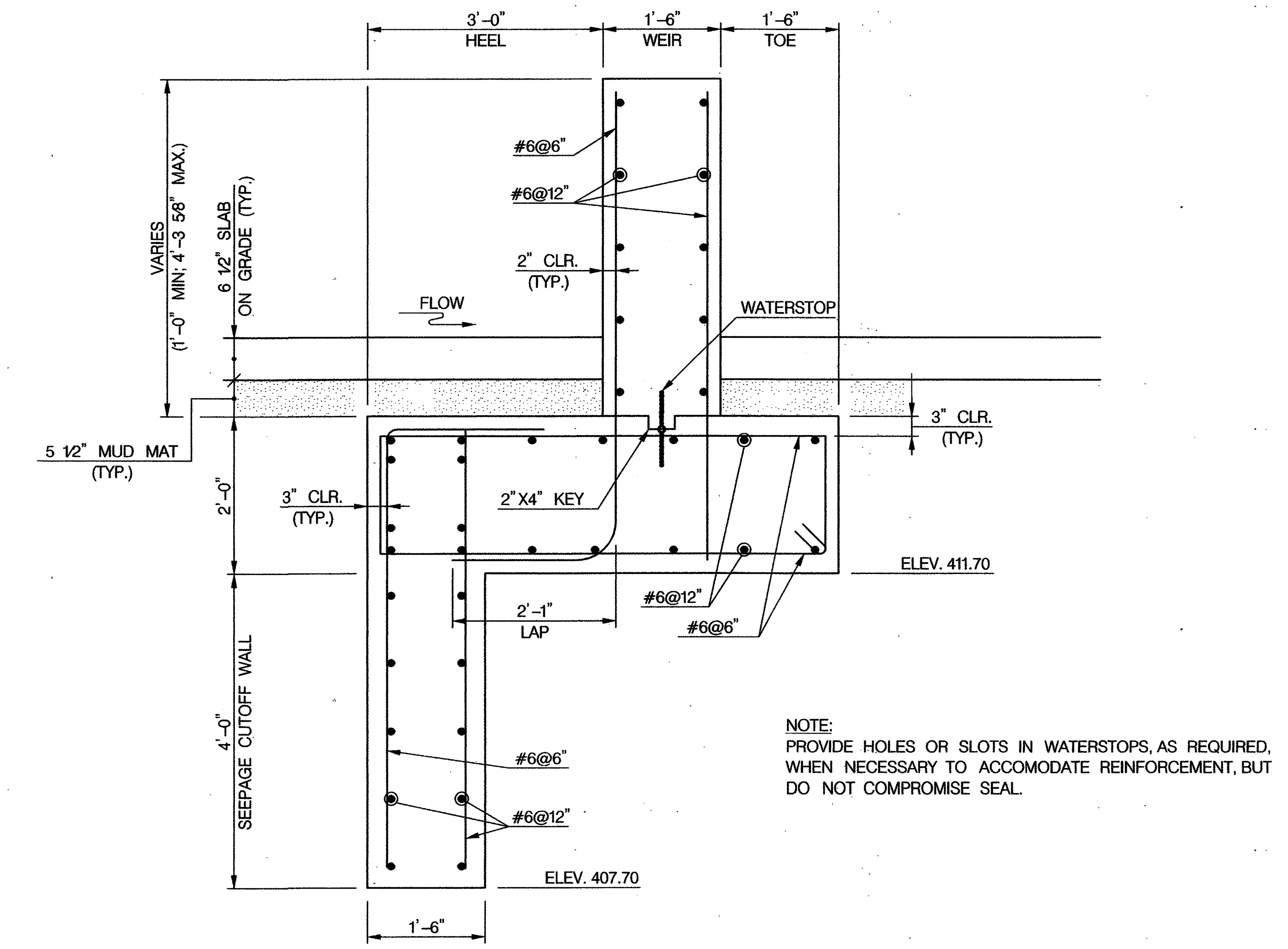
WEIR WALL PLAN AND ELEVATION

SCALE: AS SHOWN

SHEET: 4 OF 21



FOOTING PLAN
SCALE: 1" = 5'



NOTE:
PROVIDE HOLES OR SLOTS IN WATERSTOPS, AS REQUIRED, WHEN NECESSARY TO ACCOMODATE REINFORCEMENT, BUT DO NOT COMPROMISE SEAL.

WIER WALL TYPICAL SECTION
SCALE: 3/4" = 1'-0"

NOTES:
1. FOR PLAN AND GENERAL NOTES, SEE SHEET 4.
2. FOR SLAB PLAN, SEE SHEET 6.
3. FOR RETAINING WALL ELEVATIONS, SEE SHEET 7.
4. FOR RETAINING WALL AND WING WALL TYPICAL SECTIONS, SEE SHEET 8.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES 10/16/17 DATE

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Howard County
M A R Y L A N D
Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444

STATE OF MARYLAND PROFESSIONAL ENGINEER 32013

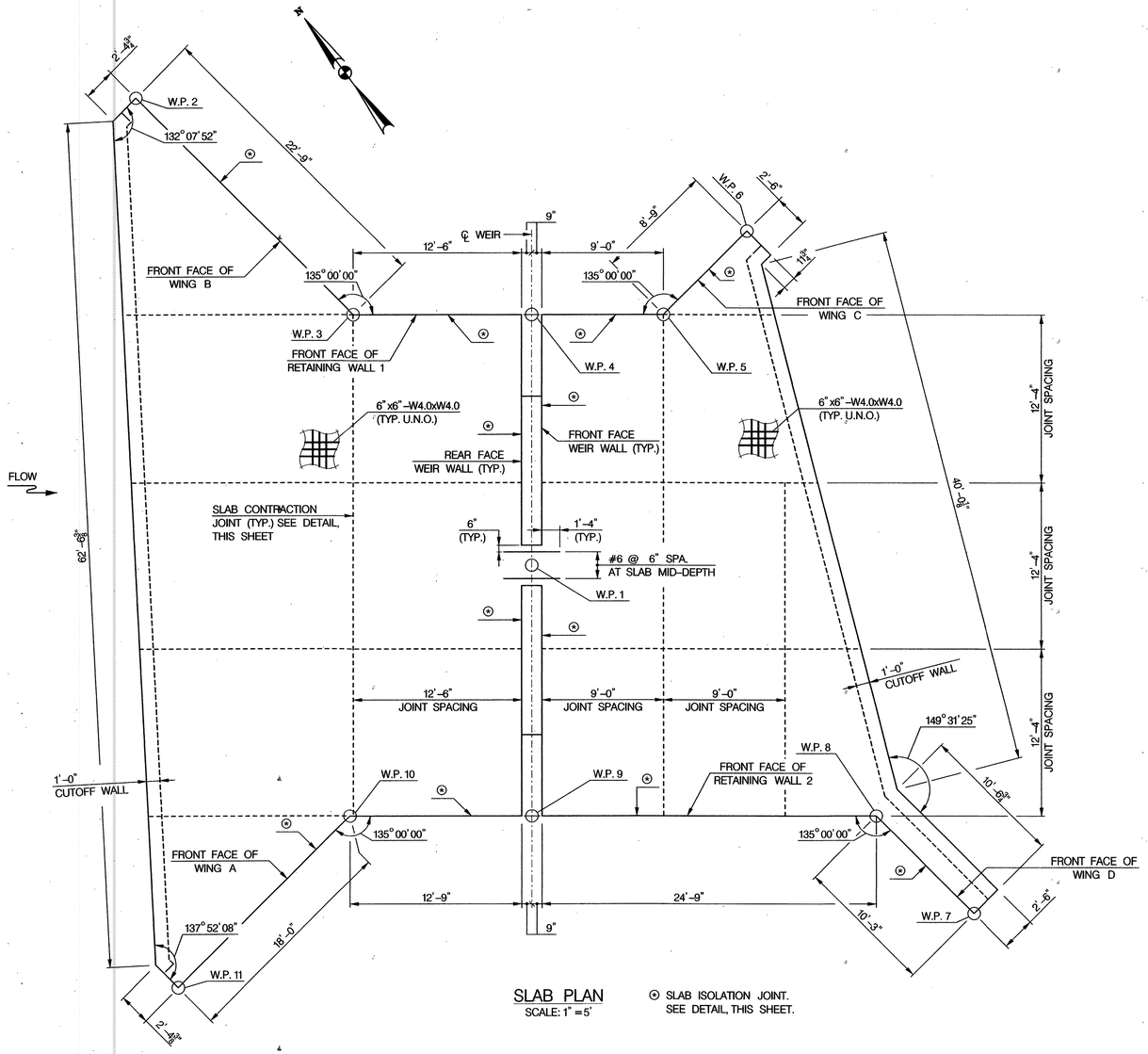
DES: JB				
DRN: MR				
CHK: AF				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

FOOTING PLAN AND WEIR TYPICAL SECTION

SCALE: AS SHOWN

SHEET 5 OF 21



SLAB PLAN
SCALE: 1" = 5'

⊙ SLAB ISOLATION JOINT. SEE DETAIL, THIS SHEET.

SLAB CONSTRUCTION NOTES:

1. CUT EXPANSION JOINT MATERIAL TO CONFORM TO THE CROSS SECTION OF THE SLAB AND FURNISH IN STRIPS EQUAL TO THE WIDTH OF THE PAVEMENT SLAB. MAKE THE TOP SURFACE SMOOTH AND HAVE HOLES FOR THE WATERSTOP. PROVIDE A SNUG FIT WITHOUT A LOSS IN THICKNESS OF THE MATERIAL.

2. WATERSTOPS SHALL BE RUBBER OR POLYVINYL CHLORIDE.

3. CONSTRUCT ALL LONGITUDINAL JOINTS PERPENDICULAR TO THE CENTERLINE OF THE WEIR.

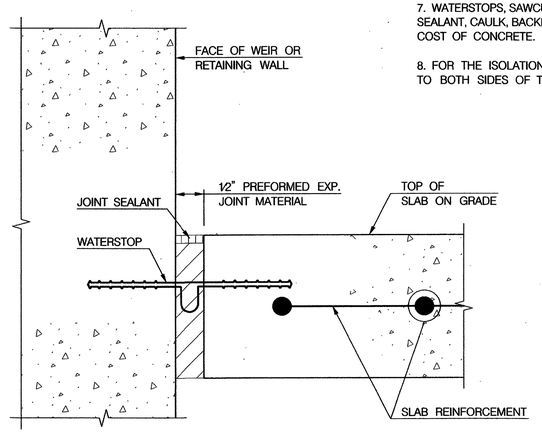
4. CONSTRUCT ALL TRANSVERSE JOINTS PERPENDICULAR TO THE FRONT FACE OF THE RETAINING WALL.

5. MAKE THE TOP OF THE JOINT SEALANT FROM 1/8" TO 1/4" BELOW THE SURFACE OF THE SLAB.

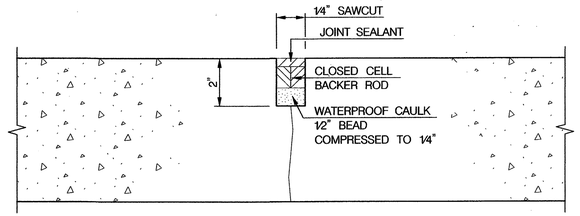
6. PROVIDE 2'-0" MINIMUM LAP FOR WELDED WIRE FABRIC REINFORCMENT.

7. WATERSTOPS, SAWCUT, PREFORMING EXPANSION JOINT MATERIAL, JOINT SEALANT, CAULK, BACKER ROD, AND LABOR SHALL BE INCIDENTAL TO THE COST OF CONCRETE.

8. FOR THE ISOLATION JOINTS, THE CONTRACTOR SHALL APPLY LUBRICANT ADHESIVE TO BOTH SIDES OF THE EXPANSION JOINT MATERIAL PRIOR TO INSTALLATION.



SLAB ISOLATION JOINT
NOT TO SCALE



NOTE: SLAB REINFORCEMENT NOT SHOWN FOR CLARITY.

SLAB CONTRACTION JOINT
NOT TO SCALE

NOTES:

1. FOR PLAN AND GENERAL NOTES, SEE SHEET 4.
2. FOR FOOTING PLAN AND WEIR WALL TYPICAL SECTION, SEE SHEET 5.
3. FOR RETAINING WALL ELEVATIONS, SEE SHEET 7.
4. FOR RETAINING WALL AND WING WALL TYPICAL SECTION, SEE SHEET 8.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/4/17

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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

STATE OF MARYLAND — AMY HRITCU — No. 32012 — PROFESSIONAL ENGINEER

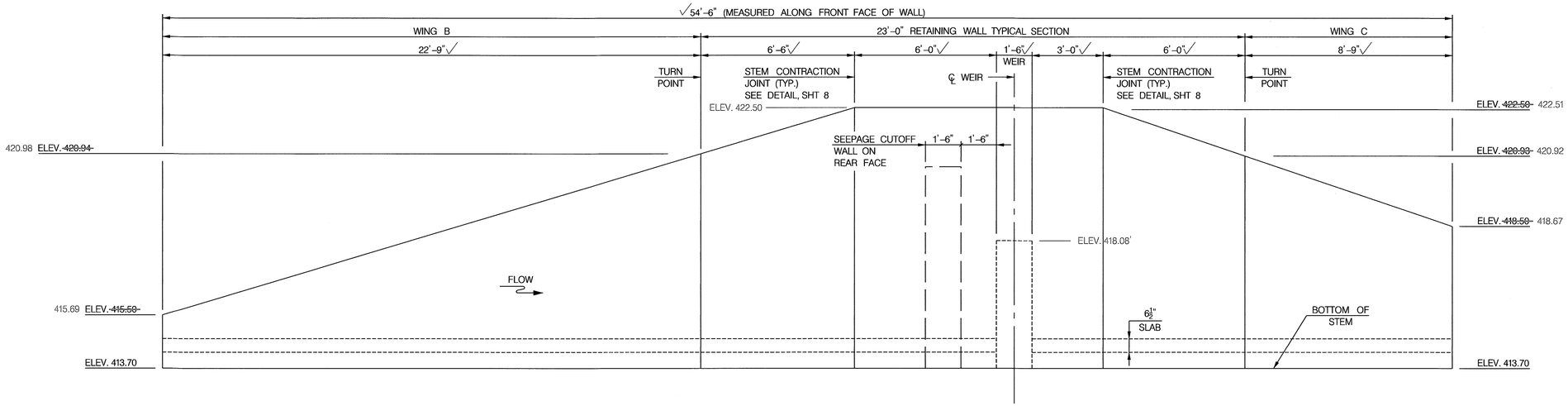
DES: JB					
DRN: MR					
CHK: AF					
DATE: 10/13/17	BY	NO.	REVISION	DATE	

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

SLAB PLAN

SCALE: AS SHOWN

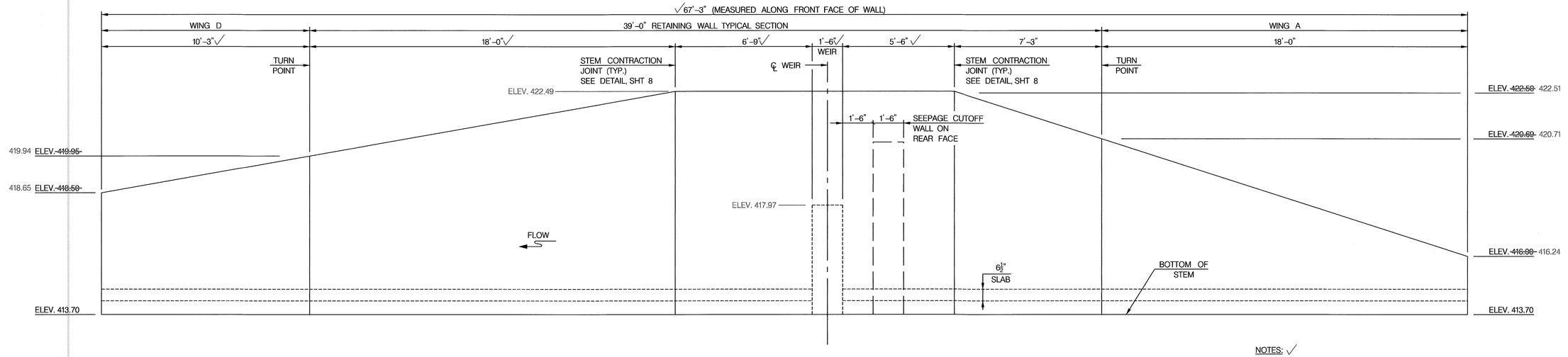
SHEET: 6 OF 21



DEVELOPED RETAINING WALL 1 ELEVATION

HORIZONTAL SCALE: 1" = 2.5'
VERTICAL SCALE: 1" = 1'

NOTE:
1. WALL FOOTING AND SLAB SUBBASE NOT SHOWN FOR CLARITY.



DEVELOPED RETAINING WALL 2 ELEVATION

HORIZONTAL SCALE: 1" = 2.5'
VERTICAL SCALE: 1" = 1'

NOTE: ✓
1. WALL FOOTING AND SLAB SUBBASE NOT SHOWN FOR CLARITY.

