THRESHFIELD COURT
STREAM RESTORATION PROJECT
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT D-1158

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LEGEND

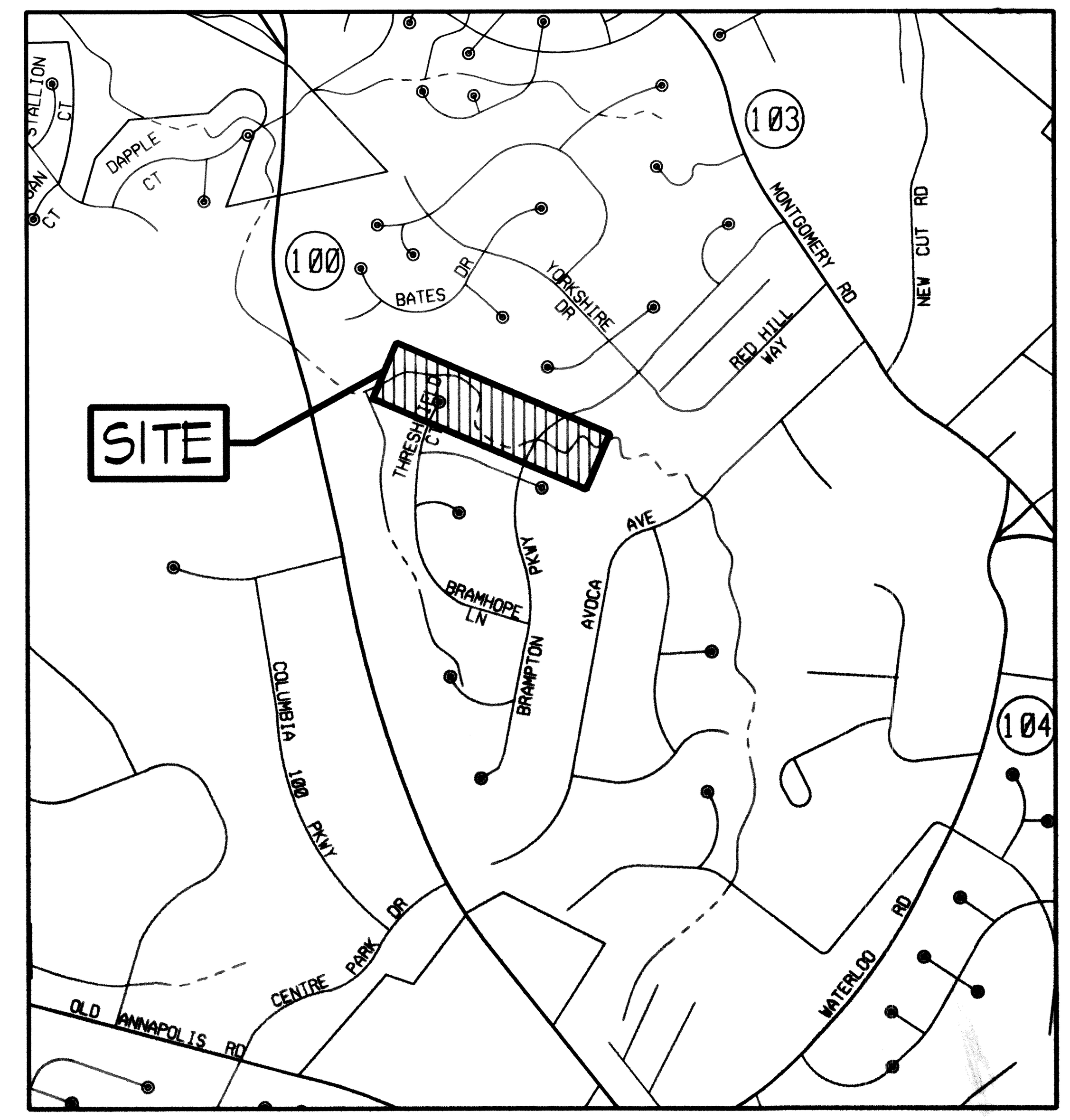
LIMITS OF DISTURBANCE — LOD —
EXISTING CONTOUR
PROPOSED CONTOUR — 350 —
100-YEAR FLOODPLAIN
PROPERTY LINE
EASEMENT LINE
WETLAND LINE
WATERS OF U.S.
WETLAND BUFFER — WB —
FENCE
SEWER LINE
SEWER MANHOLE
STORM DRAIN
EX. TREE
EX. TREE TO BE REMOVED
CONSTRUCTION BASELINE
ALTERNATING ROUGHNESS
STONE TOE PROTECTION
RIFFLE GRADE CONTROL
COBBLE STONES
CASCADE BOULDERS
STABILIZED CONSTRUCTION ENTRANCE — SCE
SILT FENCE — SF —
SUPER SILT FENCE — SSF —
ORANGE SAFETY FENCE — OSF —
SANDBAG DIVERSION
PUMP — PUMP
FILTER BAG — FB
DISCHARGE HOSE
TREE PROTECTION FENCE — TPF —
EXISTING ROAD/ PARKING LOT
EXISTING WOODS

