

INSET
SCALE: 1" = 60'

FOR CONTINUATION SEE
INSET THIS SHEET

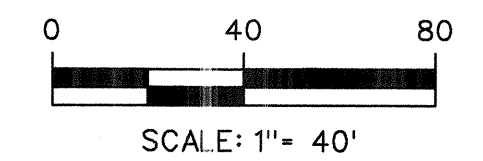
PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018

Kathy J. [Signature] 4/2/17

NOTES:
1. FIELD RUN SURVEY WITHIN THE PROJECT LIMITS HAS BEEN SUPPLEMENTED WITH AERIAL TOPOGRAPHY PROVIDED BY HOWARD COUNTY.

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
Mark DeLuca
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 DATE: 4/5/17

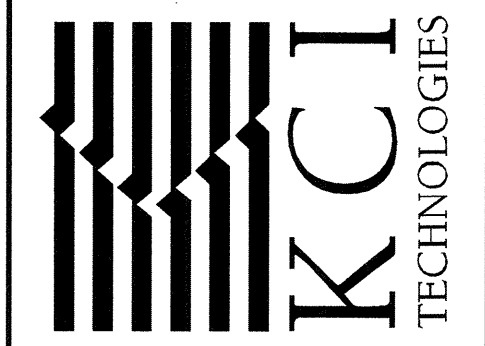
SOILS DATA TABLE		
MAP UNIT SYMBOL	MAP UNIT SYMBOL	K FACTOR
BaA-C/D	BAILE SILT LOAM	0.37
GfB-A	GLADSTONE - URBAN LAND	0.28
GfC-A	GLADSTONE - URBAN LAND	N/A
Ha-B/D	HATBORO - CODORUS SILT LOAMS	0.37
LoB-C	LEGORE - MONTALTO - URBAN LAND COMPLEX	N/A



LEGEND	
LIMITS OF DISTURBANCE	--- LOD --- LOD ---
EXISTING CONTOUR	--- 350 ---
FEMA 100-YEAR FLOODPLAIN	--- FP --- FP ---
STREAM CENTERLINE	---
PROPERTY LINE	---
EASEMENT LINE	---
WETLAND BOUNDARY	---
25' WETLAND BUFFER	--- WB --- WB ---
WATERS OF U.S.	--- WUS --- WUS ---
STREAM BUFFER	--- SB --- SB ---
FENCE	---
SEWER MANHOLE	(S)
EX. SEWER LINE	---
EX. WATER LINE	---
EX. STORM DRAIN	---
EX. TREE	(T)
EX. TREE LINE	---
EX. RIPRAP	(Riprap symbol)
15%-25% SLOPES	(Shaded area)
25% SLOPES OR GREATER	(Shaded area)
NRCS SOILS BOUNDARY	--- Fa --- --- UcB ---
HIGHLY ERODIBLE SOILS (EROSION FACTOR K>0.35)	(Dotted area)

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
 WWW.KCI.COM



DUNLOGGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1005, 396 TAX MAP 24.30
 ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04.21

ENVIRONMENTAL
 RESOURCES
 MAP

SCALE: 1" = 40'
 DATE: JUNE 2017
 KCI JOB NO.: 17133314.94
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

Curve Table - Mainstem

Curve #	Radius	Delta	Length	Tangent	Chord Direction	Chord
C1	21.00	132°38'01.74"	48.61	47.88	N 47°28'28.52" W	38.46
C2	23.00	132°24'38.93"	53.15	52.16	N 47°21'47.12" W	42.09
C3	25.00	27°15'19.43"	11.89	6.06	S 52°48'13.70" W	11.78
C4	20.00	57°51'20.08"	20.20	11.05	S 68°06'14.02" W	19.35
C5	28.00	29°33'08.39"	14.44	7.39	S 82°15'19.87" W	14.28
C6	22.00	51°23'58.82"	19.74	10.59	N 86°49'14.9" W	19.08
C7	22.00	95°56'04.62"	36.84	24.41	S 70°54'42.19" W	32.68
C8	27.00	88°39'18.16"	41.78	26.37	S 67°16'18.96" W	37.73
C9	24.00	25°28'24.02"	10.67	5.42	N 81°08'13.97" W	10.58
C10	24.00	55°47'02.40"	23.37	12.70	S 58°14'02.82" W	22.45
C11	30.00	99°29'55.41"	52.10	35.44	S 80°05'29.32" W	45.79
C12	23.00	55°43'10.08"	22.37	12.16	N 78°01'08.01" W	21.50
C13	23.00	38°47'44.97"	15.57	8.10	N 86°28'50.55" W	15.28
C14	23.00	69°00'54.17"	27.70	15.81	S 78°24'34.84" W	26.06
C15	23.00	77°53'22.68"	31.27	18.59	S 82°50'49.10" W	28.91
C16	22.00	84°37'44.03"	32.50	20.03	S 79°28'38.42" W	29.62

Line Table - Mainstem

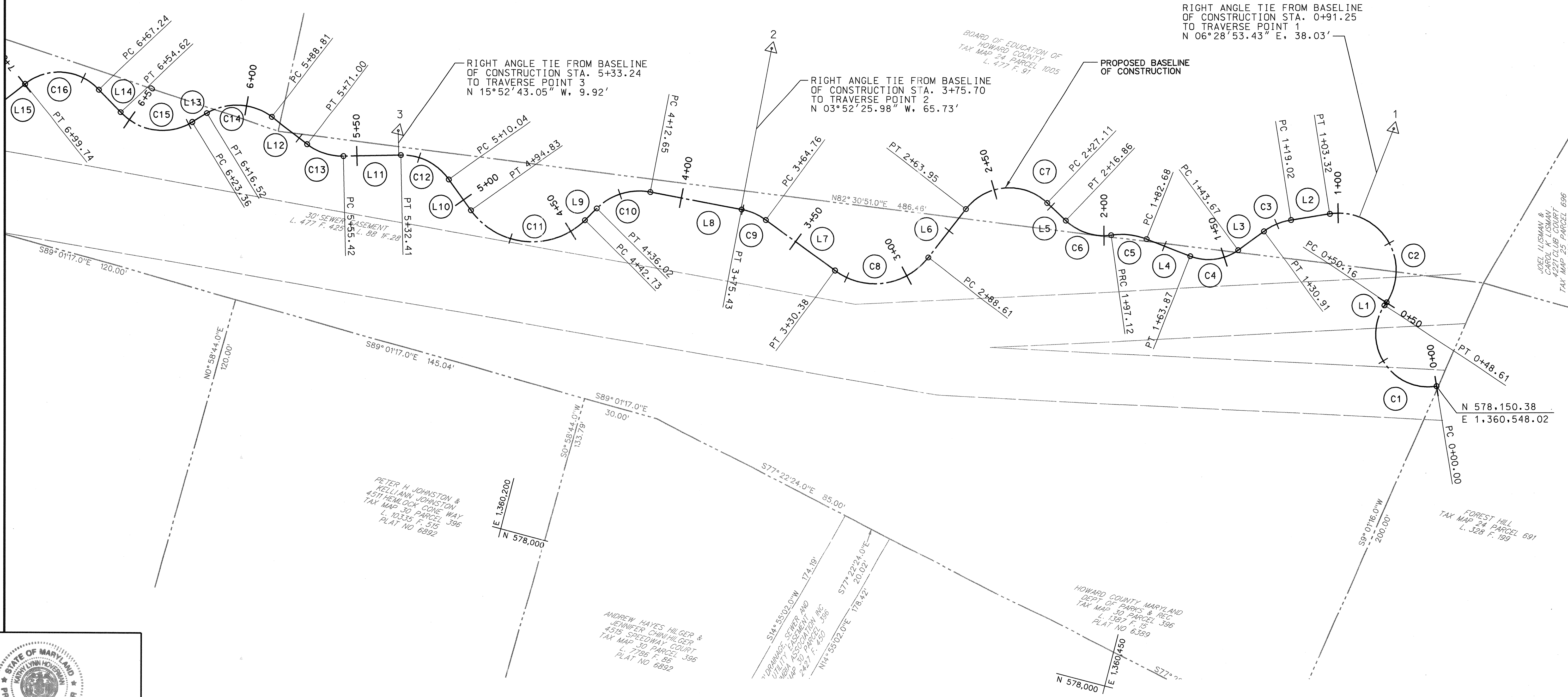
Line #	Length	Direction
L1	1.55	N 18°50'32.35" E
L2	15.70	S 66°25'53.42" W
L3	12.76	S 39°10'33.98" W
L4	18.81	N 82°58'05.94" W
L5	10.25	N 61°07'15.51" W
L6	24.66	S 22°56'39.88" W
L7	34.37	N 68°24'01.96" W
L8	37.22	S 86°07'34.02" W
L9	6.71	S 30°20'31.62" W
L10	15.21	N 50°09'32.97" W
L11	23.01	S 74°07'16.95" W
L12	17.81	N 67°04'58.08" W
L13	6.84	S 43°54'07.76" W
L14	12.62	N 58°12'29.57" W
L15	16.03	S 37°09'46.40" W

Traverse Coordinate Table

Traverse #	Northing	Easting	Elevation
1	578245.92	1360505.30	341.06
2	578214.11	1360256.15	340.19
3	578144.06	1360119.91	333.91

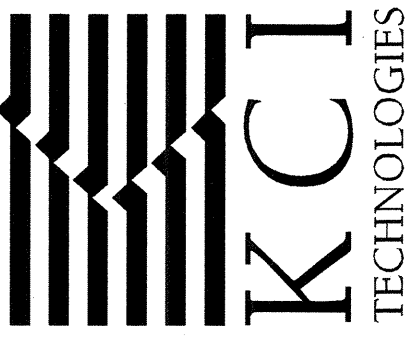
E 1,360.200
N 578,250

MATCH LINE - SEE SHEET GS-02



NO.	REVISIONS DESCRIPTION	DATE

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DUNLOGG MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 996 TAX MAP 24, 30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04, 21

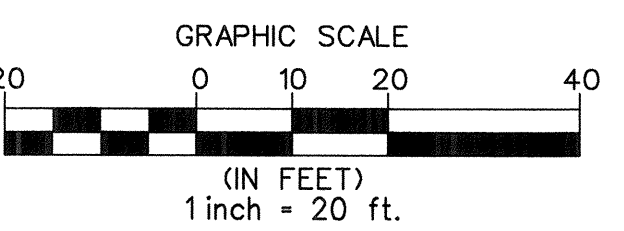
GEOMETRY SHEET

SCALE: 1" = 20'
DATE: JUNE 2017
KCIJOB NO.: 17133314.94
CAPITAL PROJECT NO.: D-1158
PERMIT ISSUE:
CONSTRUCTION ISSUE:

Peter H. Johnston & Kellian Johnston
4515 SPEEDWAY COURT
L. 10335 F. 515
PLAT NO. 6892

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
Andrew Hayes Hilger & Jennifer Chin-Hilger
4515 SPEEDWAY COURT
L. 7298 F. 86
PLAT NO. 6892

DATE: 6/17

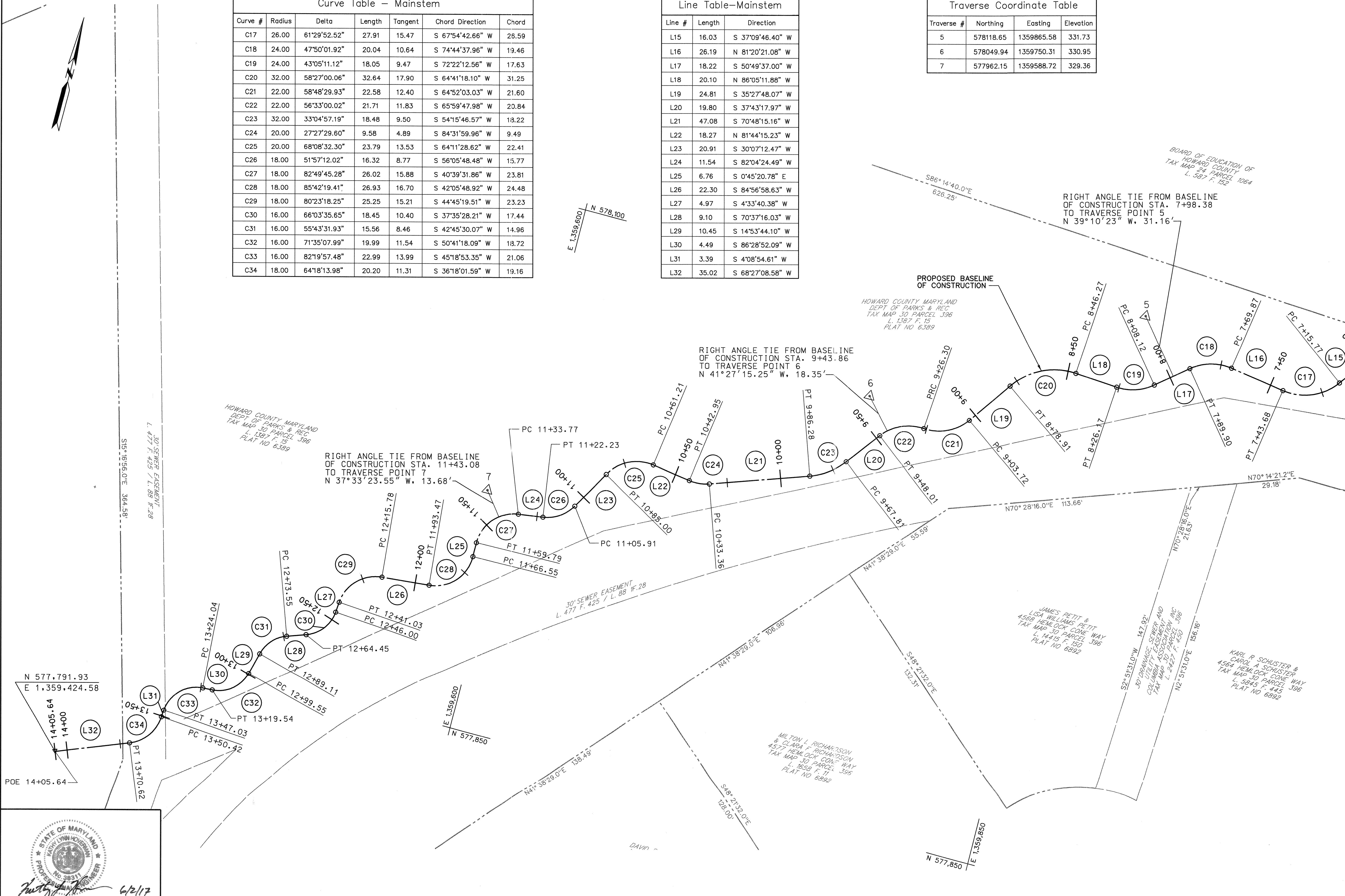


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FILE: M:\2015\17133314.94\Drawings\03-PDS\001-Dunloggin.dwg

Curve Table - Mainstem						
Curve #	Radius	Delta	Length	Tangent	Chord Direction	Chord
C17	26.00	61°29'52.52"	27.91	15.47	S 67°54'42.66" W	26.59
C18	24.00	47°50'01.92"	20.04	10.64	S 74°44'37.96" W	19.46
C19	24.00	43°05'11.12"	18.05	9.47	S 72°22'12.56" W	17.63
C20	32.00	58°27'00.06"	32.64	17.90	S 64°41'18.10" W	31.25
C21	22.00	58°48'29.93"	22.58	12.40	S 64°52'03.03" W	21.60
C22	22.00	56°33'00.02"	21.71	11.83	S 65°59'47.98" W	20.84
C23	32.00	33°04'57.19"	18.48	9.50	S 54°15'46.57" W	18.22
C24	20.00	27°27'29.60"	9.58	4.89	S 84°31'59.96" W	9.49
C25	20.00	68°08'32.30"	23.79	13.53	S 64°11'28.62" W	22.41
C26	18.00	51°57'12.02"	16.32	8.77	S 56°05'48.48" W	15.77
C27	18.00	82°49'45.28"	26.02	15.88	S 40°39'31.86" W	23.81
C28	18.00	85°42'19.41"	26.93	16.70	S 42°05'48.92" W	24.48
C29	18.00	80°23'18.25"	25.25	15.21	S 44°45'19.51" W	23.23
C30	16.00	66°03'35.65"	18.45	10.40	S 37°35'28.21" W	17.44
C31	16.00	55°43'31.93"	15.56	8.46	S 42°45'30.07" W	14.96
C32	16.00	71°35'07.99"	19.99	11.54	S 50°41'18.09" W	18.72
C33	16.00	82°19'57.48"	22.99	13.99	S 45°18'53.35" W	21.06
C34	18.00	64°18'13.98"	20.20	11.31	S 36°18'01.59" W	19.16

Line Table - Mainstem		
Line #	Length	Direction
L15	16.03	S 37°09'46.40" W
L16	26.19	N 81°20'21.08" W
L17	18.22	S 50°49'37.00" W
L18	20.10	N 86°05'11.88" W
L19	24.81	S 35°27'48.07" W
L20	19.80	S 37°43'17.97" W
L21	47.08	S 70°48'15.16" W
L22	18.27	N 81°44'15.23" W
L23	20.91	S 30°07'12.47" W
L24	11.54	S 82°04'24.49" W
L25	6.76	S 0°45'20.78" E
L26	22.30	S 84°56'58.63" W
L27	4.97	S 4°33'40.38" W
L28	9.10	S 70°37'16.03" W
L29	10.45	S 14°53'44.10" W
L30	4.49	S 86°28'52.09" W
L31	3.39	S 4°08'54.61" W
L32	35.02	S 68°27'08.58" W

Traverse Coordinate Table			
Traverse #	Northing	Easting	Elevation
5	578118.65	1359865.58	331.73
6	578049.94	1359750.31	330.95
7	577962.15	1359588.72	329.36



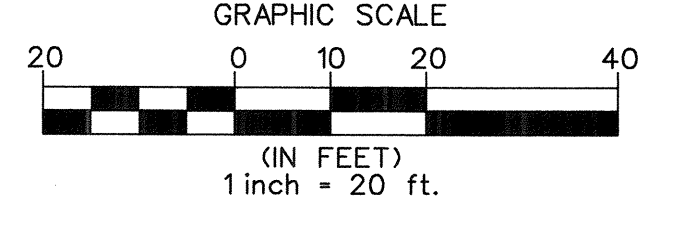
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38331. EXPIRATION DATE: JANUARY 06, 2018.

Justin J. [Signature] 6/2/17

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

Mark D. [Signature] 6/5/17

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES



MATCH LINE - SEE SHEET GS-01

NO.	REVISIONS DESCRIPTION	DATE

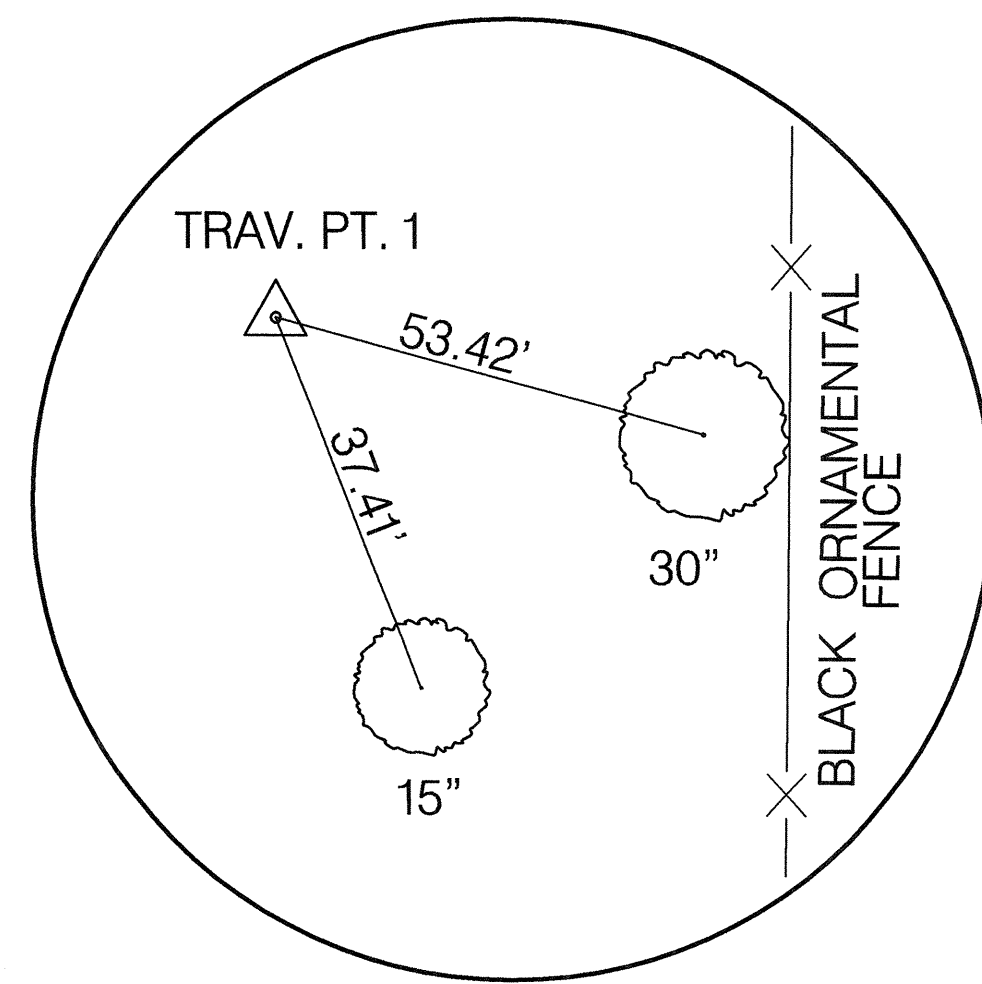
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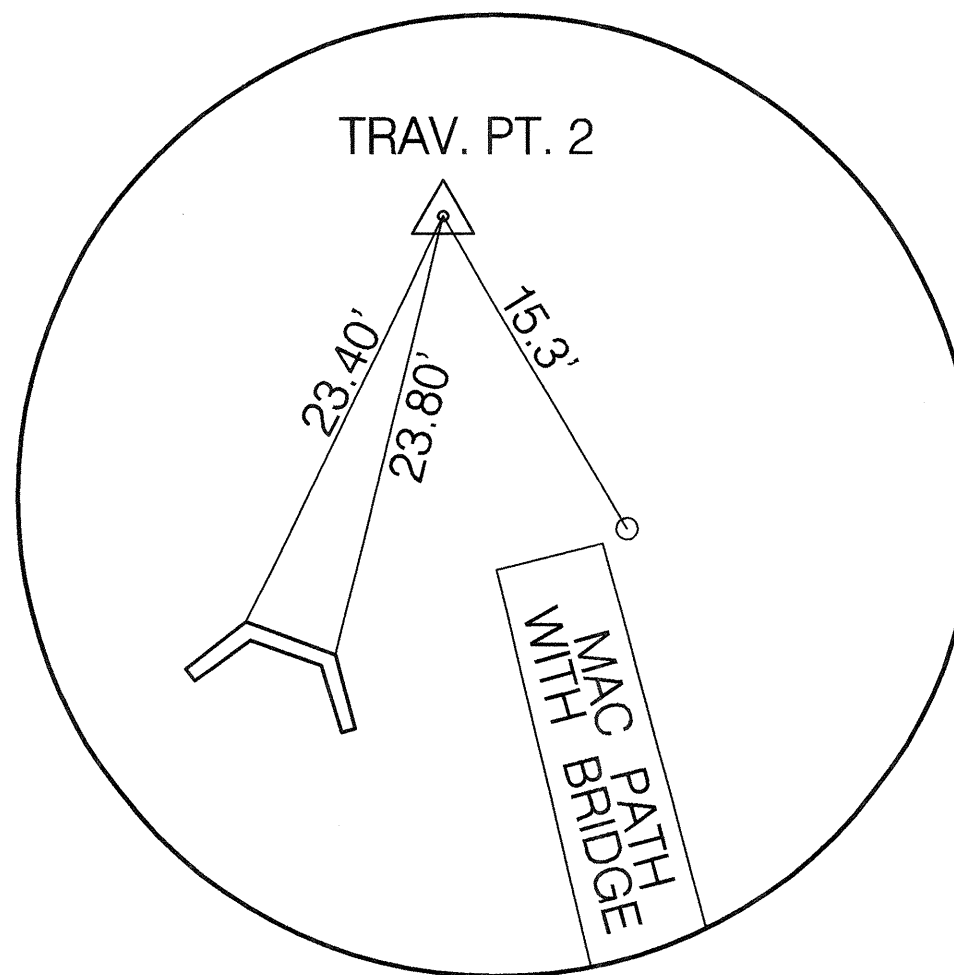
DUNLOGGIN MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 396 TAX MAP 24.30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04.21

GEOMETRY SHEET

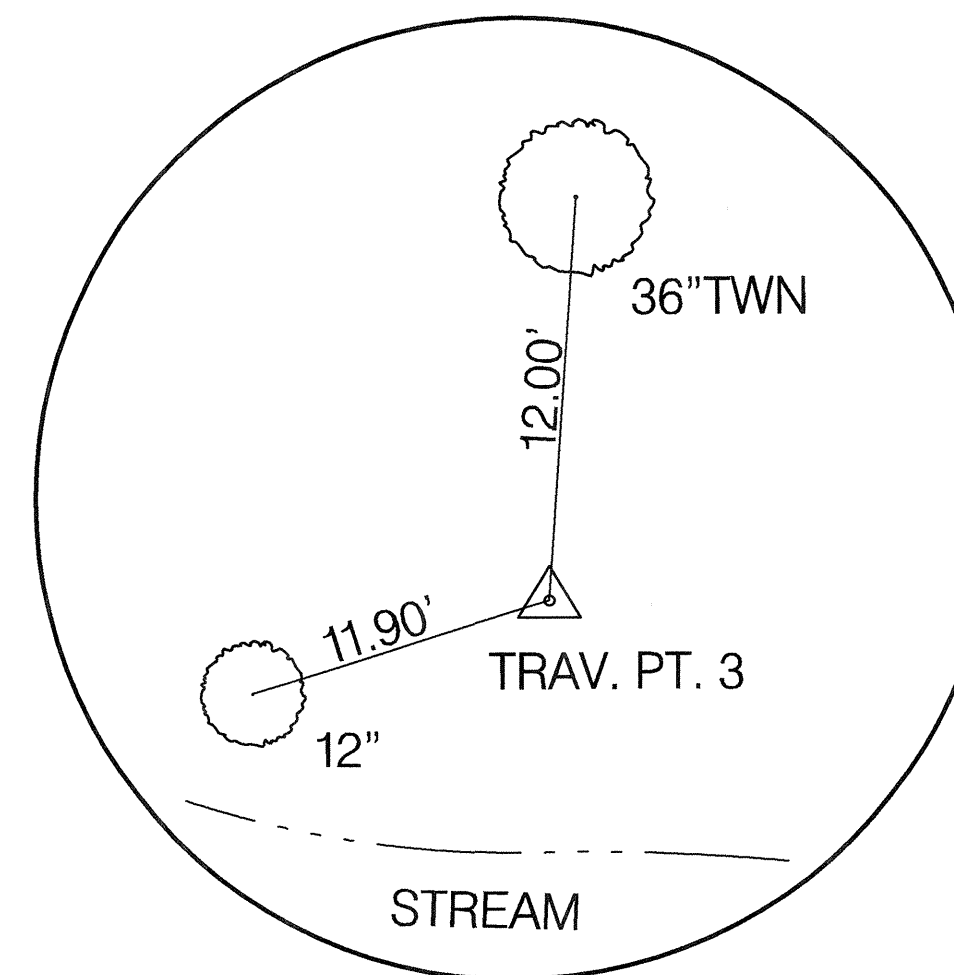
SCALE: 1" = 20'
DATE: JUNE 2017
KCIJOB NO.: 17133314.94
CAPITAL PROJECT NO.: D-1158
PERMIT ISSUE:
CONSTRUCTION ISSUE:



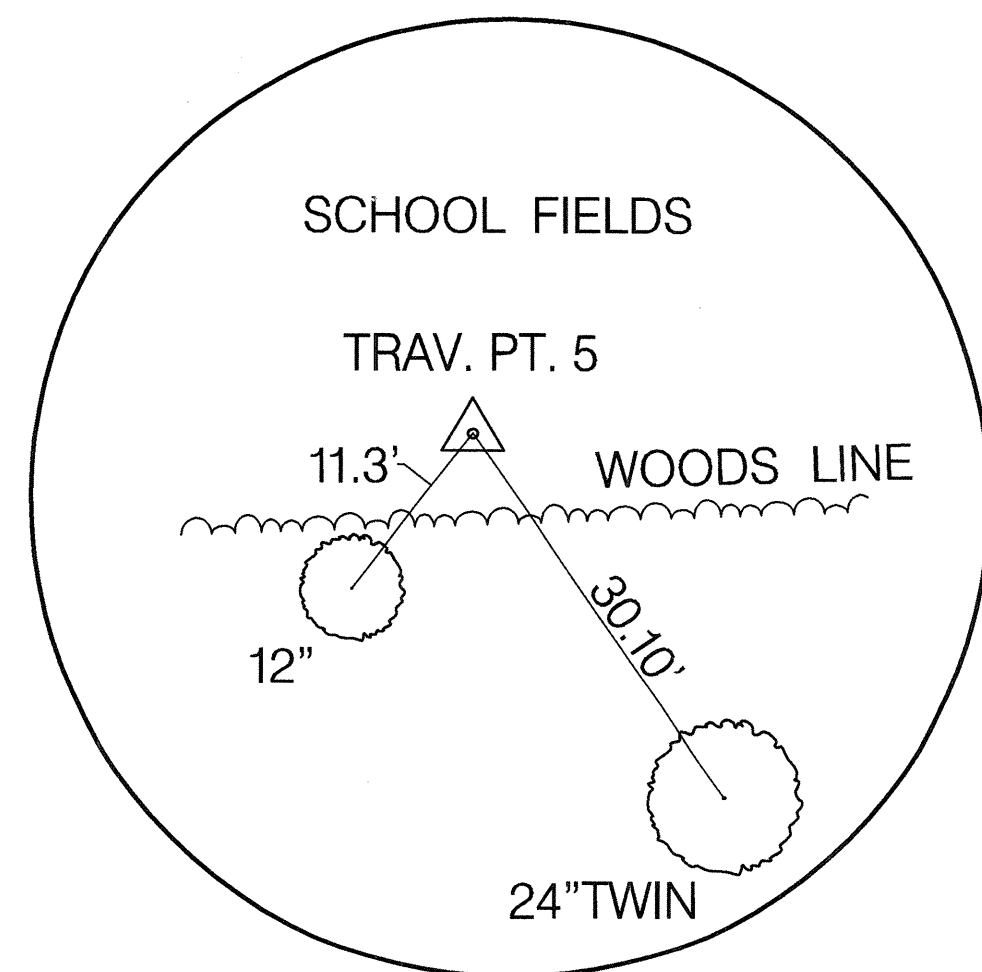
**TRAVERSE #1
REBAR & CAP**
NOT TO SCALE



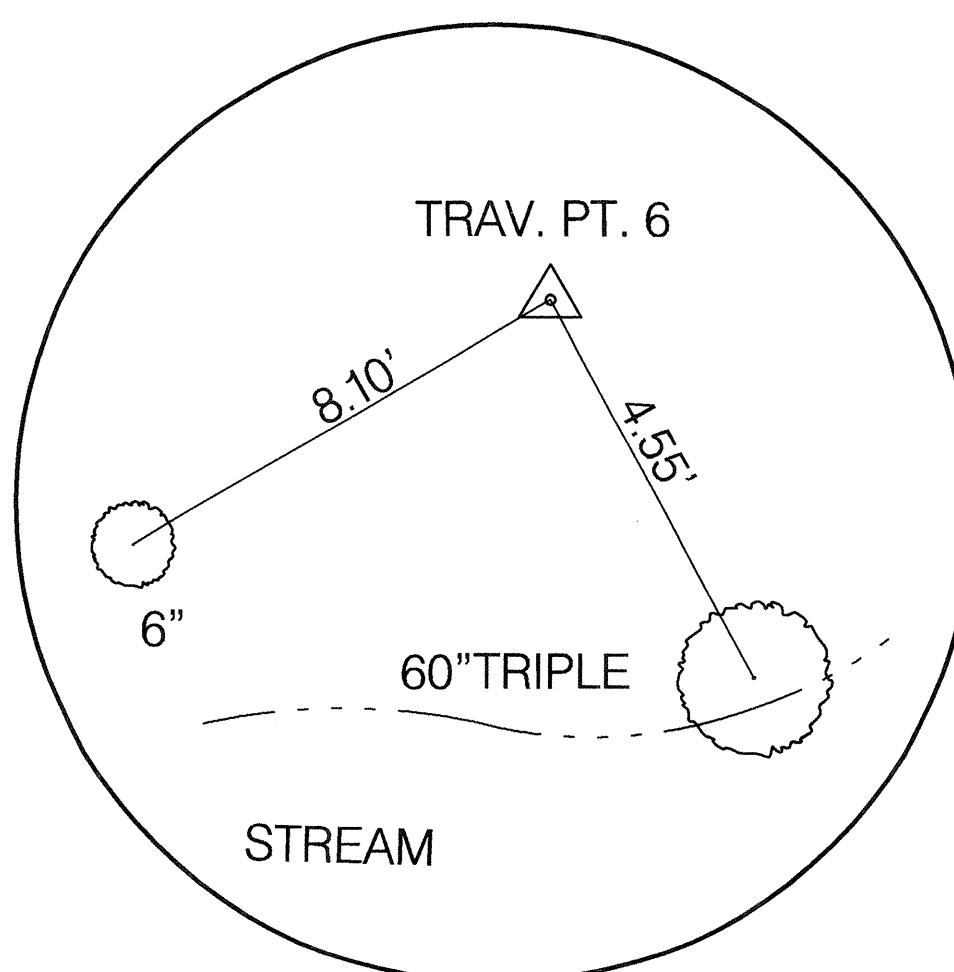
**TRAVERSE #2
REBAR & CAP**
NOT TO SCALE



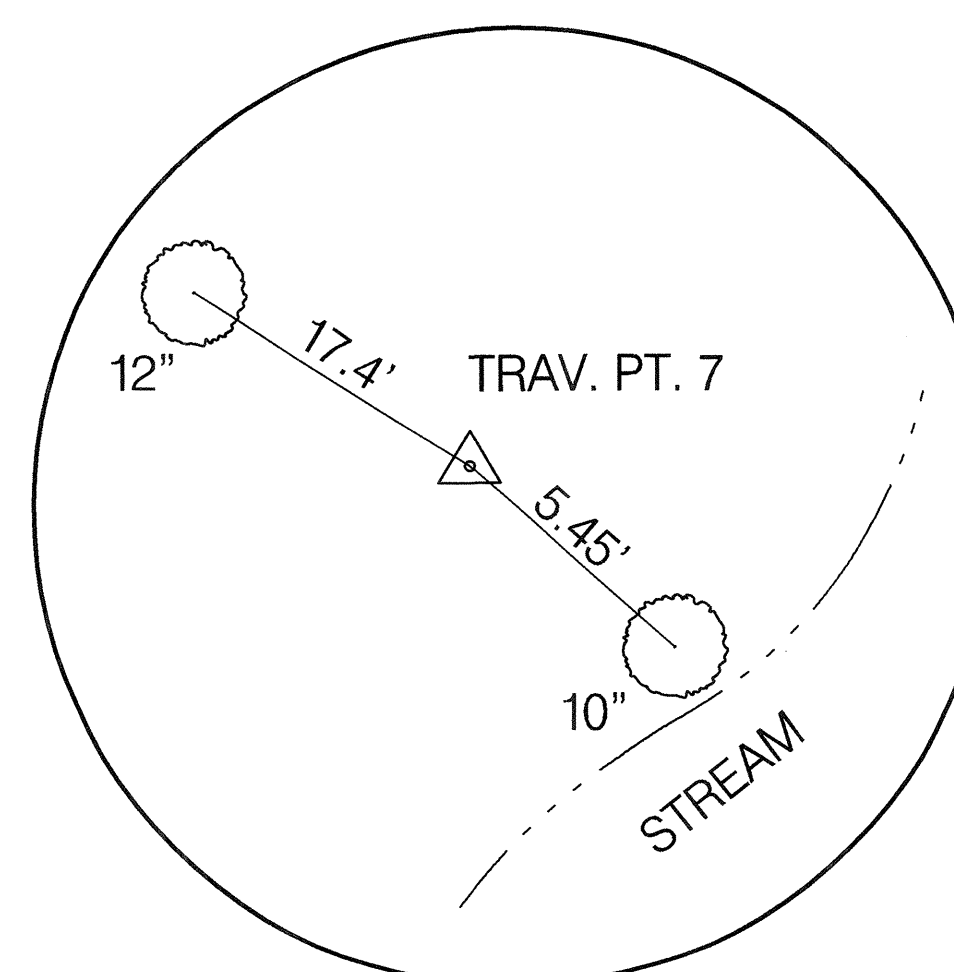
**TRAVERSE #3
REBAR & CAP**
NOT TO SCALE