NOTES: ✓
1. FOR PLAN AND GENERAL NOTES, SEE SHEET 4.
2. FOR FOOTING PLAN AND WEIR WALL TYPICAL SECTION, SEE SHEET 5.
3. FOR SLAB PLAN, SEE SHEET 6.
4. FOR RETAINING WALL AND WING WALL TYPICAL SECTIONS, SEE SHEET 8.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/26/17

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
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(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

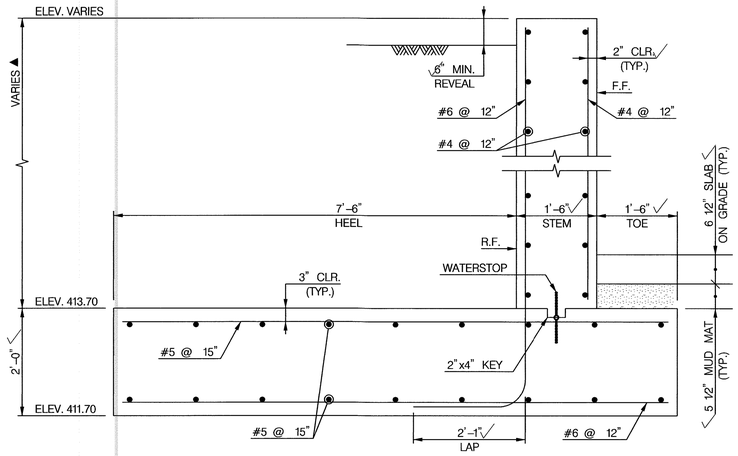
DES: JB	CLR	1	AS-BUILT SURVEY	3/23/18
DRN: MR				
CHK: AF				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

RETAINING WALL ELEVATIONS

SCALE: AS SHOWN

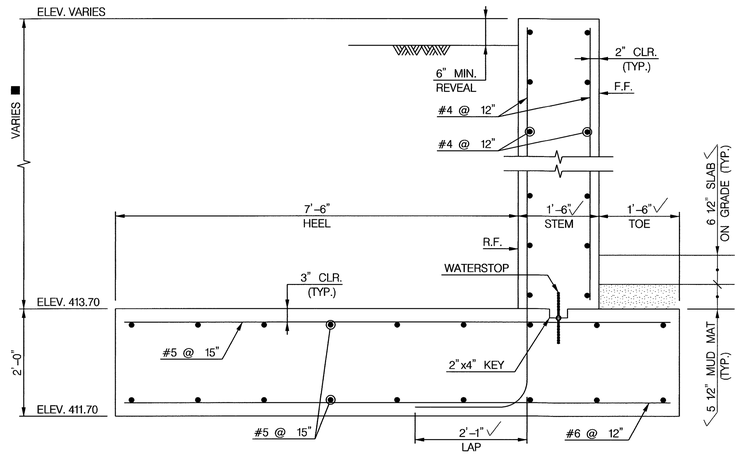
SHEET: 7 OF 21



RETAINING WALL 1 TYPICAL SECTION [1]

(RETAINING WALL 2 TYPICAL SECTION SIMILAR, OPPOSITE HAND)
SCALE: 3/4" = 1'-0"

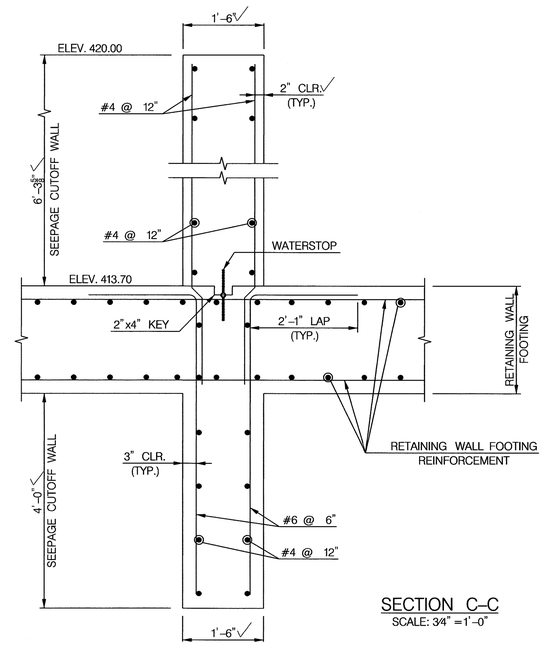
▲ RETAINING WALL 1 VARIES 7'-2 7/8" TO 8'-9 5/8"
RETAINING WALL 2 VARIES 6'-3" TO 8'-9 5/8"



■ WING A VARIES 2'-0 5/8" TO 6'-11 7/8"
WING B VARIES 1'-9 5/8" TO 7'-2 5/8"
WING C VARIES 4'-9 5/8" TO 7'-2 3/4"
WING D VARIES 4'-9 5/8" TO 6'-3"

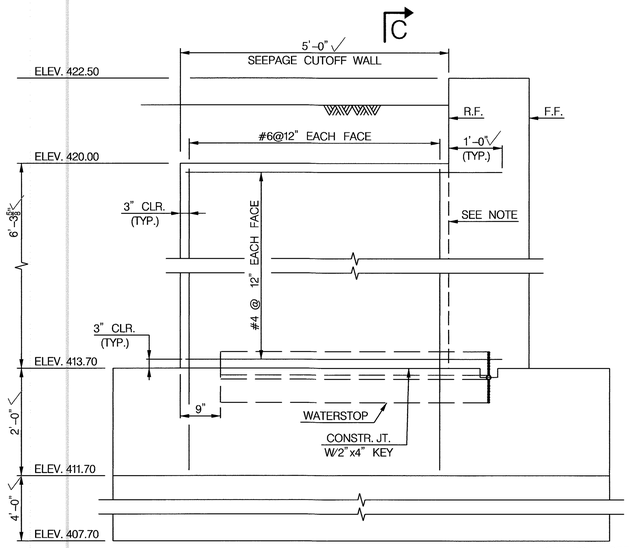
WING WALL TYPICAL SECTION [1]

SCALE: 3/4" = 1'-0"



SECTION C–C

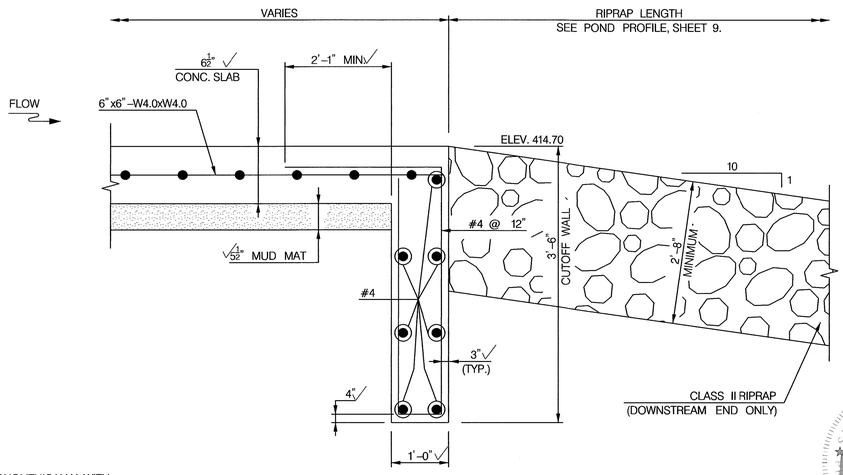
SCALE: 3/4" = 1'-0"



SECTION A–A

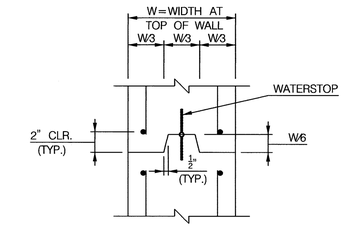
SEEPAGE CUTOFF WALL ABOVE FOOTING
SCALE: 3/4" = 1'-0"

NOTE: POUR SEEPAGE CUTOFF WALL MONOLITHICALLY WITH ✓ RETAINING WALL. CONTRACTOR MAY POUR SEEPAGE CUTOFF WALL AND RETAINING WALL AS SEPARATE POURS, AS LONG AS WATER TIGHTNESS IS MAINTAINED THROUGH THE INSTALLATION OF WATERSTOPS AND JOINT SEALERS.



SECTION B–B

NOT TO SCALE



NOTE: ✓
1. JOINT LOCATIONS SHALL BE AS SHOWN ON CONTRACT DRAWINGS.
2. STOP KEY 9" BELOW TOP OF WALL.
3. STOP WATERSTOP 12" BELOW TOP OF WALL.
4. ALL KEYS ARE NOMINAL SIZE.
5. ONLY PLACE CONTRACTION JOINT IN STEM (DO NOT PROVIDE IN FOOTING).

STEM CONTRACTION JOINT

SCALE: 1 1/2" = 1'-0"

NOTES: ✓
1. FOR PLAN AND GENERAL NOTES, SEE SHEET 4.
2. FOR FOOTING PLAN AND WEIR WALL TYPICAL SECTION, SEE SHEET 5.
3. FOR SLAB PLAN, SEE SHEET 6.
4. FOR RETAINING WALL ELEVATIONS, SEE SHEET 7.

[1]

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
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(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

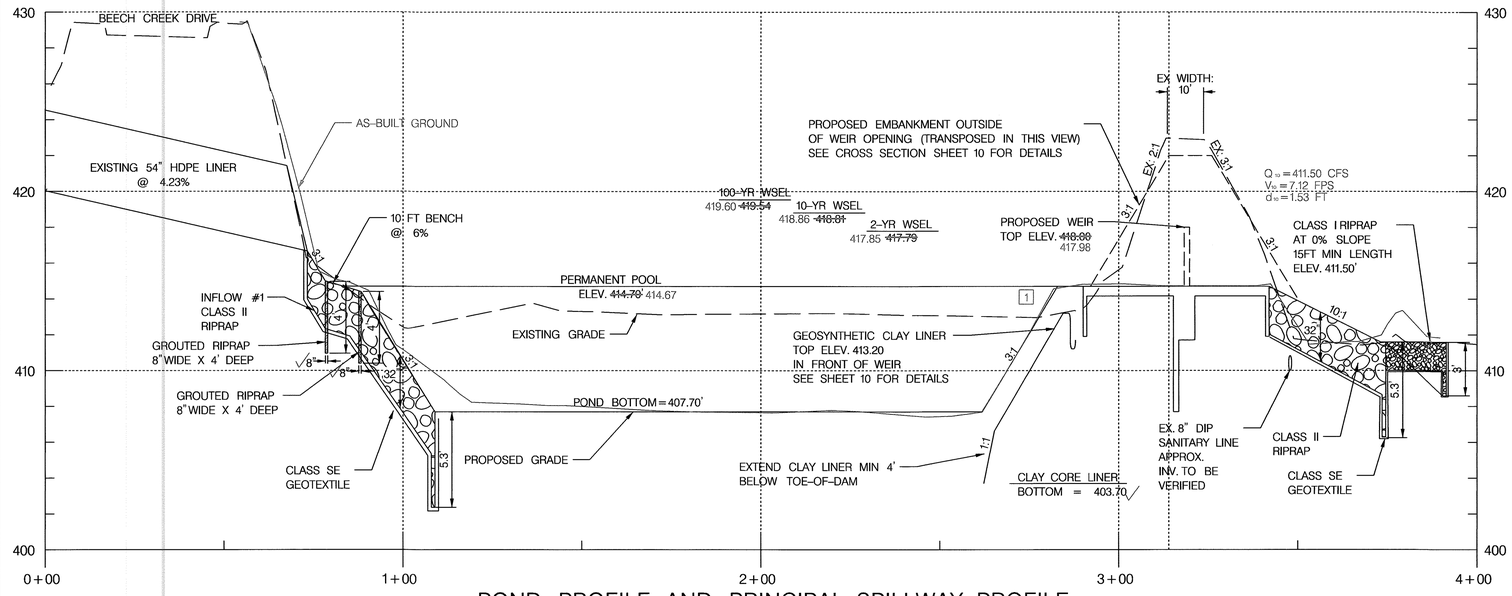
DES: JB	CLR	1	AS-BUILT SURVEY	3/23/18
DRN: MR				
CHK: AF				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

RETAINING WALL TYPICAL SECTION AND MISCELLANEOUS DETAILS

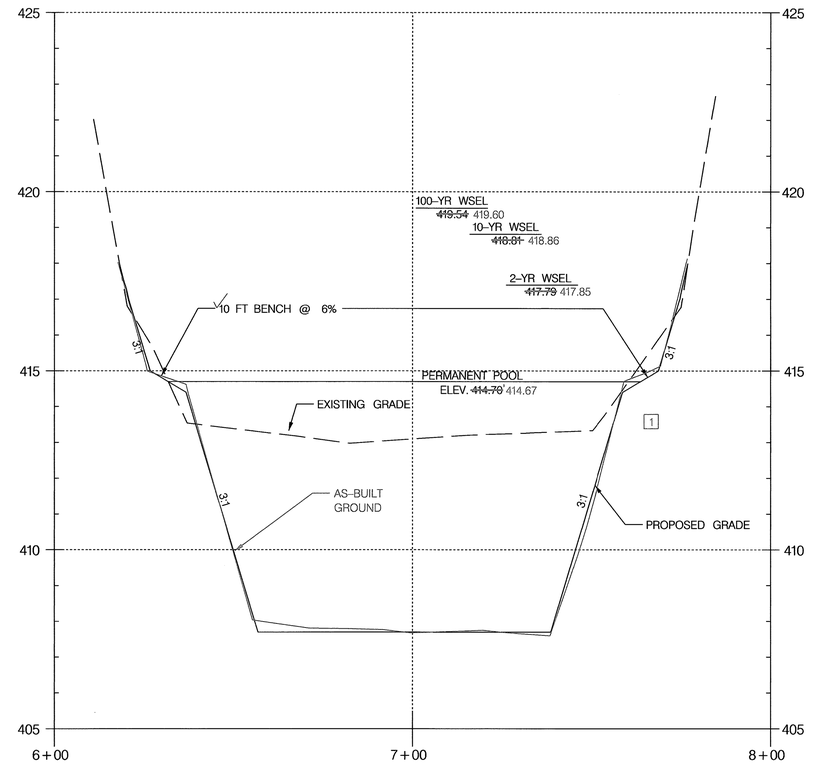
SCALE: AS SHOWN

SHEET 8 OF 21



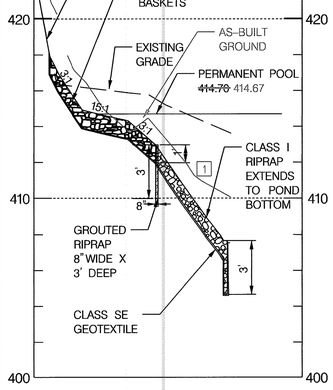
POND PROFILE AND PRINCIPAL SPILLWAY PROFILE [1]
(STA 0+00 TO STA 4+00)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'



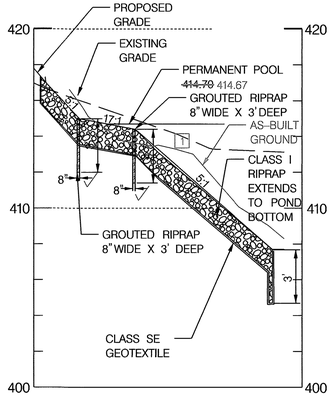
POND CROSS SECTION [1]
(STA 6+00 TO STA 8+00)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



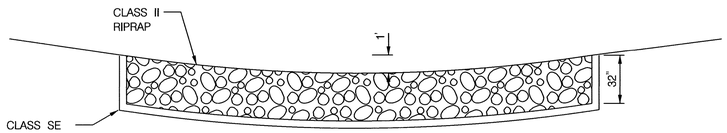
PROFILE [1]
INFLOW #2

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'



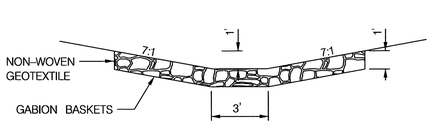
PROFILE [1]
INFLOW #3

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'



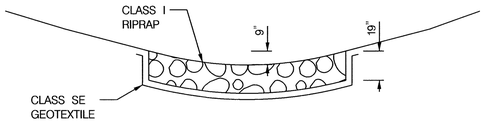
INFLOW #1 CROSS SECTION

SCALE: 1" = 5'
Q10 = 248 cfs
V10 = 20.59 fps
d10 = 418.53 ft



INFLOW #2 CROSS SECTION

SCALE: 1" = 5'
Q10 = 29 cfs
V10 = 16.10 fps
d10 = 418.53 ft



INFLOW #3 CROSS SECTION

SCALE: 1" = 5'
Q10 = 148 cfs
V10 = 9.95 fps
d10 = 418.53 ft

[1]

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

McCORMICK TAYLOR
509 South Exeter Street
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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

STATE OF MARYLAND — ANTHONY HILL — No. 12013 — PROFESSIONAL ENGINEER

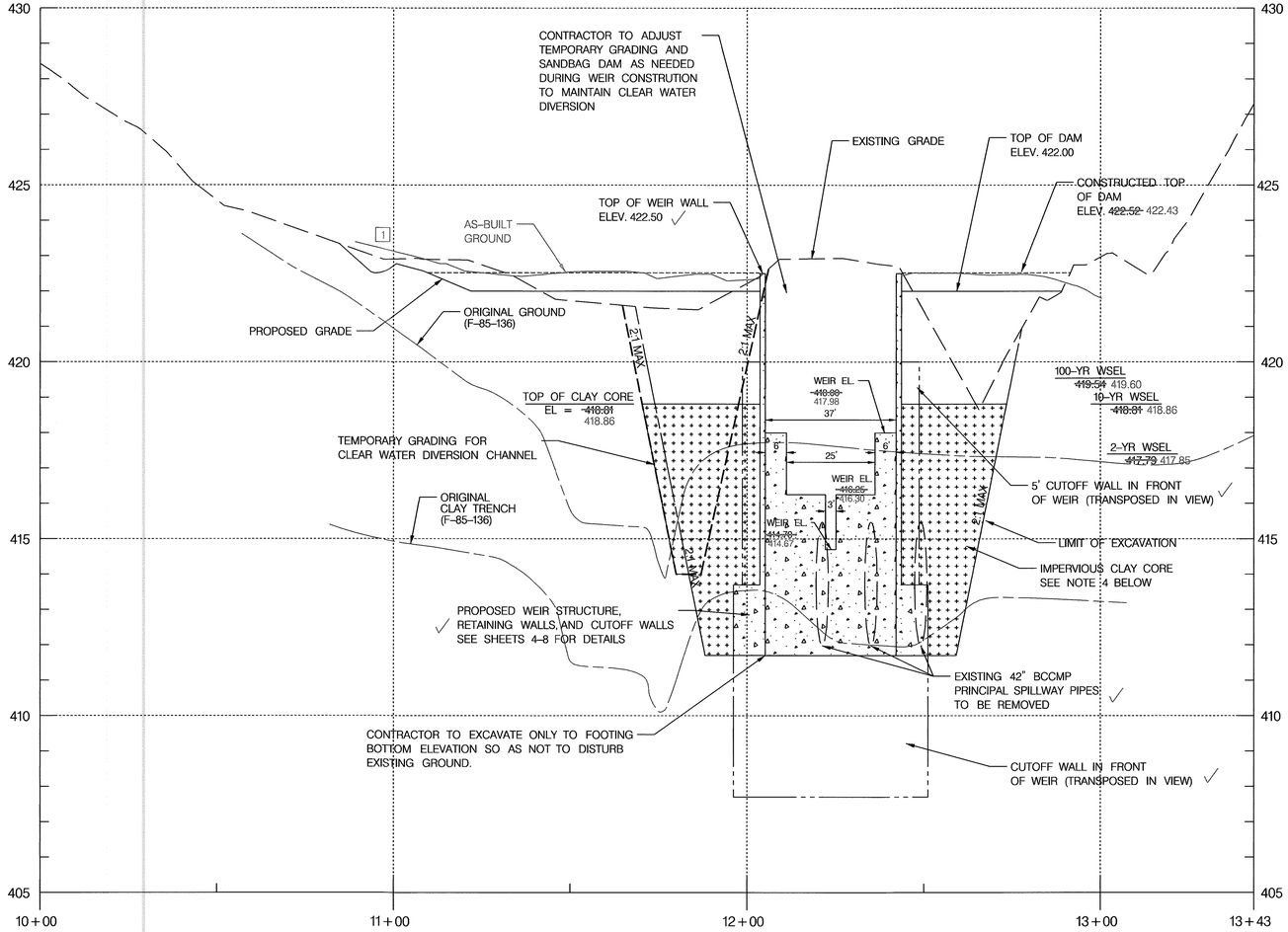
DES: CL	CLR	[1]	AS-BUILT SURVEY	3/23/18
DRN: MR				
CHK: AH				
DATE: 10/13 /17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

POND PROFILES

SCALE: AS SHOWN

SHEET: 9 OF 21

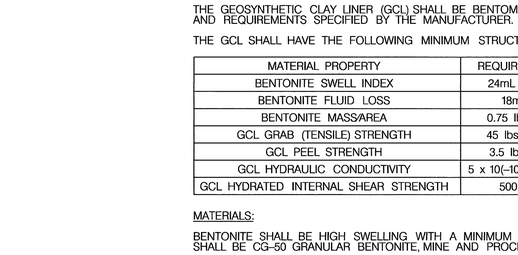


CENTERLINE OF EMBANKMENT PROFILE [1]

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

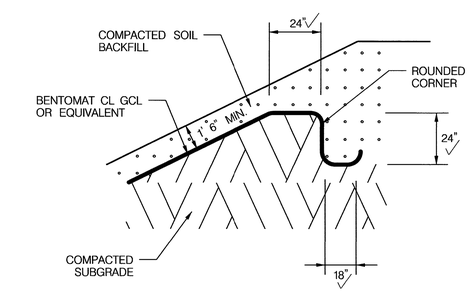
NOTES:

1. CENTERLINE OF ORIGINAL AS-BUILT WAS PROJECTED FOR COMPARISON. LOCATION OF AS-BUILT CENTERLINE IS NOT IDENTICAL TO THE CENTERLINE SHOWN. (F-85-136)
2. 10-YR WATER SURFACE ELEVATION AS GENERATED WITH HOWARD COUNTY RAINFALL AND SCS TYPE II DISTRIBUTION WAS USED FOR EMBANKMENT SIZING AS IT IS MORE CONSERVATIVE THAN THE WATER SURFACE DETERMINED USING ATLAS 14 RAINFALL.
3. PROPOSED EMBANKMENT CENTERLINE IS SHIFTED FROM EXISTING EMBANKMENT CENTERLINE.
4. MATERIAL FOR CLAY CORE TO BE SALVAGED DURING EMBANKMENT EXCAVATION FROM EXISTING EMBANKMENT CLAY LAYER (SC) PER BORING LOGS (SHEET 18). ADDITIONAL EXCAVATED SOIL OUTSIDE OF CLAY LAYER TO BE SALVAGE FOR EMBANKMENT FILL OUTSIDE OF CLAY CORE, PER CODE 378.



