

ROCKBURN BRANCH PARK

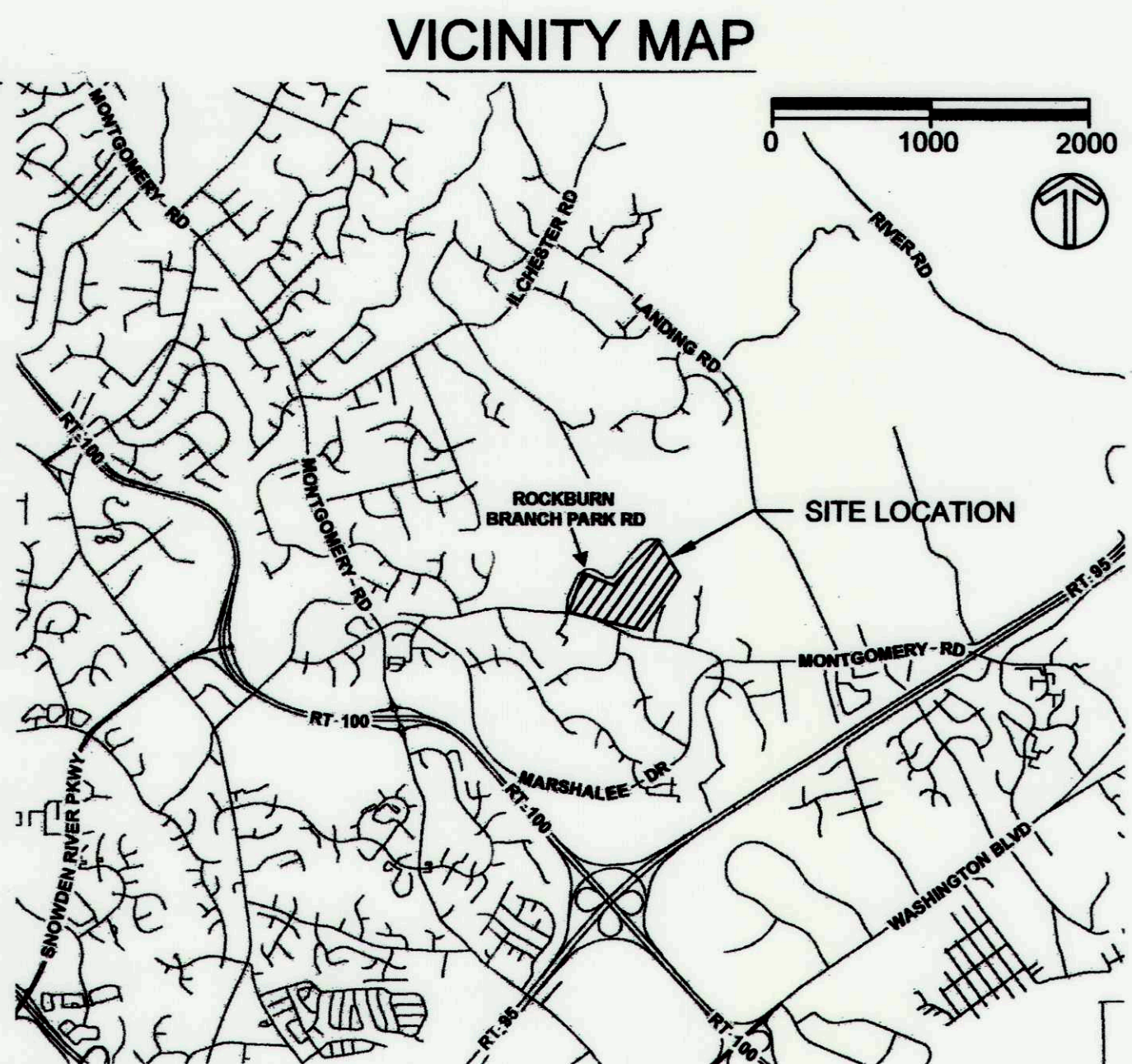
STREAM RESTORATION PROJECT - CAPITAL PROJECT # D-1158

GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
- A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (AM#96595; TRACKING #201661219) PROJECT IMPACTS INCLUDE WORK IN A USE 1 STREAM. UNDER THIS PERMIT, IN-STREAM WORK IS PROHIBITED FROM MARCH 1 TO JUNE 15, INCLUSIVE OF ANY YEAR.
- THE EXISTING TOPOGRAPHY WAS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY AB CONSULTANTS, INC. IN MARCH/APRIL 2016.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 37BC AND 37BA WERE USED FOR THIS PROJECT.
- WATER IS PUBLIC.
- SEWER IS PUBLIC.
- 100-YEAR FLOODPLAIN ELEVATION IS SHOWN ON THE PLANS. THERE ARE NO FEMA MAPPED FLOODPLAINS WITHIN THE PROJECT LIMITS.
- THE STREAM IS NOT A TIER II WATER. AS A TRIBUTARY TO ROCKBURN BRANCH WITHIN THE PATAPSCO WATERSHED, THE STREAM IS AN IMPAIRED WATERWAY WITH THE FOLLOWING TMDL'S:
 - TOTAL NITROGEN - GIS ID: G2390, REPORT: BALTIMORE HARBOR TIDAL NUTRIENTS
 - TOTAL PHOSPHORUS - GIS ID: G2390, REPORT: BALTIMORE HARBOR TIDAL NUTRIENTS
 - TSS - GIS ID: G1149, REPORT: PATAPSCO RIVER LOWER NORTH BRANCH SEDIMENT
 - ECOLI - GIS ID: G1149, REPORT: PATAPSCO RIVER LOWER NORTH BRANCH BACT
 - CHLORDANE - GIS ID: G2390, REPORT: BALTIMORE HARBOR CHLORDANE
- TEMPORARY STAGING AND/OR STOCKPILING OF ERODIBLE MATERIALS (E.G. EXCAVATED MATERIAL) WITHIN THE 100-YEAR FLOODPLAIN DESIGNATED ON THE PLANS SHALL BE LIMITED TO THE AMOUNT OF MATERIAL THE CONTRACTOR CAN PLACE AND/OR HAUL OFF IN A SINGLE DAY. THE CONTRACTOR SHALL MONITOR THE WEATHER FORECAST AND ADJUST STOCKPILE/STAGING OPERATIONS ACCORDINGLY TO MINIMIZE THE LOSS OF MATERIAL OR OTHER ADVERSE IMPACTS.
- THE CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS, AND/OR SUPPLIES BEYOND THE LIMIT OF DISTURBANCE SHOWN ON THE PLANS.
- EXISTING UTILITIES ARE BASED ON AVAILABLE RECORDS. THE CONTRACTOR MUST VERIFY INFORMATION TO HIS/HER SATISFACTION.
- THE WETLANDS DELINEATION FOR THIS SITE WAS PREPARED BY BIOHABITATS, DATED JAN 2016.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE.
- THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF 6 INCHES VERTICALLY AND A MINIMUM OF 5 FEET HORIZONTALLY.
- THE CONTRACTOR SHALL EXERCISE CARE IN ALL ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN. ALL EARTH CUTS AND ACTIVITIES IN THE VICINITY OF TREES TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRIPLINE OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCING SHALL BE APPROVED BY THE ENGINEER OR HIS/HER REPRESENTATIVE PRIOR TO CONSTRUCTION.
- UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
- BIOHABITATS SHALL CERTIFY IN WRITTEN LETTER THAT THE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED IN ACCORDANCE TO THESE PLANS.
- TEMPORARY DISTURBANCE WITHIN THE 75' PERENNIAL STREAM BUFFER, STREAM CHANNEL, 100-YR FLOODPLAIN, WETLAND AND WETLAND BUFFER ARE NECESSARY FOR CONSTRUCTION OF THE STREAM RESTORATION PROJECT IN ACCORDANCE WITH SECTION 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATION.
- THIS PROJECT IS ASSOCIATED WITH THE ROCKBURN BRANCH STREAM RESTORATION STOCKPILE AREA (EP-16-034; GRADING PERMIT NO. G16000177).
- DPZ APPROVED WAIVER PETITION #WP-17-015 ON SEPT. 14, 2016 FOR ALTERNATIVE COMPLIANCE TO SECTION 16.155(a)(1)(ii) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
- THE FOREST CONSERVATION OBLIGATION FOR PARCEL 235 HAS BEEN PREVIOUSLY ADDRESSED UNDER SDP-00-37. THE PROPOSED DISTURBANCE TO PARCEL 813 (BOARD OF EDUCATION) IS EXEMPT FROM ADDRESSING FOREST CONSERVATION SINCE IT IS ONLY TO RECONSTRUCT THE EXISTING SWM OUTFALL AND RIP-RAP.

HOWARD COUNTY PUBLIC SCHOOL SYSTEM HOWARD COUNTY, MARYLAND <i>Executive Director</i> CHIEF FACILITIES OFFICER	11/21/16 DATE
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- PROJECT LIMITS ARE WITHIN A FOREST CONSERVATION EASEMENT (FCE) AND WAS DETERMINED NECESSARY AND ESSENTIAL FOR THE IMPLEMENTATION OF THIS STREAM RESTORATION PROJECT. TREE REMOVAL WILL BE LIMITED TO THE MINIMUM NECESSARY TO COMPLETE THE WORK AND ALL DISTURBED FCE AREAS WILL BE REPLANTED IN COORDINATION WITH THE DEPARTMENT OF RECREATION & PARKS. TREE CLEARING WITHIN THE FCE IS 1.3 AC.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT <i>Howard SCD</i> Date	11/21/16 DATE
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ADC MAP COORDINATES:
MAP: 17 LETTER: A, A, B, B NUMBER: 5, 6, 5, 6

DESIGN NARRATIVE:
ROCKBURN BRANCH STREAM RESTORATION DESIGN WAS COMPLETED WITH THE FOLLOWING IN MIND:

- STREAM RESTORATION IS PROPOSED WITHIN THE LIMITS OF THE EXISTING CHANNEL TO ENHANCE STREAM FUNCTIONALITY AND IMPROVE FLOODPLAIN CONNECTION. MAJOR IMPACTS TO EXISTING WETLANDS AND TREES WERE AVOIDED AND MINIMIZED TO THE EXTENT POSSIBLE.
 - ALL PROPOSED GRADING MAINTAINS NATURAL FLOW PATTERNS OF THE SURROUNDING FLOODPLAIN FLOWING INTO THE TRIBUTARIES TO ROCKBURN BRANCH, WHILE ROCKBURN BRANCH CONTINUES TO FLOW AND DISCHARGE INTO THE PATAPSCO RIVER.
 - NO CHANGES IN IMPERVIOUS COVER OR NON-IMPERVIOUS AREAS ARE PROPOSED.
 - EROSION AND SEDIMENT CONTROLS WILL BE PROPOSED AT THE DESIGN SUBMITTAL PHASE TO PROPERLY CONTROL ALL SEDIMENT LADEN RUNOFF FROM THE CONSTRUCTION SITE AND PROTECT ALL DOWNSTREAM BODIES OF WATER IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. SWM IS NOT REQUIRED FOR THIS STREAM RESTORATION PROJECT.
 - NO ESD PRACTICES ARE BEING IMPLEMENTED.
 - ALL EXISTING TREE LINES WILL BE REESTABLISHED WITH NATIVE VEGETATION.
- SITE ANALYSIS DATA:
- TOTAL PROJECT AREA = 4.4 AC
 - WETLAND TOTAL AREA = 0.4 AC
 - WETLAND BUFFER TOTAL AREA = 0.3 AC
 - FLOODPLAIN AREA = 0.8 AC
 - FOREST AREA = 3.7 AC
 - STEEP SLOPES AREA = 0.9 AC
 - ERODIBLE SOILS AREA = 0.4 AC
 - DISTURBED AREA = 4.4 AC
 - PROPOSED SITE USE = FLOODPLAIN FOREST
 - PROPOSED IMPERVIOUS AREA = 0.0 AC

Property Owners	Deed	Map	Parcel	Plot No.
BOARD OF EDUCATION OF HD CT MD C/O HOWARD CT PUBLIC SCH	2607/674	31	813	-
HOWARD COUNTY MARYLAND DEPT REC AND PARKS	735/505	31	235	14461
HOWARD COUNTY MD	9839/125	37	45	17977
HOWARD COUNTY MD C/O REAL ESTATE SERVICES DIV	8159/254	37	202	16215
HOWARD COUNTY MD	13541/221	37	47	9862/52
HOWARD COUNTY MD	11664/196	37	48	20477
STRAIN EARL W SR L/E	6776/184	37	49	-
STRAIN EARL W SR L/E	4043/703	37	50	-
HOWARD COUNTY MD DEPT OF PUBLIC WORKS	11059/294	37	51	13272

EXISTING		PROPOSED	
GIS 2' CONTOURS	---	425	MAJOR CONTOUR
MAJOR CONTOUR	---	424	MINOR CONTOUR
MINOR CONTOUR	---	100	CHANNEL ALIGNMENT
SAN	---	---	PROPOSED 100 YEAR FLOODPLAIN
W	---	---	LIMIT OF DISTURBANCE
SD	---	---	BLAZE ORANGE FENCE
WL	---	DF	DIVERSION FENCE
TM	---	SF	SILT FENCE
WB	---	SSF	SUPER SILT FENCE
UsD	---	---	COBBLE RIFFLE
SrC	---	---	BOULDER RIFFLE
WUS	---	---	IMPERVIOUS CHANNEL PLUG
100 YR	---	---	WOODY TOE PROTECTION
---	---	---	LOG SILL
---	---	---	BOULDER TOE PROTECTION
---	---	---	COBBLE SILL
FCE	---	---	TREE REMOVAL
---	---	---	TREE SAVE
---	---	---	STAGING AND STOCKPILING AREA
---	---	---	MULCH ACCESS ROAD
---	---	---	SAME-DAY SOIL STABILIZATION MATTING
---	---	---	HARDWOOD MATTING
---	---	---	STABILIZED CONSTRUCTION ENTRANCE
---	---	---	TEMPORARY BRIDGE
---	---	---	FILTER BAG
---	---	---	PUMP
---	---	---	INTAKE/DISCHARGE HOSE SAND BAG DIKES

AS-BUILT LEGEND

---	STREAM CENTERLINE
---	MAJOR CONTOUR
---	MINOR CONTOUR
---	CONSTRUCTED RIFFLE OUTLINE
---	RIPRAP OUTFALL PROTECTION

Map Unit Symbol	Map Unit Name	K-Factor (Whole Soil)	Hydroic Rating	Hydrologic Soil Group	Permeability	Drainage Class
FsaA	Fallington sandy loam, 0-2% slopes	0.02	Hydric	D	NO	Rootly Drained
RuC	Russell fine sandy loam, 5-10% slopes	0.24	Non-Hydric	C	NO	Moderately Well Drained
RuB	Russell and Beltsville, 2-5% slopes	0.24	Non-Hydric	C	NO	Moderately Well Drained
SaC	Sassafras loam, 5-10% slopes	0.24	Non-Hydric	B	NO	Well Drained
SrC	Sassafras and Crom, 5-10% slopes	0.37	Non-Hydric	B	YES	Well Drained
SrD	Sassafras and Crom, 10-15% slopes	0.37	Non-Hydric	B	YES	Well Drained
UsD	Urban land-Sassafras-Beltsville complex, 5-15% slopes	0.37	Non-Hydric	D	YES	Well Drained

DEPARTMENT OF PUBLIC WORKS, HOWARD CO, MD

Jan G. Khan
11/16/16
DIRECTOR, DEPARTMENT OF PUBLIC WORKS
DATE

Mark P. DeLuca
11/18/16
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
DATE

Mark S. Schmitt
11/21/16
CHIEF, STORMWATER MANAGEMENT DIVISION
DATE

DEPARTMENT OF RECREATION AND PARKS, HOWARD CO, MD

Robert R. Boyd
11/18/16
DIRECTOR OF RECREATION AND PARKS
DATE

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 #: 48608
EXPIRATION DATE: 03/29/2017

ENGINEERS CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

BRAD ADAMI
11/17/2016
SIGNATURE OF ENGINEER (PRINTNAME BELOW SIGNATURE)
DATE

DEVELOPERS CERTIFICATE

"WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE THE BEGINNING OF THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

Jan G. Khan
11/18/16
SIGNATURE OF DEVELOPER (PRINTNAME BELOW SIGNATURE)
DATE

Sheet List Table	
Sheet Number	Sheet Title
1	TITLE SHEET AS-BUILT
2	EXISTING CONDITIONS
3	EXISTING CONDITIONS
4	EXISTING CONDITIONS
5	EXISTING CONDITIONS
6	EXISTING CONDITIONS
7	GEOMETRY TABLES
8	PROPOSED CONDITIONS AS-BUILT
9	PROPOSED CONDITIONS AS-BUILT
10	PROPOSED CONDITIONS AS-BUILT
11	PROPOSED CONDITIONS AS-BUILT
12	PROPOSED CONDITIONS AS-BUILT
13	PROFILES
14	PROFILES
15	PROFILES
16	PROFILES
17	PROFILES
18	PROFILES
19	CROSS-SECTIONS
20	DETAILS
21	DETAILS
22	DETAILS
23	EROSION AND SEDIMENT CONTROL PLAN - DRAINAGE AREAS
24	EROSION AND SEDIMENT CONTROL PLAN
25	EROSION AND SEDIMENT CONTROL PLAN
26	EROSION AND SEDIMENT CONTROL PLAN
27	EROSION AND SEDIMENT CONTROL PLAN
28	EROSION AND SEDIMENT CONTROL PLAN
29	EROSION AND SEDIMENT CONTROL DETAILS
30	EROSION AND SEDIMENT CONTROL DETAILS
31	EROSION AND SEDIMENT CONTROL DETAILS
32	EROSION AND SEDIMENT CONTROL DETAILS
33	EROSION AND SEDIMENT CONTROL NOTES
34	PLANTING PLAN
35	PLANTING PLAN
36	PLANTING PLAN
37	PLANTING PLAN
38	PLANTING PLAN
39	PLANTING DETAILS
40	PLANTING SCHEDULE

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

AS BUILT CERTIFICATE

I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.

Mark P. DeLuca
11/18/16
NAME: DATE
APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

Biohabitats

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fx: 410.554.0168 / www.biohabitats.com
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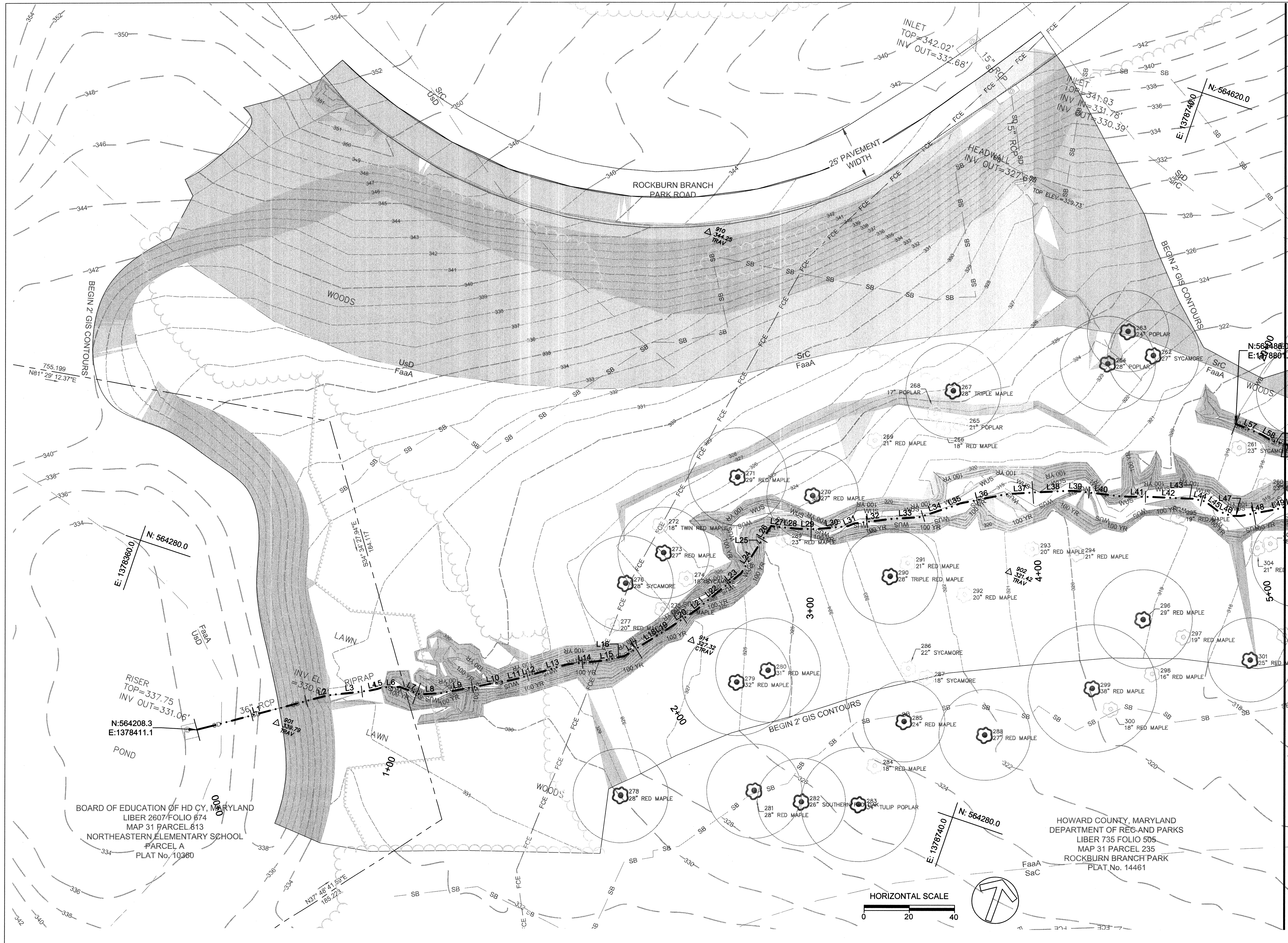
ROCKBURN BRANCH
STREAM
RESTORATION

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 00310023/0235
ELECTION DISTRICT: 07 OPEN LOT I/A
WAIVER PETITION #WP-17-015

TITLE SHEET
AS-BUILT

PROJECT NO.: 13005.36 SCALE: AS SHOWN

SEAL: BY: RW/KT CHECK: MDT
DATE: 11/18/16 DWG. NO.: 1 OF 40



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HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Environmental Services
 DATE

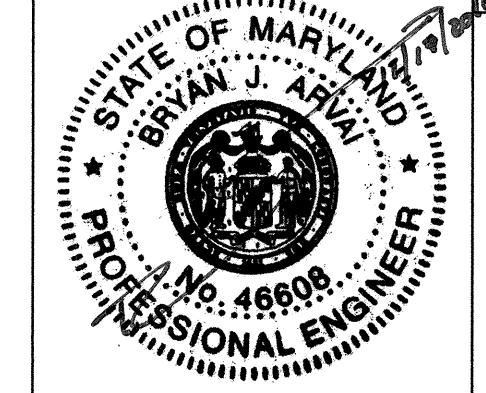
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

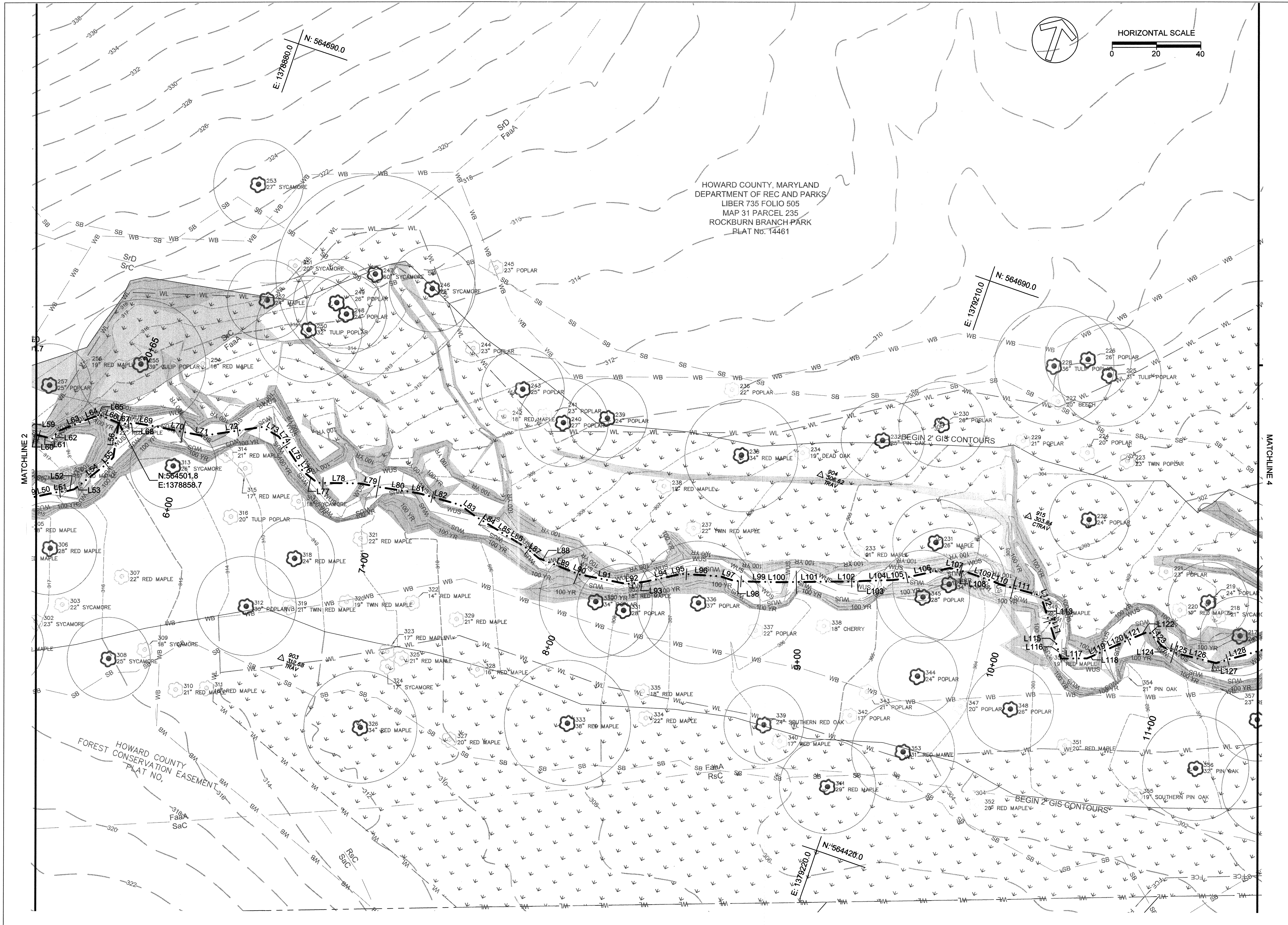
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRID/PARCEL: 0031/0023/0235
 ELECTION DISTRICT: 07 OPEN LOT NA
 WAIVER PETITION #WP-17-015

**EXISTING
 CONDITIONS**

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 SEAL: BY: RW/KT CHECK: MDT
 DWS. NO.:



2 OF 40

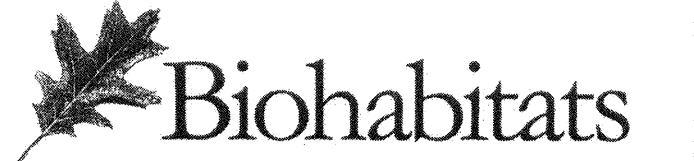


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HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
Matthew Shuman
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



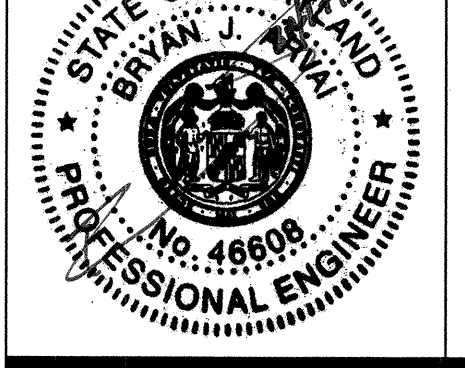
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

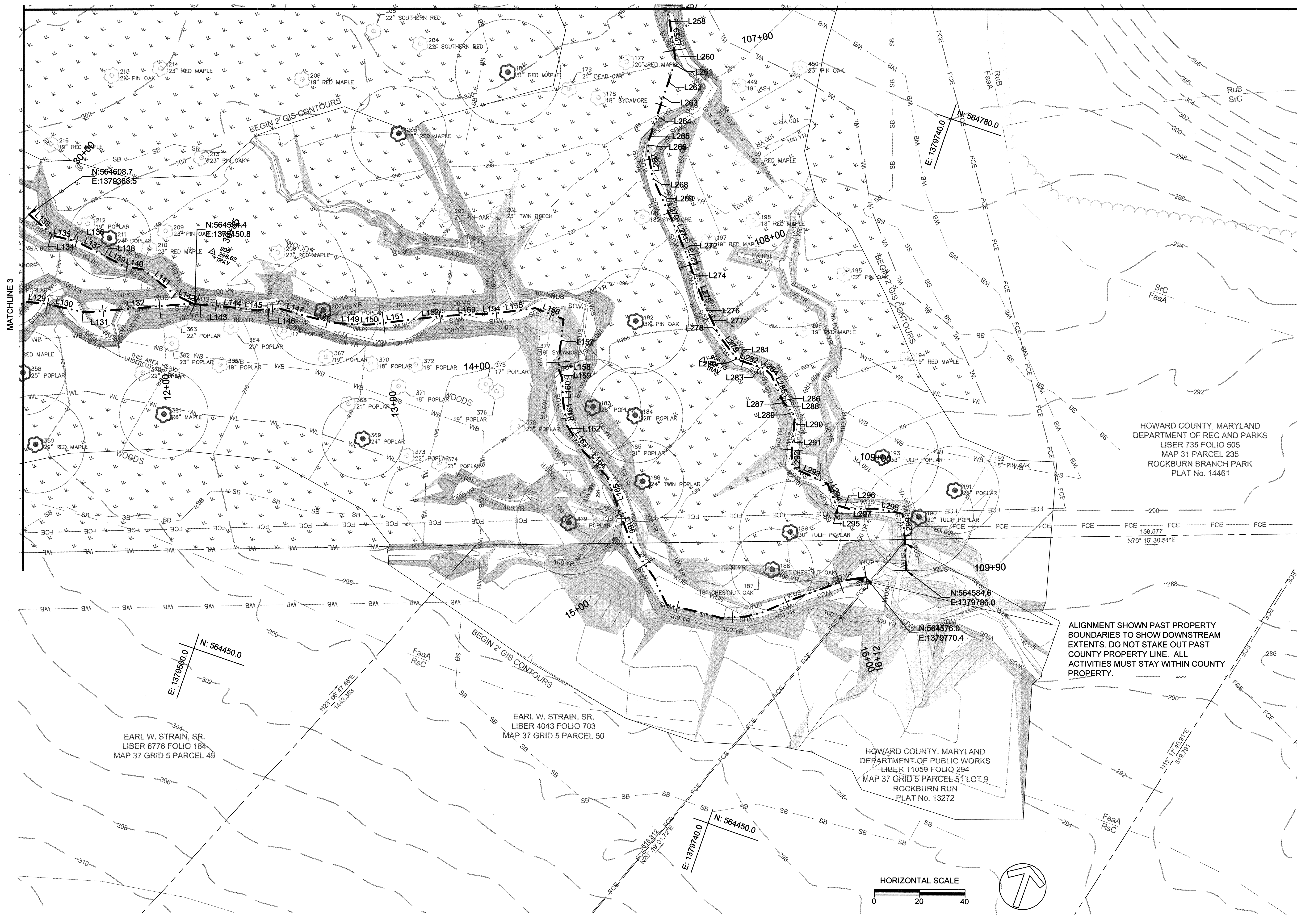
**EXISTING
 CONDITIONS**

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 SEAL: BY: RW/KWT CHECK: MDT
 DWG. NO.:



3 OF 40

MATCHLINE 5



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HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE	ISSUES / REVISIONS

APPROVED: *[Signature]* DEPARTMENT OF PUBLIC WORKS
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: *[Signature]*

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-29 TAX MAP GRID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

**EXISTING
 CONDITIONS**

PROJECT NO.:	13005.36	SCALE:	1" = 20'
SEAL:	BY: RW/KT	CHECK:	MDT
	DWG. NO.:		



MATCHLINE 6

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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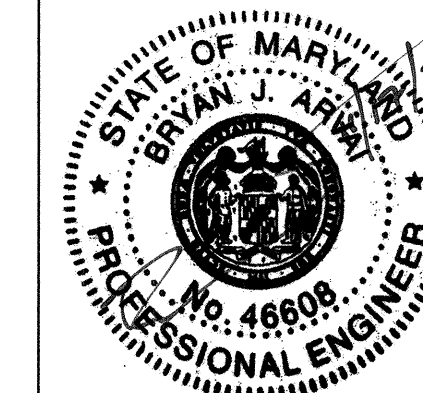
**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELKRIEGE, MD
ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
ELECTION DISTRICT: 07 OPEN LOT NA
WAIVER PETITION #WP-17-015

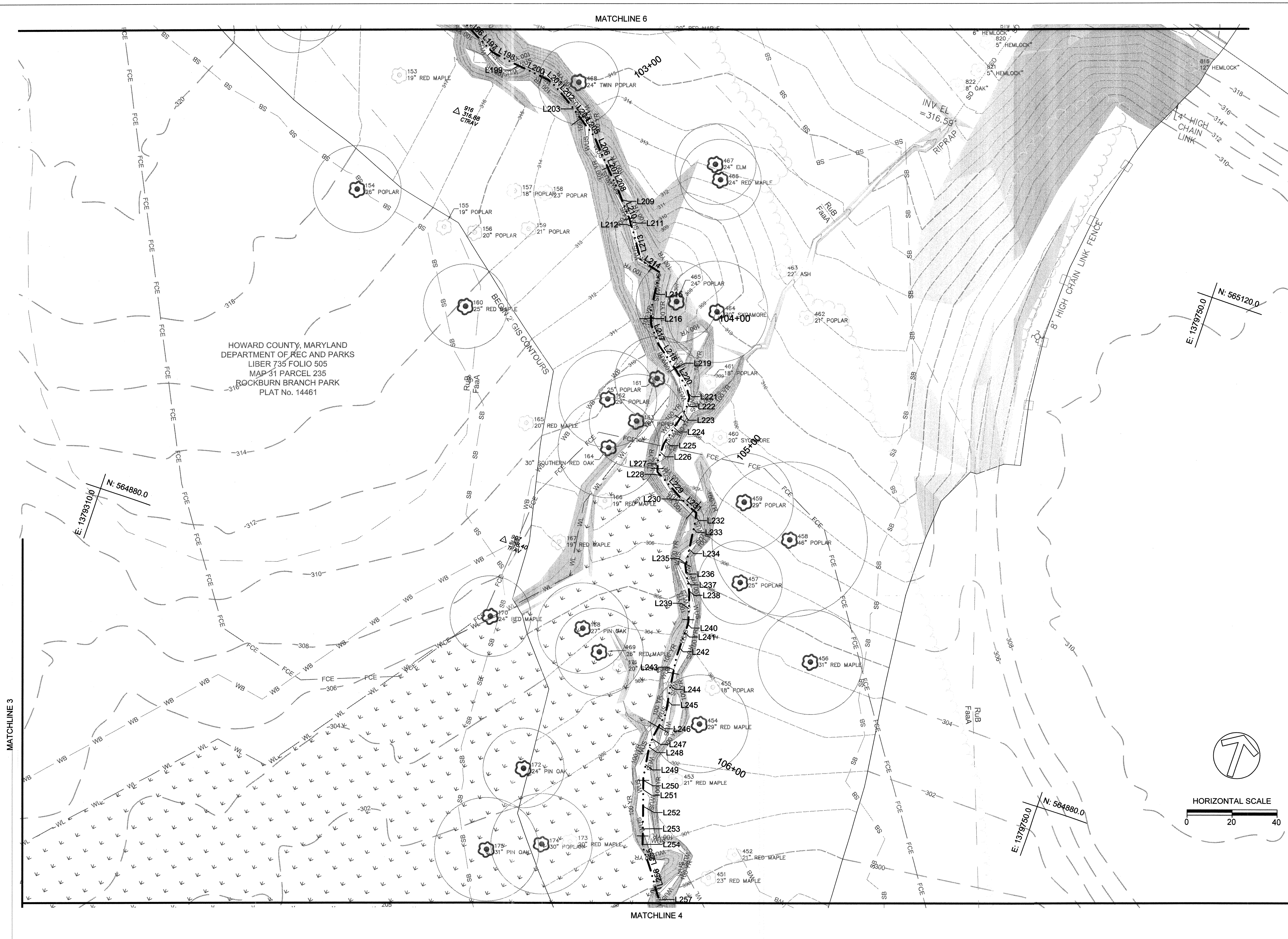
TITLE
**EXISTING
CONDITIONS**

PROJECT NO.: 13005.36 SCALE: 1" = 20'

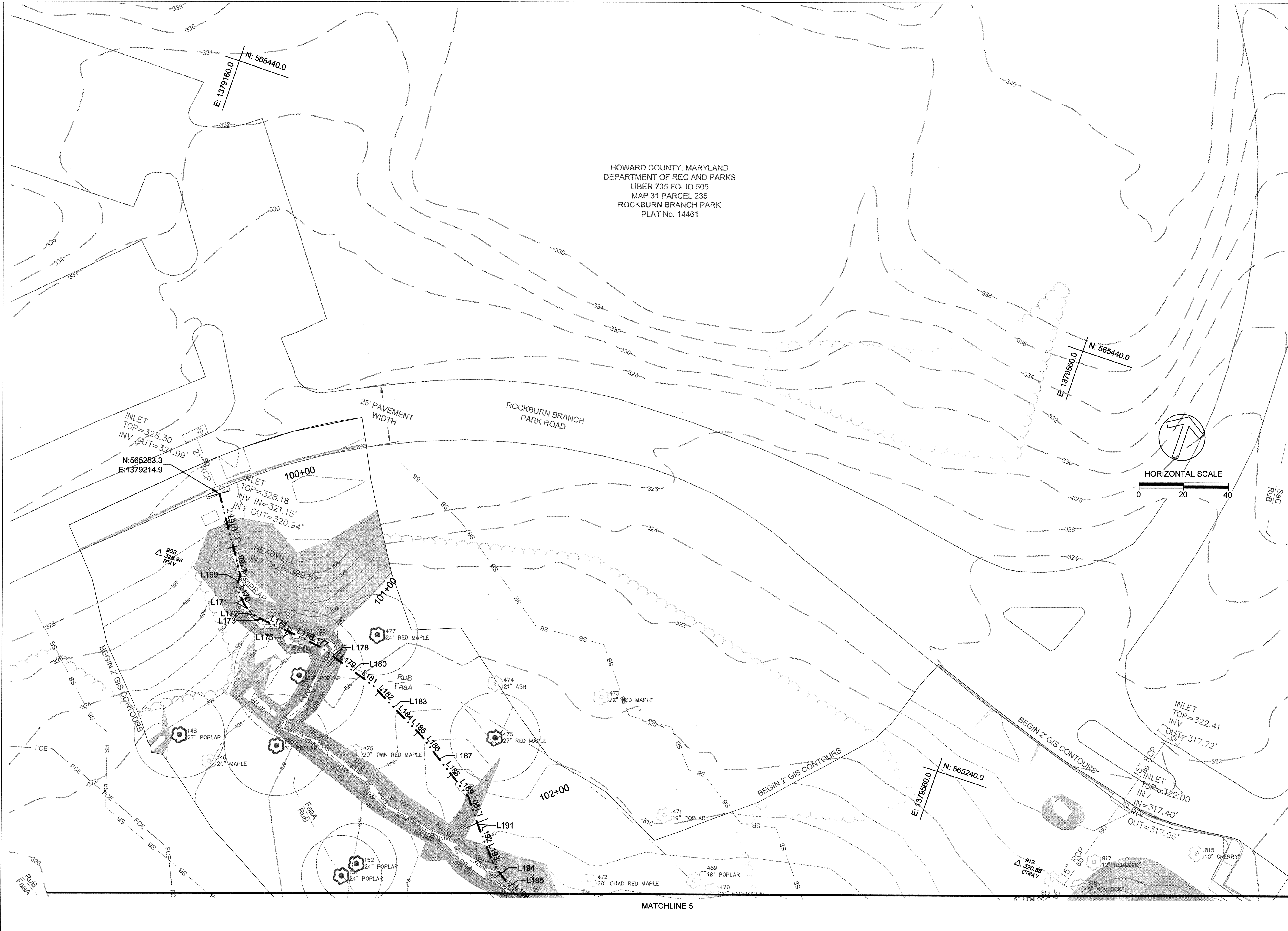
SEAL: BY: RW/KT CHECK: MDT
DWG. NO.:



5 OF 40



MATCHLINE 4



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HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
Michael W. ...
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE *4/19/16*

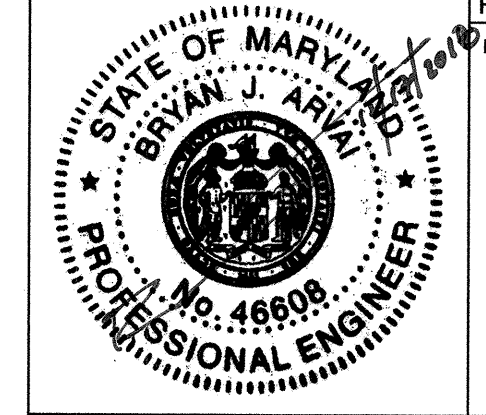
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**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 003100230235
ELECTION DISTRICT: 07 OPEN LOT WA
WAIVER PETITION #WP-17-015

**EXISTING
CONDITIONS**

PROJECT NO.: 13005.36 SCALE: 1" = 20'
SEAL: BY: RW/KT CHECK: MDT
DWG. NO.:



6 OF 40

Line Table: Alignments		
Line #	Length	Direction
L1	55.1	N56° 11' 12"E
L2	5.3	N58° 15' 26"E
L3	18.0	N64° 34' 05"E
L4	3.4	N59° 04' 06"E
L5	2.4	N52° 00' 29"E
L6	7.8	N69° 44' 56"E
L7	9.5	S88° 08' 57"E
L8	9.2	N67° 47' 53"E
L9	16.0	N60° 10' 17"E
L10	16.0	N60° 34' 56"E
L11	3.1	N56° 30' 11"E
L12	10.6	N54° 36' 11"E
L13	11.9	N54° 48' 12"E
L14	16.0	N64° 50' 44"E
L15	4.0	N59° 33' 01"E
L16	5.9	N58° 08' 43"E
L17	10.5	N38° 34' 27"E
L18	8.0	N38° 38' 45"E
L19	4.0	N38° 38' 45"E
L20	16.0	N37° 37' 09"E
L21	2.3	N30° 44' 11"E
L22	14.3	N31° 39' 33"E
L23	8.0	N32° 23' 25"E
L24	14.0	N13° 19' 53"E
L25	3.0	N13° 26' 14"E
L26	7.9	N12° 52' 14"E
L27	4.7	N77° 53' 49"E
L28	7.4	N76° 22' 00"E
L29	8.0	N71° 54' 36"E
L30	14.0	N65° 43' 49"E
L31	3.0	N47° 28' 34"E
L32	16.8	N63° 59' 10"E
L33	12.0	N67° 55' 29"E
L34	16.0	N53° 11' 49"E
L35	3.0	N47° 43' 32"E
L36	20.6	N59° 18' 12"E
L37	13.4	N67° 11' 12"E
L38	16.0	N68° 59' 22"E
L39	3.0	N75° 45' 12"E
L40	19.8	N77° 53' 33"E
L41	12.0	N71° 58' 49"E
L42	16.0	N73° 40' 14"E
L43	3.2	N74° 22' 41"E
L44	5.4	N83° 45' 11"E
L45	7.0	S71° 29' 12"E
L46	6.2	S88° 25' 52"E
L47	4.3	N70° 54' 08"E
L48	16.0	N60° 33' 23"E
L49	3.0	N55° 30' 28"E
L50	9.8	N59° 19' 10"E

Line Table: Alignments		
Line #	Length	Direction
L51	4.6	N65° 21' 03"E
L52	4.0	N57° 24' 42"E
L53	4.0	N33° 03' 36"E
L54	16.0	N32° 57' 26"E
L55	3.1	N20° 53' 18"E
L56	15.8	N10° 10' 49"W
L57	12.2	S87° 08' 21"E
L58	5.3	S78° 18' 55"E
L59	4.3	N87° 27' 12"E
L60	2.6	N83° 09' 30"E
L61	6.7	N84° 58' 38"E
L62	4.5	N19° 34' 32"E
L63	16.0	N49° 18' 59"E
L64	2.0	N49° 10' 50"E
L65	2.5	N61° 50' 04"E
L66	8.8	S85° 14' 45"E
L67	3.8	N77° 55' 01"E
L68	4.0	N66° 20' 55"E
L69	8.7	N81° 08' 47"E
L70	20.0	N82° 34' 38"E
L71	2.0	N82° 34' 38"E
L72	27.2	N62° 42' 40"E
L73	8.6	S78° 28' 52"E
L74	4.0	S55° 24' 56"E
L75	14.0	S52° 46' 35"E
L76	2.0	S58° 29' 34"E
L77	7.8	S70° 45' 50"E
L78	19.1	N72° 04' 28"E
L79	9.2	N81° 52' 34"E
L80	16.0	N80° 05' 59"E
L81	2.0	N80° 09' 01"E
L82	19.0	N86° 34' 08"E
L83	8.0	S72° 24' 37"E
L84	14.0	S76° 54' 10"E
L85	2.0	S76° 02' 04"E
L86	11.4	S77° 40' 06"E
L87	7.8	S69° 36' 26"E
L88	4.0	S86° 39' 01"E
L89	14.0	S87° 28' 10"E
L90	2.0	S86° 47' 44"E
L91	21.6	N82° 29' 02"E
L92	5.1	N64° 37' 50"E
L93	4.0	N61° 59' 14"E
L94	14.0	N58° 40' 00"E
L95	2.0	N58° 40' 00"E
L96	17.7	N74° 36' 50"E
L97	6.2	N89° 36' 03"E
L98	4.5	N74° 56' 32"E
L99	14.0	N72° 20' 19"E
L100	2.0	N70° 51' 55"E