PLANTING ZONES

LIVE STAKE ZONE
HERBACEOUS ZONE
RIPARIAN FOREST ZONE
TURF GRASS ZONE
ALTERNATING ROUGHNESS PLANTING ZONE
PFO WETLAND ZONE
PEM WETLAND ZONE

GENERAL NOTES

1. THE SUBJECT PROPERTIES ARE ZONED R-20 PER FEBRUARY 2, 2004 COMPREHENSIVE ZONING PLAN AND THE COMP-LITE ZONING AMENDMENTS DATED 7/28/2006.
2. THE HOWARD SOIL CONSERVATION DISTRICT HAS DETERMINED THAT THE DISTURBANCES WITHIN THE 100-YEAR FLOODPLAIN, WETLANDS, STREAM AND REQUIRED BUFFERS FOR THE PROPOSED STREAM RESTORATION PROJECT ARE CONSIDERED ESSENTIAL OR NECESSARY IN ACCORDANCE WITH SECTIONS 16.115(C) AND 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
3. THIS PROJECT WILL MEET THE PURPOSE AND INTENT OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL BY ALTERNATIVE COMPLIANCE.
4. THERE ARE NO KNOWN BURIAL GROUNDS OR CEMETERY SITES WITHIN THE PROJECT LIMITS.
5. THIS PLAN MEETS THE REQUIREMENTS OF THE FOREST CONSERVATION REGULATIONS.
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
7. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 24 HOURS IN ADVANCE OF ANY WORK BEING DONE.
8. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
9. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NUMBERS 30EC AND 31GB WERE USED FOR THIS SITE.
10. WATER IS PUBLIC.
11. SEWER IS PUBLIC.
12. STORMWATER MANAGEMENT IS NOT REQUIRED FOR THIS PROJECT SINCE THE PROJECT WILL NOT ADD IMPERVIOUS AREA NOR WILL IT CHANGE THE EXISTING HYDROLOGY OF THE SITE.
13. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
14. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY KCI TECHNOLOGIES, INC., IN MARCH 2011.
15. ALL WORK SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT (MDE TRACKING #201161171/11-NT-0283).
16. A TRAFFIC STUDY IS NOT REQUIRED FOR THIS PROJECT.
17. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE ENGINEER, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
18. 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.
19. A WAIVER PETITION (WP-12-042) FROM SECTION 16.155 (A)(1)(ii) WAIVER OF SITE DEVELOPMENT PLAN AND 16.1201 (n) DEFINITION OF NET TRACT AREA FOR FOREST CONSERVATION COMPUTATIONS WAS APPROVED ON 10/17/11 SUBJECT TO THE FOLLOWING CONDITIONS: A COPY OF THE TRANSFER ~~SHEET~~ RECEIPT FOR THE FOREST CONSERVATION FEE-IN-LIEU PAYMENT AND THE COMPLETED FOREST CONSERVATION DATA SUMMARY SHALL BE SUBMITTED TO DPZ, DIVISION OF LAND DEVELOPMENT; NO DISTURBANCE PERMITTED BEYOND THE LOD AS SHOWN ON THE WAIVER PETITION; AND ANY REQUIRED MDE AND/OR US ARMY CORPS OF ENGINEERS PERMITS SHALL BE ACQUIRED.