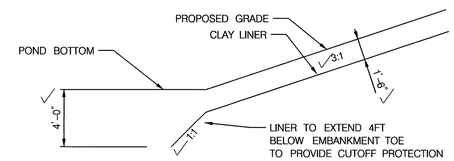
CROSS SECTION A-A: EMBANKMENT [1]

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'



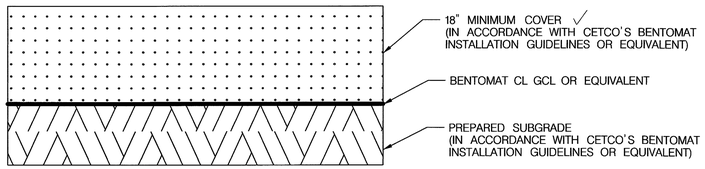
GEOSYNTHETIC CLAY LINER ANCHOR DETAIL

NOT TO SCALE



CLAY LINER TIE-IN DETAIL

NOT TO SCALE



GEOSYNTHETIC CLAY LINER DETAIL

NOT TO SCALE

GEOSYNTHETIC CLAY LINER SPECIFICATIONS

THE GEOSYNTHETIC CLAY LINER (GCL) SHALL BE BENTOMAT CL OR EQUIVALENT AND SHALL BE FOLLOW THE DETAILED GUIDELINES AND REQUIREMENTS SPECIFIED BY THE MANUFACTURER.

THE GCL SHALL HAVE THE FOLLOWING MINIMUM STRUCTURAL VALUES WHEN TESTED IN ACCORDANCE WITH THE NOTED METHODS.

MATERIAL PROPERTY	REQUIRED VALUES	TEST METHOD
BENTONITE SWELL INDEX	24mL /2 g min.	ASTM D 5890
BENTONITE FLUID LOSS	18mL max.	ASTM D 5891
BENTONITE MASS/AREA	0.75 lb /ft2 min.	ASTM D 5993
GCL GRAB (TENSILE) STRENGTH	45 lbs /in MARV	ASTM D 6768
GCL PEEL STRENGTH	3.5 lbs /in min.	ASTM D 6496
GCL HYDRAULIC CONDUCTIVITY	5 x 10(-10) cm/sec max.	ASTM D 5887
GCL HYDRATED INTERNAL SHEAR STRENGTH	500 psf typ.	ASTM D 5321&6243

MATERIALS:

BENTONITE SHALL BE HIGH SWELLING WITH A MINIMUM SWELL INDEX OF 24 mL/2g AND A MAXIMUM FLUID LOSS OF 18 mL. BENTONITE SHALL BE CG-50 GRANULAR BENTONITE, MINE AND PROCESSED BY AMERICAN COLLOID COMPANY.

BENTONITE SHALL HAVE A GRANULAR CONSISTENCY OF (1 PERCENT MAX. PASSING A NO. 200 SIEVE) TO ENSURE UNIFORM DISTRIBUTION THROUGHOUT THE GCL.

STRUCTURAL REQUIREMENTS:

THE PRODUCT SHALL CONSIST OF A LAYER OF GRANULAR SODIUM BENTONITE BETWEEN TWO GEOTEXTILES NEEDLEPUNCHED TOGETHER. PRODUCT IS LAMINATED TO A THIN FLEXIBLE MEMBERANE LINER.

INSTALLATION:

THE EARTHEN SURFACE UPON WHICH THE GCL IS INSTALLED SHALL BE PREPARED ANC COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DRAWINGS. THE SURFACE SHALL BE SMOOTH, FIRM UNYEILDING, AND FREE FROM VEGETATION, SHARP ROCKS, VOID SPACES, STANDING WATER, ABRUPT ELEVATION CHANGES, AND CRACKS LARGER THAN ONE INCH.

IMMEDIATELY PRIOR TO GCL DEPLOYMENT, SUBGRADE SHALL BE FINAL-GRADED AND SMOOTH-ROLLED TO PROVIDE BEST PRACTICABLE SURFACE FOR INSTALLATION. NO WHEEL RUTS, FOOTPRINTS, OR OTHER IRREGULARITIES SHALL BE PRESENT. ALL PROTRUSIONS EXTENDING MORE THAN ONE-HALF INCH FROM THE SURFACE SHALL BE REMOVED OR PUNCHED IN THE SURFACE.

AT THE TOP OF THE SLOPED AREAS, AN ANCHOR TRENCH FOR THE GCL SHALL BE EXCAVATED OR AN EQUIVALENT RUNOUT SHALL BE UTILIZED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

MINIMIZE THE EXTENT TO WHICH THE GCL IS DRAGGED ACROSS THE SUBGRADE. A SLIP SHEET MAY BE USED TO REDUCE DAMAGE DURING PLACEMENT.

GCL PANELS SHALL BE PLACED PARALLEL TO THE DIRECTION OF THE SLOPE AND SHOULD LIE FLAT WITH NO WRINKLES OR FOLDS.

GCL SHALL NOT BE LEFT UNCOVERED OVERNIGHT.

COVER SOIL SHALL BE FREE OF ANGULAR STONES OR OTHER DAMAGING FOREIGN MATTER. SOIL SHALL BE PLACED A MINIMUM OF 1.5 FOOT THICKNESS OVER THE GCL AND SHALL BE PUSHED UP SLOPES TO MINIMIZE TENSILE FORCE ON THE GCL.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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

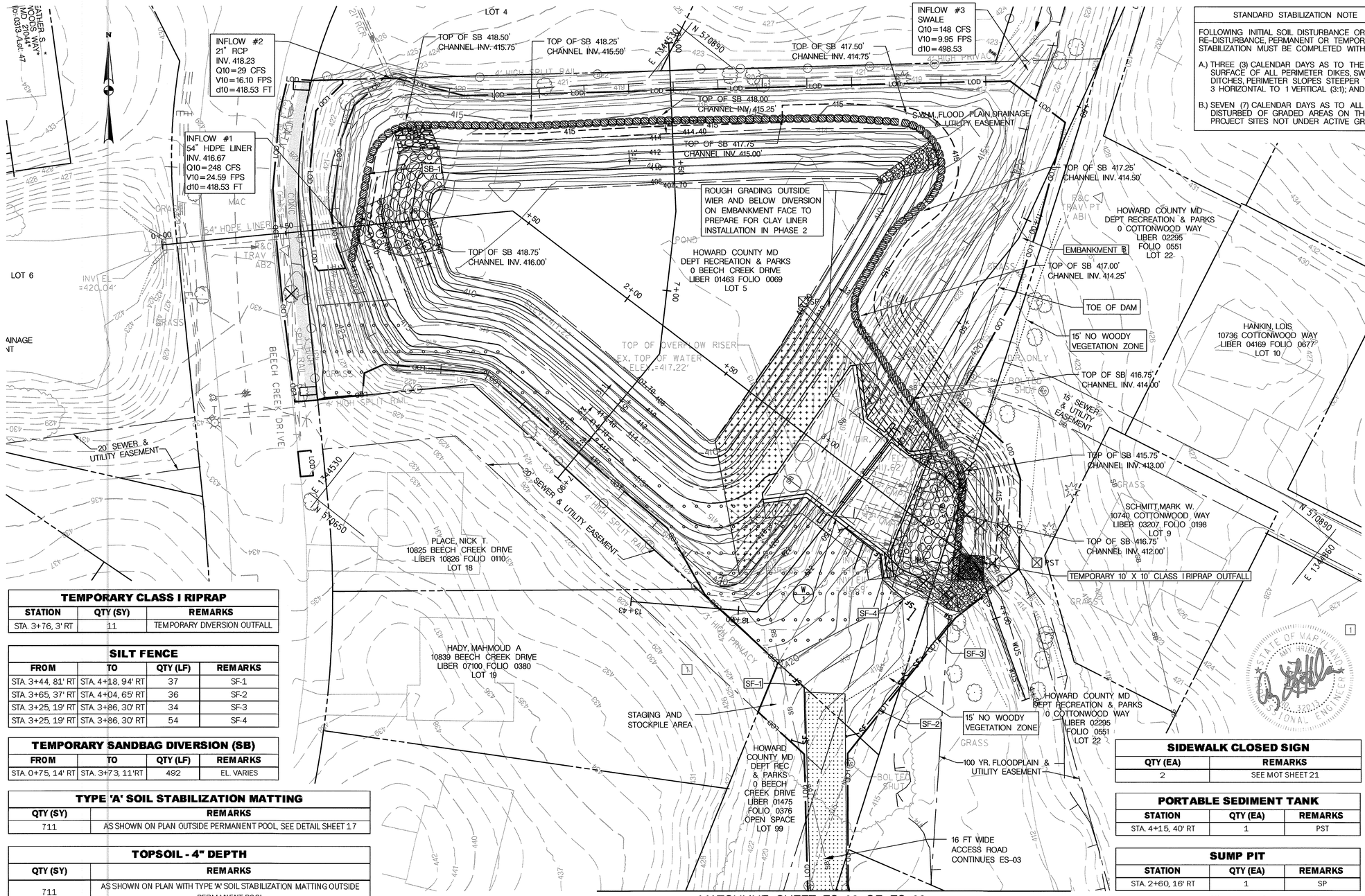
DES: CL	CLR	[1]	AS-BUILT SURVEY	3/23/18
DRN: MR				
CHK: AH				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

POND PROFILES

SCALE: AS SHOWN

SHEET: 10 OF 21



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 THEN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
B.) SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OF GRADED AREAS ON THE PROJECT SITES NOT UNDER ACTIVE GRADING.

TIME RESTRICTION NOTES:

1. PUMPING IS NOT PERMITTED BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM, MONDAY THROUGH FRIDAY.
2. CONSTRUCTION EQUIPMENT SHALL NOT BE STARTED NOR RUN BETWEEN THE HOURS OF 7:00 PM AND 7:00AM, MONDAY THROUGH FRIDAY.
3. FOR SATURDAY WORK, THE ABOVE HOURS SHALL BE 5:00 PM AND 9:00 AM, RESPECTIVELY.
4. NO WORK SHALL BE DONE ON SUNDAY.

NOTE:

1. EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.
2. 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.
3. CONTRACTOR SHALL ADJUST SF-4 AS REQUIRED TO INSTALL WEIR AND OUTFALL RIPRAP. ENSURE RIPRAP OUTFALL IS STABILIZED AT THE END OF EACH WORKDAY AND SF-3 AND SF-4 PREVENT DIRTY WATER FROM ENTERING STABLE RIPRAP.
4. 6" STONE WITH FILTER CLOTH MAY BE INSTALLED IN LIEU OF MULCH ACCESS PATH AT THE DISCRETION OF THE ENGINEER.

TEMPORARY CLASS I RIPRAP		
STATION	QTY (SY)	REMARKS
STA. 3+76, 3' RT	11	TEMPORARY DIVERSION OUTFALL

SILT FENCE			
FROM	TO	QTY (LF)	REMARKS
STA. 3+44, 81' RT	STA. 4+18, 94' RT	37	SF-1
STA. 3+65, 37' RT	STA. 4+04, 65' RT	36	SF-2
STA. 3+25, 19' RT	STA. 3+86, 30' RT	34	SF-3
STA. 3+25, 19' RT	STA. 3+86, 30' RT	54	SF-4

TEMPORARY SANDBAG DIVERSION (SB)			
FROM	TO	QTY (LF)	REMARKS
STA. 0+75, 14' RT	STA. 3+73, 11'RT	492	EL. VARIES

TYPE 'A' SOIL STABILIZATION MATTING	
QTY (SY)	REMARKS
711	AS SHOWN ON PLAN OUTSIDE PERMANENT POOL, SEE DETAIL SHEET 17

TOPSOIL - 4" DEPTH	
QTY (SY)	REMARKS
711	AS SHOWN ON PLAN WITH TYPE 'A' SOIL STABILIZATION MATTING OUTSIDE PERMANENT POOL

SIDEWALK CLOSED SIGN	
QTY (EA)	REMARKS
2	SEE MOT SHEET 21

PORTABLE SEDIMENT TANK		
STATION	QTY (EA)	REMARKS
STA. 4+15, 40' RT	1	PST

SUMP PIT		
STATION	QTY (EA)	REMARKS
STA. 2+60, 16' RT	1	SP

LEGEND

- TEMPORARY MAJOR CONTOUR
- TEMPORARY MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT LINE
- TOE OF DAM
- 15' NO WOODY VEGETATION
- EXISTING TREE
- TREE TO BE REMOVED
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY CLASS I RIPRAP
- SF — SILT FENCE
- OCF — CONSTRUCTION FENCE
- PROPOSED 100-YR FLOODPLAIN
- SAND BAG DIVERSION
- PST — PORTABLE SEDIMENT TANK
- SP — SUMP PIT
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- MULCH ACCESS ROAD
- TIMBER MAT ACCESS ROAD
- SB — STREAM BUFFER

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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509 South Exeter Street
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Howard County MARYLAND
Storm Water Management Division
Bureau of Environmental Services
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DES: CL
DRN: MR
CHK: AH
DATE: 10/13/17

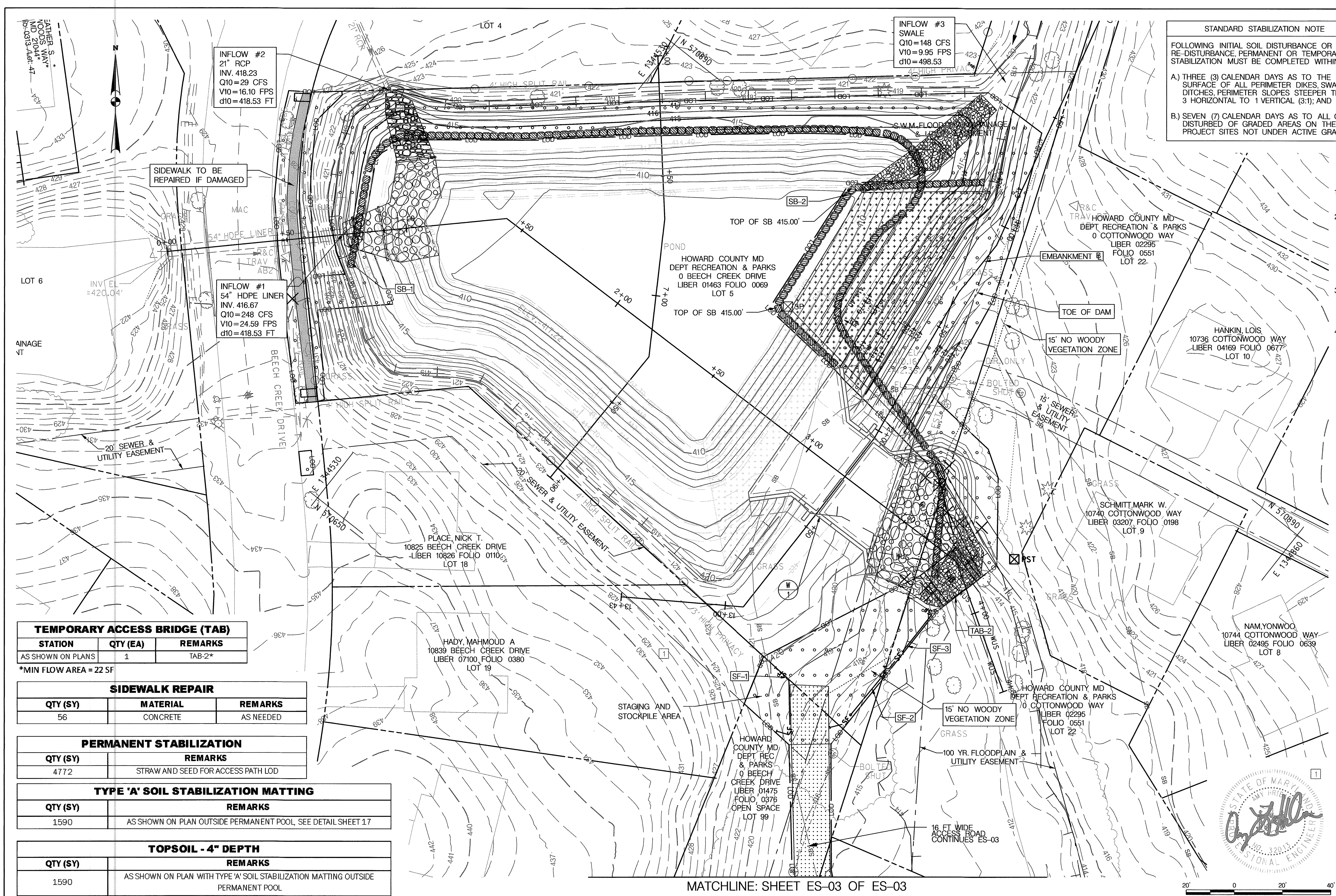
BY	NO.	REVISION	DATE
CLR	1	AS-BUILT SURVEY	8/21/18

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

EROSION AND SEDIMENT CONTROL PLAN PHASE 1 ES-01 OF ES-03

SCALE: 1" = 20'

SHEET 11 OF 21



STANDARD STABILIZATION NOTE

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TIME RESTRICTION NOTES:

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NOTES:

1. EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.
2. 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.
3. CONTRACTOR SHALL ADJUST SB-2 AS REQUIRED TO COMPLETE POND AND EMBANKMENT GRADING AND INSTALL CLAY CORE AND CLAY LINER ON EMBANKMENT FACE.
4. 6" STONE WITH FILTER CLOTH MAY BE INSTALLED IN LIEU OF MULCH ACCESS PATH AT THE DISCRETION OF THE ENGINEER.