**TRAVERSE #5
REBAR & CAP**
NOT TO SCALE



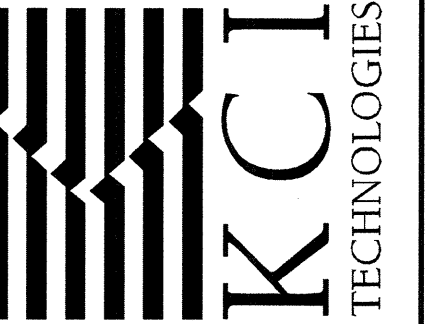
**TRAVERSE #6
REBAR & CAP**
NOT TO SCALE



**TRAVERSE #7
REBAR & CAP**
NOT TO SCALE

NO.	REVISIONS DESCRIPTION	DATE

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DUNLOGGIN MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1065, 396 TAX MAP 24.30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04.21

**GEOMETRY
SHEET**

SCALE:	NOT TO SCALE
DATE:	JUNE 2017
KCI JOB NO.:	17133314.94
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

STATE OF MARYLAND
PROFESSIONAL ENGINEER
No. 98911
6/2/17

PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311. EXPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
Chief, Bureau of Environmental Services
6/5/17
DATE

Plotted: 10:53 AM on Friday, June 02, 2017. File: M:\2013\17133314_94\Drawings\05_pds-P003_Dunloggin.dgn

RIFLE GRADE CONTROL SCHEDULE	
FROM STATION	TO STATION
0+37	0+57
1+03	1+19
3+30	3+65
3+75	4+13

WOODY TOE SCHEDULE		
FROM STATION	TO STATION	OFFSET X
1+97	2+17	L
4+13	4+36	R
5+10	5+32	R
5+89	6+17	R
6+67	7+00	R

* OFFSET DESIGNATED FROM BASELINE FACING DOWNSTREAM

COIR FIBER ROLL SCHEDULE		
FROM STATION	TO STATION	OFFSET X
1+31	1+44	L
1+64	1+83	R
2+17	2+27	R
2+64	2+89	L
4+36	4+43	R
4+95	5+10	L
5+32	5+55	R
5+71	5+89	L
6+55	6+67	R
7+00	7+16	L/R

* OFFSET DESIGNATED FROM BASELINE FACING DOWNSTREAM

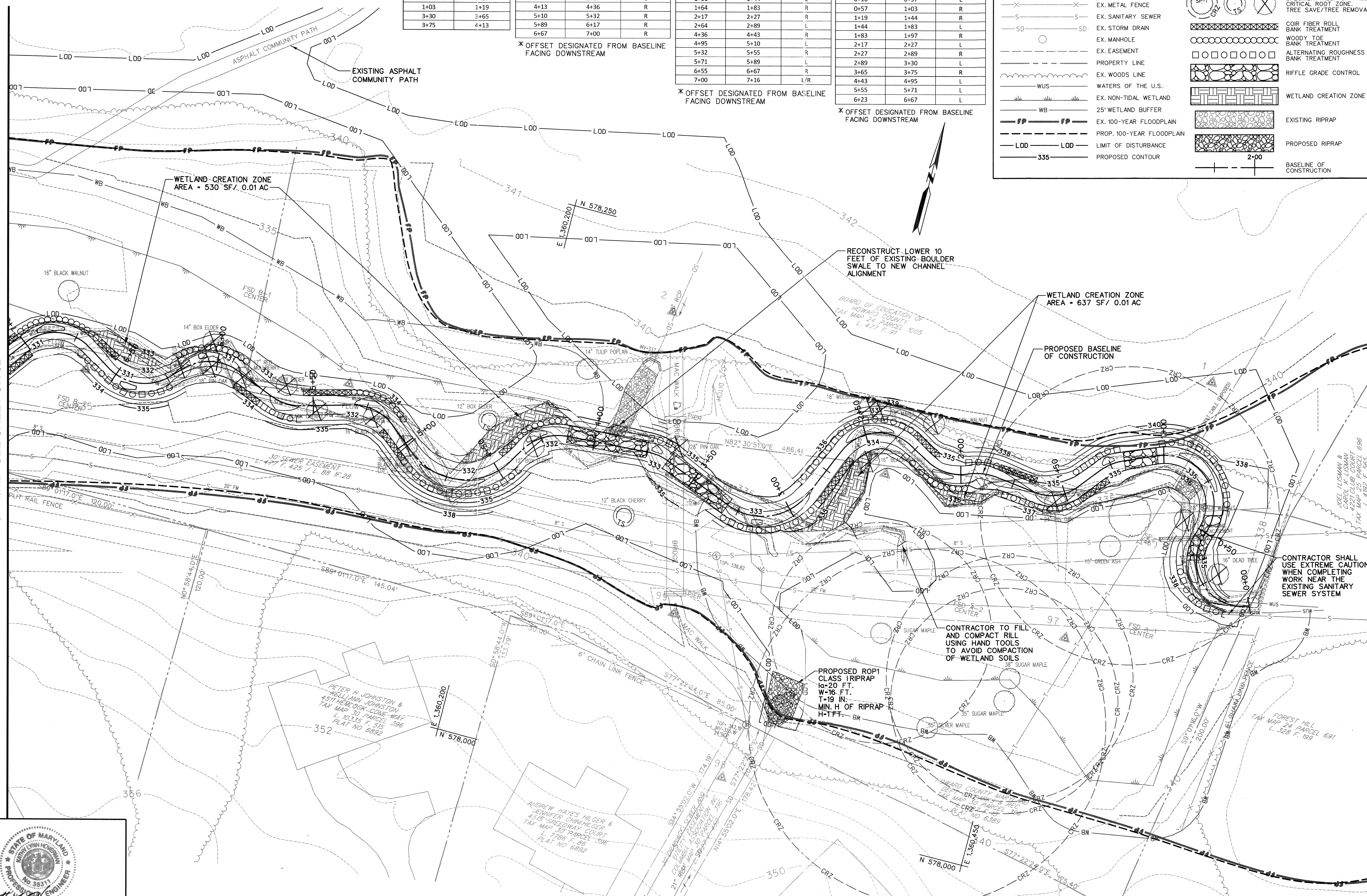
ALTERNATING ROUGHNESS SCHEDULE		
FROM STATION	TO STATION	OFFSET X
0+10	0+37	L
0+57	1+03	R
1+19	1+44	R
1+44	1+83	L
1+83	1+97	R
2+17	2+27	L
2+27	2+89	R
2+89	3+30	L
3+65	3+75	R
4+43	4+95	L
5+55	5+71	L
6+23	6+67	L

* OFFSET DESIGNATED FROM BASELINE FACING DOWNSTREAM

LEGEND

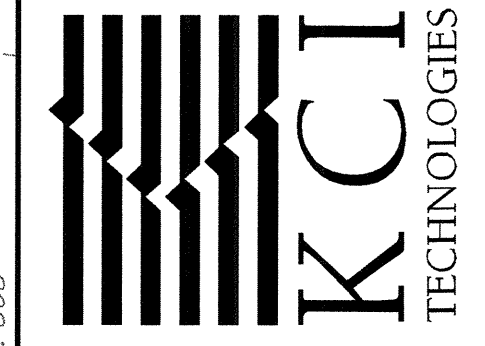
---	EX. CONTOUR		SPECIMEN TREE / EX. TREE CRITICAL ROOT ZONE, TREE SAVE/TREE REMOVAL
-X-X-	EX. METAL FENCE		COIR FIBER ROLL BANK TREATMENT
-S-S-	EX. SANITARY SEWER		WOODY TOE BANK TREATMENT
-SD-SD-	EX. STORM DRAIN		ALTERNATING ROUGHNESS BANK TREATMENT
---	EX. MANHOLE		RIFLE GRADE CONTROL
---	EX. EASEMENT		WETLAND CREATION ZONE
---	PROPERTY LINE		EXISTING RIPRAP
---	EX. WOODS LINE		PROPOSED RIPRAP
---	WATERS OF THE U.S.		BASELINE OF CONSTRUCTION
---	EX. NON-TIDAL WETLAND		
---	25' WETLAND BUFFER		
---	EX. 100-YEAR FLOODPLAIN		
---	PROP. 100-YEAR FLOODPLAIN		
---	LIMIT OF DISTURBANCE		
---	PROPOSED CONTOUR		

MATCH LINE - SEE SHEET GR-02



NO.	REVISIONS DESCRIPTION	DATE

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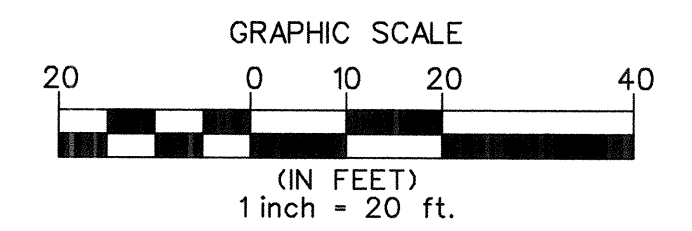
DUNLOGGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1005, 396 TAX MAP 24, 30
 ZONING P20 ELECTION DISTRICT 12, GRIDBLOCK 04, 21

GRADING PLAN

SCALE: 1" = 20'
 DATE: JUNE 2017
 KCIJOB NO.: 17133314.94
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

PETER H. JOHNSTON
 451 HERLOCK-COME WAY
 TAX MAP 30, PARCEL 396
 L. 10335 F. 515
 PLAT NO. 6892

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 Chief, Bureau of Environmental Services
 DATE: 6/5/17



PLOTTER: "10x6.3", AM, 49, F:\dwy, June 03, 2017, FILE: M:\2013\17133314_94\DWG\mains 06-pwr-p001.dwg

RIFLE GRADE CONTROL SCHEDULE	
FROM STATION	TO STATION
7+90	8+08
13+47	13+94

WOODY TOE SCHEDULE		
FROM STATION	TO STATION	OFFSET X
7+70	7+90	R
9+26	9+48	R
13+24	13+47	R

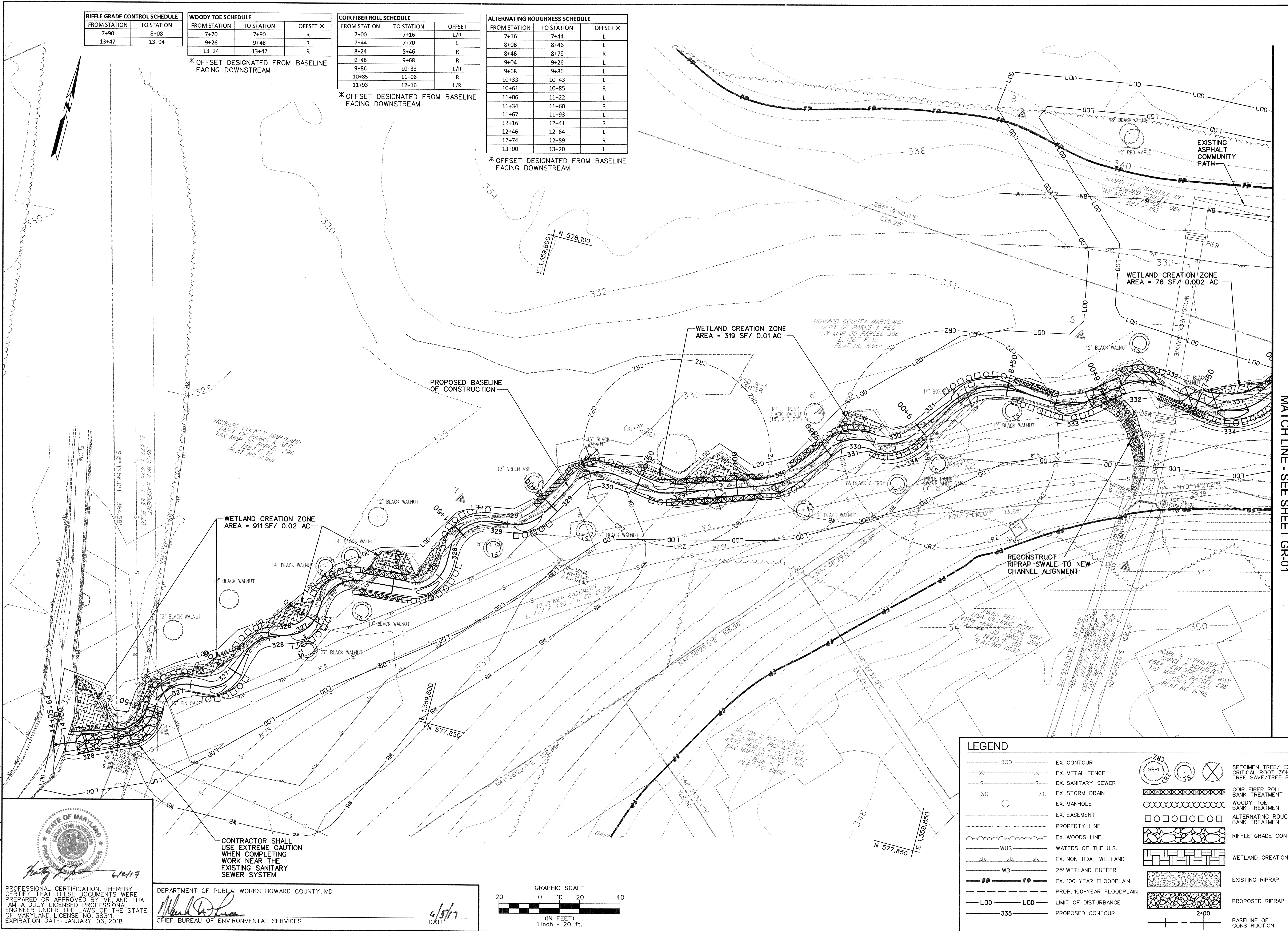
* OFFSET DESIGNATED FROM BASELINE FACING DOWNSTREAM

COIR FIBER ROLL SCHEDULE		
FROM STATION	TO STATION	OFFSET
7+00	7+16	L/R
7+44	7+70	L
8+24	8+46	R
9+48	9+68	R
9+86	10+33	L/R
10+85	11+06	R
11+93	12+16	L/R

* OFFSET DESIGNATED FROM BASELINE FACING DOWNSTREAM

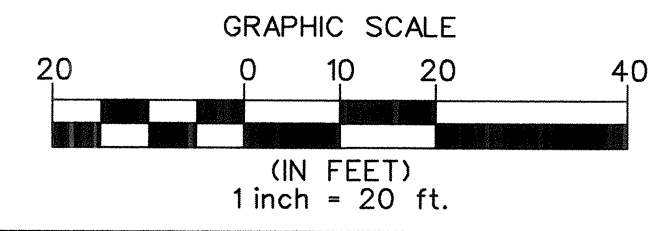
ALTERNATING ROUGHNESS SCHEDULE		
FROM STATION	TO STATION	OFFSET X
7+16	7+44	L
8+08	8+46	L
8+46	8+79	R
9+04	9+26	L
9+68	9+86	L
10+33	10+43	L
10+61	10+85	R
11+06	11+22	L
11+34	11+60	R
11+67	11+93	L
12+16	12+41	R
12+46	12+64	L
12+74	12+89	R
13+00	13+20	L

* OFFSET DESIGNATED FROM BASELINE FACING DOWNSTREAM



MATCH LINE - SEE SHEET GR-01

LEGEND	
	EX. CONTOUR
	EX. METAL FENCE
	EX. SANITARY SEWER
	EX. STORM DRAIN
	EX. MANHOLE
	EX. EASEMENT
	PROPERTY LINE
	EX. WOODS LINE
	WATERS OF THE U.S.
	EX. NON-TIDAL WETLAND
	25' WETLAND BUFFER
	EX. 100-YEAR FLOODPLAIN
	PROP. 100-YEAR FLOODPLAIN
	LIMIT OF DISTURBANCE
	PROPOSED CONTOUR
	SPECIMEN TREE/ EX. TREE CRITICAL ROOT ZONE, TREE SAVE/TREE REMOVAL
	COIR FIBER ROLL BANK TREATMENT
	WOODY TOE BANK TREATMENT
	ALTERNATING ROUGHNESS BANK TREATMENT
	RIFLE GRADE CONTROL
	WETLAND CREATION ZONE
	EXISTING RIPRAP
	PROPOSED RIPRAP
	BASELINE OF CONSTRUCTION



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311. EXPIRATION DATE: JANUARY 06, 2018.

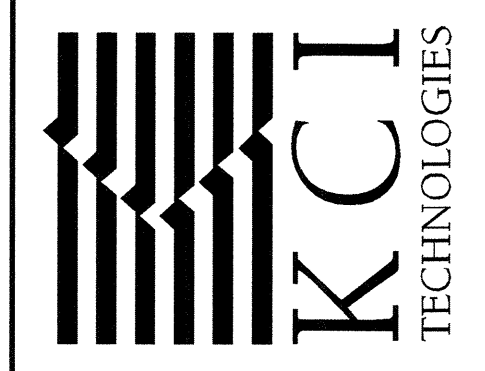
Mark D. L...
DATE: 6/17/17

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

CONTRACTOR SHALL USE EXTREME CAUTION WHEN COMPLETING WORK NEAR THE EXISTING SANITARY SEWER SYSTEM

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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DUNLOGGIN MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 386 TAX MAP 24, 30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04, 21

GRADING PLAN

SCALE: 1" = 20'
DATE: JUNE 2017
KCIJOB NO.: 17133314.94
CAPITAL PROJECT NO.: D-1158
PERMIT ISSUE:
CONSTRUCTION ISSUE:

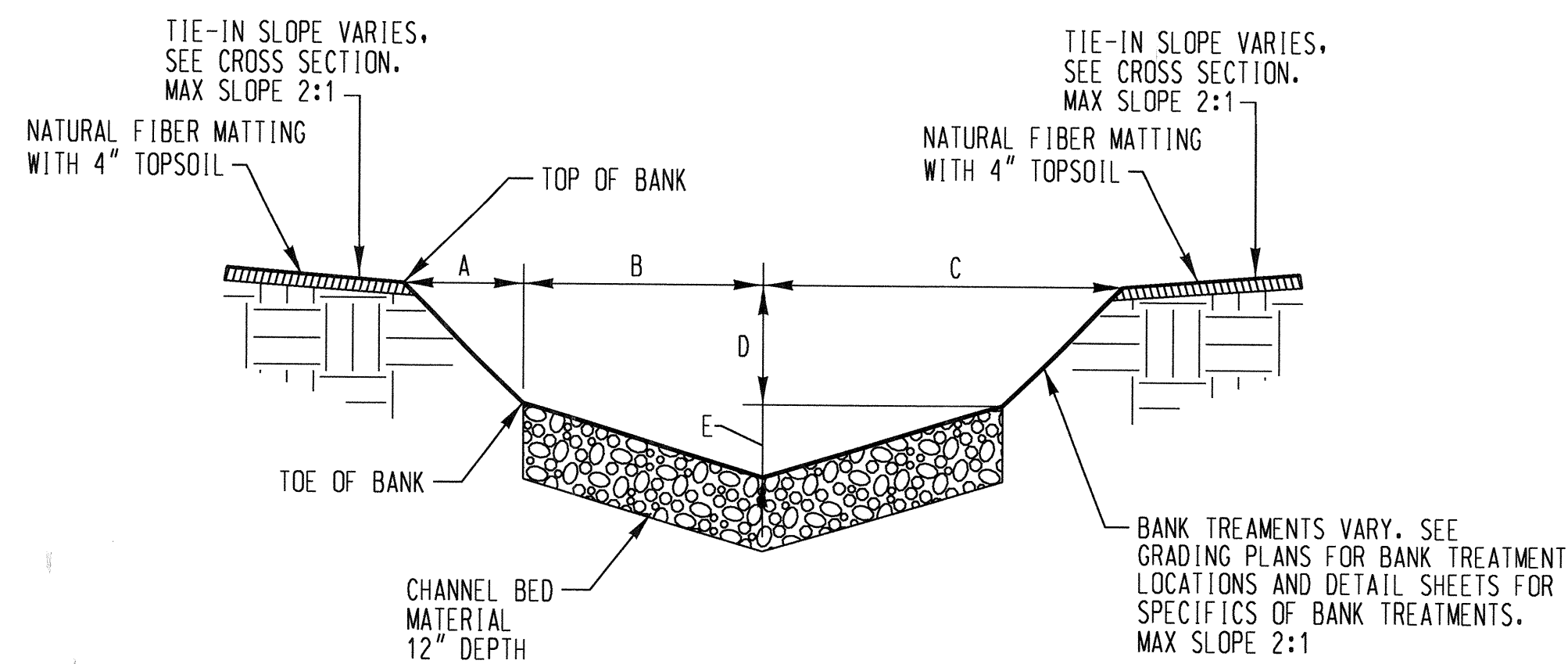
GR-02

SHEET NO.: 7 OF 24

PLOTTED: 10:53 AM on Friday, June 02, 2017
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KCIFILE: MA_2013_17133314.94

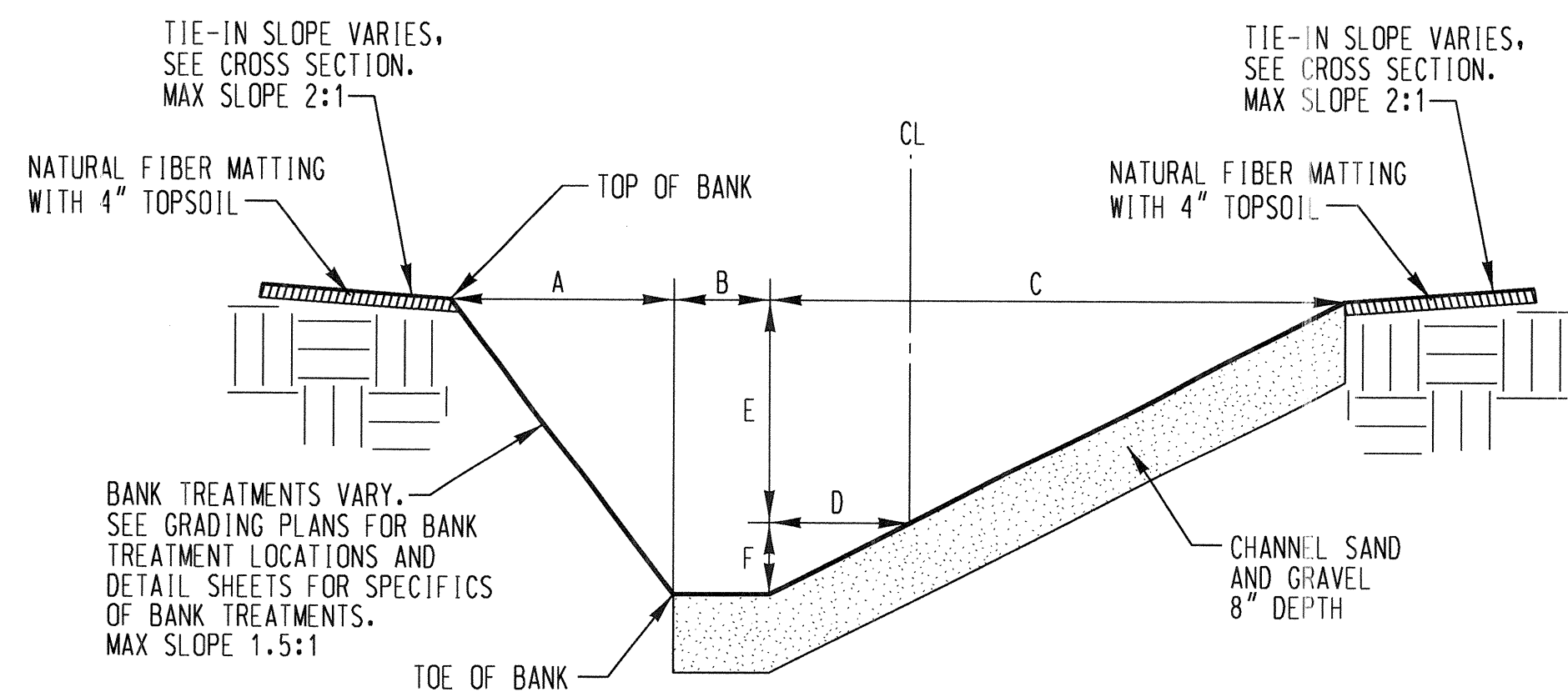
NOTE: PERMANENT STABILIZATION CONSISTING OF, AT A MINIMUM, NATURAL FIBER MATTING AND SEEDING SHALL BE INSTALLED IN ALL AREAS DISTURBED BY THE WORK.



TYPICAL SECTION RIFFLE

NOT TO SCALE

TYPICAL RIFFLE					
PROFILE FEATURE	A	B	C	D	E
RIFFLE 1 / 2 / 3	1.8'	3.5'	5.3'	1.1'	0.3'
RIFFLE 4	1.3'	3.5'	4.8'	1.1'	0.3'

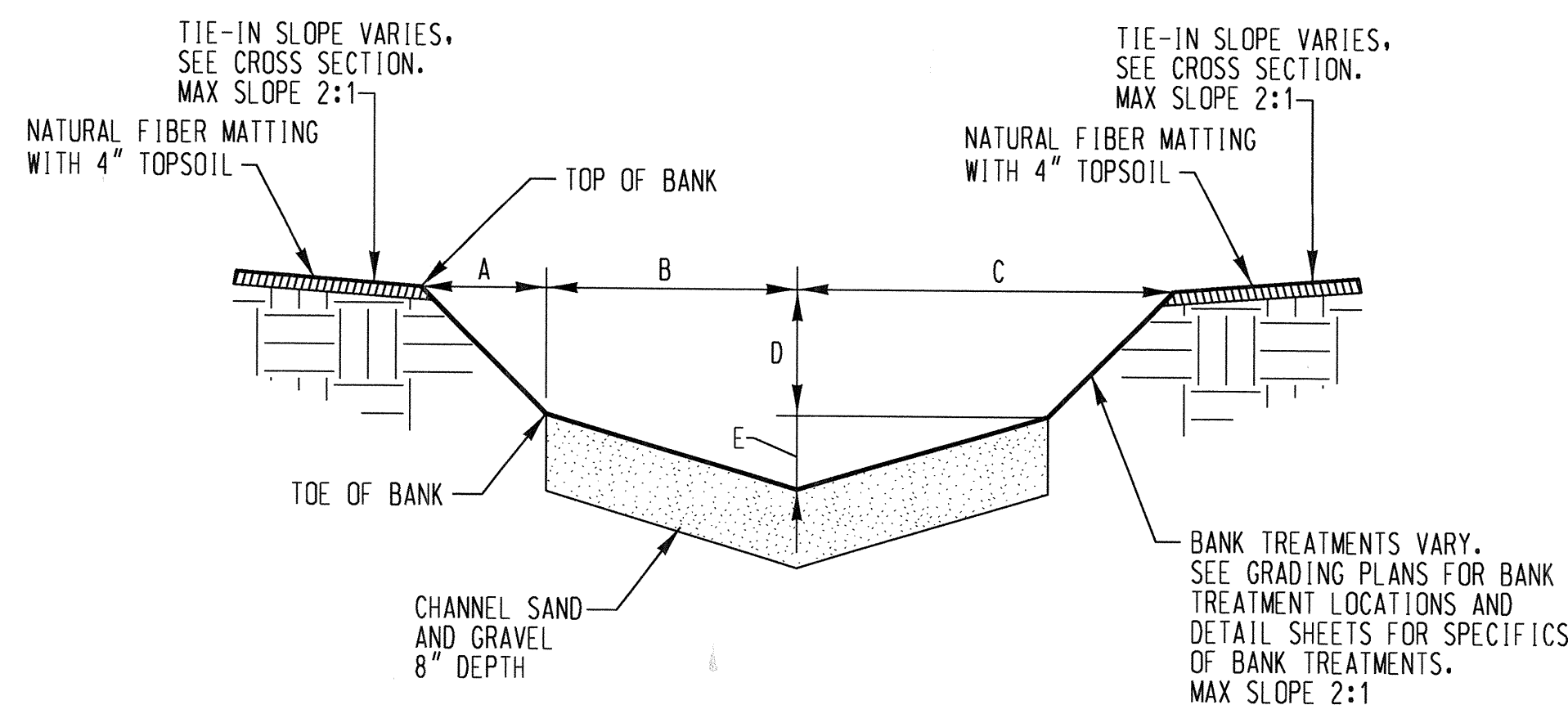


TYPICAL SECTION POOL LEFT

NOT TO SCALE

TYPICAL POOL						
PROFILE FEATURE	A	B	C	D	E	F
POOL 1 / 2 / 3	1.3'	2.0'	9.3'	2.0'	1.9'	0.5'
POOL 4	1.3'	1.5'	8.0'	2.0'	1.9'	0.6'
SHORT POOL 2	1.3'	2.0'	9.3'	2.0'	1.5'	0.4'
SHORT POOL 3	1.3'	2.0'	8.5'	2.0'	1.5'	0.5'
SHORT POOL 4	1.3'	1.5'	7.5'	2.0'	1.5'	0.5'

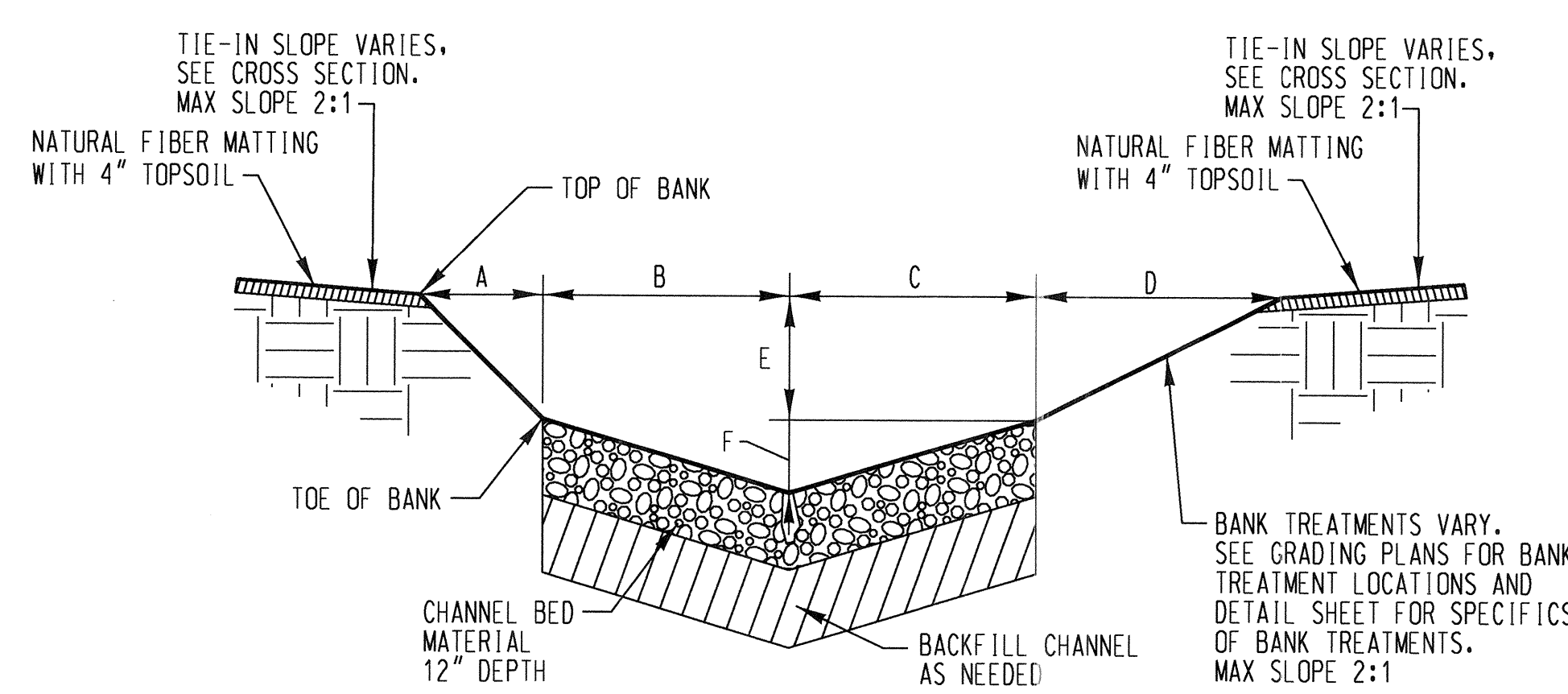
NOTE: POOL RIGHT IS A MIRROR IMAGE OF POOL LEFT.



TYPICAL SECTION POOL-POOL TRANSITION

NOT TO SCALE

TYPICAL POOL-POOL TRANSITION					
STATIONS	A	B	C	D	E
1+97.12 & 9+26.30	1.8'	3.5'	5.3'	1.4'	0.3'

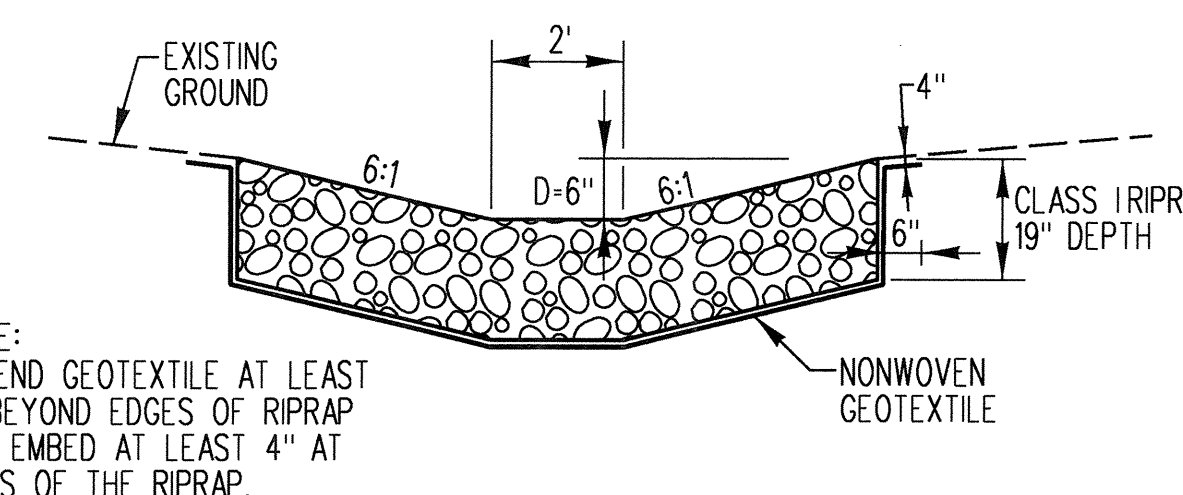


TYPICAL SECTION TRANSITION RIFFLE LEFT

NOT TO SCALE

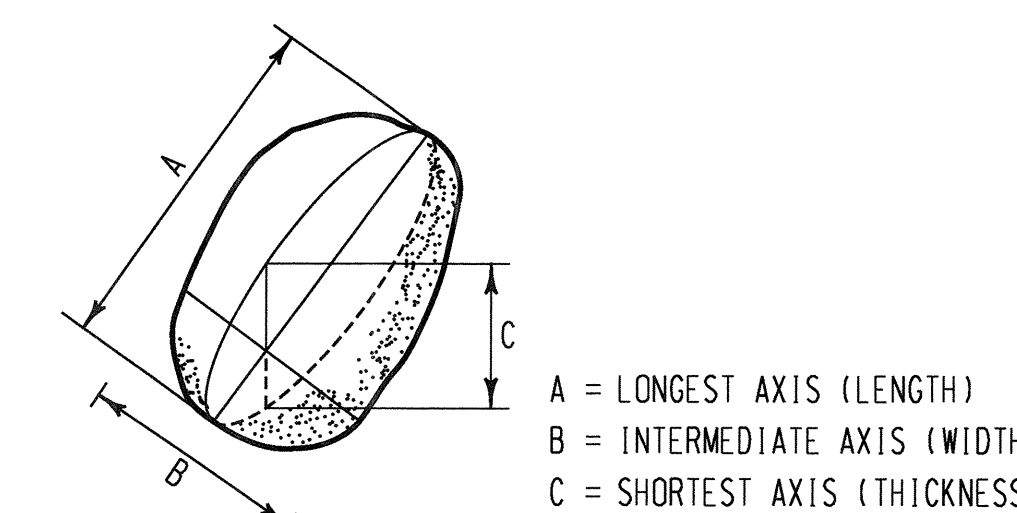
TYPICAL TRANSITION RIFFLE						
PROFILE FEATURE	A	B	C	D	E	F
RIFFLE 1 / 2 / 3	1.8'	3.5'	3.5'	2.5'	1.1'	0.3'
RIFFLE 4	1.3'	3.5'	3.5'	1.7'	1.1'	0.3'

NOTE: TRANSITION RIFFLE RIGHT IS A MIRROR IMAGE OF TRANSITION RIFFLE LEFT.