Line Table: Alignments		
Line #	Length	Direction
L101	27.2	N70° 29' 57"E
L102	6.5	N71° 24' 52"E
L103	4.0	N66° 34' 41"E
L104	14.0	N69° 16' 36"E
L105	2.0	N64° 21' 16"E
L106	24.0	N58° 32' 06"E
L107	3.8	N82° 16' 06"E
L108	4.0	N85° 35' 51"E
L109	14.0	S89° 05' 54"E
L110	2.0	S86° 09' 58"E
L111	19.0	N86° 19' 00"E
L112	3.9	S39° 04' 28"E
L113	4.0	S36° 28' 16"E
L114	14.0	S36° 37' 30"E
L115	2.0	S36° 37' 30"E
L116	6.3	S36° 37' 30"E
L117	11.7	N70° 48' 42"E
L118	4.0	N47° 39' 34"E
L119	4.0	N46° 45' 54"E
L120	14.0	N46° 58' 49"E
L121	2.0	N48° 56' 49"E
L122	6.3	N48° 56' 49"E
L123	9.2	S61° 36' 55"E
L124	5.4	S82° 26' 15"E
L125	4.0	N88° 54' 53"E
L126	14.0	N84° 43' 20"E
L127	2.0	N85° 19' 25"E
L128	21.5	N55° 09' 20"E
L129	8.0	N76° 59' 09"E
L130	16.0	N83° 50' 08"E
L131	2.0	N83° 50' 08"E
L132	45.0	N66° 21' 05"E
L133	12.2	S66° 54' 38"E
L134	2.4	S69° 06' 11"E
L135	6.7	N84° 14' 38"E
L136	4.0	N86° 06' 06"E
L137	13.0	S81° 16' 33"E
L138	1.0	S77° 37' 59"E
L139	9.5	S81° 39' 56"E
L140	8.5	N81° 47' 05"E
L141	17.9	S70° 29' 54"E
L142	9.8	S82° 56' 02"E
L143	12.0	N74° 26' 43"E
L144	16.0	N78° 04' 53"E
L145	3.0	N73° 24' 18"E
L146	10.1	N67° 50' 00"E
L147	13.1	N87° 42' 54"E
L148	12.0	N85° 10' 36"E
L149	14.0	N73° 53' 29"E
L150	3.0	N69° 14' 23"E

Line Table: Alignments		
Line #	Length	Direction
L151	19.8	N63° 55' 19"E
L152	12.0	N64° 43' 31"E
L153	20.0	N68° 13' 00"E
L154	2.0	N68° 45' 46"E
L155	18.4	N63° 20' 42"E
L156	13.4	S86° 42' 47"E
L157	18.7	S12° 10' 35"E
L158	4.0	S22° 00' 34"E
L159	3.9	S40° 15' 22"E
L160	10.0	S21° 02' 14"E
L161	10.6	S27° 20' 47"E
L162	4.0	S51° 26' 27"E
L163	10.0	S51° 26' 27"E
L164	15.2	S62° 11' 19"E
L165	16.0	S38° 03' 52"E
L166	15.6	S39° 01' 10"E
L167	28.1	S33° 32' 38"E
L168	10.3	S31° 55' 43"E
L169	5.1	S00° 08' 13"E
L170	8.8	S42° 31' 25"E
L171	5.3	S59° 50' 51"E
L172	4.0	S78° 58' 50"E
L173	2.4	S81° 49' 02"E
L174	12.0	S84° 04' 47"E
L175	2.0	S83° 25' 00"E
L176	10.5	S83° 25' 00"E
L177	4.0	S83° 25' 00"E
L178	12.0	S72° 08' 53"E
L179	2.0	S72° 35' 37"E
L180	6.9	S72° 35' 37"E
L181	8.0	S72° 35' 37"E
L182	12.0	S62° 36' 40"E
L183	2.0	S62° 53' 05"E
L184	9.2	S62° 53' 05"E
L185	8.0	S62° 53' 05"E
L186	12.0	S55° 48' 14"E
L187	2.0	S56° 05' 11"E
L188	13.0	S55° 48' 06"E
L189	8.0	S55° 48' 06"E
L190	12.0	S37° 59' 16"E
L191	2.0	S40° 51' 34"E
L192	9.2	S40° 51' 34"E
L193	8.0	S40° 51' 34"E
L194	12.0	S53° 43' 03"E
L195	2.0	S62° 20' 20"E
L196	9.6	S62° 20' 20"E
L197	8.0	S62° 18' 04"E
L198	12.0	S80° 57' 35"E
L199	2.0	S83° 40' 39"E
L200	13.4	S83° 40' 36"E

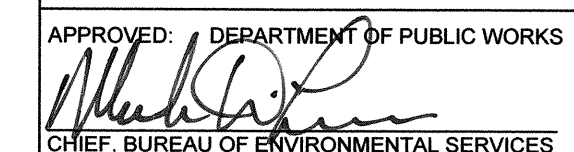
Line Table: Alignments		
Line #	Length	Direction
L201	4.0	S67° 52' 32"E
L202	12.0	S59° 41' 49"E
L203	2.0	S55° 32' 42"E
L204	6.3	S55° 33' 15"E
L205	8.0	S55° 33' 30"E
L206	12.0	S42° 27' 33"E
L207	7.7	S42° 38' 21"E
L208	8.0	S43° 21' 48"E
L209	6.0	S39° 37' 18"E
L210	6.0	S40° 33' 24"E
L211	3.0	S31° 56' 17"E
L212	1.7	S42° 04' 38"E
L213	14.8	S33° 48' 02"E
L214	9.7	S76° 00' 57"E
L215	17.3	S06° 23' 50"E
L216	6.0	S19° 06' 44"E
L217	9.9	S39° 13' 52"E
L218	12.0	S52° 54' 35"E
L219	2.0	S52° 54' 35"E
L220	8.8	S49° 58' 24"E
L221	4.6	S34° 02' 04"E
L222	5.3	S02° 55' 35"E
L223	4.0	S13° 09' 16"W
L224	12.0	S13° 27' 55"W
L225	2.4	S14° 21' 18"W
L226	8.7	S00° 00' 10"E
L227	4.5	S18° 03' 49"E
L228	4.2	S61° 30' 00"E
L229	12.0	S60° 10' 16"E
L230	2.0	S60° 15' 18"E
L231	6.9	S67° 42' 24"E
L232	3.5	S12° 14' 40"E
L233	7.0	S06° 27' 56"E
L234	12.0	S06° 58' 40"E
L235	1.2	S06° 59' 47"W
L236	5.1	S25° 08' 52"E
L237	4.7	S29° 57' 49"E
L238	4.0	S23° 22' 16"E
L239	12.0	S17° 07' 38"E
L240	2.0	S03° 10' 53"E
L241	6.1	S00° 51' 28"W
L242	8.1	S00° 17' 31"W
L243	12.0	S07° 22' 35"E
L244	2.0	S06° 32' 37"E
L245	12.0	S09° 06' 21"E
L246	10.6	S10° 14' 53"W
L247	3.8	S04° 29' 26"W
L248	4.2	S04° 01' 49"E
L249	12.0	S08° 32' 43"E
L250	2.0	S18° 33' 13"E


Line Table: Alignments		
Line #	Length	Direction
L251	6.9	S18° 33' 13"E
L252	8.0	S18° 33' 13"E
L253	12.0	S17° 57' 03"E
L254	2.0	S17° 57' 03"E
L255	11.2	S37° 19' 53"E
L256	8.0	S34° 25' 48"E
L257	12.0	S35° 57' 53"E
L258	2.0	S27° 40' 49"E
L259	12.2	S27° 40' 49"E
L260	4.0	S27° 06' 23"E
L261	4.0	S00° 35' 06"E
L262	12.0	S00° 35' 06"E
L263	2.0	S00° 27' 16"E
L264	15.4	N00° 27' 16"W
L265	4.0	S00° 27' 16"E
L266	4.0	S13° 53' 32"E
L267	12.0	S28° 07' 10"E
L268	2.0	S43° 20' 12"E
L269	11.7	N43° 23' 51"W
L270	8.0	S43° 14' 52"E
L271	12.0	S42° 09' 59"E
L272	2.0	S43° 12' 04"E
L273	7.2	S37° 51' 15"E
L274	8.0	S37° 38' 43"E
L275	12.0	S40° 00' 50"E
L276	2.0	S44° 51' 43"E
L277	7.8	S44° 41' 55"E
L278	4.0	S46° 05' 35"E
L279	12.0	S55° 41' 22"E
L280	1.2	S66° 44' 07"E
L281	1.0	S88° 57' 06"E
L282	7.3	N89° 02' 45"E
L283	4.0	N88° 59' 55"E
L284	4.0	S66° 13' 02"E
L285	12.0	S43° 12' 00"E
L286	1.0	S43° 12' 00"E
L287	1.0	S57° 29' 44"E
L288	3.1	S58° 55' 06"E
L289	4.0	S56° 22' 22"E
L290	4.0	S14° 13' 45"E
L291	12.0	S13° 45' 11"E
L292	6.7	S21° 07' 34"E
L293	17.2	S84° 15' 47"E
L294	10.3	S40° 11' 07"E
L295	1.9	N86° 56' 43"E
L296	4.0	N86° 56' 43"E
L297	12.0	N70° 42' 39"E
L298	11.8	N82° 03' 03"E
L299	11.6	S24° 02' 21"E

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS

 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE 11/15/16



The Stables Building 2081 Clipper Park Road
 Baltimore, MD 21211 / ph: 410.554.0156
 fx: 410.554.0168 / www.biohabitats.com
 Restore the Earth & Inspire Ecological Stewardship

**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

GEOMETRY TABLES

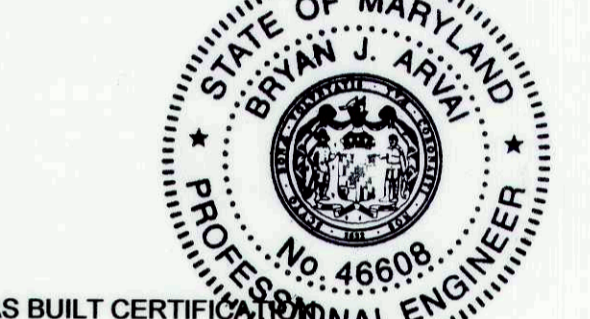
PROJECT NO.: 13005.36 SCALE: 1" = 20'



CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS



AS BUILT CERTIFICATE

I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.

NAME: *Bryan J. Arvink* DATE: 27 June 2017

APPROVED: DEPARTMENT OF PUBLIC WORKS
Michael R. Peterson
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: *10/26/17*

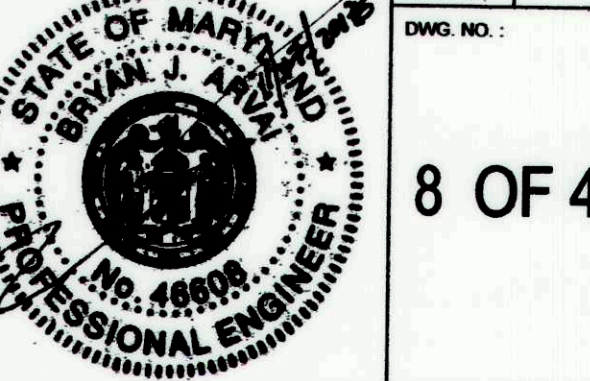
The Stables Building, 2081 Clipper Park Road
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

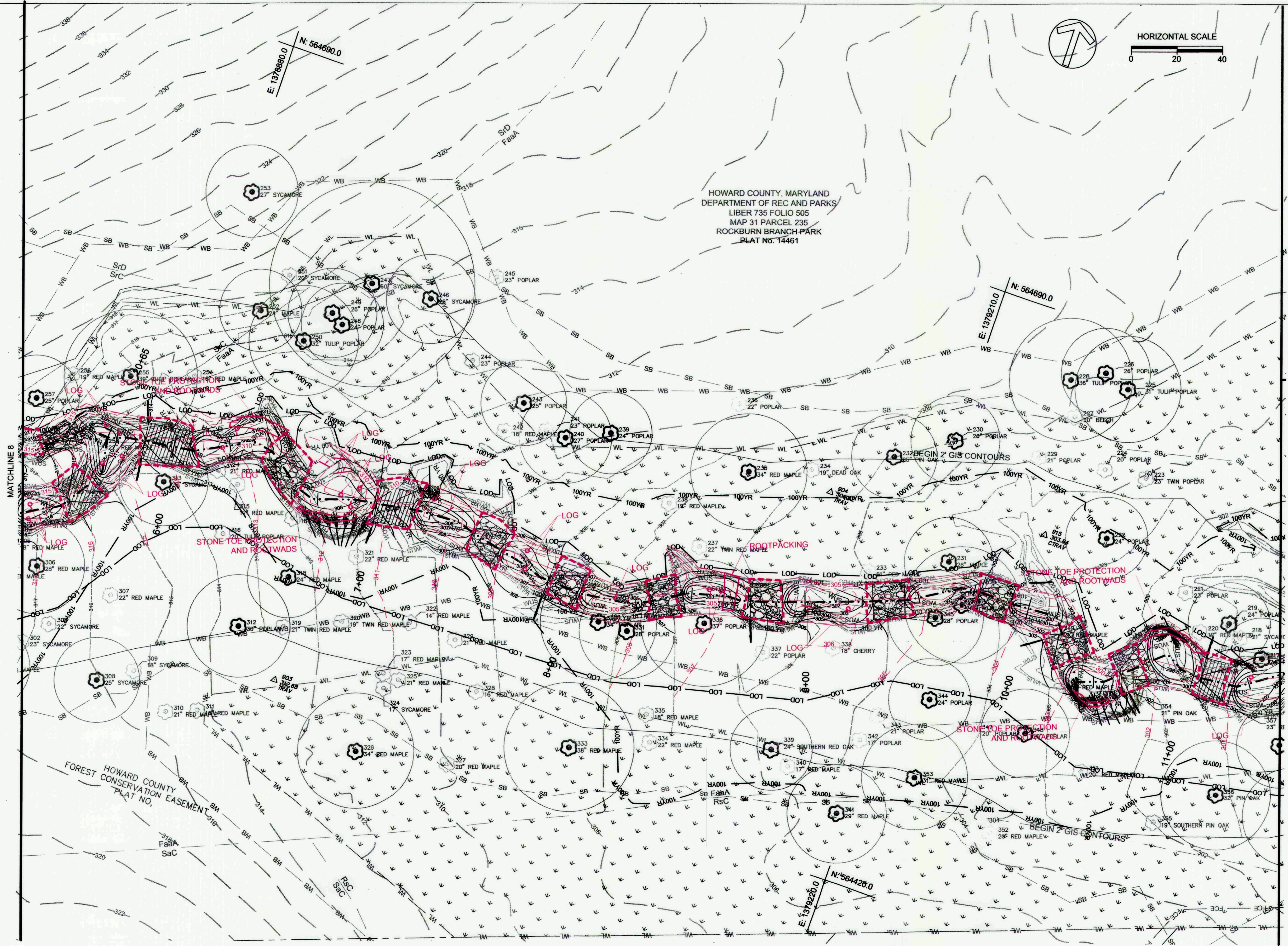
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRID/PARCEL: 0031/0023/0225
 ELECTION DISTRICT: 07 OPEN LOT #1A
 WAIVER PETITION #WP-17-015

**PROPOSED
 CONDITIONS
 AS-BUILT**

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 BY: RW/KT CHECK: MDT
 SEAL: DWG. NO.:



8 OF 40



HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT NO. 14461

CLIENT
 HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE: _____ ISSUES / REVISIONS: _____

STATE OF MARYLAND
 BRYAN J. ARIANO
 P.E. No. 46608
 PROFESSIONAL ENGINEER

AS BUILT CERTIFICATION

I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.

NAME: _____ DATE: 22 June 2012

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] DATE: _____
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

Biohabitats
 The Stables Building 2081 Clipper Park Road
 Baltimore, MD 21211 / ph: 410.554.0156
 fx: 410.554.0168 / www.biohabitats.com
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

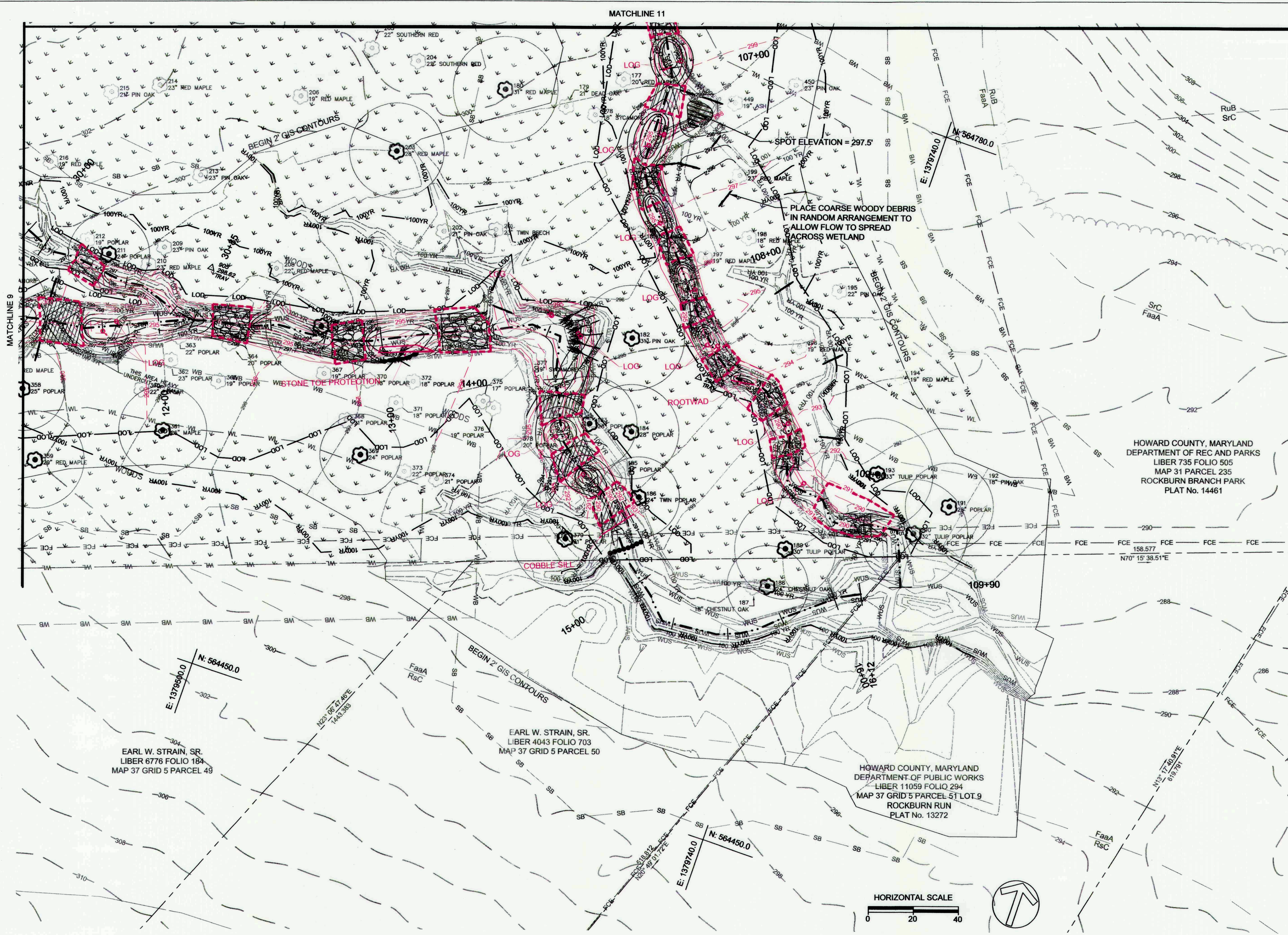
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 ZONING: R-20 TAX MAP/GRID/PARCEL: 0031/0023/0225
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

**PROPOSED
 CONDITIONS
 AS-BUILT**

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 SEAL: _____ BY: RW/KT CHECK: MDT
 DWG. NO.: _____

STATE OF MARYLAND
 BRYAN J. ARIANO
 P.E. No. 46608
 PROFESSIONAL ENGINEER

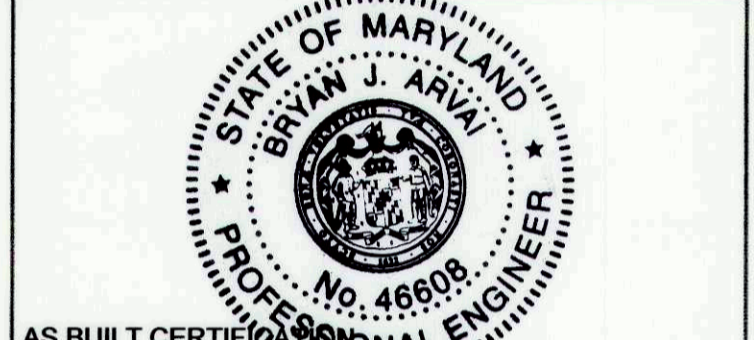
9 OF 40



CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS



AS BUILT CERTIFIED PROFESSIONAL ENGINEER
 I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.

NAME: *Bryan J. Arivalo* DATE: 27 June 2017

APPROVED: DEPARTMENT OF PUBLIC WORKS
Mark D. Brown 11/15/16
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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 Baltimore, MD 21211 / ph: 410.554.0156
 fx: 410.554.0168 / www.biohabitats.com
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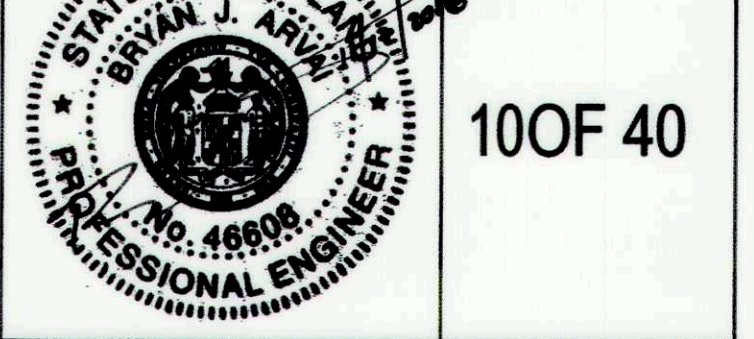
**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRID/PARCEL: 0031/0023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

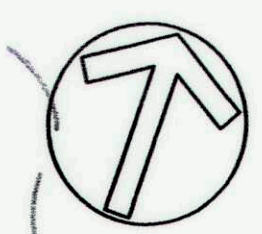
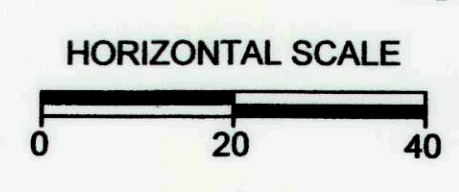
**PROPOSED
 CONDITIONS
 AS-BUILT**

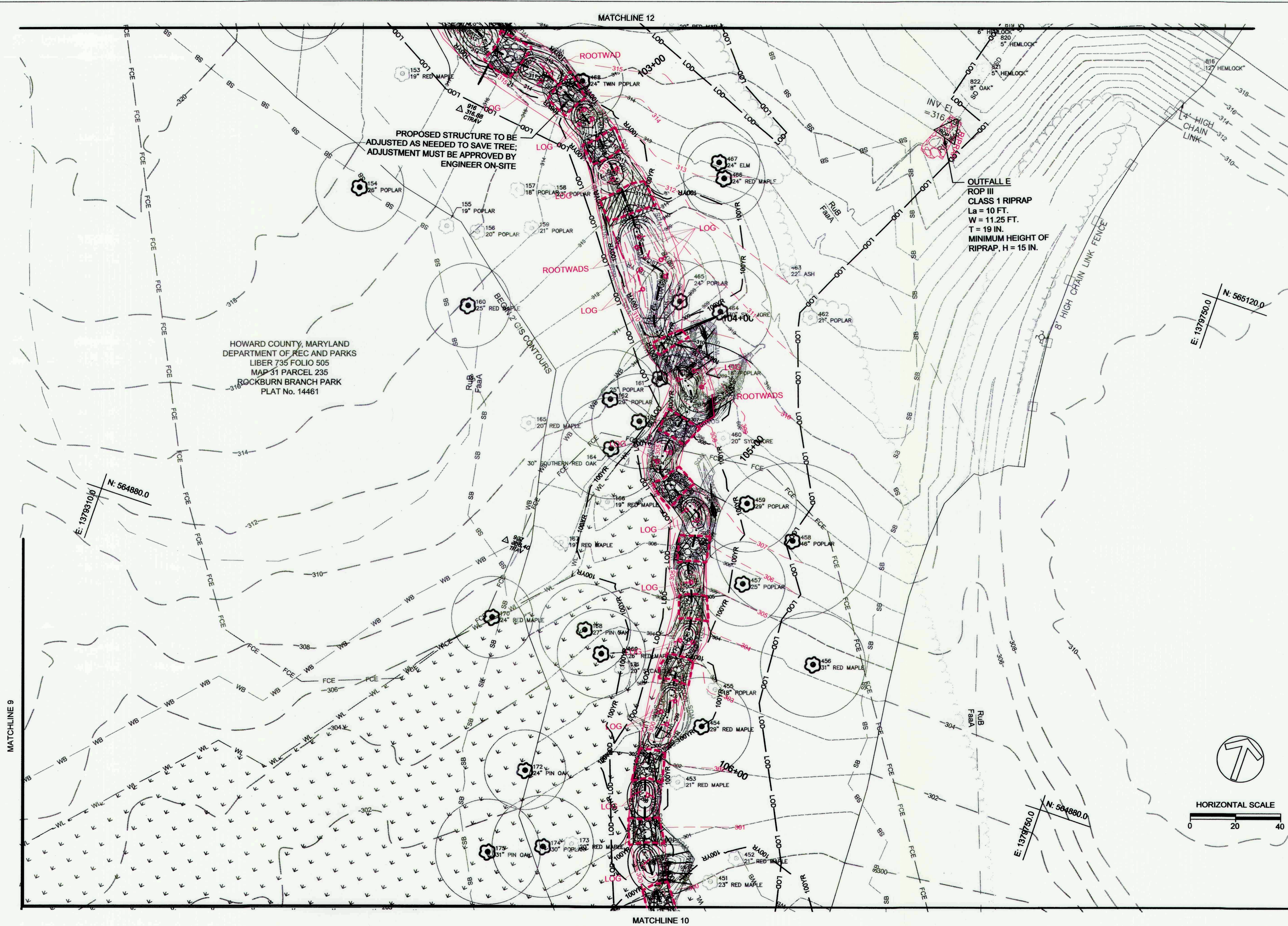
PROJECT NO.: 13005.36 SCALE: 1" = 20'

SEAL: BY: RW/KT CHECK: MDT
 DWS NO.:



100F 40





HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT No. 14461

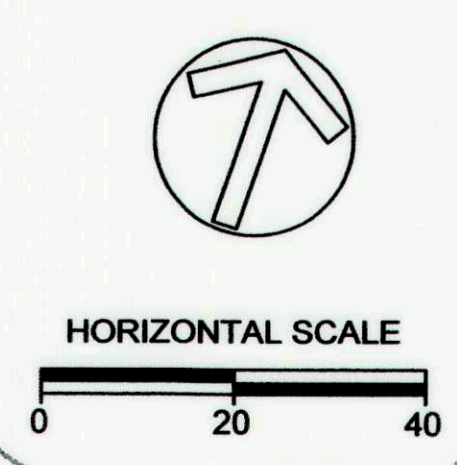
PROPOSED STRUCTURE TO BE
 ADJUSTED AS NEEDED TO SAVE TREE;
 ADJUSTMENT MUST BE APPROVED BY
 ENGINEER ON-SITE

OUTFALL E
 ROP III
 CLASS 1 RIPRAP
 La = 10 FT.
 W = 11.25 FT.
 T = 19 IN.
 MINIMUM HEIGHT OF
 RIPRAP, H = 15 IN.

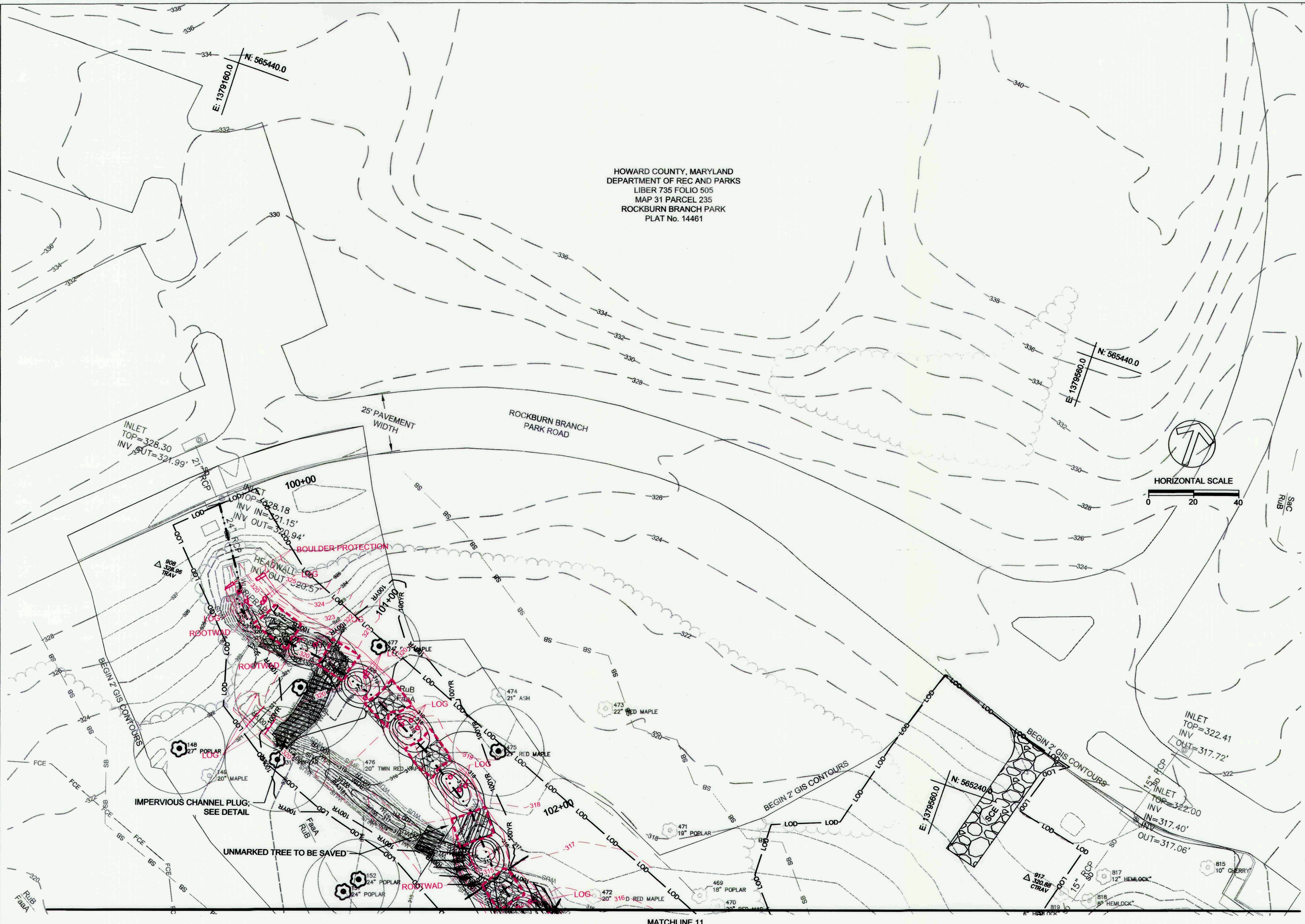
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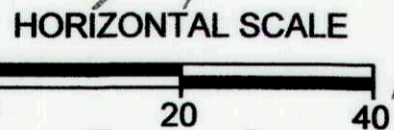
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 E: 1379750.0



CLIENT	
HOWARD COUNTY STORMWATER MANAGEMENT DIVISION 6751 GATEWAY DRIVE SUITE 514 COLUMBIA, MD 21046 PHONE: (410) 313-6413	
DATE	ISSUES / REVISIONS
AS BUILT CERTIFICATE I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS "AS-BUILT" PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.	
NAME	27 JUNE 2017 DATE
APPROVED: DEPARTMENT OF PUBLIC WORKS CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE	
The Stables Building 2081 Clipper Park Road Baltimore, MD 21211 / ph: 410.554.0156 fx: 410.554.0168 / www.biohabitats.com Restore the Earth & Inspire Ecological Stewardship	
ROCKBURN BRANCH STREAM RESTORATION	
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD ZONING: R-20 TAX MAP/GRID/PARCEL: 00310023/0235 ELECTION DISTRICT: 07 OPEN LOT NA WAIVER PETITION #WP-17-015	
PROPOSED CONDITIONS AS-BUILT	
PROJECT NO.: 13005.36	SCALE: 1" = 20'
SEAL:	BY: RW/KT CHECK: MDT
110F 40	



HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT No. 14461

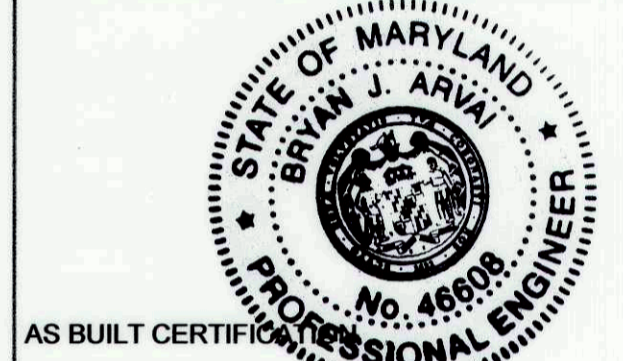


MATCHLINE 11

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS



AS BUILT CERTIFICATE
 I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND SPECIFICATIONS.

NAME: *Bryan J. Arwi* DATE: 27 June 2017

APPROVED: *[Signature]* DEPARTMENT OF PUBLIC WORKS
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: *[Signature]*

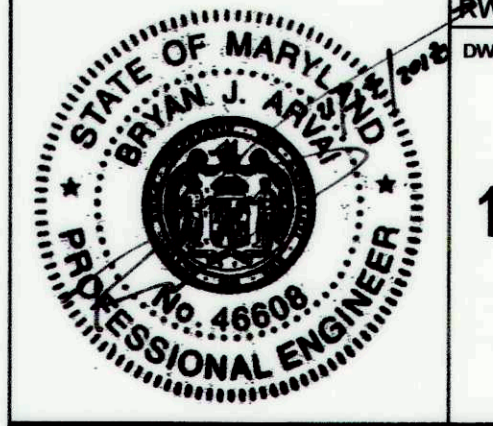
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 Baltimore, MD 21211 / ph: 410.554.0156
 Ex: 410.554.0168 / www.biohabitats.com
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

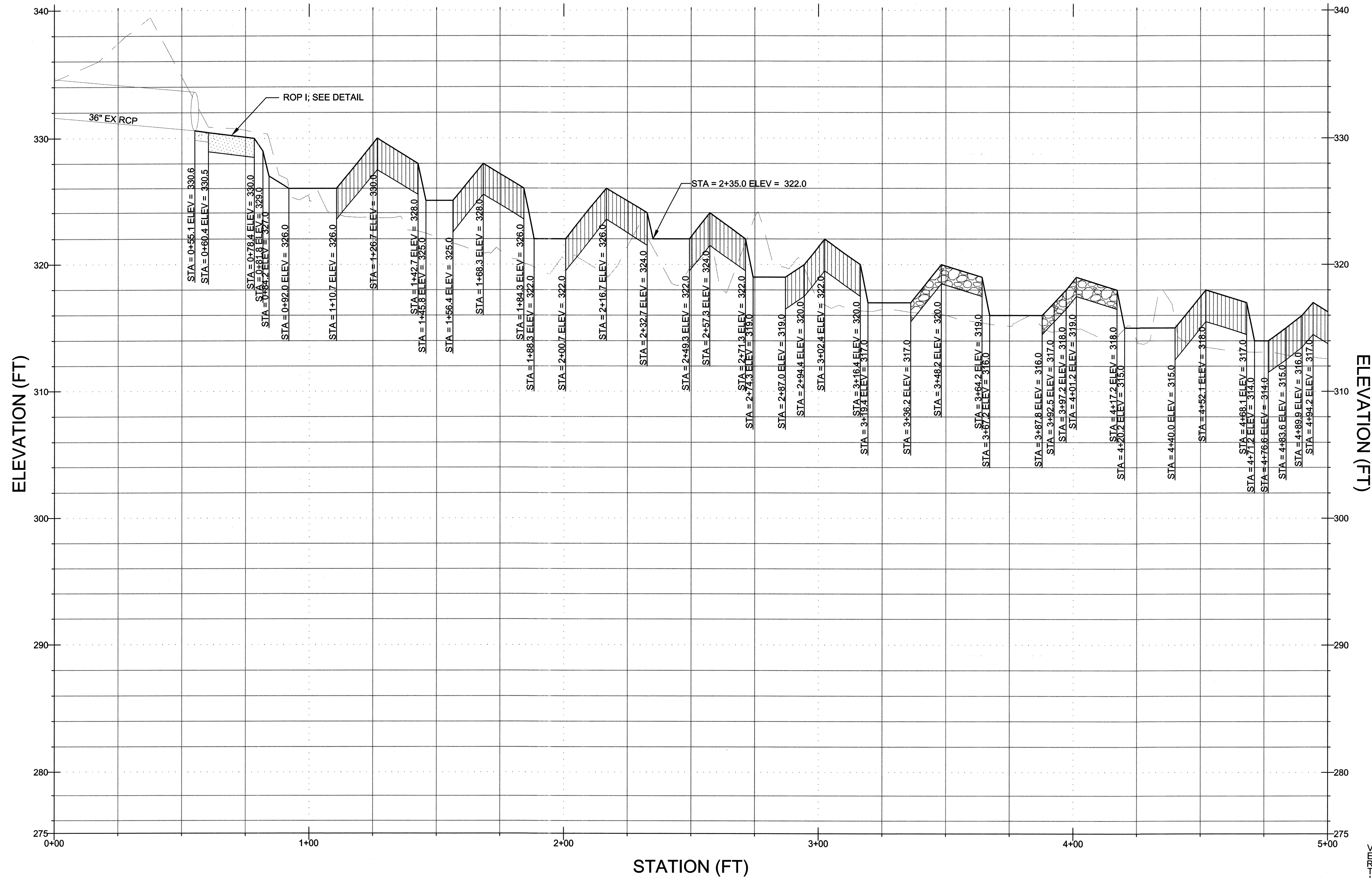
**PROPOSED
 CONDITIONS
 AS-BUILT**

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 SEAL: BY: RWK/T CHECK: MDT
 DWG. NO.:



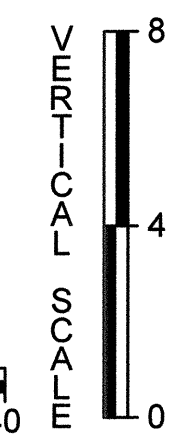
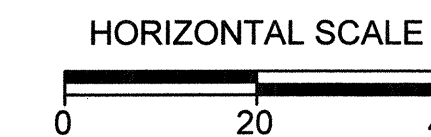
12 OF 40

PROFILE VIEW OF MAINSTEM



PROFILE LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- COBBLE SILL
- COBBLE RIFFLE
- BOULDER RIFFLE



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COLUMBIA, MD 21046
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[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE *[Signature]*

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ROCKBURN BRANCH STREAM RESTORATION

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 0031/0023/00235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

TITLE

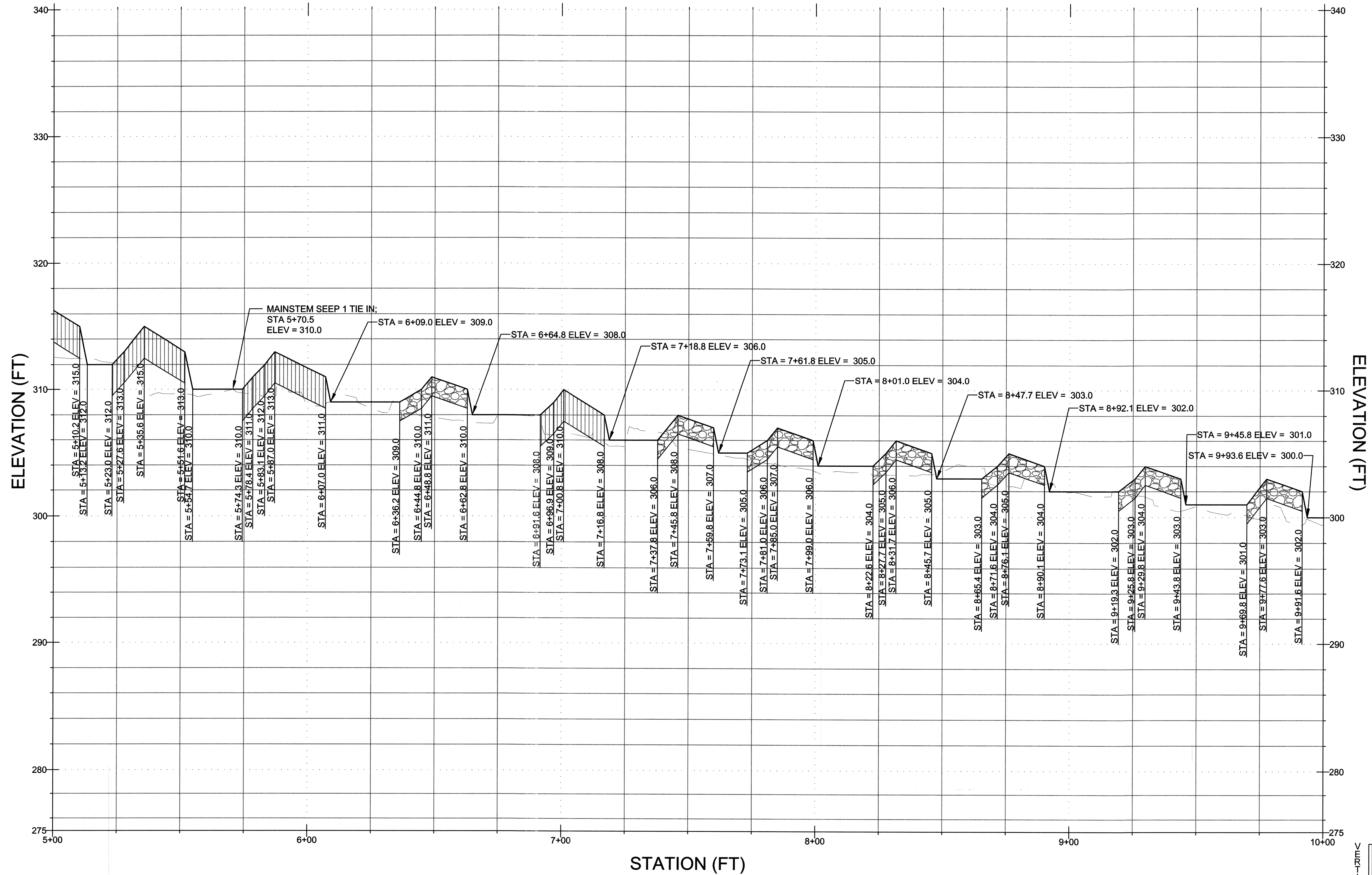
PROFILES

PROJECT NO.: 13005.36 SCALE: AS SHOWN

SEAL: BY: RW/KT CHECK: MDT
DWG. NO.:

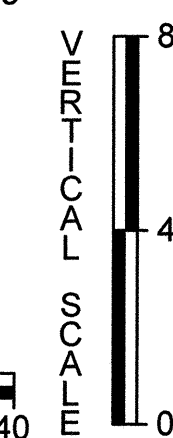
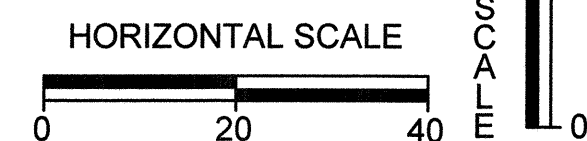
13OF 40

PROFILE VIEW OF MAINSTEM



PROFILE LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- COBBLE SILL
- COBBLE RIFFLE
- BOULDER RIFFLE



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APPROVED: DEPARTMENT OF PUBLIC WORKS
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ROCKBURN BRANCH STREAM RESTORATION