LEGEND

- TEMPORARY MAJOR CONTOUR
- TEMPORARY MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT LINE
- TOE OF DAM
- 15' NO WOODY VEGETATION
- EXISTING TREE
- TREE TO BE REMOVED
- LOD — LIMIT OF DISTURBANCE
- CLASS I RIPRAP
- CLASS II RIPRAP
- SF — SILT FENCE
- OCF — CONSTRUCTION FENCE
- PROPOSED 100-YR FLOODPLAIN
- SAND BAG DIVERSION
- PORTABLE SEDIMENT TANK
- SP — SUMP PIT
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- MULCH ACCESS ROAD
- TIMBER MAT ACCESS ROAD
- SB — STREAM BUFFER
- SOIL STABILIZATION MATTING
- TAB — TEMPORARY ACCESS BRIDGE

TEMPORARY ACCESS BRIDGE (TAB)

STATION	QTY (EA)	REMARKS
AS SHOWN ON PLANS	1	TAB-2*

*MIN FLOW AREA = 22 SF

SIDEWALK REPAIR

QTY (SY)	MATERIAL	REMARKS
56	CONCRETE	AS NEEDED

PERMANENT STABILIZATION

QTY (SY)	REMARKS
4772	STRAW AND SEED FOR ACCESS PATH LOD

TYPE 'A' SOIL STABILIZATION MATTING

QTY (SY)	REMARKS
1590	AS SHOWN ON PLAN OUTSIDE PERMANENT POOL, SEE DETAIL SHEET 17

TOPSOIL - 4" DEPTH

QTY (SY)	REMARKS
1590	AS SHOWN ON PLAN WITH TYPE 'A' SOIL STABILIZATION MATTING OUTSIDE PERMANENT POOL

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
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Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6444

DES: CL	BY	NO.	REVISION	DATE
DRN: MR	CLR	1	AS-BUILT SURVEY	8/21/18
CHK: AH				
DATE: 10/13/17				

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

EROSION AND SEDIMENT CONTROL PLAN
PHASE 2 ES-02 OF ES-03

SCALE 1" = 20'

TIME RESTRICTION NOTES:

1. PUMPING IS NOT PERMITTED BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM, MONDAY THROUGH FRIDAY.
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NOTES:

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3. CONTRACTOR SHALL STABILIZE DISTURBED AREAS WITHIN THE WORK AREA AT THE END OF EACH WORK DAY.
4. 6" STONE WITH FILTER CLOTH MAY BE INSTALLED IN LIEU OF MULCH ACCESS PATH AT THE DISCRETION OF THE ENGINEER.

TOPSOIL - 4" DEPTH	
QTY (SY)	REMARKS
623	AS SHOWN ON PLAN WITH TYPE 'A' SOIL STABILIZATION MATTING

SIDEWALK REPAIR		
QTY (SY)	MATERIAL	REMARKS
104	CONCRETE	AS NEEDED
140	ASPHALT	AS NEEDED

SILT FENCE			
FROM	TO	QTY (LF)	REMARKS
AS SHOWN ON PLANS	AS SHOWN ON PLANS	124	SF-5

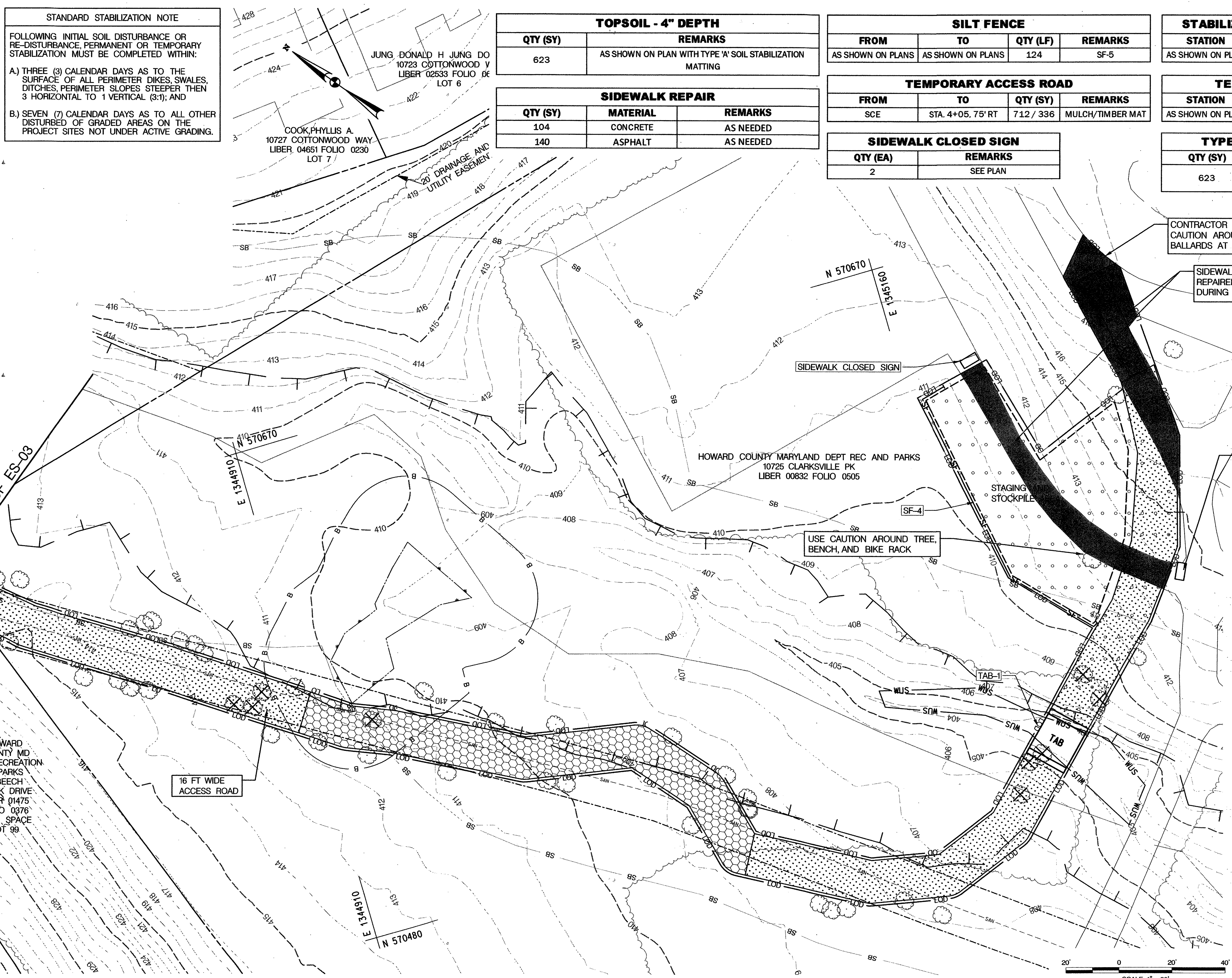
TEMPORARY ACCESS ROAD			
FROM	TO	QTY (SY)	REMARKS
SCE	STA. 4+05, 75' RT	712 / 336	MULCH/TIMBER MAT

SIDEWALK CLOSED SIGN	
QTY (EA)	REMARKS
2	SEE PLAN

STABILIZED CONSTRUCTION ENTRANCE (SCE)		
STATION	QTY (TON)	REMARKS
AS SHOWN ON PLANS	35	SCE

TEMPORARY ACCESS BRIDGE (TAB)		
STATION	QTY (EA)	REMARKS
AS SHOWN ON PLANS	1	TAB-1: MIN FLOW AREA: 22 SF

TYPE 'A' SOIL STABILIZATION MATTING	
QTY (SY)	REMARKS
623	AS SHOWN ON PLAN AT ENTRANCE AND STOCKPILE AREA, SEE DETAIL SHEET 17



LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT LINE
- TOE OF DAM
- 15' NO WOODY VEGETATION
- EXISTING TREE
- TREE TO BE REMOVED
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY CLASS I RIPRAP
- SF — SILT FENCE
- OCF — CONSTRUCTION FENCE
- PROPOSED 100-YR FLOODPLAIN
- SAND BAG DAM
- PST — PORTABLE SEDIMENT TANK
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- SCE — STABILIZED CONSTRUCTION ENTRANCE
- MULCH ACCESS ROAD
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- SB — STREAM BUFFER
- SOIL STABILIZATION MATTING
- TAB — TEMPORARY ACCESS BRIDGE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES 10/16/17 DATE

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509 South Exeter Street
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Howard County
MARYLAND
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BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

EROSION AND SEDIMENT CONTROL PLAN
PHASES 1 & 2 ES-03 OF ES-03

SCALE 1" = 20'

SHEET 13 OF 21

EROSION AND SEDIMENT CONTROL – GENERAL NOTES

SEQUENCE OF CONSTRUCTION

1. INSTALL APPROPRIATE CONTROL AND SAFETY DEVICES AS SHOWN ON THE STANDARD DETAILS PROVIDED.

2. A MINIMUM 5-DAY DRY WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE WEATHER CENTER, AND PERMISSION FROM THE INSPECTOR SHALL BE GRANTED PRIOR TO PROCEEDING WITH ANY WORK. OBTAIN MDE PERMIT (201761452) AND GRADING PERMIT. (1 DAY)

3. 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) 313-1855 A MINIMUM OF 24 HOURS PRIOR TO THE START OF ANY CONSTRUCTION. (1 DAY)

4. STAKEOUT LIMITS OF DISTURBANCE (LOD). ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED AROUND THE PERIMETER OF THE LOD. THIS SHALL BE COMPLETED BY AND INSPECTED AT THE PRE-CONSTRUCTION MEETING. (1 DAY)

5. 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, A REPRESENTATIVE FROM RECREATION AND PARKS, AND THE CONTRACTOR. (1 DAY)

PHASE 1

6. MOBILIZE EQUIPMENT FOR CONSTRUCTION ACTIVITIES. INSTALL STABILIZED CONSTRUCTION ENTRANCE, MULCH ACCESS PATH, AND TEMPORARY ACCESS BRIDGE (TAB-1). PERFORM CLEARING AND GRUBBING FOR INSTALLATION OF PERIMETER CONTROLS. DEWATER POND. COMPLETE TEMPORARY GRADING AS SHOWN ON PHASE 1 PLAN AND INSTALL SANDBAG DAM FOR TEMPORARY DIVERSION. TEMPORARY DIVERSION CHANNEL SHALL OUTFALL ONTO TEMPORARY STABILIZED RIPRAP OUTFALL PROTECTION. CONSTRUCT SUMP PIT AND PUMP SEDIMENT LADEN WATER TO PORTABLE SEDIMENT TANK. INSTALL SILT FENCES. (10 DAYS)

7. DURING A 5 DAY DRY WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, BEGIN EXCAVATION AND REMOVE EXISTING BCCMP RISERS AND 42" BCCMP SPILLWAY PIPES. (3 DAYS)

8. INSTALL CLASS II AND CLASS I RIPRAP OUTFALL PROTECTION AND CONSTRUCT CONCRETE WEIR. RELOCATE SILT FENCES AND TEMPORARY DIVERSION AS NEEDED TO INSTALL CONCRETE WEIR AND OUTFALL PROTECTION. COMPLETE POND GRADING AS SHOWN ON PHASE 1 PLAN. INSTALL GABION AND RIPRAP INFLOW PROTECTION BELOW TEMPORARY DIVERSION. DIVERSION CHANNEL MUST BE IN PLACE TO DIVERT CLEAR WATER TO A STABLE OUTFALL AT THE END OF EACH WORK DAY. DEWATER WORK AREA TO PORTABLE SEDIMENT TANK AS NEEDED. STABILIZE DISTURBED EARTH AREAS ABOVE PERMANENT POOL AS SHOWN ON SITE PLAN WITH TYPE 'A' SOIL STABILIZATION MATTING, TOPSOIL, AND SEED. (30 DAYS)

9. DURING A 5 DAY DRY WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE, RE-ESTABLISH AND GRADE EMBANKMENT WITH CLAY CORE AND CLAY LINER AROUND WEIR AS SHOWN ON PHASE 1 PLAN. (5 DAYS)

PHASE 2

10. DURING A 5 DAY DRY WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE AND WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR, INSTALL TAB-2 AND CONVERT POND TO ONLINE. PERFORM GRADING AND INSTALL REMAINING GABION AND RIPRAP INFLOW PROTECTION WHILE REMOVING TEMPORARY DIVERSION. BEGIN WORKING AT INFLOW #1 AND COMPLETE FINAL GRADING THROUGH INFLOW #3. ONLY REMOVE WHAT CAN BE STABILIZED AT THE END OF EACH DAY. STABILIZE DISTURBED EARTH AREAS ABOVE PERMANENT POOL AS SHOWN ON SITE PLAN WITH TYPE 'A' SOIL STABILIZATION MATTING, TOPSOIL, AND SEED. (5 DAYS)

11. COMPLETE GRADING OF EMBANKMENT AND INSTALLATION OF CLAY CORE AND CLAY LINER BETWEEN INFLOW #3 AND CONCRETE WEIR. SANDBAG AROUND WORK AREAS AS NEEDED AND AS SHOWN ON PHASE 2 PLAN (SB-2). STABILIZE DISTURBED EARTH AREAS ABOVE PERMANENT POOL AS SHOWN ON SITE PLAN WITH TYPE 'A' SOIL STABILIZATION MATTING, TOPSOIL, AND SEED. MAINTAIN CLEAR WATER DIVERSION THROUGH CONCRETE WEIR STRUCTURE. DEWATER WORK AREA TO PORTABLE SEDIMENT TANK AS NEEDED. (10 DAYS)

12. REMOVE TEMPORARY ACCESS BRIDGE (TAB-2) AND COMPLETE FINAL GRADING DOWNSTREAM OF EMBANKMENT AND INSTALL REMAINING CLASS II AND PERMANENT CLASS I RIPRAP OUTFALL STABILIZATION. (2 DAYS)

13. WHEN AREAS ARE FULLY STABILIZED AND WITH PERMISSION FROM THE INSPECTOR, REMOVE THE REMAINING SEDIMENT CONTROL DEVICES. STABILIZE ANY REMAINING DISTURBED AREAS WITH SEED AND MULCH. DEMOBILIZE EQUIPMENT. (5 DAYS)

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), 410-313-1855 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 STARTE OF EARTH DISTRUBANCE,
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 BENCHED WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPE, 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	1.60 ACRES
AREA DISTURBED	1.60 ACRES
AREA TO BE ROOFED OR PAVED	0.00 ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.85 ACRES
TOTAL CUT	4197 CY
TOTAL FILL	301 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 HOWARDSCD.ORG.

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

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.

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

A. SOIL PREPARATION
1. TEMPORARY STABILIZATION
A. 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 LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
B. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
C. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

2.PERMANENT STABILIZATION
A. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
I.SOIL PH BETWEEN 6.0 AND 7.0.
II.SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
III.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.
IV.SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
V.SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
B. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
C. 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.
D. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
E. 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.

B.TOPSOILING
1.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.
2.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.
3.TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
A.THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
B.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.
C.THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
D.THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
4.AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
5.TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
A. 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.
B. 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.
C. 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.
6. TOPSOIL APPLICATION
A. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
B. 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.
C. 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.

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
1. 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.
2. FERTILIZERS MUST 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.
3. 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.
4. 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.
5. 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-4-3 SEEDING AND MULCHING

A. SEEDING
1.SPECIFICATIONS
A. 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.
B. 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.
C. 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.
D. 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.
2. APPLICATION
A. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
I. 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.
II. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
B. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
I. 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.
II. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
C. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
I. 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 (PHOSPHOROUS), 200 POUNDS PER ACRE; K2O (POTASSIUM), 200 POUNDS PER ACRE.
II. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
III. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
IV. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

B. MULCHING
1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
A. 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.
B. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
I. 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 UNIFORMLY SPREAD SLURRY.
II. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
III. 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 SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-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.
IV. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
V. 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.
2. APPLICATION
A. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
B. 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 1 TO 2 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.
C. 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.
3. ANCHORING
A. 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:
I. 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.
II. WOOD CELLULOSE FIBER 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.
III. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL 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.
IV. 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-4-4 TEMPORARY STABILIZATION

HARDINESS ZONE (FROM FIGURE B.3) 6B SEED MIXTURE (FROM TABLE B.3) SEE BELOW					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS		
	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-4-5 PERMANENT STABILIZATION

HARDINESS ZONE (FROM FIGURE B.3) 6B SEED MIXTURE (FROM TABLE B.3) 1,6					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P_2O_5	K_2O	
1	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)
	CREEPING RED FESCUE	15	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15*	1/4-1/2 IN.				
	PARTRIDGE PEA	4	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15*	1/4-1/2 IN.				
6	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)
	PERENNIAL RYEGRASS	25	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.				
	WHITE CLOVER	5	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

10/16/17
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 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

STATE OF MARYLAND — AMY HRIB... — No. 32013 — PROFESSIONAL ENGINEER

DES: CL				
DRN: MR				
CHK: AH				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

EROSION AND SEDIMENT CONTROL NOTES

SCALE: NOT TO SCALE

SWM POND CONSTRUCTION SPECIFICATIONS (MARYLAND CODE 378 POND – JANUARY 2000)

THESE SPECIFICATIONS ARE APPROPRIATE TO ALL PONDS WITHIN THE SCOPE OF THE STANDARD FOR PRACTICE MD-378. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.

SITE PREPARATION

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE TOE OF THE EMBANKMENT.

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH, AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE. FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED.

ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE. WHEN SPECIFIED, A SUFFICIENT QUANTITY OF TOPSOIL WILL BE STOCKPILED IN A SUITABLE LOCATION FOR USE ON THE EMBANKMENT AND OTHER DESIGNATED AREAS.

EARTH FILL

MATERIAL: – THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT, AND CUTOFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGNS MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

PLACEMENT: – AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION: – THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIRED OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.

WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN +/- 2% OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).

CUT OFF TRENCH: – THE CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE GOVERNED BY THE EQUIPMENT USED FOR EXCAVATION, WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.

EMBANKMENT CORE: – THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM IMPERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

EARTH FILL (CONTINUED)

STRUCTURE BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 313 AS MODIFIED. THE MIXTURE SHALL HAVE A 100-200 PSI; 28 DAY UNCONFINED COMPRESSIVE STRENGTH. THE FLOWABLE FILL SHALL HAVE A MINIMUM PH OF 4.0 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE. WHEN USING FLOWABLE FILL, ALL METAL PIPE SHALL BE BITUMINOUS COATED. ANY ADJOINING SOIL FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL VOIDS ADJACENT TO THE FLOWABLE FILL ZONE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

CORRUGATED METAL PIPE – ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORRUGATED METAL PIPE:

1. MATERIALS – (POLYMER COATED STEEL PIPE) – STEEL PIPES WITH POLYMERIC COATINGS SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATIONS M-245 & M-246 WITH WATERTIGHT COUPLING BANDS OR FLANGES.

MATERIALS – (ALUMINUM COATED STEEL PIPE) – THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION ON M-274 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM COATED STEEL PIPE, WHEN USED WITH FLOWABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT THE NEED FOR INCREASED DURABILITY, SHALL BE FULLY BITUMINOUS COATED PER REQUIREMENTS OF AASHTO SPECIFICATION ON M-190 TYPE A. ANY ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ASPHALT.

MATERIALS – (ALUMINUM PIPE) – THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-196 OR M-211 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM PIPE, WHEN USED WITH FLOWABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT FOR INCREASED DURABILITY, SHALL BE FULLY BITUMINOUS COATED PER REQUIREMENTS OF AASHTO SPECIFICATION M-190 TYPE A. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ASPHALT. HOT DIP GALVANIZED BOLTS MAY BE USED FOR CONNECTIONS. THE PH OF THE SURROUNDING SOILS SHALL BE BETWEEN 4 AND 9.

2. COUPLING BANDS, ANTI-SEEP COLLARS, END SECTIONS, ETC., MUST BE COMPOSED OF THE SAME MATERIAL AND COATINGS AS THE PIPE. METALS MUST BE INSULATED FROM DISSIMILAR MATERIALS WITH USE OF RUBBER OR PLASTIC INSULATING MATERIALS AT LEAST 24 MILS IN THICKNESS.