STONE OUTLET DITCH

NOT TO SCALE



ROCK AXIS DEFINITION

NOT TO SCALE

GRANULAR FILTER AND CHANNEL SAND & GRAVEL	
% LESS THAN	PARTICLE SIZE
100	2.5 in
85-100	1.0 in
60-100	0.5 in
35-70	No. 10
20-50	No. 40
3-20	No. 200

CHANNEL BED MATERIAL	
% LESS THAN	PARTICLE SIZE
100	5.6 in
84	4.7 in
60	3.5 in
50	2.8 in
30	2.0 in
10	0.6 in

RIFFLE GRADE CONTROL MATERIAL	
% LESS THAN	PARTICLE SIZE
100	9.6 in
84	8.1 in
60	6.2 in
50	4.8 in
30	3.2 in
10	0.8 in

SIZES FOR STONE TYPES			
AXIS	STONE TYPE		
	A (LONGEST)	B (INTERMEDIATE)	C (SHORTEST)
ALTERNATING ROUGHNESS STONES	MAX. 1.5'	RANGE 0.8' - 1.3'	MIN. 0.8'
RIFFLE GRADE CONTROL BANK STONES	1.8'	1.1' - 1.5'	1.1'

NOTE: ALL STONES SHALL BE GREY OR BROWN IN COLOR.

NOTE: CHANNEL BED MATERIAL SHALL BE SALVAGED WHEN POSSIBLE. ONLY FURNISH CHANNEL BED MATERIAL WHEN SALVAGED MATERIAL IS NOT AVAILABLE. MATERIAL SHALL NOT BE COMPRISED OF RIPRAP BUT OF A NATURAL STREAM MATERIAL.

NO.	REVISIONS DESCRIPTION	DATE

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HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 396 TAX MAP 24-30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04, 21

STREAM DETAILS	
SCALE:	NOT TO SCALE
DATE:	JUNE 2017
KCI JOB NO.:	17133314-94
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	
DE-01	
SHEET NO.: 8 OF 24	

PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018

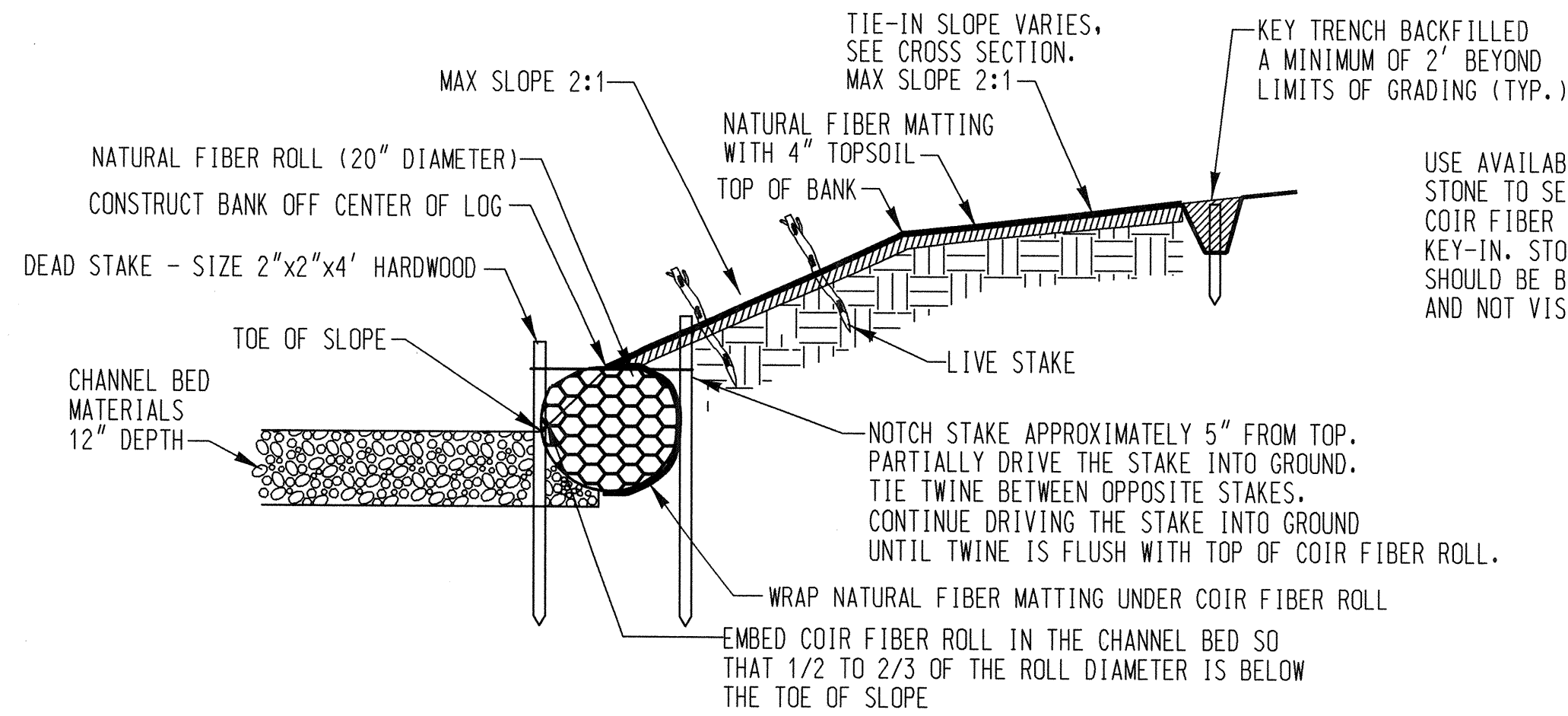
Mark DeLuca 6/9/17

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
FOR MARK DELUCA
Mark DeLuca 6/12/17
BUREAU OF ENVIRONMENTAL SERVICES

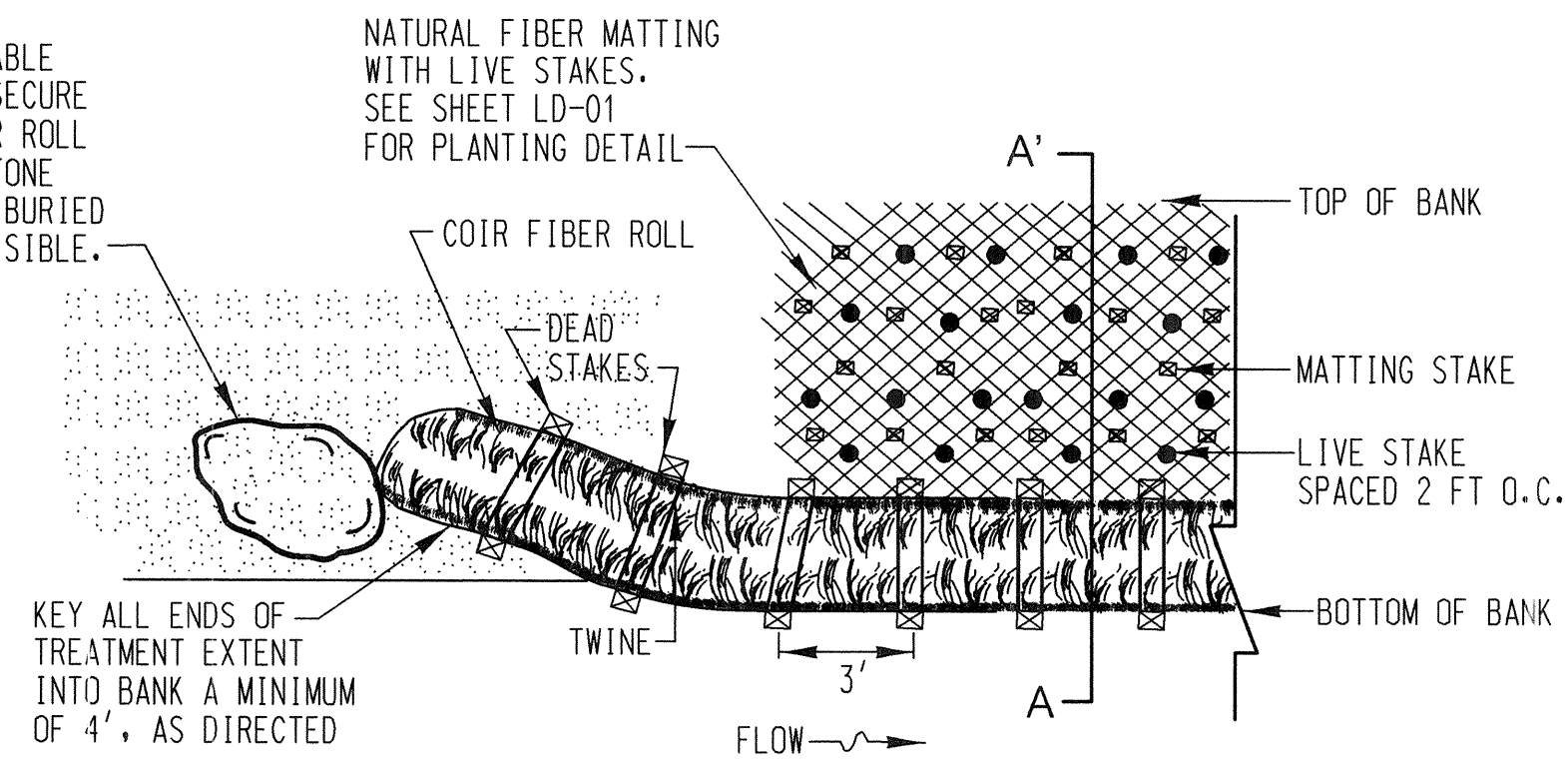
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NOTE: PERMANENT STABILIZATION CONSISTING OF, AT A MINIMUM, NATURAL FIBER MATTING AND SEEDING SHALL BE INSTALLED IN ALL AREAS DISTURBED BY THE WORK.

COIR FIBER ROLL DETAILS



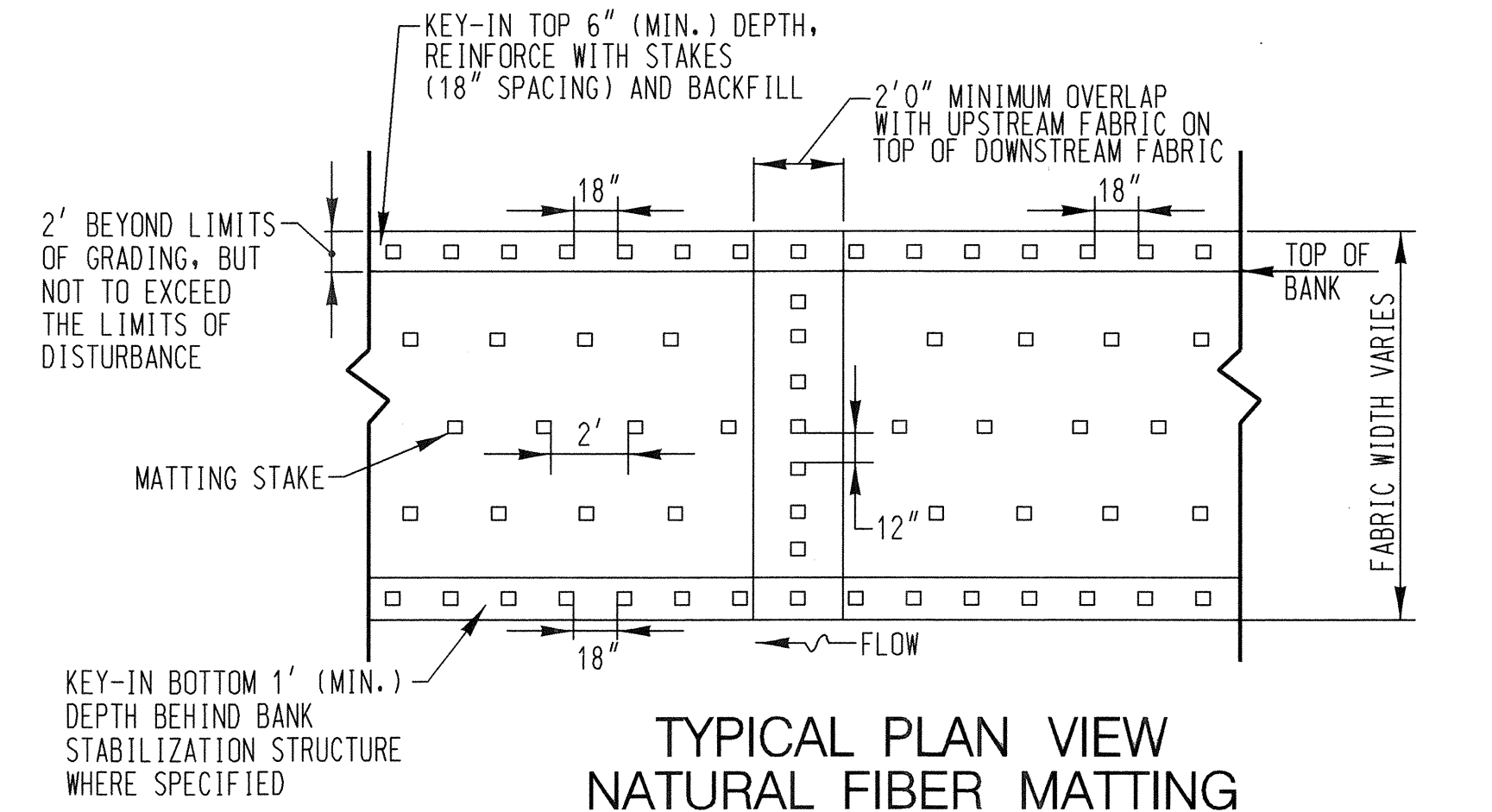
COIR FIBER ROLL WITH MATTING - SECTION A-A'
NOT TO SCALE



COIR FIBER ROLL WITH MATTING - PLAN VIEW DETAIL
NOT TO SCALE

NOTES FOR COIR FIBER ROLL:

- DEAD STAKES SHOULD BE USED TO ANCHOR THE COIR FIBER ROLLS IN PLACE. STAKES SHOULD BE NOTCHED APPROXIMATELY 5 INCHES (13 CENTIMETERS) FROM THEIR TOPS AND POUNDED PARTIALLY INTO THE GROUND ON EITHER SIDE OF THE BUNDLE AT A SPACING OF 3 TO 4 FEET (0.9 TO 1.2 METERS). TWINE SHOULD BE TIED FROM THE NOTCH IN ONE STAKE TO THE NOTCH IN THE STAKE DIRECTLY OPPOSITE. THE STAKES SHOULD THEN BE DRIVEN SO THAT THE TWINE IS SECURED AGAINST THE TOP OF THE ROLL. IDEALLY, THE TOP OF THE STAKE SHOULD BE FLUSH WITH THE TOP OF THE ROLL.
- THE ENDS OF ADJACENT LOGS SHOULD BE LACED TOGETHER WITH TWINE BY MAKING A NUMBER OF PASSES IN THE END NETTING BETWEEN THE LOGS AND PULLING THE TWINE TAUT. WHERE A FIBER ROLL DOES NOT ABUT ANOTHER FIBER ROLL, THE END SHOULD BE BENT INWARD AND BURIED IN THE BANK TO PREVENT WATER FROM INTRUDING BEHIND THE ROLL AND DISLODGING IT.
- SUCCESSIVE ROWS OF FIBER ROLLS SHOULD BE OFFSET 3 TO 8 INCHES (8 TO 20 CENTIMETERS). ADDITIONALLY, TO ENSURE THAT ROOTS EXTEND INTO THE SOIL, PLANTS SHOULD BE PLUGGED INTO THE SIDES OF THE FIBER LOG NEAR THE SOIL. THE NEED TO BACKFILL/CONTOUR THE SOIL BEHIND THE FIBER LOGS AND BETWEEN SUCCESSIVE LIFTS WILL DEPEND ON THE SPECIFIC AESTHETIC AND PHYSICAL REQUIREMENTS OF THE PROJECT. THE RE-CONTOURED SOIL SHOULD BE SEEDING AND/OR PLUGGED WITH APPROPRIATE VEGETATIVE SPECIES AND COVERED WITH AN EROSION CONTROL BLANKET TO PREVENT SLOPE EROSION.



TYPICAL PLAN VIEW NATURAL FIBER MATTING AND REINFORCED NATURAL FIBER MATTING
NOT TO SCALE

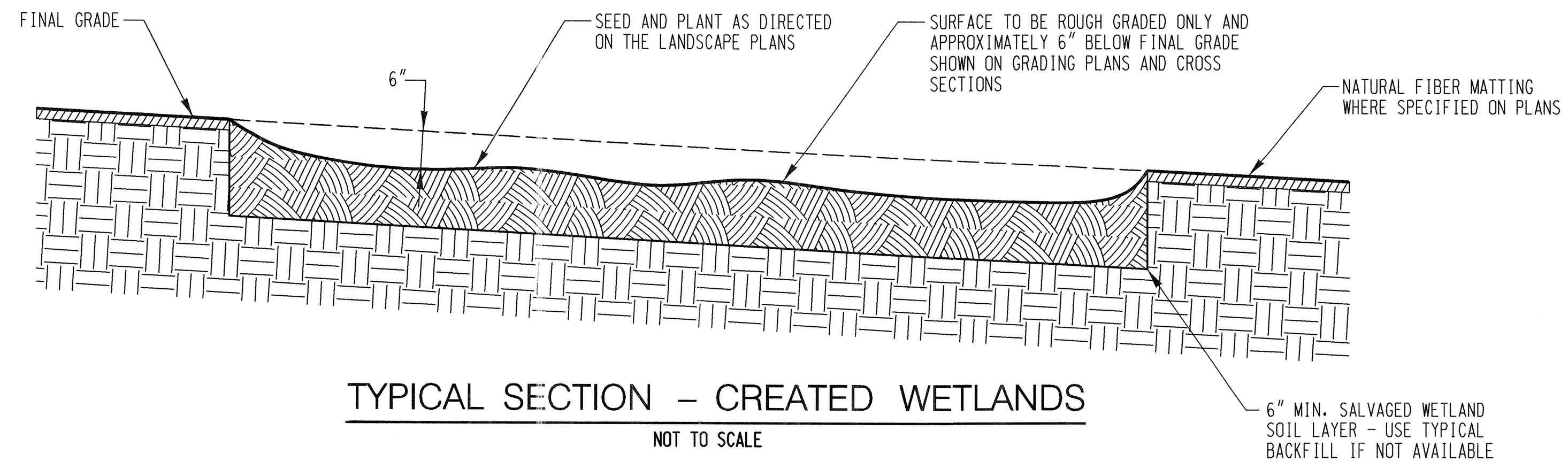
NOTES FOR NATURAL AND REINFORCED NATURAL FIBER MATTING:

- NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF BANK STABILIZATION STRUCTURE WHERE SPECIFIED AND A MINIMUM OF TWO FEET PAST THE LIMITS OF GRADING. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES. AT TRANSITION BETWEEN NATURAL FIBER MATTING AND REINFORCED NATURAL FIBER MATTING, MATTING SHOULD BE OVERLAPPED A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES.
- NATURAL FIBER MATTING IS TO BE INSTALLED ON ALL GRADED SLOPES, HIGHLY ERODIBLE SOILS (SEE SHEETS ES-01 AND ES-02), AND WETLAND AREAS.
- NATURAL FIBER MATTING. MATTING FOR THE BANK TREATMENT AREAS SHALL CONSIST OF A MACHINE PRODUCED MAT OF DEGRADABLE NATURAL FIBERS AND SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

MATERIAL: WOVEN COIR FIBER YARN OR TWINE
THICKNESS: 0.20 IN.
WEIGHT: 20 OZ/SY (700 GRAMS/SM)
FLOW VELOCITY: 8 FT./SEC. (2.4 M/SEC.)
SHEAR STRESS: 2 LBS./SQ. FT. (96 Pa)
LONGEVITY: 2 YEARS
- REINFORCED NATURAL FIBER MATTING. MATTING SHALL CONSIST OF A DOUBLE-LAYERED BIODEGRADABLE FABRIC: A BOTTOM LAYER OF JUTE FABRIC AND A TOP LAYER OF HIGH STRENGTH COIR MATTING, CONNECTED TOGETHER. REINFORCED NATURAL FIBER MATTING SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

MATERIALS: WOVEN COIR FIBER (TOP LAYER) AND JUTE FABRIC (BOTTOM LAYER)
THICKNESS: 0.30 IN.
WEIGHT: 28 OZ/SY (900 GRAMS/SM)
FLOW VELOCITY: 10 FT/SEC. (3.0 M/SEC.)
SHEAR STRESS: 3 LBS./SQ. FT. (144 Pa)
LONGEVITY: 3 YEARS
- MATTING STAKES. STAKES FOR SECURING THE MATTING ALONG OTHER PORTIONS OF THE MATTING MATERIAL ABOVE THE TOE TRENCH AND FOR THE KEY-IN TRENCH AT THE TOP OF THE SLOPE SHALL CONSIST OF 1-1/2" X 1-1/2" HARDWOOD STAKES, 18-INCHES IN LENGTH, TAPERED AT THE BOTTOM END FOR EASY INSERTION INTO THE SOIL AND FLAT AT THE TOP END FOR HAMMERING.

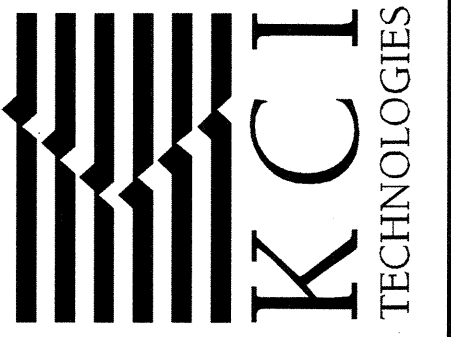
SHEAR STRESS: 4.5 PSF
FLOW VELOCITY: 12 FT./SEC.
LIFE EXPECTANCY: 3 YEARS IN REINFORCED NATURAL FIBER MATTING
- SEE DETAIL B-4-6-B AND DETAIL B-4-6-D ON SHEET ESD-01 FOR ADDITIONAL INFORMATION ON INSTALLATION.



TYPICAL SECTION - CREATED WETLANDS
NOT TO SCALE

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STREAM DETAILS

SCALE:	NOT TO SCALE
DATE:	JUNE 2017
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PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

DE-02

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Matthew J. Puer 6/2/17
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

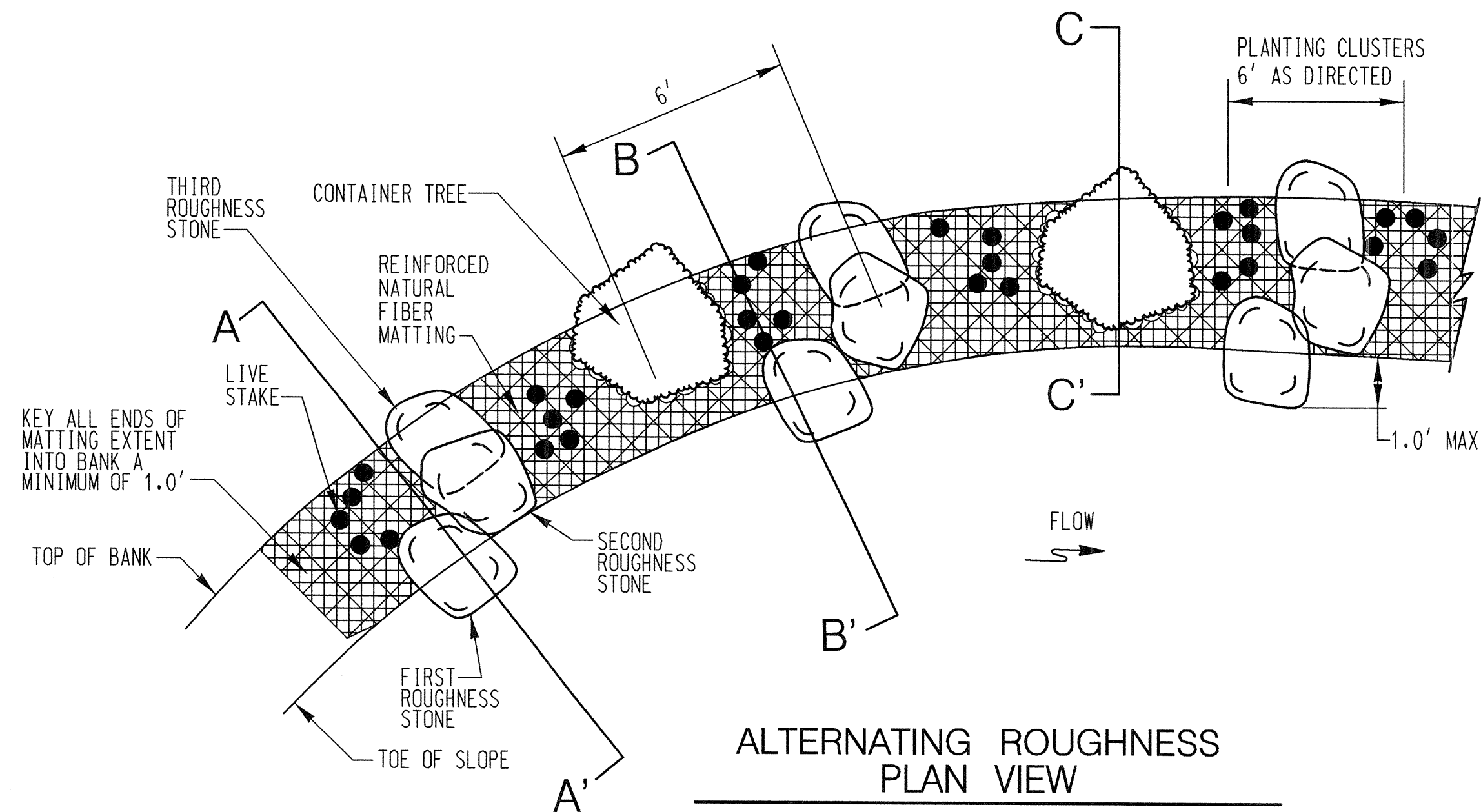
DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

Matthew J. Puer 6/2/17
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

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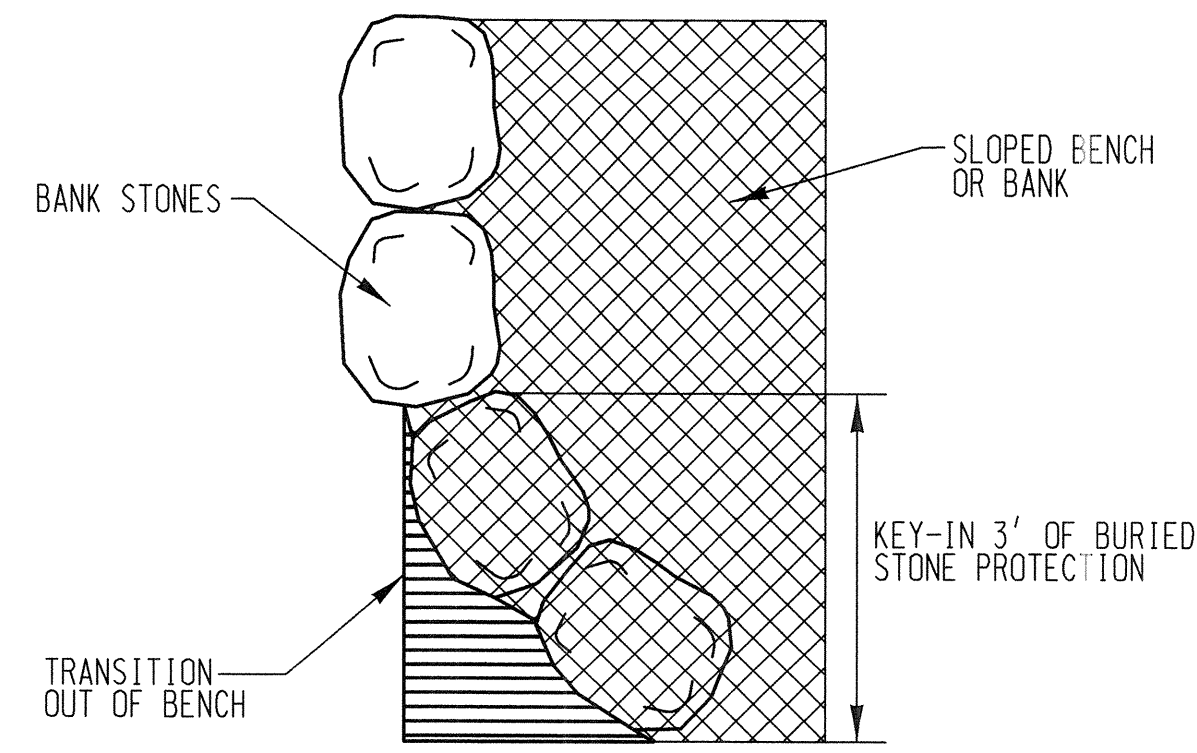
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ALTERNATING ROUGHNESS DETAILS



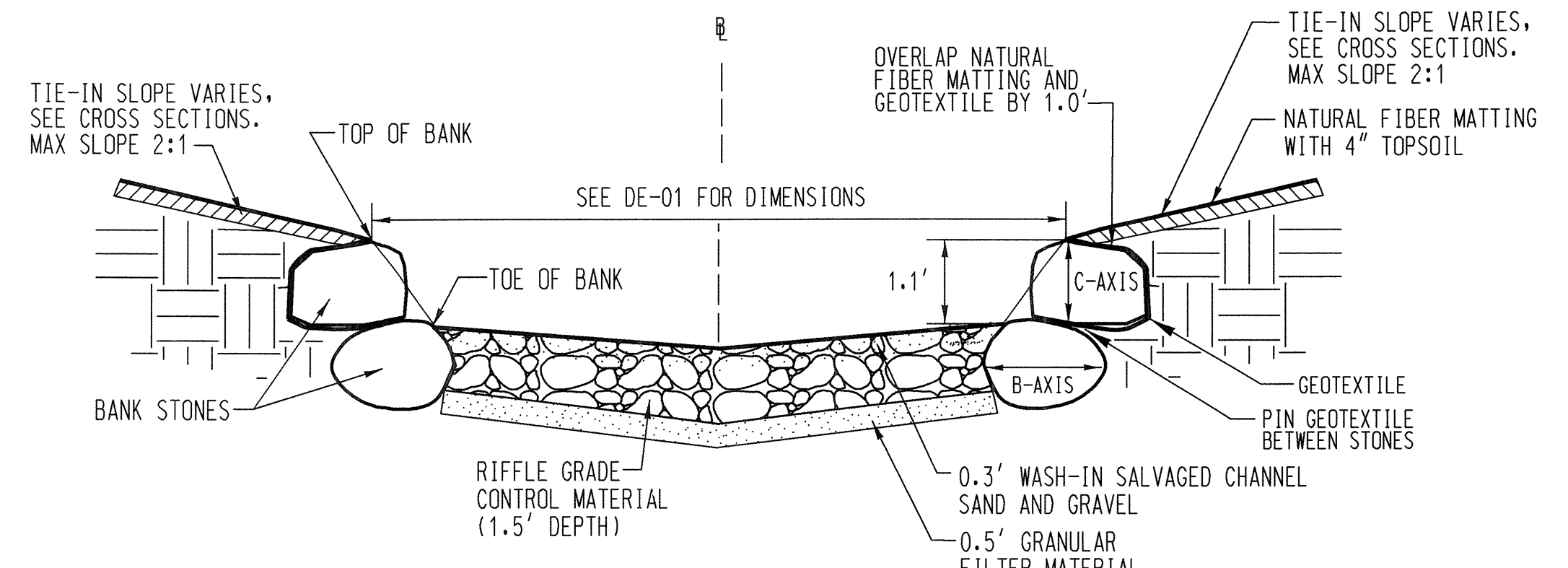
ALTERNATING ROUGHNESS PLAN VIEW
NOT TO SCALE

NOTE: REFER TO THE LANDSCAPE PLAN FOR PLANT SPECIES AND PLACEMENT.

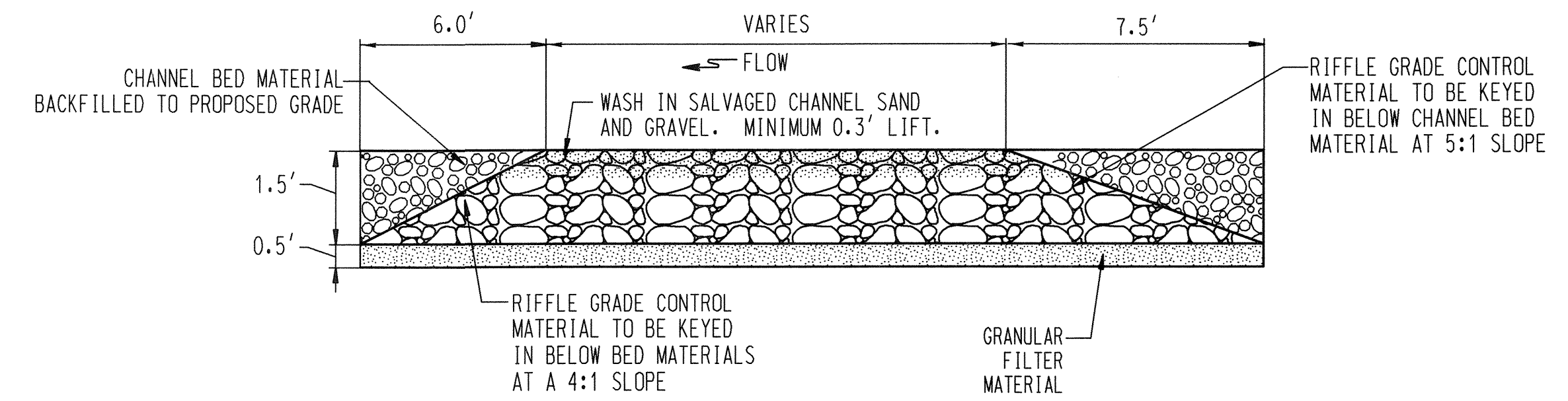


RIFFLE GRADE CONTROL BANK STONE PROTECTION KEY-IN
NOT TO SCALE

NOTE: KEY-IN SHALL BE APPLIED AT UP AND DOWNSTREAM EXTENTS WHEN NO OTHER BANK TREATMENT IS PRESCRIBED. STONE TOE AND TOE BOULDER PROTECTION KEY IN ELEVATION SHALL BE TAPERED DOWN WITH GRADE WHEN NO OTHER BANK TREATMENT IS PRESCRIBED.