VICINITY MAP
SCALE: 1" = 1000'
NORTH

ADC MAP NO. 16 GRID E2

THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON GPS OBSERVATIONS FROM THE FOLLOWING N.G.S.TRAVERSE POINTS
HORIZONTAL NAD 1983/91
VERTICAL NAVD 1988

HOWARD COUNTY CONTROL POINTS

	NORTH	EAST	ELEVATION
30EC	571962.9162	1360059.8748	399.19
31GB	567567.4238	1367353.4231	511.28

SPECIAL CONTRACTOR NOTES

1. 100-YEAR FLOODPLAIN BOUNDARY IS SHOWN ON THE PLANS.
2. NO PERMANENT STOCKPILE OF ANY MATERIAL IS ALLOWED IN THE 100-YEAR FLOODPLAIN. MATERIAL IN STOCKPILE #2 SHALL NOT BE LEFT OVERNIGHT.
3. IN-STREAM WORK IS PROHIBITED FROM MARCH 1ST TO MAY 31ST, INCLUSIVE. STREAM CLASSIFICATION: USE IV.
4. CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
5. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN AT THE CONSTRUCTION SITE. 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.
6. CONTRACTOR SHALL NOT STORE EQUIPMENT,MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
7. 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 TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
8. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
9. ALL TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS OR BY THE ENGINEER.
10. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE. REMOVED TREES AND BRUSH MAY BE REDISTRIBUTED ON SITE AT THE DISCRETION OF THE ENGINEER OR HIS/HER REPRESENTATIVE.

STATE OF MARYLAND — JAMES A. TOMLINSON — No. 31201 — PROFESSIONAL ENGINEER

9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

PERMIT INFORMATION CHART

SUBDIVISION NAME			SECTION/AREA		PARCEL#
BRAMPTON HILLS S 4 AR1 MONTGOMERY ESTATES			NA		0393,0014
PLAT# or L/F	GRID #	ZONING	TAX MAP NO.	ELECT. DISTR.	CENSUS TRACT
20716 7497,8161	12,7	R-20	30,31	02	
WATER CODE			SEWER CODE		
PUBLIC		-	PUBLIC		-

OWNER:
HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
410-313-6444

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

[signature] 9/23/11
DIRECTOR OF PUBLIC WORKS — DATE

Evelyn [signature] 9/23/11
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE

Howard E. Saltzman 9/22/11
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

DEPARTMENT OF RECREATION AND PARKS, HOWARD COUNTY, MD

[signature] 9/22/11
DIRECTOR OF RECREATION AND PARKS — DATE

ENGINEER'S 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 SOIL CONSERVATION DISTRICT"

[signature] P.E. # 31201 — 9/29/11
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) — DATE
JAMES TOMLINSON, P.E.

DEVELOPER'S CERTIFICATE

"I/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 SOIL CONSERVATION DISTRICT"

Howard E. Saltzman [signature] — 9/22/11
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) — DATE
Howard E. Saltzman

NO.	REVISIONS DESCRIPTION	DATE
	AS-BUILT SHEETS 7-10 (KCI)	3/12

KCI FILE: M:\ 2008 \ 01081795.53 \

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SPARKS, MARYLAND 21152
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KCI TECHNOLOGIES