3. CONNECTIONS – ALL CONNECTIONS WITH PIPES MUST BE COMPLETELY WATERTIGHT. THE DRAIN PIPE OR BARREL CONNECTION TO THE RISER SHALL BE WELDED ALL AROUND WHEN THE PIPE AND RISER ARE METAL. ANTI-SEEP COLLARS SHALL BE CONNECTED TO THE PIPE IN SUCH A MANNER AS TO BE COMPLETELY WATERTIGHT. DIMPLE BANDS ARE NOT CONSIDERED TO BE WATERTIGHT.

ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BANDWIDTH.

THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24 INCHES IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR 3/8 INCH CLOSED CELL NEOPRENE GASKET, PRE-PUNCHED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12 INCH WIDE STANDARD LAP TYPE BAND WITH 12 INCH WIDE BY 3/8 INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12 INCH WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF 1/2 INCH GREATER THAN THE CORRUGATION DEPTH. PIPES 24 INCHES IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24 INCH LONG ANNULAR CORRUGATED BAND USING A MINIMUM OF 4 (FOUR) RODS AND LUGS, 2 ON EACH CONNECTING PIPE END. A 24 INCH WIDE BY 3/8 INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED WITH 12 INCHES ON THE END OF EACH PIPE. FLANGED JOINTS WITH 3/8 INCH CLOSED CELL GASKETS THE FULL WIDTH OF THE FLANGE IS ALSO ACCEPTABLE.

HELICALLY CORRUGATED PIPE SHALL HAVE EITHER CONTINUOUSLY WELDED SEAMS OR HAVE LOCK SEAMS WITH INTERNAL CAULKING OR A NEOPRENE BEAD.

4. BEDDING – THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

5. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

PIPE CONDUITS (CONTINUED)

REINFORCED CONCRETE PIPE – ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS – REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.

2. BEDDING – REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/CRADLE FOR THEIR ENTIRE LENGTH. THIS BEDDING/CRADLE SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADLE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.

3. LAYING PIPE – BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

PLASTIC PIPE – THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:

1. MATERIAL – PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241. CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE, COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4"–10" PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M252 TYPE S, AND 12" THROUGH 24" SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE S.

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATERTIGHT.

3. BEDDING – THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSUITABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

DRAINAGE DIAPHRAGMS – WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

DRAINAGE DIAPHRAGM – WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

ROCK RIPRAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311.

GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATION AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

STABILIZATION

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH THE NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANING DRAWINGS.

EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES.

SEE EROSION AND SEDIMENT CONTROL SHEETS FOR DETAILED SEQUENCE OF CONSTRUCTION.

NOTE: GEOTECHNICAL CONSTRUCTION GUIDANCE BELOW IS FROM THE GEOTECHNICAL SUBSURFACE INVESTIGATION REPORT FOR THE BEECH CREEK DRIVE POND (APRIL 2017). CODE 378 SHALL SUPERCEDE ANY DISCREPENCIES.

SITE GRADING

Site Grading

Once the approved erosion measures are installed, site preparation operation may be initiated. Grading preparation should include clearing within the limits of construction, grubbing and removal of the organic surficial soils. Depth of stripping and undercutting will be determined at the site during construction and is expected to be on the order of 4 inches. Design and construction should include provisions for temporary storage, hauling, and disposal of stripped materials at an approved off-site location. Following stripping and cutting, the subgrade should be verified prior to the installation of any SWM structures. Areas identified during the verification process as soft or exhibiting "pumping" tendencies, should be undercut, processed and recompacted or removed and replaced with suitable fill, whichever is appropriate.

Suitable Fill Material

Fill material for the cutoff trench, embankment core and clay liner shall conform to the latest version of the NRCS-MD 378 Code for Pond Standards and Specifications.
Clayey soils used in cutoff/core trench and clay liner construction should conform to USCS high plasticity clay (CH), low plasticity clay (CL), clayey sand (SC), or clayey gravel (GC), and must have at least 30% passing the #200 sieve. Fill and backfill for general areas including access roads and SWM embankments should be free of organics, debris and rock fragments in excess of 3-inches in any dimension. In the top 18 inches of fill, maximum particle size should be limited to approximately 1.5 inches. As per ASTM D2478 classification, imported select fill should consist of low-plasticity sandy clay (CL), clayey sand (SC), or clayey gravel (GC) with a liquid limit and plasticity index of less than 40 and 15, respectively, or an approved alternate.

CONSTRUCTION CONSIDERATIONS

Positive surface drainage should be established at the start of work, be maintained during construction and following completion of the project to prevent surface water ponding and subsequent saturation of subgrade soils. Prolonged exposure or saturation of subgrade soils by ponding or runoff water may result in significant changes in strength and compressibility characteristics. Saturated subgrade soils should be excavated and replaced with suitable materials. Depending on weather conditions during and prior to construction, groundwater may be encountered. During construction, diversion of normal stormwater flows will be the responsibility of the contractor. It is anticipated that a temporary cofferdam or other necessary temporary structure will be constructed to divert stormwater flows away from the riser and outlet pipe area. Any seepage into the construction excavation could be controlled by pumping from sump pits. During site preparation, surface runoff should be directed away from the construction areas.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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

STATE OF MARYLAND — ANY HRUSKA — 32013 — PROFESSIONAL ENGINEER

DES: CL
DRN: MR
CHK: AH
DATE: 10/13/17

BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

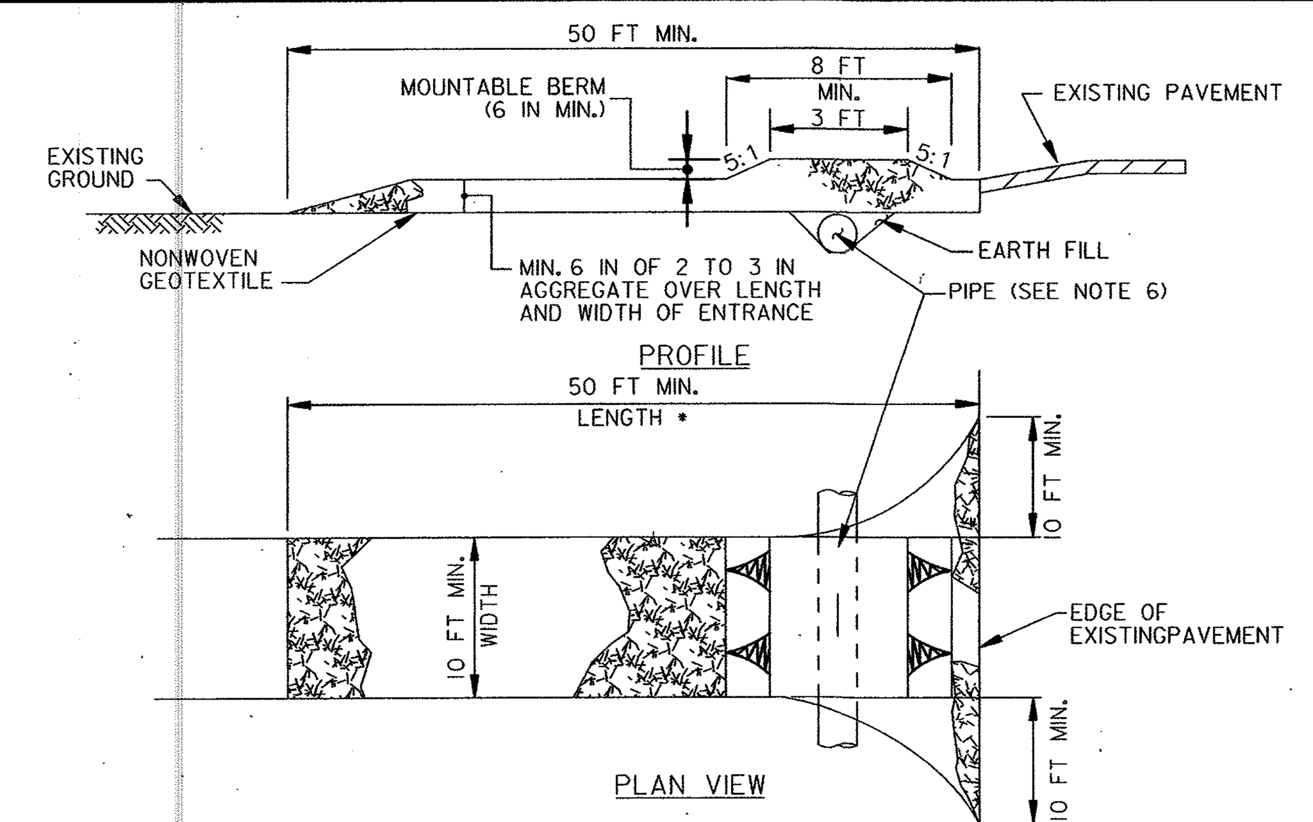
POND CONSTRUCTION SPECIFICATIONS

SCALE: NOT TO SCALE

SHEET: 15 OF 21

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

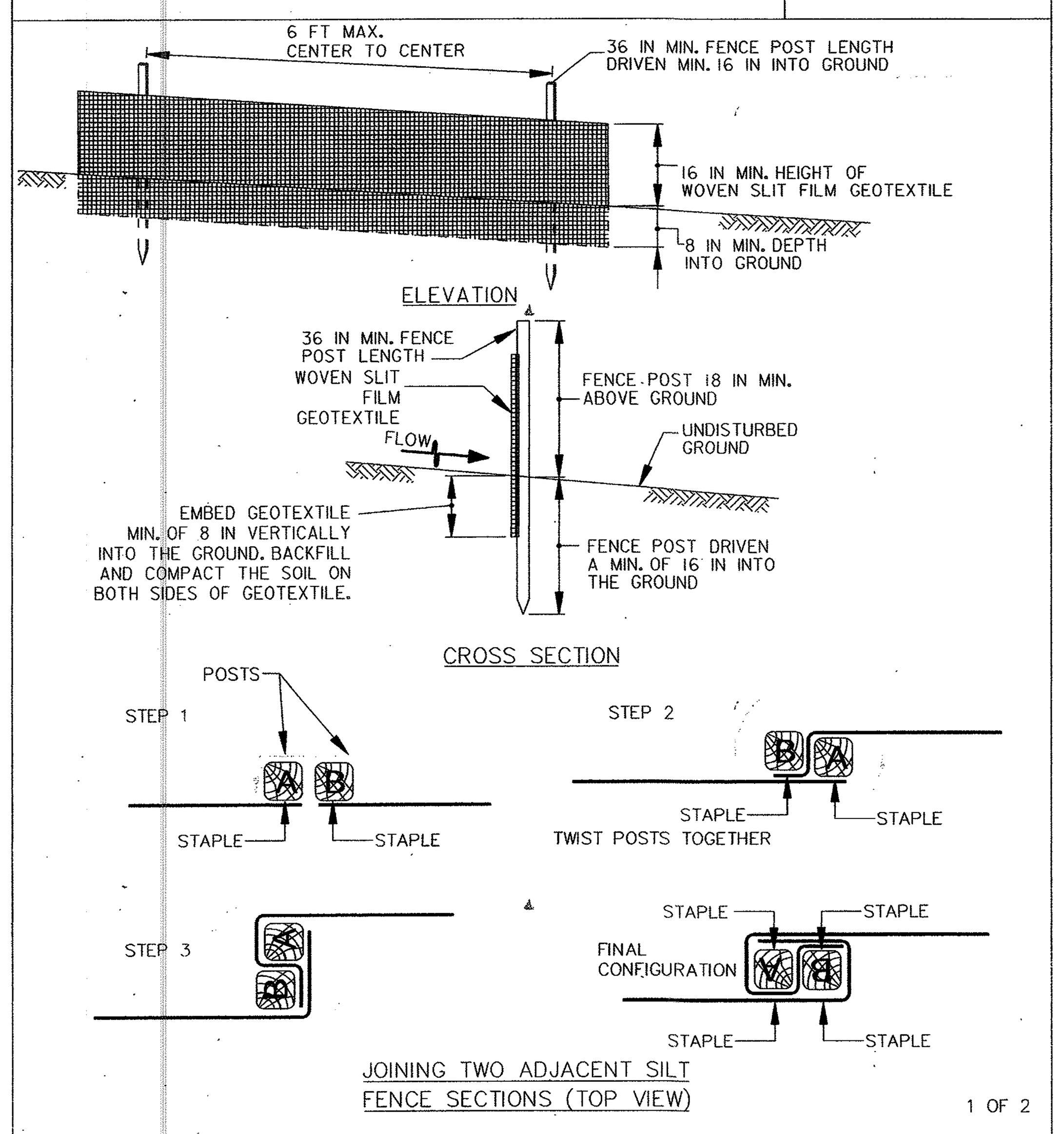
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ——SF——



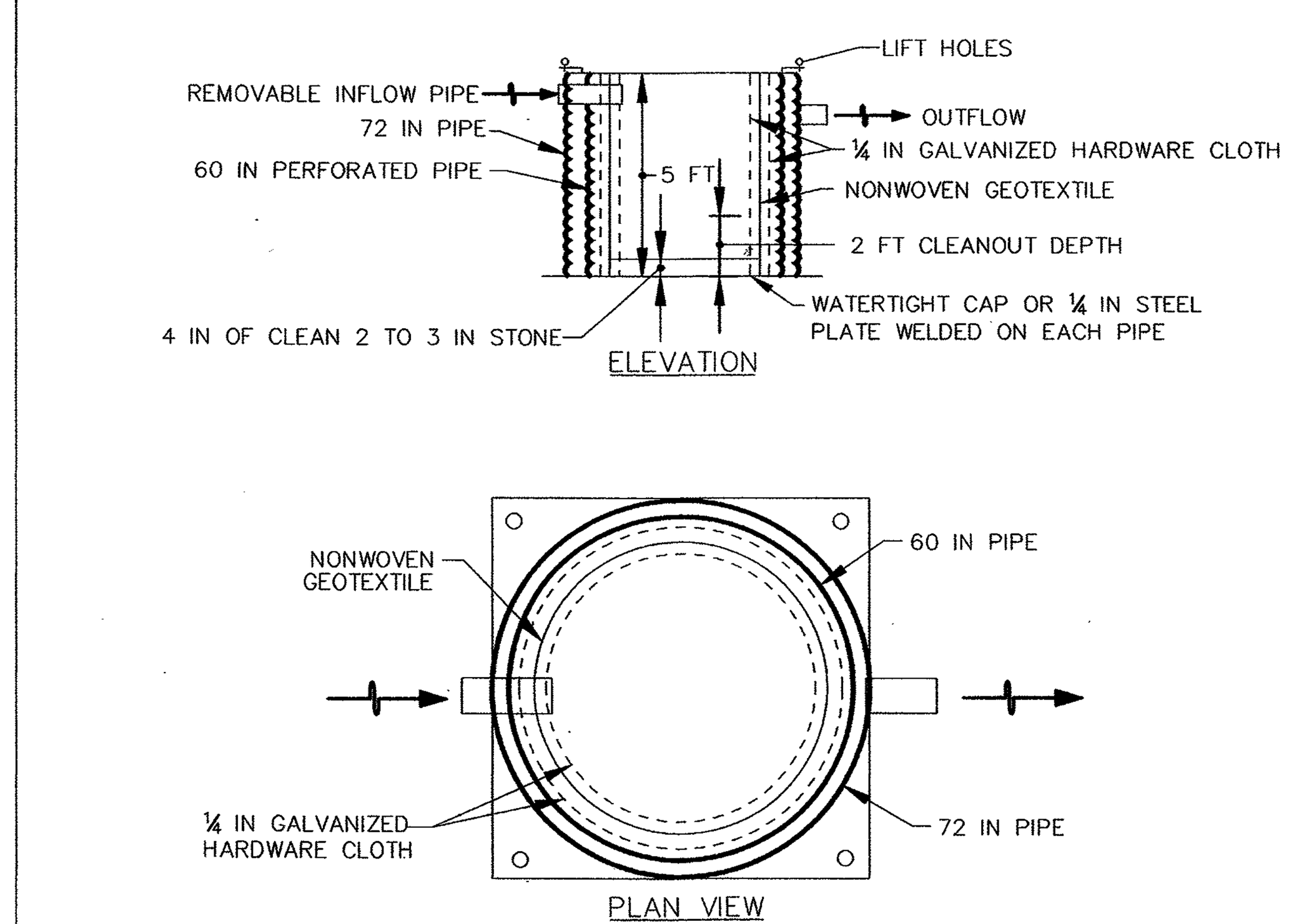
1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-3 PORTABLE SEDIMENT TANK

STANDARD SYMBOL: ☒PST



CONSTRUCTION SPECIFICATIONS

1. PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
2. USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, ¼ INCH HARDWARE CLOTH.
3. OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
4. ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE
5. USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE
6. INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
7. PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE
8. A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOGS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ——SF——

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

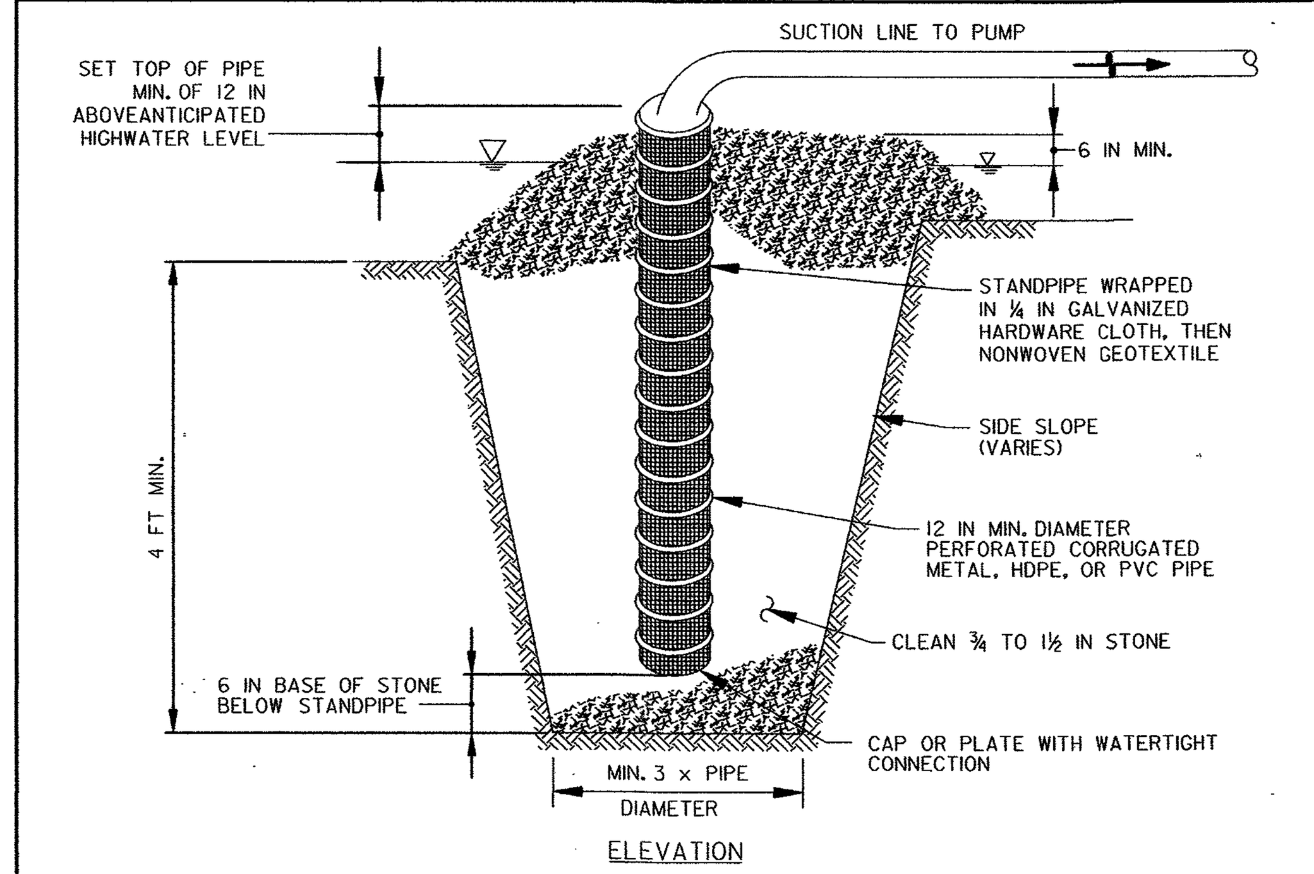
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-2 SUMP PIT

STANDARD SYMBOL: ☒SP



CONSTRUCTION SPECIFICATIONS

1. USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
2. WRAP PIPE WITH 1/4 INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
3. EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE 3/4 TO 1 1/2 INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
4. SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
5. BACKFILL PIT AROUND THE PIPE WITH 3/4 TO 1 1/2 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
6. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
7. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

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

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing sandbag or stone flow diversions for the purpose of erosion control when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS

Diversions are used to isolate work areas from flow during the construction of in-stream projects. Diversions which have an insufficient flow capacity can fail and severely erode the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low rainfall. This temporary measure may not be practical in large channels.