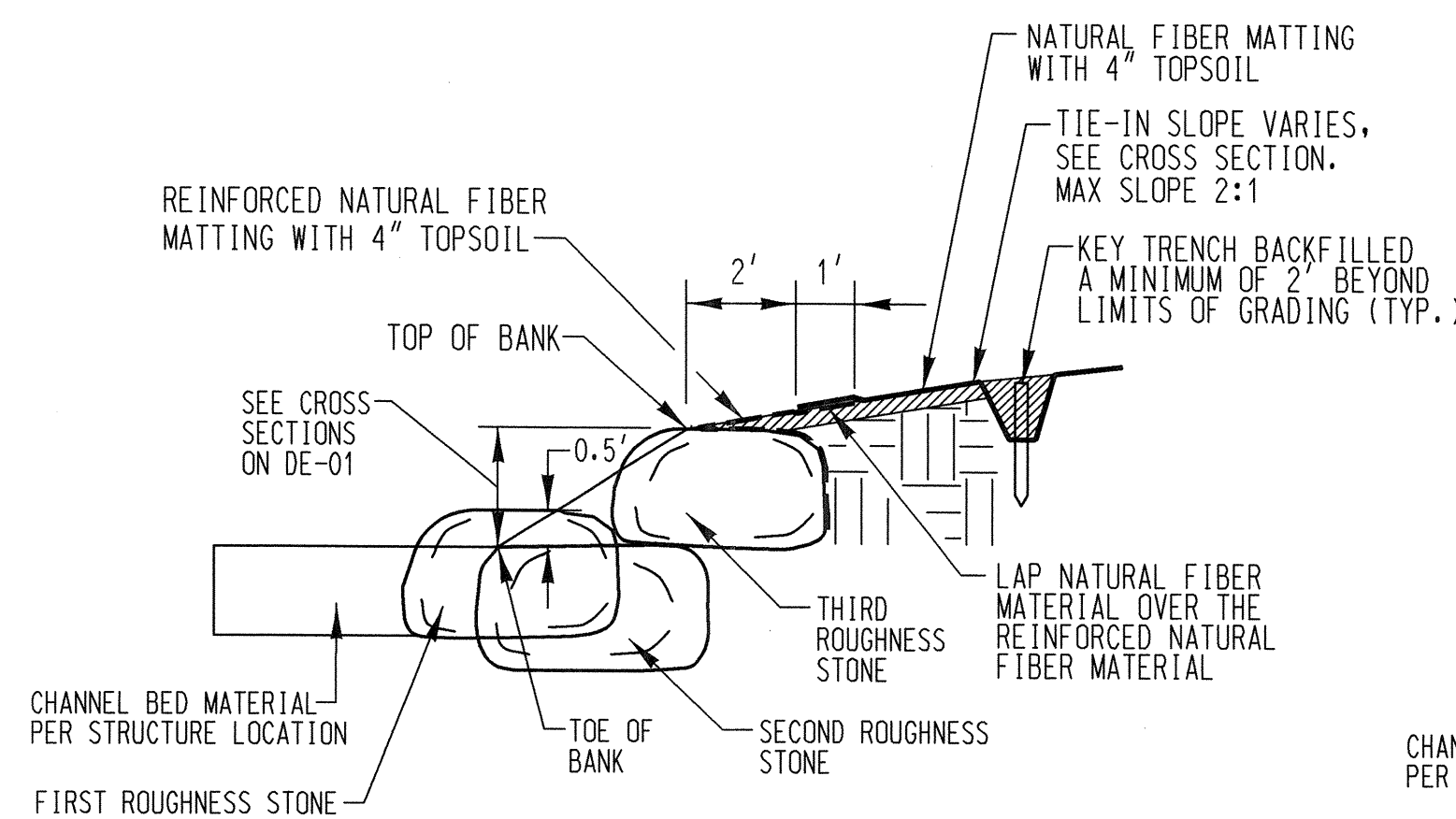


RIFFLE GRADE CONTROL CROSS SECTION
NOT TO SCALE

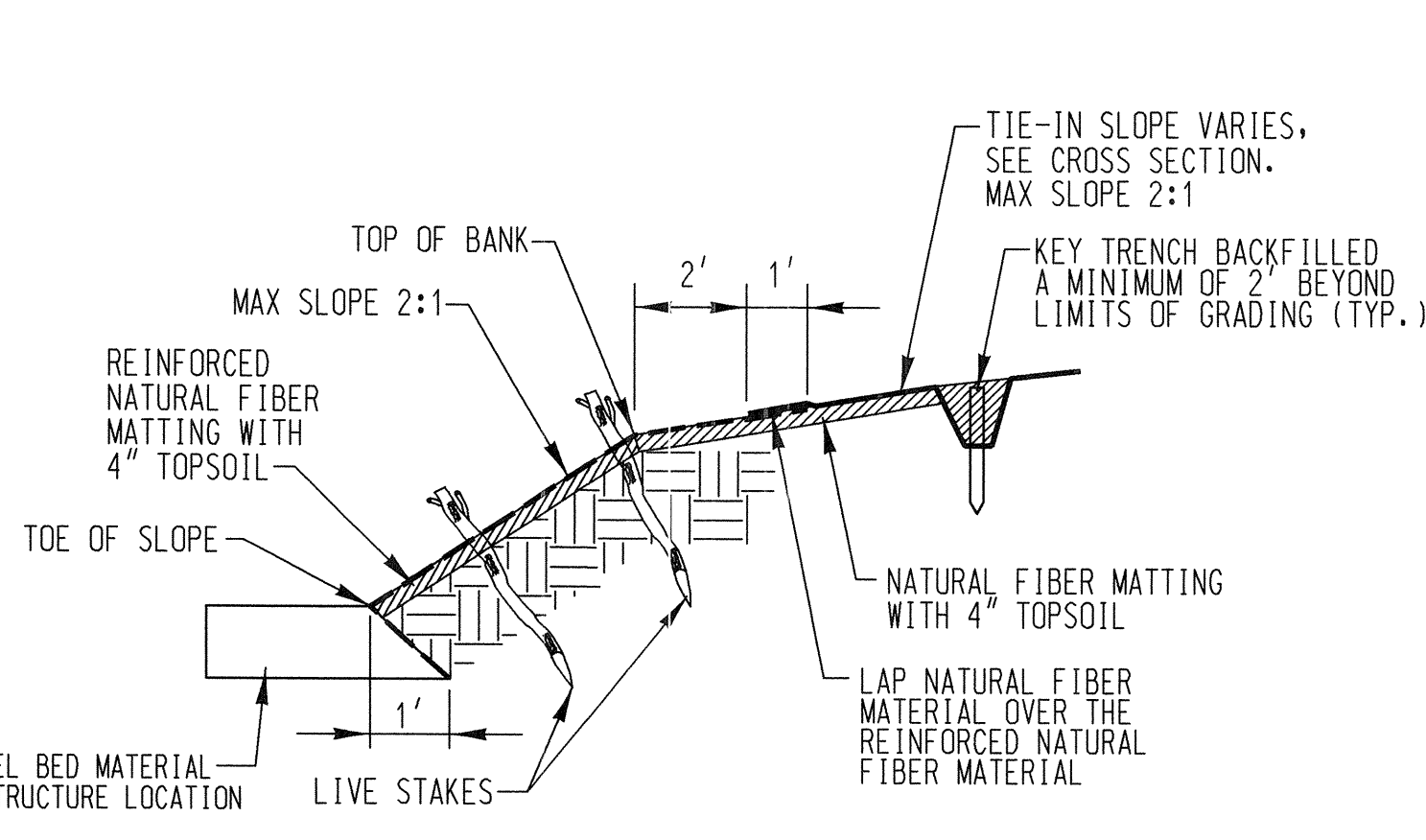


TYPICAL RIFFLE GRADE CONTROL PROFILE
NOT TO SCALE

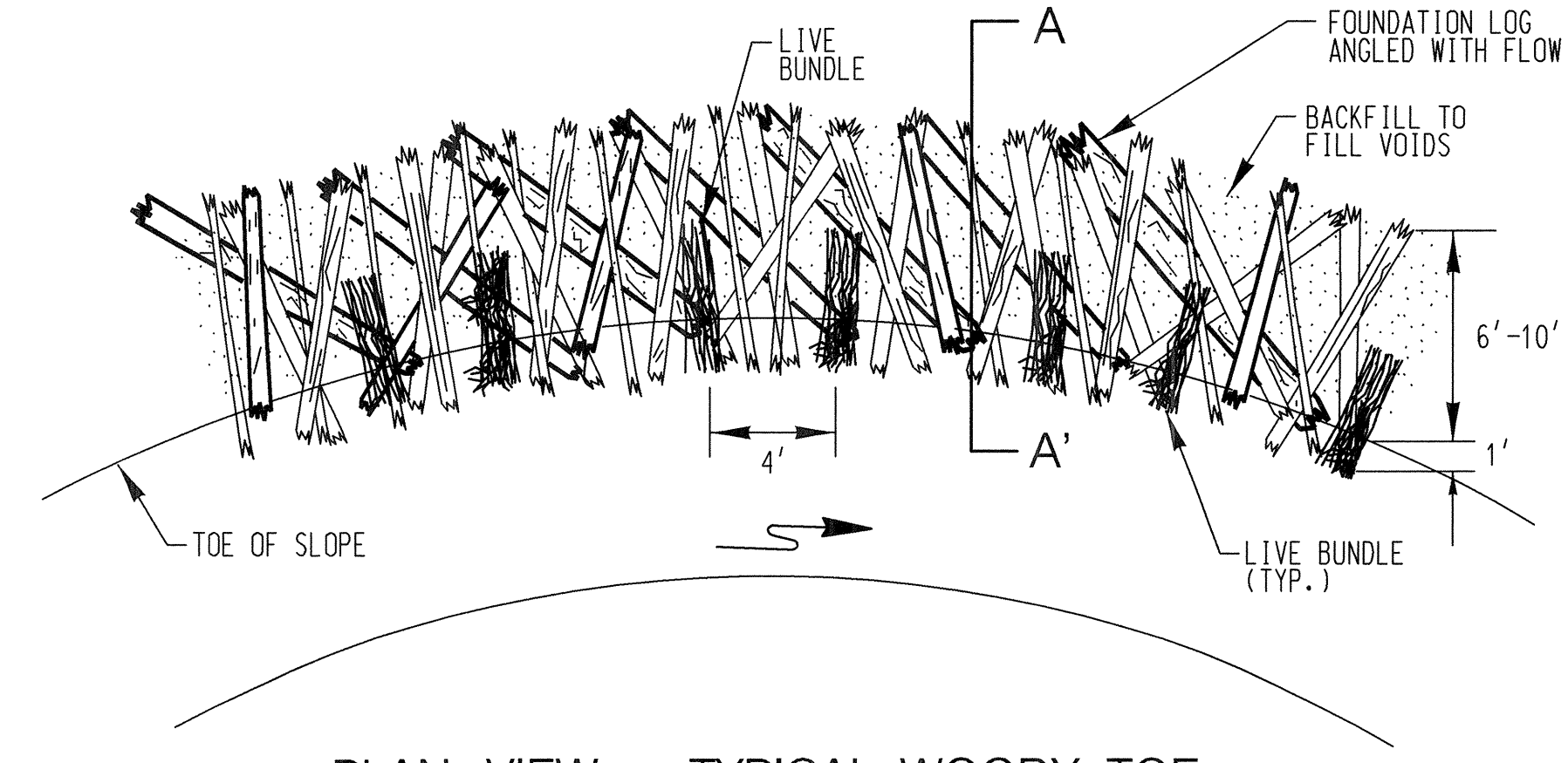
NOTES: 1. ALL RIFFLE GRADE CONTROL STRUCTURES SHALL BE CONSTRUCTED FROM DOWNSTREAM TO UPSTREAM.
2. THE RIFFLE GRADE CONTROL MATERIAL SHALL BE PLACED TO ITS FULL DEPTH MOVING FROM ONE BANK TO THE OPPOSING BANK.



ALTERNATING ROUGHNESS SECTION A-A
NOT TO SCALE

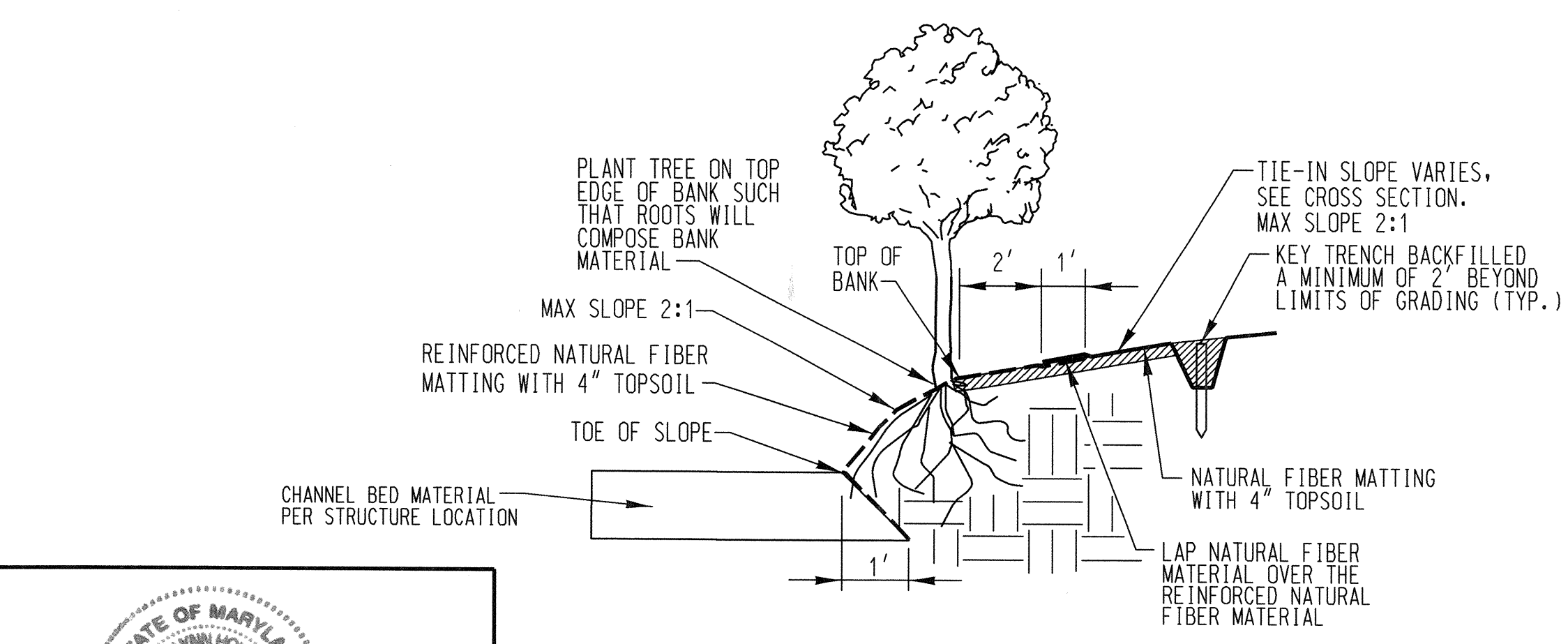


ALTERNATING ROUGHNESS SECTION B-B
NOT TO SCALE

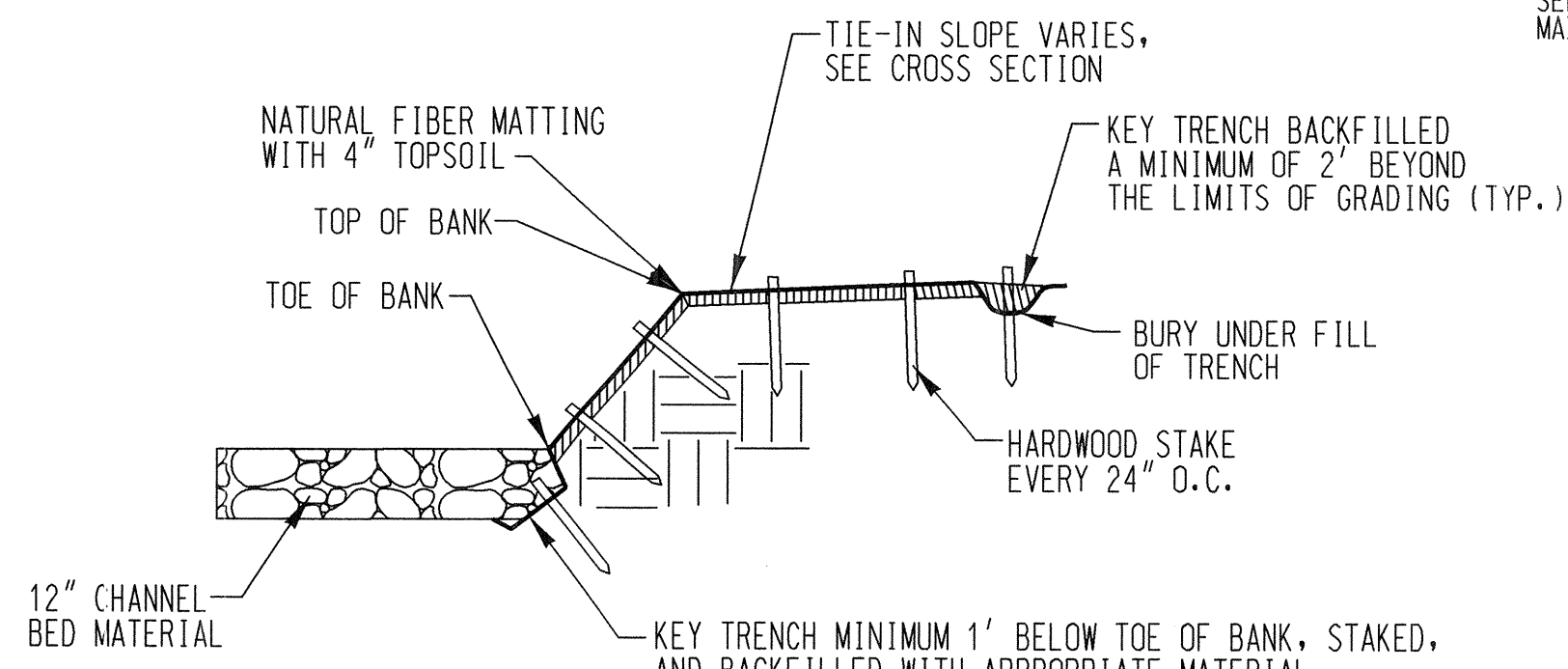


PLAN VIEW - TYPICAL WOODY TOE
NOT TO SCALE

NOTE: FOUNDATION LOG PLACEMENT MUST BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF ADDITIONAL MATERIAL.

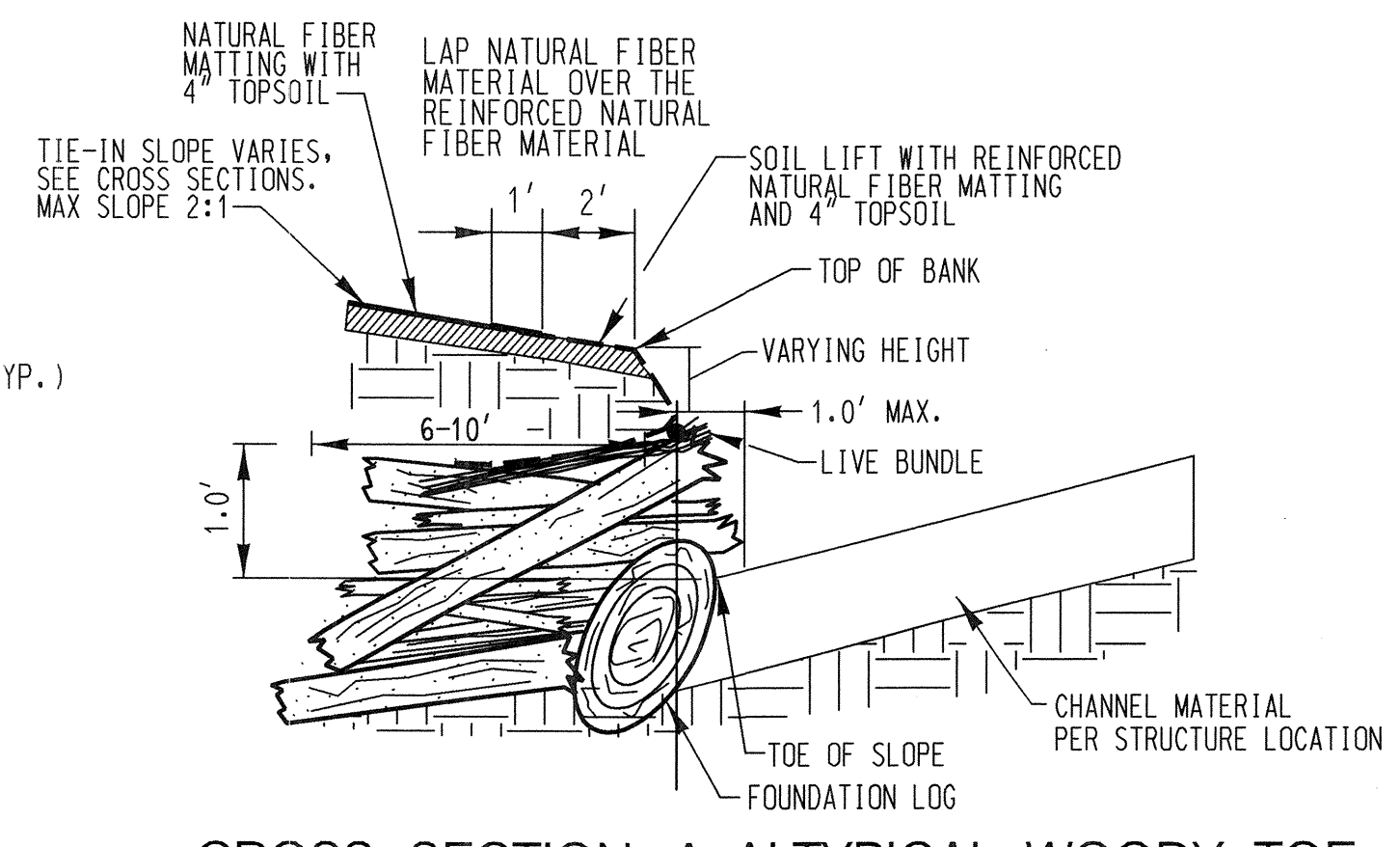


ALTERNATING ROUGHNESS SECTION C-C
NOT TO SCALE



NATURAL FIBER MATTING CROSS SECTION
NOT TO SCALE

NOTE: FOR RIFFLE LOCATIONS WHERE NO STRUCTURE IS SPECIFIED



CROSS SECTION A-A TYPICAL WOODY TOE
NOT TO SCALE

NOTES:

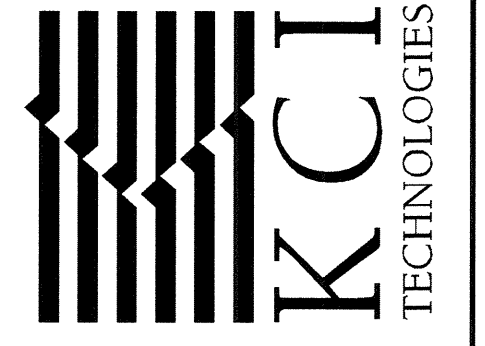
- SUITABLE TREE MATERIALS INCLUDING TRUNKS, TOPS, AND LIMBS, SHALL BE SALVAGED FOR USE IN WOODY TOE APPLICATIONS AS APPROVED BY THE ENGINEER.
- FOUNDATION LOGS SHALL BE ANGLED WITH THE FLOW AND EXTEND THE FULL WIDTH OF THE FILL SECTION.
- WOODY MATERIAL SHALL BE PLACED RANDOMLY ON FOUNDATION LOGS AND PRESSED FLAT WITH THE BUCKET UNTIL THE FINAL DEPTH OF MATERIAL IS REACHED (SEE TABLE).
- FILL VOIDS WITH SUITABLE BACKFILL MATERIAL.
- INSTALL SOIL LIFT WITH REINFORCED NATURAL FIBER MATTING.
- INSTALL LIVE BUNDLES DURING THE DORMANT PERIOD. PILOT HOLES SHOULD BE CREATED HORIZONTALLY BETWEEN THE WOODY DEBRIS AND THE SOIL LIFT AT THE SPACING NOTED IN THE PLAN VIEW. LIVE BUNDLES SHOULD BE INSTALLED IN THE PILOT HOLES AND CONSIST OF 3 LIVE STAKES.

SUITABLE SALVAGED TREE MATERIALS

MATERIAL	SIZE
FOUNDATION LOGS	12" TO 14" DIAMETER
TRUNKS, TOPS, LIMBS	2" - 8" DIAMETER

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PARCELS 1064, 1065, 396 TAX MAP 24, 30
ZONING REQ ELECTION DISTRICT 12 GRIDBLOCK 04, 21

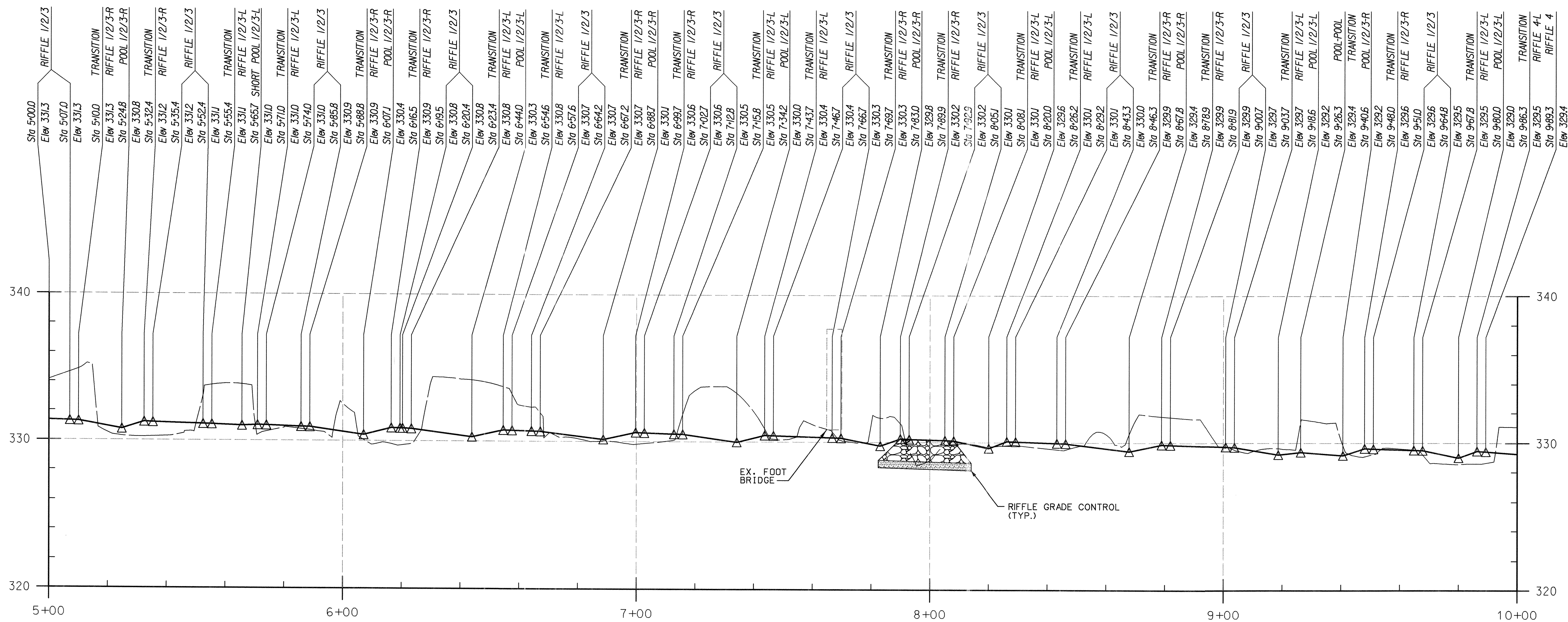
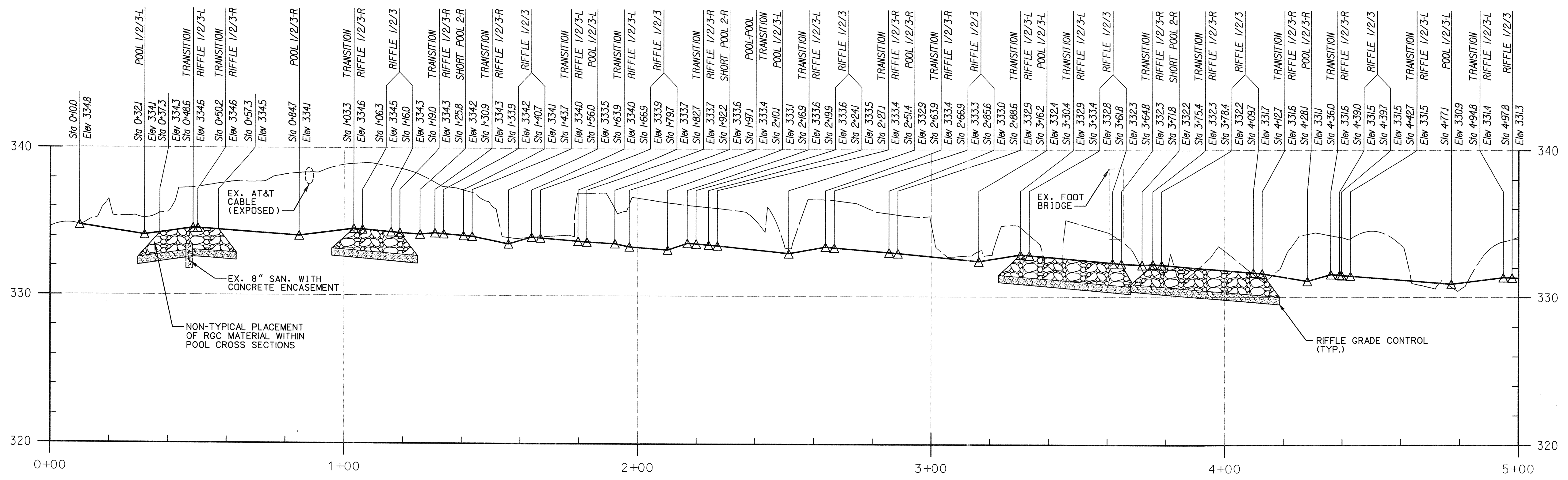
STREAM DETAILS

SCALE:	NOT TO SCALE
DATE:	JUNE 2017
KCI JOB NO.:	17133314.94
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

6/2/17
6/5/17

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

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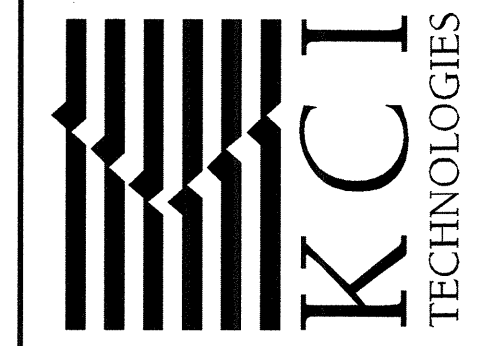
LEGEND	
EXISTING GROUND	-----
PROPOSED GRADE	—————

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
Michael J. Puccio
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 DATE: 6/5/17

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311. EXPIRATION DATE: JANUARY 06, 2018.
Henry J. Puccio
 6/21/17

NO.	REVISIONS DESCRIPTION	DATE

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 PARCELS 1064, 1005, 306 TAX MAP 24.30
 ZONING R20 ELECTION DISTRICT 12_GRIDBLOCK 04.21

PROFILES

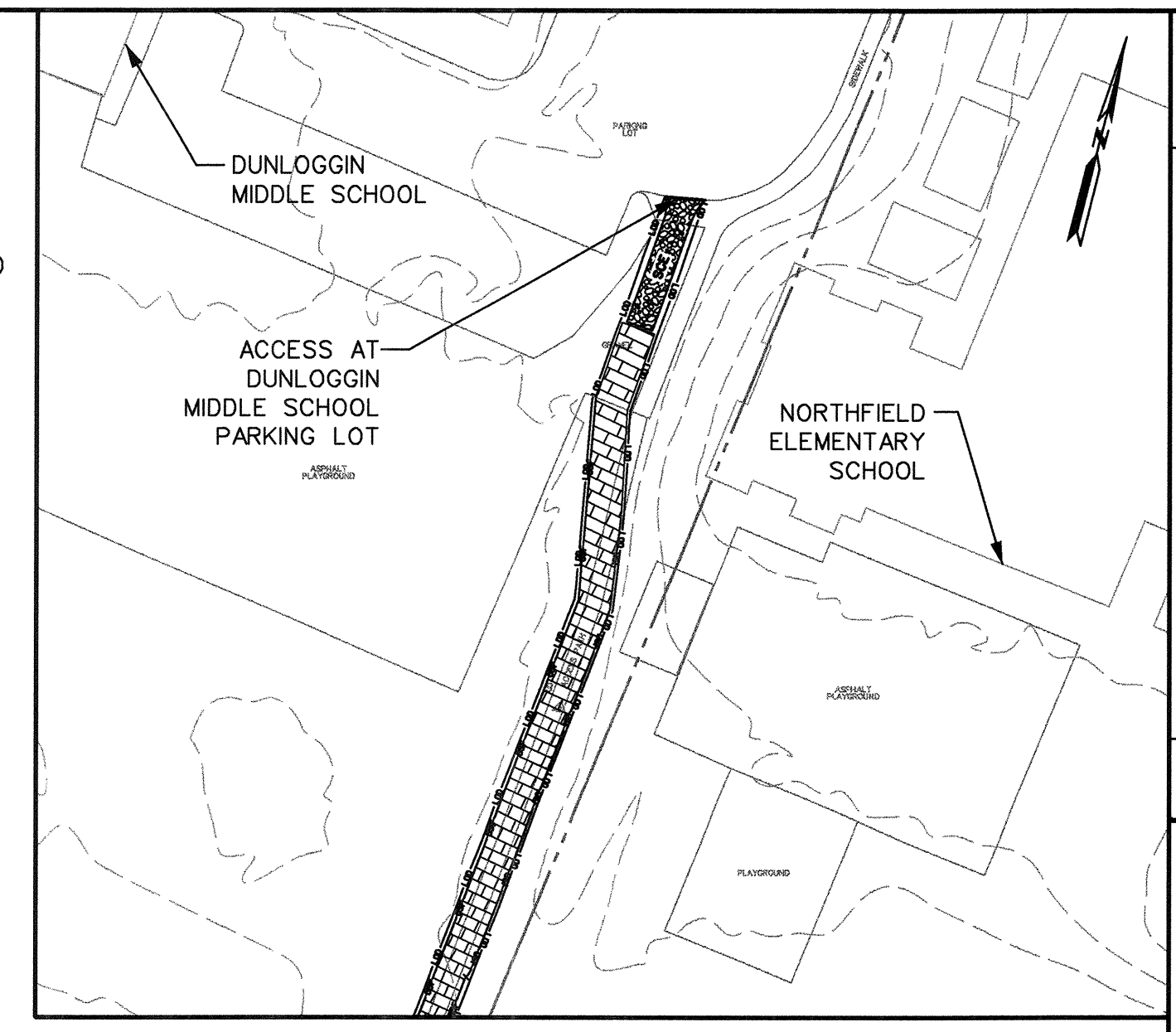
SCALE: HOR. 1" = 20'	VERT. 1" = 4'
DATE: JUNE 2017	
KCI JOB NO.: 17133314.94	
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PR-01
 SHEET NO.: 11 OF 24

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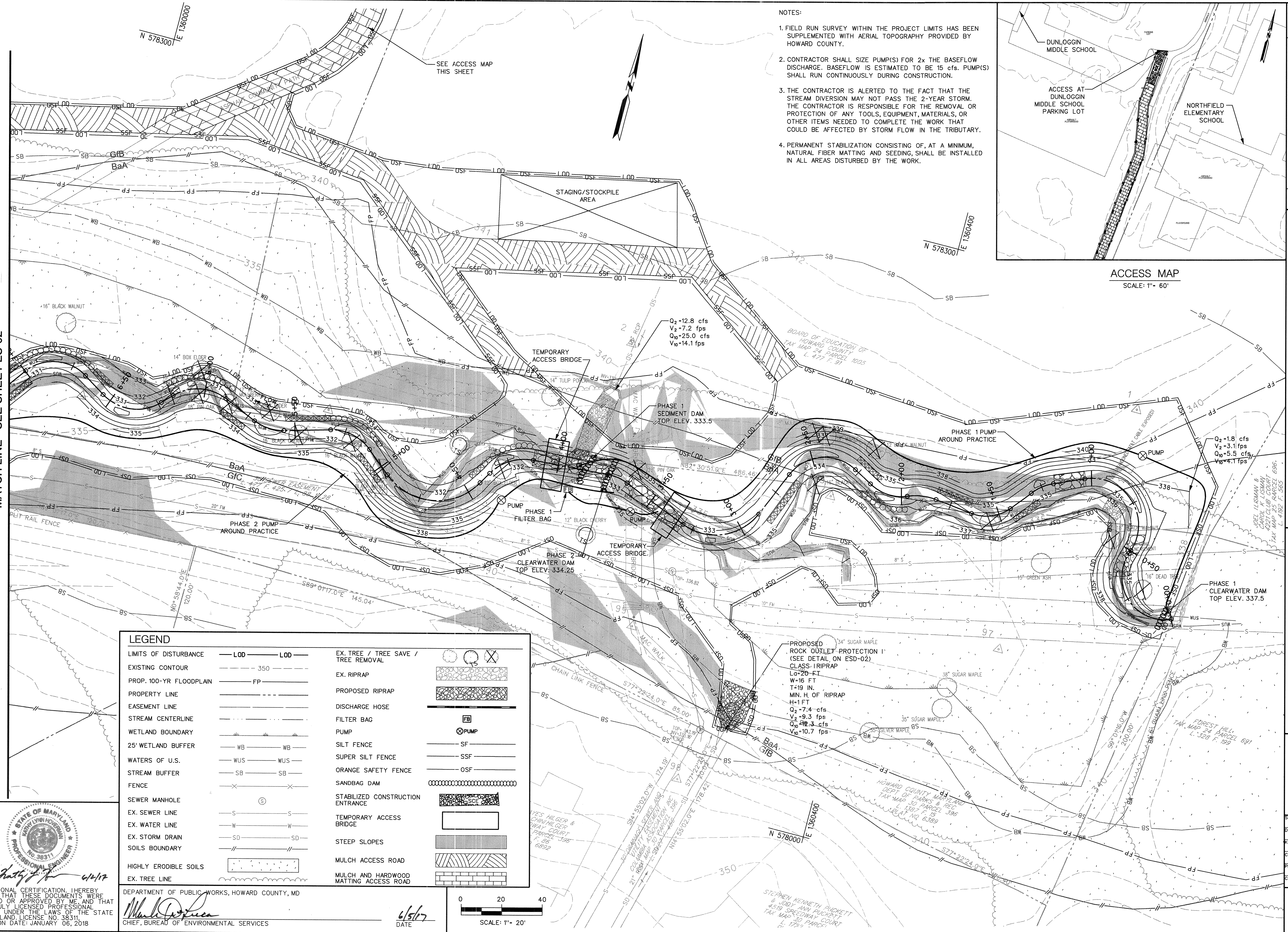
SEE ACCESS MAP
THIS SHEET

- NOTES:
1. FIELD RUN SURVEY WITHIN THE PROJECT LIMITS HAS BEEN SUPPLEMENTED WITH AERIAL TOPOGRAPHY PROVIDED BY HOWARD COUNTY.
 2. CONTRACTOR SHALL SIZE PUMP(S) FOR 2x THE BASEFLOW DISCHARGE. BASEFLOW IS ESTIMATED TO BE 15 cfs. PUMP(S) SHALL RUN CONTINUOUSLY DURING CONSTRUCTION.
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 4. PERMANENT STABILIZATION CONSISTING OF, AT A MINIMUM, NATURAL FIBER MATTING AND SEEDING, SHALL BE INSTALLED IN ALL AREAS DISTURBED BY THE WORK.