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

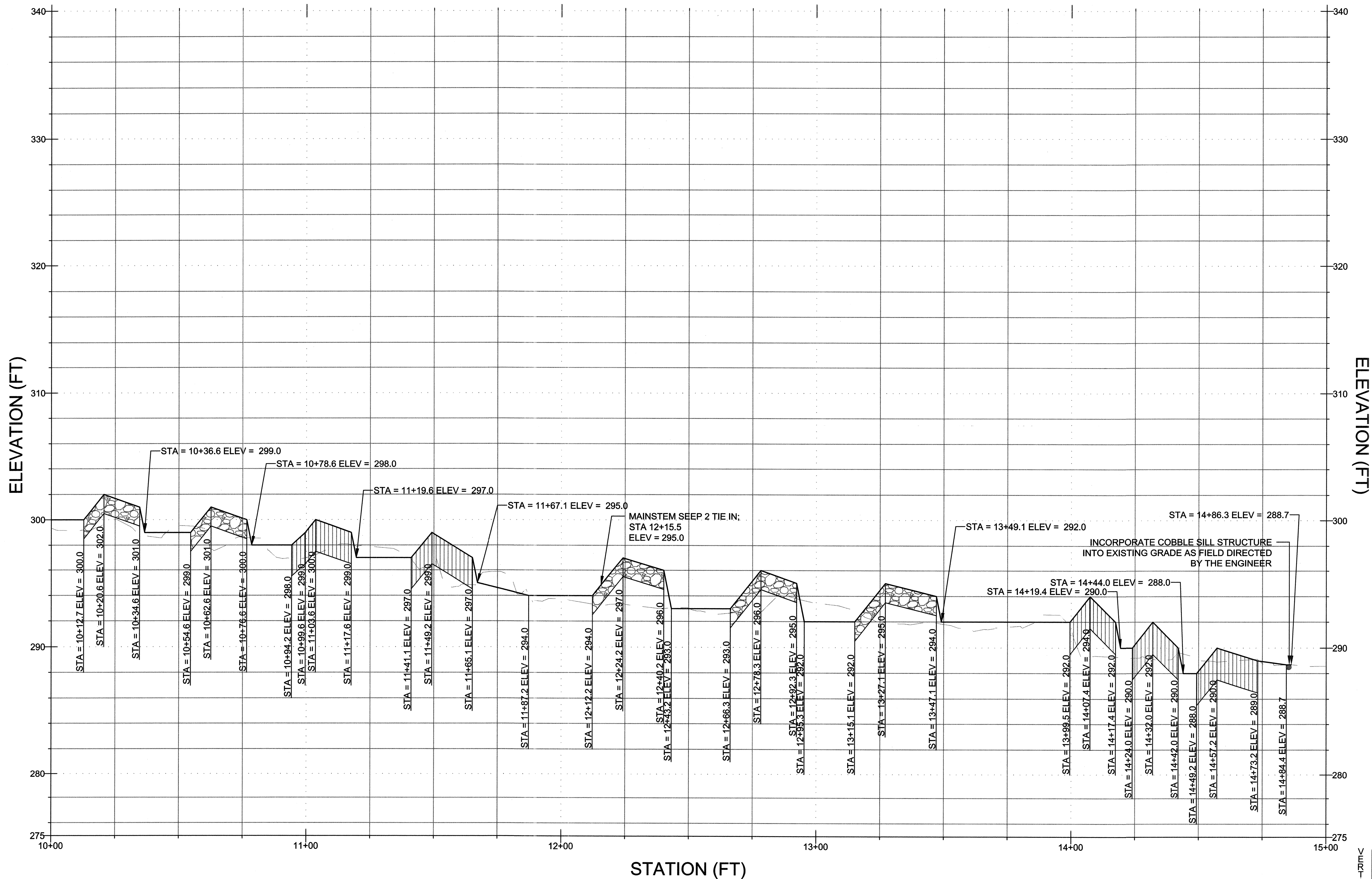
PROFILES

PROJECT NO.: 13005.36 SCALE: AS SHOWN
 SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.:



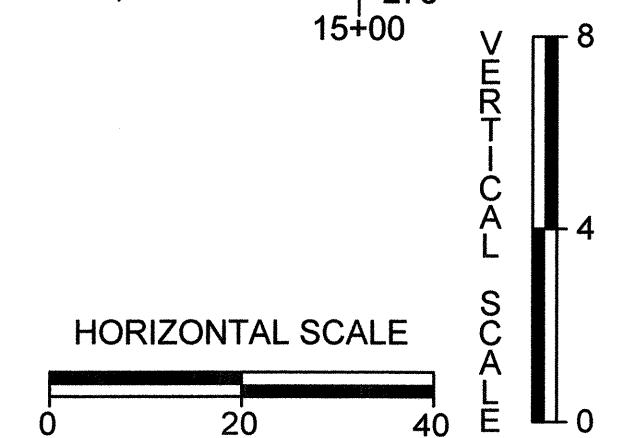
14 OF 40

PROFILE VIEW OF MAINSTEM



PROFILE LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- COBBLE SILL
- COBBLE RIFFLE
- BOULDER RIFFLE



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 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
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APPROVED: DEPARTMENT OF PUBLIC WORKS

 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-29 TAX MAP/PARCEL/PARCEL: 00310023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

TITLE

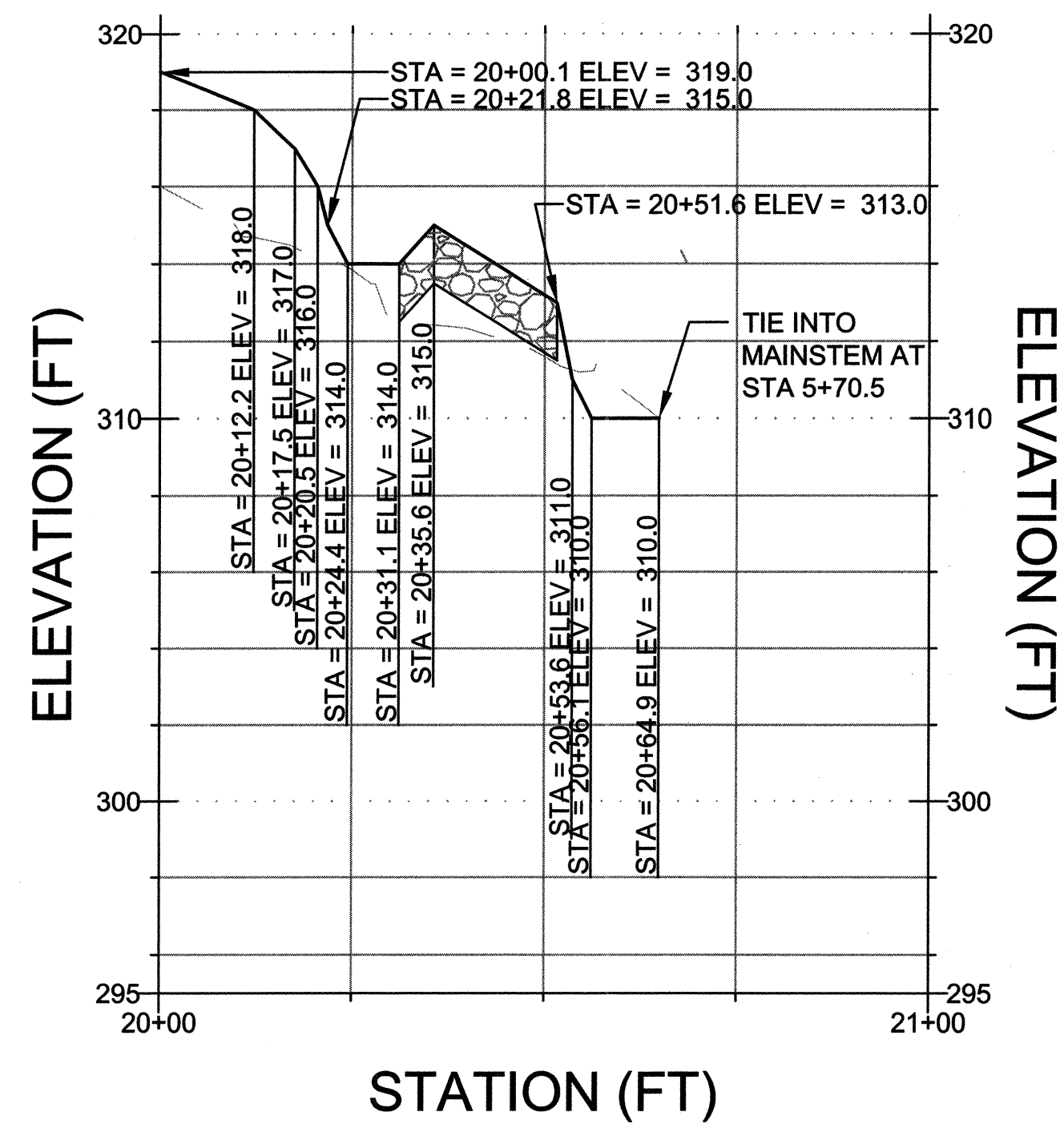
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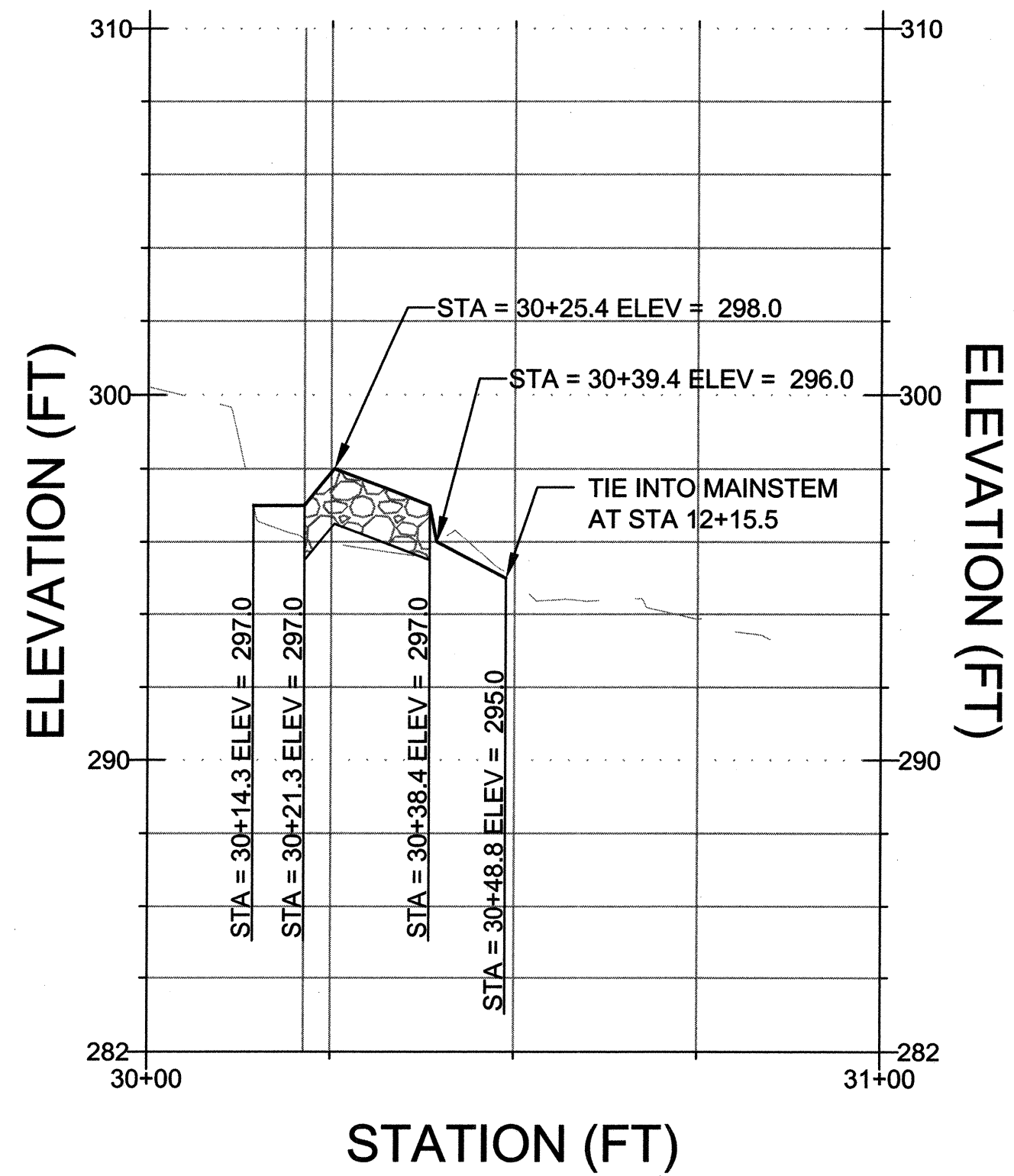
SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.:

15OF 40

PROFILE VIEW OF MAINSTEM SEEP 1

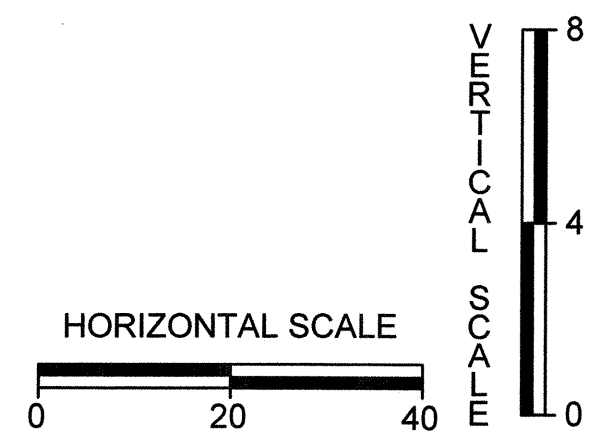


PROFILE VIEW OF MAINSTEM SEEP 2



PROFILE LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- COBBLE SILL
- ▨ COBBLE RIFFLE
- ▨ BOULDER RIFFLE



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APPROVED: DEPARTMENT OF PUBLIC WORKS
Mark W. [Signature]
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE 1/16/16



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**ROCKBURN BRANCH
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 ZONING: R-20 TAX MAP GRID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

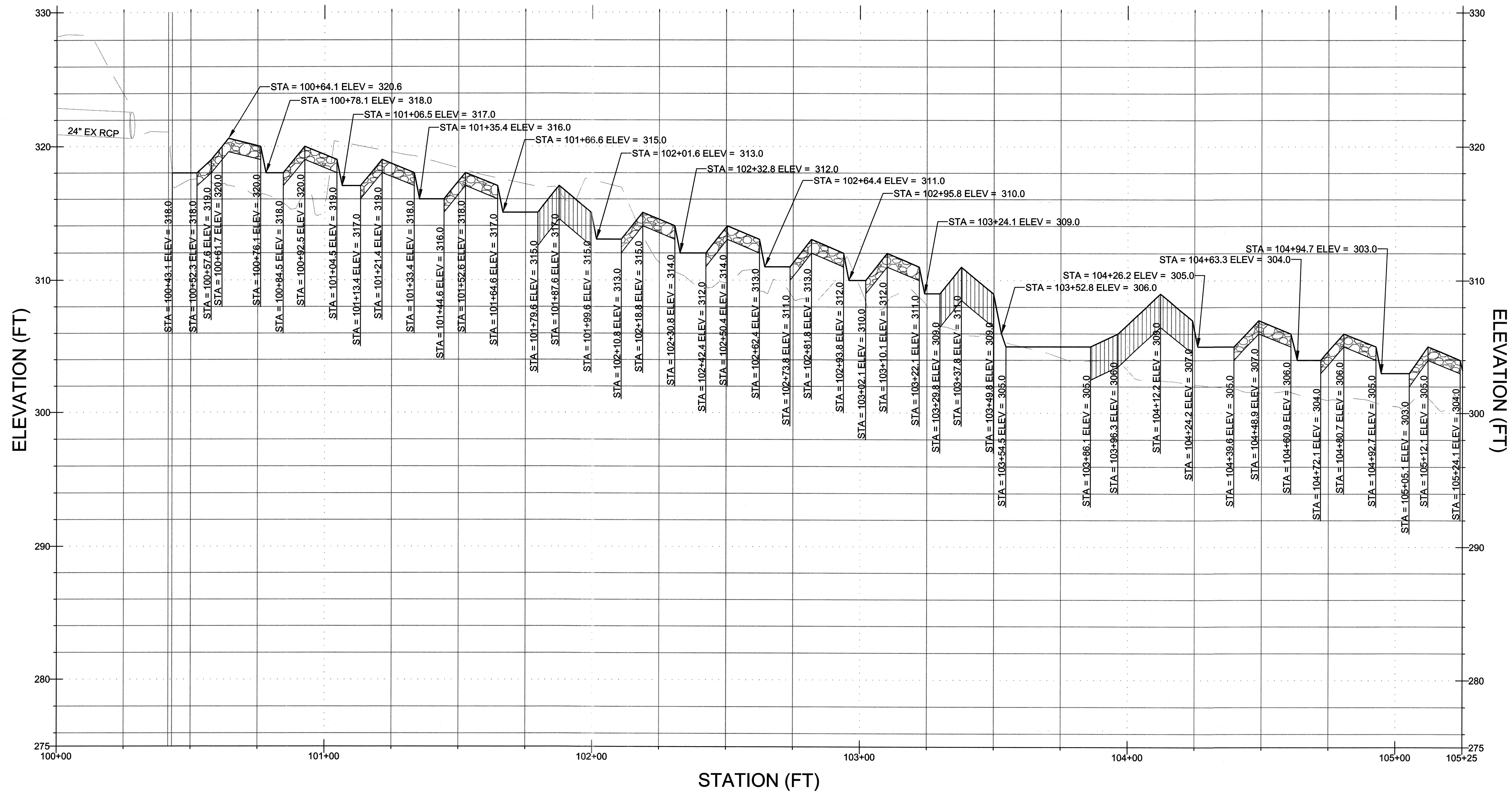
PROFILES

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 SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.:

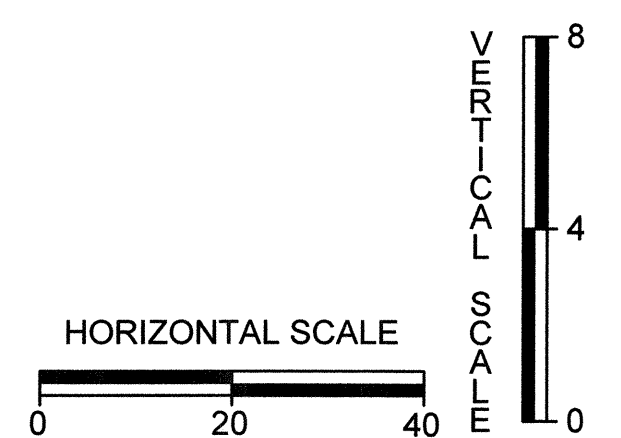
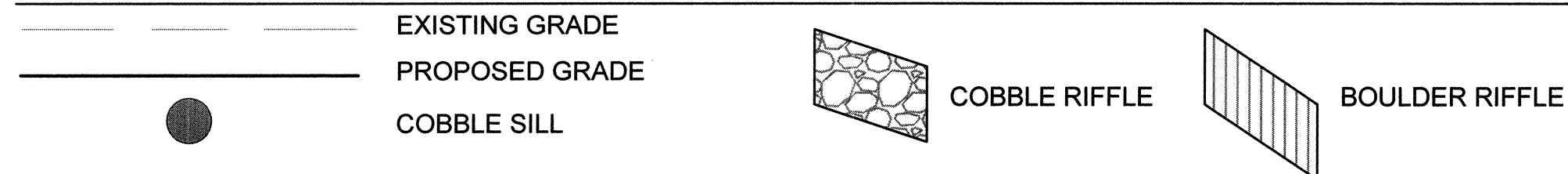


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PROFILE VIEW OF TRIBUTARY



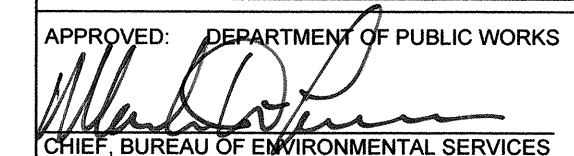
PROFILE LEGEND



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ROCKBURN BRANCH STREAM RESTORATION

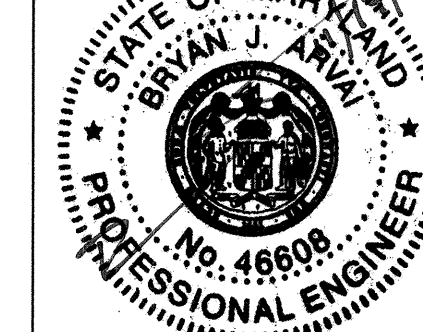
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

TITLE

PROFILES

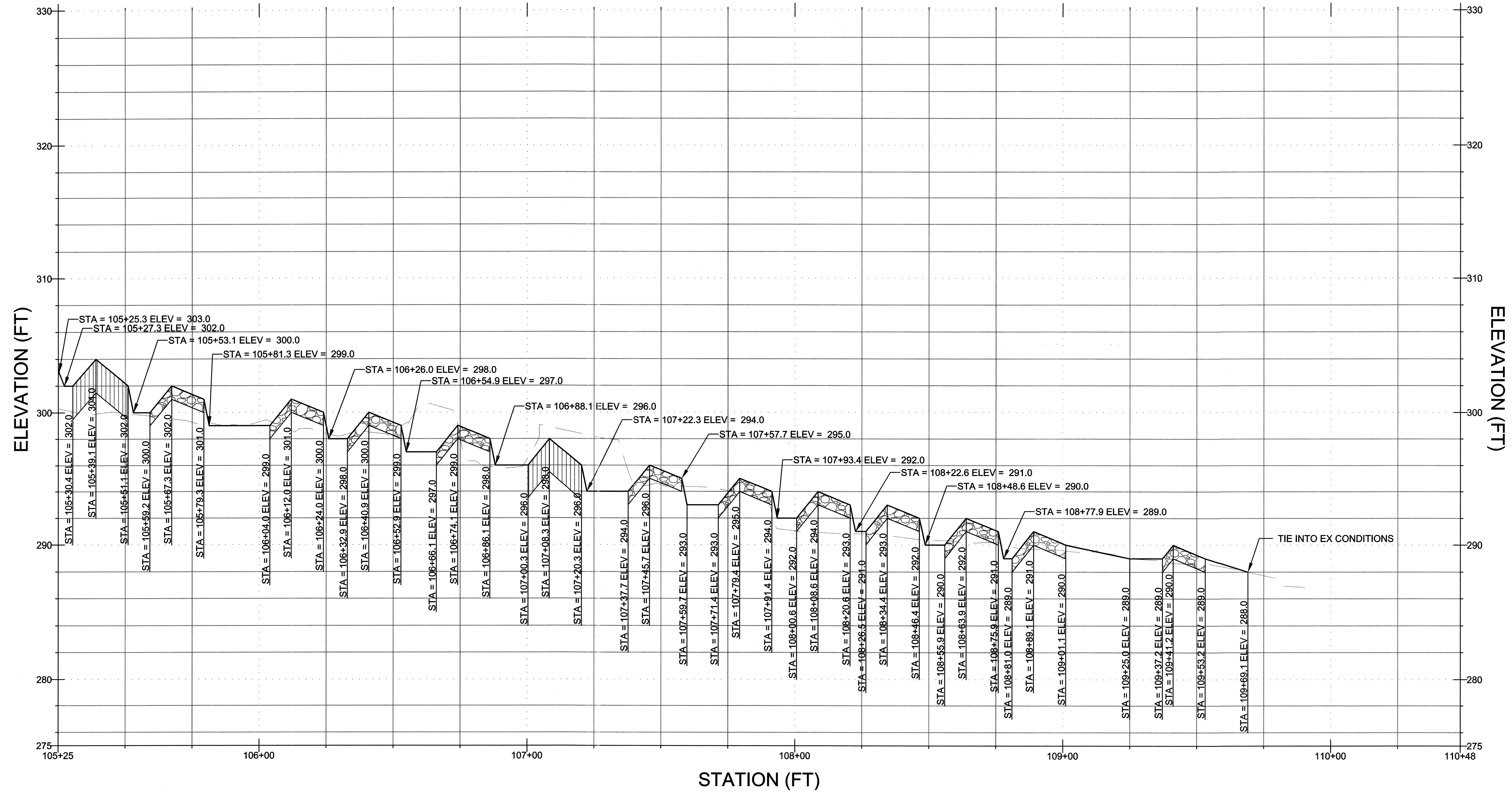
PROJECT NO.: 13005.36 SCALE: AS SHOWN

SEAL: BY: RWKKT CHECK: MDT
 DWG. NO.:

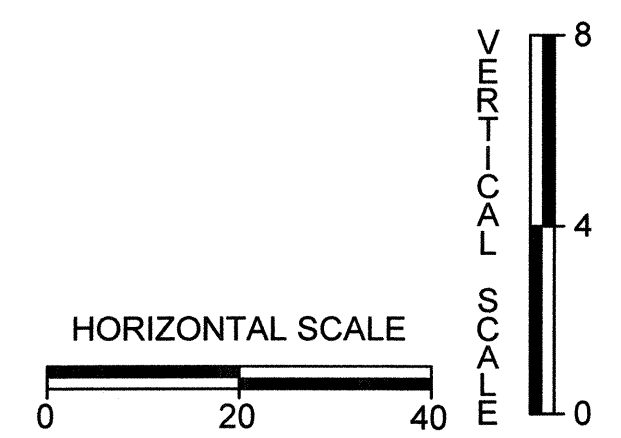
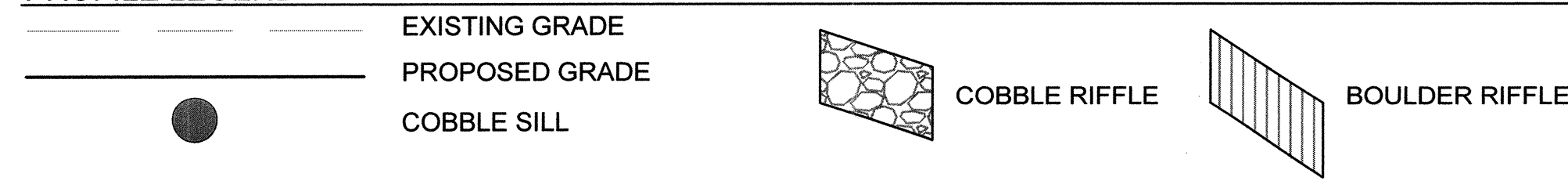


17 OF 40

PROFILE VIEW OF TRIBUTARY



PROFILE LEGEND



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 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: *Michael P. ...* DEPARTMENT OF PUBLIC WORKS
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



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ROCKBURN BRANCH STREAM RESTORATION

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 ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

PROFILES

PROJECT NO.: 13005.36 SCALE: AS SHOWN

SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.:



18 OF 40

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DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

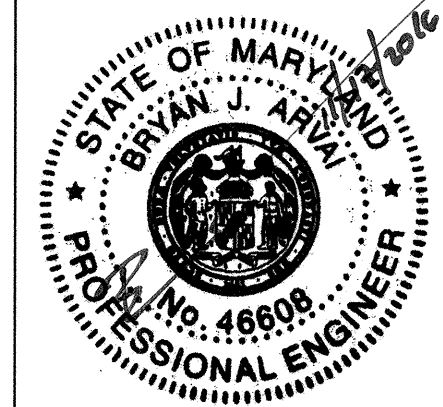
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

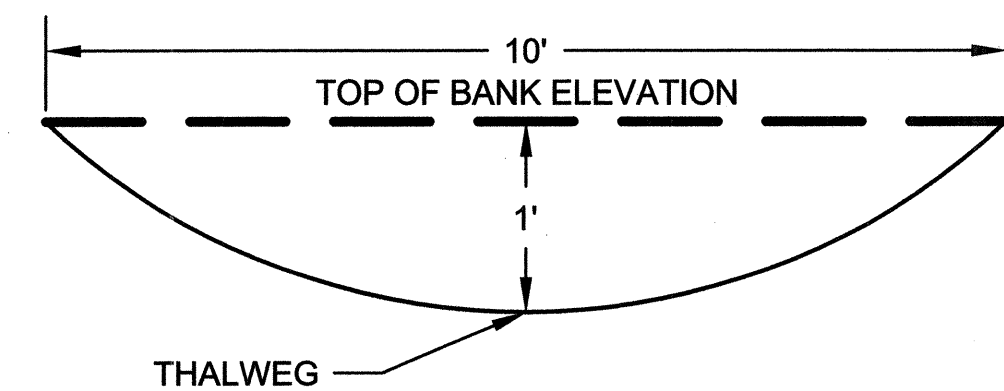
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRIED/PARCEL: 0031/0023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

CROSS-SECTIONS

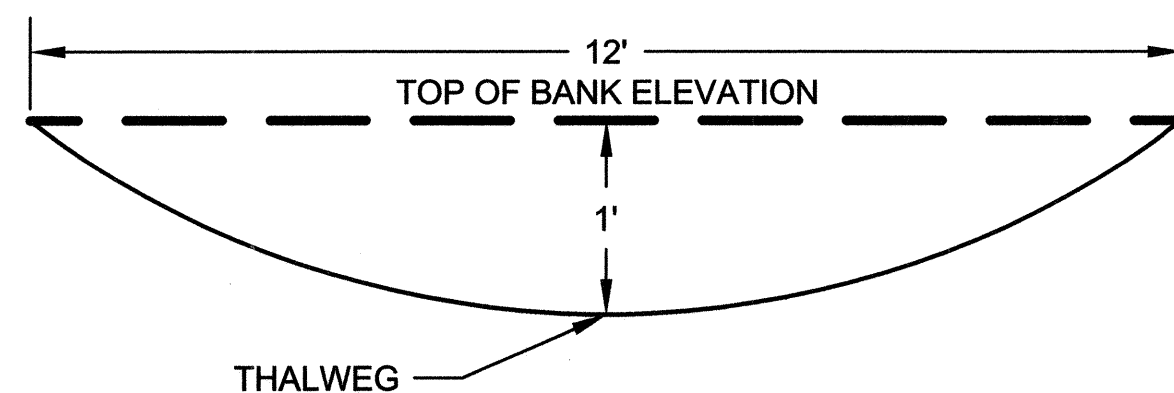
PROJECT NO.: 13005.36 SCALE: NTS
 SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.:



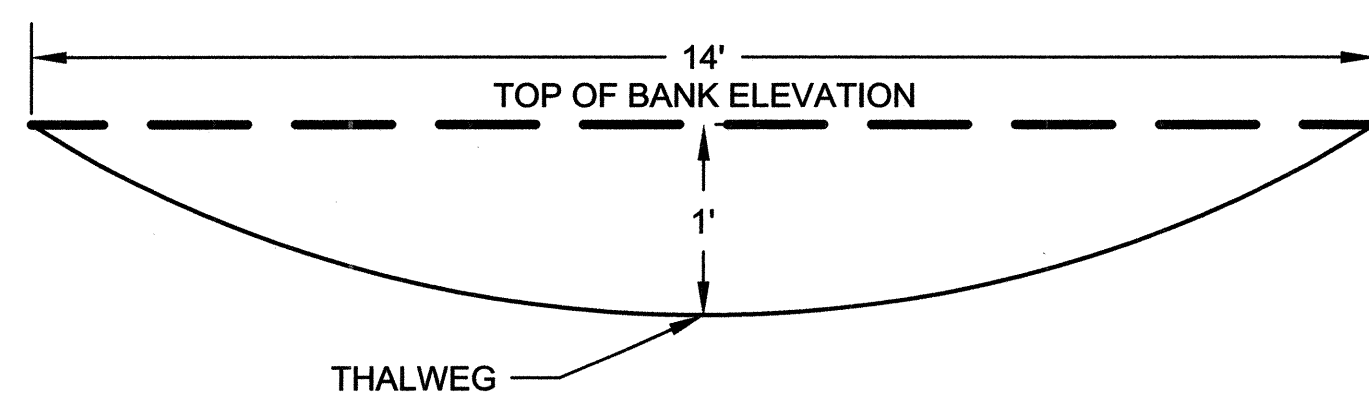
19 OF 40



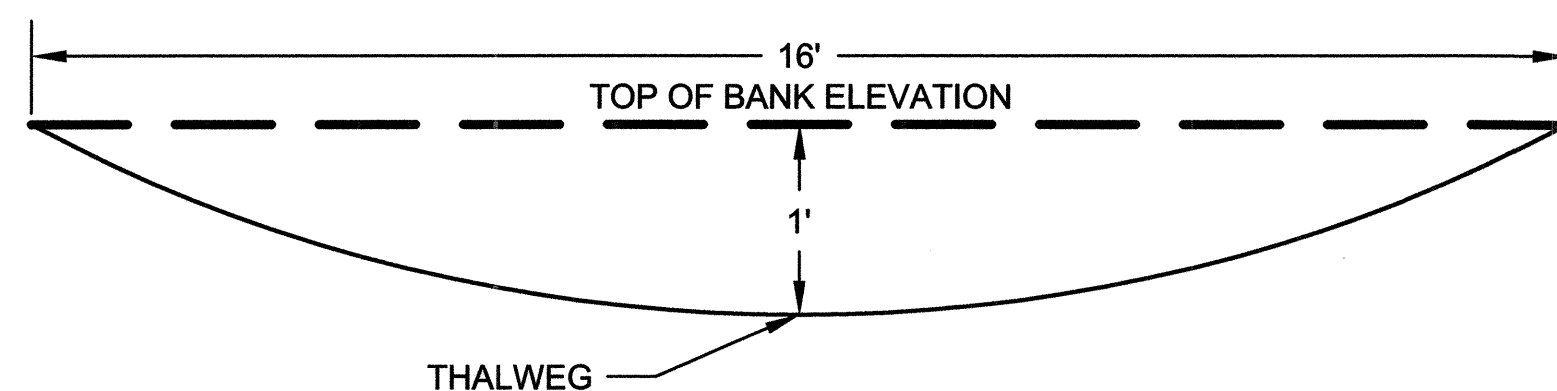
MAINSTEM DESIGN CROSS-SECTIONS
 PROFILE STA 20+35.6, 30+25.4; NOT MODELED IN HEC-RAS (SEEPS) NTS



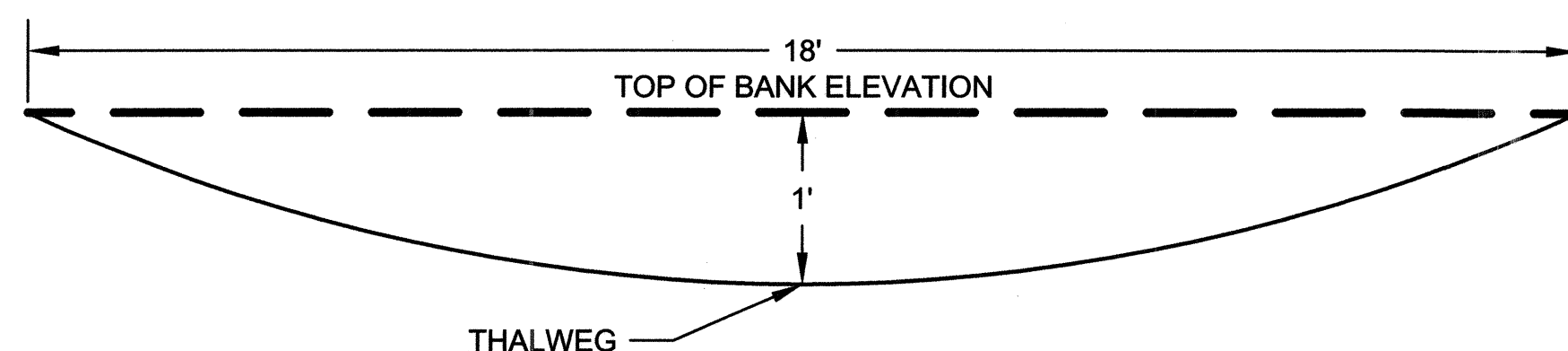
MAINSTEM DESIGN CROSS-SECTIONS
 PROFILE STA 2+16.7, 3+02.4, 14+57.2; HEC-RAS STA 1395.32, 1309.69, 154.82 NTS



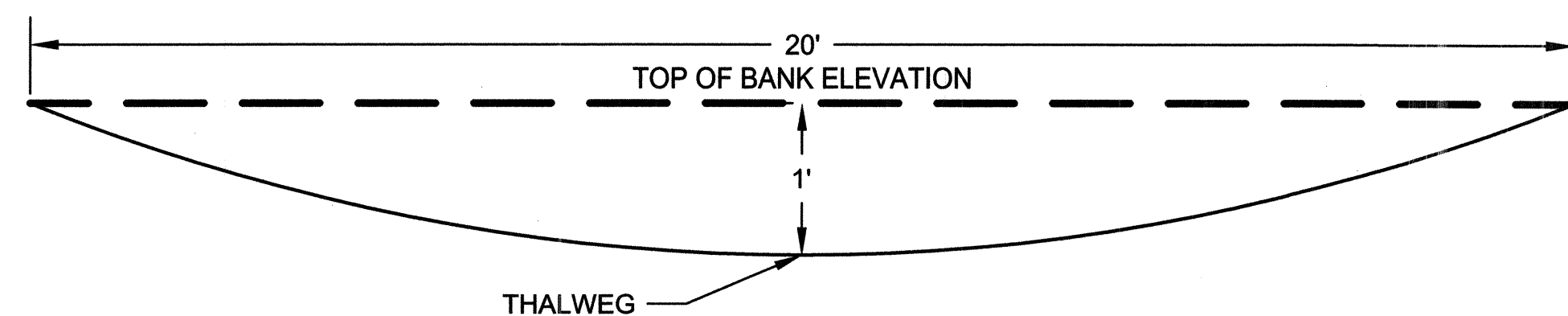
MAINSTEM DESIGN CROSS-SECTIONS
 PROFILE STA 1+26.7, 1+68.3, 2+57.3, 3+48.2 - 4+52.1, 12+24.2;
 HEC-RAS STA 1485.39, 1443.75, 1354.77, 1263.86 - 1159.99, 387.88 NTS



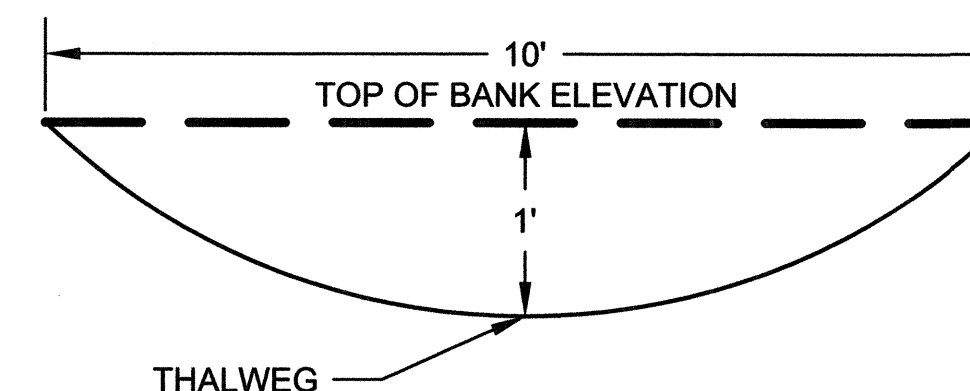
MAINSTEM DESIGN CROSS-SECTIONS
 PROFILE STA 4+94.2, 5+35.6, 5+87.0 - 9+77.6, 12+78.3, 13+27.1, 14+32.0;
 HEC-RAS STA 1117.85, 1076.45, 1025.03 - 634.42, 333.78, 284.99, 180.04 NTS



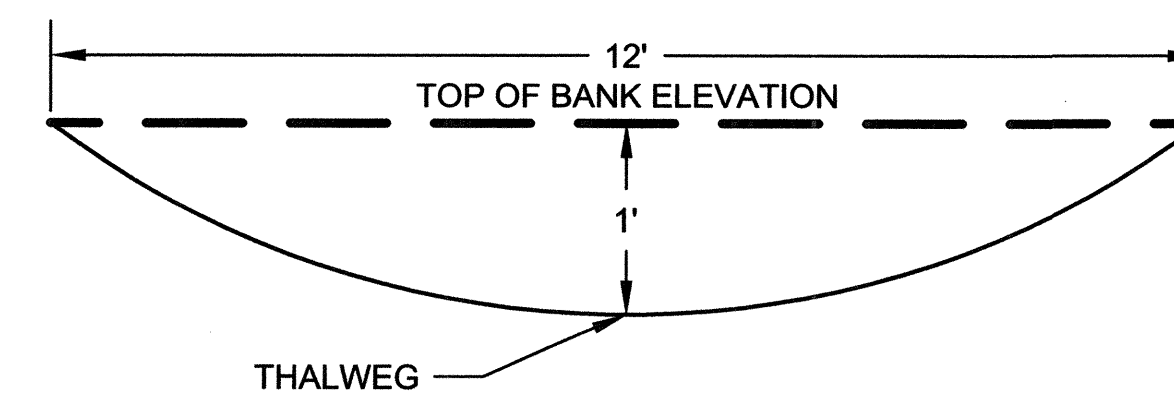
MAINSTEM DESIGN CROSS-SECTIONS
 PROFILE STA 10+20.6 - 11+49.2; HEC-RAS STA 591.49 - 462.91 NTS



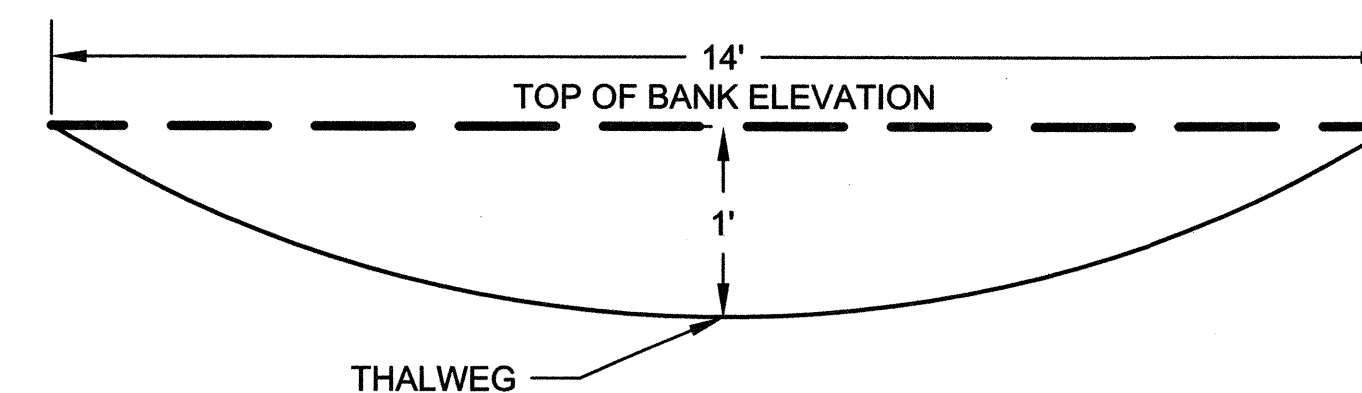
MAINSTEM DESIGN CROSS-SECTIONS
 PROFILE STA 14+07.4; HEC-RAS STA 204.61 NTS



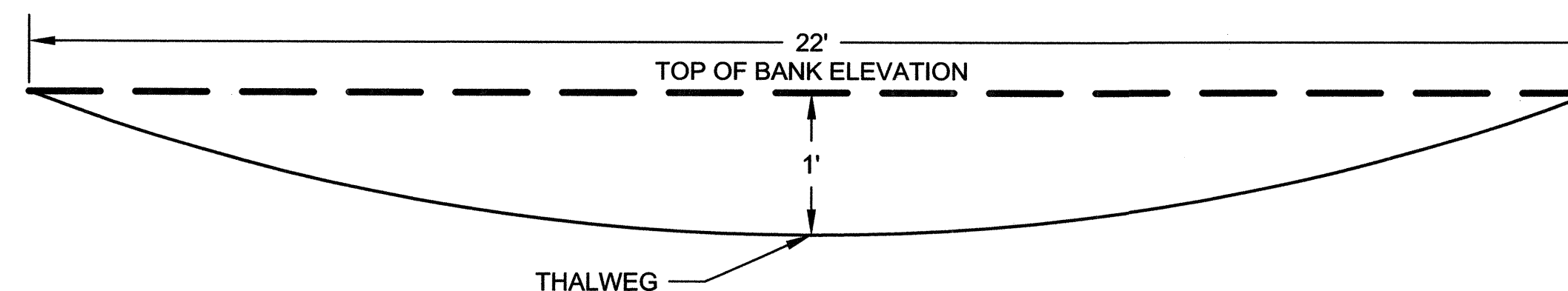
TRIBUTARY DESIGN CROSS-SECTIONS
 PROFILE STA 105+39.1 - 109+41.2; HEC-RAS STA 10451.21 - 10049.11 NTS