MATERIAL SPECIFICATIONS

Materials for sandbag and stone stream diversions should meet the following requirements:

- *Riprap*: Riprap should be washed and have a minimum diameter of 6 inches (0.15 meters).
- *Sandbags*: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of the fill material (i.e., sand, fine gravel, etc.).
- *Sheeting*: Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

INSTALLATION GUIDELINES

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should proceed as follows (refer to Detail 1.5):

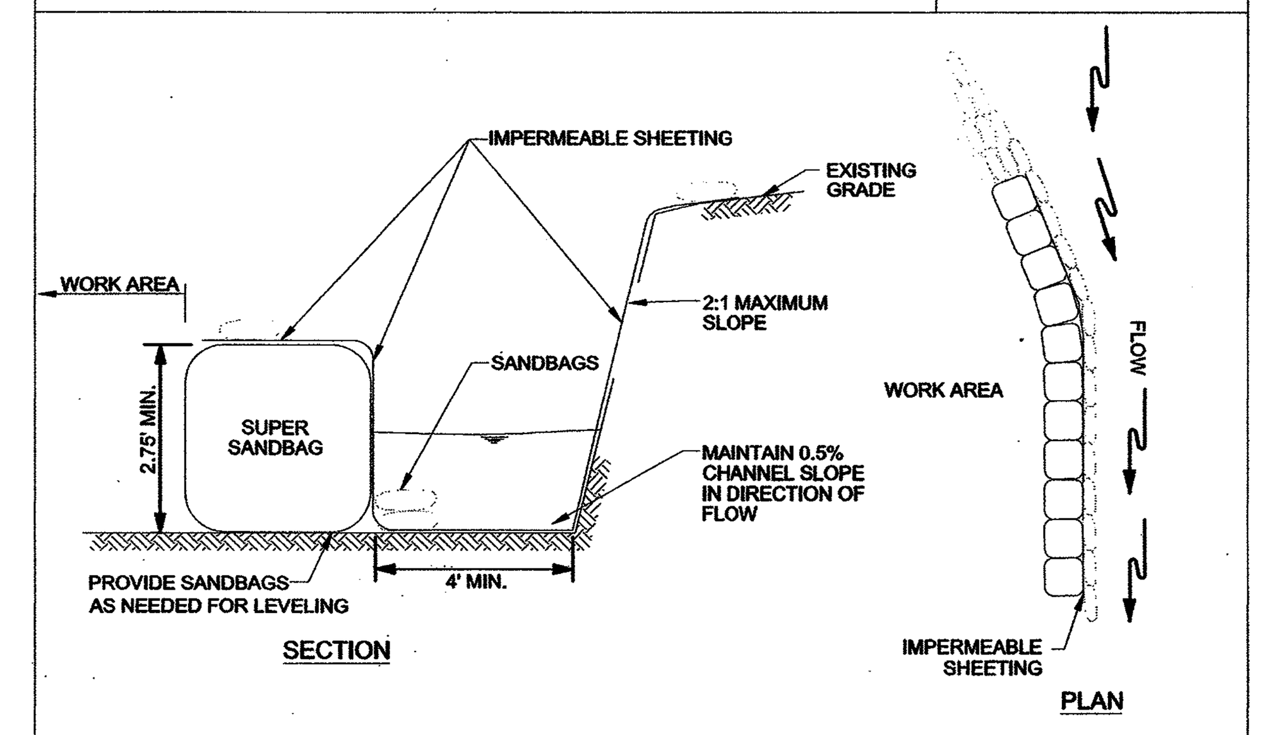
1. The diversion structure should be installed from upstream to downstream.
2. The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration less than 2 weeks, the height of the diversion should be one half the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.
3. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
4. Sediment-laden water from the construction area should be pumped to a dewatering basin.

TEMPORARY INSTREAM CONSTRUCTION MEASURES — *MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000*

PAGE 1.5 - 1

SANDBAG CHANNEL DIVERSION DETAIL PROVIDED FOR CLARITY OF MGWC 1.5

STANDARD SYMBOL



CONSTRUCTION SPECIFICATIONS

1. FOR SANDBAGS AND SUPER SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLET RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
2. SUPER SANDBAGS TO BE INDIVIDUAL ELEMENTS ON AVERAGE 3 FEET BY 3 FEET BY 3 FEET IN DIMENSION.
3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNCTURING AND TEARING.
4. ESTABLISH CONSISTENT TOP ELEVATION MATCHING THAT OF THE DIVERSION CHANNEL AND ALLOWING 2 FEET 8 INCHES OF FLOW DEPTH AT A MINIMUM. (2-YEAR STORM)
5. INSTALL DIVERSION STRUCTURE FROM UPGRADE TO DOWNGRADE.
6. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
7. USE SANDBAG BASE FOR LEVELING AND TO ESTABLISH MINIMUM TOP ELEVATION OF THE DIVERSION AS REQUIRED.
8. DISPOSE OF ALL EXCAVATED MATERIALS IN AN APPROVED DISPOSAL AREA OUTSIDE OF THE 100-YEAR FLOODPLAIN.
9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
10. KEEP ABUTMENTS BETWEEN SUPER SANDBAGS WATER TIGHT. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

5. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.
6. Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project time is expected to last more than 2 weeks.
7. Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
8. Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

NOTE: SEE DETAIL THIS SHEET FOR PROJECT APPLICATION OF CHANNEL DIVERSION

TEMPORARY INSTREAM CONSTRUCTION MEASURES — *MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000*

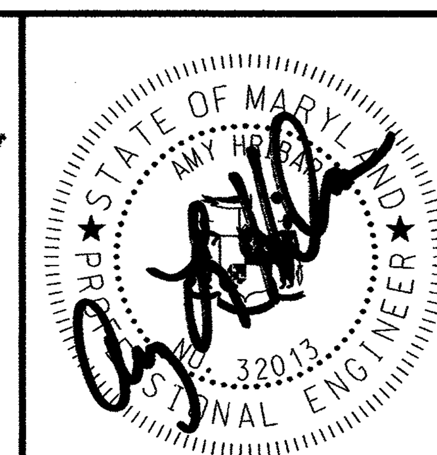
PAGE 1.5 - 2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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
DRN: MR
CHK: AH
DATE: 10/13/17

BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

EROSION AND SEDIMENT CONTROL DETAIL SHEET

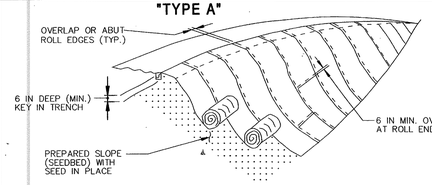
SCALE: NOT TO SCALE

SHEET 16 OF 21

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

STANDARD SYMBOL: TSSMS - 2.0 lb/ft² (* INCLUDE SHEAR STRESS)

"TYPE A"



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

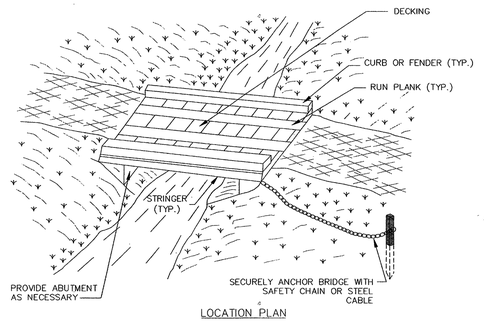
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION4IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



LOCATION PLAN

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

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB

CONSTRUCTION SPECIFICATIONS

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

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

DEFINITION

A MOUND OR PILE OF SOIL PROTECTED BY APPROPRIATELY DESIGNED EROSION AND SEDIMENT CONTROL MEASURES.

PURPOSE

TO PROVIDE A DESIGNATED LOCATION FOR THE TEMPORARY STORAGE OF SOIL THAT CONTROLS THE POTENTIAL FOR EROSION, SEDIMENTATION, AND CHANGES TO DRAINAGE PATTERNS.

CONDITIONS WHERE PRACTICE APPLIES

STOCKPILE AREAS ARE UTILIZED WHEN IT IS NECESSARY TO SALVAGE AND STORE SOIL FOR LATER USE.

CRITERIA

1. THE STOCKPILE LOCATION AND ALL RELATED SEDIMENT CONTROL PRACTICES MUST BE CLEARLY INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN.
2. THE FOOTPRINT OF THE STOCKPILE MUST BE SIZED TO ACCOMMODATE THE ANTICIPATED VOLUME OF MATERIAL AND BASED ON A SIDE SLOPE RATIO NO STEEPER THAN 2:1. BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.
3. RUNOFF FROM THE STOCKPILE AREA MUST DRAIN TO A SUITABLE SEDIMENT CONTROL PRACTICE.
4. ACCESS THE STOCKPILE AREA FROM THE UPGRADE SIDE.
5. CLEAR WATER RUNOFF INTO THE STOCKPILE AREA MUST BE MINIMIZED BY USE OF A DIVERSION DEVICE SUCH AS AN EARTH DIKE, TEMPORARY SWALE OR DIVERSION FENCE. PROVISIONS MUST BE MADE FOR DISCHARGING CONCENTRATED FLOW IN A NON-EROSIVE MANNER.
6. WHERE RUNOFF CONCENTRATES ALONG THE TOE OF THE STOCKPILE FILL, AN APPROPRIATE EROSION/SEDIMENT CONTROL PRACTICE MUST BE USED TO INTERCEPT THE DISCHARGE.
7. STOCKPILES MUST BE STABILIZED IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENT AS WELL AS STANDARD B-4-1 INCREMENTAL STABILIZATION AND STANDARD B-4-4 TEMPORARY STABILIZATION.
8. IF THE STOCKPILE IS LOCATED ON AN IMPERVIOUS SURFACE, A LINER SHOULD BE PROVIDED BELOW THE STOCKPILE TO FACILITATE CLEANUP. STOCKPILES CONTAINING CONTAMINATED MATERIAL MUST BE COVERED WITH IMPERMEABLE SHEETING.

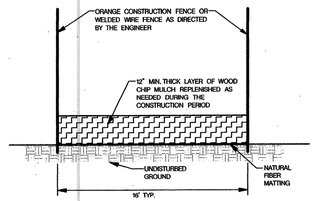
MAINTENANCE

THE STOCKPILE AREA MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION. SIDE SLOPES MUST BE MAINTAINED AT NO STEEPER THAN A 2:1 RATIO. THE STOCKPILE AREA MUST BE KEPT FREE OF EROSION. IF THE VERTICAL HEIGHT OF A STOCKPILE EXCEEDS 20 FEET FOR 2:1 SLOPES, 30 FEET FOR 3:1 SLOPES, OR 40 FEET FOR 4:1 SLOPES, BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.

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

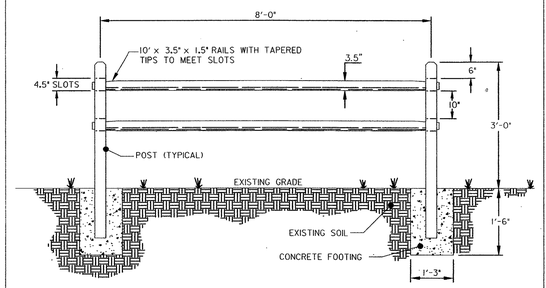
MULCH ACCESS ROAD DETAIL



NOTES:

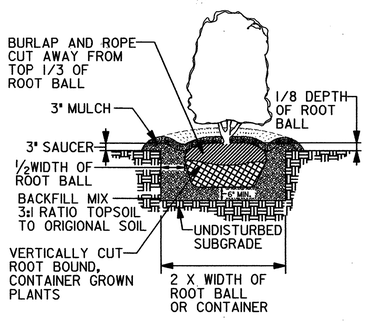
1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
2. NATURAL FIBER MATTING SHALL BE PLACED WITH SEAMS PARALLEL TO THE FLOW OF TRAFFIC. OVERLAP FABRIC BY 18" MINIMUM AT SEAMS.
3. NATURAL FIBER MATTING MAY BE ELIMINATED AT DIRECTION OF ENGINEER.
4. CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION PERIOD. UPON COMPLETION OF THE PROJECT, MULCH CAN REMAIN IN PLACE AT A MAXIMUM DEPTH OF 2" IF APPROVED BY THE ENGINEER.
5. SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF HAUL ROAD, AT DIRECTION OF THE ENGINEER.

NOTES:
1) ALL WOOD FOR SPLIT RAIL FENCE TO BE PRESSURE TREATED.
2) END POST SHALL BE TERMINAL POST.

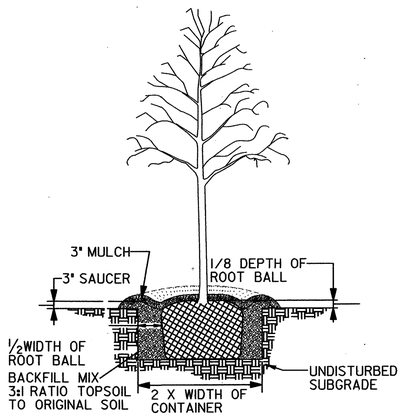


FRONT VIEW

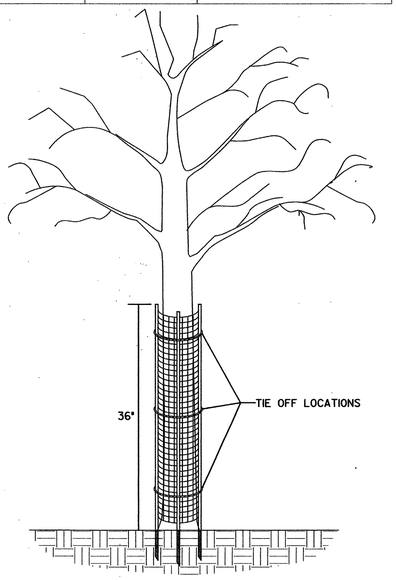
STANDARD SPLIT-RAIL FENCE



SHRUB PLANTING DETAIL
B & B AND CONTAINER GROWN
NOT TO SCALE



DECIDUOUS TREE PLANTING DETAIL
B & B AND CONTAINER GROWN
NOT TO SCALE



INSTALLATION INSTRUCTIONS:

1. PLANT TREE ACCORDING TO STANDARD SPECIFICATIONS.
2. PLACE THE SHELTER AROUND THE TREE.
3. DRIVE LONGER STAKES INTO THE GROUND.
4. TIE-OFF ROPE ENDS AROUND TREE.

PRODUCT NOTES:

1. TREE SHELTER SHALL BE A.M. LEONARD TREE BARK PROTECTOR OR APPROVED EQUAL
2. TREE SHELTER MUST HAVE LONGER, HARDY STAKES FOR INSERTION INTO GROUND TO PROVIDE SUPPORT.

TREE SHELTER DETAIL
NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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

STATE OF MARYLAND — MY HOWARD — 32013 — PROFESSIONAL ENGINEER

DES: CL				
DRN: MR				
CHK: AH				
DATE: 10/13 /17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

EROSION AND SEDIMENT CONTROL AND LANDSCAPE DETAIL SHEET

SCALE: NOT TO SCALE

SHEET: 17 OF 21

LOG OF BOREHOLE B-1

Project No. 2013055.45 — Sheet 1 of 1

CLIENT: McCormick Taylor, Inc — PROJECT: Beech Creek SWM Pond Retrofit

ARCHITECT/ENGINEER: — SITE: Howard County, Maryland

SURFACE ELEV.: 423.5 ft.

Depth (ft)	Description	Elev.
0.3	4" Topsoil	423.2
5.5	Medium dense brown and gray CLAYEY SAND (SC) with gravel and mica (Fill)	418.0
8.0	Loose greenish gray SILTY SAND (SM) with mica and layers of clay (Possible Fill)	415.5
13.0	Dense greenish gray SILTY SAND (SM) with gravel	410.5
20.0	Very dense to medium dense greenish gray and brown SANDY SILT (ML) (Possible Decomposed Rock)	403.5

Blows/6" N-Value RQD	Number	Type	In. Recovered / In. Driven	Moisture (%)	Dry Density (PCF)	Qu (TSF)	% Passing #200 Sieve	Remarks/ Additional Data
4-4-6 N=10	1	SS	15/18 83%	18			41	
4-6-8 N=14	2	SS	18/18 100%	22				LL = 43 PL = 26 PI = 17
3-4-5 N=9	3	SS	18/18 100%	14				
3-22-14 N=36	4	SS	15/18 83%	20			22	
51/1"	5	SS	1/1 100%	13				
8-10-14 N=24	6	SS	18/18 100%	16				

End of Boring @ 20 ft

Borehole was backfilled with bentonite mix after 24 hours water reading

WATER LEVEL OBSERVATIONS			
WL	∇	8	@ Drilling
WL	▼	11	@ 0 Hrs
WL	▼	7	@ 24 Hrs

AB Consultants, Inc. 9450 Annapolis Road Lanham, MD 20706 Phone: 301-306-3091 Fax: 301-306-3092

STARTED: 3/22/17 FINISHED: 3/22/17 DRILL CO.: ABC DRILL RIG: CME-45 DRILLER: UP ASS'T DRILLER: LOGGED BY: APPROVED:

BORING LOG AB09 2013055.45 BEECH CREEK SWM POND REHAB.GPJ AB CONS.GDT 4/6/17

LOG OF BOREHOLE B-2

Project No. 2013055.45 — Sheet 1 of 1

CLIENT: McCormick Taylor, Inc — PROJECT: Beech Creek SWM Pond Retrofit

ARCHITECT/ENGINEER: — SITE: Howard County, Maryland

SURFACE ELEV.: 422.5 ft.