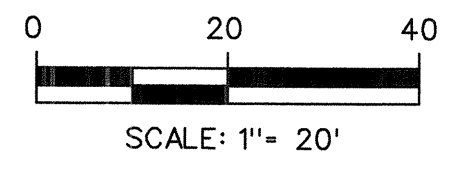
ACCESS MAP
SCALE: 1" = 60'

MATCH LINE - SEE SHEET ES-02



LEGEND	
LIMITS OF DISTURBANCE	— LOD — LOD —
EXISTING CONTOUR	— 350 —
PROP. 100-YR FLOODPLAIN	— FP —
PROPERTY LINE	— — — — —
EASEMENT LINE	— — — — —
STREAM CENTERLINE	— — — — —
WETLAND BOUNDARY	— — — — —
25' WETLAND BUFFER	— WB — WB —
WATERS OF U.S.	— WUS — WUS —
STREAM BUFFER	— SB — SB —
FENCE	— X — X —
SEWER MANHOLE	⊙
EX. SEWER LINE	— S — S —
EX. WATER LINE	— W — W —
EX. STORM DRAIN	— SD — SD —
SOILS BOUNDARY	— // — // —
HIGHLY ERODIBLE SOILS	—
EX. TREE LINE	— — — — —
EX. TREE / TREE SAVE / TREE REMOVAL	⊙ ⊙ ⊙ ⊙
EX. RIPRAP	▨ ▨ ▨ ▨
PROPOSED RIPRAP	▨ ▨ ▨ ▨
DISCHARGE HOSE	— — — — —
FILTER BAG	FB
PUMP	⊙ PUMP
SILT FENCE	— SF — SF —
SUPER SILT FENCE	— SSF — SSF —
ORANGE SAFETY FENCE	— OSF — OSF —
SANDBAG DAM	▬ ▬ ▬ ▬
STABILIZED CONSTRUCTION ENTRANCE	▨ ▨ ▨ ▨
TEMPORARY ACCESS BRIDGE	▭
STEEP SLOPES	▨ ▨ ▨ ▨
MULCH ACCESS ROAD	▨ ▨ ▨ ▨
MULCH AND HARDWOOD MATTING ACCESS ROAD	▨ ▨ ▨ ▨

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 Chief, Bureau of Environmental Services
 DATE: 6/5/17



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311. EXPIRATION DATE: JANUARY 06, 2018.

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
 www.kci.com



DUNLOGGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1065, 396. TAX MAP 24.30
 ZONING R20 ELECTION DISTRICT 12. GRIDBLOCK 04.21

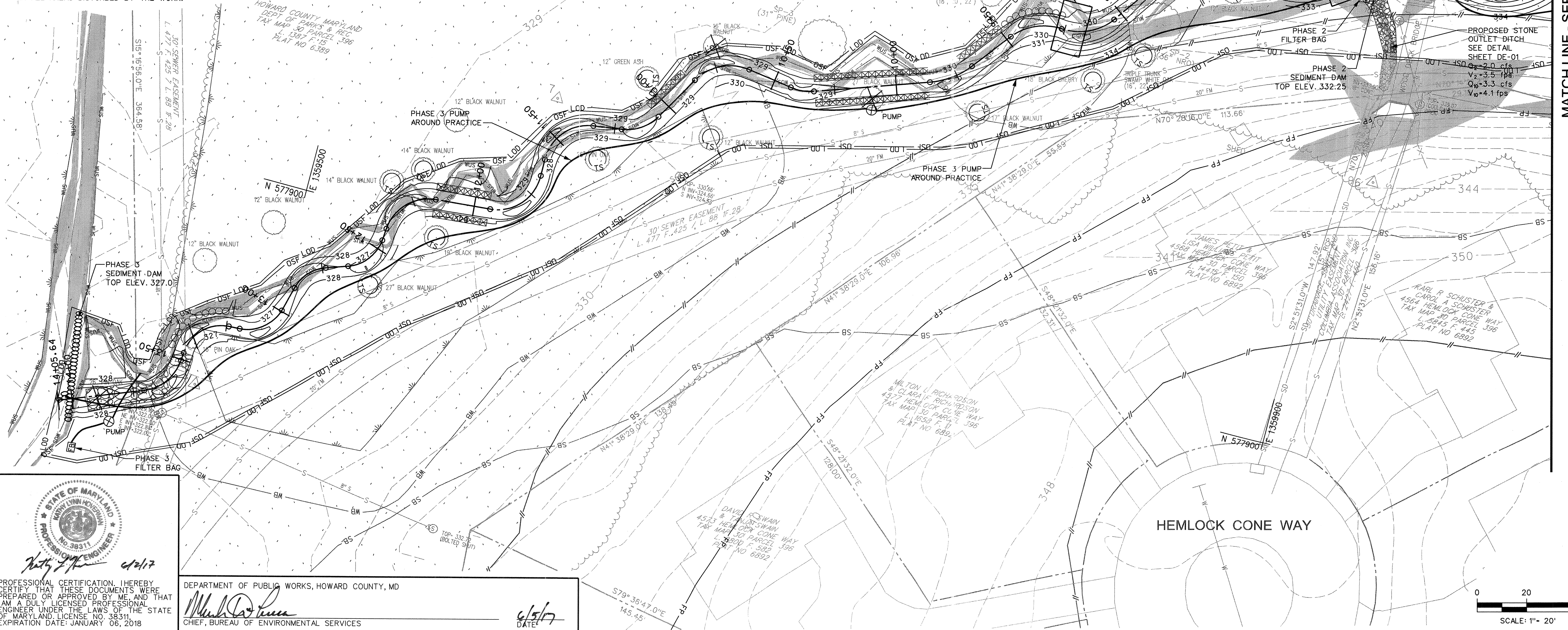
EROSION & SEDIMENT CONTROL PLAN

SCALE: 1" = 20'
 DATE: JUNE 2017
 KCI JOB NO.: 17133314.94
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

LEGEND

LIMITS OF DISTURBANCE	LOD	LOD	EX. TREE / TREE SAVE / TREE REMOVAL	
EXISTING CONTOUR	---	350	EX. RIPRAP	
PROP. 100-YR FLOODPLAIN	FP		PROPOSED RIPRAP	
PROPERTY LINE	---		DISCHARGE HOSE	
EASEMENT LINE	---		FILTER BAG	
STREAM CENTERLINE	---		PUMP	
WETLAND BOUNDARY	---		SILT FENCE	
25' WETLAND BUFFER	WB	WB	SUPER SILT FENCE	
WATERS OF U.S.	WUS	WUS	ORANGE SAFETY FENCE	
STREAM BUFFER	SB	SB	SANDBAG DAM	
FENCE	X	X	STABILIZED CONSTRUCTION ENTRANCE	
SEWER MANHOLE	S	S	TEMPORARY ACCESS BRIDGE	
EX. SEWER LINE	S	S	STEEP SLOPES	
EX. WATER LINE	W	W	MULCH ACCESS ROAD	
EX. STORM DRAIN	SD	SD	MULCH AND HARDWOOD MATTING ACCESS ROAD	
SOILS BOUNDARY	---	---		
HIGHLY ERODIBLE SOILS				
EX. TREE LINE				

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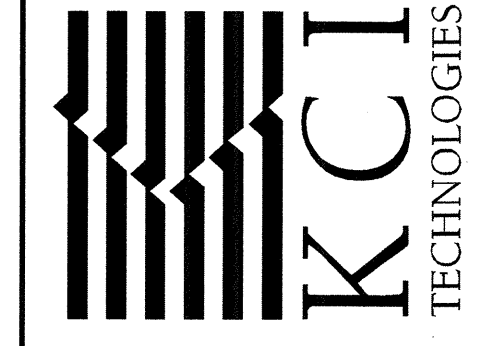


STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 No. 38311
 DATE: 6/5/17

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

NO.	REVISIONS DESCRIPTION	DATE

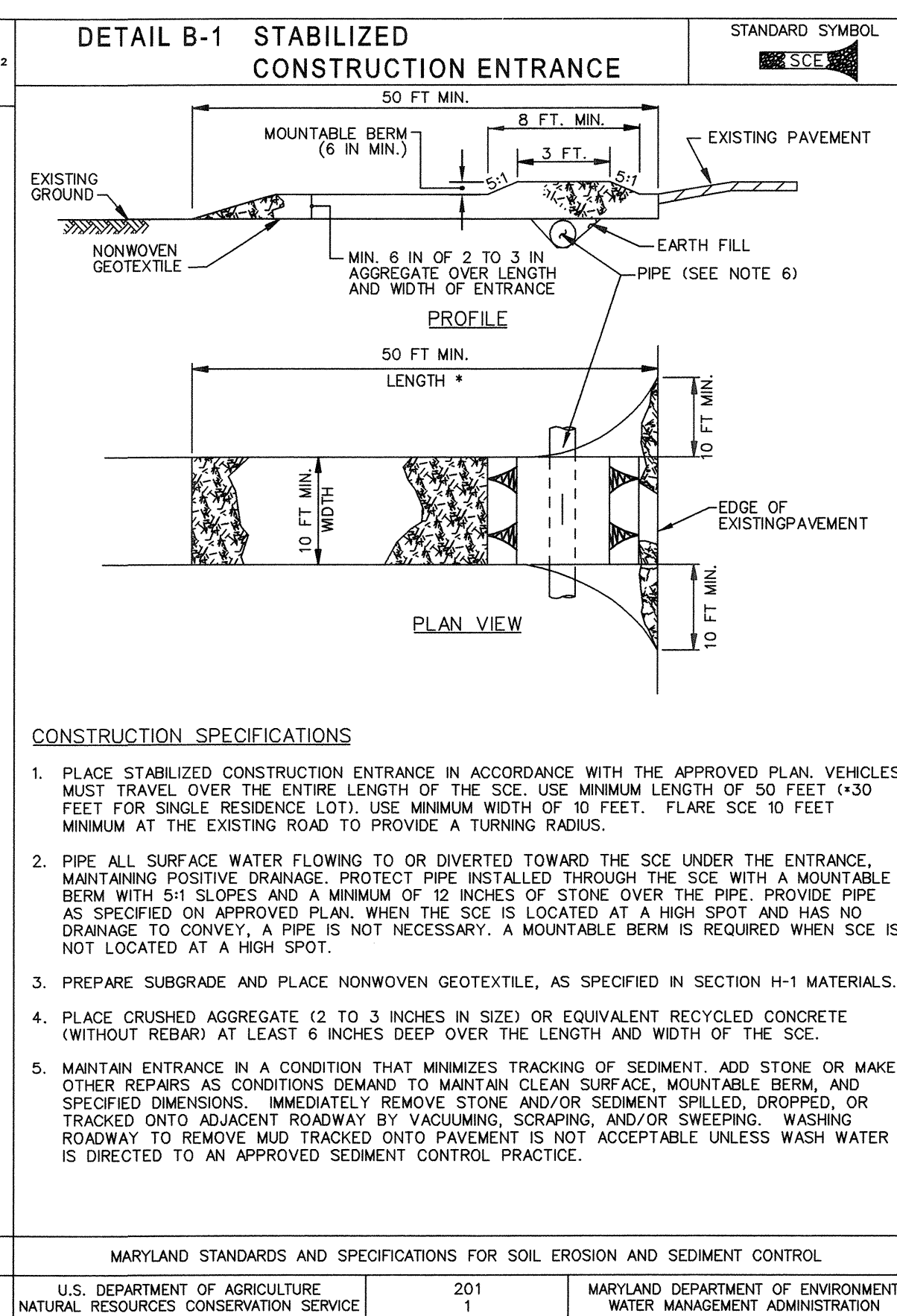
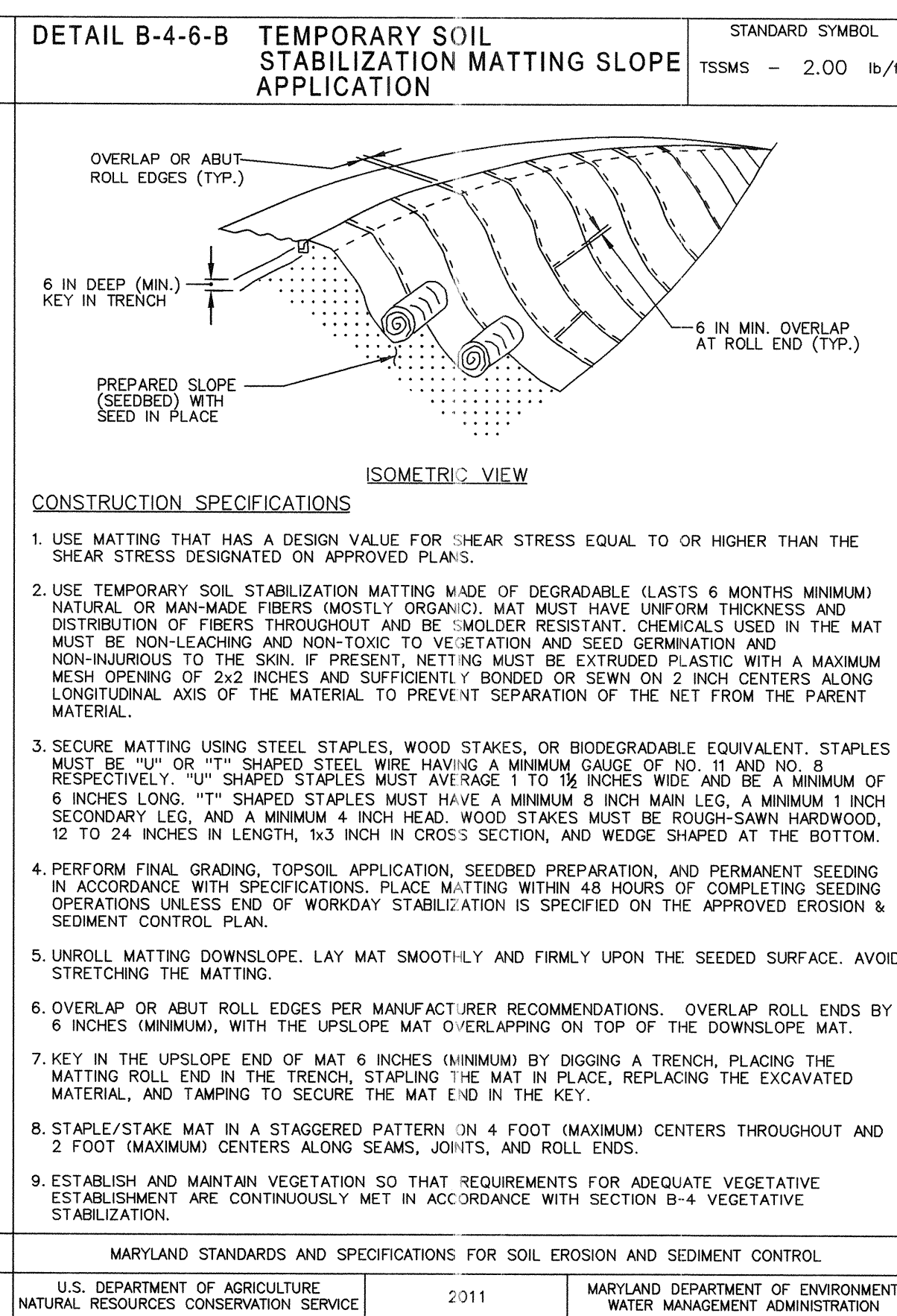
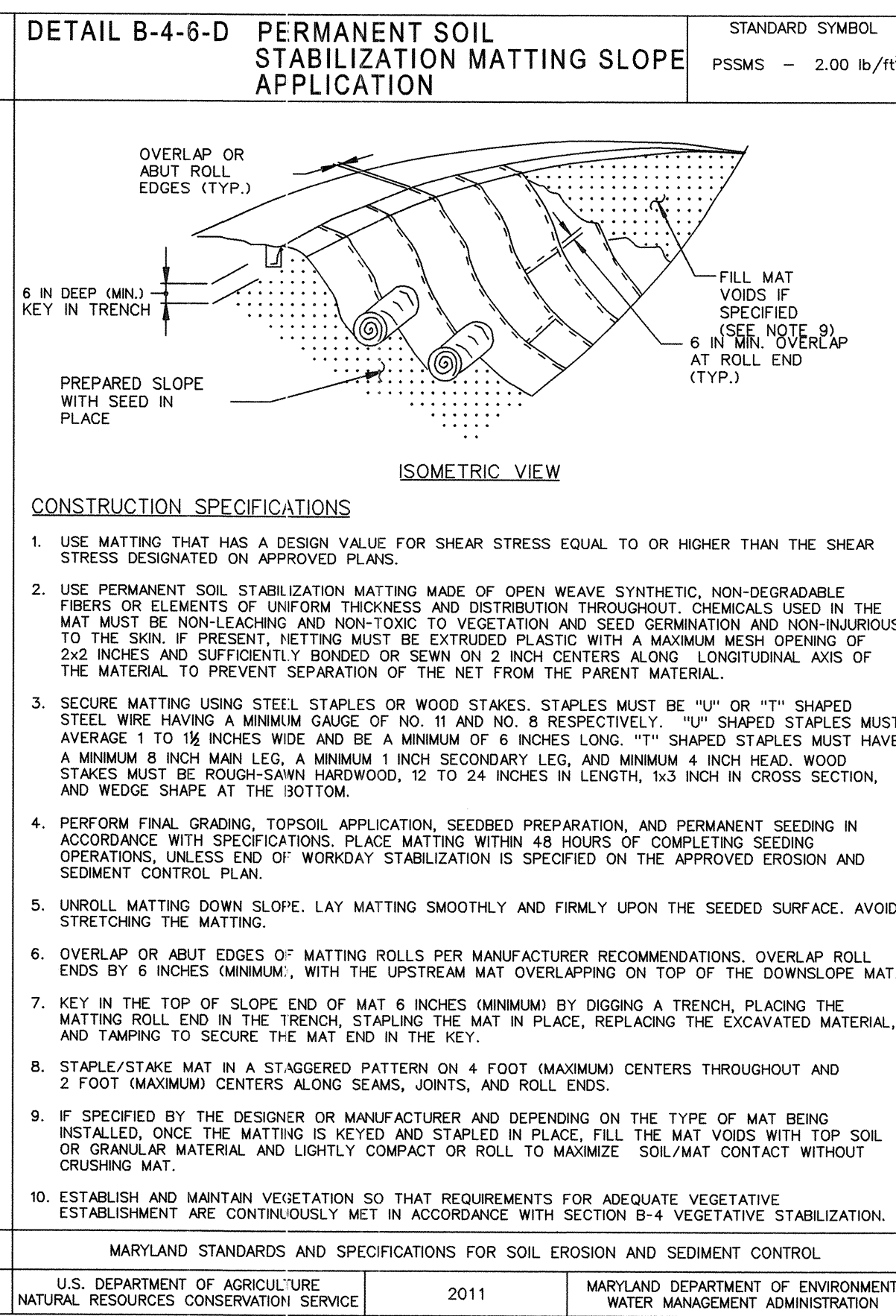
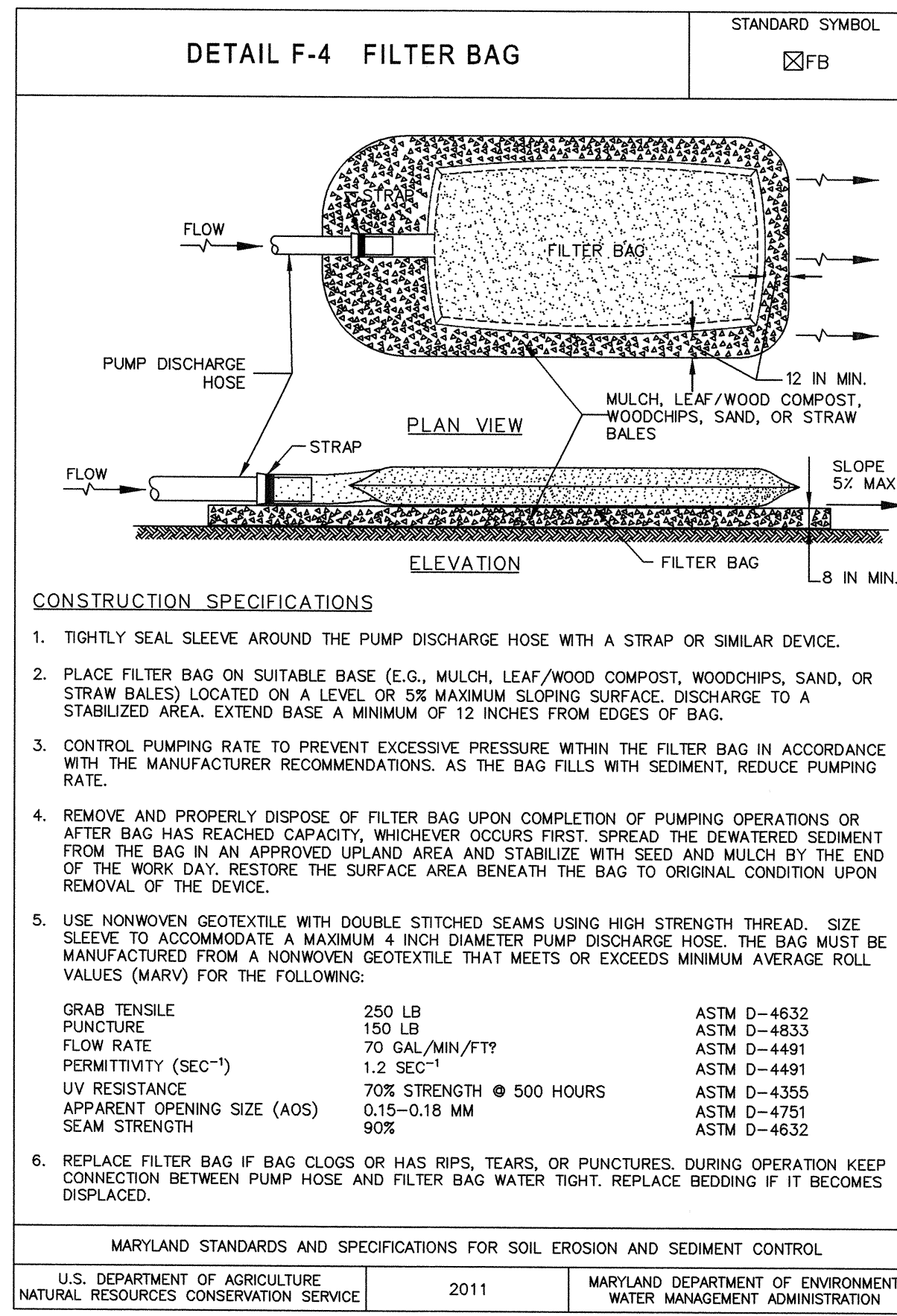
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 TELEPHONE: (410) 316-7800
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**DUNLOGGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT**
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1005, 396. TAX MAP 24.30
 ZONING R20. ELECTION DISTRICT 12. GRIDBLOCK 04. 21

**EROSION &
 SEDIMENT
 CONTROL
 PLAN**

SCALE:	1" = 20'
DATE:	JUNE 2017
KCI JOB NO.:	17133314.94
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	
ES-02	
SHEET NO.: 14 OF 24	



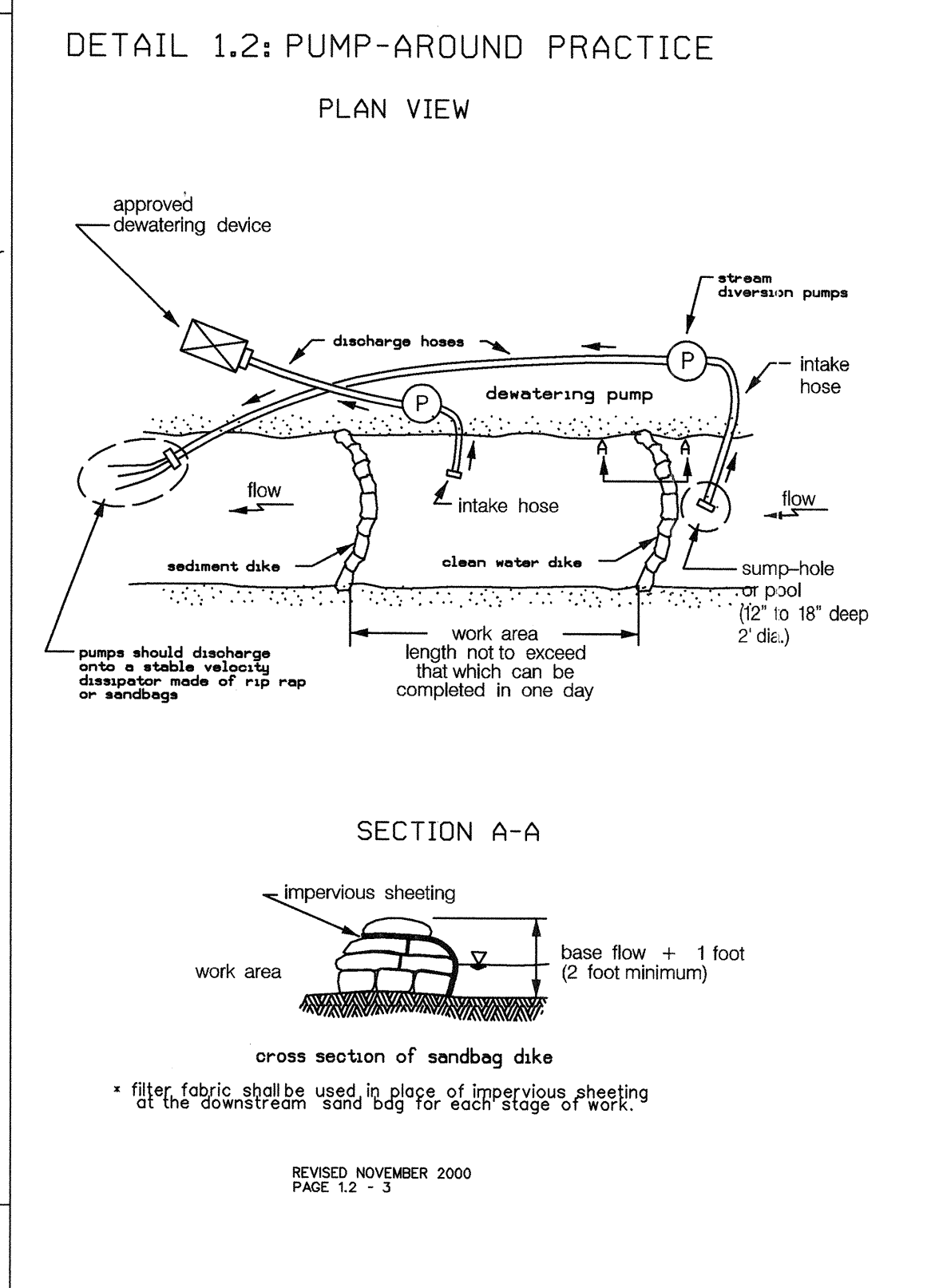
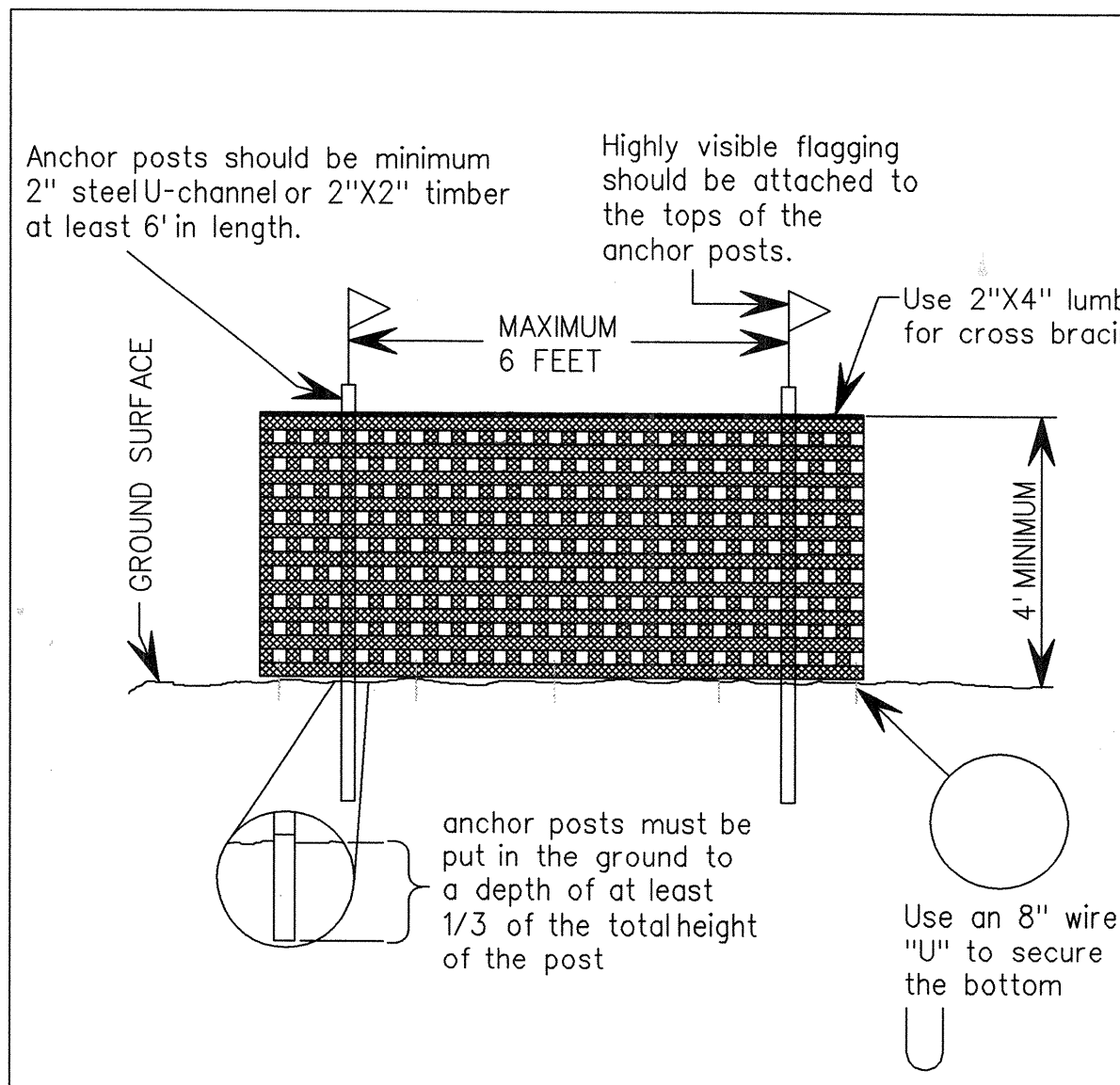
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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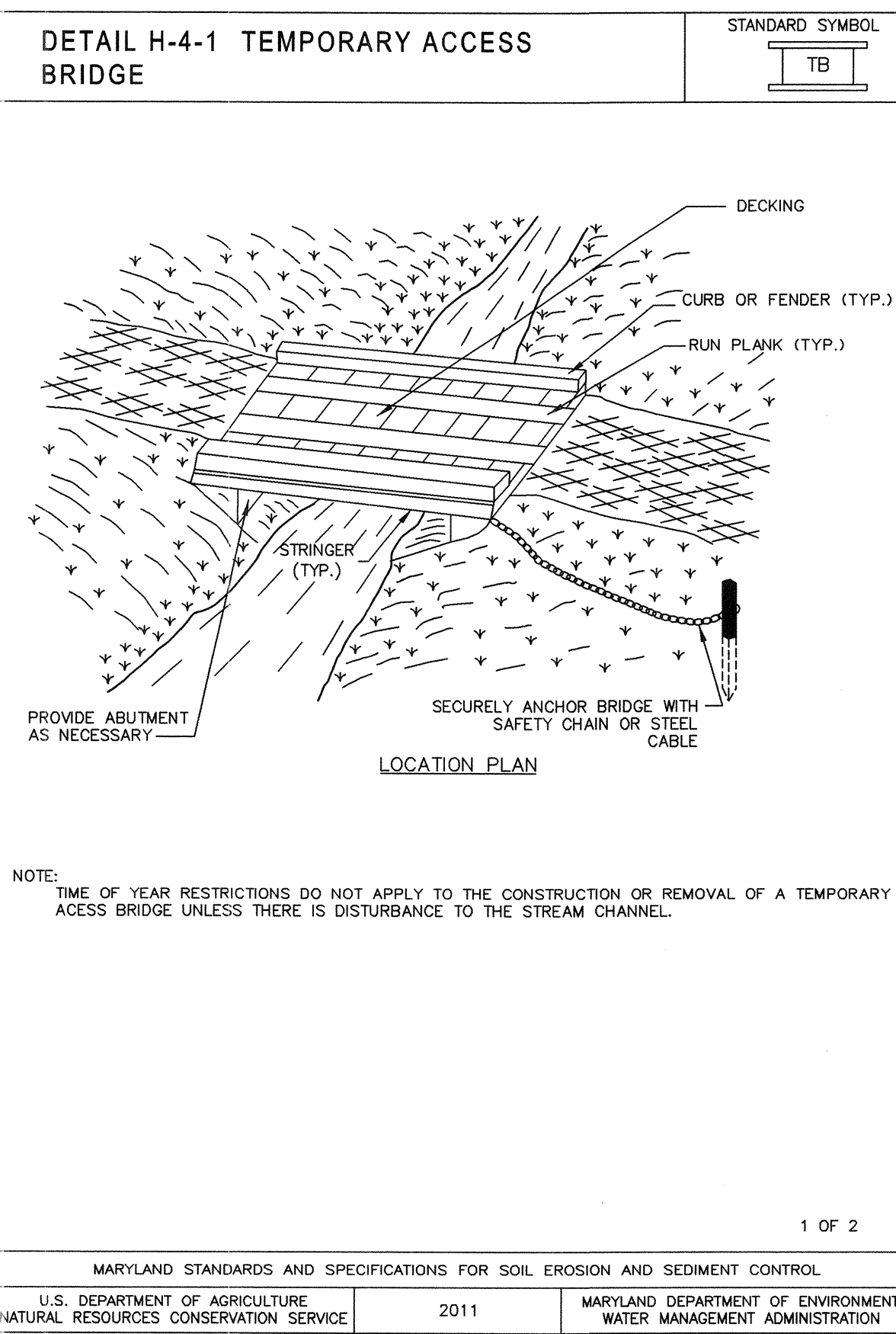
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

* SEE SHEET 9, NATURAL FIBER MATTING DETAIL FOR ADDITIONAL INFORMATION ON THE SPECIFICATIONS OF THE MATTING REQUIRED.