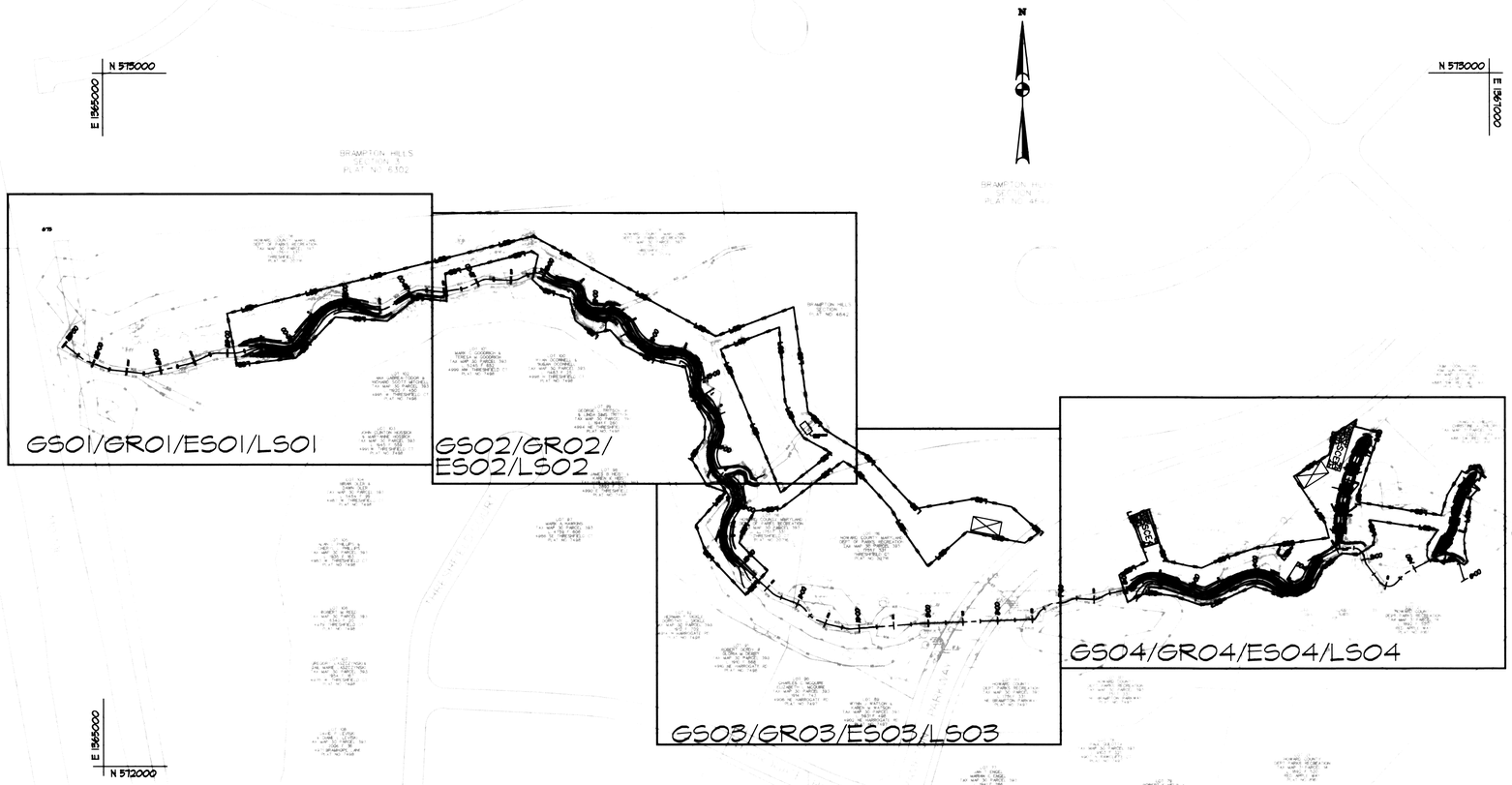
THRESHFIELD COURT
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

TITLE SHEET

SCALE:	AS SHOWN
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

EP-12-005

BY: Jacquelyn Krayenvenger Division: P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\T101_Threshfield.dgn



THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson
HOWARD SCD

9/29/11
DATE

STATE OF MARYLAND
JOHN R. ROBERTSON
No. 31201
PROFESSIONAL ENGINEER

9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

LEGEND

LIMITS OF DISTURBANCE	—LD——LD—
EXISTING CONTOUR	
PROPOSED CONTOUR	——345——
PROPERTY BOUNDARY	
EASEMENT BOUNDARY	
EXISTING TREE	
EXISTING FENCE	
EXISTING WATERS OF U.S.	
EXISTING WETLANDS	
EXISTING 25' WETLAND BOUNDARY	
STABILIZED CONSTRUCTION ENTRANCE	SCE

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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KCI TECHNOLOGIES

THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
DEVELOPMENT ENGINEERING DIVISION
8731 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD. 21046

KEY & ACCESS PLAN

SCALE:	1" = 100'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

KP01

SHEET NO.: 2 OF 27

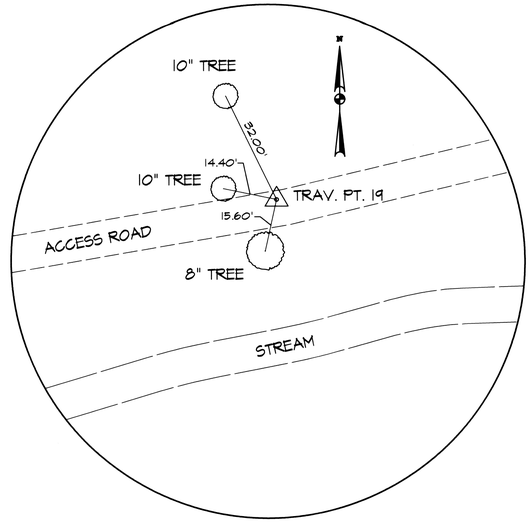
EP-12-005

PLOTTED: 09:34 AM on Thursday, September 29, 2011
BY: Kristy Potter Division P053: Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\pGR-KEY_Threshfield.dgn