Depth (ft)	Description	Elev.
0.3	4" Topsoil	422.2
3.5	Loose brown and gray SANDY SILT (ML) with mica (Fill)	419.0
12.0	Medium dense brown and gray CLAYEY SAND (SC) with gravel and mica (Fill)	410.5
20.0	Medium dense brown SILTY SAND (SM) with mica and gravel	402.5

Blows/6" N-Value RQD	Number	Type	In. Recovered / In. Driven	Moisture (%)	Dry Density (PCF)	Qu (TSF)	% Passing #200 Sieve	Remarks/ Additional Data
4-4-4 N=8	1	SS	15/18 83%	14				
4-4-7 N=11	2	SS	18/18 100%	19			48	
5-5-6 N=11	3	SS	16/18 89%	18				LL = 38 PL = 22 PI = 16
7-9-9 N=18	4	SS	18/18 100%	18				
9-7-5 N=12	5	SS	14/18 78%	10				
7-9-9 N=18	6	SS	18/18 100%	19				

End of Boring @ 20 ft

Borehole was backfilled with bentonite mix after 24 hours water reading

WATER LEVEL OBSERVATIONS			
WL	∇	14	@ Drilling
WL	▼	16	@ 0 Hrs
WL	Dry, caved in 11 ft		@ 24 Hrs

AB Consultants, Inc. 9450 Annapolis Road Lanham, MD 20706 Phone: 301-306-3091 Fax: 301-306-3092

STARTED: 3/22/17 FINISHED: 3/22/17 DRILL CO.: ABC DRILL RIG: CME-45 DRILLER: UP ASS'T DRILLER: LOGGED BY: APPROVED:

BORING LOG AB09 2013055.45 BEECH CREEK SWM POND REHAB.GPJ AB CONS.GDT 4/6/17

LOG OF BOREHOLE B-3

Project No. 2013055.45 — Sheet 1 of 1

CLIENT: McCormick Taylor, Inc — PROJECT: Beech Creek SWM Pond Retrofit

ARCHITECT/ENGINEER: — SITE: Howard County, Maryland

SURFACE ELEV.: 422.5 ft.

Depth (ft)	Description	Elev.
0.3	4" Topsoil	422.2
5.0	Loose to medium dense brown and gray SILTY SAND (SM) with mica and trace of gravel (Fill)	417.5
13.0	Loose to medium dense brown and gray CLAYEY FINE SAND (SC) with mica and trace of gravel (Fill)	409.5
18.0	Loose brown and gray SILTY FINE SAND (SM)	404.5
20.0	Very dense tan and brown SILTY FINE SAND (SM) (Possible Decomposed Rock)	402.5

Blows/6" N-Value RQD	Number	Type	In. Recovered / In. Driven	Moisture (%)	Dry Density (PCF)	Qu (TSF)	% Passing #200 Sieve	Remarks/ Additional Data
3-3-5 N=8	1	SS	16/18 89%	8				
4-4-11 N=15	2	SS	17/18 94%	17			44	
4-5-5 N=10	3	SS	14/18 78%	19				
3-4-6 N=10	4	SS	15/18 83%	19				
3-4-5 N=9	5	SS	17/18 94%	27			28	
15-51/5"	6	SS	11/11 100%	16				

End of Boring @ 20 ft

Borehole was backfilled with bentonite mix after 24 hours water reading

WATER LEVEL OBSERVATIONS			
WL	∇	12	@ Drilling
WL	▼	16	@ 0 Hrs
WL	▼	12	@ 24 Hrs

AB Consultants, Inc. 9450 Annapolis Road Lanham, MD 20706 Phone: 301-306-3091 Fax: 301-306-3092

STARTED: 3/22/17 FINISHED: 3/22/17 DRILL CO.: ABC DRILL RIG: CME-45 DRILLER: UP ASS'T DRILLER: LOGGED BY: APPROVED:

BORING LOG AB09 2013055.45 BEECH CREEK SWM POND REHAB.GPJ AB CONS.GDT 4/6/17

LOG OF BOREHOLE B-4

Project No. 2013055.45 — Sheet 1 of 1

CLIENT: McCormick Taylor, Inc — PROJECT: Beech Creek SWM Pond Retrofit

ARCHITECT/ENGINEER: — SITE: Howard County, Maryland

SURFACE ELEV.: 422.5 ft.

Depth (ft)	Description	Elev.
0.3	4" Topsoil	422.2
5.0	Loose brown and gray SILTY SAND (SM) with mica (Fill)	417.5
8.5	Firm brown and gray FINE SANDY CLAY (CL) with mica (Fill)	414.0
17.0	Medium dense brown SILTY SAND (SM)	405.5
20.0	Dense brown, gray and tan SILTY SAND (SM) (Possible Decomposed Rock)	402.5

Blows/6" N-Value RQD	Number	Type	In. Recovered / In. Driven	Moisture (%)	Dry Density (PCF)	Qu (TSF)	% Passing #200 Sieve	Remarks/ Additional Data
4-4-3 N=7	1	SS	15/18 83%	17				
5-5-4 N=9	2	SS	18/18 100%	18				
4-5-5 N=10	3	SS	15/18 83%	19			62	
6-6-6 N=12	4	SS	16/18 89%	14				LL = NP PL = NP PI = 0
6-8-13 N=21	5	SS	10/18 56%	17				
15-26-33 N=59	6	SS	18/18 100%	11				

End of Boring @ 20 ft

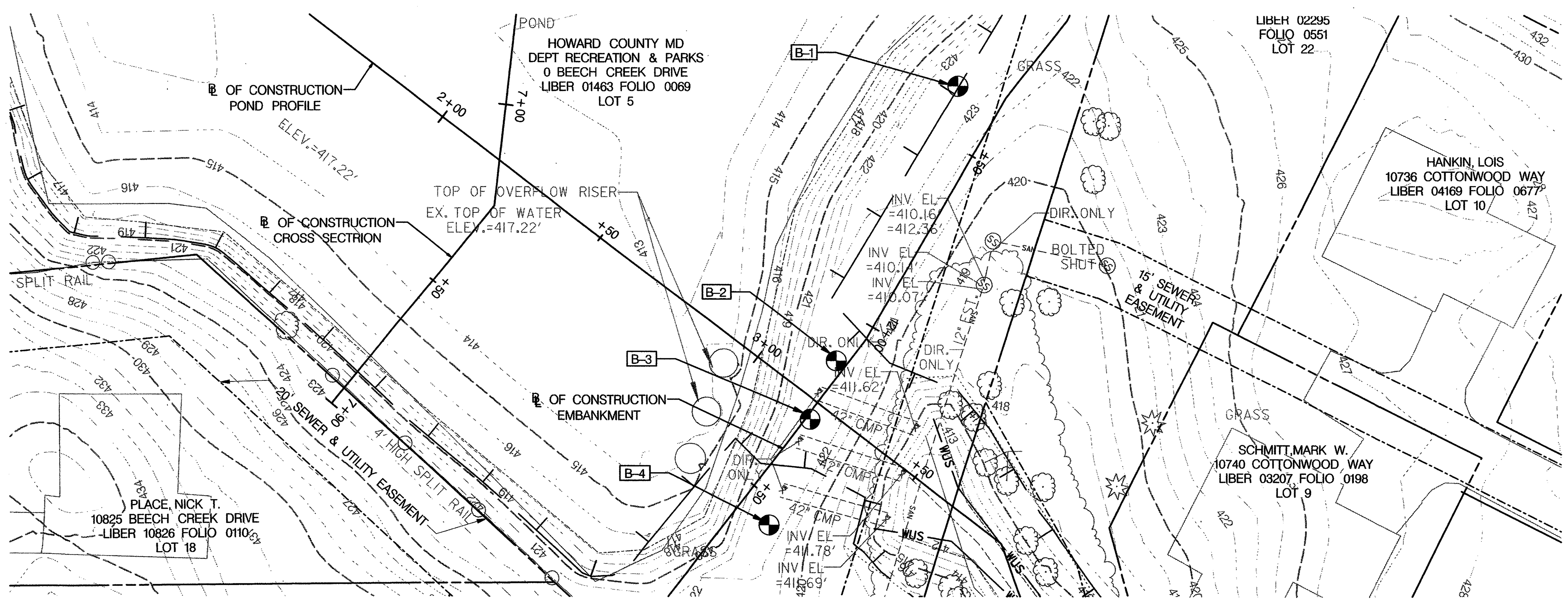
Borehole was backfilled with bentonite mix after 24 hours water reading

WATER LEVEL OBSERVATIONS			
WL	∇	13	@ Drilling
WL	▼	9	@ 0 Hrs
WL	▼	8	@ 24 Hrs

AB Consultants, Inc. 9450 Annapolis Road Lanham, MD 20706 Phone: 301-306-3091 Fax: 301-306-3092

STARTED: 3/22/17 FINISHED: 3/22/17 DRILL CO.: ABC DRILL RIG: CME-45 DRILLER: UP ASS'T DRILLER: LOGGED BY: APPROVED:

BORING LOG AB09 2013055.45 BEECH CREEK SWM POND REHAB.GPJ AB CONS.GDT 4/6/17



BORINGS AND DRIVE TESTS LOCATION PLAN

SCALE: 1" = 20'

NOTES:

1. THE BORINGS WERE TAKEN IN MARCH, 2017 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.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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

STATE OF MARYLAND — AMY ... — PROFESSIONAL ENGINEER — NO. 32013

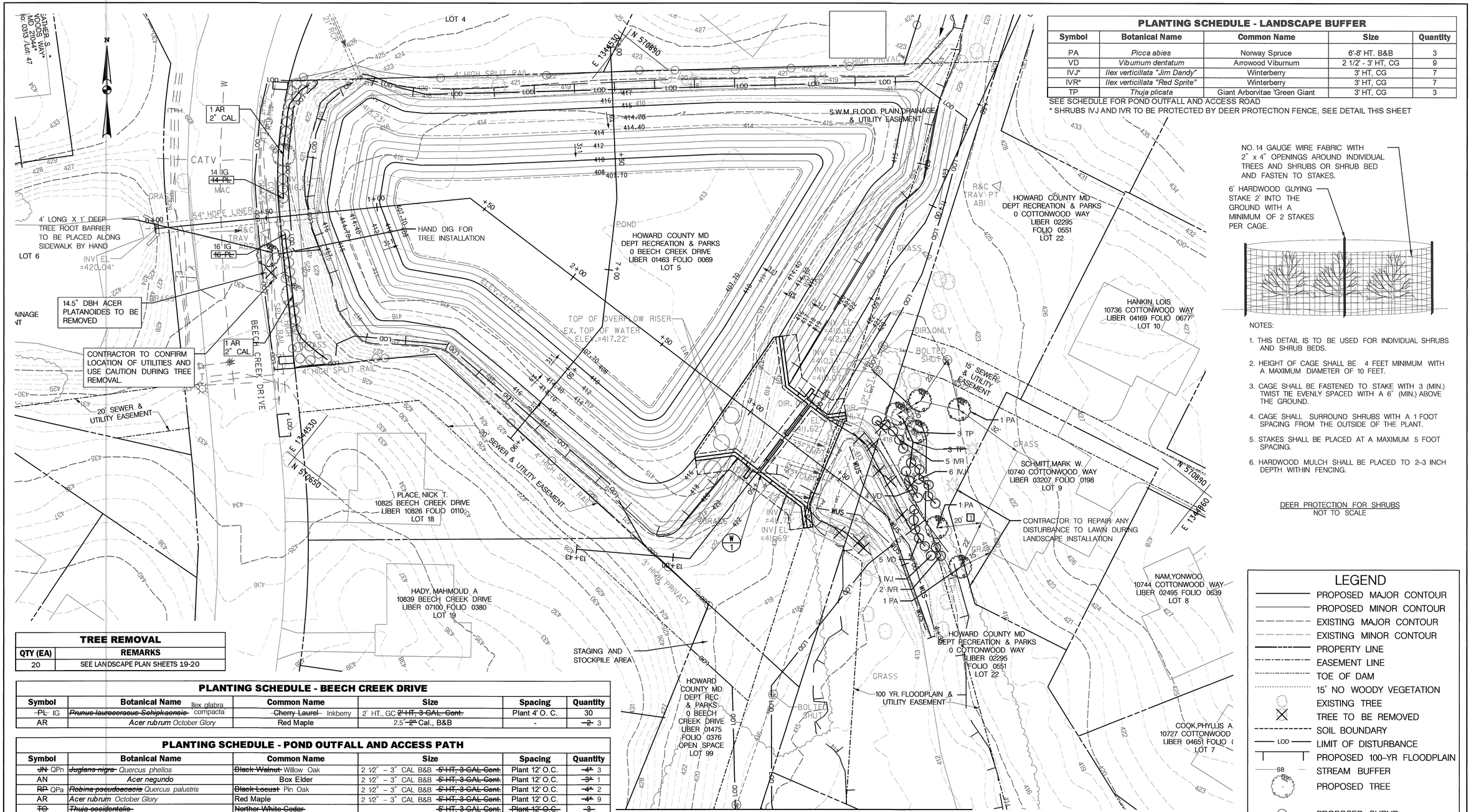
DES: CL
DRN: MR
CHK: AH
DATE: 10/13/17

BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

SOIL BORING AND DRIVE TESTS

SCALE: AS SHOWN



PLANTING SCHEDULE - LANDSCAPE BUFFER

Symbol	Botanical Name	Common Name	Size	Quantity
PA	*Picca abies*	Norway Spruce	6'-8' HT. B&B	3
VD	*Vibumum dentatum*	Arrowood Viburnum	2 1/2' - 3' HT, CG	9
IVJ*	*Ilex verticillata "Jim Dandy"*	Winterberry	3' HT, CG	7
IVR*	*Ilex verticillata "Red Sprite"*	Winterberry	3' HT, CG	7
TP	*Thuja plicata*	Giant Arborvitae 'Green Giant	3' HT, CG	3

SEE SCHEDULE FOR POND OUTFALL AND ACCESS ROAD

* SHRUBS IVJ AND IVR TO BE PROTECTED BY DEER PROTECTION FENCE, SEE DETAIL THIS SHEET

NO. 14 GAUGE WIRE FABRIC WITH 2" x 4" OPENINGS AROUND INDIVIDUAL TREES AND SHRUBS OR SHRUB BED AND FASTEN TO STAKES.

6' HARDWOOD GUYING STAKE 2' INTO THE GROUND WITH A MINIMUM OF 2 STAKES PER CAGE.

NOTES:

1. THIS DETAIL IS TO BE USED FOR INDIVIDUAL SHRUBS AND SHRUB BEDS.
2. HEIGHT OF CAGE SHALL BE 4 FEET MINIMUM WITH A MAXIMUM DIAMETER OF 10 FEET.
3. CAGE SHALL BE FASTENED TO STAKE WITH 3 (MIN.) TWIST TIE EVENLY SPACED WITH A 6" (MIN.) ABOVE THE GROUND.
4. CAGE SHALL SURROUND SHRUBS WITH A 1 FOOT SPACING FROM THE OUTSIDE OF THE PLANT.
5. STAKES SHALL BE PLACED AT A MAXIMUM 5 FOOT SPACING.
6. HARDWOOD MULCH SHALL BE PLACED TO 2-3 INCH DEPTH WITHIN FENCING.

DEER PROTECTION FOR SHRUBS
NOT TO SCALE

TREE REMOVAL

QTY (EA)	REMARKS
20	SEE LANDSCAPE PLAN SHEETS 19-20

PLANTING SCHEDULE - BEECH CREEK DRIVE

Symbol	Botanical Name	Common Name	Size	Spacing	Quantity
~~PL~~ IG	~~*Prunus laurocerasus Schipkaensis* compacta~~	~~Cherry Laurel~~ Inkberry	2' HT., GC ~~2' HT, 3 GAL. Cont.~~	Plant 4' O. C.	30
AR	*Acer rubrum October Glory*	Red Maple	2.5"~~-2"~~ Cal., B&B	-	~~2~~ 3

PLANTING SCHEDULE - POND OUTFALL AND ACCESS PATH

Symbol	Botanical Name	Common Name	Size	Spacing	Quantity
~~JN~~ QPn	~~*Juglans nigra*~~ *Quercus phellos*	~~Black Walnut~~ Willow Oak	2 1/2" – 3" CAL B&B ~~5' HT, 3 CAL Cont.~~	Plant 12' O.C.	~~4~~ 3
AN	*Acer negundo*	Box Elder	2 1/2" – 3" CAL B&B ~~5' HT, 3 CAL Cont.~~	Plant 12' O.C.	~~3~~ 1
~~RP~~ QPa	~~*Robina pseudoacacia* *Quercus palustris*~~	~~Black Locust~~ Pin Oak	2 1/2" – 3" CAL B&B ~~5' HT, 3 CAL Cont.~~	Plant 12' O.C.	~~4~~ 2
AR	*Acer rubrum October Glory*	Red Maple	2 1/2" – 3" CAL B&B ~~5' HT, 3 CAL Cont.~~	Plant 12' O.C.	~~4~~ 9
~~TO~~	~~*Thuja occidentalis*~~	~~Norther White Cedar~~	~~5' HT, 3 CAL Cont.~~	~~Plant 12' O.C.~~	~~3~~

*6 TREES NOT SHOWN ON PLANS ARE TO BE PLACED AT THE DISCRETION OF HOWARD COUNTY RECREATION AND PARKS SEE SHEET LS-03

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT LINE
- TOE OF DAM
- 15' NO WOODY VEGETATION
- EXISTING TREE
- TREE TO BE REMOVED
- SOIL BOUNDARY
- LOD — LIMIT OF DISTURBANCE
- PROPOSED 100-YR FLOODPLAIN
- SB — STREAM BUFFER
- PROPOSED TREE
- PROPOSED SHRUB

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 10/16/17

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

STATE OF MARYLAND — 32013 — PROFESSIONAL ENGINEER

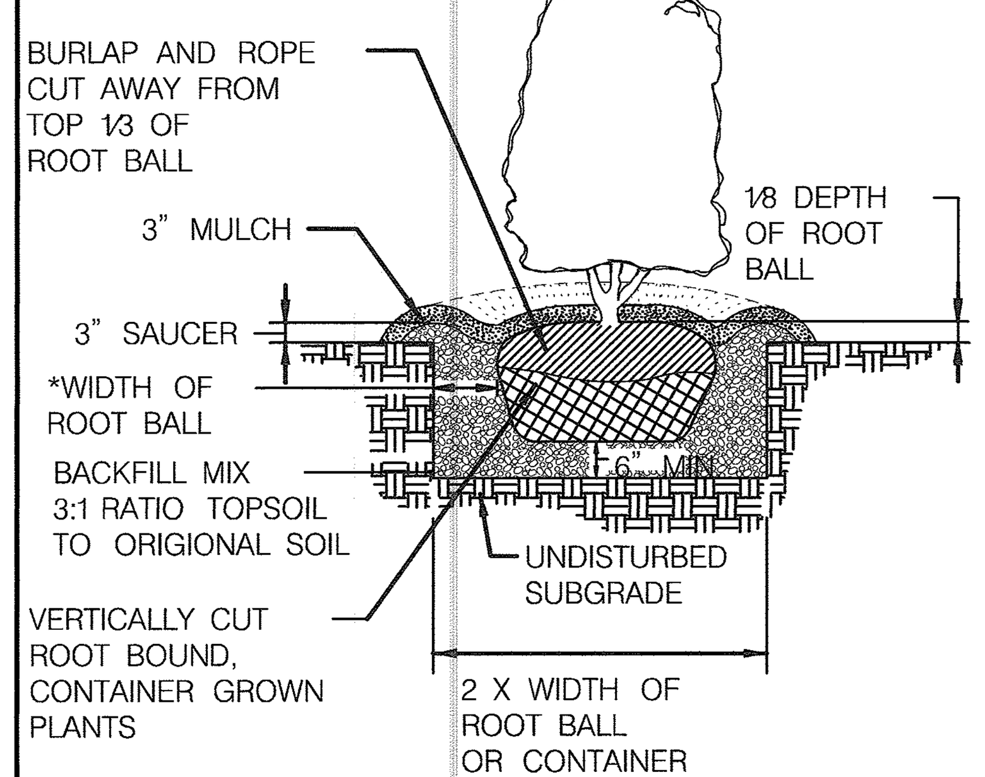
DES: CL				
DRN: MR				
CHK: AH				
DATE: 10/13/17	ADM	1	LANDSCAPING REVISION	4/13/18
	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