MGWC 1.2: PUMP-AROUND PRACTICE
 Temporary measure for dewatering in-channel construction sites
DESCRIPTION
 The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.
IMPLEMENTATION SEQUENCE
 Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):
 1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county or utility company's satisfaction.
 2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform and the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
 3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance, which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
 4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
 5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each workday, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
 6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of rip rap or sandbags.
 7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
 8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only when noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).
 9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
 10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike should be removed.
 11. A pump around must be installed on any tributary or storm drain outfall, which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
 12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around to the main stem.
 13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
 14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.



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

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 DATE: 6/5/17

DATE: _____

NO. _____

REVISIONS DESCRIPTION: _____

936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
 WWW.KCI.COM

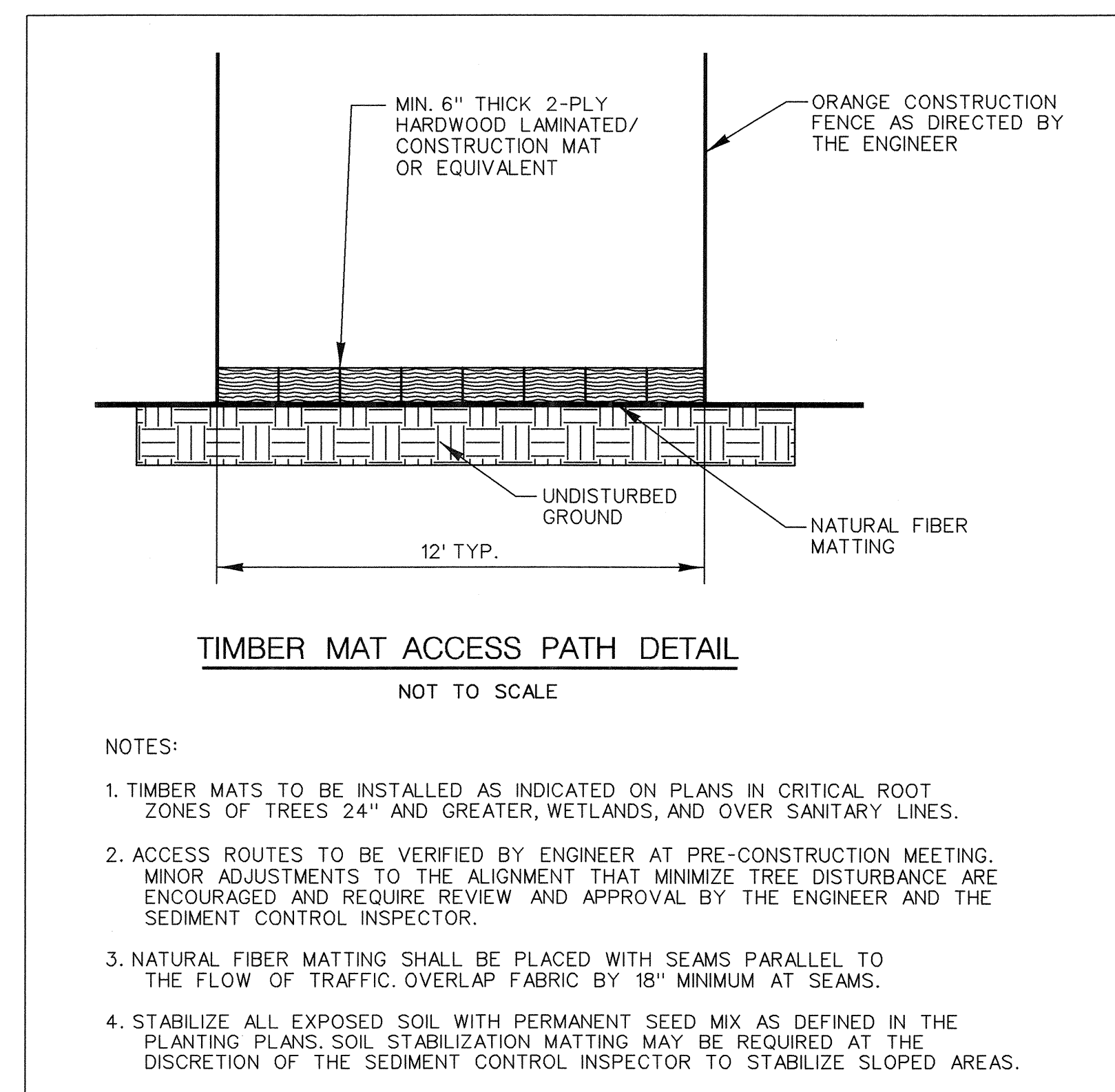
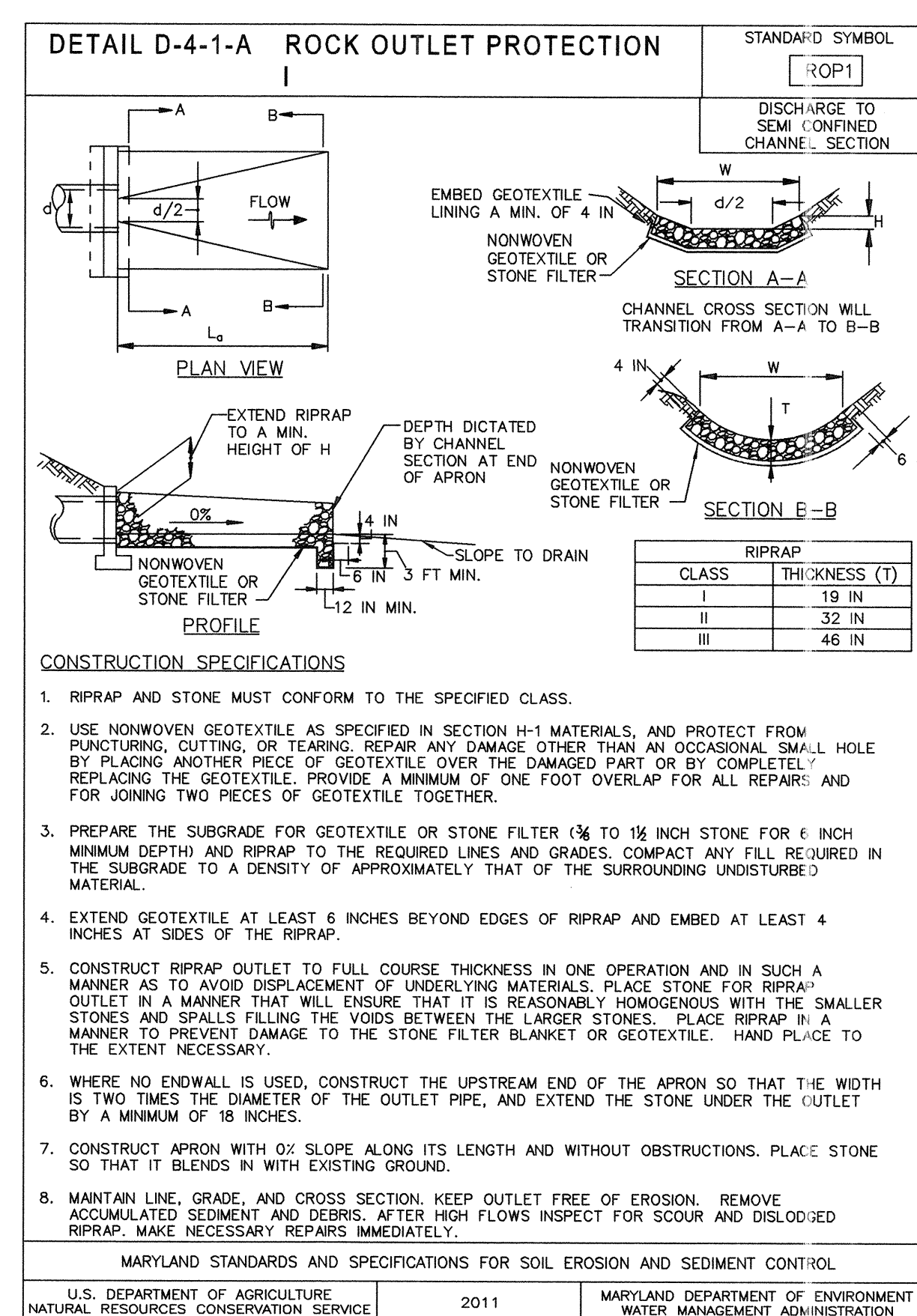
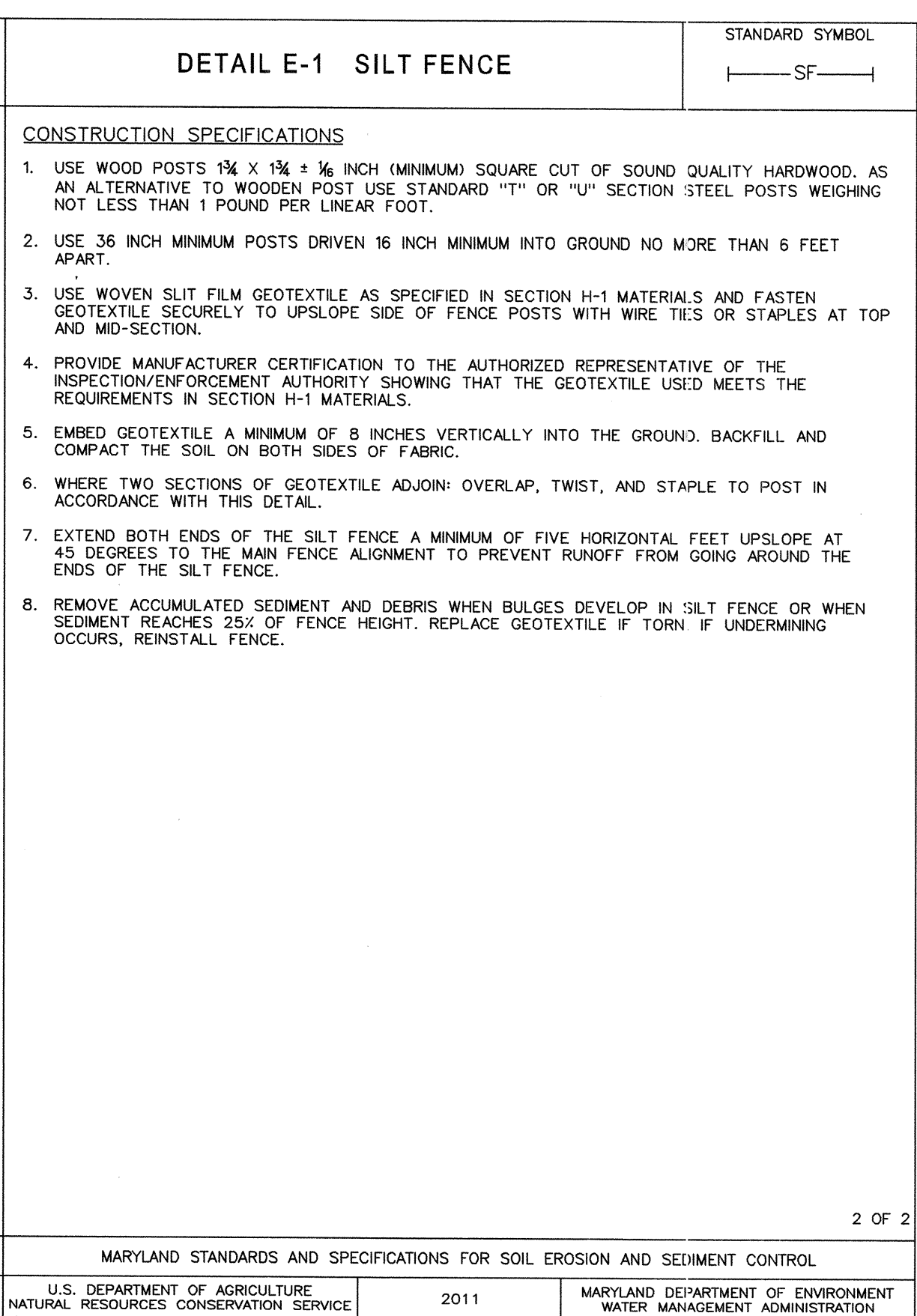
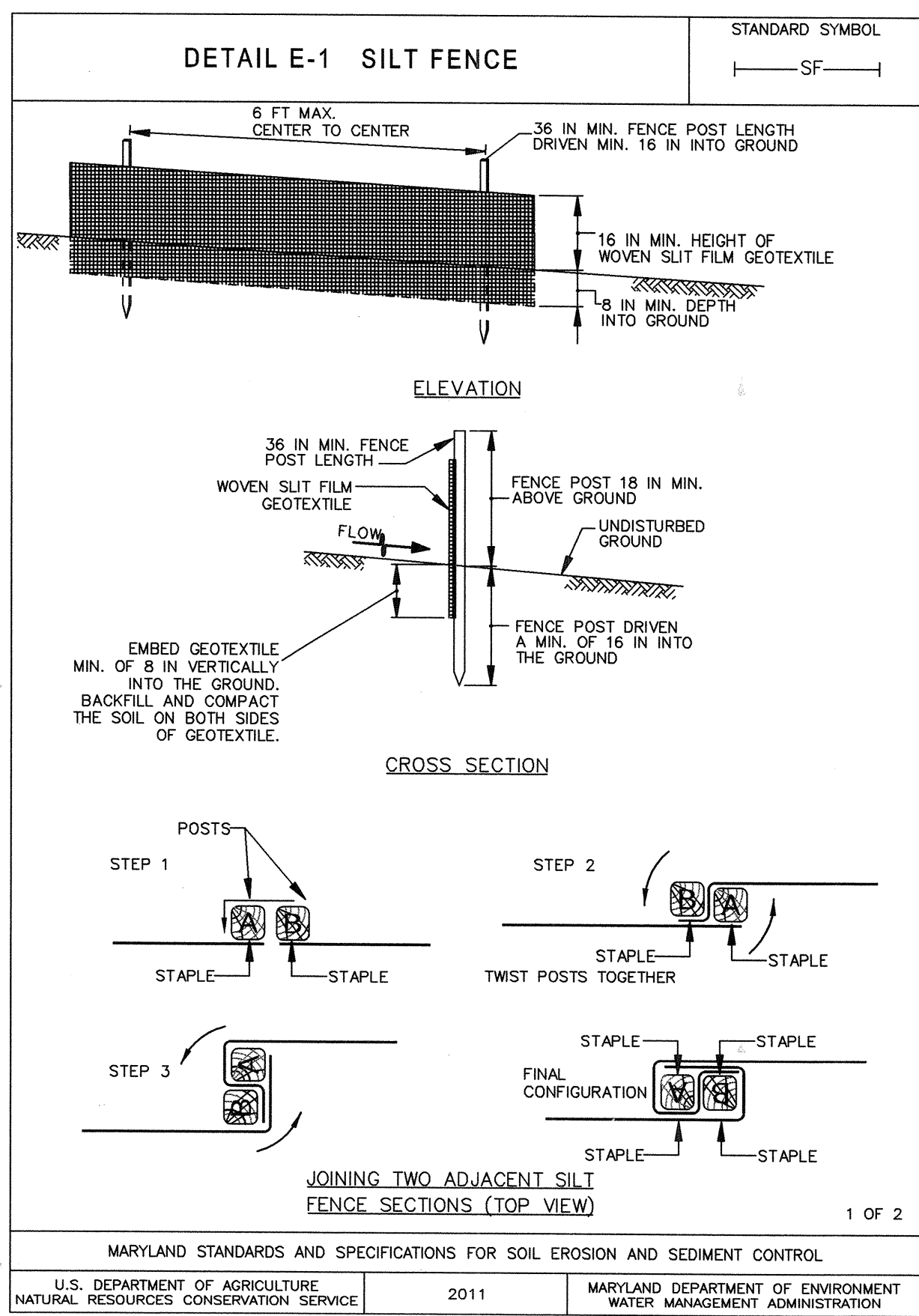
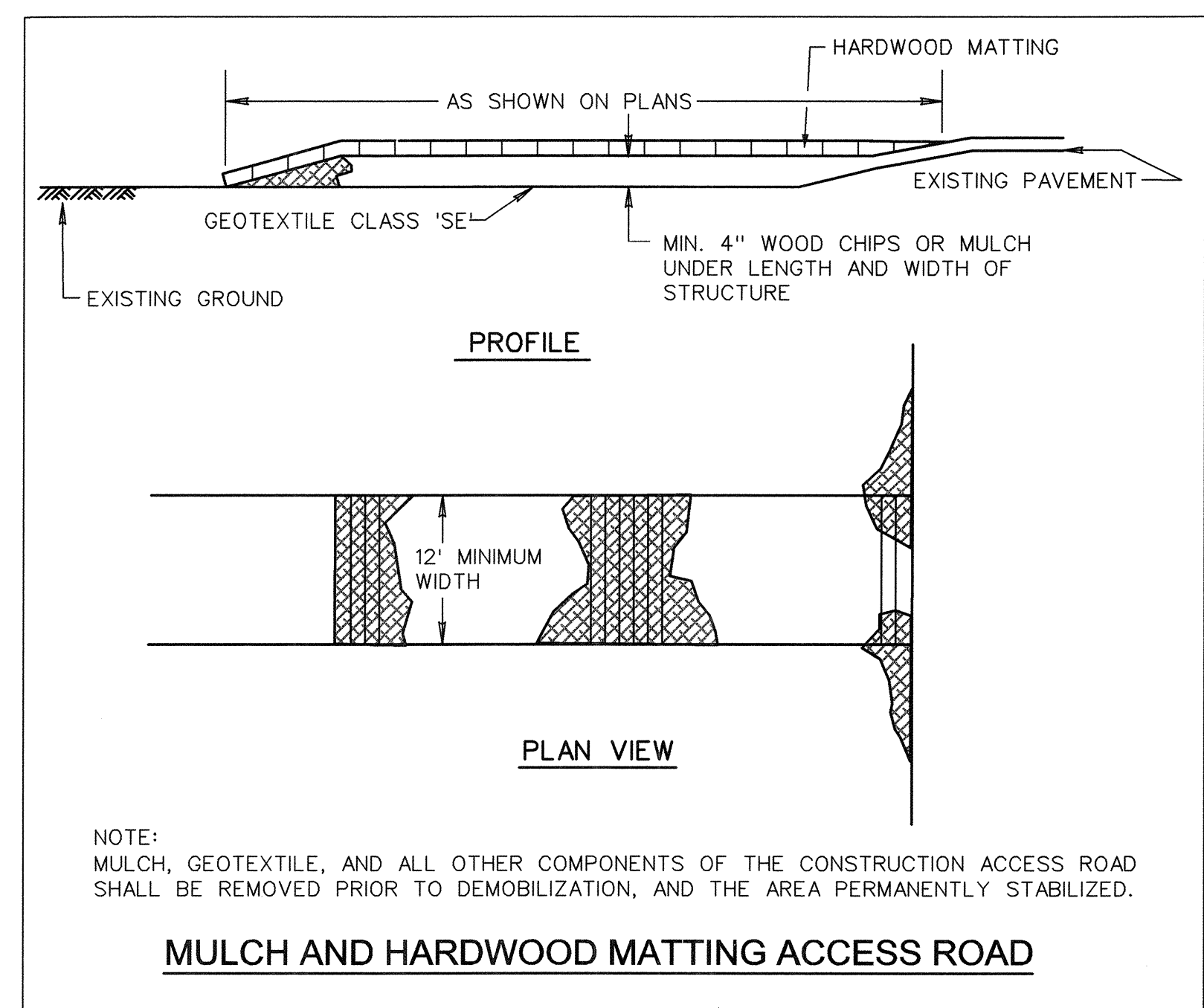
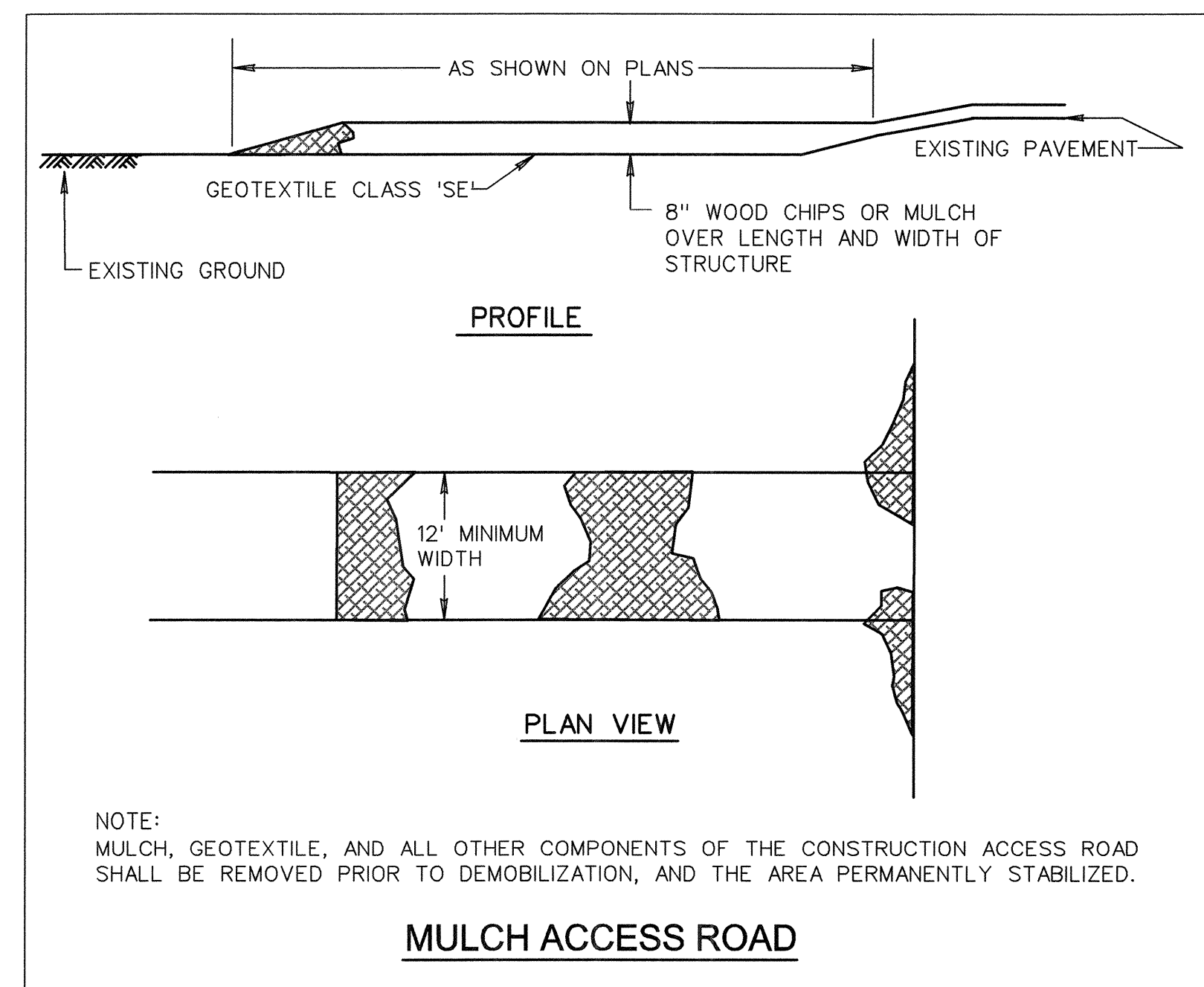
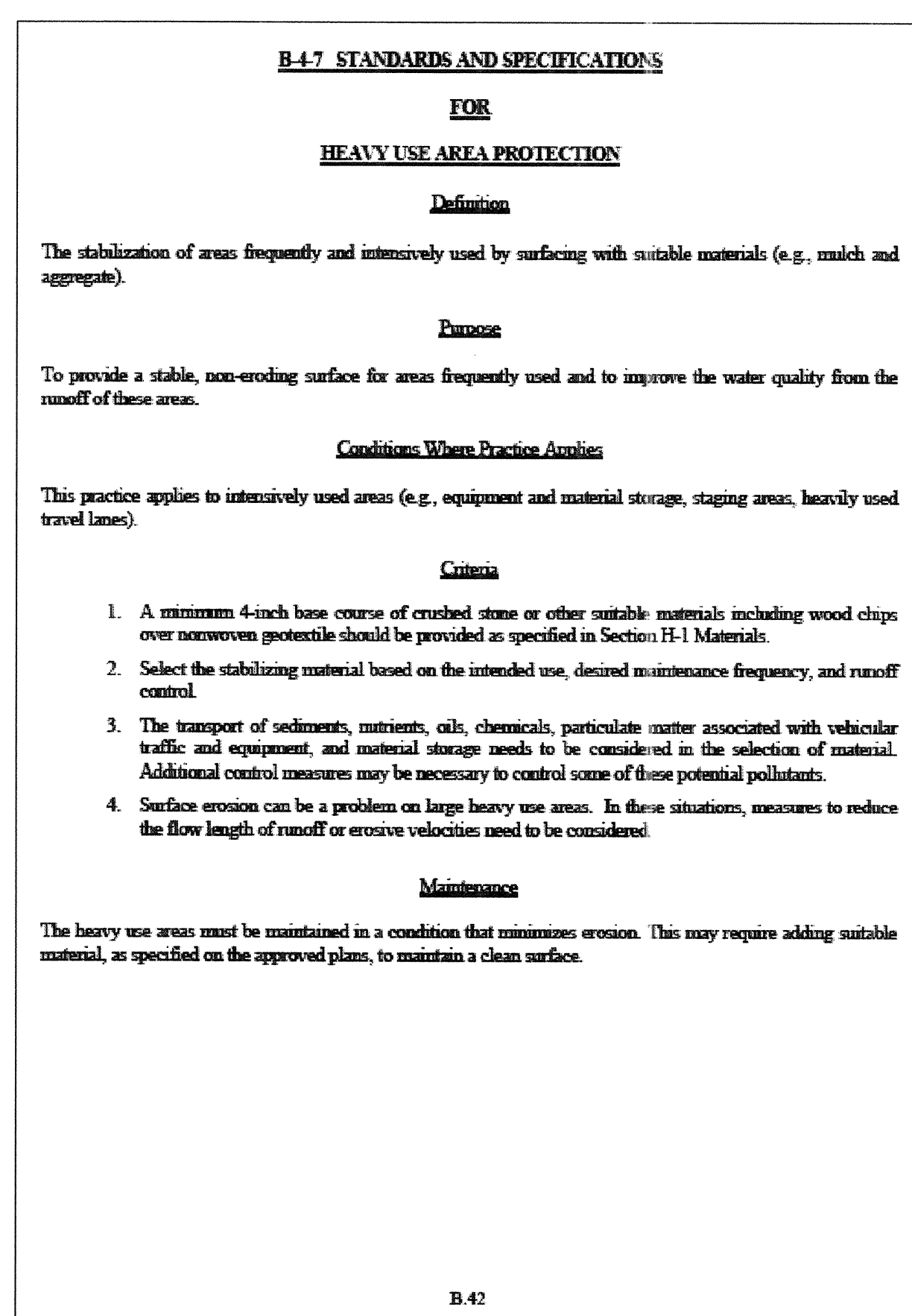
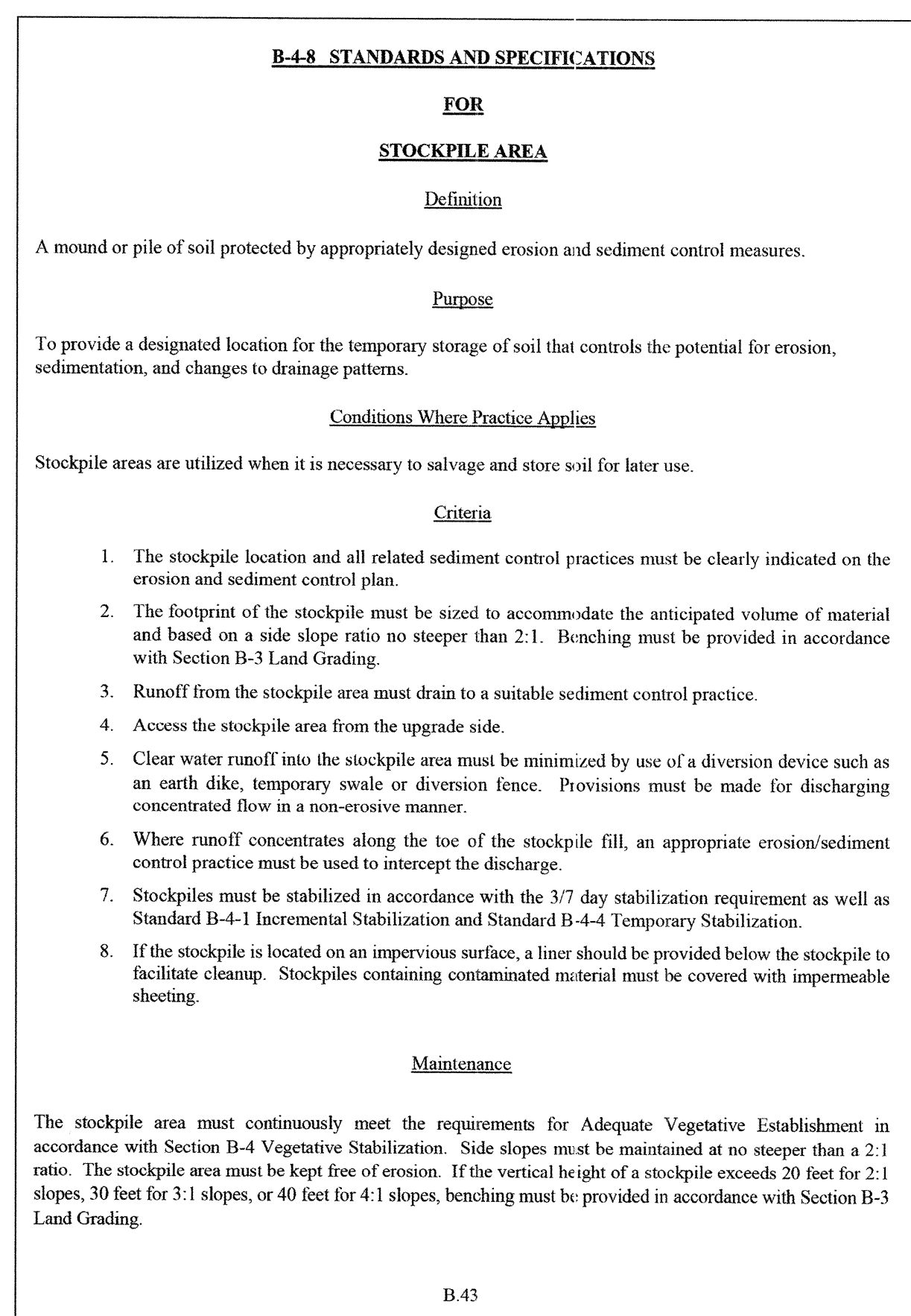
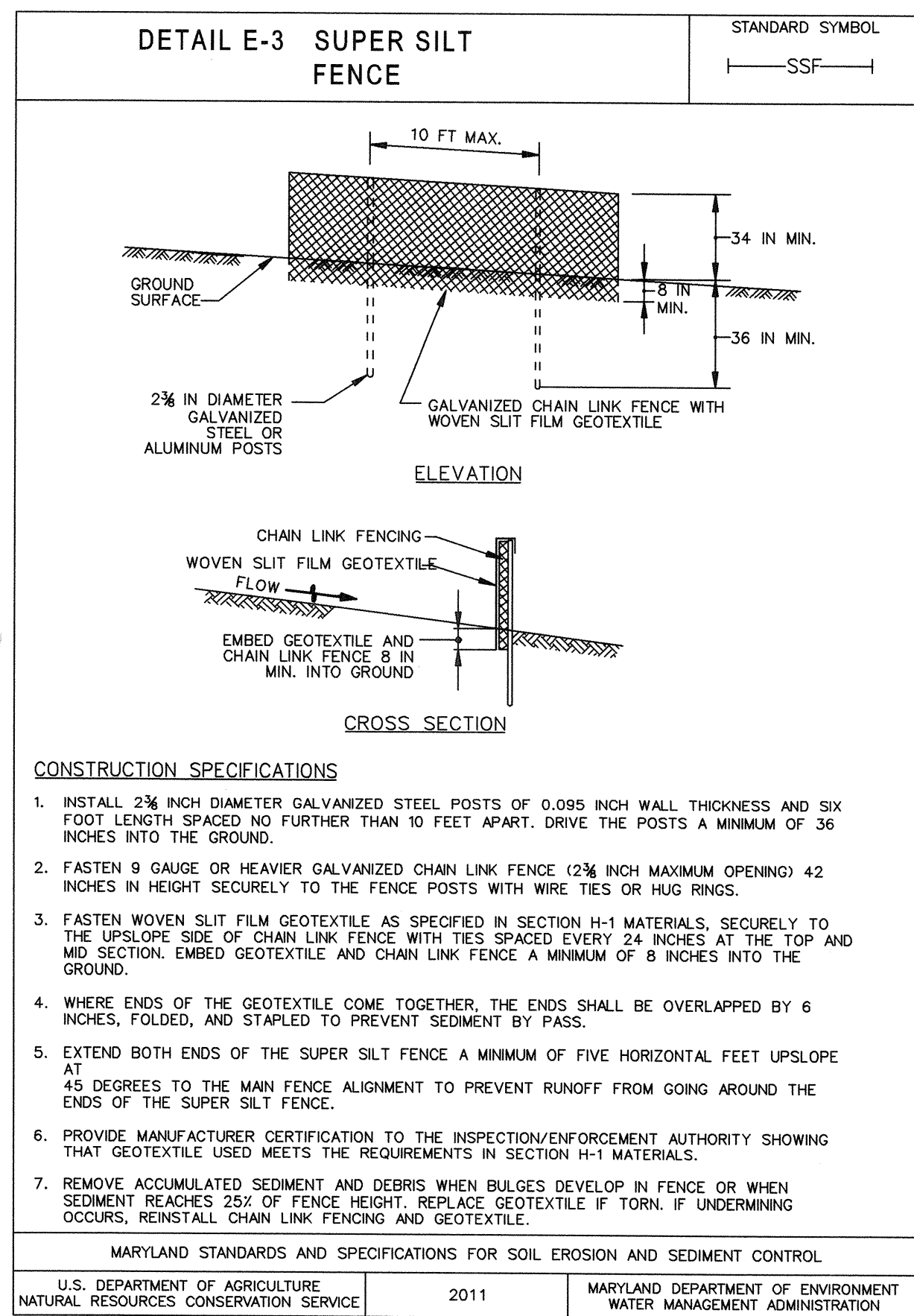
KCI
 TECHNOLOGIES

DUNLOGGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1005, 396 TAX MAP 24.30
 ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04.21

EROSION & SEDIMENT CONTROL DETAILS

SCALE: N/A
 DATE: JUNE 2017
 KCI JOB NO.: 17133314.94
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

ESD-01
 SHEET NO.: 15 OF 24



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6/2/17

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

6/5/17
DATE

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
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KCI TECHNOLOGIES

DUNLOGGON MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1168
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 396 TAX MAP 24.30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04.21

EROSION & SEDIMENT CONTROL DETAILS

SCALE: N/A
DATE: JUNE 2017
KCI JOB NO.: 17133314.94
CAPITAL PROJECT NO.: D-1168
PERMIT ISSUE:
CONSTRUCTION ISSUE:

ESD-02
SHEET NO.: 16 OF 24

MATCH LINE - FOR CONTINUATION SEE INSET THIS SHEET

DUNLOGGIN MIDDLE SCHOOL

ACCESS AT DUNLOGGIN MIDDLE SCHOOL PARKING LOT

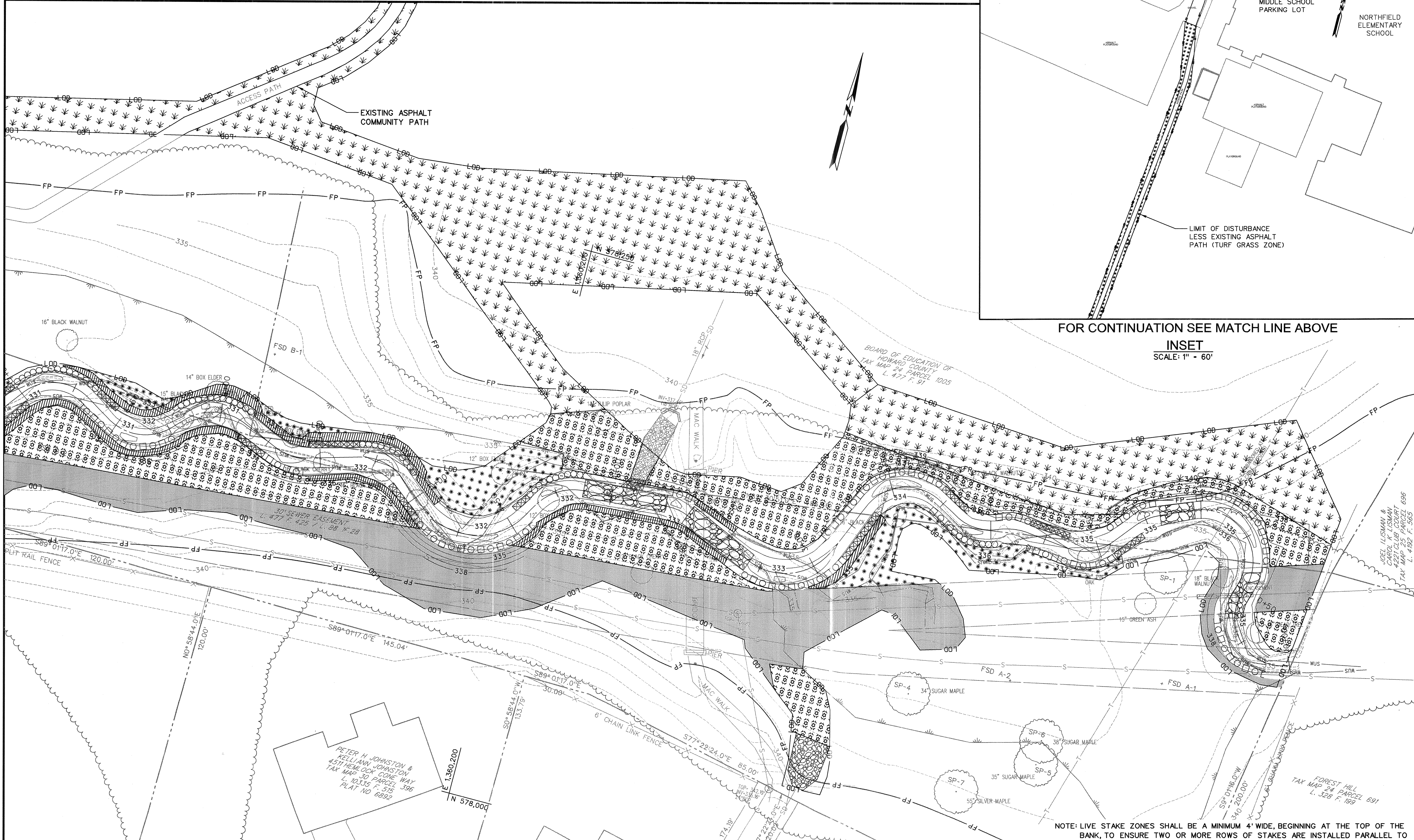
NORTHFIELD ELEMENTARY SCHOOL

LIMIT OF DISTURBANCE LESS EXISTING ASPHALT PATH (TURF GRASS ZONE)

FOR CONTINUATION SEE MATCH LINE ABOVE

INSET
SCALE: 1" = 60'

MATCH LINE - SEE SHEET LS-02

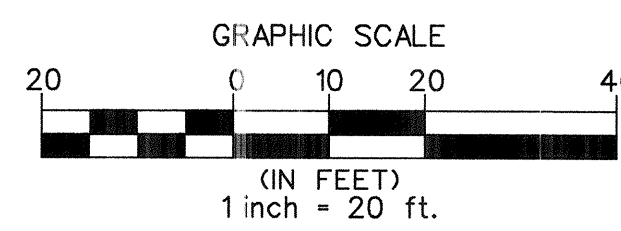


NOTE: LIVE STAKE ZONES SHALL BE A MINIMUM 4' WIDE, BEGINNING AT THE TOP OF THE BANK, TO ENSURE TWO OR MORE ROWS OF STAKES ARE INSTALLED PARALLEL TO THE TOP OF BANK.

NOTE: PERMANENT STABILIZATION CONSISTING OF, AT A MINIMUM, NATURAL FIBER MATTING AND SEEDING, SHALL BE INSTALLED IN ALL AREAS DISTURBED BY THE WORK.

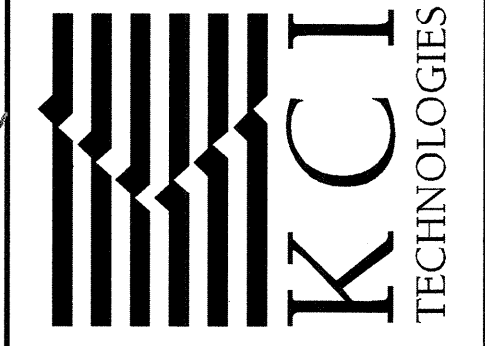
LEGEND

	WOODY TOE BANK TREATMENT		LIVE STAKE ZONE		ALTERNATING ROUGHNESS BANK TREATMENT
	RIPARIAN ZONE		SEED ONLY ZONE		PFO WETLAND ZONE
					TURF GRASS ZONE



NO.	REVISIONS DESCRIPTION	DATE

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DUNLOGGIN MIDDLE SCHOOL
STREAM RESTORATION PROJECT
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HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
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6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 396 TAX MAP 24.30
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LANDSCAPE PLAN

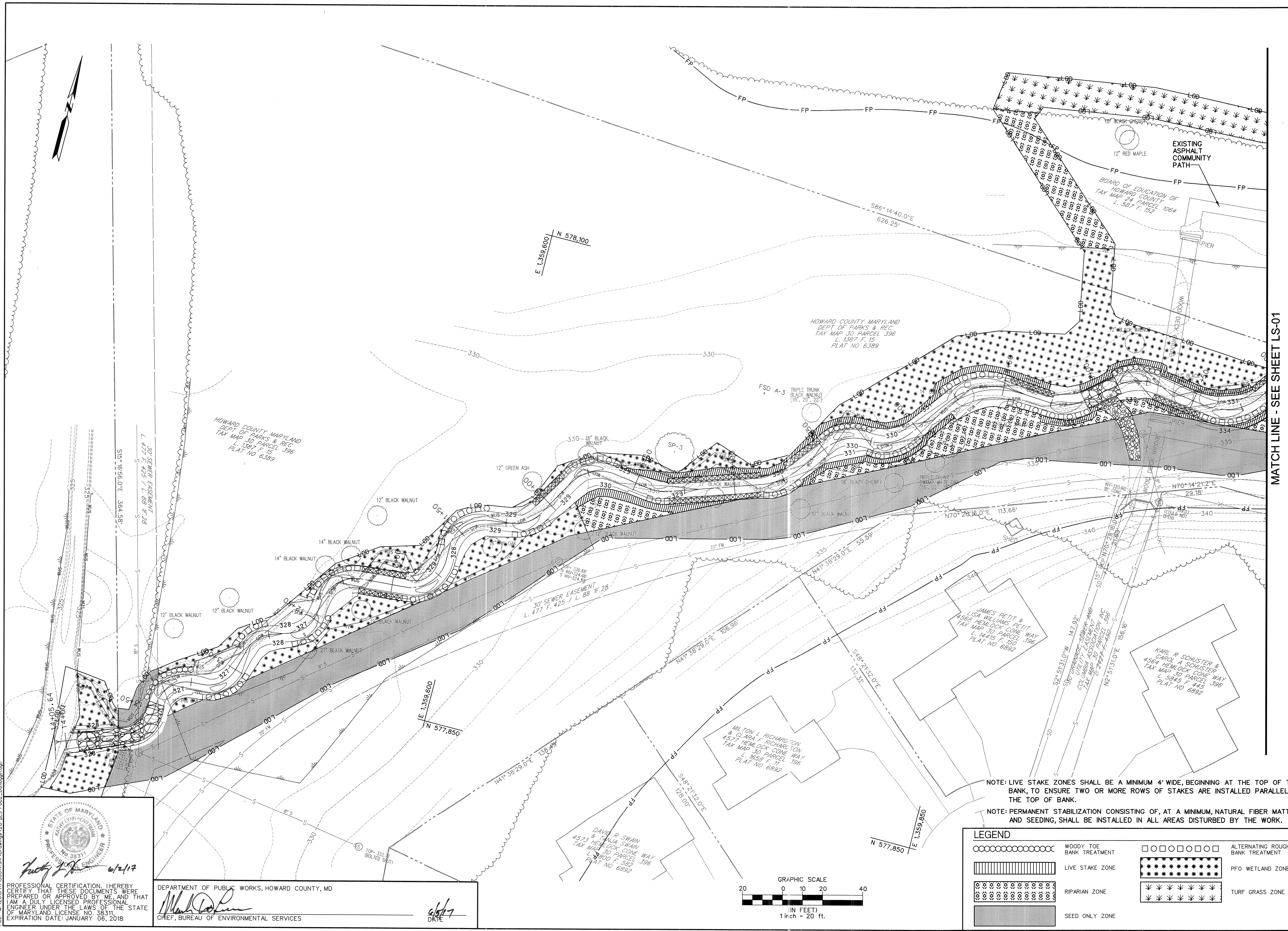
SCALE:	1" = 20'
DATE:	JUNE 2017
KCI JOB NO.:	17133314.94
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	
LS-01	
SHEET NO.: 19 OF 24	

PETER H. JOHNSTON
KELLIANN JOHNSTON
4517 HEMLOCK CIRCLE WAY
L 10330 F. 515
PLAT NO 6882

ANDREW HAYES HILGER &
JENNIFER CHAMBERLAIN
4515 SPEEDWAY COURT
L 7286 F. 89
PLAT NO 6882

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
DATE: 6/5/17

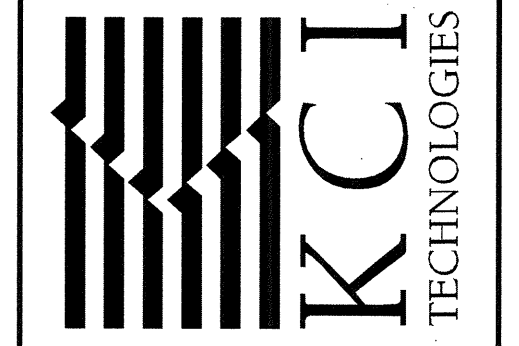
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MATCH LINE - SEE SHEET LS-01

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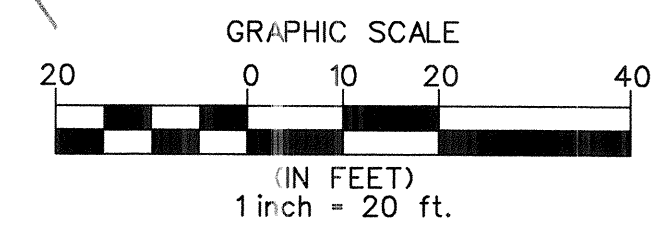


**DUNLOGGIN MIDDLE SCHOOL
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 PARCELS 1064, 1005, 396, TAX MAP 24, 30
 ZONING R20 ELECTION DISTRICT 12, GRIDBLOCK 04, 21

LANDSCAPE PLAN

NOTE: LIVE STAKE ZONES SHALL BE A MINIMUM 4' WIDE, BEGINNING AT THE TOP OF THE BANK, TO ENSURE TWO OR MORE ROWS OF STAKES ARE INSTALLED PARALLEL TO THE TOP OF BANK.
 NOTE: PERMANENT STABILIZATION CONSISTING OF, AT A MINIMUM, NATURAL FIBER MATTING AND SEEDING, SHALL BE INSTALLED IN ALL AREAS DISTURBED BY THE WORK.

LEGEND	
	WOODY TOE BANK TREATMENT
	LIVE STAKE ZONE
	RIPARIAN ZONE
	SEED ONLY ZONE
	ALTERNATING ROUGHNESS BANK TREATMENT
	PFO WETLAND ZONE
	TURF GRASS ZONE



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2018

6/2/17
 DATE

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
6/2/17
 DATE

MASTER PLANT SCHEDULE +

RIPARIAN ZONE (SHEETS 19 - 20)

(13,685 SQ. FT / 0.31 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
TREES					
21	<i>Quercus rubra</i>	Northern Red Oak	5' Height	Container	11' O.C.
21	<i>Quercus palustris</i>	Pin Oak	5' Height	Container	11' O.C.
21	<i>Prunus serotina</i>	Black cherry	5' Height	Container	11' O.C.
21	<i>Quercus alba</i>	White Oak	5' Height	Container	11' O.C.
21	<i>Betula nigra</i>	River Birch	5' Height	Container	11' O.C.
SHRUBS					
14	<i>Cercis canadensis</i>	Eastern redbud	3' Height	Container	6'-8' O.C.
14	<i>Viburnum dentatum</i>	Arrowwood viburnum	3' Height	Container	6'-8' O.C.

PFO WETLAND ZONE (SHEETS 19 - 20)

(11,528 SQ. FT / 0.26 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
TREES					
18	<i>Platanus occidentalis</i>	American Sycamore	5' Height	Container	11' O.C.
18	<i>Quercus palustris</i>	Pin Oak	5' Height	Container	11' O.C.
18	<i>Acer negundo</i>	Boxelder	5' Height	Container	11' O.C.
18	<i>Acer rubrum</i>	Red maple	5' Height	Container	11' O.C.
18	<i>Nyssa sylvatica</i>	Black gum	5' Height	Container	11' O.C.
SHRUBS					
12	<i>Lindera benzoin</i>	Northern Spicebush	3' Height	Container	6'-8' O.C.
12	<i>Carpinus caroliniana</i>	Musclewood	3' Height	Container	6'-8' O.C.

WOODY TOE (SHEETS 19 - 20)

(690 SF / 0.02 AC, 251 LF)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
LIVE BUNDLES					
48	<i>Cornus racemosa</i>	Gray Dogwood	3' Length 0.5"-1.0" dia.	Dormant stems	Bundles of three, every 4'
48	<i>Cornus amomum</i>	Silky Dogwood	3' Length 0.5"-1.0" dia.	Dormant stems	Bundles of three, every 4'
48	<i>Salix sericea</i>	Silky Willow	3' Length 0.5"-1.0" dia.	Dormant stems	Bundles of three, every 4'
48	<i>Salix eriocephala</i>	Missouri River willow	3' Length 0.5"-1.0" dia.	Dormant stems	Bundles of three, every 4'

Note: Dormant stem quantities represent the total number of individual stems.

ALTERNATING ROUGHNESS PLANTINGS (SHEETS 19 - 20)

(2,382 SQ. FT / 0.05 AC, 866 LF)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
TREES					
19	<i>Celtis occidentalis</i>	Hackberry	2" Caliper	Container	12' O.C.
19	<i>Quercus bicolor</i>	Swamp White Oak	2" Caliper	Container	12' O.C.
19	<i>Platanus occidentalis</i>	Sycamore	2" Caliper	Container	12' O.C.
19	<i>Acer saccharinum</i>	Silver Maple	2" Caliper	Container	12' O.C.
LIVE STAKES					
181	<i>Cornus racemosa</i>	Gray Dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF
181	<i>Cornus amomum</i>	Silky Dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF
181	<i>Salix sericea</i>	Silky Willow	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF
181	<i>Salix lucida</i>	Shinning Willow	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF

Note: Alternate Roughness Planting locations shall be staked for approval by the engineer, prior to installation. Dormant stem quantities represent the total number of individual stems.

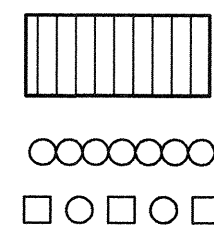
LIVE STAKES ZONE (SHEETS 19 - 20)

(3,320 SQ. FT / 0.08 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
139	<i>Cornus sericea</i>	Red Osier Dogwood	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
139	<i>Cornus amomum</i>	Silky Dogwood	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
139	<i>Viburnum dentatum</i>	Arrowwood Viburnum	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
139	<i>Cephalanthus occidentalis</i>	Buttonbush	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
139	<i>Salix lucida</i>	Shinning Willow	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
139	<i>Salix sericea</i>	Silky Willow	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.

+NOTES:

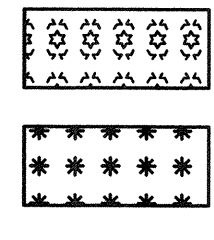
- 4 INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE SITE EXCEPT IN EXISTING WETLANDS TO INCREASE SOIL FERTILITY.
- ALL PLANT MATERIAL EXCEPT TEMPORARY SEEDING SHOULD BE INSTALLED AFTER CONSTRUCTION DURING THE DORMANT PERIOD (BEGINNING MID-AUGUST).



PERMANENT SEEDING FOR LIVE STAKES, WOODY TOE & ALTERNATING ROUGHNESS (6,392 SQ. FT / 0.15 AC) (SHEETS 19 - 20)

Qty(lbs)*	Seed Mix
2.3	ERNMX-723 OR EQUIVALENT

*Seeding shall be applied at a 15 lbs/AC seeding rate.



PERMANENT SEEDING FOR SEED ONLY, RIPARIAN ZONE & PFO WETLAND ZONE (45,328 SQ. FT / 1.04 AC) (SHEETS 19 - 20)

Qty(lbs)*	Seed Mix
15.6	ERNMX-722 OR EQUIVALENT

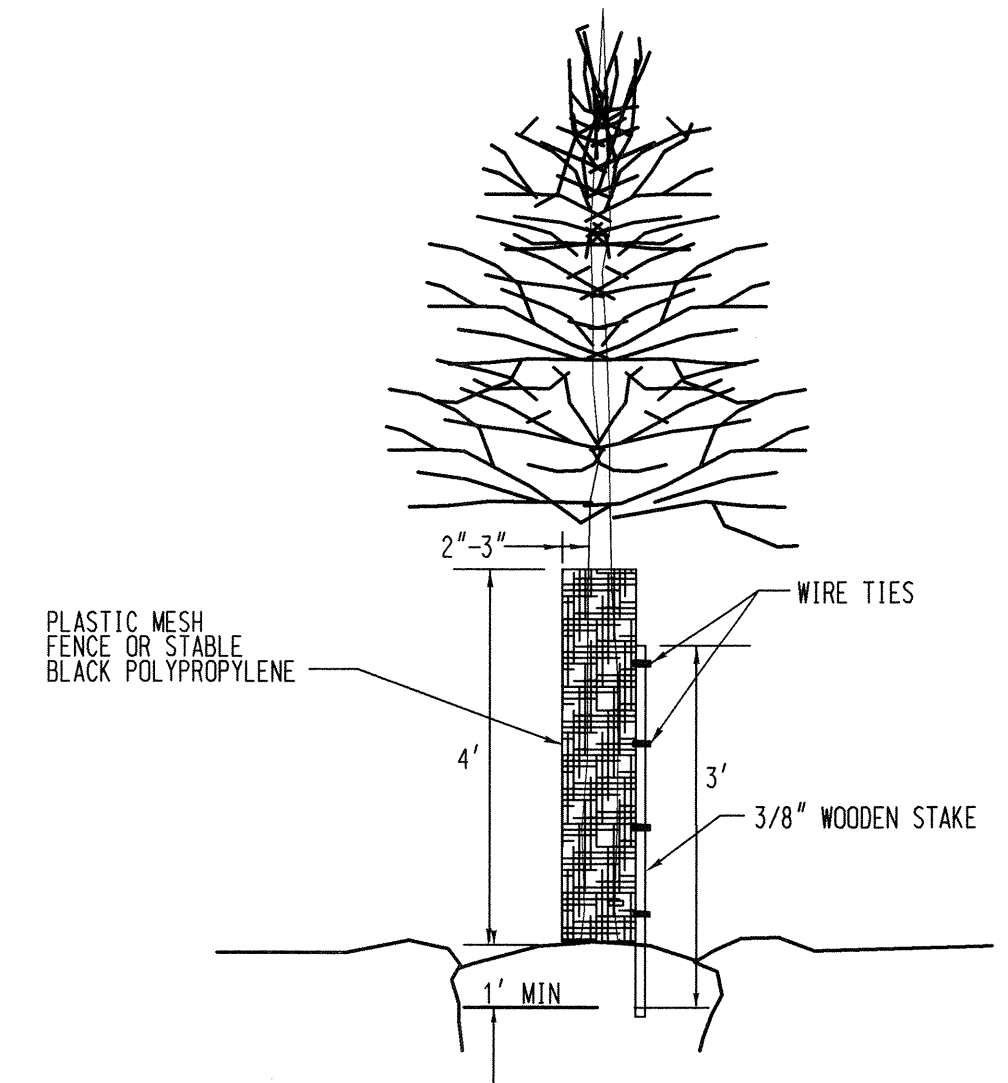
*Seeding shall be applied at a 15 lbs/AC seeding rate.



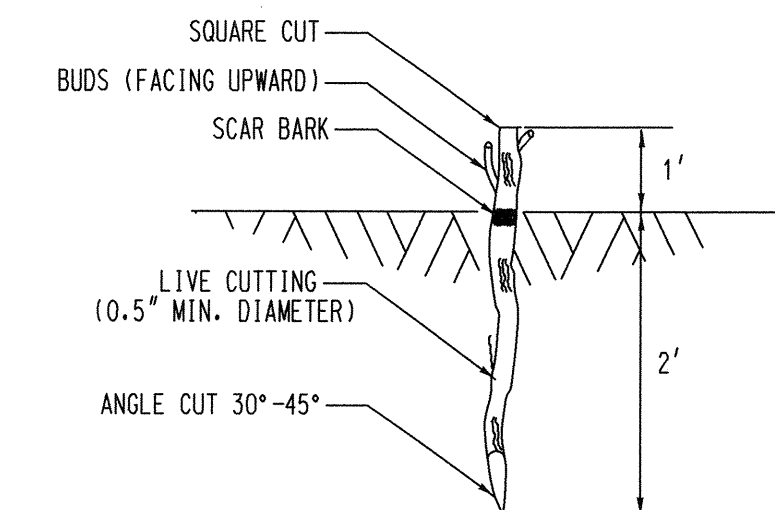
TURF GRASS ZONE (SHEETS 19 - 20)

Qty(lbs)*	Seed Mix
116.0	SHA Seed mix No. 1 (920.06.07'0)

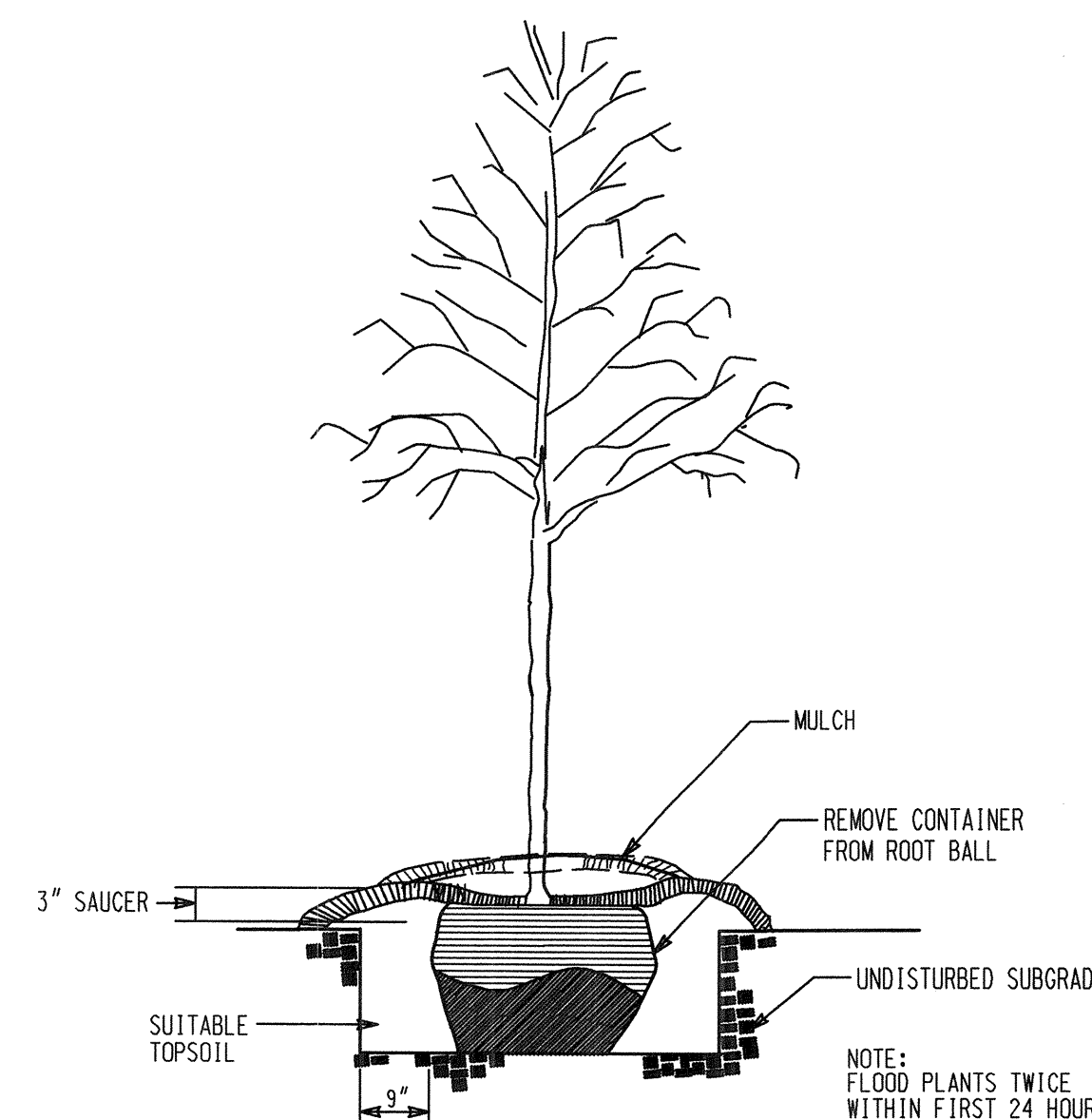
*Seeding shall be applied at a 200 lbs/AC seeding rate.



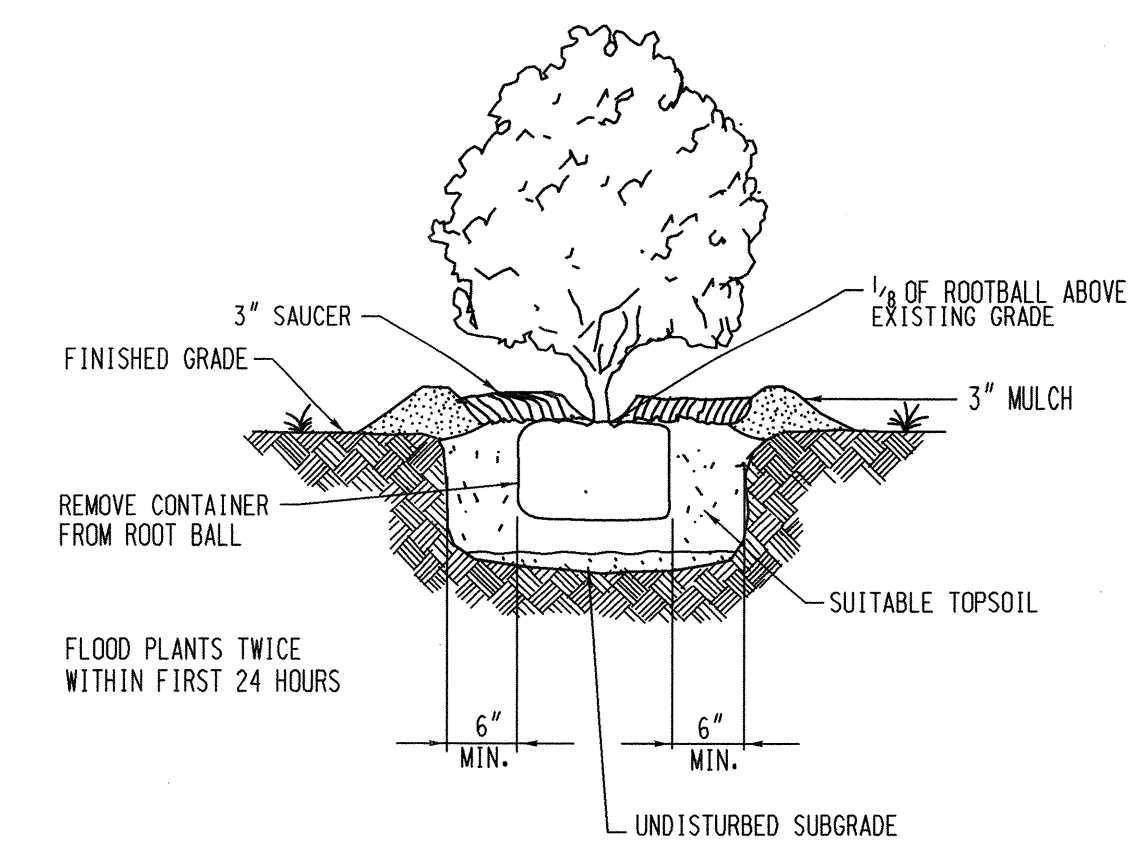
TREE SHELTER DETAIL
NOT TO SCALE



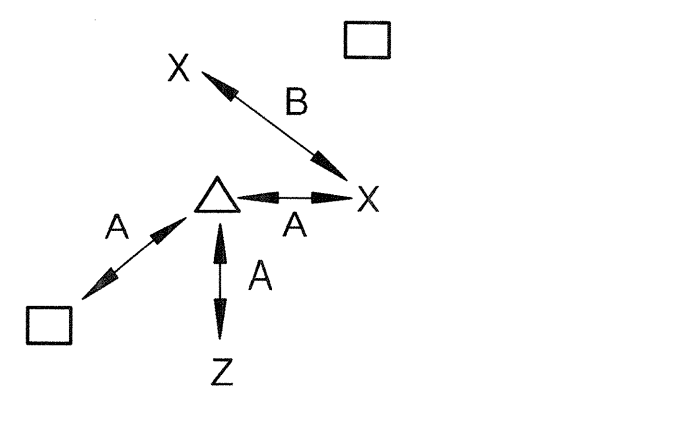
LIVE STAKE DETAIL
NOT TO SCALE



TREE PLANTING DETAIL
NOT TO SCALE



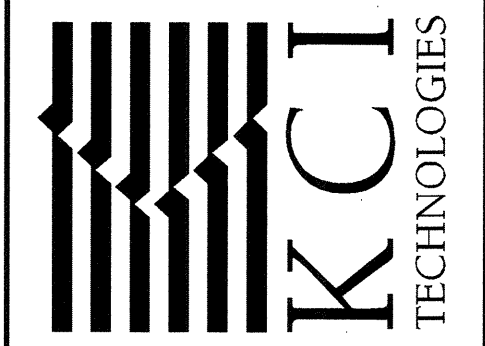
SHRUB PLANTING DETAIL
NOT TO SCALE



TREE AND SHRUB RANDOM SPACING
NOT TO SCALE

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com



DUNLOGGIN MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 396 TAX MAP 24.30
ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04, 21

LANDSCAPE DETAILS

SCALE:	NOT TO SCALE
DATE:	JUNE 2017
KCI JOB NO.:	17133314.94
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018