TRIBUTARY DESIGN CROSS-SECTIONS
 PROFILE STA 104+80.7; HEC-RAS STA 10509.59 NTS



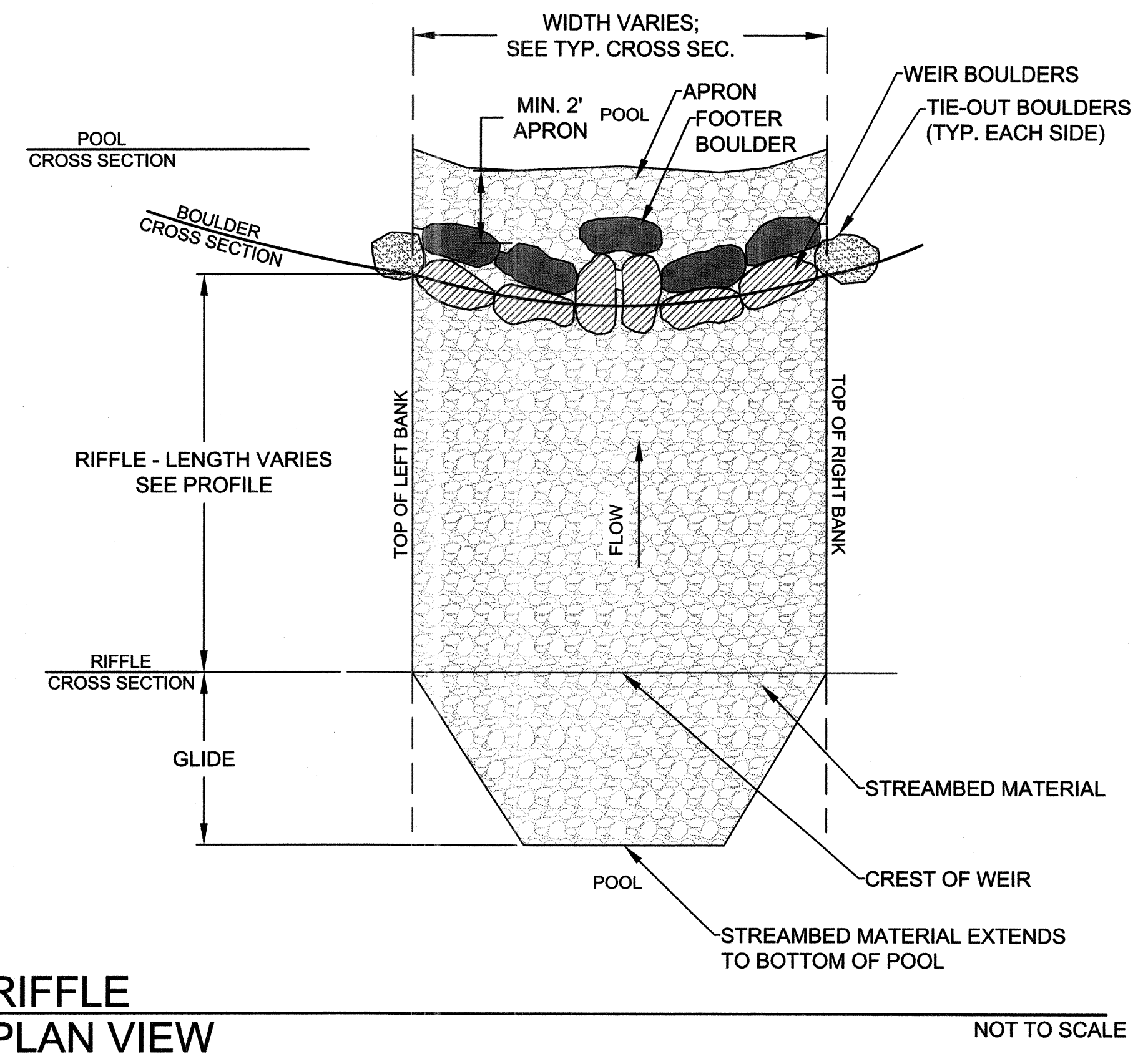
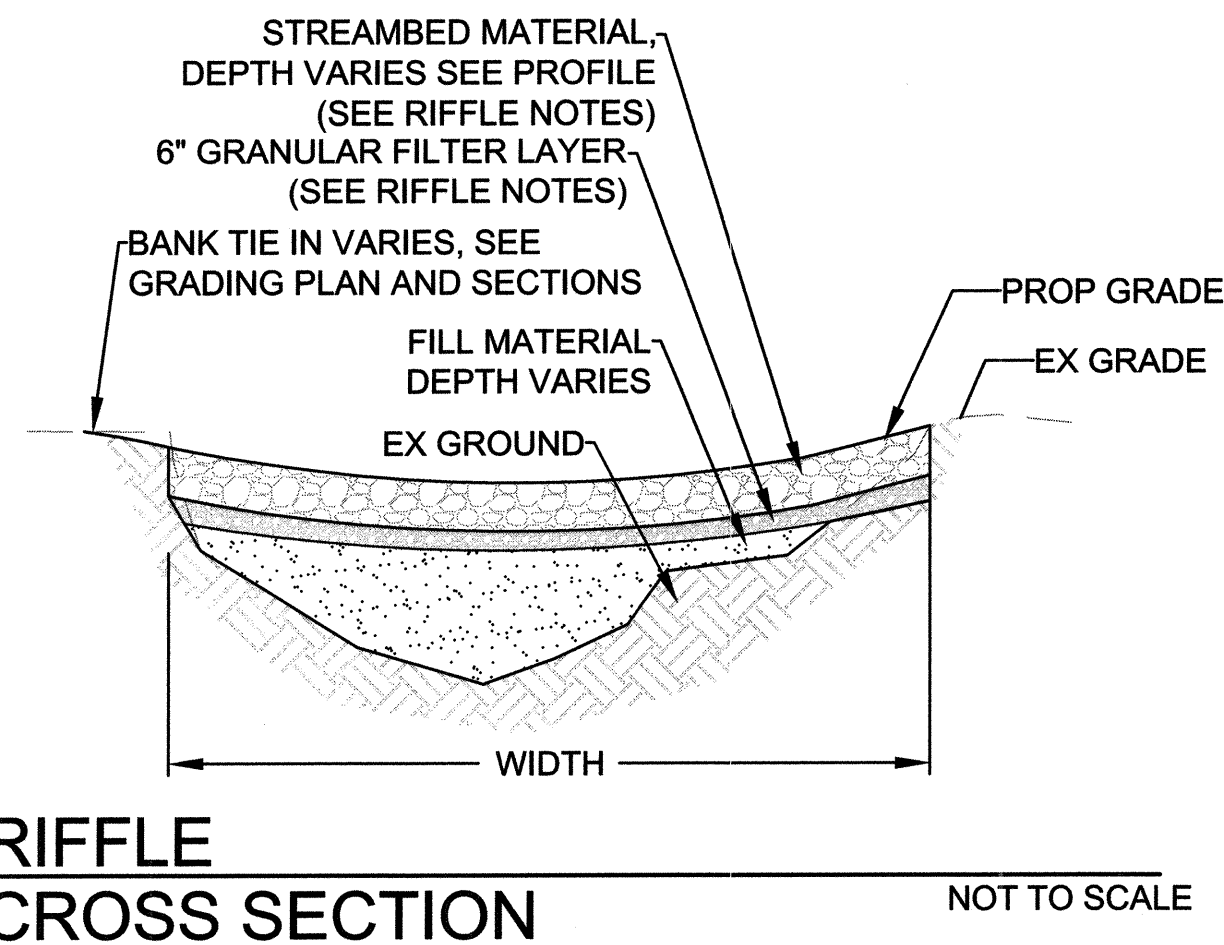
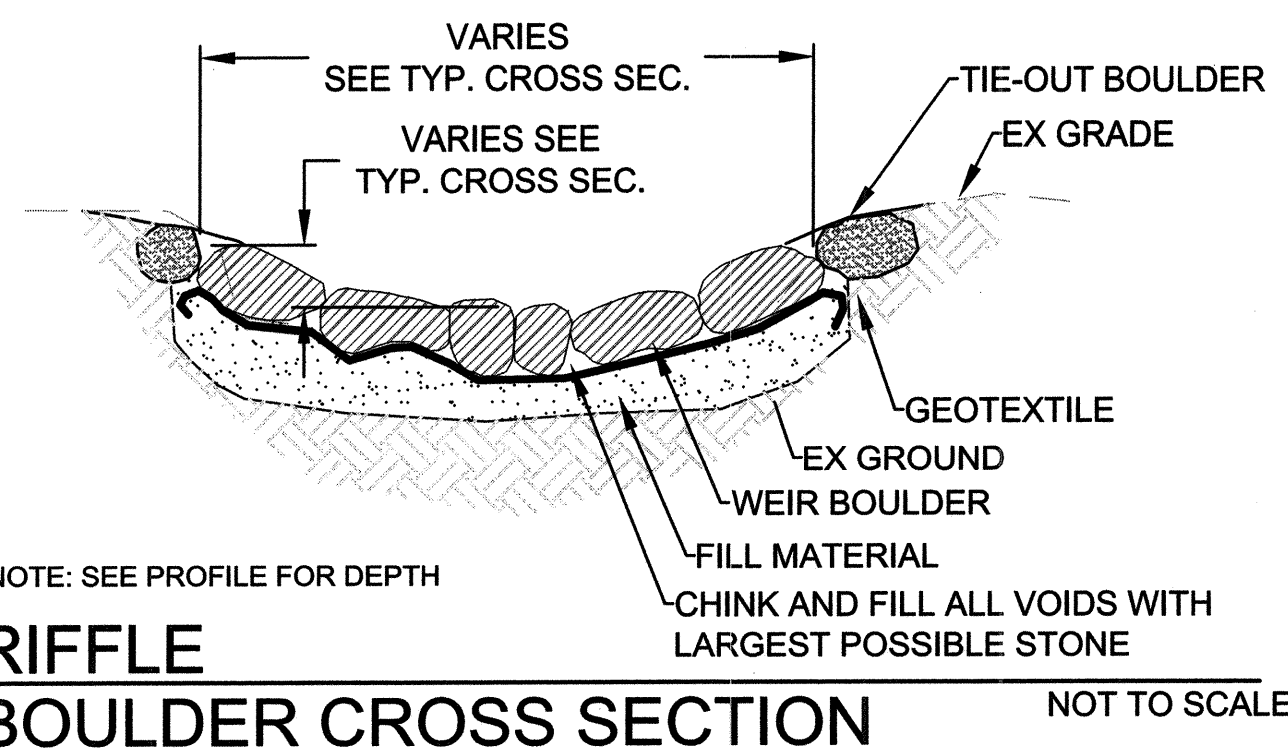
TRIBUTARY DESIGN CROSS-SECTIONS
 PROFILE STA 100+64.1 - 103+10.1, 104+12.20, 104+48.9, 105+12.1;
 HEC-RAS STA 10926.24 - 10680.20, 10578.09, 10541.37, 10478.18 NTS



TRIBUTARY DESIGN CROSS-SECTIONS
 PROFILE STA 103+37.8; HEC-RAS STA 10652.48 NTS

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PHONE: (410) 313-6413



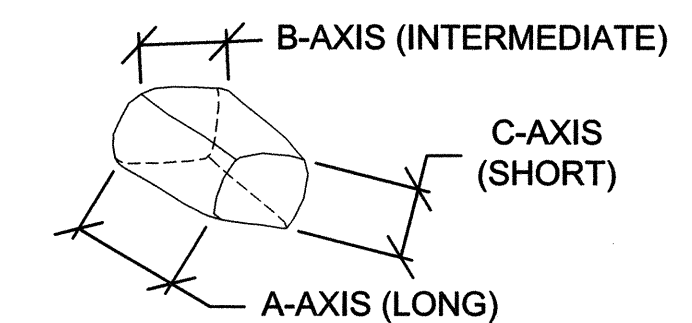
COBBLE RIFFLE GRADATION TABLE

CUMULATIVE % FINER	STREAMBED MATERIAL		GRAVEL ALL REACHES SIZE (IN)
	MAINSTEM RIFFLES SIZE (IN)	TRIBUTARY RIFFLES SIZE (IN)	
10	4.6	3.1	1/4
15	5.3	3.5	X
30	7.5	5.0	1/2
50	10.5	7.0	1
85	14.9	10.0	2
100	16.8	11.2	3

GRANULAR FILTER MATERIAL

CUMULATIVE % FINER	COBBLE SIZE (IN)
100	2 1/2 in (64 mm)
85-100	1 in (25 mm)
60-100	1/2 in (13 mm)
35-70	No. 10
20-50	No. 40
3-20	No. 200

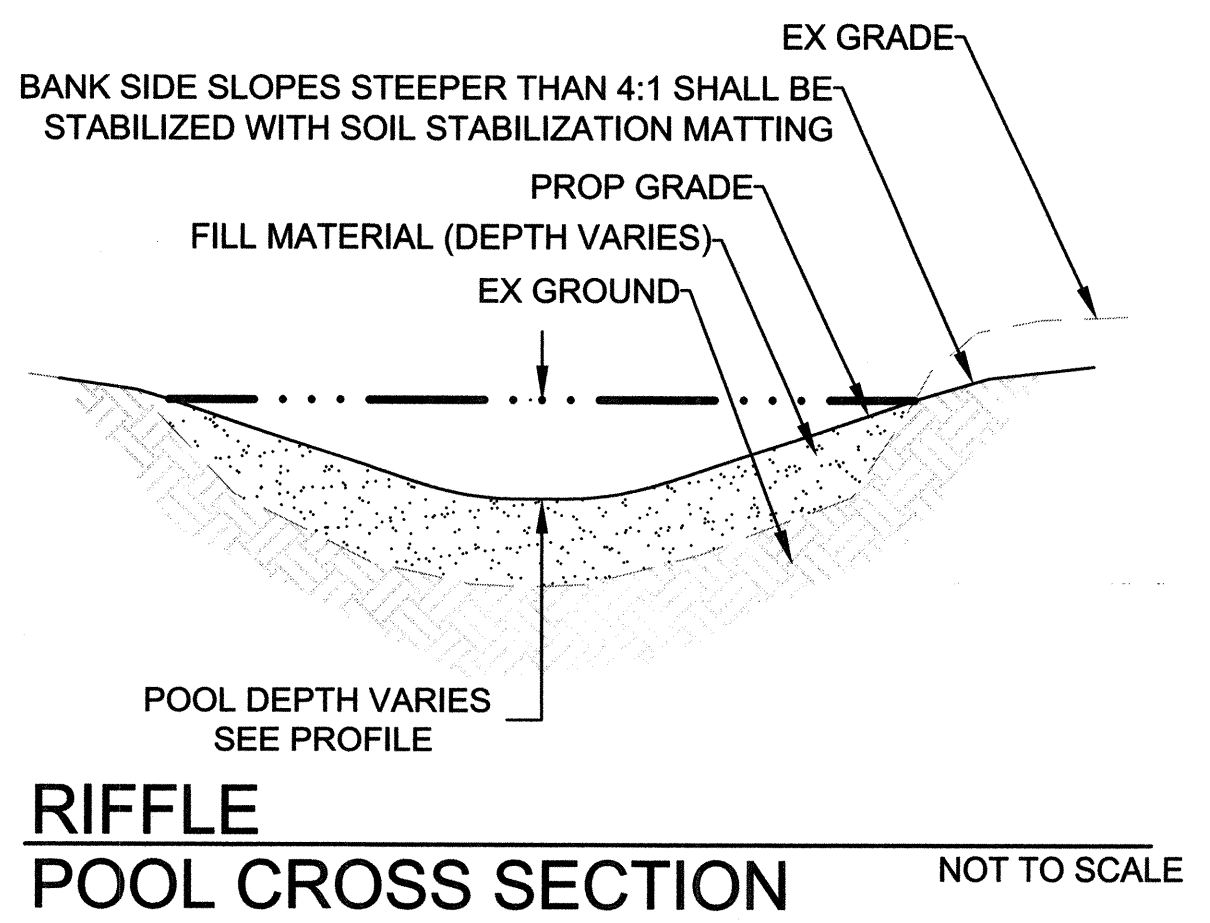
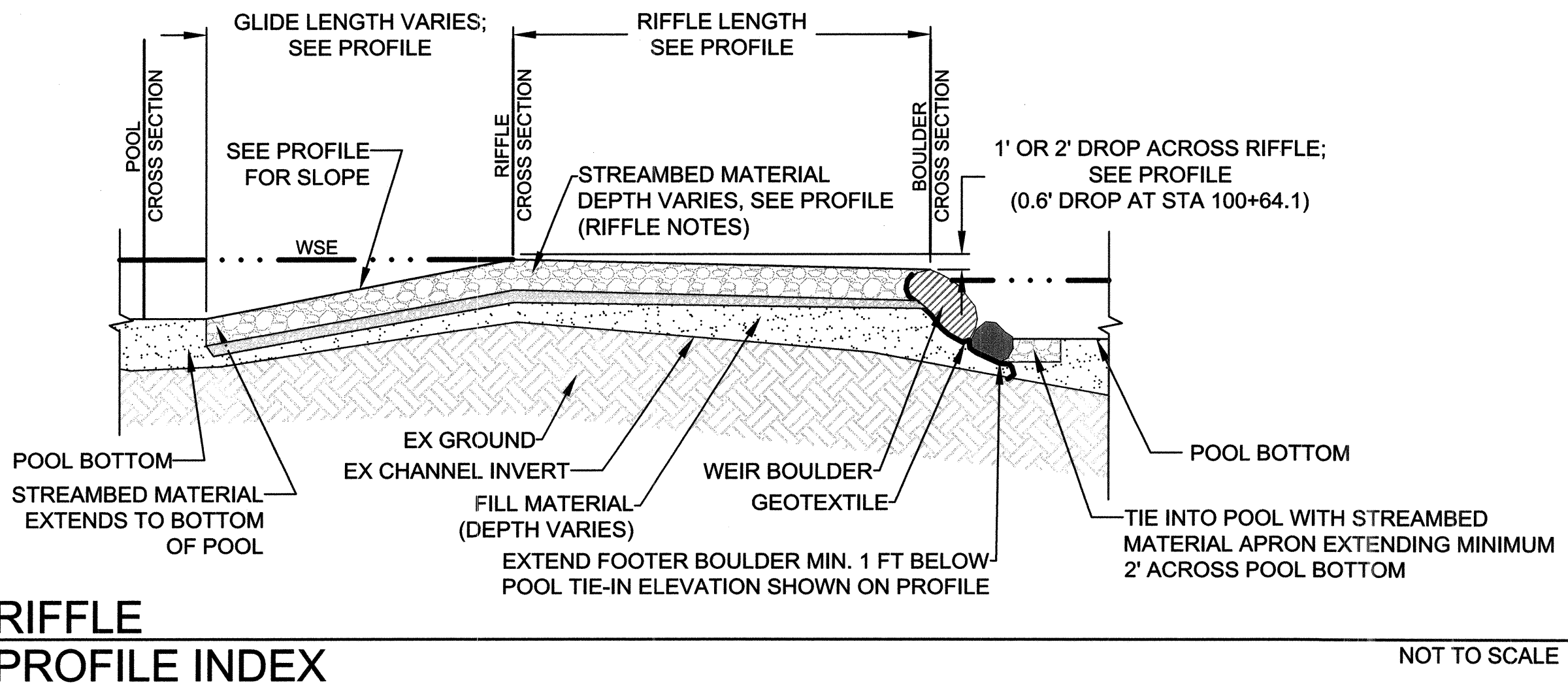
- RIFFLE NOTES:**
- TIE-OUT BOULDER SHALL EXTEND A MIN. OF ONE BOULDER LENGTH INTO EXISTING BANK. WHERE THIS CONFLICTS WITH EXISTING TREE ROOTS OR BEDROCK, TIE-OUT BOULDER MAY BE ELIMINATED OR ADJUSTED AT DIRECTION OF OWNER.
 - SEE TYPICAL SECTIONS FOR DEPTH AND WIDTH AT BOULDER CROSS SECTION.
 - STREAMBED MATERIAL DEPTH VARIES BETWEEN MAINSTEM AND TRIBUTARY. SEE PROFILE.
 - APRON MATERIAL SHALL CONSIST OF STREAMBED MATERIAL OF THE SAME GRADATION AS THE RIFFLE.
 - GRAVEL MATERIAL SHALL BE MIXED, WORKED IN, OR WASHED INTO THE STREAMBED MATERIAL TO THE SATISFACTION OF THE ENGINEER. THE QUANTITY OF GRAVEL MATERIAL REQUIRED MAY BE UP TO 25% OF THE VOLUME OF STREAMBED MATERIAL.
 - SUITABLE GRAVEL MATERIAL HARVESTED ON-SITE SHALL BE USED PRIOR TO IMPORTING GRAVEL.
 - GRANULAR FILTER MATERIAL IS A SUITABLE SUBSTITUTION FOR GRAVEL MATERIAL.
 - NUMBER OF BOULDERS VARIES DEPENDING ON TYPICAL SECTIONS AND BOULDER DIMENSIONS.
 - ALL BOULDER RIFFLES SHALL USE CLASS 2 RIPRAP AS STREAM BED MATERIAL.



BOULDER DIMENSIONS (FT)

BOULDER TYPE	A-AXIS	B-AXIS	C-AXIS
WEIR	2-3	2-3	1-2
FOOTER	2-3	2-3	1-2
TIE-OUT	2-3	2-3	1-2
SPLASH	2-3	2-3	1-2
RIFFLE	2-3	1-2	1-2

**SELECT CLASS 3 BOULDERS SHALL BE ACCEPTABLE



DATE	ISSUES / REVISIONS

APPROVED: [Signature] DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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ROCKBURN BRANCH STREAM RESTORATION

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP GRID/PARCEL: 0031/0023/0235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

DETAILS

PROJECT NO. 13005.36	SCALE: NTS
SEAL: [Signature]	BY: RW/KT CHECK: MDT
DWG. NO. :	

STATE OF MARYLAND
BRYAN J. ARRA
No. 46608
PROFESSIONAL ENGINEER

20 OF 40

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Environmental Services
 DATE

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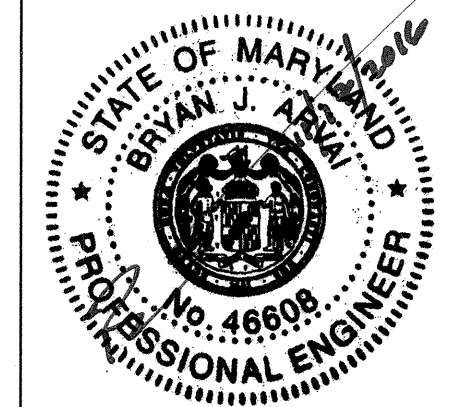
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 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-02 TAX MAP/GRID/PARCEL: 003110023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

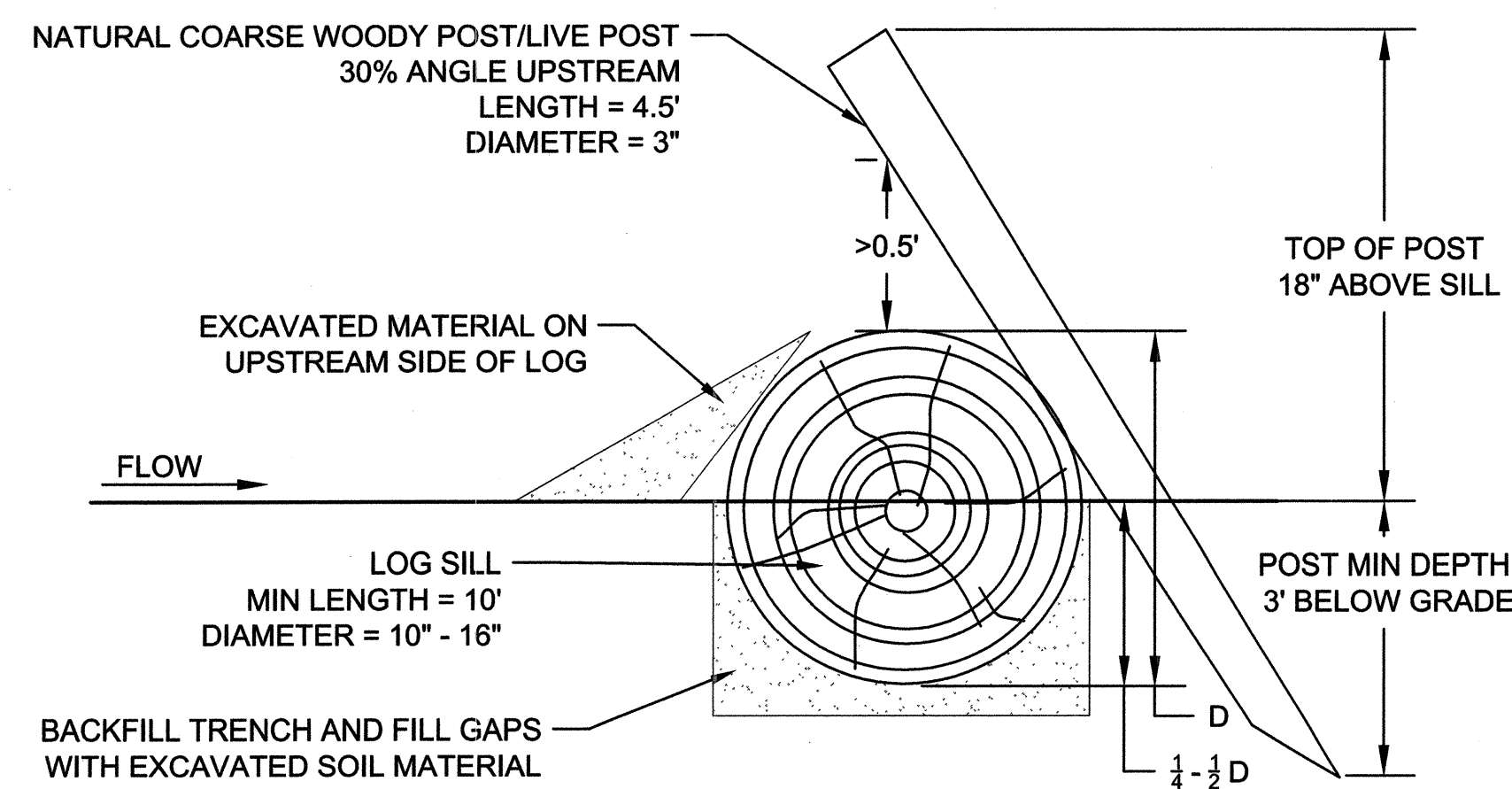
TITLE

DETAILS

PROJECT NO.: 13005.36 SCALE: NTS
 SEAL BY: RW/KT CHECK: MDT
 DWG. NO.:



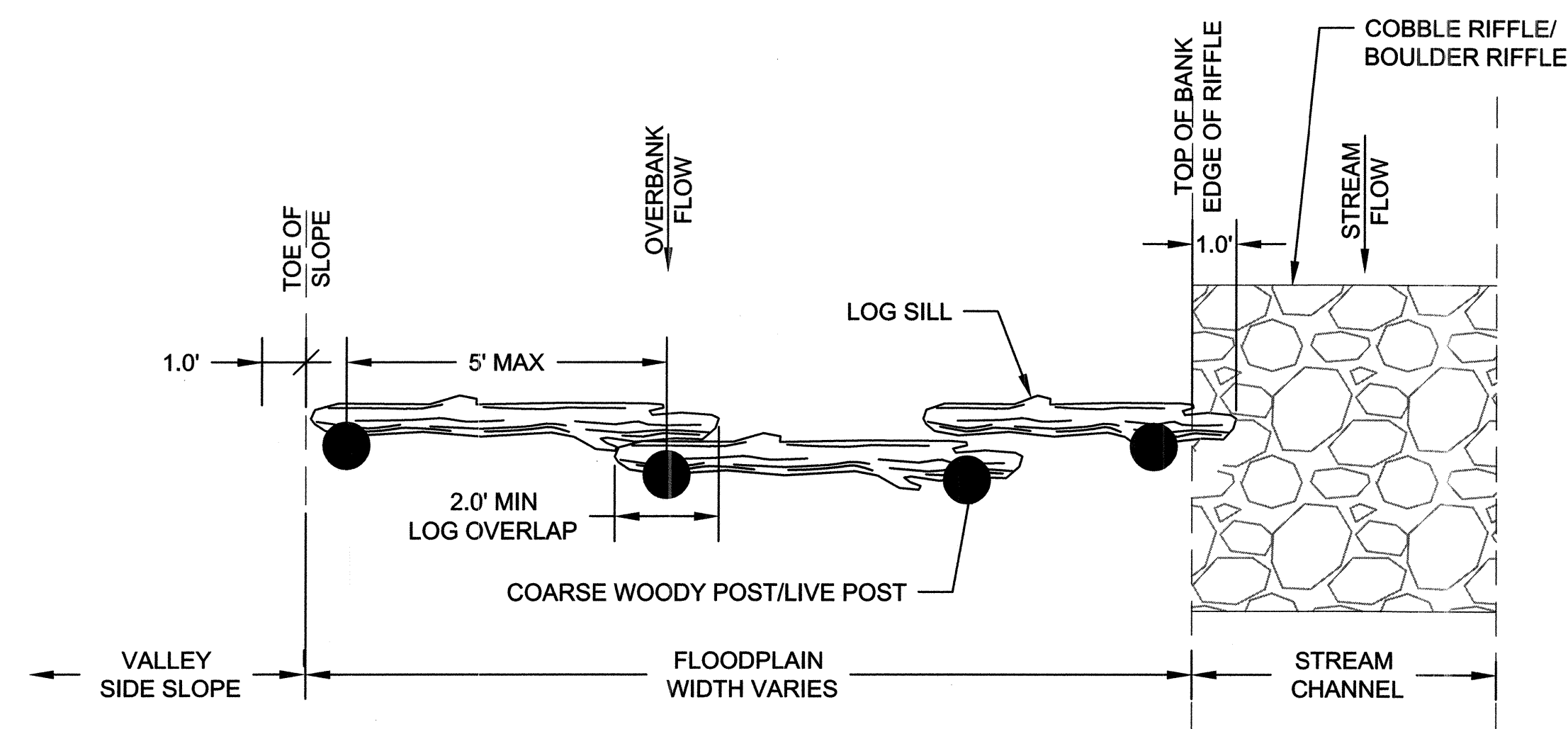
21 OF 40



- NOTES:
- SILLS SHALL BE FIELD LOCATED TO AVOID SIGNIFICANT IMPACTS TO EXISTING ROOT STRUCTURES, AT DIRECTION OF ENGINEER.
 - INSTALLATION OF SILLS SHALL INCLUDE MINIMAL EXCAVATION. EXCAVATE TRENCH ONLY AS NECESSARY TO SEAT THE SILL.
 - IF SILL LENGTH EXCEEDS THE LENGTH OF A SINGLE LOG, ADDITIONAL LOGS MAY BE ADDED AND SHALL OVERLAP A MINIMUM OF 2' IN THE CONFIGURATION SHOWN ON PLAN VIEW.
 - LOG SILL SHALL SLOPE FROM TOE OF VALLEY SLOPE TO EDGE OF RIFFLE FOLLOWING SLOPE OF EXISTING GROUND.
 - POSTS SHALL BE INSTALLED EVERY 5' MAX SPACING, NOT LOCATED AT JOINT BETWEEN 2 LOGS.
 - TWO LIVE POSTS SHALL BE INSTALLED IN 5' ADJACENT TO CHANNEL. COARSE WOODY POSTS SHALL BE INSTALLED EVERY 5' THERE AFTER. A MINIMUM OF TWO POSTS SHALL SUPPORT EACH LOG.

**LOG SILL
 SECTION VIEW**

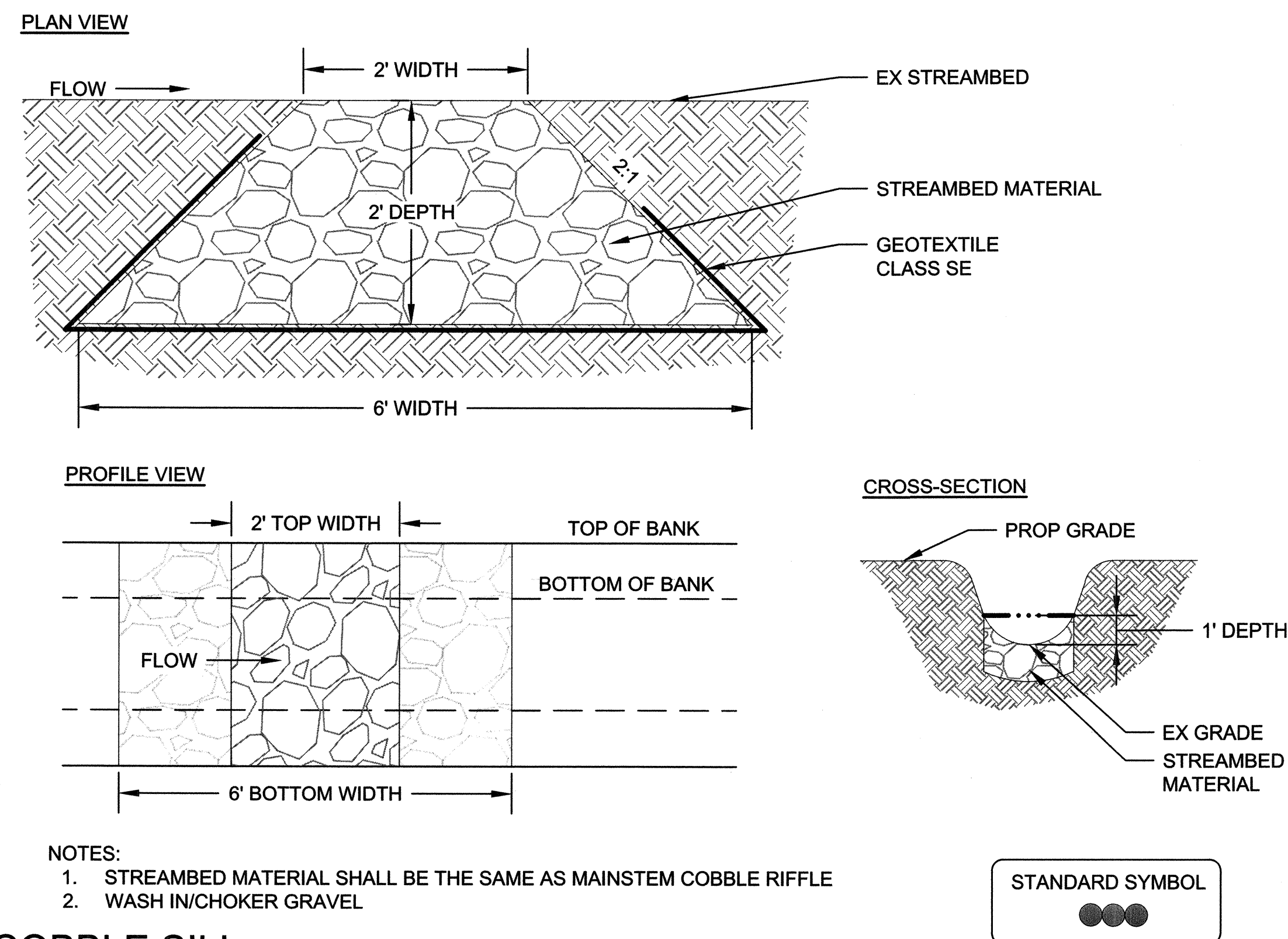
NOT TO SCALE



- NOTES:
- LOG SILLS PLACED ALONG STREAMBANKS SHALL HAVE TREE PLANTINGS ON THE DOWNSTREAM SIDE OF LOG FOR REINFORCEMENT.
 - LOG SILLS PLACED WITHIN SEEPS AND/OR POOLS SHALL BE PLACED AT THE DIRECTION OF ENGINEER ON-SITE.

**LOG SILL
 PLAN VIEW**

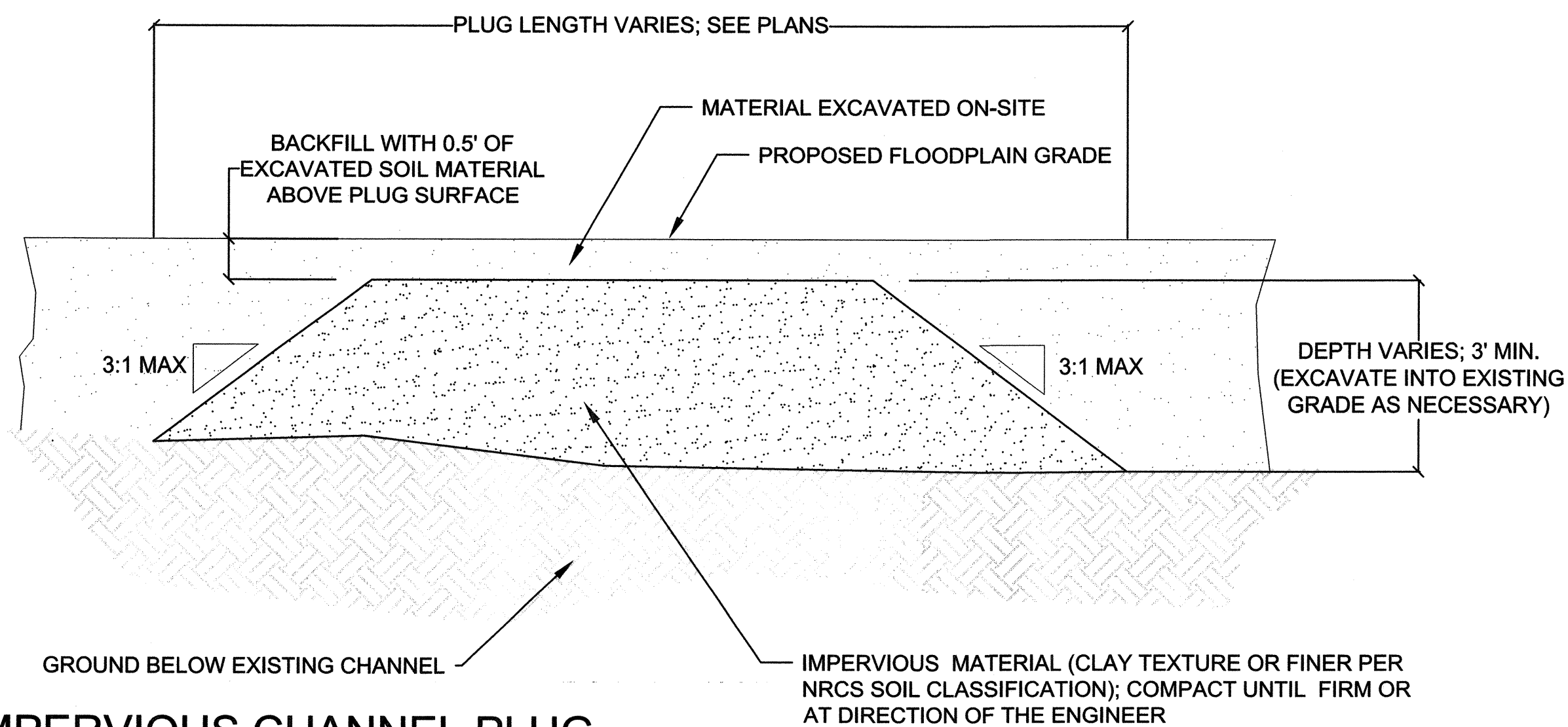
NOT TO SCALE



- NOTES:
- STREAMBED MATERIAL SHALL BE THE SAME AS MAINSTEM COBBLE RIFFLE
 - WASH IN/CHOKER GRAVEL

**COBBLE SILL
 DETAIL**

NOT TO SCALE



**IMPERVIOUS CHANNEL PLUG
 PROFILE**

NOT TO SCALE

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
Mark L. Lucas 4/15/16
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

Biohabitats
The Stables Building, 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com
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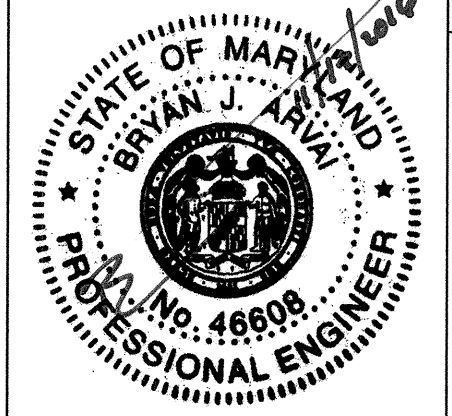
**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
ELECTION DISTRICT: 07 OPEN LOT NA
WAIVER PETITION #WP-17-015

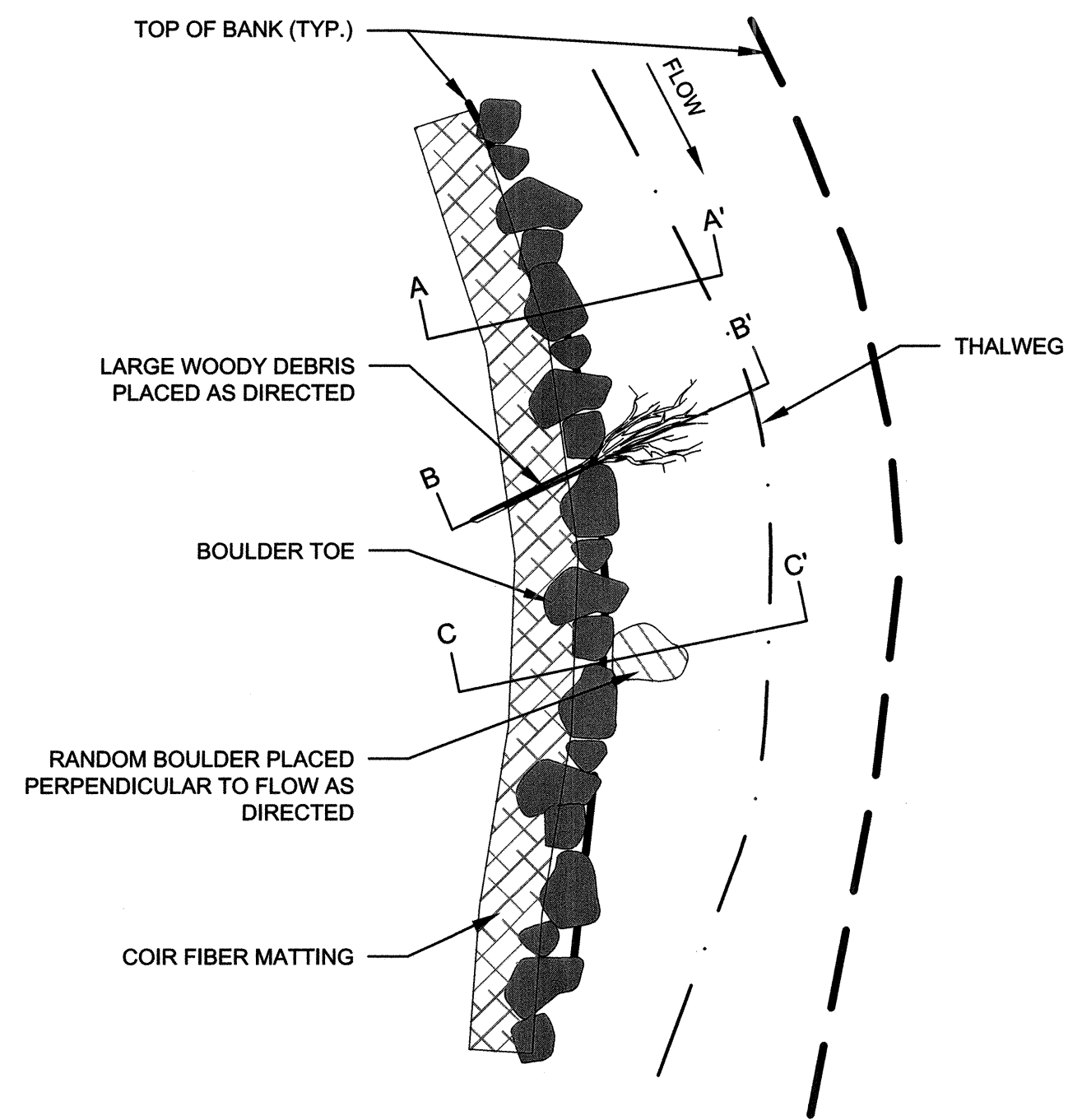
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DETAILS

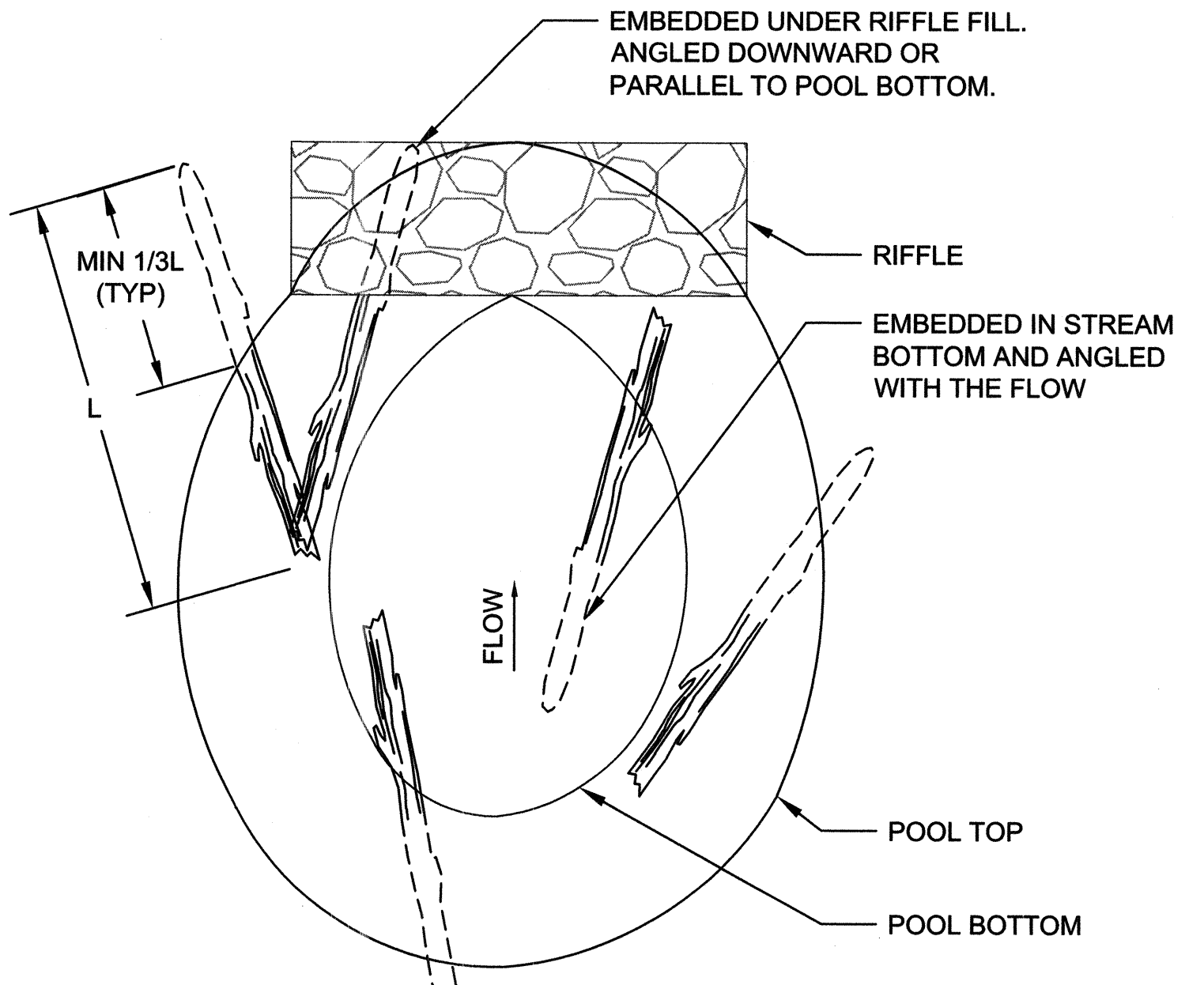
PROJECT NO.: 13005.36 SCALE: NTS
SEAL: BY: RW/KT CHECK: MDT
DWG. NO.