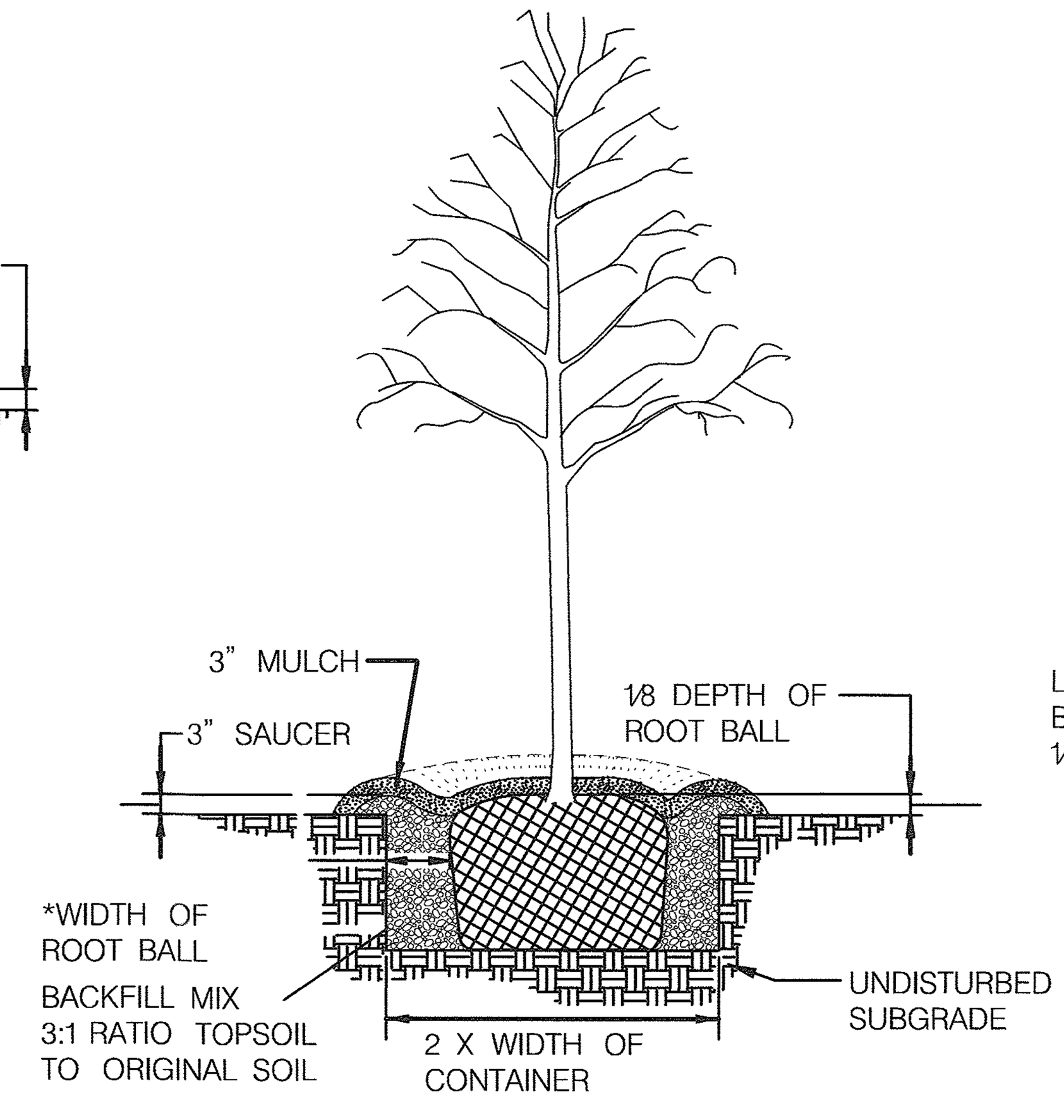
LANDSCAPE PLAN
LS-01 OF LS-02

SCALE: 1" = 20'

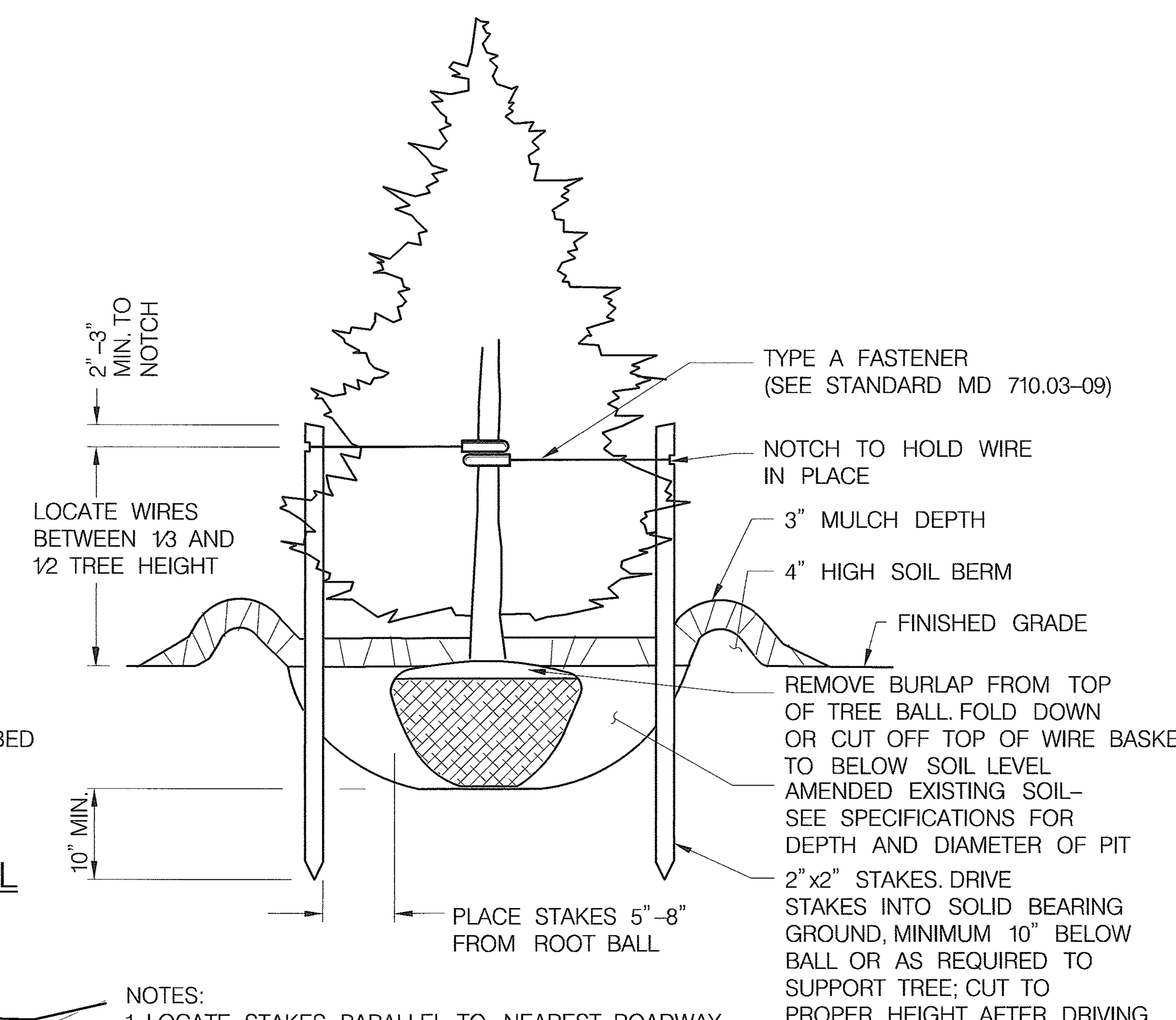
SHEET 19 OF 21



SHRUB PLANTING DETAIL
B & B AND CONTAINER GROWN
NOT TO SCALE

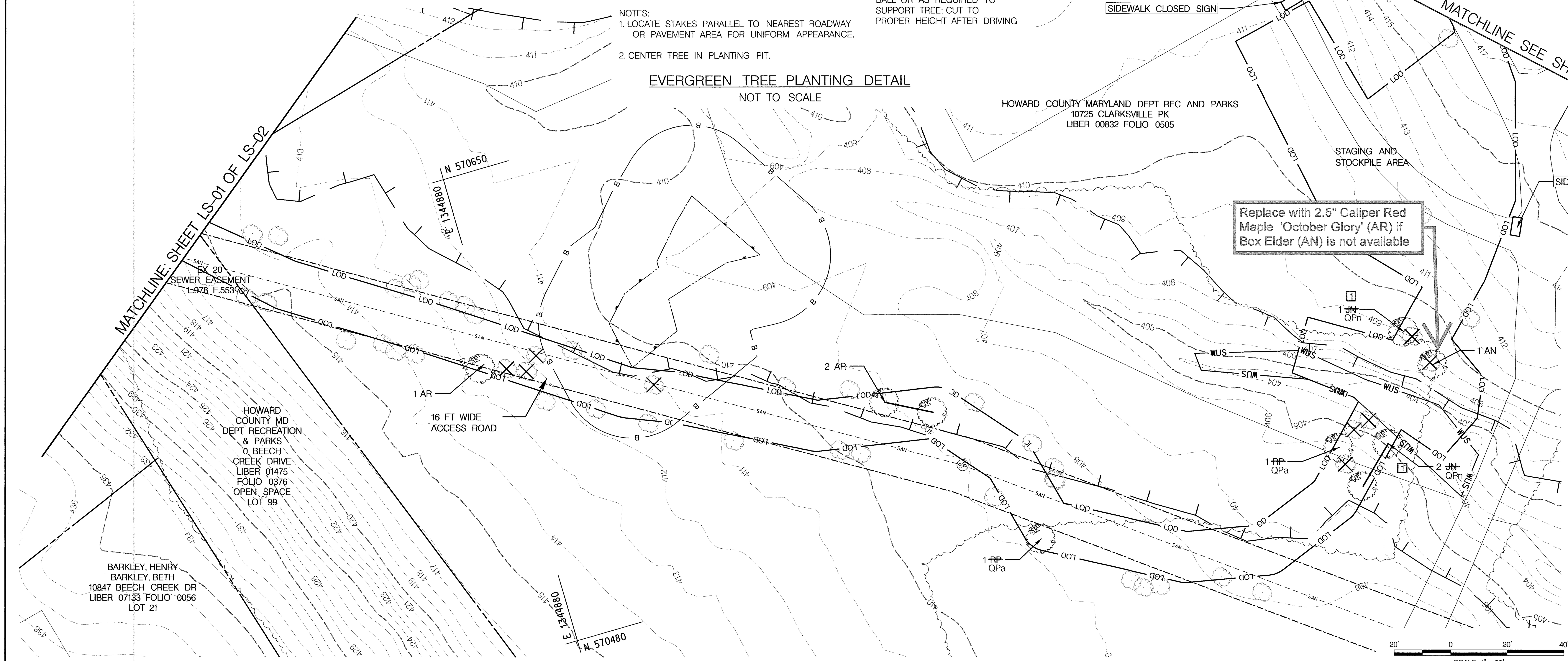


DECIDUOUS TREE PLANTING DETAIL
B & B AND CONTAINER GROWN
NOT TO SCALE



NOTES:
1. LOCATE STAKES PARALLEL TO NEAREST ROADWAY OR PAVEMENT AREA FOR UNIFORM APPEARANCE.
2. CENTER TREE IN PLANTING PIT.

EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE



NOTE:
1. SEE SHEET 19 FOR LANDSCAPING TABLE

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT LINE
- TOE OF DAM
- 15' NO WOODY VEGETATION
- EXISTING TREE
- TREE TO BE REMOVED
- SOIL BOUNDARY
- LOD — LIMIT OF DISTURBANCE
- PROPOSED 100-YR FLOODPLAIN
- SB — SR — STREAM BUFFER
- PROPOSED TREE
- PROPOSED SHRUB

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 10/16/17 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
DRN: MR
CHK: AH
DATE: 10/13/17

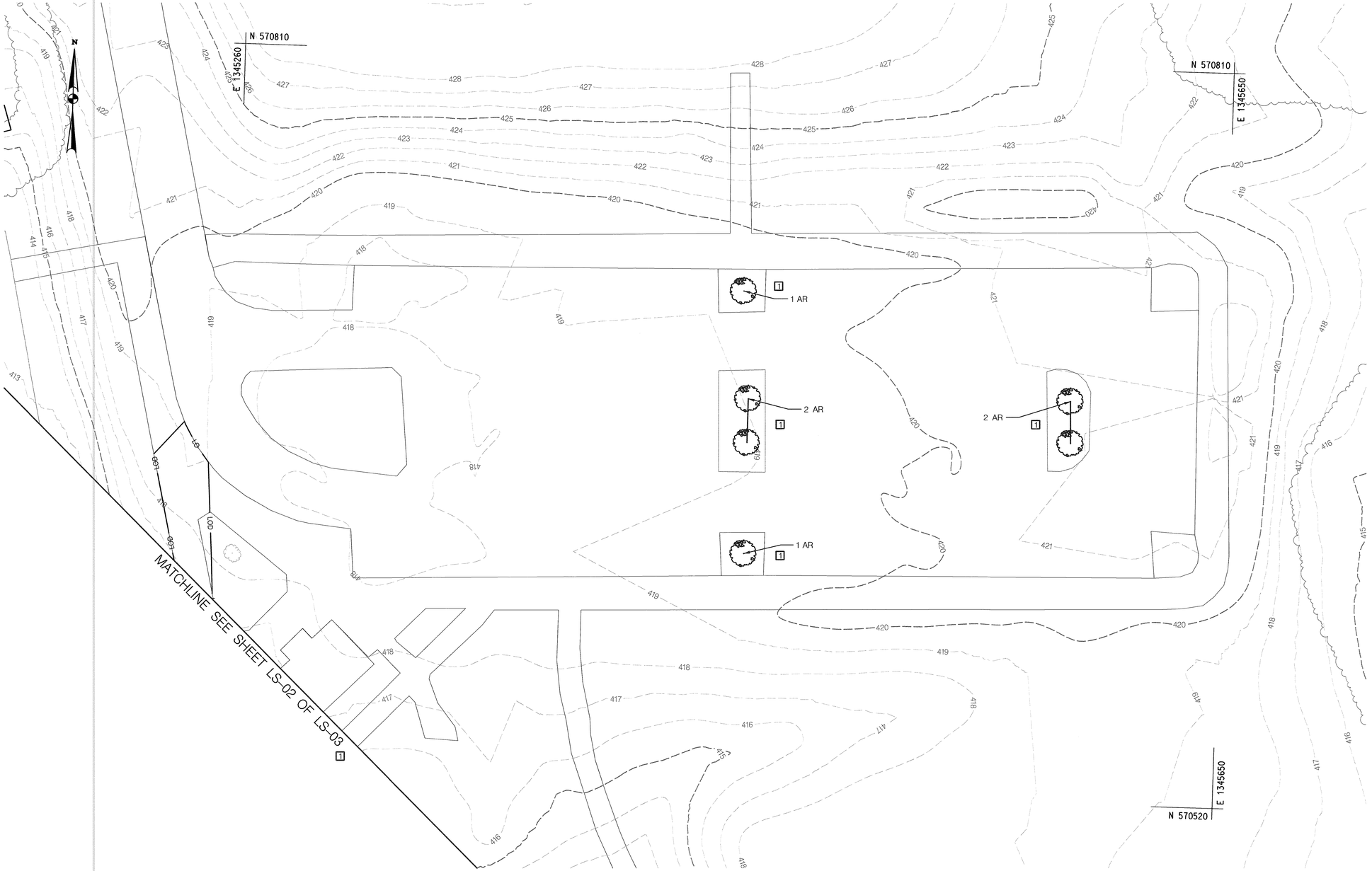
BY	NO.	REVISION	DATE
ADM	1	LANDSCAPING REVISION	4/13/18

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

LANDSCAPE PLAN
LS-02 OF LS-02

SCALE 1" = 20'

SHEET 20 OF 21



NOTE: SEE SHEET LS-01 FOR PLANTING SCHEDULE

NOTE:
1. SEE SHEET 19 FOR LANDSCAPING TABLE

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EASEMENT LINE
- TOE OF DAM
- 15' NO WOODY VEGETATION
- EXISTING TREE
- TREE TO BE REMOVED
- SOIL BOUNDARY
- LOD — LIMIT OF DISTURBANCE
- PROPOSED 100-YR FLOODPLAIN
- SB — SR — STREAM BUFFER
- PROPOSED TREE
- PROPOSED SHRUB

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE

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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

STATE OF MARYLAND — AMY HRIBAR — NO. 32013 — PROFESSIONAL ENGINEER

DES: CL
DRN: MR
CHK: AH
DATE: 10/13/17

BY	NO.	REVISION	DATE
ADM	1	LANDSCAPING REVISION	4/13/18

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

PARKING LOT LANDSCAPE PLAN
LS-03

SCALE: 1" = 20'

SHEET 20A OF 21

MAINTENANCE OF TRAFFIC LEGEND

- TEMPORARY CONSTRUCTION SIGN AND SUPPORT(S)
- TEMPORARY CONCRETE BARRIER
- TYPE III BARRICADE
- TEMPORARY TRAFFIC MOVEMENT
- EXISTING TRAFFIC MOVEMENT
- WORK AREA
- CHANNELIZING DEVICE
- FLAGGER LOCATION
- TEMPORARY ASPHALT PEDESTRIAN RAMP

NOTES:

1. PEDESTRIAN DETOUR TO BE ESTABLISHED ON THE SOUTHBOUND SIDE OF BEECH CREEK DRIVE PER MD STD. 104.06-09A AND MD STD. 104.06-09C.
2. PROVIDE TOP AND SIDE BARRIER MARKERS AS PER MD STD. 104.01-25
3. FLAGGING OPERATION IS ALLOWED BETWEEN THE HOURS OF 9 AM AND 3 PM
4. FLAGGERS MUST HAVE THEIR FLAGGER CARDS IN THEIR POSSESION DURING FLAGGING OPERATIONS

TEMPORARY PAVEMENT MARKING LEGEND

(A) 12 INCH SOLID WHITE REMOVABLE PAVEMENT MARKING TAPE

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES 10/16/17 DATE

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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

STATE OF MARYLAND
AMY H...
32013
PROFESSIONAL ENGINEER

DES: CL				
DRN: MR				
CHK: AH				
DATE: 10/13/17	BY	NO.	REVISION	DATE

BEECH CREEK DRIVE
STORMWATER MANAGEMENT RETROFIT PROJECT
CAPITAL PROJECT #D-1160
HOWARD COUNTY
HSCD #EP-16-23

MAINTENANCE OF TRAFFIC PLAN
MT-01 OF MT-01

SCALE
1" = 20'

SHEET
21 OF 21