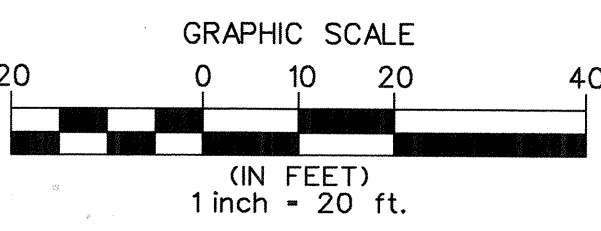
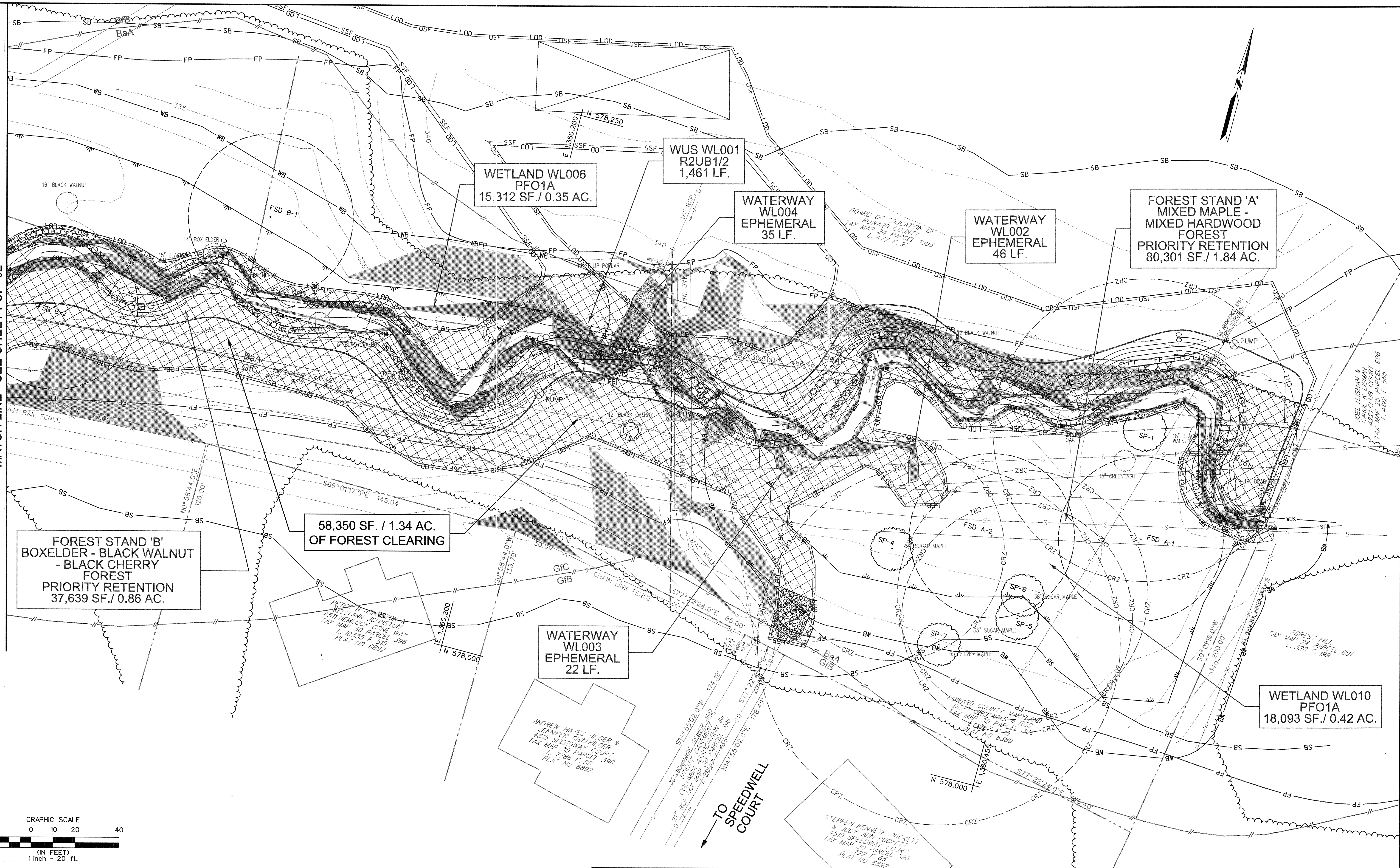
DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

Chief, Bureau of Environmental Services

6/21/17
DATE

PLOTED: 11:01 AM on Friday, June 02, 2017
FILE: M:\2013\17133314.94\Drawings\21-pl-LD-001-Dunloggin.dwg

MATCH LINE - SEE SHEET FCP-02



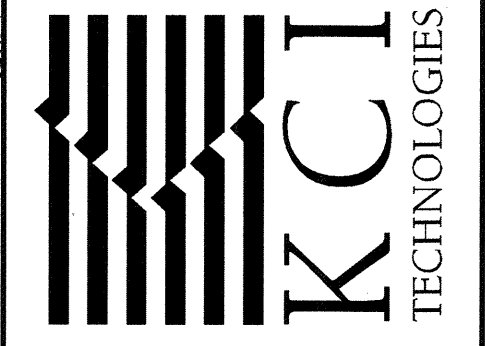
THIS PLAN WAS PREPARED BY:
 JENNIFER BIRD
 KCI TECHNOLOGIES
 MDNR QUALIFIED PROFESSIONAL
 STATUS
 (SEPTEMBER 2011)
Jennifer K. Bird
 SIGNATURE
 DECEMBER, 2016
 DATE

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
Mark D. ...
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 6/5/17
 DATE

LEGEND	
--- 330 ---	EX. CONTOUR
-x-x-	EX. METAL FENCE
-s-s-	EX. SANITARY SEWER
-sd-sd-	EX. STORM DRAIN
o	EX. MANHOLE
- - -	EX. EASEMENT
---	PROPERTY LINE
WUS	WATERS OF THE U.S.
WB	EX. NON-TIDAL WETLAND
WB	25' WETLAND BUFFER
SB	100' STREAM BUFFER
[Shaded Area]	SLOPES 15-25%
[Shaded Area]	SLOPES 25% OR GREATER
[Symbol]	UPL-1
[Symbol]	010-WET
[Symbol]	FSD A-2
[Symbol]	CRZ
[Symbol]	SP-1
[Symbol]	TS
[Symbol]	GfB
[Symbol]	Ha
[Symbol]	ALTERNATING ROUGHNESS
[Symbol]	COIR FIBER ROLL
[Symbol]	WOODY TOE
[Symbol]	SPECIMEN TREE / CRITICAL ROOT ZONE EX. TREE / TREE SAVE
[Symbol]	FOREST STAND BREAK EX. WOODS LINE
[Symbol]	SOILS LINE
[Symbol]	RIFFLE GRADE CONTROL
[Symbol]	LIMIT OF DISTURBANCE
[Symbol]	EX. H & H 100-YEAR FLOODPLAIN
[Symbol]	EX. FOREST TO BE REMOVED

NO.	REVISIONS DESCRIPTION	DATE

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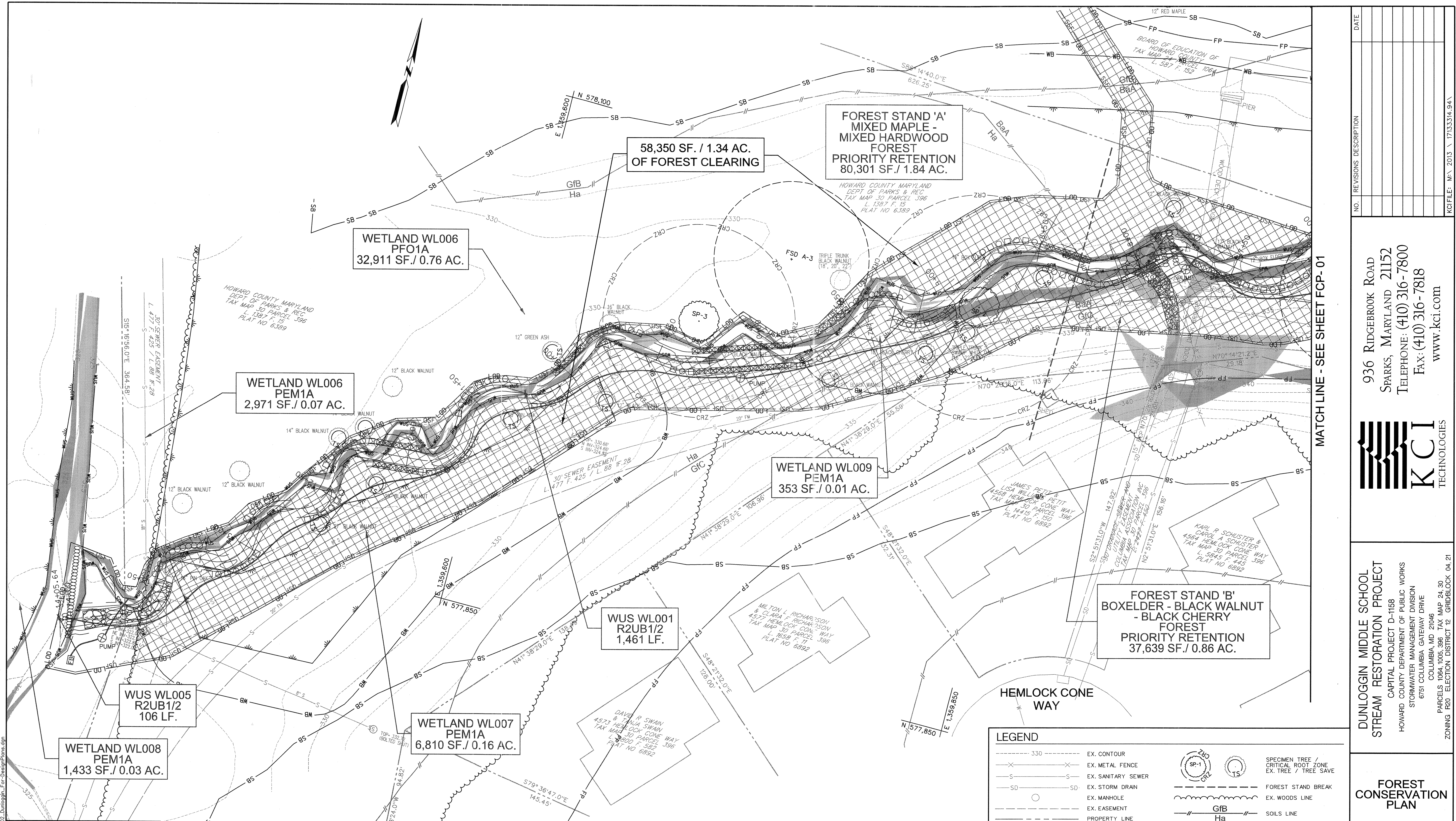


DUNLOGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1005, 396 TAX MAP 24.30
 ZONING R20 ELECTION DISTRICT 12 GRIDBLOCK 04.21

FOREST CONSERVATION PLAN

SCALE: 1" = 20'
 DATE: JUNE 2017
 KCI JOB NO.: 17133314.94
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

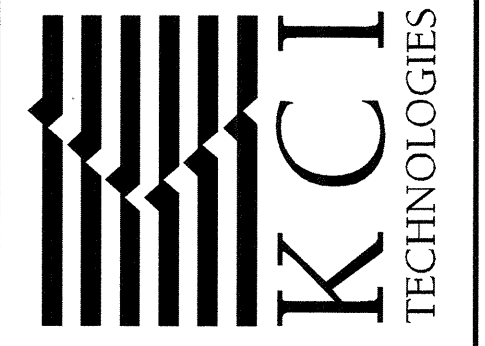
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MATCH LINE - SEE SHEET FCP-01

NO.	REVISIONS DESCRIPTION	DATE

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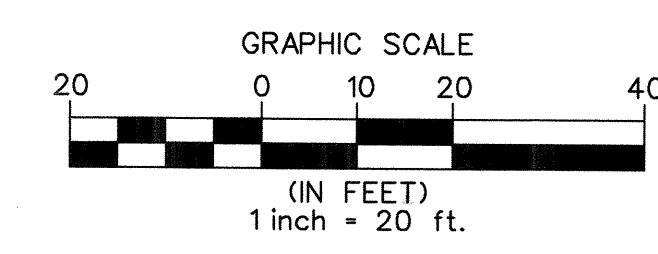
DUNLOGGIN MIDDLE SCHOOL
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 1064, 1065, 396 TAX MAP 24, 30
 ZONING P20 ELECTION DISTRICT 12 GRIDBLOCK 04, 21

FOREST CONSERVATION PLAN

SCALE: 1" = 20'
 DATE: JUNE 2017
 KCI JOB NO.: 17133314.94
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

FCP-02
 SHEET NO.: 23 OF 24

THIS PLAN WAS PREPARED BY:
 JENNIFER BIRD
 KCI TECHNOLOGIES
 MNRR QUALIFIED PROFESSIONAL STATUS
 (SEPTEMBER 2011)
 SIGNATURE: *Jennifer Bird*
 DATE: DECEMBER, 2016



DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 SIGNATURE: *Mark D. Lee*
 DATE: 4/5/17

LEGEND

--- 330 ---	EX. CONTOUR	○ SP-1	SPECIMEN TREE / CRITICAL ROOT ZONE
-x-x-	EX. METAL FENCE	○ TS	EX. TREE / TREE SAVE
-s-s-	EX. SANITARY SEWER	---	FOREST STAND BREAK
-SD-SD-	EX. STORM DRAIN	---	EX. WOODS LINE
○	EX. MANHOLE	GfB	SOILS LINE
- - -	EX. EASEMENT	Ha	ALTERNATING ROUGHNESS
---	PROPERTY LINE	○	COIR FIBER ROLL
WUS	WATERS OF THE U.S.	○	WOODY TOE
WB	EX. NON-TIDAL WETLAND	○	RIFFLE GRADE CONTROL
SB	25' WETLAND BUFFER	LOD	LIMIT OF DISTURBANCE
	100' STREAM BUFFER	FP	EX. H & H 100-YEAR FLOODPLAIN
█	SLOPES 15-25%	---	EX. FOREST TO BE REMOVED
█	SLOPES 25% OR GREATER		
○ UPL-1	UPLAND / WETLAND SAMPLE PLOT		
○ O10-WET			
○ FSD A-2	FOREST STAND SAMPLE PLOT		

PLOTED: 11:46 AM on Friday, June 02, 2017
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WATER RESOURCES NOTES

1. WATERS OF THE UNITED STATES (WUS) AND WETLANDS WERE DELINEATED BY KCI TECHNOLOGIES, INC. IN JUNE 2016.
2. FIVE NONTIDAL WETLAND, TWO WUS, AND THREE EPHEMERAL CHANNELS WERE IDENTIFIED WITHIN THE STUDY AREA.
3. WETLANDS SHOWN REPRESENT THE VERIFIED USACE BOUNDARIES.

FOREST RESOURCES NOTES

1. THE STUDY AREA BOUNDARY IS APPROXIMATELY 100-FEET WIDE.
2. FOREST STANDS EXTEND BEYOND THE STUDY AREA BOUNDARY.
3. TWO FOREST STANDS WERE IDENTIFIED DURING FIELD INVESTIGATIONS AND ARE CLASSIFIED AS PRIORITY RETENTION.
4. SEVEN SPECIMEN TREES WERE LOCATED DURING FIELD INVESTIGATIONS (SEE TABLE, THIS SHEET).

FOREST CONSERVATION NOTES

1. THE LOD (LIMIT OF DISTURBANCE) WAS USED AS THE TOTAL TRACT FOR FOREST CONSERVATION CALCULATIONS AS APPROVED UNDER WAIVER PETITION WP-17-066.
2. 1.32 ACRES OF CLEARING WILL BE WITHIN THE 100-YEAR FLOODPLAIN. THESE AREAS WILL BE REPLANTED AS SEEN ON THE LANDSCAPE PLANS, SHEETS 18 THROUGH 19 AND THE LANDSCAPE DETAILS ON SHEET 20.
3. ALL EFFORTS TO MINIMIZE THE AREA OF DISTURBANCE WILL BE MADE.
4. THE 0.15 ACRES OF FOREST MITIGATION WILL BE SATISFIED THROUGH FEE-IN-LIEU. FEE-IN-LIEU WILL BE PAID AT \$0.75/SF. (6,534 SF. X \$0.75 = \$4,900.50).
5. CURRENT ACREAGE OF FOREST WITHIN THE LOD IS 1.34 ACRES. THE ENTIRE LOD WILL BE REPLANTED.

GENERAL NOTES

1. TOPOGRAPHICAL SURVEY DATA PROVIDED BY KCI TECHNOLOGIES, INC. WAS COMPLETED IN AUGUST 2016.
2. THE EXISTING LAND USE IS FORESTED. SURROUNDING LAND USE IS DESIGNATED AS MEDIUM DENSITY RESIDENTIAL.
3. EXISTING ZONING IS RESIDENTIAL SINGLE (R-20).
4. CRITICAL HABITATS CONSIST OF NONTIDAL WETLANDS, THEIR BUFFERS, STEEP SLOPES, AND THE PERENNIAL UNNAMED TRIBUTARIES TO PLUMTREE BRANCH.
5. NO RARE, THREATENED OR ENDANGERED SPECIES WERE ENCOUNTERED DURING THE FIELD INVESTIGATIONS. CORRESPONDENCE WITH THE THE MARYLAND HISTORICAL TRUST INDICATE NO HISTORIC RESOURCES WITHIN THE STUDY AREA. IN ADDITION, CORRESPONDENCE WITH THE U.S. FISH & WILDLIFE SERVICE AND THE MARYLAND DEPARTMENT OF NATURAL RESOURCES INDICATE NO RARE, THREATENED OR ENDANGERED SPECIES WITHIN THE STUDY AREA.
6. THE PROJECT AREA IS LOCATED ON PROPERTIES OWNED BY HOWARD COUNTY PARKS AND RECREATION AND HOWARD COUNTY BOARD OF EDUCATION (MAP 30 PARCEL 396, AND MAP 24, PARCELS 1005 AND 1064).
7. TOTAL AREA OF NONTIDAL WETLANDS WITHIN THE PROJECT AREA: 13,400 SF / 0.31 AC.
8. TOTAL LINEAR FEET OF PERENNIAL AND INTERMITTENT STREAMS: 1,500 LF.
9. TOTAL FORESTED AREA WITHIN LIMITS OF DISTURBANCE BUT OUTSIDE THE 100 YEAR FLOODPLAIN IS: 0.02 AC
10. NO SPECIMEN TREES WILL BE REMOVED.
11. TREE SAVES ARE SHOWN WITHIN THE LOD BECAUSE AN ATTEMPT WILL BE MADE TO SAVE THESE TREES. TREES WILL ONLY BE REMOVED IF NECESSARY FOR GRADING OR ACCESS.

Forest Conservation Worksheet 2.2

Net Tract Area		
A. Total Tract Area		A = 2.31
B. Deductions		B = 1.64
C. Net Tract Area		C = 0.67
Land Use Category		
Input the number "1" under the appropriate land use zoning, and limit to only one entry		
	ARA	MDR
	0	1
	IDA	HDR
	0	0
	MPD	CIA
	0	0
D. Afforestation Threshold (Net Tract Area x 20%)		D = 0.13
E. Conservation Threshold (Net Tract Area x 25%)		E = 0.17
Existing Forest Cover		
F. Existing Forest Cover within the Net Tract Area		F = 0.02
G. Area of Forest Above Conservation Threshold		G = 0.00
Break Even Point		
H. Break Even Point		H = 0.02
I. Forest Clearing Permitted Without Mitigation		I = 0.00
Proposed Forest Clearing		
J. Total Area of Forest to be Cleared		J = 0.02
K. Total Area of Forest to be Retained		K = 0.00
Planting Requirements		
L. Reforestation for Clearing Above the Conservation Threshold		L = 0.00
M. Reforestation for Clearing Below the Conservation Threshold		M = 0.04
N. Credit for Retention above the Conservation Threshold		N = 0.00
P. Total Reforestation Required		P = 0.04
Q. Total Afforestation Required		Q = 0.11
R. Total Planting Requirement		R = 0.15

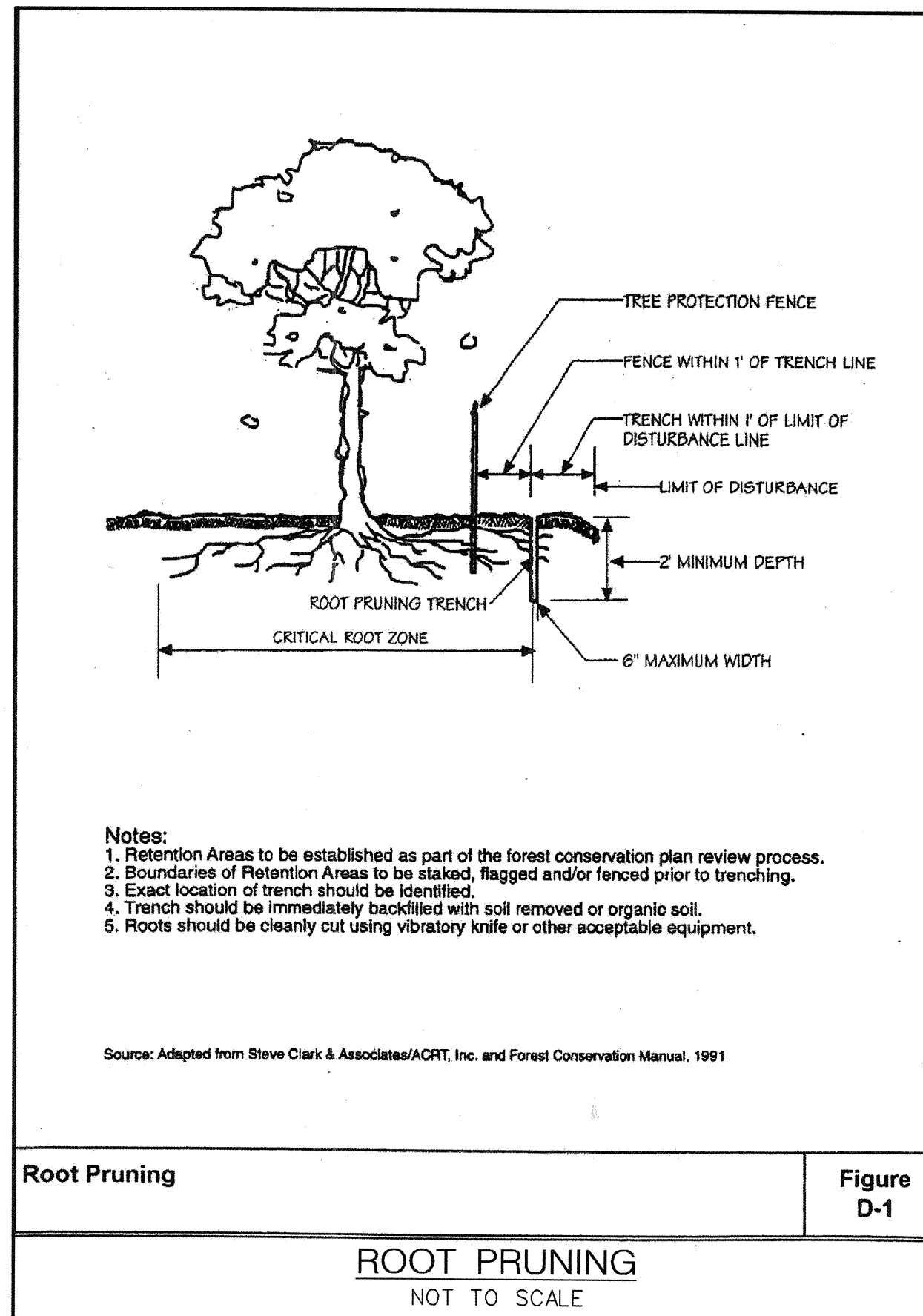
NOTE:
TOTAL FOREST CLEARING WITHIN THE LOD = 1.34 AC.
CLEARING OUTSIDE THE FLOODPLAIN BUT WITHIN THE LOD = 0.02 AC.

SPECIMEN TREES

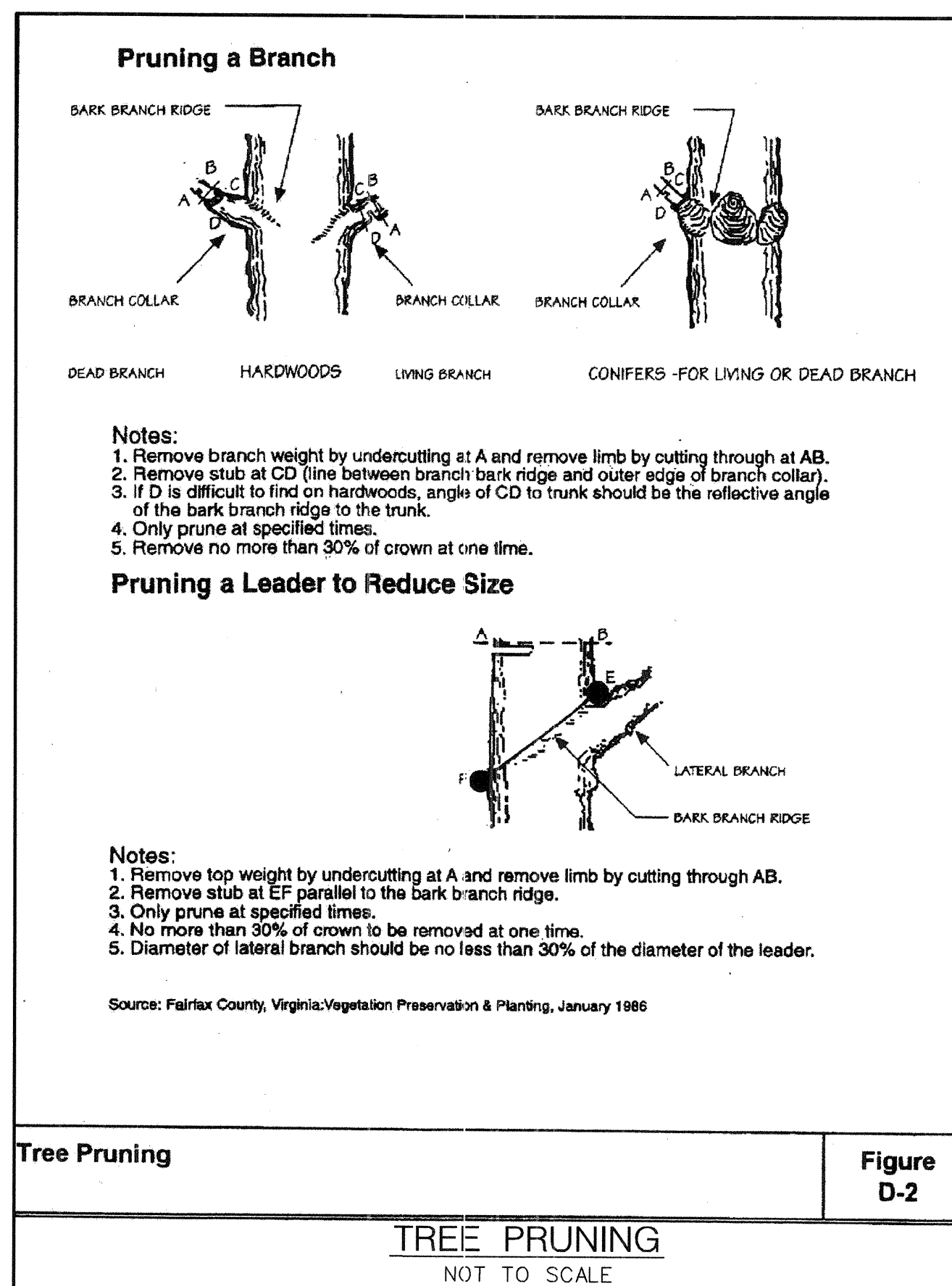
Number	Species	Common Name	Size, DBH (in)	Condition	Comments
1	<i>Quercus palustris</i>	Pin oak	46.0	Fair	Vines, broken branches
2	<i>Quercus rubra</i>	Northern red oak	36.0	Good	Located on streambank
3	<i>Quercus palustris</i>	Pin oak	31.0	Poor	Broken/dead branches, one trunk dead
4	<i>Acer saccharinum</i>	Silver maple	34.0	Fair	Vines, broken branches
5	<i>Acer saccharum</i>	Sugar maple	35.0	Fair	Missing branches, splits above dbh
6	<i>Acer saccharinum</i>	Silver maple	38.0	Fair	Some hollow spots on branches, missing branches
7	<i>Acer saccharum</i>	Sugar maple	55.0	Fair	Broken, missing branches

SOILS TABLE

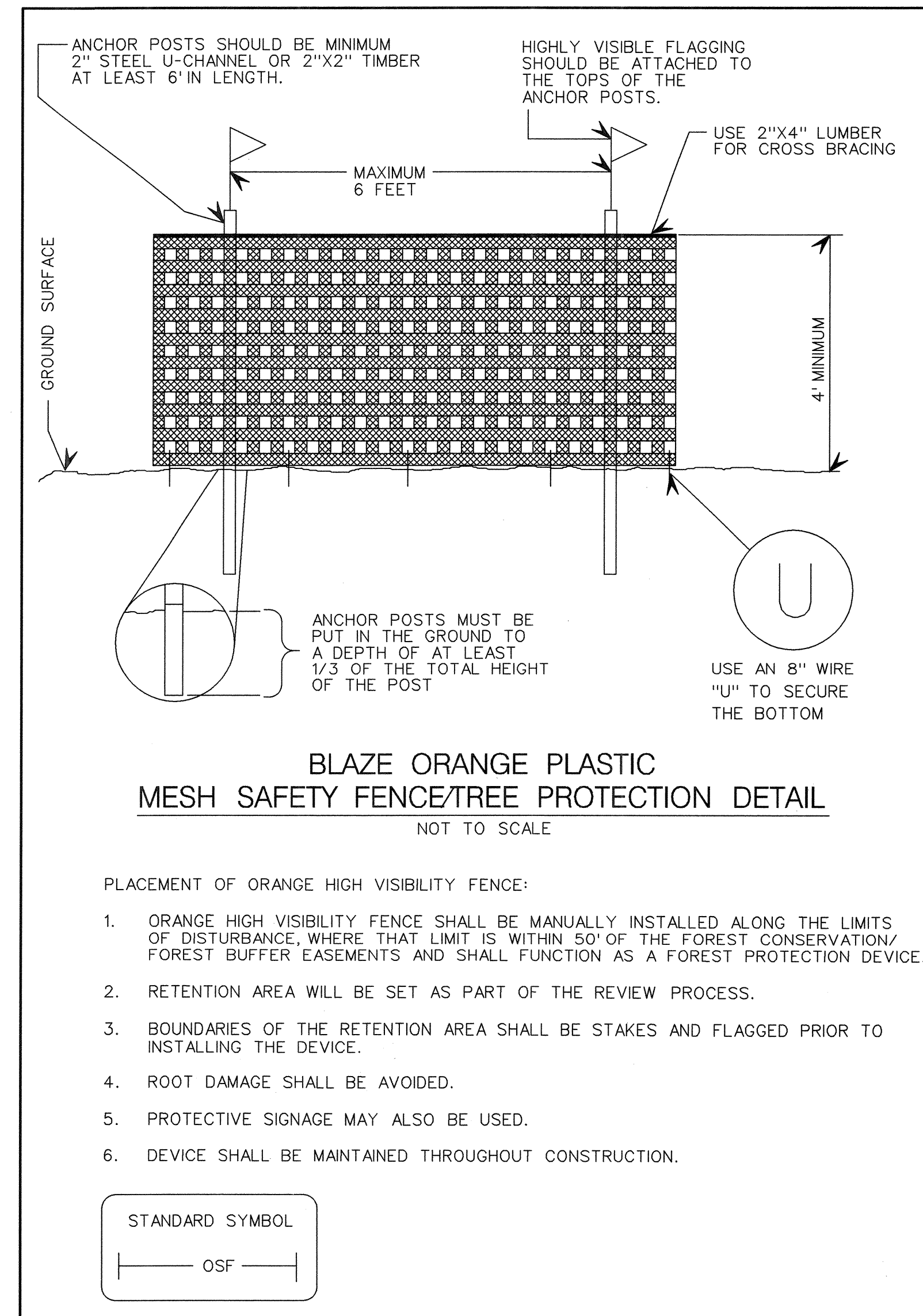
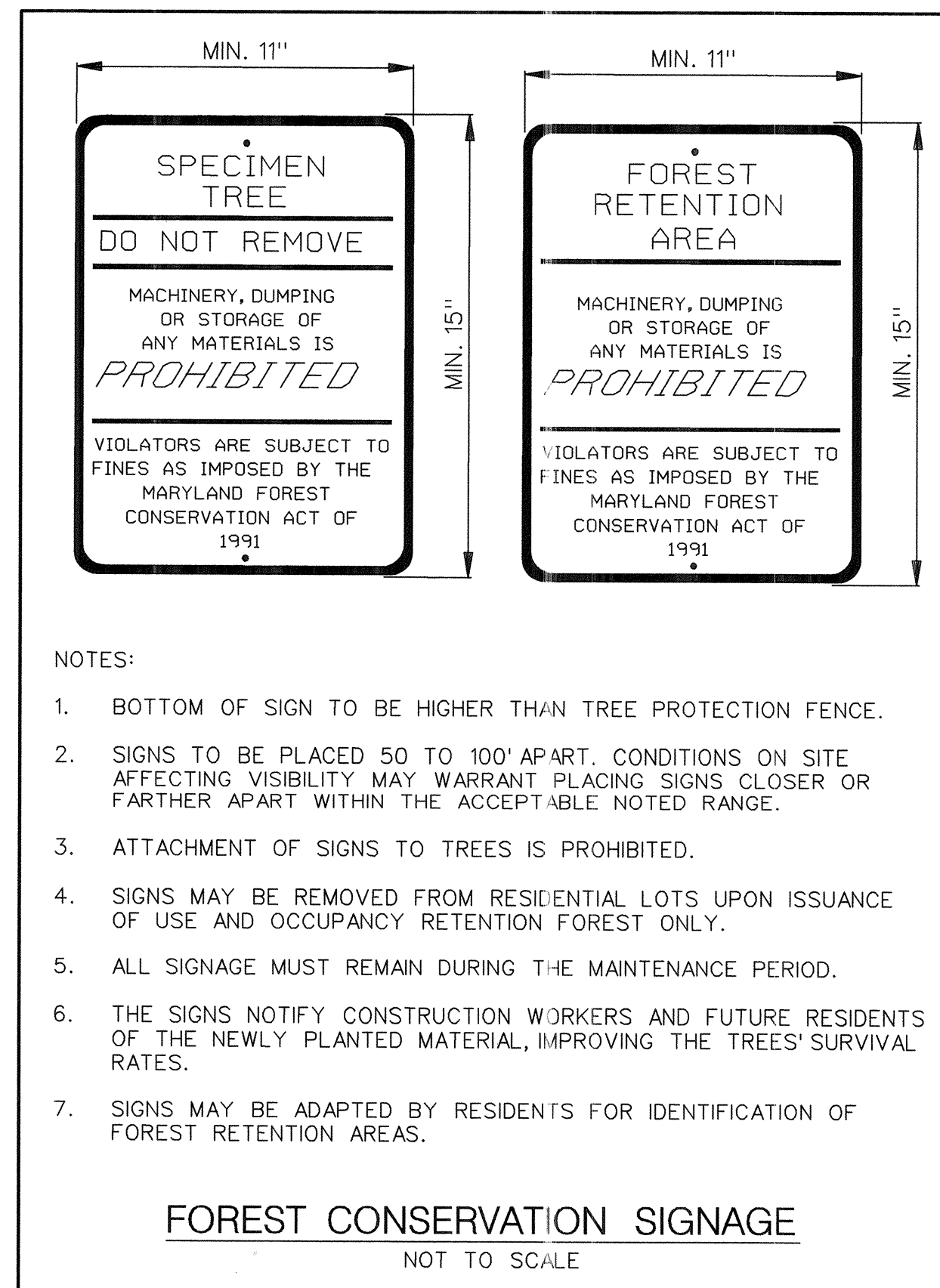
Soil Symbol	Soil Unit Name	Percent Slope	K _t value	Hydric (Y/N)
BaA	Baile silt loam	0-3	0.37	Yes
GfB	Gladstone-Urban land complex	0-8	0.28	No
GfC	Gladstone-Urban land complex	8-15		No
Ha	Hatboro-Codorus silt loams	0-3	0.37	Yes



Root Pruning Figure D-1
ROOT PRUNING
NOT TO SCALE



Tree Pruning Figure D-2
TREE PRUNING
NOT TO SCALE



NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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KCI TECHNOLOGIES

DUNLOGGIN MIDDLE SCHOOL
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 1064, 1005, 396, TAX MAP 24, 30
ZONING P20 ELECTION DISTRICT 12 GRIDBLOCK 04, 21

FOREST CONSERVATION PLAN NOTES & DETAILS

SCALE:
DATE: JUNE 2017
KCI JOB NO.: 17133314.94
CAPITAL PROJECT NO.: D-1158
PERMIT ISSUE:
CONSTRUCTION ISSUE:

FCP-03
SHEET NO.: 24 OF 24

THIS PLAN WAS PREPARED BY:
JENNIFER BIRD
KCI TECHNOLOGIES
MDNR QUALIFIED PROFESSIONAL STATUS
(SEPTEMBER 2011)

Jennifer K. Bird
SIGNATURE
DECEMBER, 2016
DATE

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

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

6/5/17
DATE

PLOTTED: 11:46 AM on Friday, June 02, 2017
FILE: W:\2013\17133314_94\Drawings\FCP\FCP-03-Dunloggin.dgn