22 OF 40

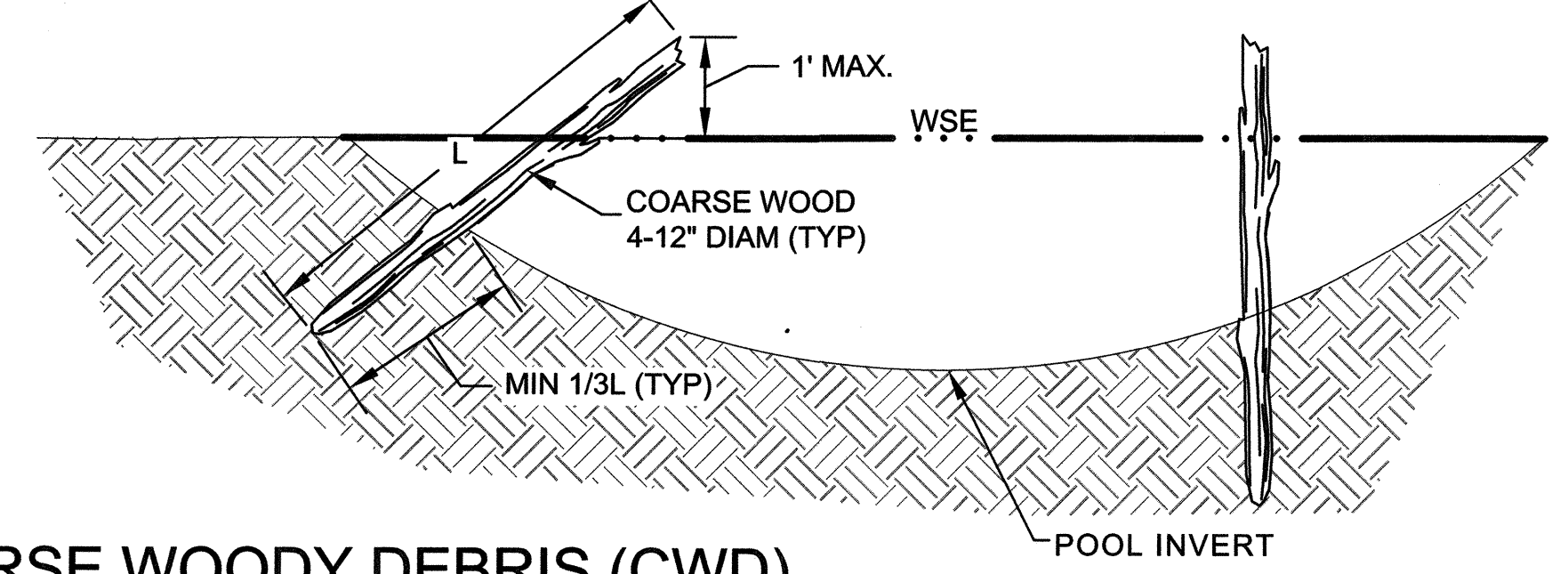


**BOULDER TOE PROTECTION
PLAN -TYPICAL** NOT TO SCALE

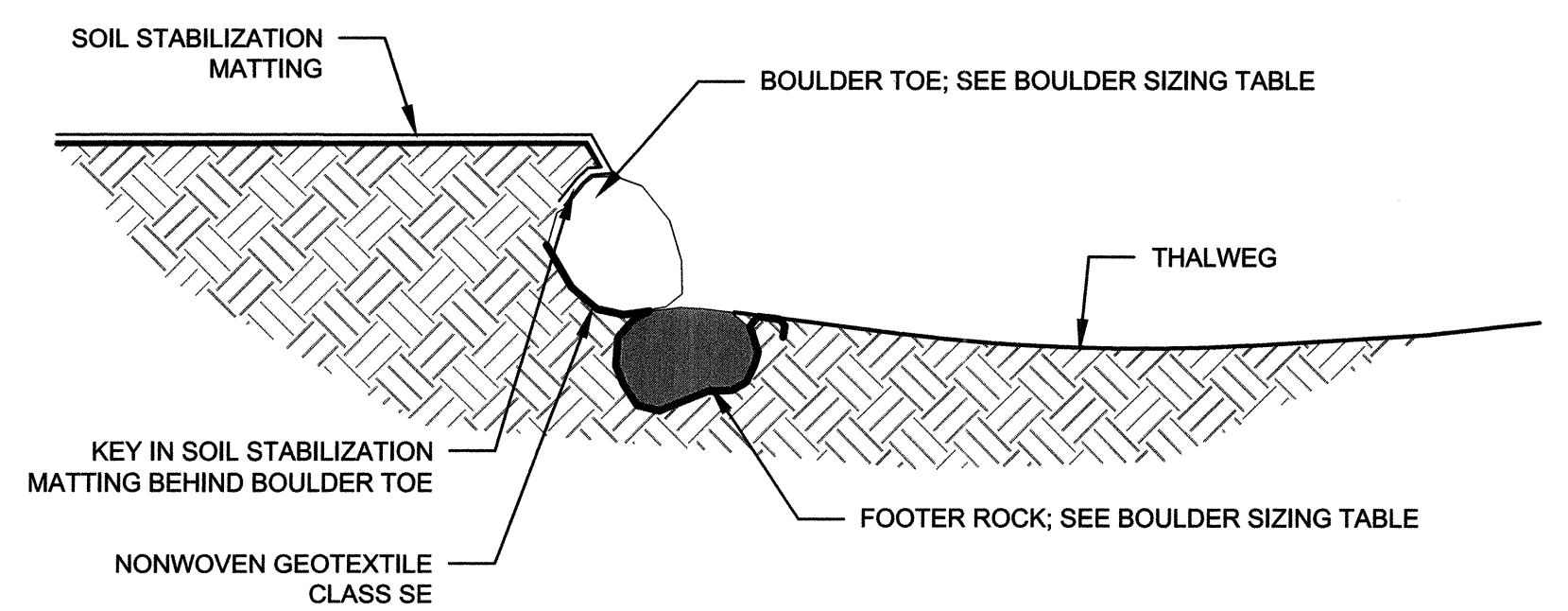


**COARSE WOODY DEBRIS (CWD)
PLAN VIEW- TYPICAL** NOT TO SCALE

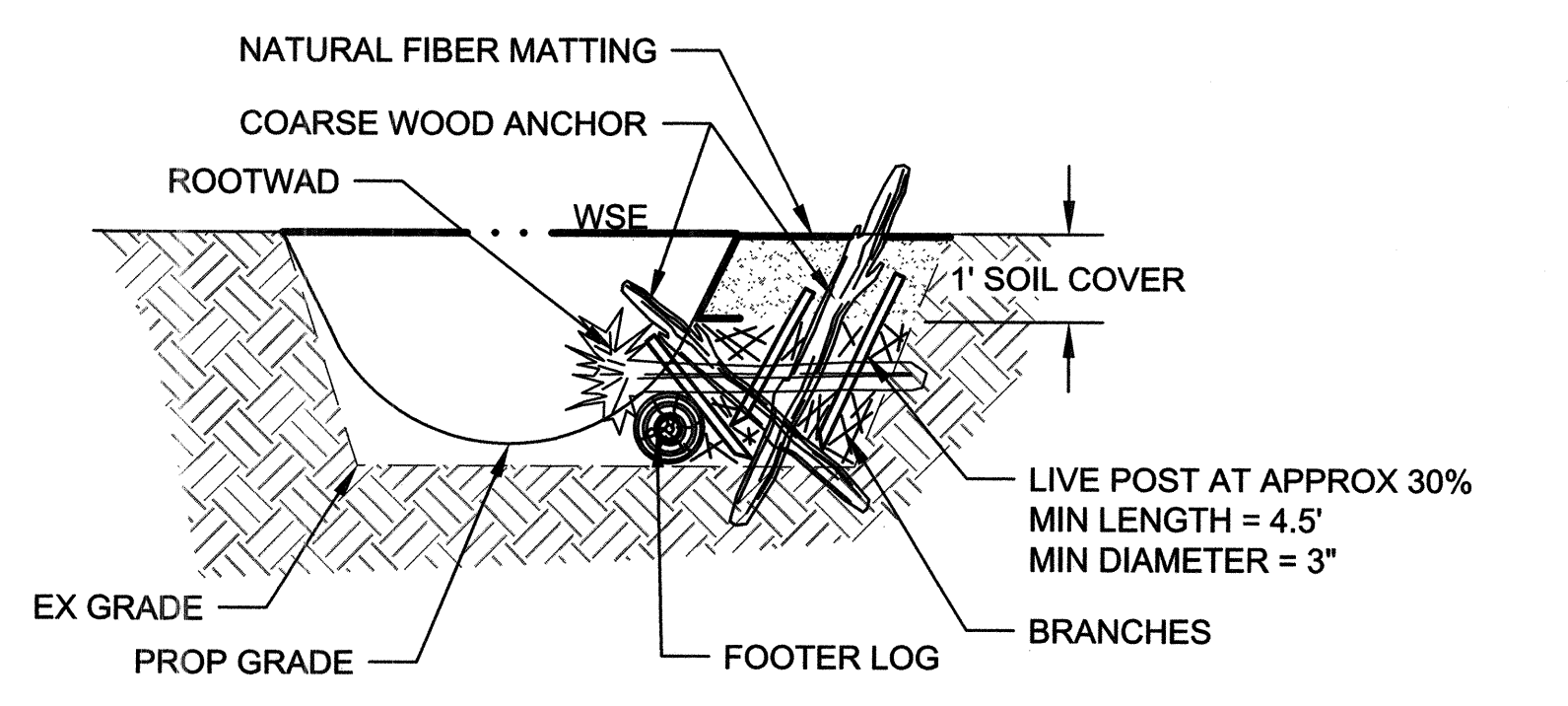
- COARSE WOOD DEBRIS NOTES:**
1. A MINIMUM OF 3 COARSE WOODY DEBRIS (CWD) SHALL BE INSTALLED IN EACH POOL.
 2. CWD SHALL CONSIST OF TREE TRUNKS, BRANCHES, AND/OR ROOTWADS THAT HAVE A DIAMETER SUFFICIENT TO BE DRIVEN INTO THE STREAM BED OR BANKS WITH THE BUCKET OR OTHER MEANS.
 3. CWD TO BE DRIVEN INTO STREAM BANK OR PLACED BELOW CHANNEL FILLS TO A DEPTH THAT IS A MINIMUM OF 1/3 THE LENGTH OF LOG. EXCAVATION FOR PLACEMENT OF CWD IS NOT ACCEPTABLE.
 4. PLACEMENT OF CWD SHALL APPEAR NATURAL AND VARY BETWEEN POOLS.
 5. CWD SHALL NOT BE PLACED IN A MANNER THAT IMPEDES FLOW THROUGH THE DOWNSTREAM RIFFLE.



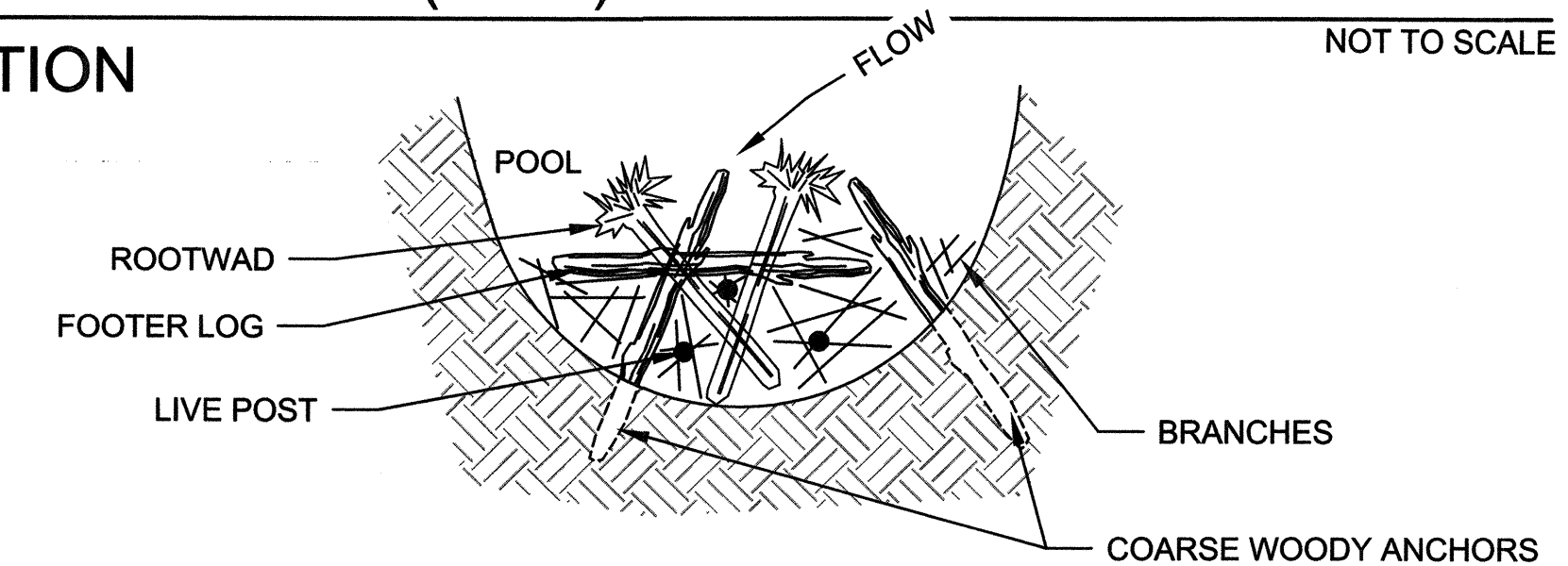
**COARSE WOODY DEBRIS (CWD)
CROSS SECTION** NOT TO SCALE



**BOULDER TOE PROTECTION
SECTION A-A'** NOT TO SCALE

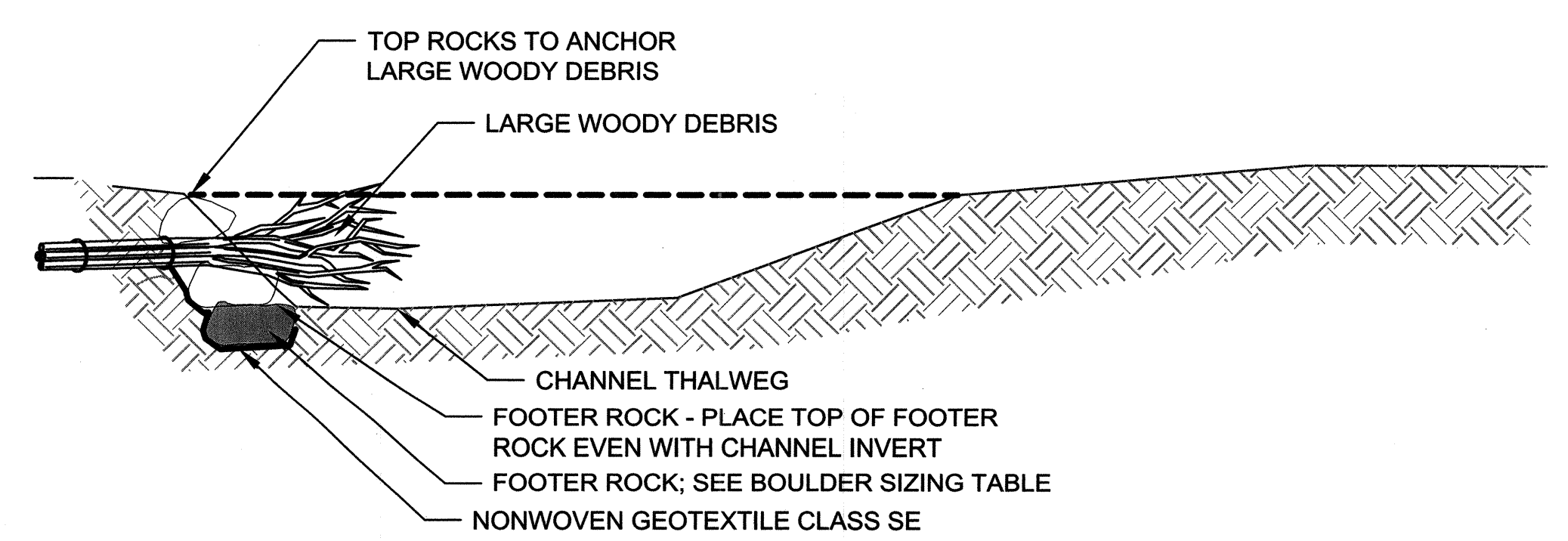


**WOODY TOE PROTECTION
SECTION VIEW** NOT TO SCALE



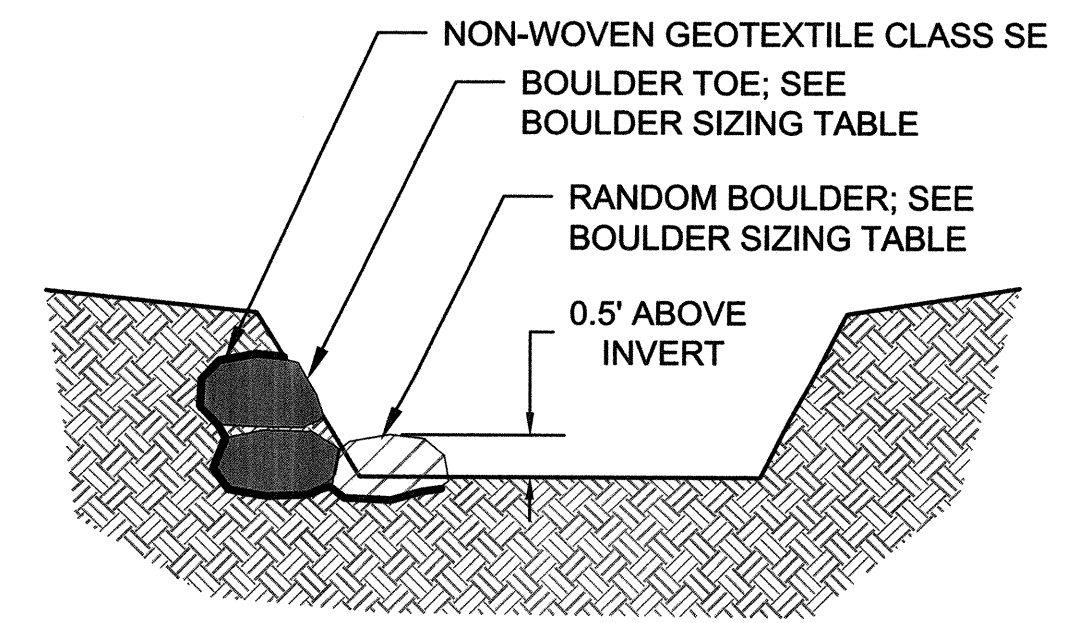
- NOTES:**
1. A MAXIMUM OF ONE ROOTWAD PER 10 LF OF BANK. COARSE WOOD ANCHORS SHALL BE INSTALLED AT MIN OF 1 PER 10 SF OF TOE.
 2. BRANCHES AND LOGS SHALL BE PLACE IN RANDOM ORIENTATION AND COMPACTED WITH THE BUCKET OR OTHER MEANS IN BETWEEN ROOTWAD, COARSE WOODY ANCHORS, AND FOOTER LOGS.
 3. A MINIMUM OF 3 LIVE POSTS SHALL BE INSTALLED THROUGHOUT BRANCHES TO PIN IN PLACE.
 4. TOP OF LIVE POST SHALL BE LEFT ROUGH, AND NOT SAW CUT.
 5. ROOTWAD AND FOOTER LOG SIZE SHALL BE APPROVED BY ENGINEER.

**WOODY TOE PROTECTION
PLAN VIEW** NOT TO SCALE

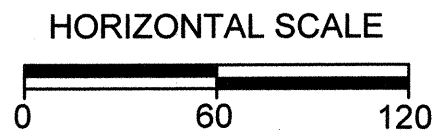
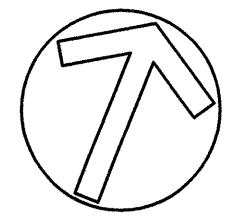


- NOTE:**
1. WHEN BACKFILLING OVER AND AROUND FOOTER ROCKS AND LARGE WOODY DEBRIS, PACK ROCK AND SOIL IN BETWEEN ALL VOIDS TO FIRMLY SECURE ALL COMPONENTS INCLUDING JOINTS, CONNECTIONS AND GAPS.

**BOULDER TOE PROTECTION WITH LARGE WOODY DEBRIS
SECTION B-B'** NOT TO SCALE



**RANDOM BOULDER DETAIL
SECTION C-C'** NOT TO SCALE



DRAINAGE AREA LEGEND

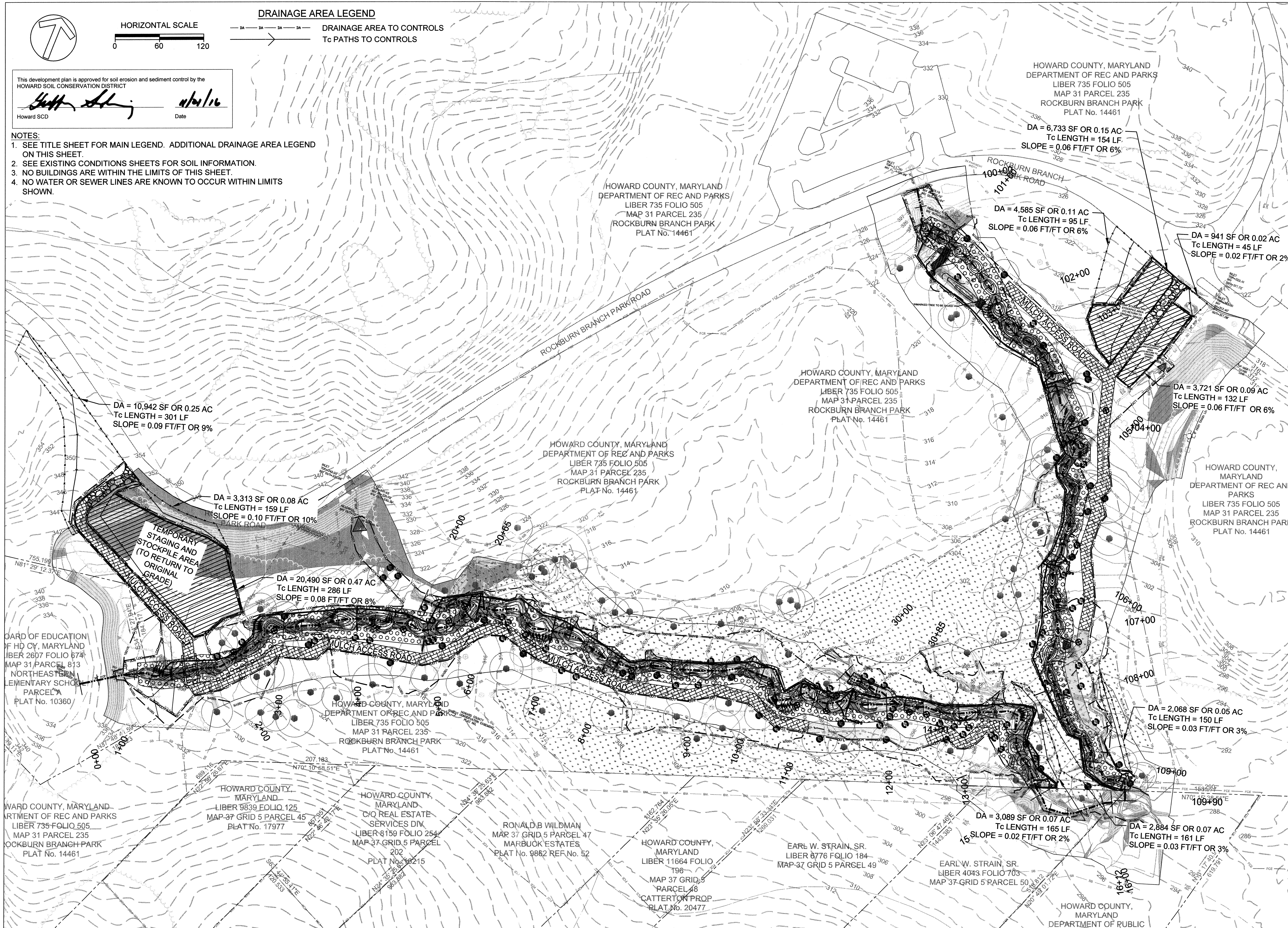


This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

Scott A. ...
Howard SCD Date

NOTES:

1. SEE TITLE SHEET FOR MAIN LEGEND. ADDITIONAL DRAINAGE AREA LEGEND ON THIS SHEET.
2. SEE EXISTING CONDITIONS SHEETS FOR SOIL INFORMATION.
3. NO BUILDINGS ARE WITHIN THE LIMITS OF THIS SHEET.
4. NO WATER OR SEWER LINES ARE KNOWN TO OCCUR WITHIN LIMITS SHOWN.



CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: *Michael ...*
DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



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fx: 410.554.0168 / www.biohabitats.com
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**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 003100230235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

**EROSION AND SEDIMENT
CONTROL PLAN -
DRAINAGE AREAS**

PROJECT NO.: 13005.36 SCALE: 1" = 60'

SEAL: BY: RW/KT CHECK: MDT
DWG. NO.:



23 OF 40

- NOTES:**
- SEE EROSION AND SEDIMENT CONTROL PLAN - DRAINAGE AREAS FOR THE DRAINAGE AREAS TO EACH CONTROL.
 - NO BUILDINGS ARE WITHIN THE LIMITS OF THIS SHEET.
 - NO WATER OR SEWER LINES ARE KNOWN TO OCCUR WITHIN LIMITS SHOWN.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

Jeffrey L. [Signature] 11/21/16
 Date
 Howard SCD

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 11/19/16
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

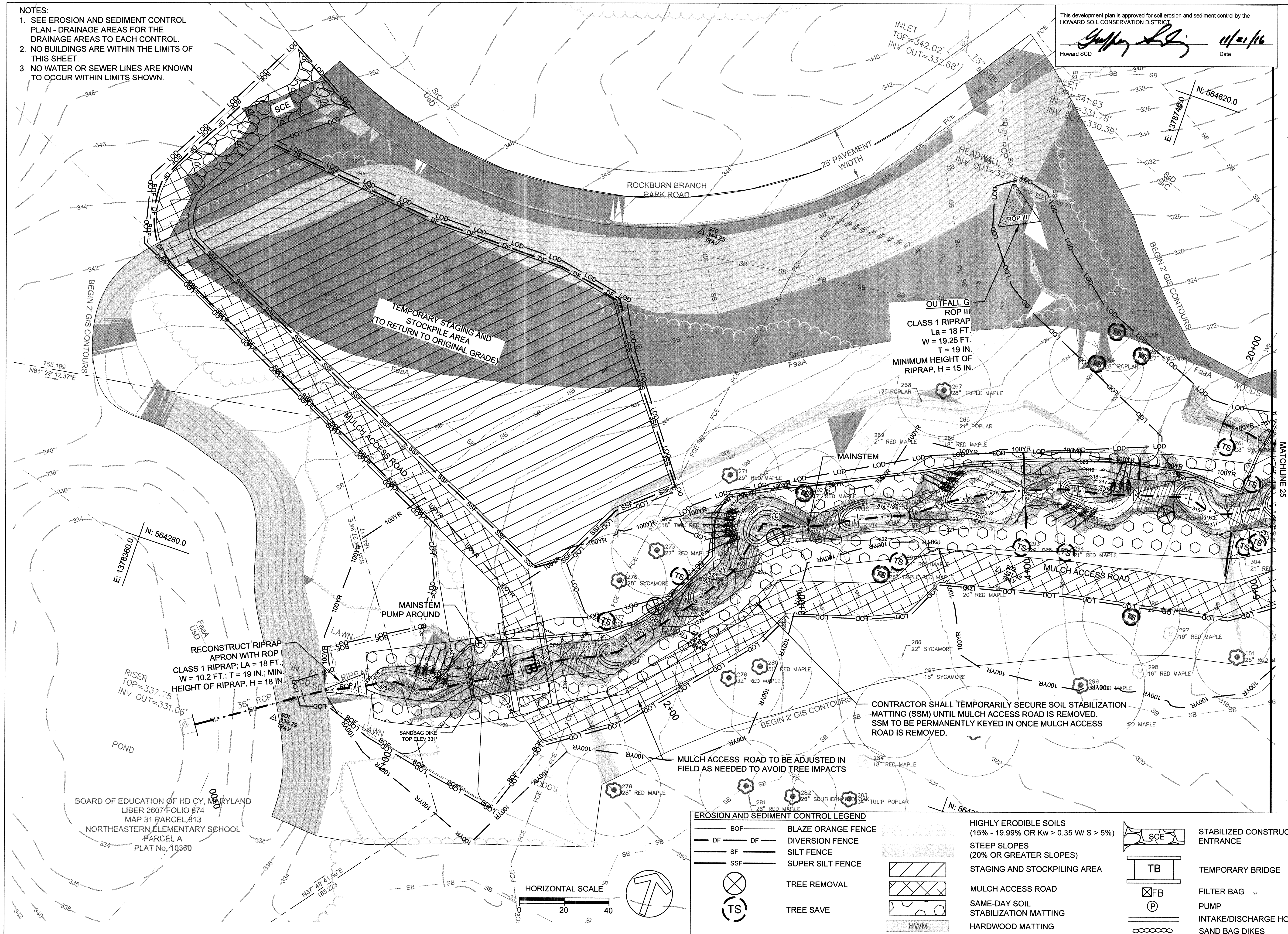
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRIID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

**EROSION AND
 SEDIMENT CONTROL
 PLAN**

PROJECT NO.: 13005.36 SCALE: 1:20

SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.: 24 OF 40

STATE OF MARYLAND
 BAYAN J. ARRABO
 No. 48608
 PROFESSIONAL ENGINEER



EROSION AND SEDIMENT CONTROL LEGEND

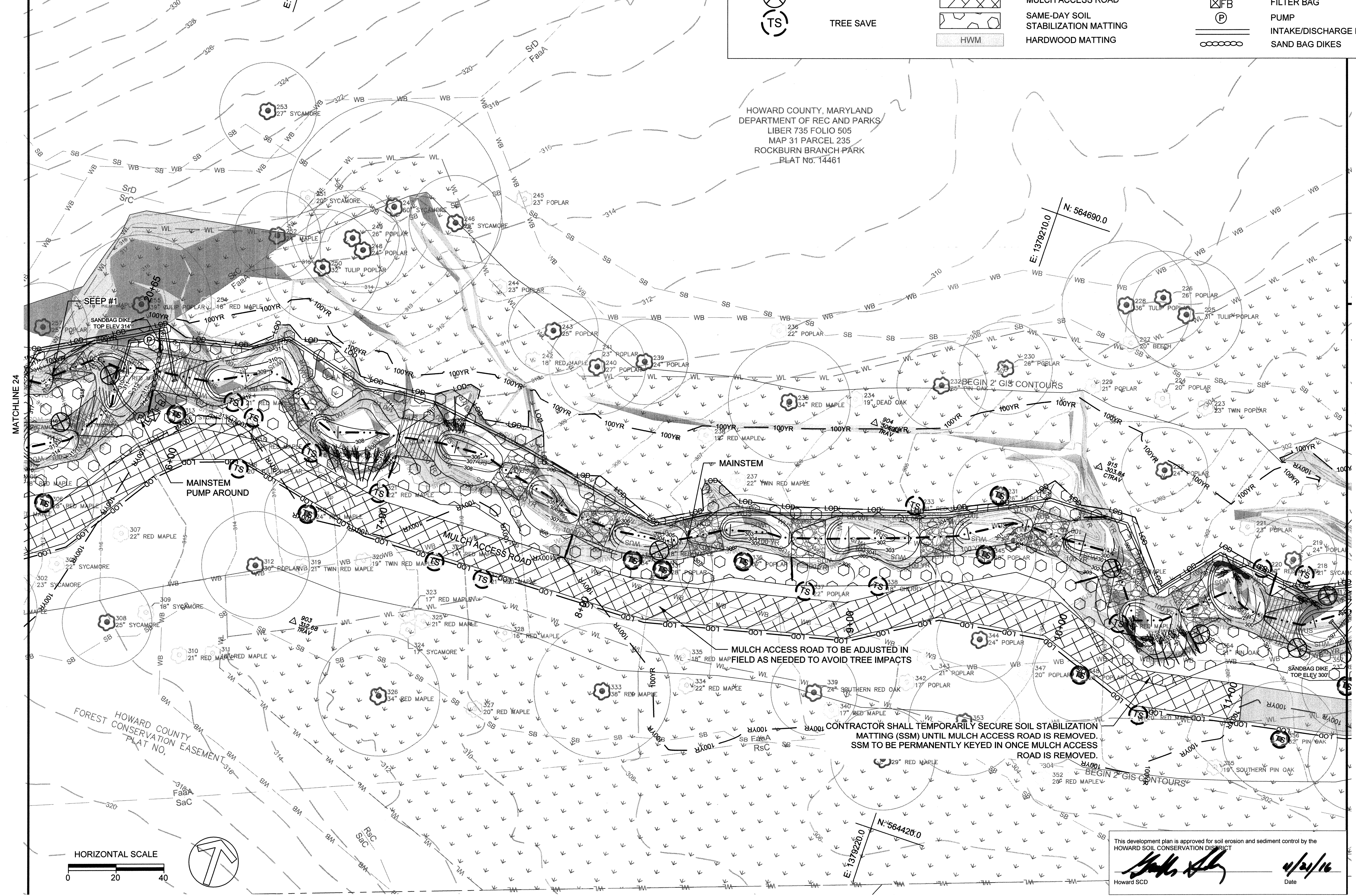
BOF	BLAZE ORANGE FENCE	HIGHLY ERODIBLE SOILS (15% - 19.99% OR Kw > 0.35 W/ S > 5%)	SCE	STABILIZED CONSTRUCTION ENTRANCE
DF	DIVERSION FENCE	STEEP SLOPES (20% OR GREATER SLOPES)	TB	TEMPORARY BRIDGE
SF	SILT FENCE	STAGING AND STOCKPILING AREA	FB	FILTER BAG
SSF	SUPER SILT FENCE	MULCH ACCESS ROAD	P	PUMP
(X)	TREE REMOVAL	SAME-DAY SOIL STABILIZATION MATTING	OO	INTAKE/DISCHARGE HOSE
(TS)	TREE SAVE	HARDWOOD MATTING		SAND BAG DIKES
		HWM		

- NOTES:
- SEE EROSION AND SEDIMENT CONTROL PLAN - DRAINAGE AREAS FOR THE DRAINAGE AREAS TO EACH CONTROL.
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EROSION AND SEDIMENT CONTROL LEGEND

BOF	BLAZE ORANGE FENCE	(15% - 19.99% OR Kw > 0.35 W/ S > 5%)	SCE	STABILIZED CONSTRUCTION ENTRANCE
DF	DIVERSION FENCE	STEEP SLOPES (20% OR GREATER SLOPES)	TB	TEMPORARY BRIDGE
SF	SILT FENCE	STAGING AND STOCKPILING AREA	FB	FILTER BAG
SSF	SUPER SILT FENCE	MULCH ACCESS ROAD	P	PUMP
(X)	TREE REMOVAL	SAME-DAY SOIL STABILIZATION MATTING	○	INTAKE/DISCHARGE HOSE
(TS)	TREE SAVE	HARDWOOD MATTING	○	SAND BAG DIKES
		HWM		

HOWARD COUNTY, MARYLAND
DEPARTMENT OF REC AND PARKS
LIBER 735 FOLIO 505
MAP 31 PARCEL 235
ROCKBURN BRANCH PARK
PLAT No. 14461



CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



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Restore the Earth. Inspire Ecological Stewardship.

**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 003100230235
ELECTION DISTRICT: 07 OPEN LOT NO:
WAVER PETITION #WV-17-015

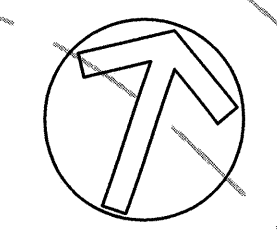
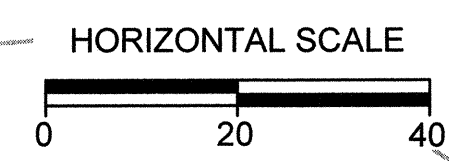
**EROSION AND
SEDIMENT CONTROL
PLAN**

PROJECT NO. 13005.36 SCALE 1:20
SEAL: BY: RWKT CHECK: MDT
DWG NO.:



25 OF 40

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT
[Signature]
Howard SCD Date 4/24/16



MATCHLINE 27

- NOTES:
1. SEE EROSION AND SEDIMENT CONTROL PLAN - DRAINAGE AREAS FOR THE DRAINAGE AREAS TO EACH CONTROL.
 2. NO BUILDINGS ARE WITHIN THE LIMITS OF THIS SHEET.
 3. NO WATER OR SEWER LINES ARE KNOWN TO OCCUR WITHIN LIMITS SHOWN.

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

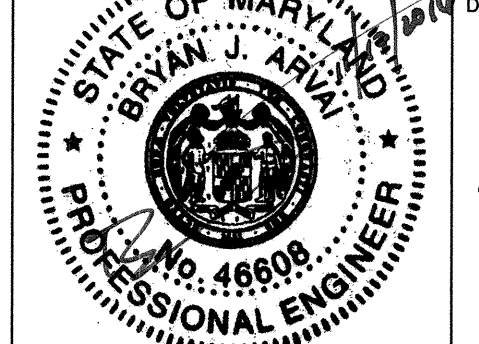
SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID/PARCEL: 0031/0023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

**EROSION AND
 SEDIMENT CONTROL
 PLAN**

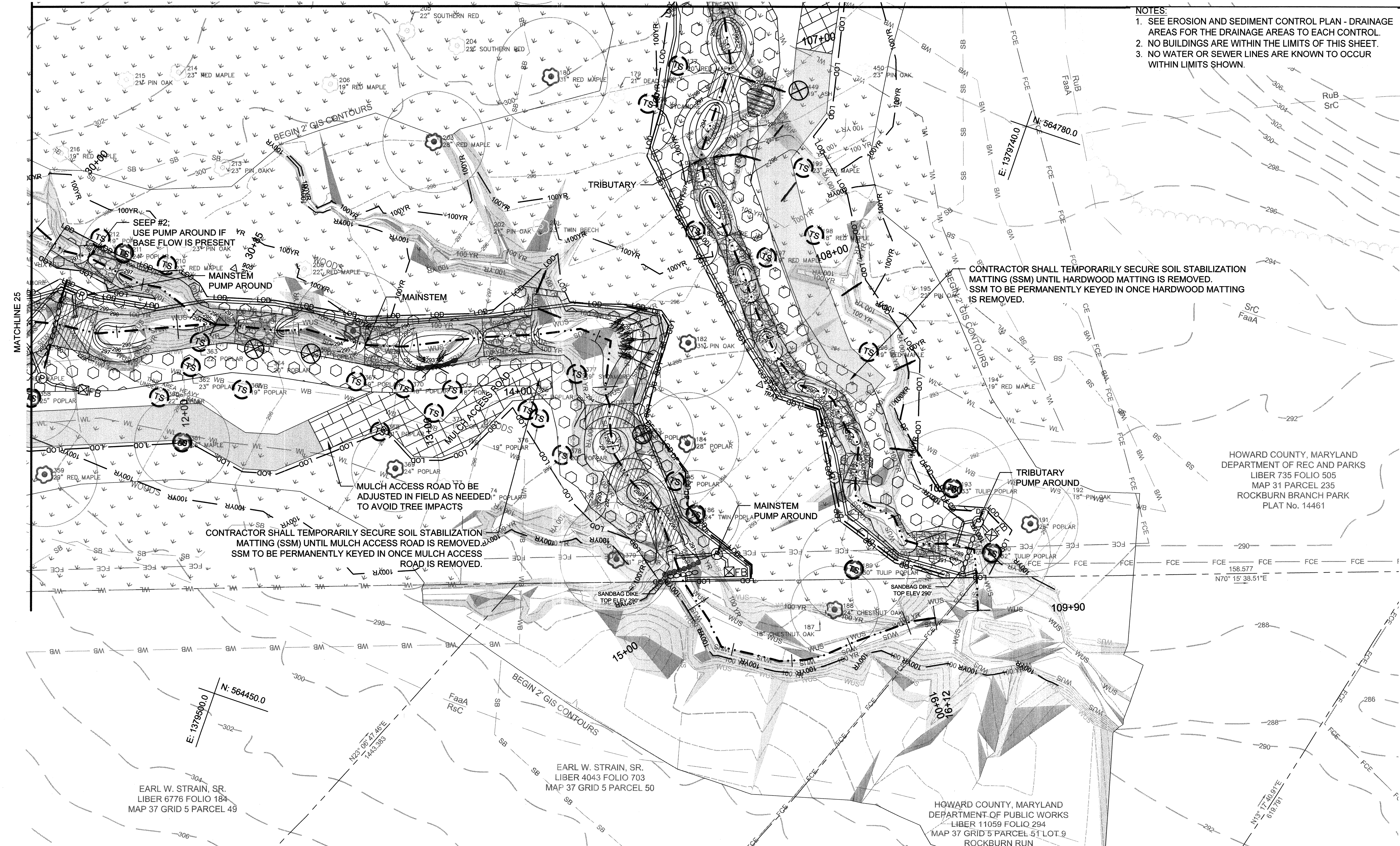
PROJECT NO.: 13005.36

SCALE: 1:20

SEAL: BY: *[Signature]* CHECK: MDT
 DWG. NO.:



26 OF 40



SEEP #2,
 USE PUMP AROUND IF
 BASE FLOW IS PRESENT

MAINSTEM
 PUMP AROUND

MULCH ACCESS ROAD TO BE
 ADJUSTED IN FIELD AS NEEDED
 TO AVOID TREE IMPACTS

CONTRACTOR SHALL TEMPORARILY SECURE SOIL STABILIZATION
 MATTING (SSM) UNTIL MULCH ACCESS ROAD IS REMOVED.
 SSM TO BE PERMANENTLY KEYED IN ONCE MULCH ACCESS
 ROAD IS REMOVED.

CONTRACTOR SHALL TEMPORARILY SECURE SOIL STABILIZATION
 MATTING (SSM) UNTIL HARDWOOD MATTING IS REMOVED.
 SSM TO BE PERMANENTLY KEYED IN ONCE HARDWOOD MATTING
 IS REMOVED.

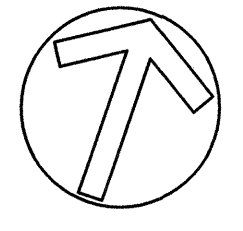
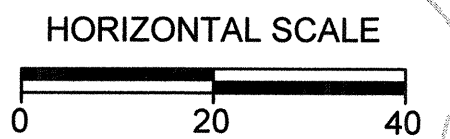
HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT No. 14461

HOWARD COUNTY, MARYLAND
 DEPARTMENT OF PUBLIC WORKS
 LIBER 11059 FOLIO 294
 MAP 37 GRID 5 PARCEL 51 LOT 9
 ROCKBURN RUN
 PLAT No. 13272

EARL W. STRAIN, SR.
 LIBER 6776 FOLIO 184
 MAP 37 GRID 5 PARCEL 49

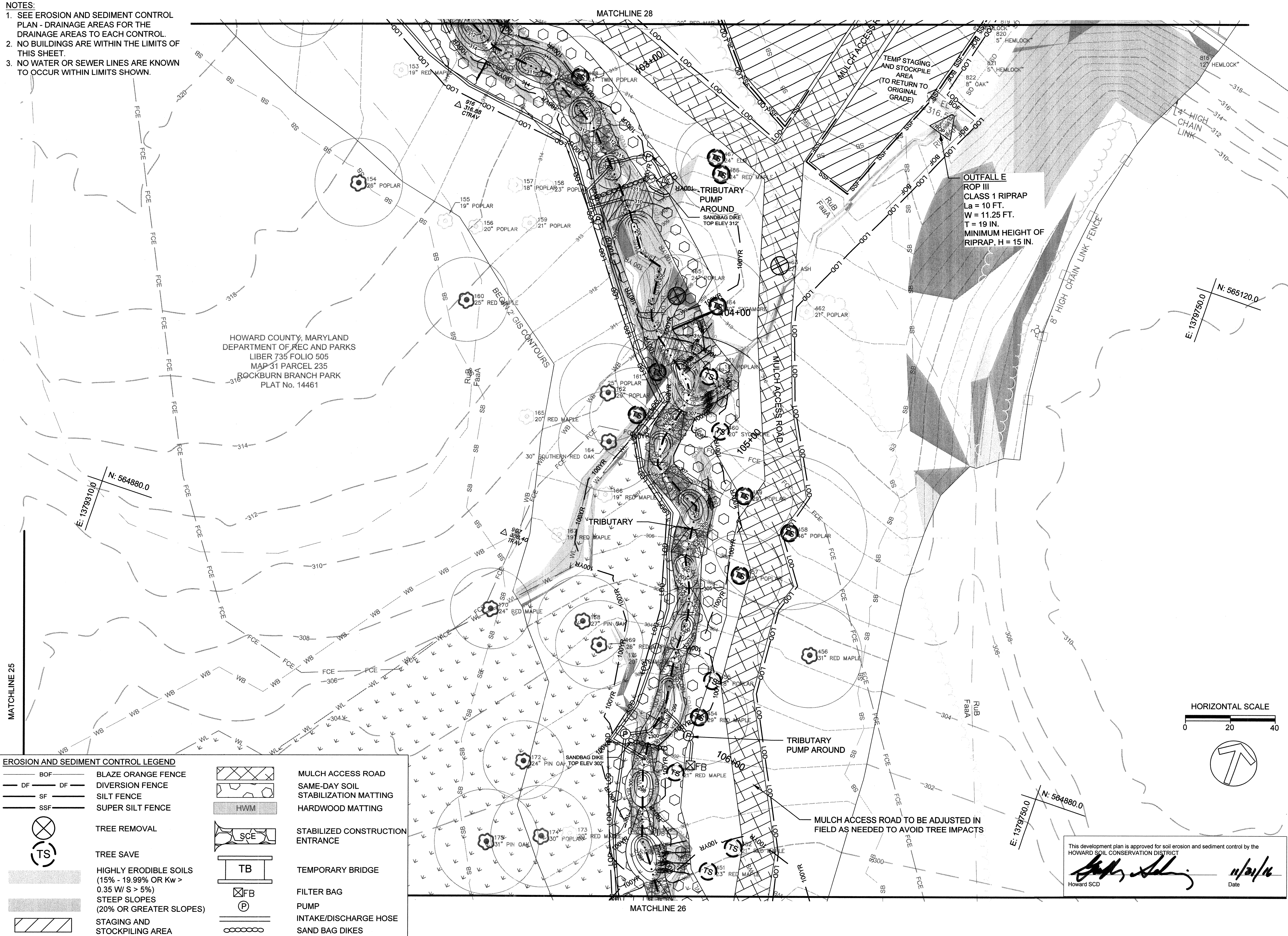
EARL W. STRAIN, SR.
 LIBER 4043 FOLIO 703
 MAP 37 GRID 5 PARCEL 50

EROSION AND SEDIMENT CONTROL LEGEND			
	BLAZE ORANGE FENCE		HARDWOOD MATTING
	DIVERSION FENCE		STABILIZED CONSTRUCTION ENTRANCE
	SILT FENCE		TEMPORARY BRIDGE
	SUPER SILT FENCE		FILTER BAG
	TREE REMOVAL		PUMP
	TREE SAVE		INTAKE/DISCHARGE HOSE
	STEEP SLOPES (20% OR GREATER SLOPES)		SAND BAG DIKES
	HIGHLY ERODIBLE SOILS (15% - 19.99% OR Kw > 0.35 W/S > 5%)		
	STAGING AND STOCKPILING AREA		
	MULCH ACCESS ROAD		
	SAME-DAY SOIL STABILIZATION MATTING		



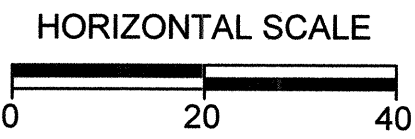
This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.
[Signature]
 Howard SCD Date

- NOTES:**
- SEE EROSION AND SEDIMENT CONTROL PLAN - DRAINAGE AREAS FOR THE DRAINAGE AREAS TO EACH CONTROL.
 - NO BUILDINGS ARE WITHIN THE LIMITS OF THIS SHEET.
 - NO WATER OR SEWER LINES ARE KNOWN TO OCCUR WITHIN LIMITS SHOWN.



HOWARD COUNTY, MARYLAND
DEPARTMENT OF REC AND PARKS
LIBER 735 FOLIO 505
MAP-31 PARCEL 235
ROCKBURN BRANCH PARK
PLAT No. 14461

OUTFALL E
ROP III
CLASS 1 RIPRAP
La = 10 FT.
W = 11.25 FT.
T = 19 IN.
MINIMUM HEIGHT OF
RIPRAP, H = 15 IN.



EROSION AND SEDIMENT CONTROL LEGEND	
BOF	BLAZE ORANGE FENCE
DF	DIVERSION FENCE
SF	SILT FENCE
SSF	SUPER SILT FENCE
(X)	TREE REMOVAL
(TS)	TREE SAVE
(Hatched)	HIGHLY ERODIBLE SOILS (15% - 19.99% OR Kw > 0.35 W/ S > 5%)
(Hatched)	STEEP SLOPES (20% OR GREATER SLOPES)
(Hatched)	STAGING AND STOCKPILING AREA
(Hatched)	MULCH ACCESS ROAD
(Hatched)	SAME-DAY SOIL STABILIZATION MATTING
(Hatched)	HARDWOOD MATTING
(Hatched)	STABILIZED CONSTRUCTION ENTRANCE
(TB)	TEMPORARY BRIDGE
(FB)	FILTER BAG
(P)	PUMP
(Hatched)	INTAKE/DISCHARGE HOSE
(Hatched)	SAND BAG DIKES

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



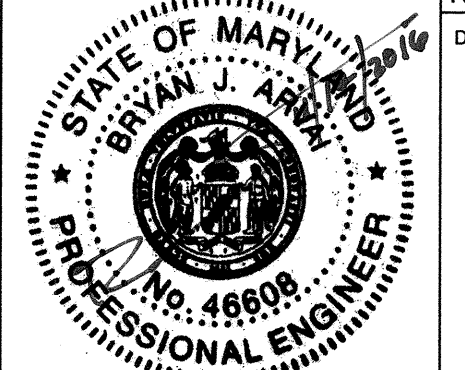
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fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 00310023/0235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

**EROSION AND
SEDIMENT CONTROL
PLAN**

PROJECT NO.: 13005.36 SCALE: 1:20
SEAL: BY: RW/KT CHECK: MDT
DWS. NO.:



27 OF 40

- NOTES:**
1. SEE EROSION AND SEDIMENT CONTROL PLAN - DRAINAGE AREAS FOR THE DRAINAGE AREAS TO EACH CONTROL.
 2. NO BUILDINGS ARE WITHIN THE LIMITS OF THIS SHEET.
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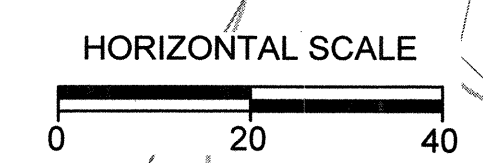
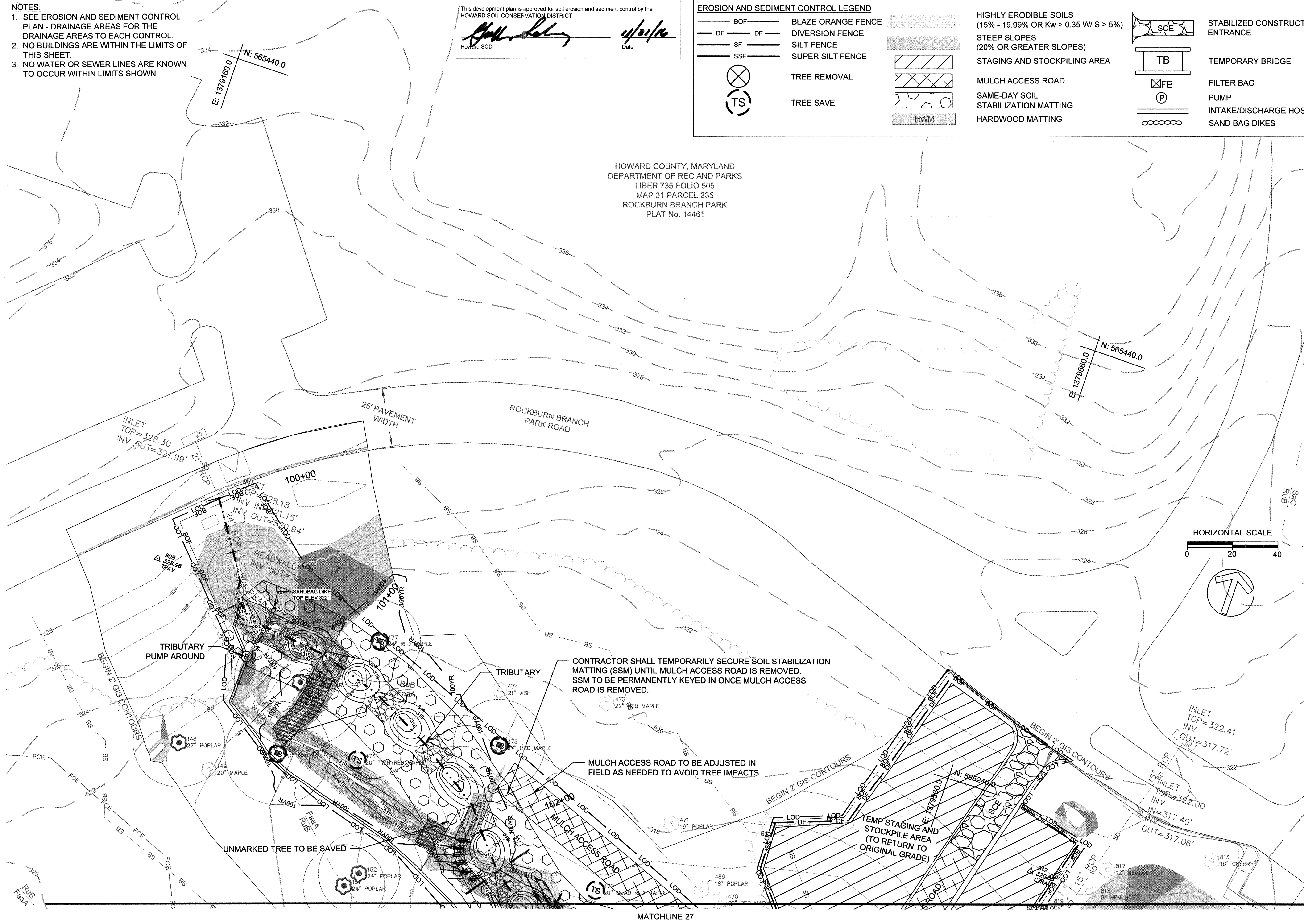
This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

[Signature]
Howard SCD

[Signature]
Date: 11/21/16

EROSION AND SEDIMENT CONTROL LEGEND		HIGHLY ERODIBLE SOILS (15% - 19.99% OR Kw > 0.35 W/ S > 5%)		STABILIZED CONSTRUCTION ENTRANCE	
BOF	BLAZE ORANGE FENCE	[Hatched Box]	STEEP SLOPES (20% OR GREATER SLOPES)	[SCE Symbol]	
DF	DIVERSION FENCE	[Hatched Box]	STAGING AND STOCKPILING AREA	[TB Symbol]	TEMPORARY BRIDGE
SF	SILT FENCE	[Hatched Box]	MULCH ACCESS ROAD	[FB Symbol]	FILTER BAG
SSF	SUPER SILT FENCE	[Hatched Box]	SAME-DAY SOIL STABILIZATION MATTING	[P Symbol]	PUMP
[X Symbol]	TREE REMOVAL	[Hatched Box]	HARDWOOD MATTING	[Hose Symbol]	INTAKE/DISCHARGE HOSE
[TS Symbol]	TREE SAVE	[Hatched Box]		[Dikes Symbol]	SAND BAG DIKES

HOWARD COUNTY, MARYLAND
DEPARTMENT OF REC AND PARKS
LIBER 735 FOLIO 505
MAP 31 PARCEL 235
ROCKBURN BRANCH PARK
PLAT No. 14461



CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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Restore the Earth & Inspire Ecological Stewardship

**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP GRID/PARCEL: 003110023/0235
ELECTION DISTRICT: 07 OPEN LOT NA
WAIVER PETITION #WV-17-015

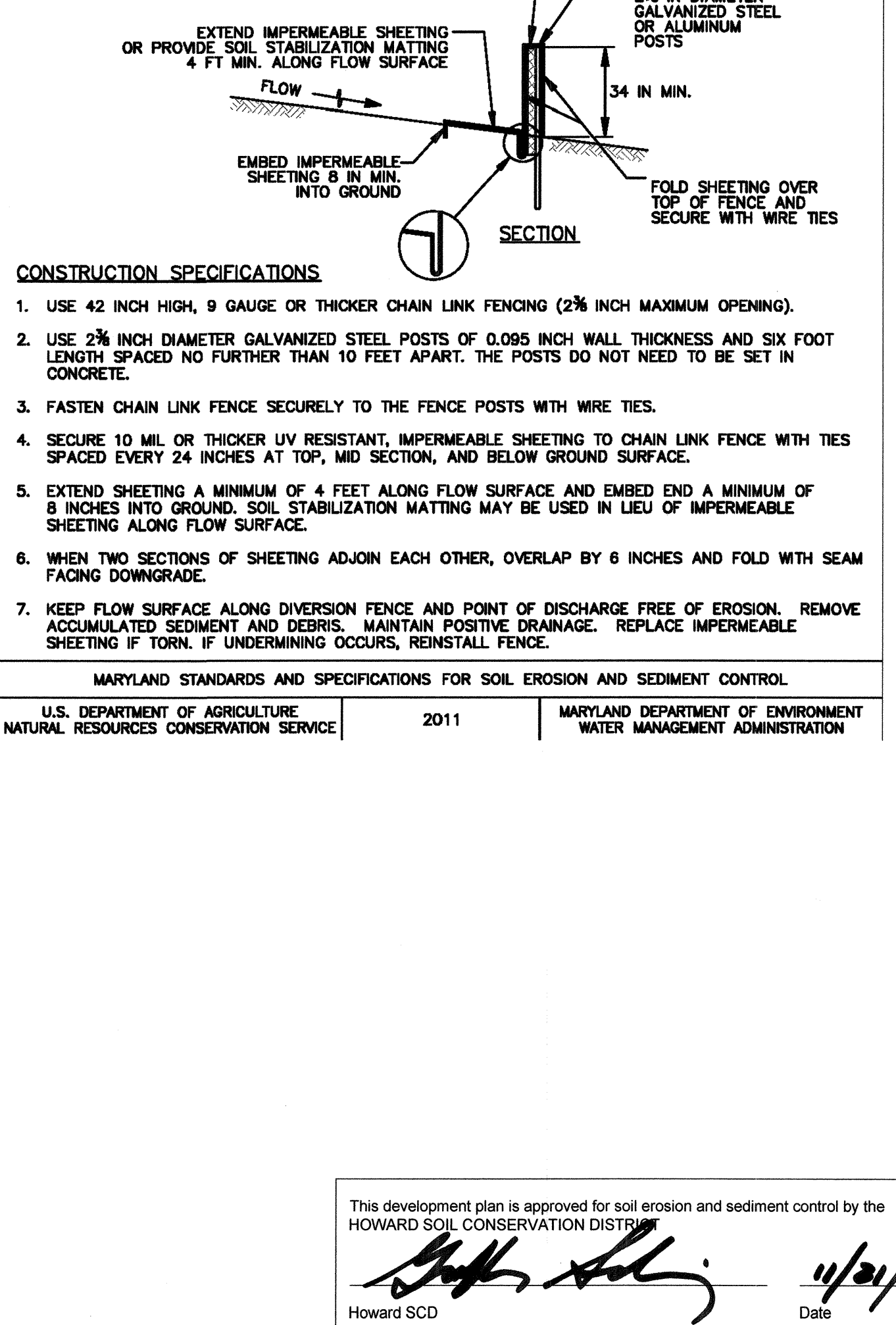
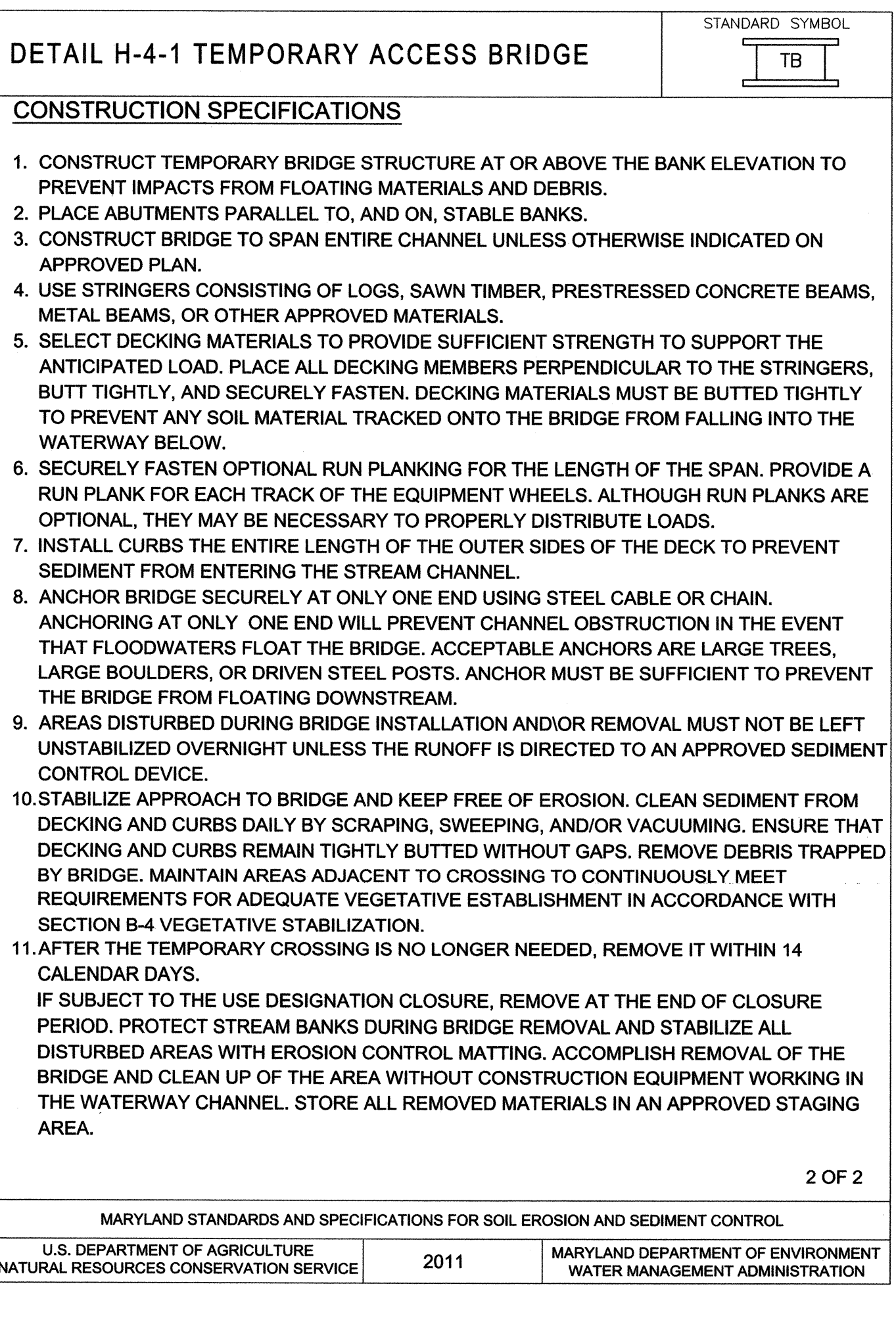
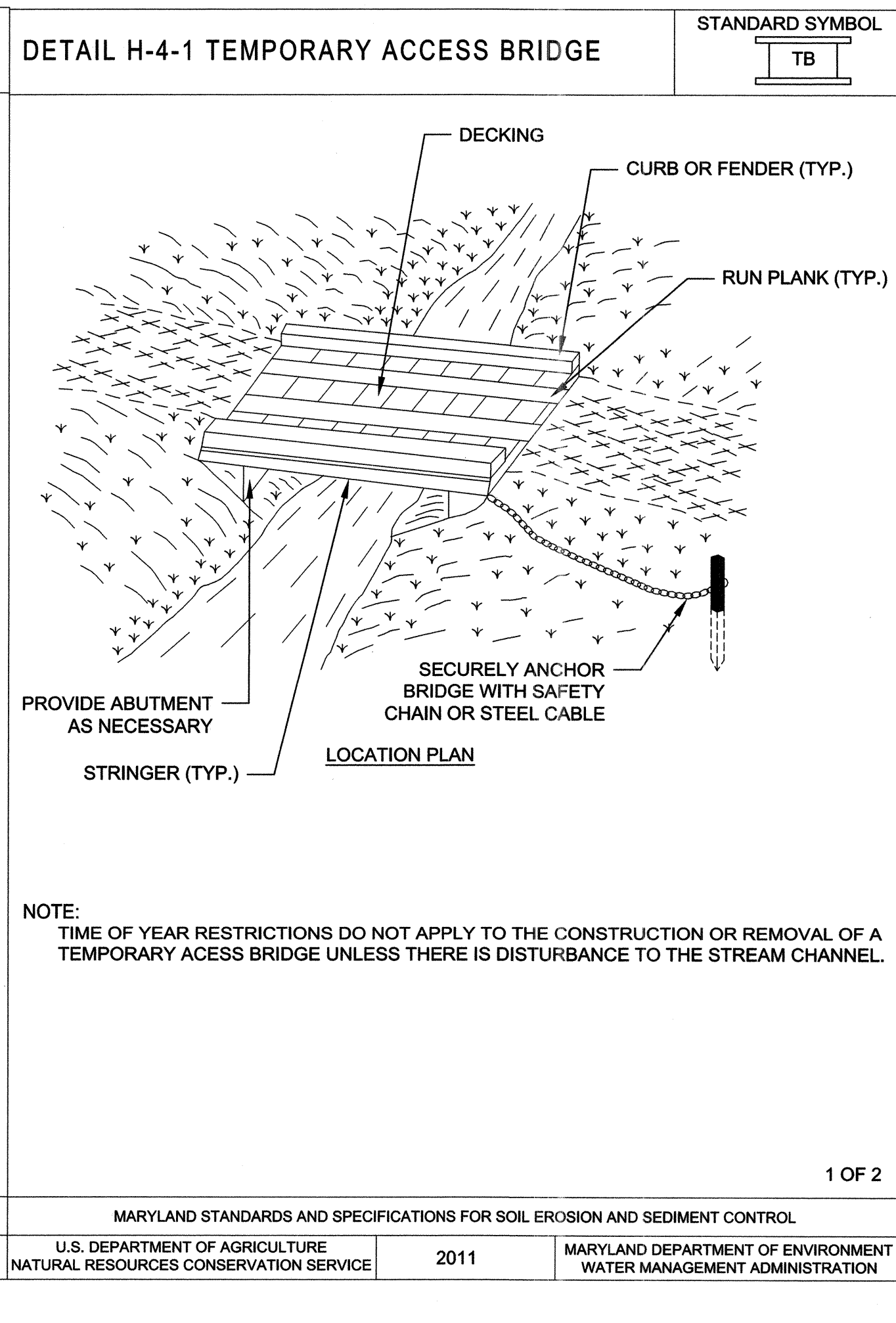
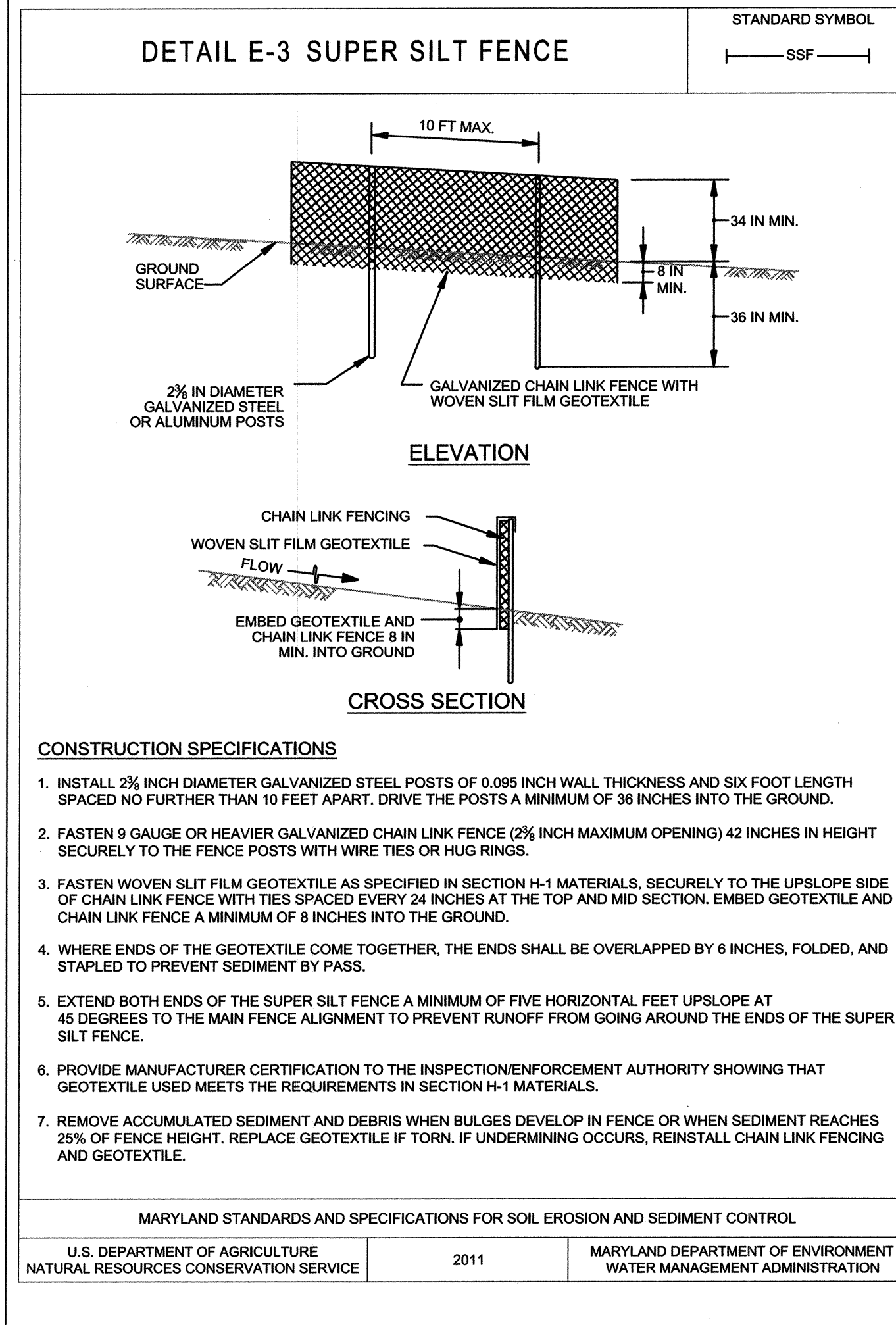
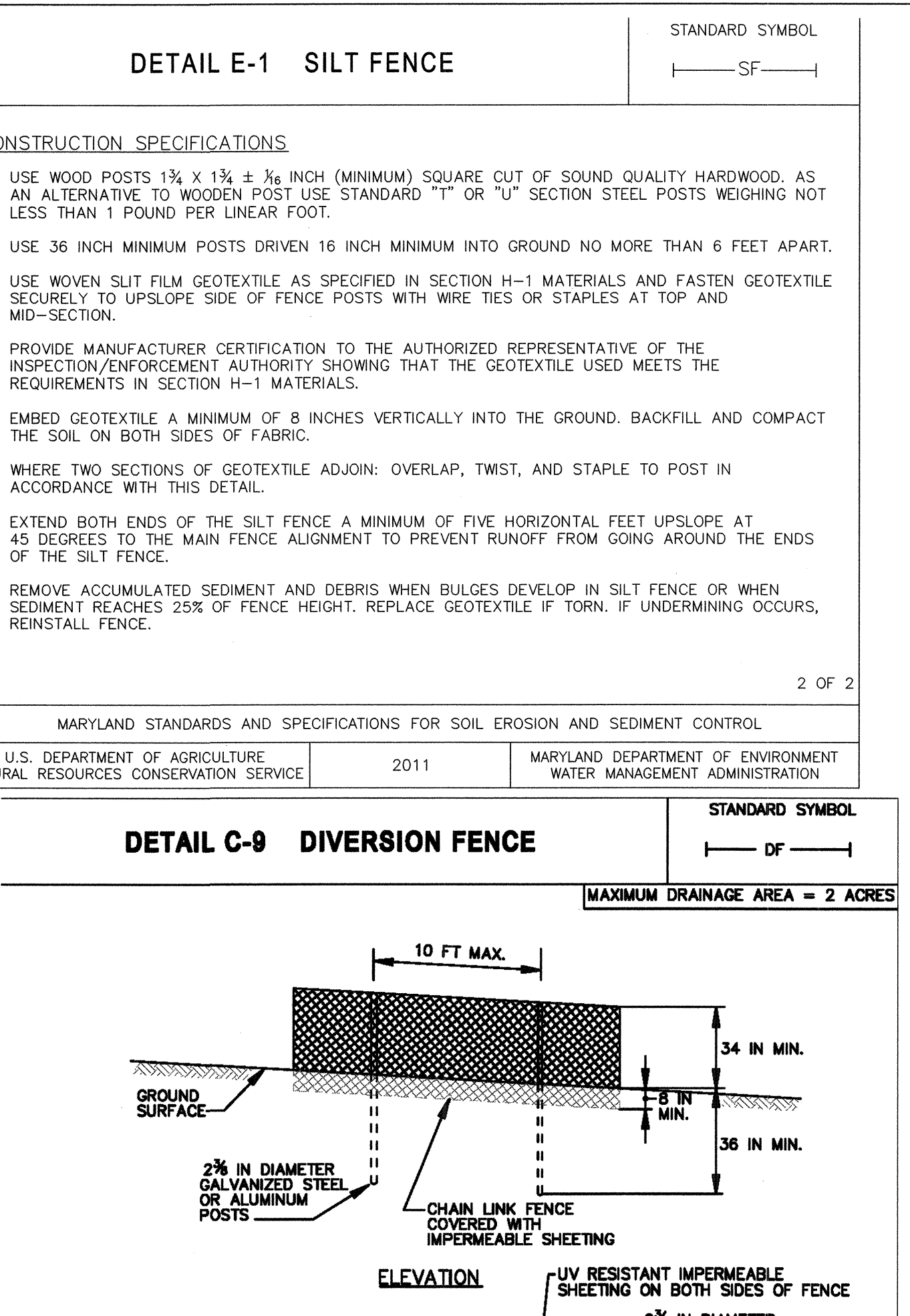
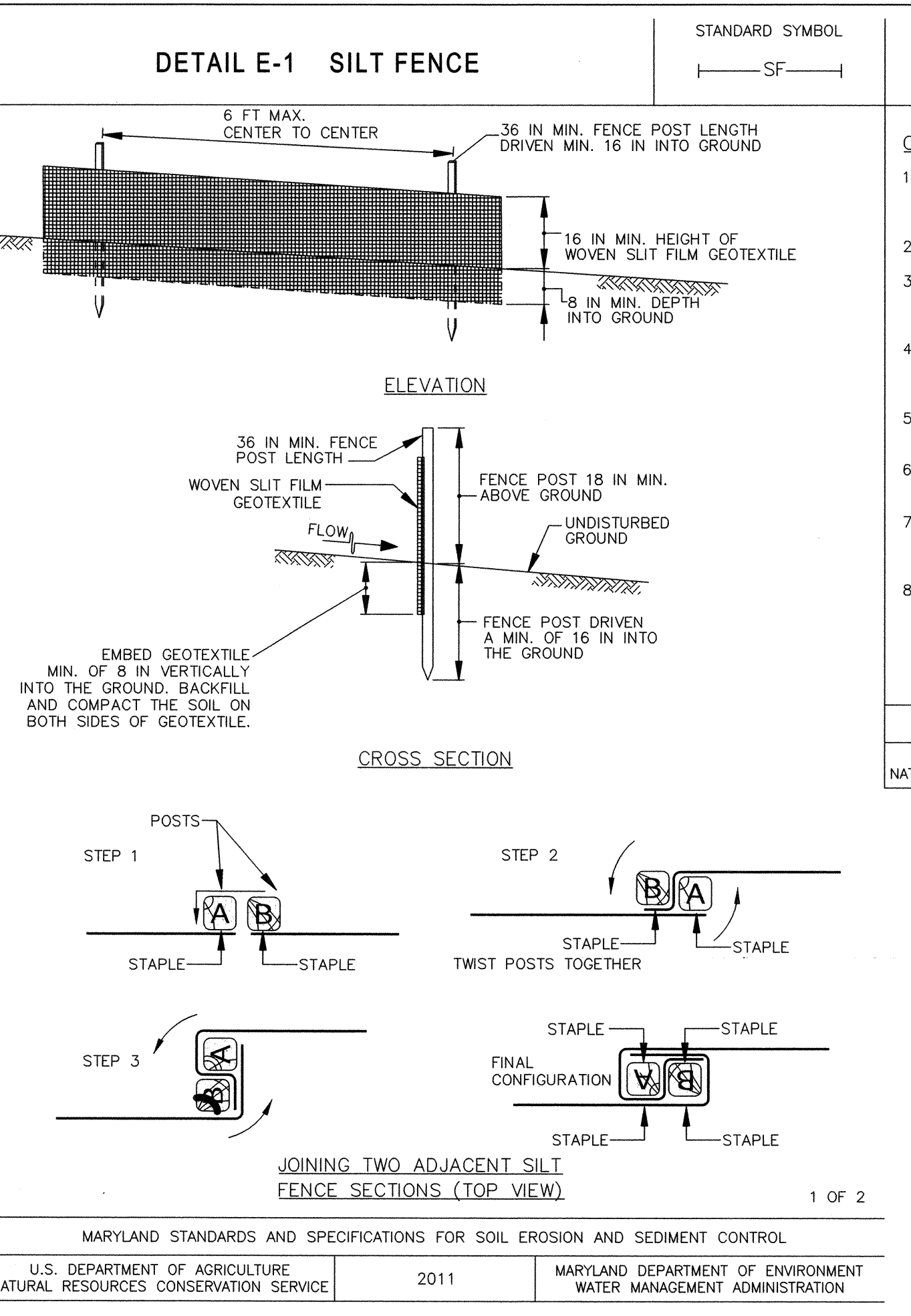
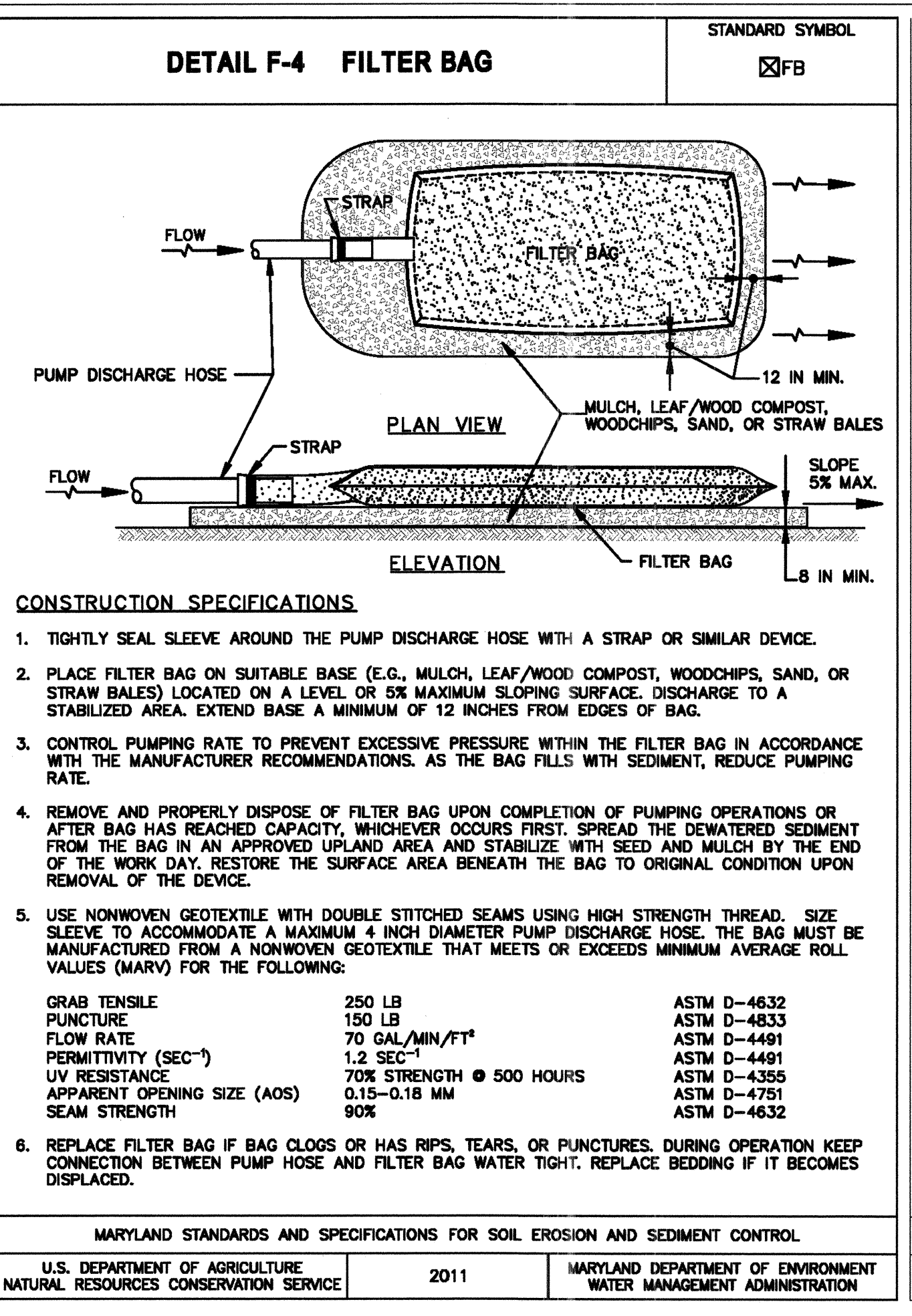
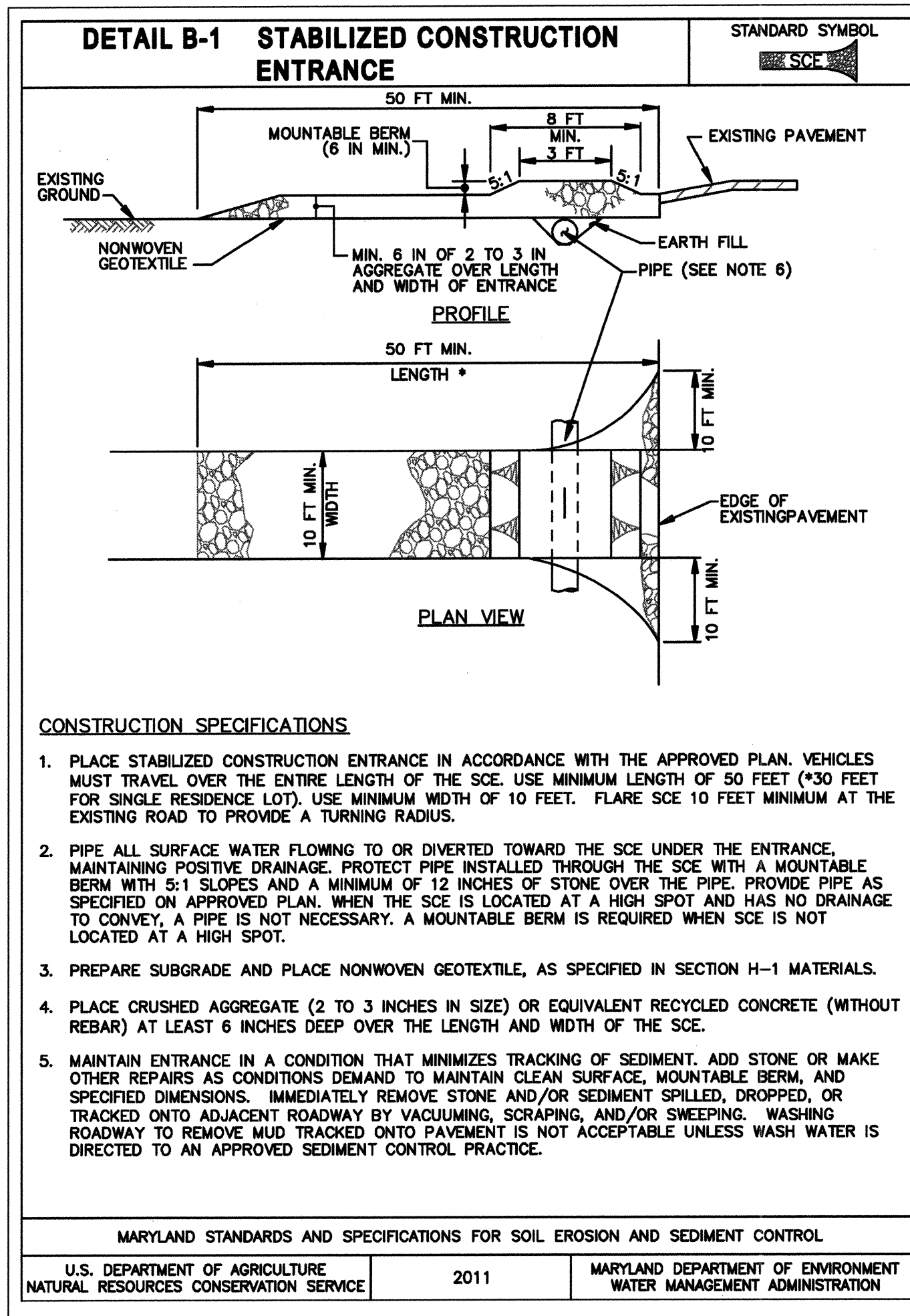
**EROSION AND
SEDIMENT CONTROL
PLAN**

PROJECT NO.: 13005.36 SCALE: 1:20

SEAL: BY: RW/KT CHECK: MDT
DWG. NO.:

STATE OF MARYLAND
BRYAN J. ARVIND
PROFESSIONAL ENGINEER
No. 48808

28 OF 40



CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE: _____ ISSUES / REVISIONS: _____

APPROVED:
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: 11/20/16

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fx: 410.554.0168 / www.biohabitats.com
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**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 3400 LANDING RD. ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 00310023/0235
ELECTION DISTRICT: 07
WAIVER PETITION #WP-17-015 OPEN LOT N/A

TITLE: **EROSION AND SEDIMENT CONTROL DETAILS**

PROJECT NO.: 13005.36 SCALE: NTS
SEAL: BY: RW/KT CHECK: MDT
DWG. NO.: 29 OF 40

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.

Howard SCD Date: 11/20/16

B-4.2 STANDARDS AND SPECIFICATIONS

FOR

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

- 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 1½ inches 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-4.5 STANDARDS AND SPECIFICATIONS

FOR

PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for 6 months or more.

Criteria

- A. Seed Mixtures
1. General Use
 - a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
 - c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
 2. Turfgrass Mixtures
 - a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes, Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
 - iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes, Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

Notes:
 Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"
 Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line

- c. Ideal Times of Seeding for Turf Grass Mixtures
- Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
 - Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
 - Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)

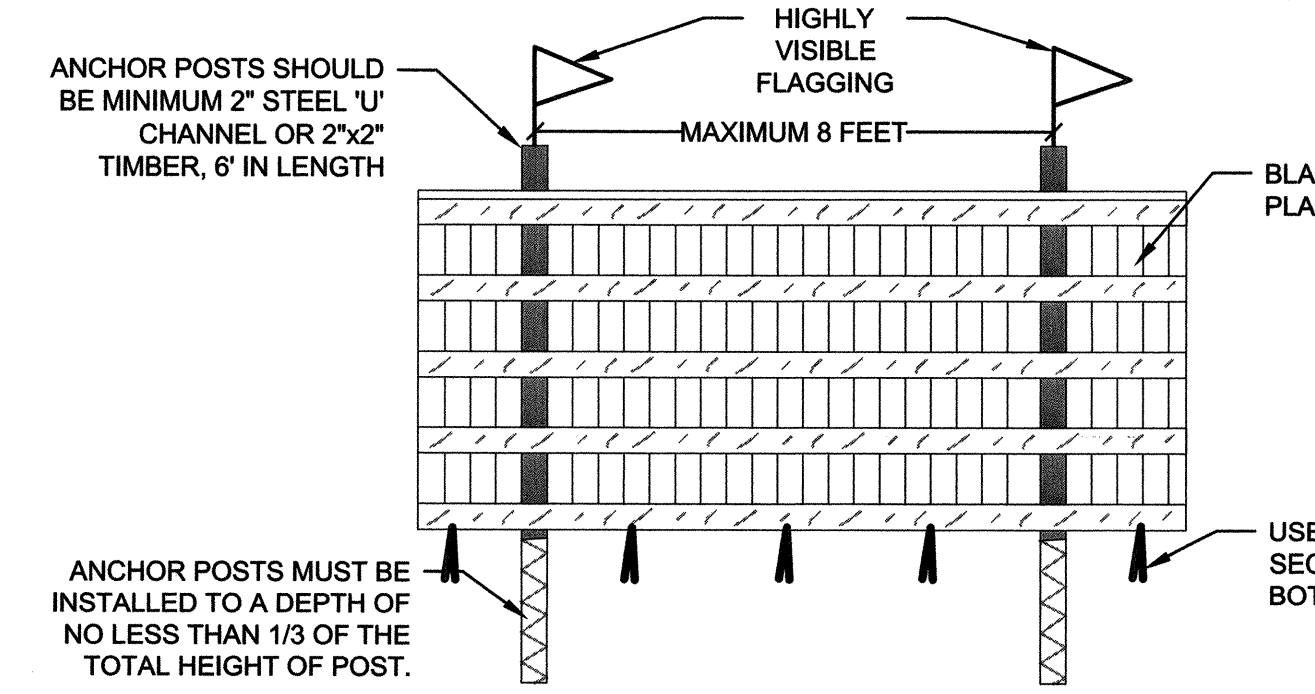
- d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- e. If soil moisture is deficient, supply new seedlings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Hardiness Zone (from Figure B.3):		6b		Fertilizer Rate (10-20-20)			Lime Rate
Seed Mixture (from Table B.3):		4		N	P ₂ O ₅	K ₂ O	
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths			
4	DEERTONGUE	15	3/1 - 6/15	¼- ½ in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/ac (90 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	CREeping RED FESCUE	20	3/1 - 5/15 8/1 - 10/15	¼- ½ in	(2 lb/1000 sf)	(2 lb/1000 sf)	
	VIRGINIA WILD RYE	5	3/1 - 5/15 8/1 - 10/15	¼- ½ in	1000 sf)	1000 sf)	

- B. Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).
1. General Specifications
 - a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
 - b. Sod must be machine cut at a uniform soil thickness of ¼ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
 - c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
 - d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

- e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
2. Sod Installation
 - a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
 - b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
 - c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
 - d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
3. Sod Maintenance
 - a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
 - b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
 - c. Do not mow until the sod is firmly rooted. No more than ½ of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

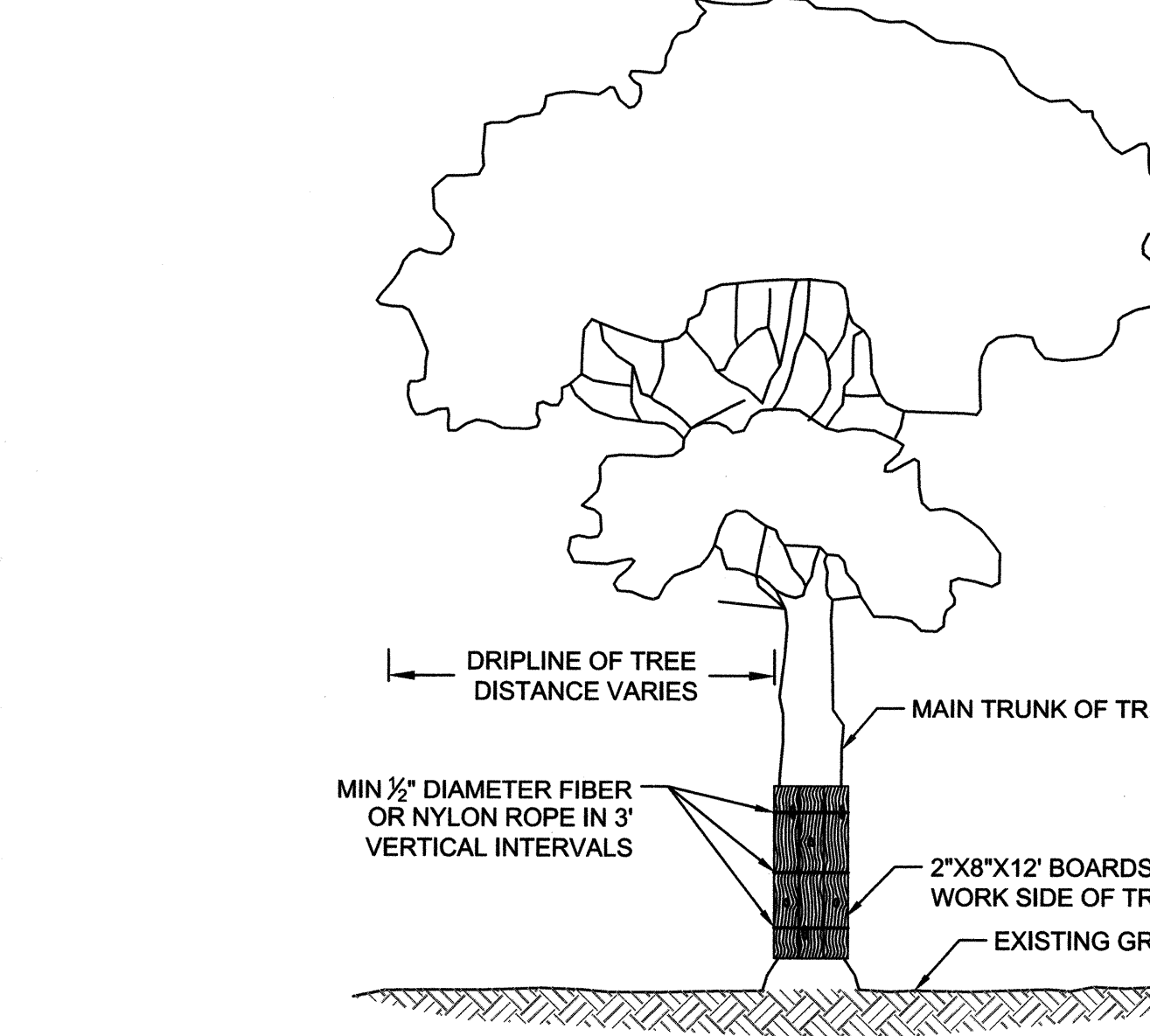
NOTES:
 1. IF PERMANENT STABILIZATION IS REQUIRED OUTSIDE OF SPECIFIED SEEDING DATES, THE CONTRACTOR SHALL PROVIDE TEMPORARY STABILIZATION MEASURES (SEED AND MULCH) UNTIL THE APPROPRIATE SEEDING DATES FOR THE SPECIFIED SEED MIXES OCCUR. THE CONTRACTOR SHALL PROVIDE PERMANENT STABILIZATION SEEDING WITHIN THE SPECIFIED SEEDING DATES. 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.



NOTES:
 1. PROTECTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
 2. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
 3. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

BLAZE ORANGE PLASTIC FENCE

NOT TO SCALE



- NOTES:**
1. THE SUFFICIENT 2"x8"x12" BOARDS AROUND MAIN TRUNK OF TREE WITH ½" DIAMETER ROPE (FIBER OR NYLON) TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION.
 2. INSTALL WIRE EYE BOLTS WITH MINIMUM INNER DIAMETER OF ¾" AND MINIMUM LENGTH OF 4" FIRMLY IN EACH PLANK WHERE FIBER OR NYLON ROPES CROSS OVER PLANKS.
 3. WHERE SIGNIFICANT TREE BRANCHES EXIST WHICH PREVENT PLANK INSTALLATION, PLANKING SHALL EXTEND TO THE ELEVATION OF THE LOWEST BRANCH.

TREE PLANKING

NOT TO SCALE

B-4.4 STANDARDS AND SPECIFICATIONS

FOR

TEMPORARY STABILIZATION

Definition

To stabilize disturbed soils with vegetation for up to 6 months.

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

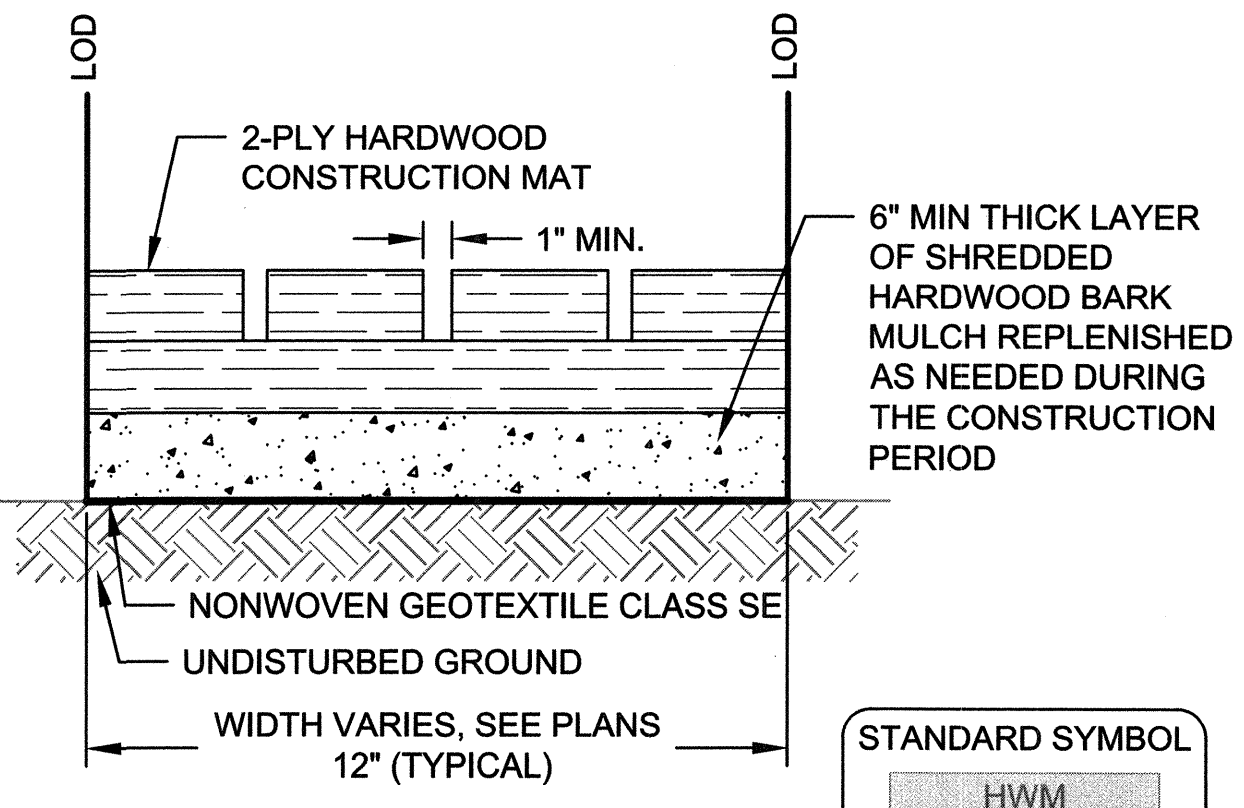
Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4.3.A.1.b and maintain until the next seeding season.

Temporary Seeding Summary

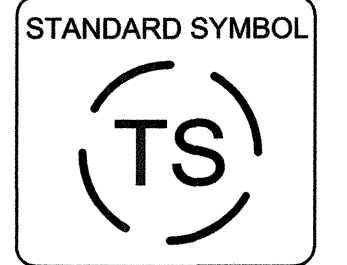
Hardiness Zone (from Figure B.3):		6b		Fertilizer Rate (10-20-20)	Lime Rate
Seed Mixture (from Table B.1):		ANNUAL RYEGRASS/FOXTAIL MILLET			
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	
	ANNUAL RYEGRASS	40	5/1 - 5/15 8/1 - 10/15	0.5	436 lb/ac (10 lb/1000 sf)
	FOXTAIL MILLET	30	5/16 - 7/31	0.5	



- NOTES:**
1. HARDWOOD MATS TO BE INSTALLED AS SHOWN ON THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER.
 2. ACCESS ROUTES TO BE VERIFIED BY THE ENGINEER AT THE EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED, AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
 3. THE CONTRACTOR SHALL ENSURE THAT EQUIPMENT IS KEPT ON MATS AT ALL TIMES WHERE MATS ARE PRESENT. THE CONTRACTOR SHALL MAINTAIN MULCH ACCESS ROADS THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF PROJECT, ALL MULCH ACCESS ROADS SHALL BE REMOVED AND RESTORED TO PRE-EXISTING CONDITIONS.

HARDWOOD MAT DETAIL CROSS SECTION

NOT TO SCALE



This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT
 Howard SCD
 Date: 4/21/16

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Environmental Services
 DATE

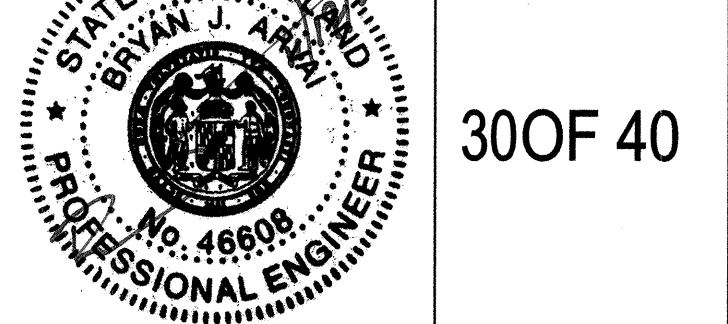
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 Restore the Earth & Inspire Ecological Stewardship

ROCKBURN BRANCH STREAM RESTORATION

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/SRID/PARCEL: 003100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

EROSION AND SEDIMENT CONTROL DETAILS

PROJECT NO.: 13005.36 SCALE: NTS
 BY: RW/KT CHECK: MDT
 DWG. NO.:



30 OF 40

MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

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

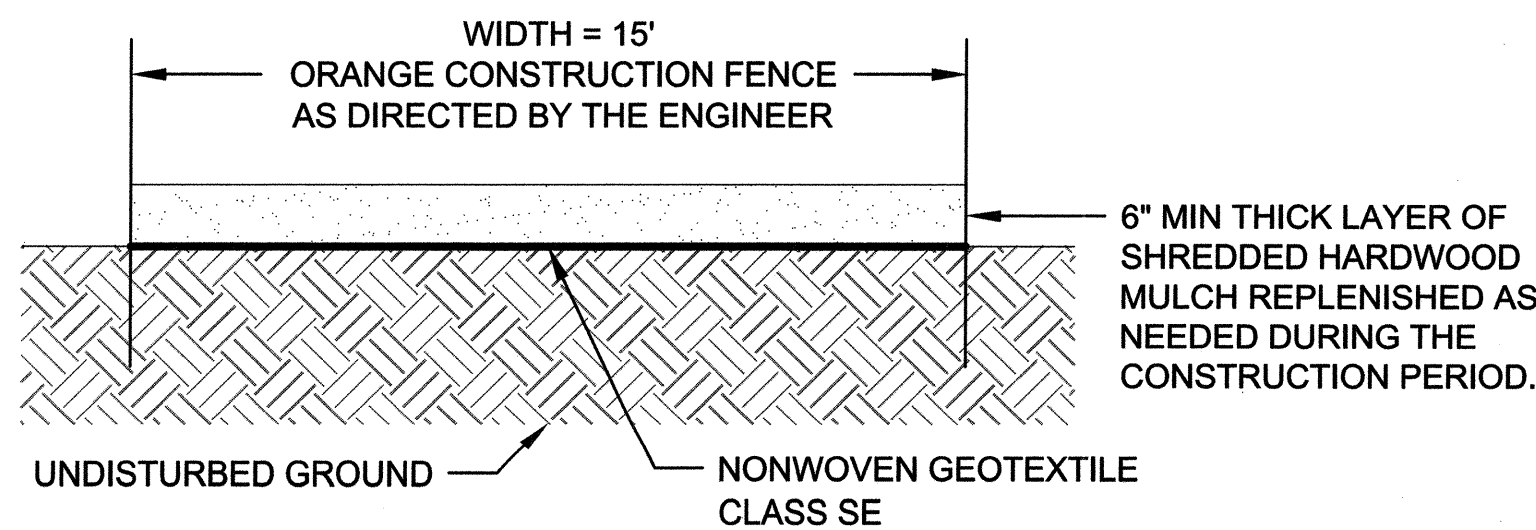
IMPLEMENTATION SEQUENCE

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

- Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
- The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
- Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
- Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
- Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.
- Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
- Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).
- All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
- After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
- A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
- If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
- The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
- After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

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

PAGE 1.2 - 2

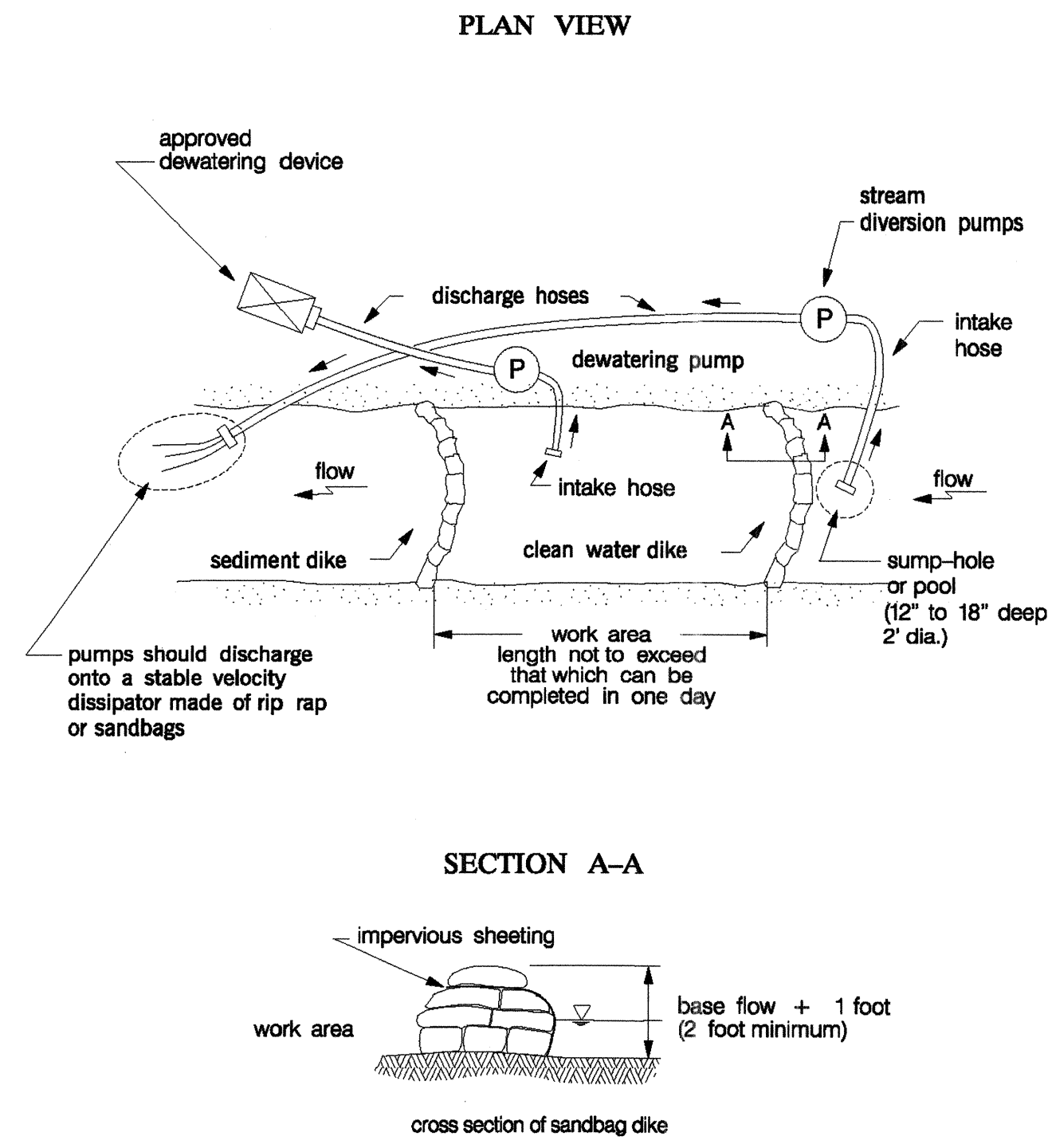


- NOTES:**
- ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
 - CONTRACTOR SHALL MAINTAIN MULCH ACCESS PATH THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF PROJECT, ALL MULCH ACCESS ROADS SHALL BE REMOVED AND RESTORED TO PRE-EXISTING CONDITIONS.
 - SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF ACCESS ROAD, AT THE DIRECTION OF THE ENGINEER.
 - FILTER LOGS TO PLACED ALONG MULCH ACCESS ROAD AS SHOWN ON EROSION AND SEDIMENT CONTROL PLANS.

MULCH ACCESS ROAD

NOT TO SCALE

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

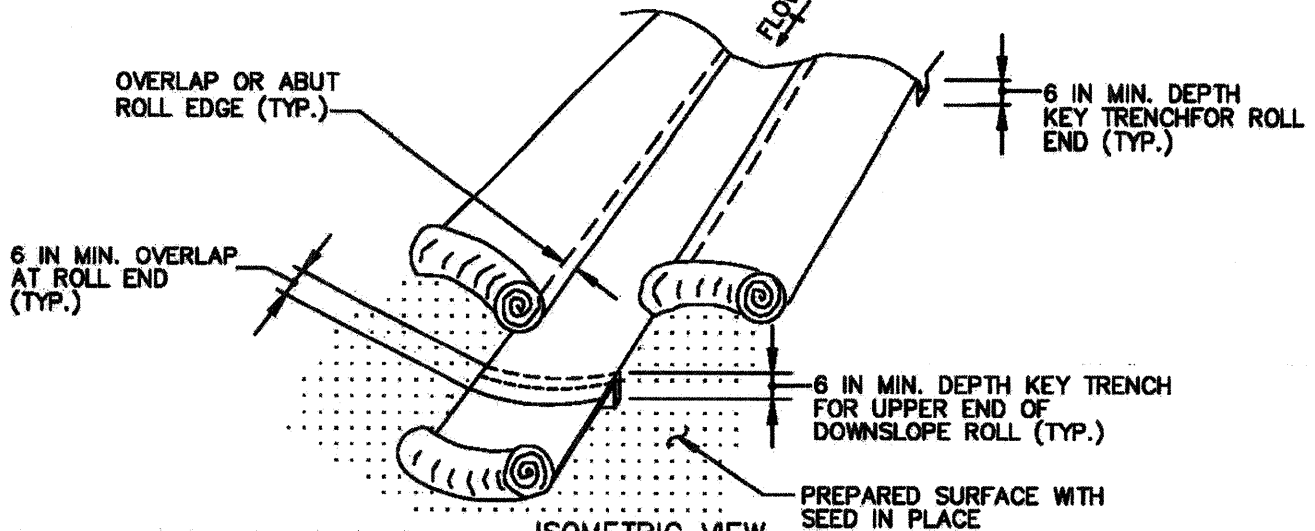


NOTE: CONTRACTOR SHALL USE PUMP CAPABLE OF PUMPING STREAMS BASE FLOW.

TEMPORARY INSTREAM CONSTRUCTION MEASURES REVISED NOVEMBER 2000 PAGE 1.2 - 2 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES

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

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

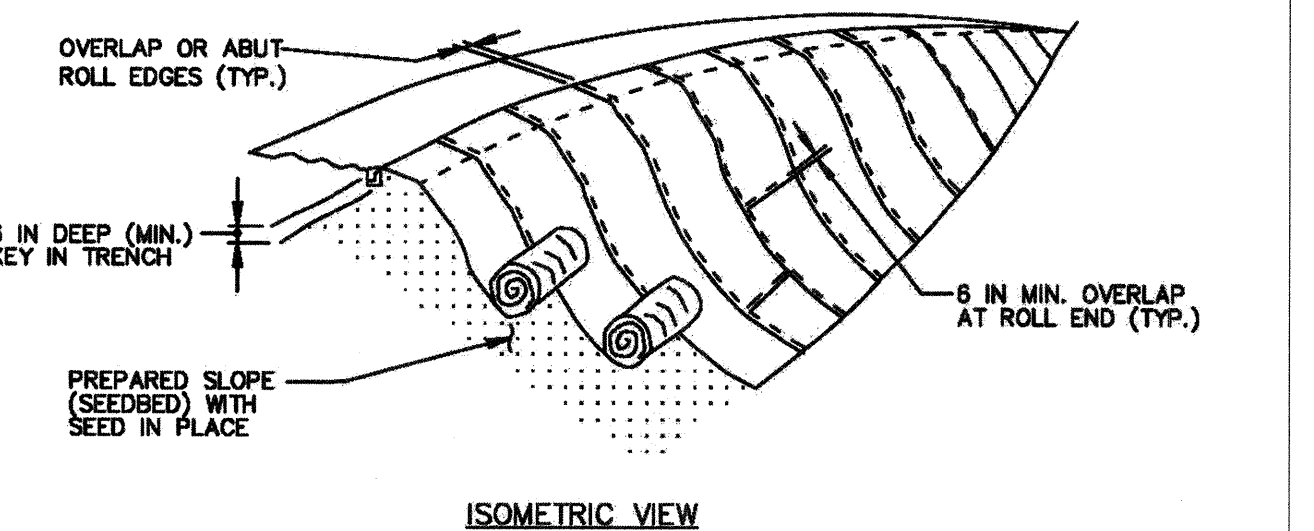


- CONSTRUCTION SPECIFICATIONS**
- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
 - USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE 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.
 - 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 1 1/2 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.
 - PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
 - UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
 - KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
 - OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
 - STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
 - ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

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

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



- CONSTRUCTION SPECIFICATIONS**
- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
 - 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.
 - 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 1 1/2 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.
 - PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
 - UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
 - 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.
 - 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.
 - STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
 - 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

B-4 STANDARDS AND SPECIFICATIONS

FOR

VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

- Adequate vegetative stabilization requires 95 percent groundcover.
- If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
- If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
- Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT
Howard SCD Date

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
Chief, Bureau of Environmental Services DATE

Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP/GRID/PARCEL: 00310023/0236
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

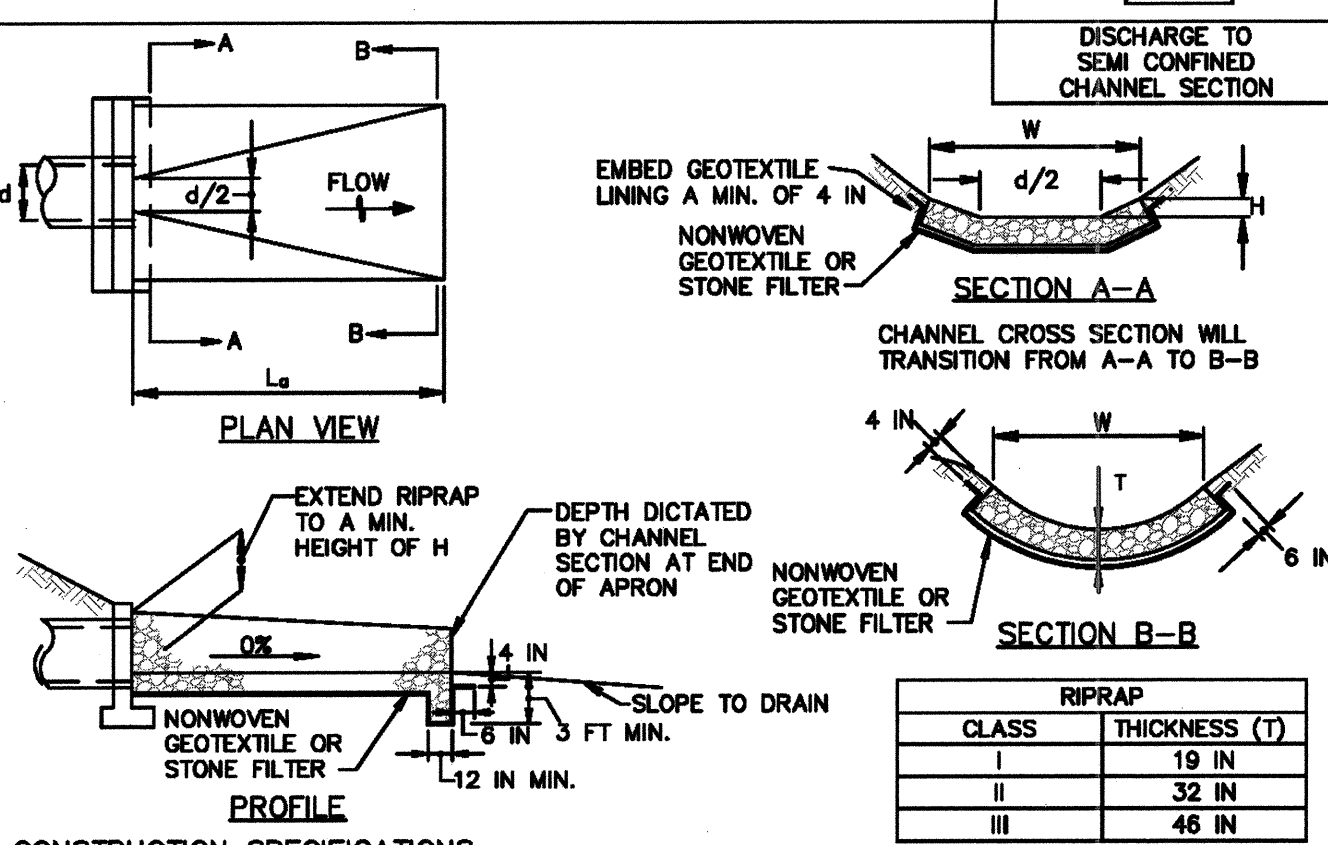
**EROSION AND
SEDIMENT
CONTROL DETAILS**

PROJECT NO.: 13005.36 SCALE: NTS
SEAL: BY: RW/KT CHECK: MDT
DWS. NO.:

STATE OF MARYLAND
BRIAN J. ARMSTRONG
Professional Engineer
No. 46608
31 OF 40

DETAIL D-4-1-A ROCK OUTLET PROTECTION I

STANDARD SYMBOL
ROP1



CONSTRUCTION SPECIFICATIONS

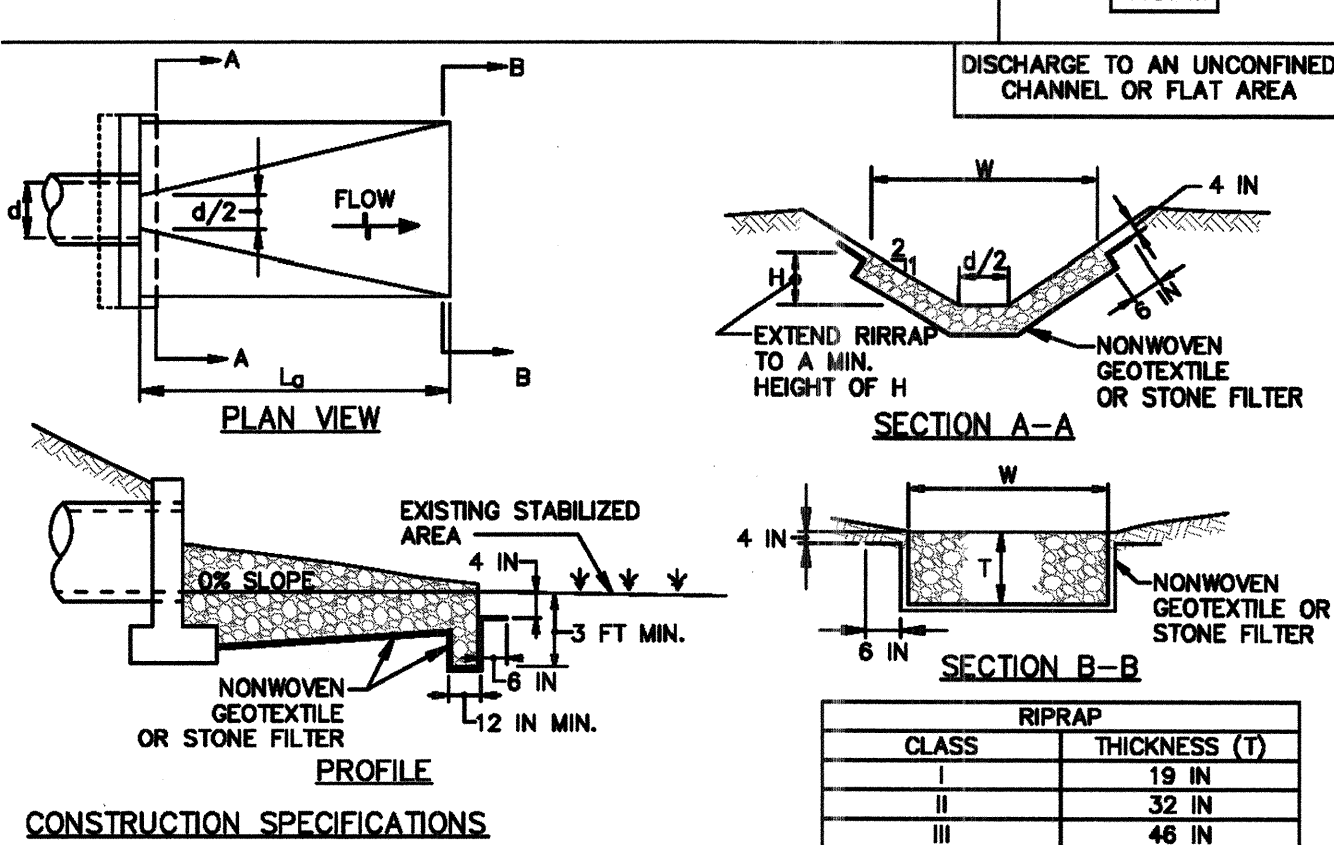
- RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
- USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
- PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (3/8 TO 1 1/2 INCH STONE FOR 8 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
- EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF THE RIPRAP.
- CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
- WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
- CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
- MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL D-4-1-C ROCK OUTLET PROTECTION III

STANDARD SYMBOL
ROP3



CONSTRUCTION SPECIFICATIONS

- RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
- USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
- PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (3/8 TO 1 1/2 INCH MINIMUM STONE FOR 8 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
- EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF RIPRAP.
- CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
- WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
- CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
- MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND RIPRAP DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELKRIE, MD
ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

**EROSION AND
SEDIMENT
CONTROL DETAILS**

PROJECT NO.: 13005.36 SCALE: NTS
SEAL: RW/KT BY: MDT CHECK: MDT
DWG. NO.:

STATE OF MARYLAND
BRYAN J. ARBY
No. 46808
PROFESSIONAL ENGINEER

32 OF 40

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT
[Signature]
Howard SCD Date: 11/21/16

SEQUENCE OF CONSTRUCTION

EROSION AND SEDIMENT CONTROL SETUP - 2 WEEKS

- 1. THE CONTRACTOR SHALL STAKE OUT THE LIMITS OF DISTURBANCE AS SHOWN ON THE GRADING PLAN. STREAM CHANNEL MUST NOT BE DISTURBED DURING CLOSURE PERIOD FROM MARCH 1 TO JUNE 15. (1 DAY) THIS PROJECT IS SUBJECT TO THE FOLLOWING APPROVALS:
1.1. U.S. ARMY CORPS OF ENGINEERS NONTIDAL WETLANDS AND WATERWAYS PERMIT TRACKING #201661219
1.2. MDE NONTIDAL WETLANDS AND WATERWAYS PERMIT AI #96595
1.3. MDE NOI PERMIT REFERENCE #MDRCN02R4
1.4. OBTAIN GRADING PERMIT FROM DILP
2. THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ONSITE WITH SEDIMENT CONTROL INSPECTOR AND THE ENGINEER TO REVIEW THE LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE PARTICIPANTS WILL ALSO VERIFY THE LOCATION OF THE TEMPORARY STOCKPILE AREA AND ANY NECESSARY STAGING AREA, AND FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS AND GRADING. (1 DAY)
3. THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE AND BLAZE ORANGE FENCE AND TREE PROTECTION AREAS AS SHOWN ON THE GRADING PLANS OR AS DIRECTED BY THE ENGINEER. (1 WEEK)
4. THE CONTRACTOR SHALL ESTABLISH THE TEMPORARY STOCKPILE AREA IN THE LOCATION INDICATED ON THE GRADING PLAN (NOTE: INSTALL SUPER SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE AREA AS SHOWN). (1 DAY)
5. INSTALL REMAINING PERIMETER EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLANS, INCLUDING FENCING, FILTER LOGS, AND PUMPS. (1 DAY)
6. THE HOWARD COUNTY DEPARTMENT OF INSPECTION AND PERMITS SHALL BE NOTIFIED UPON COMPLETION OF CONTROL INSTALLATION FOR EACH PHASE OF CONSTRUCTION. UPON COMPLETION OF CONTROL INSTALLATION WITH APPROVAL OF SEDIMENT AND EROSION CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN GRADING OPERATIONS. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION AND GRADING PLANS AND EROSION AND SEDIMENT CONTROL STANDARD DETAILS AND NOTES. DO NOT CLEAR AND GRUB THE ENTIRE PROJECT AREA. CLEAR AND GRUB ONLY AS DIRECTED BY THE ENGINEER AND ONLY WHERE CONSTRUCTION ACCESS IS NEEDED. (1 DAY)

MAINSTEM: STREAM LIMITS STA. 0+00 TO 14+84 (8 WEEKS)

- 7. CLEAR CORRIDOR ALONG THE MAINSTEM AS REQUIRED TO INSTALL THE MULCH ACCESS ROAD IN THE LOCATION DEPICTED ON THE PLANS. CARE SHOULD BE TAKEN TO MINIMIZE ANY UNNECESSARY DISTURBANCE TO EXISTING VEGETATION AND ROOT ZONES. INSTALL MULCH ACCESS ROAD AND STABILIZE DISTURBED AREAS WITH MULCH AS WORK PROGRESSES. (3 DAYS)
8. INSTALL PUMP AROUND DIVERSION. PUMP AROUND SHALL DIVERT FLOW AROUND THE ACTIVE WORK AREA AND RUN CONTINUOUSLY DURING ALL WORK HOURS UNTIL SITE IS STABILIZED. SITE SHALL BE STABILIZED DAILY. (1 DAY)
9. CLEAR LIMITS OF DISTURBANCE AS REQUIRED AND BEGIN EXCAVATION AT THE DOWNSTREAM PROJECT LIMITS WORKING IN AN UPSTREAM DIRECTION. GRADING SHALL BE LIMITED TO THE AREA THAT CAN BE STABILIZED IN A SINGLE WORK DAY. INSTALL IN-STREAM STRUCTURES (COBBLE RIFFLES, BOULDER RIFFLES, AND CWD) AND COIR MATTING AS WORK PROGRESSES DAILY. INSTALL COBBLE RIFFLE STRUCTURE ALONG SEEP 2 AT APPROX. STA. 30+25. INSTALL BOULDER RIFFLE STRUCTURE ALONG SEEP 2 AT APPROX. STA. 20+35. LOG SILLS ALONG FLOODPLAIN AND WITHIN SEEPS SHALL BE INSTALLED AT THE LOCATIONS DEPICTED ON THE PLANS OR AS OTHERWISE DIRECTED BY THE ENGINEER (6 WEEKS)
10. STABILIZE REMAINDER OF WORK AREA. (1 DAY)
11. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ENGINEER REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL TAKE CARE TO REMOVE ALL EXCESS CONSTRUCTION DEBRIS AND TRASH GENERATED FROM CONSTRUCTION ACTIVITIES FROM THE SITE. (1 DAY)
12. PLANT SITE ACCORDING TO PLANTING PLAN IN APPROPRIATE PLANTING SEASON. (1 WEEK)

TRIBUTARY: STREAM LIMITS STA. 100+00 TO 109+95 (6 WEEKS)

- 13. CLEAR CORRIDOR ALONG THE MAINSTEM AS REQUIRED TO INSTALL THE MULCH ACCESS ROAD IN THE LOCATION DEPICTED ON THE PLANS. CARE SHOULD BE TAKEN TO MINIMIZE ANY UNNECESSARY DISTURBANCE TO EXISTING VEGETATION AND ROOT ZONES. INSTALL MULCH ACCESS ROAD AND STABILIZE DISTURBED AREAS WITH MULCH AS WORK PROGRESSES. (3 DAYS)
14. INSTALL PUMP AROUND DIVERSION. PUMP AROUND SHALL DIVERT FLOW AROUND THE ACTIVE WORK AREA AND RUN CONTINUOUSLY DURING ALL WORK HOURS UNTIL SITE IS STABILIZED. SITE SHALL BE STABILIZED DAILY. (1 DAY)
15. CLEAR LIMITS OF DISTURBANCE AS REQUIRED AND BEGIN EXCAVATION AT THE DOWNSTREAM PROJECT LIMITS WORKING IN AN UPSTREAM DIRECTION. GRADING SHALL BE LIMITED TO THE AREA THAT CAN BE STABILIZED IN A SINGLE WORK DAY. INSTALL IN-STREAM STRUCTURES (COBBLE RIFFLES, BOULDER RIFFLES, AND CWD) AND COIR MATTING AS WORK PROGRESSES DAILY. LOG SILLS ALONG FLOODPLAIN AND WITHIN SEEPS SHALL BE INSTALLED AT THE LOCATIONS DEPICTED ON THE PLANS OR AS OTHERWISE DIRECTED BY THE ENGINEER (4 WEEKS)
16. STABILIZE REMAINDER OF WORK AREA. (1 DAY)
17. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ENGINEER REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL TAKE CARE TO REMOVE ALL EXCESS CONSTRUCTION DEBRIS AND TRASH GENERATED FROM CONSTRUCTION ACTIVITIES FROM THE SITE. (1 DAY)
18. PLANT SITE ACCORDING TO PLANTING PLAN IN APPROPRIATE PLANTING SEASON. (1 WEEK)

NOTES:

- 19. A THREE DAY DRY WEATHER PERIOD PER THE NOAA FORECAST IS REQUIRED PRIOR TO INITIATING MAINSTEM AND TRIBUTARY WORK.
20. MAINSTEM AND TRIBUTARY CAN BE COMPLETED CONCURRENTLY.

HOWARD SOIL CONSERVATION DISTRICT STANDARD (HSCD)

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 START OF EARTH DISTURBANCE,
b. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH 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 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION IS REQUIRED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE EXCEPT FOR THOSE AREAS UNDER ACTIVE GRADING.
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS 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 FT. MUST BE BENCHED WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPE, AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOIL STABILIZATION MATTING (SEC. B-4-6). 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 CID.
6. SITE ANALYSIS:
TOTAL AREA OF SITE: 4.4 ACRES
AREA DISTURBED: 4.4 ACRES
AREA TO BE ROOFED OR PAVED: 0.0 ACRES
AREA TO BE VEGETATIVELY STABILIZED: 4.4 ACRES
TOTAL CUT: 1,485 CU. YDS.
TOTAL FILL: 3,401 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION: ONSITE

- 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 CID. 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 SHOULD INCLUDE:
• INSPECTION DATE
• INSPECTION TYPE (ROUTINE, PRE-STORM EVENT, DURING RAIN EVENT)
• NAME AND TITLE OF INSPECTOR
• WEATHER INFORMATION (CURRENT CONDITIONS AS WELL AS TIME AND AMOUNT OF LAST RECORDED PRECIPITATION)
• BRIEF DESCRIPTION OF PROJECT'S STATUS (E.G., PERCENT COMPLETE) AND/OR CURRENT ACTIVITIES
• EVIDENCE OF SEDIMENT DISCHARGES
• IDENTIFICATION OF PLAN DEFICIENCIES
• IDENTIFICATION OF SEDIMENT CONTROLS THAT REQUIRE MAINTENANCE
• IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS
• COMPLIANCE STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS
• PHOTOGRAPHS
• MONITORING/SAMPLING
• MAINTENANCE AND/OR CORRECTIVE ACTION PERFORMED
• OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MDE).
9. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN AND SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.
10. ANY MAJOR CHANGES OR REVISIONS TO THE PLAN OR SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE HSCD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY 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. 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.

SEDIMENT CONTROL NOTES

- 1. NOTE: CONDUCT A PRE-CONSTRUCTION MEETING. NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT LEAST 48 HOURS BEFORE COMMENCING WORK AT (410) 313-1880. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PE HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS.
2. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENCES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
3. THE CONTRACTOR SHALL NOTIFY "MISS-UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
4. 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 SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
5. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL REQUIRED EASEMENTS AND RIGHT-OF-WAYS HAVE BEEN OBTAINED. CONSTRUCTION SHALL NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHALL STAY WITHIN THE LIMIT OF DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORKING AREA WHEREVER POSSIBLE. NO TREES SHALL BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM THE ENGINEER. THE CONSTRUCTION SEQUENCE MUST BE FOLLOWED UNLESS THE CONTRACTOR GETS WRITTEN APPROVAL FROM THE HOWARD COUNTY SOIL CONSERVATION DISTRICT OR THE SEDIMENT CONTROL INSPECTOR.
6. FOR ALL ASPECTS OF CONSTRUCTION FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:
6.1. THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
6.2. SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
7. ANY SEDIMENT CONTROL PRACTICE THAT 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.
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.

2011 MD STANDARDS & SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL - B-4-8 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.

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
Chief, Bureau of Environmental Services
Date



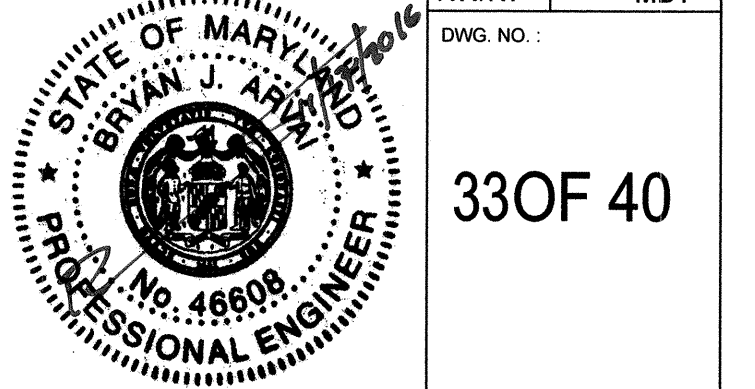
ROCKBURN BRANCH
STREAM
RESTORATION

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAPS/GRID/PARCEL: 0031.0023/0235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

EROSION AND
SEDIMENT
CONTROL NOTES

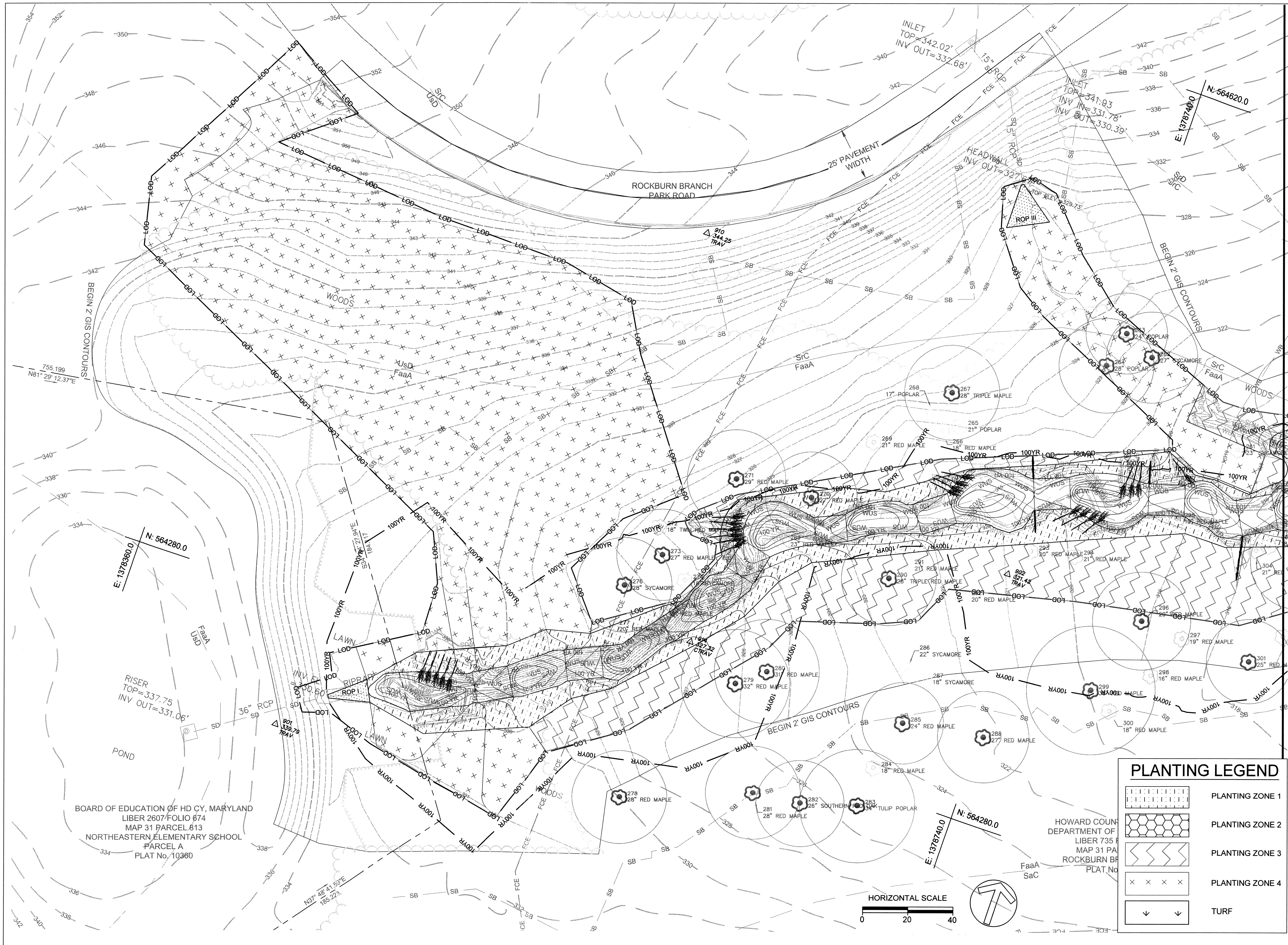
PROJECT NO.: 13005.36 SCALE: NTS

SEAL: BY: RW/KT CHECK: MDT
DWG. NO.:



33 OF 40

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT
Howard SCD Date



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HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature]
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

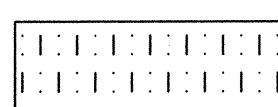
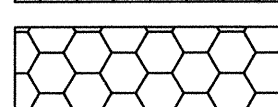

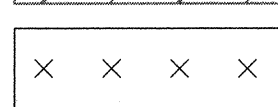
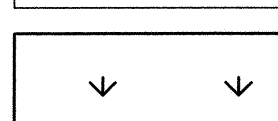
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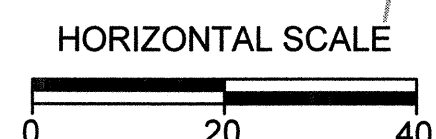
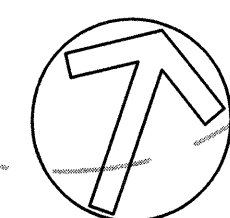
PLANTING PLAN

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 SEAL: BY: RWK/T CHECK: MDT
 DWG. NO.:

STATE OF MARYLAND
 BRYAN J. ARNOLD
 No. 46608
 PROFESSIONAL ENGINEER
 34 OF 40

PLANTING LEGEND

-  PLANTING ZONE 1
-  PLANTING ZONE 2
-  PLANTING ZONE 3
-  PLANTING ZONE 4
-  TURF



CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS

Mark A. Sullivan
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



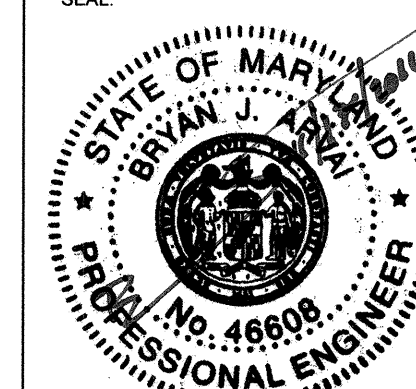
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 fx: 410.554.0168 / www.biohabitats.com
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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

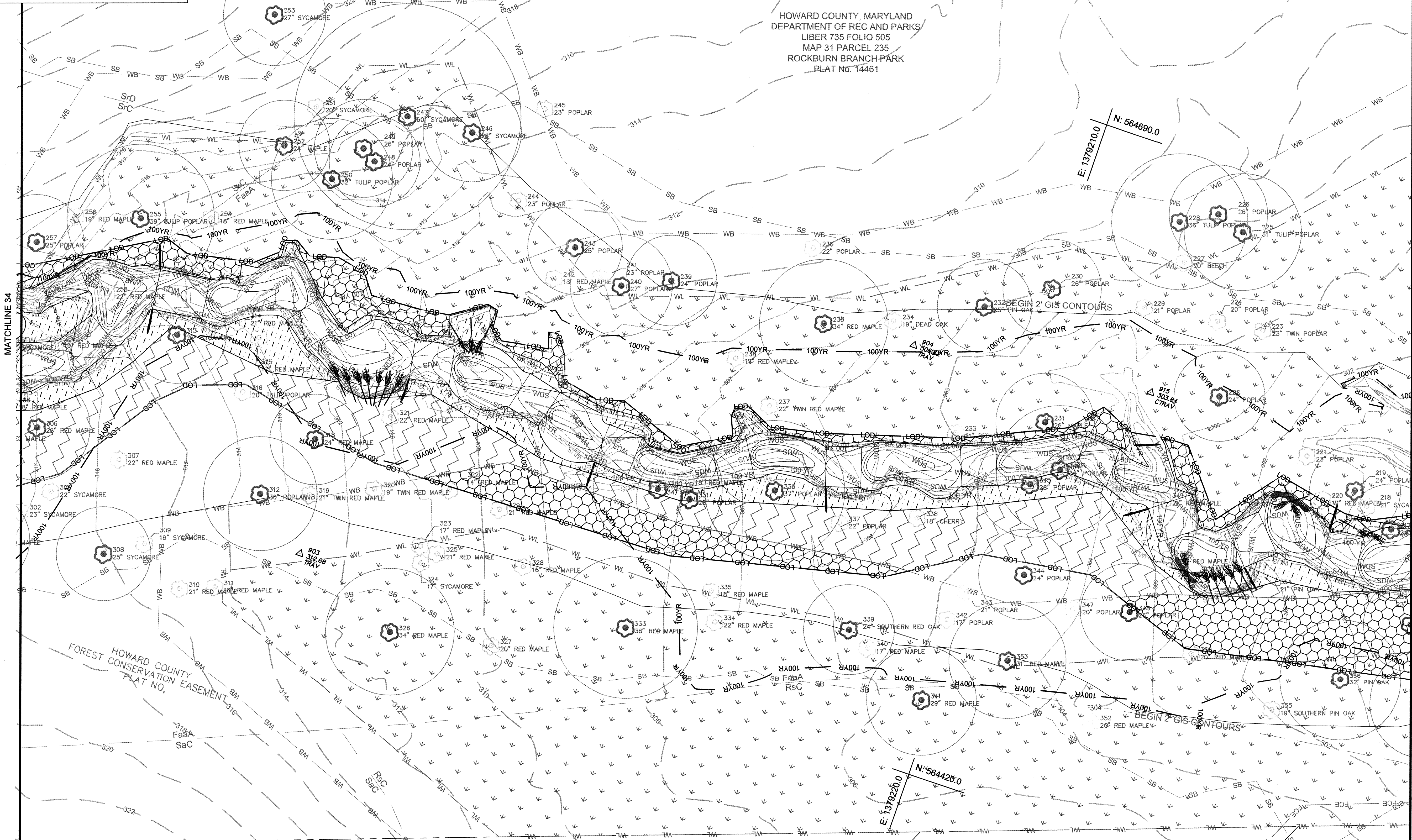
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 ZONING: R-30 TAX MAP/GIS/PARCEL: 0031/0023/00235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

PLANTING PLAN

PROJECT NO.: 13005.36 SCALE: 1" = 20'
 BY: RW/KT CHECK: MDT
 DWG. NO.:

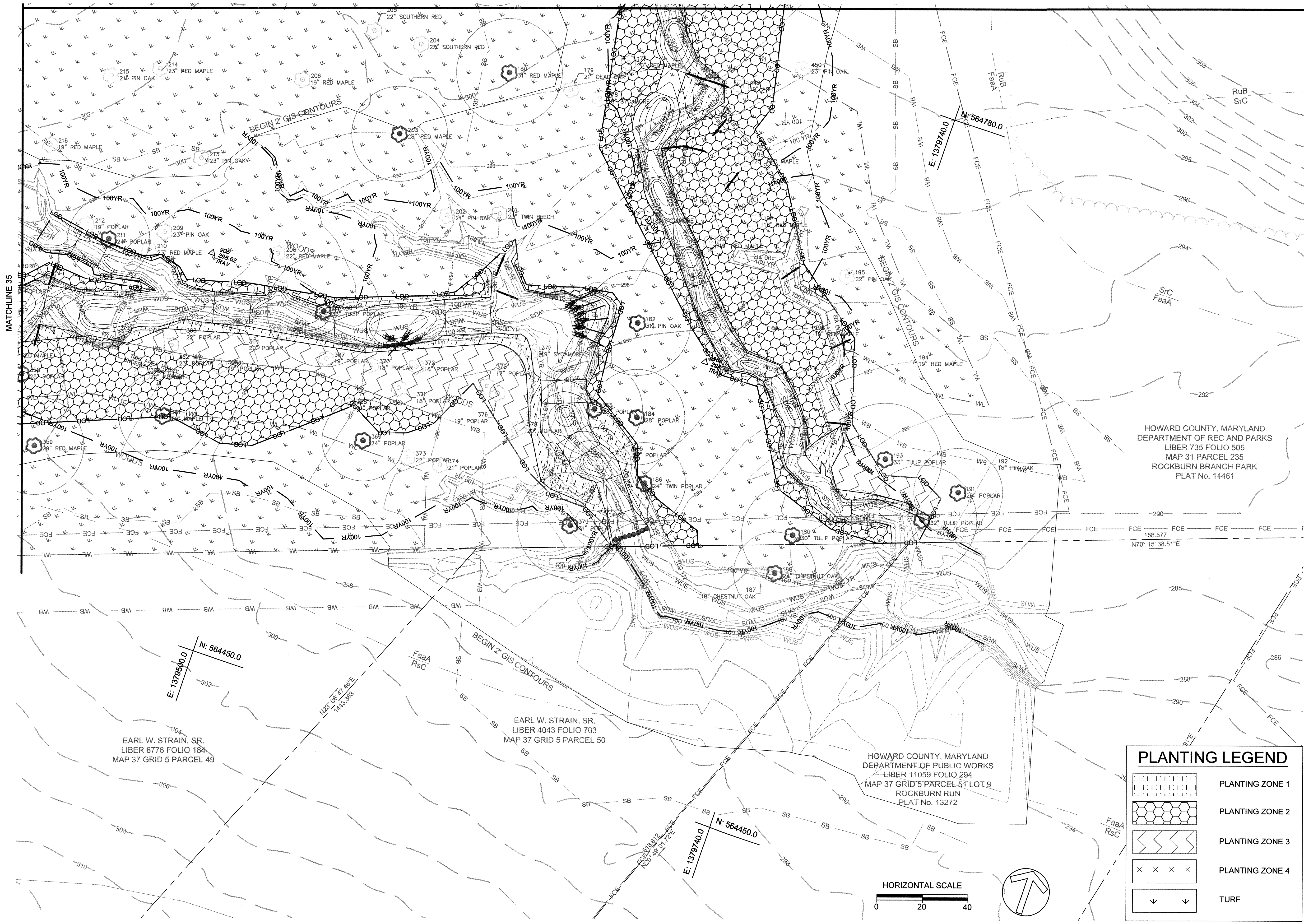


35OF 40

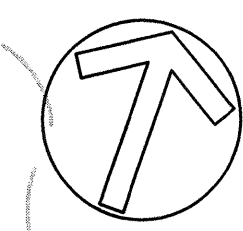
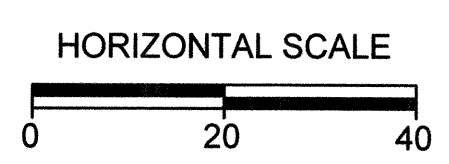


HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT No. 14461

MATCHLINE 37



PLANTING LEGEND	
	PLANTING ZONE 1
	PLANTING ZONE 2
	PLANTING ZONE 3
	PLANTING ZONE 4
	TURF



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HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE	ISSUES / REVISIONS

HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT No. 14461

APPROVED: DEPARTMENT OF PUBLIC WORKS
Mark Wilson DATE
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-20 TAX MAP/GRID/PARCEL: 0031/0023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

PLANTING PLAN

PROJECT NO.:	13005.36	SCALE:	1" = 20'
SEAL:		BY:	RW/KT
		CHECK:	MDT
		DWG. NO.:	



36 OF 40

MATCHLINE 38

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STORMWATER MANAGEMENT DIVISION
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SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

HOWARD COUNTY, MARYLAND
DEPARTMENT OF REC AND PARKS
LIBER 735 FOLIO 505
MAP 31 PARCEL 235
ROCKBURN BRANCH PARK
PLAT No. 14461

PLANTING LEGEND

	PLANTING ZONE 1
	PLANTING ZONE 2
	PLANTING ZONE 3
	PLANTING ZONE 4
	TURF

APPROVED: DEPARTMENT OF PUBLIC WORKS
Michael Wilson
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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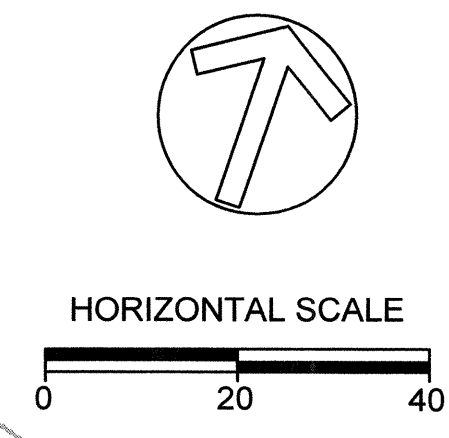
**ROCKBURN BRANCH
STREAM
RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
ZONING: R-20 TAX MAP GRID/PARCEL: 003100235
ELECTION DISTRICT: 07 OPEN LOT N/A
WAIVER PETITION #WP-17-015

PLANTING PLAN

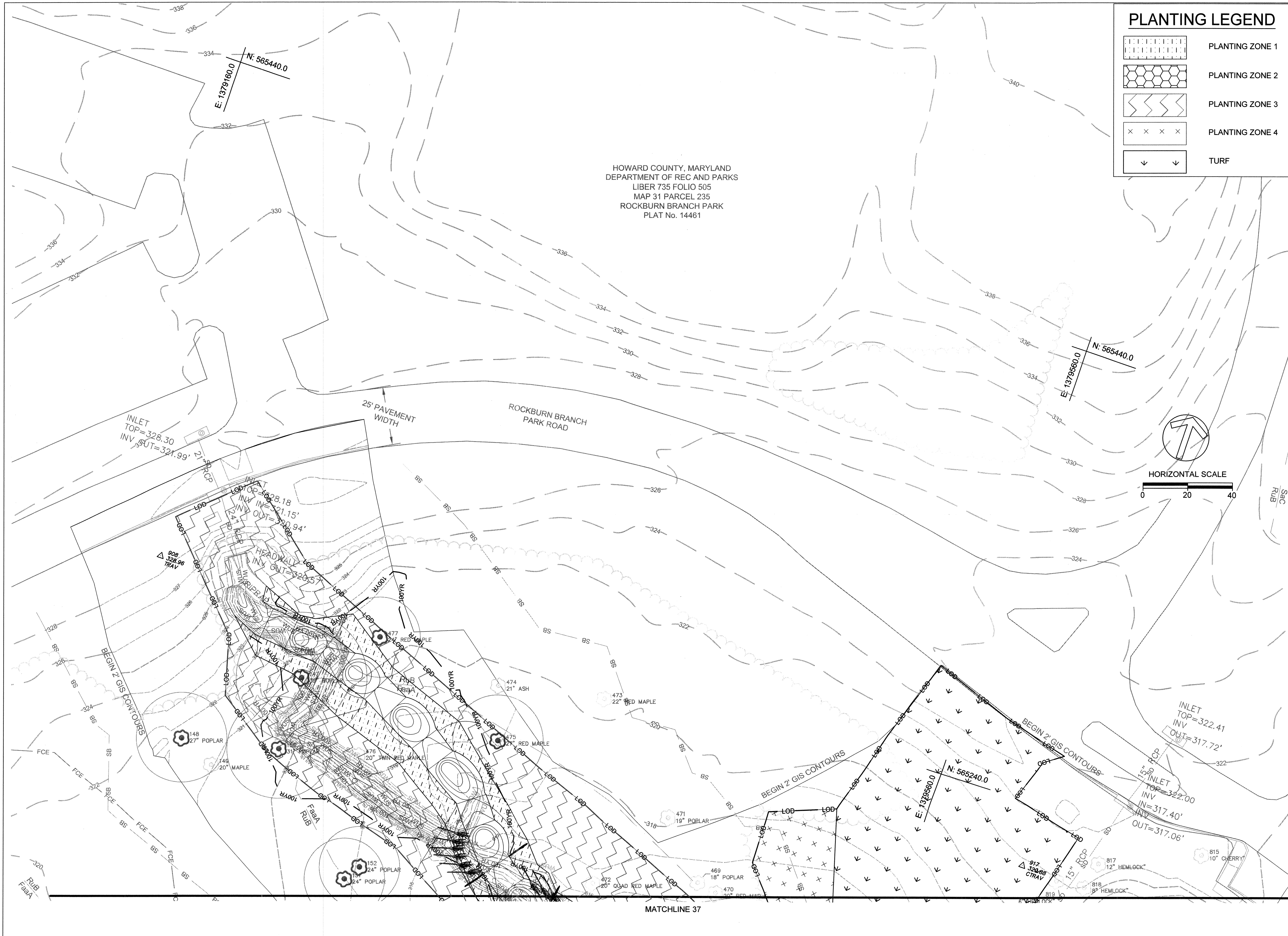
PROJECT NO.: 13005.36 SCALE: 1" = 20'
SEAL: BY: RW/KT CHECK: MDT
DWS NO.:

STATE OF MARYLAND
PROFESSIONAL ENGINEER
No. 48608
37 OF 40



MATCHLINE 35

MATCHLINE 36



PLANTING LEGEND	
	PLANTING ZONE 1
	PLANTING ZONE 2
	PLANTING ZONE 3
	PLANTING ZONE 4
	TURF

HOWARD COUNTY, MARYLAND
 DEPARTMENT OF REC AND PARKS
 LIBER 735 FOLIO 505
 MAP 31 PARCEL 235
 ROCKBURN BRANCH PARK
 PLAT No. 14461

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
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DATE ISSUES / REVISIONS

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

SITE ADDRESS: 5400 LANDING RD, ELK RIDGE, MD
 ZONING: R-02 TAX MAP/GRID: PARCEL: 0031100230235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WAIVER PETITION #WP-17-015

TITLE:

PLANTING PLAN

PROJECT NO.: 13005.36 SCALE: 1" = 20'

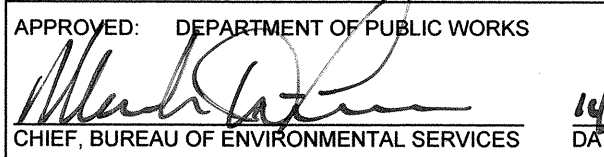
SEAL: BY: RW/KT CHECK: MDT
 DWG. NO.:

38OF 40

CLIENT

HOWARD COUNTY
 STORMWATER MANAGEMENT DIVISION
 6751 GATEWAY DRIVE
 SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS

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**ROCKBURN BRANCH
 STREAM
 RESTORATION**

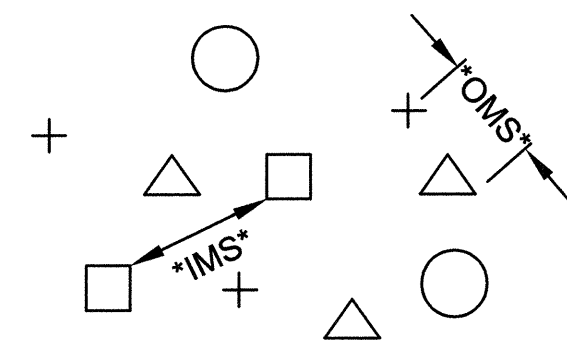
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 ZONING: R-20 TAX MAP GRID/PARCEL: 00310023/0235
 ELECTION DISTRICT: 07 OPEN LOT N/A
 WALKER PETITION #WR-17-015

TITLE
PLANTING DETAILS

PROJECT NO.: 13005.36 SCALE: NTS

SEAL: BY: RW/KT CHECK: MDT
 DWS NO.:


 BRYAN J. ARVID
 No. 46608
 PROFESSIONAL ENGINEER
 39OF 40



OMS: AN OVERALL MINIMUM SPACING DISTANCE *OMS* IS ASSIGNED TO THE PLANTING CONFIGURATION *SEE PLANT SCHEDULE*

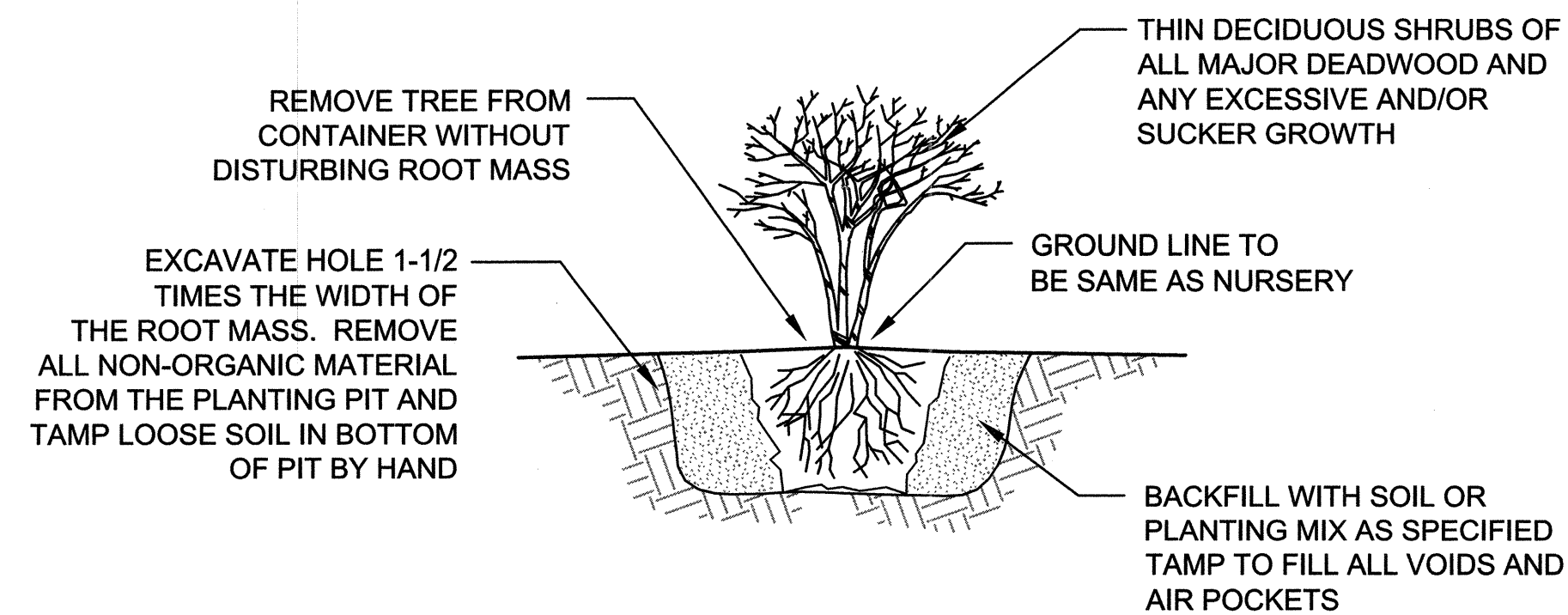
IMS: AN INDIVIDUAL MINIMUM SPACING DISTANCES *IMS* IS ASSIGNED TO EACH INDIVIDUAL SPECIES *SEE PLANT SCHEDULE*

NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES

PLANT SPACING - RANDOM

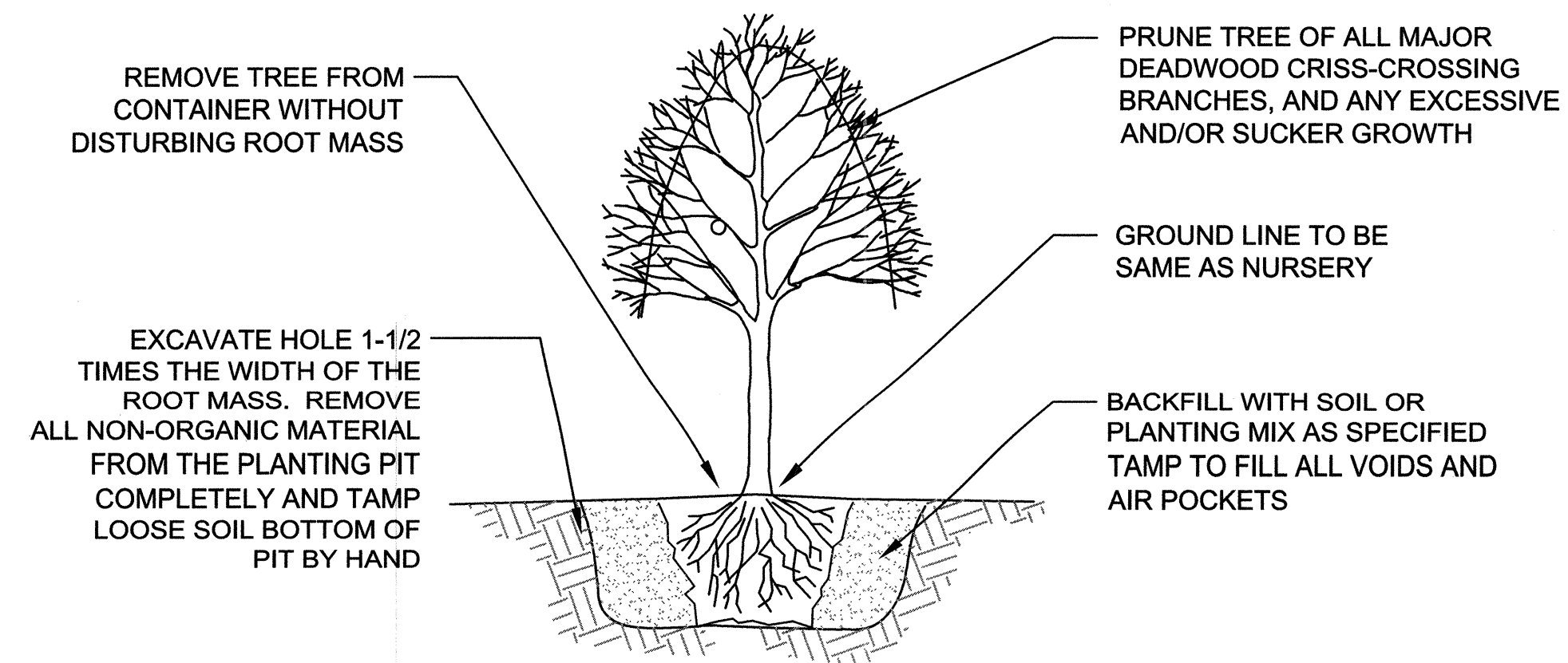
PLAN VIEW

NOT TO SCALE



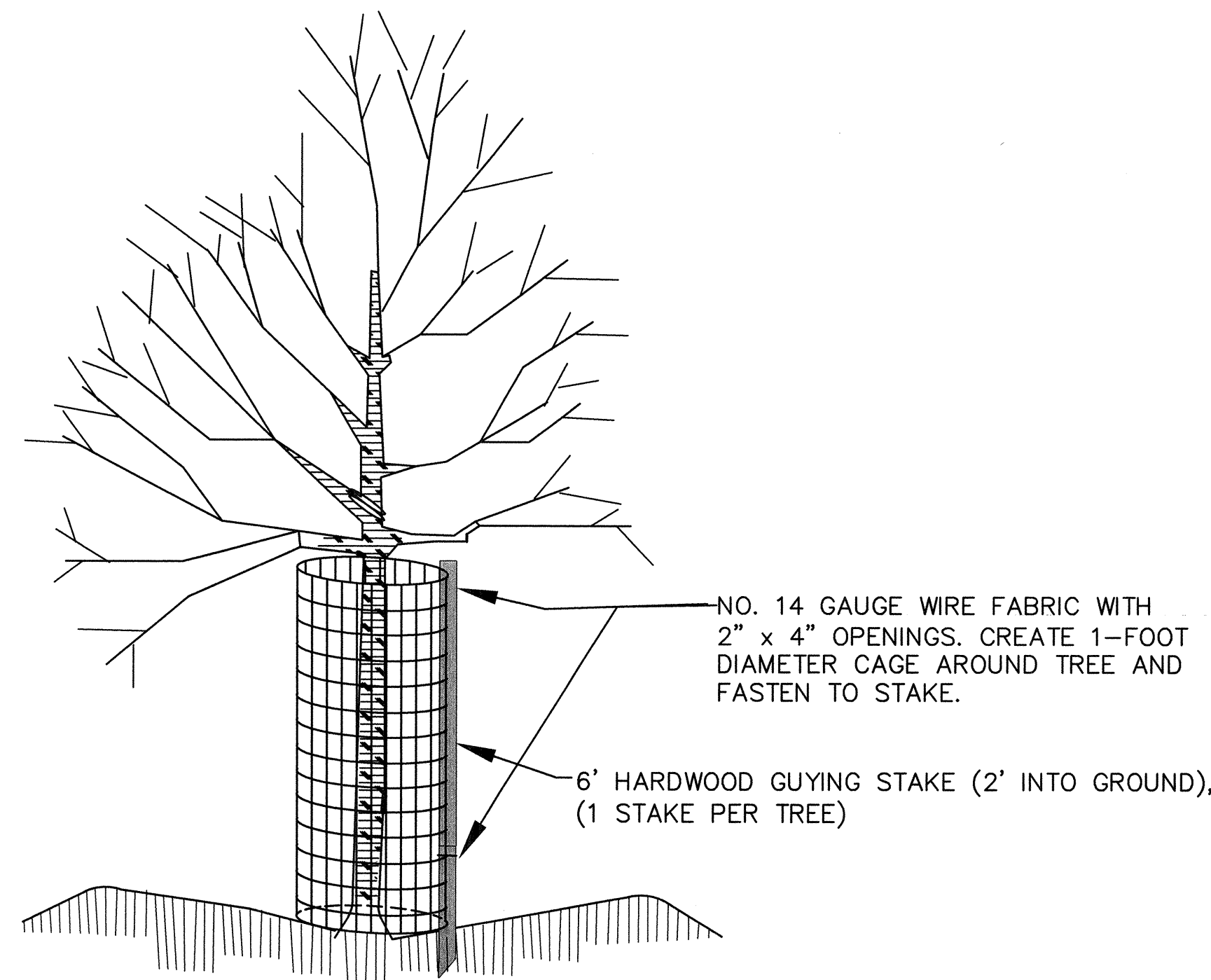
SHRUB PLANTING - CONTAINER GROWN

NOT TO SCALE



TREE PLANTING - CONTAINER GROWN

NOT TO SCALE



- NOTES:
1. DEER PROTECTION CAGES TO BE INSTALLED AROUND ALL PLANTED TREES AND SHRUBS.
 2. HEIGHT OF CAGE SHALL BE 4-FEET (MIN.)
 3. CAGE SHALL BE FASTENED TO STAKE WITH TWO (MIN.) 11-INCH RELEASABLE CABLE TIES (ONE AT TOP AND ONE 6" (MIN.) ABOVE THE GROUND.)
 4. DO NOT DAMAGE TREE DURING INSTALLATION.
 5. DEER BARK PROTECTORS (ITEM #bg48, BY A.M. LEONARD, OR EQUAL) MAY BE SUBSTITUTED FOR TREES GREATER THAN 3/4" CALIPER. ALL OTHER SUBSTITUTIONS MUST BE APPROVED BY FOREST ECOLOGIST.
 6. CAGES TO BE REMOVED AT DIRECTION OF FOREST ECOLOGIST.
 7. ENSURE CAGE IS SECURE TO GROUND TO PREVENT UPLIFT BY DEER.


DEER PROTECTION CAGE

NOT TO SCALE

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413

DATE ISSUES / REVISIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS

 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: 10/19/16


 The Stables Building 2081 Clipper Park Road
 Baltimore, MD 21211 / ph: 410.554.0156
 fx: 410.554.0168 / www.biohabitats.com
 Restore the Earth & Inspire Ecological Stewardship

ROCKBURN BRANCH
STREAM
RESTORATION

SITE ADDRESS: 5400 LANDING RD. ELK RIDGE, MD
 ZONING: R-20 TAX MAP GRID: PARCEL: 003110023/0235
 ELECTION DISTRICT: 07 OPEN LOT: N/A
 WAIVER PETITION #WP-17-015

TITLE
PLANTING SCHEDULE

PROJECT NO.: 13005.36 SCALE: NTS
 SEAL BY: RW/KT CHECK: MDT
 DWG. NO.:



40 OF 40

PLANT COMPOSITION SCHEDULE

ZONE 1 - Stream Bank Restoration

Size (acres): 0.51

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Species Name	Common Name	Unit	Spacing Type	Size
3	4840			LIVE STAKES				
		30	741	<i>Cornus amomum</i>	Silky dogwood	18" LIVE STAKE	Cluster	1" - 2.5" CAL
		30	741	<i>Cornus racemosa</i>	Gray dogwood	18" LIVE STAKE	Cluster	1" - 2.5" CAL
		20	494	<i>Salix sericea</i>	Silky willow	18" LIVE STAKE	Cluster	1" - 2.5" CAL
		20	494	<i>Sambucus canadensis</i>	American elder	18" LIVE STAKE	Cluster	1" - 2.5" CAL
		100	2470	= total				
2.5	6970			HERBACEOUS PLUGS				
		15	533	<i>Elymus riparius</i>	Riverbank wild rye	PLUG	Cluster	2" Plug
		15	533	<i>Elymus virginicus</i>	Virginia wild rye	PLUG	Cluster	2" Plug
		20	711	<i>Juncus effusus</i>	Soft rush	PLUG	Cluster	2" Plug
		15	533	<i>Juncus canadensis</i>	Canada rush	PLUG	Cluster	2" Plug
		15	533	<i>Lobelia cardinalis</i>	Cardinal flower	PLUG	Cluster	2" Plug
		20	711	<i>Onoclea sensibilis</i>	Riverbank wild rye	PLUG	Cluster	2" Plug
		100	3554	= total				

PLANT COMPOSITION SCHEDULE

ZONE 2 - Forested Wetland

Size (acres): 0.57

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
15	194			TREES					
		20	22	<i>Acer rubrum</i>	Red maple	CON	Random	1" CAL	33
		30	33	<i>Nyssa sylvatica</i>	Red maple	CON	Random	1" CAL	27
		30	33	<i>Quercus bicolor</i>	Swamp white oak	CON	Random	1" CAL	15
		20	22	<i>Magnolia virginiana</i>	Sweetbay magnolia	CON	Random	1" CAL	33
		100	110	= total					
15	194			SHRUB					
		20	22	<i>Cornus sericea</i>	Red-osier dogwood	CON	Random	24-36"	33
		15	16	<i>Alnus serrulata</i>	Smooth alder	CON	Random	24-36"	39
		30	33	<i>Lindera benzoin</i>	Common spicebush	CON	Random	24-36"	27
		15	16	<i>Sambucus canadensis</i>	American elder	CON	Random	24-36"	39
		20	22	<i>Viburnum dentatum</i>	Southern arrowwood	CON	Random	24-36"	33
		100	109	= total					
N/A	35			HERBACEOUS SEED					
		2	0.4	<i>Asclepias incarnata</i>	Swamp milkweed	SEED	LB of P.L.S. 76 %	N/A	N/A
		15	3	<i>Dichanthelium clandestinum</i>	Deertongue	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	5	<i>Elymus riparius</i>	Riverbank wild rye	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	5	<i>Elymus virginicus</i>	Virginia wild rye	SEED	LB of P.L.S. 76 %	N/A	N/A
		10	2	<i>Scirpus cyperinus</i>	Wool grass	SEED	LB of P.L.S. 76 %	N/A	N/A
		23	4.6	<i>Tridens flavus</i>	Purpletop	SEED	LB of P.L.S. 76 %	N/A	N/A
		100	20	= total					

CON = Contaminized
 P.L.S. = Pure Live Seed
 B&B= Balled & Burlapped

PLANT COMPOSITION SCHEDULE

ZONE 3 - Floodplain Forest Enhancement

Size (acres): 1.17

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
15	194			TREES					
		5	11	<i>Acer rubrum</i>	Red maple	CON	Random	1" CAL	68
		5	11	<i>Fagus grandifolia</i>	American beech	CON	Random	1" CAL	68
		5	11	<i>Nyssa sylvatica</i>	Red maple	CON	Random	1" CAL	68
		5	11	<i>Quercus bicolor</i>	Swamp white oak	CON	Random	1" CAL	68
		15	34	<i>Amelanchier canadensis</i>	Serviceberry	CON	Random	1" CAL	39
		15	34	<i>Carpinus caroliniana</i>	American hophornbeam	CON	Random	1" CAL	39
		15	34	<i>Celtis occidentalis</i>	Hackberry	CON	Random	1" CAL	39
		10	23	<i>Cornus florida</i>	Flowering dogwood	CON	Random	1" CAL	47
		10	23	<i>Ilex opaca</i>	American holly	CON	Random	1" CAL	47
		15	34	<i>Magnolia virginiana</i>	Sweetbay magnolia	CON	Random	1" CAL	39
		100	226	= total					
15	194			SHRUB					
		20	45	<i>Cornus sericea</i>	Red-osier dogwood	CON	Random	24-36"	34
		15	34	<i>Alnus serrulata</i>	Smooth alder	CON	Random	24-36"	39
		30	68	<i>Lindera benzoin</i>	Common spicebush	CON	Random	24-36"	27
		15	34	<i>Sambucus canadensis</i>	American elder	CON	Random	24-36"	39
		20	45	<i>Viburnum dentatum</i>	Southern arrowwood	CON	Random	24-36"	34
		100	226	= total					
N/A	35			HERBACEOUS SEED					
		2	0.8	<i>Asclepias incarnata</i>	Swamp milkweed	SEED	LB of P.L.S. 76 %	N/A	N/A
		15	6.1	<i>Dichanthelium clandestinum</i>	Deertongue	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	10.2	<i>Elymus riparius</i>	Riverbank wild rye	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	10.2	<i>Elymus virginicus</i>	Virginia wild rye	SEED	LB of P.L.S. 76 %	N/A	N/A
		10	4.1	<i>Scirpus cyperinus</i>	Wool grass	SEED	LB of P.L.S. 76 %	N/A	N/A
		23	9.4	<i>Tridens flavus</i>	Purpletop	SEED	LB of P.L.S. 76 %	N/A	N/A
		100	40.8	= total					

CON = Contaminized
 P.L.S. = Pure Live Seed

PLANT COMPOSITION SCHEDULE

ZONE 4 - Reforestation

Size (acres): 0.92

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
30	48			CANOPY TREES					
		5	2	<i>Acer rubrum</i>	Red maple	B&B	Random	2.5" CAL	142
		10	4	<i>Betula nigra</i>	River birch	CON	Random	1" CAL	100
		10	4	<i>Diospyros virginiana</i>	Common persimmon	CON	Random	1" CAL	100
		5	2	<i>Liriodendron tulipifera</i>	Tuliptree	B&B	Random	2.5" CAL	142
		10	4	<i>Platanus occidentalis</i>	American sycamore	CON	Random	1" CAL	100
		15	7	<i>Quercus alba</i>	White oak	B&B	Random	2.5" CAL	76
		10	4	<i>Amelanchier canadensis</i>	Serviceberry	CON	Random	1" CAL	100
		15	7	<i>Cercis canadensis</i>	Eastern redbud	CON	Random	2.5" CAL	76
		10	4	<i>Celtis occidentalis</i>	Hackberry	CON	Random	1" CAL	100
		10	4	<i>Ilex opaca</i>	American holly	CON	Random	1" CAL	100
		100	42	= total					
15	194			SHRUB					
		20	36	<i>Cornus sericea</i>	Red-osier dogwood	CON	Random	24-36"	33
		15	27	<i>Alnus serrulata</i>	Smooth alder	CON	Random	24-36"	39
		30	54	<i>Lindera benzoin</i>	Common spicebush	CON	Random	24-36"	27
		15	27	<i>Sambucus canadensis</i>	American elder	CON	Random	24-36"	39
		20	36	<i>Viburnum dentatum</i>	Southern arrowwood	CON	Random	24-36"	33
		100	180	= total					
N/A	35			HERBACEOUS SEED					
		5	1.6	<i>Agrostis perennans</i>	Autumn Bentgrass	SEED	LB of P.L.S. 76 %	N/A	N/A
		5	1.6	<i>Andropogon gerardi</i>	Big Bluestem	SEED	LB of P.L.S. 76 %	N/A	N/A
		2	0.6	<i>Asclepias syriaca</i>	Common Milkweed	SEED	LB of P.L.S. 76 %	N/A	N/A
		5	1.6	<i>Chamaecrista fasciculata</i>	Partridge Pea	SEED	LB of P.L.S. 76 %	N/A	N/A
		20	6.4	<i>Elymus virginicus</i>	Virginia Wildrye	SEED	LB of P.L.S. 76 %	N/A	N/A
		3	1	<i>Rudbeckia hirta</i>	Blackeyed Susan	SEED	LB of P.L.S. 76 %	N/A	N/A
		40	12.9	<i>Sorghastrum nutans</i>	Indiangrass	SEED	LB of P.L.S. 76 %	N/A	N/A
		20	6.4	<i>Tridens flavus</i>	Purpletop	SEED	LB of P.L.S. 76 %	N/A	N/A
		100	32.1	= total					

CON = Contaminized
 P.L.S. = Pure Live Seed
 B&B= Balled & Burlapped

PLANT COMPOSITION SCHEDULE

ZONE 5 - Shaded Emergent Wetland / Pool Fringe

Size (acres): 0.06

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
2.5	6970			HERBACEOUS PLANTS					
		15	63	<i>Iris versicolor</i>	Blue flag iris	CON	Clump	2" Plug	6
		20	84	<i>Peltandra virginica</i>	Pickeralweed	CON	Clump	2" Plug	6
		10	42	<i>Peltandra virginica</i>	Arrow arum	CON	Clump	2" Plug	8
		20	84	<i>Saururus cernuus</i>	Lizards tail	CON	Clump	2" Plug	6
		15	63	<i>Juncus effusus</i>	Soft rush	CON	Clump	2" Plug	6
		20	84	<i>Carex stricta</i>	Tussock sedge	CON	Clump	2" Plug	6
		100	420	= total					

CON = Contaminized

PLANTING NOTES:

- EACH PLANTING ZONE SHALL INCLUDE A TRANSITION WHERE PLANTS FROM TWO ADJOINING ZONES ARE MIXED. THE TRANSITION ZONE SHALL NOT EXCEED 2 TIMES THE OVERALL MINIMUM SPACING FOR THE VEGETATION STRATA.
- THE PLANTING AREA FOR ZONE 5 IS NOT DEPICTED ON THE PLANTING PLAN. ZONE 5 SHALL BE LAID OUT RELATIVE TO THE PERMANENT POOL ELEVATIONS AND ENCOMPASS AN AREA BETWEEN 0.5' AND 1.0' BELOW FROM THE ESTABLISHED WATER SURFACE ELEVATIONS OF ALL POOLS AND DEPRESSIONAL WETLAND AREAS.
- 0.25 AC OF TURF SHALL BE PLANTED AS DEPICTED ON THE PLANTING PLAN.
- ALL TREE AND SHRUB PLANTINGS SHALL INCLUDE DEER PROTECTION CAGE.