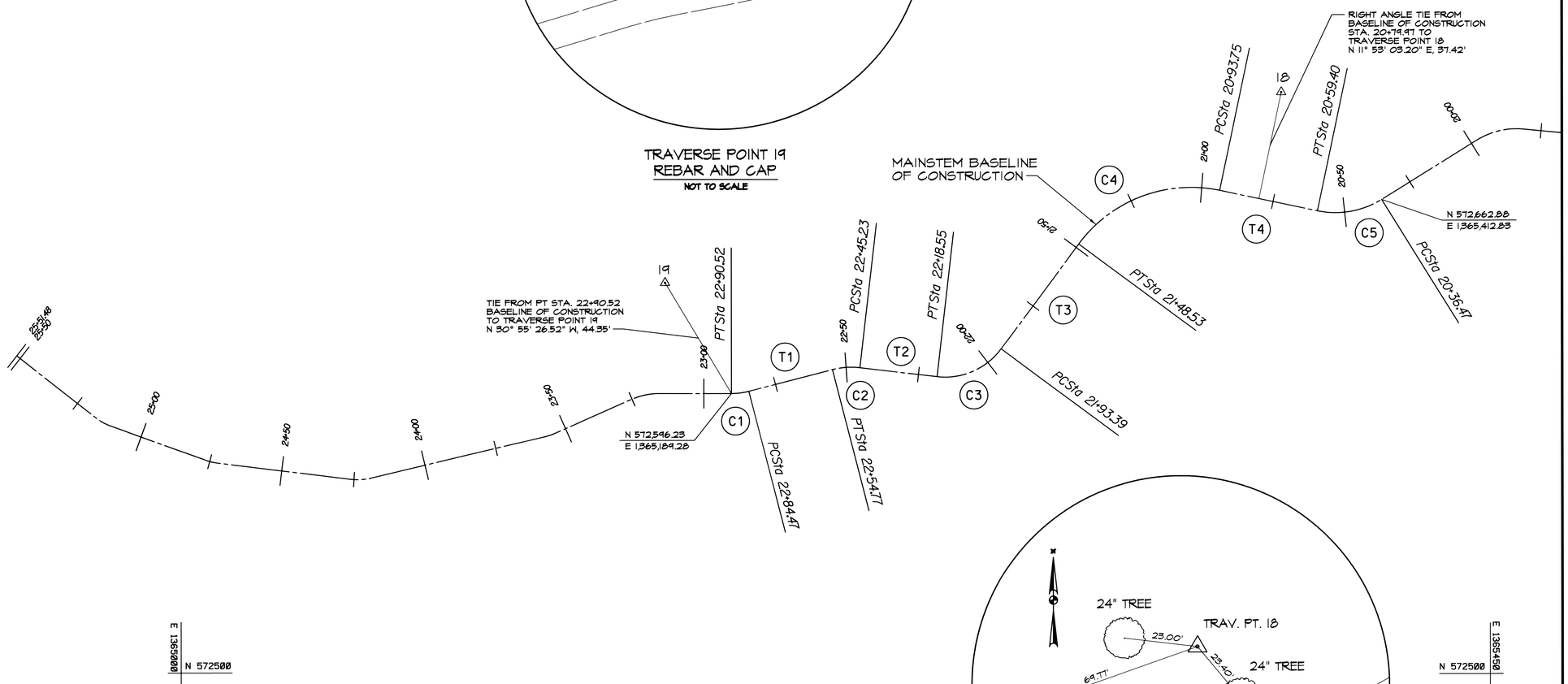
CURVE DATA						
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	
C1	24.00'	6.06'	14°27'26.56"	3.04'	S 82°46'16.72" W	6.04'
C2	26.00'	9.54'	21°01'07.88"	4.82'	S 86°03'07.38" W	9.48'
C3	24.00'	25.16'	60°04'08.92"	13.88'	S 66°31'36.86" W	24.03'
C4	48.00'	54.78'	65°23'30.80"	30.81'	S 69°11'17.80" W	51.86'
C5	30.00'	22.94'	43°48'18.35"	12.06'	S 79°58'54.02" W	22.38'

TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T1	S 75°32'33.44" W	29.70'
T2	N 83°26'18.68" W	26.68'
T3	S 36°29'32.39" W	44.85'
T4	N 78°06'56.80" W	34.35'

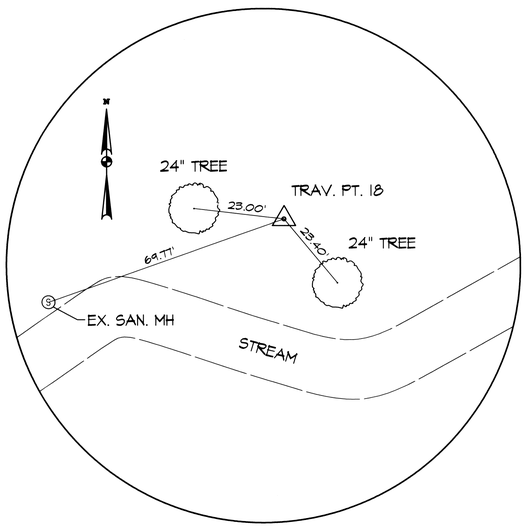
TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
18	N 572,699.84	E 1,365,378.37	383.18
19	N 572,634.27	E 1,365,166.48	381.55



TRAVERSE POINT 19
REBAR AND CAP
NOT TO SCALE



MATCHLINE (SEE SHEET GS02)



TRAVERSE POINT 18
REBAR AND CAP
NOT TO SCALE

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

9/29/11

PLOTTED: "09:36 AM on Thursday, September 29, 2011"
BY: Kristy Potter Division: P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\gs5-P001_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
9770 GUILFORD ROAD
COLUMBIA, MD 21046

GEOMETRY SHEET

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GS01

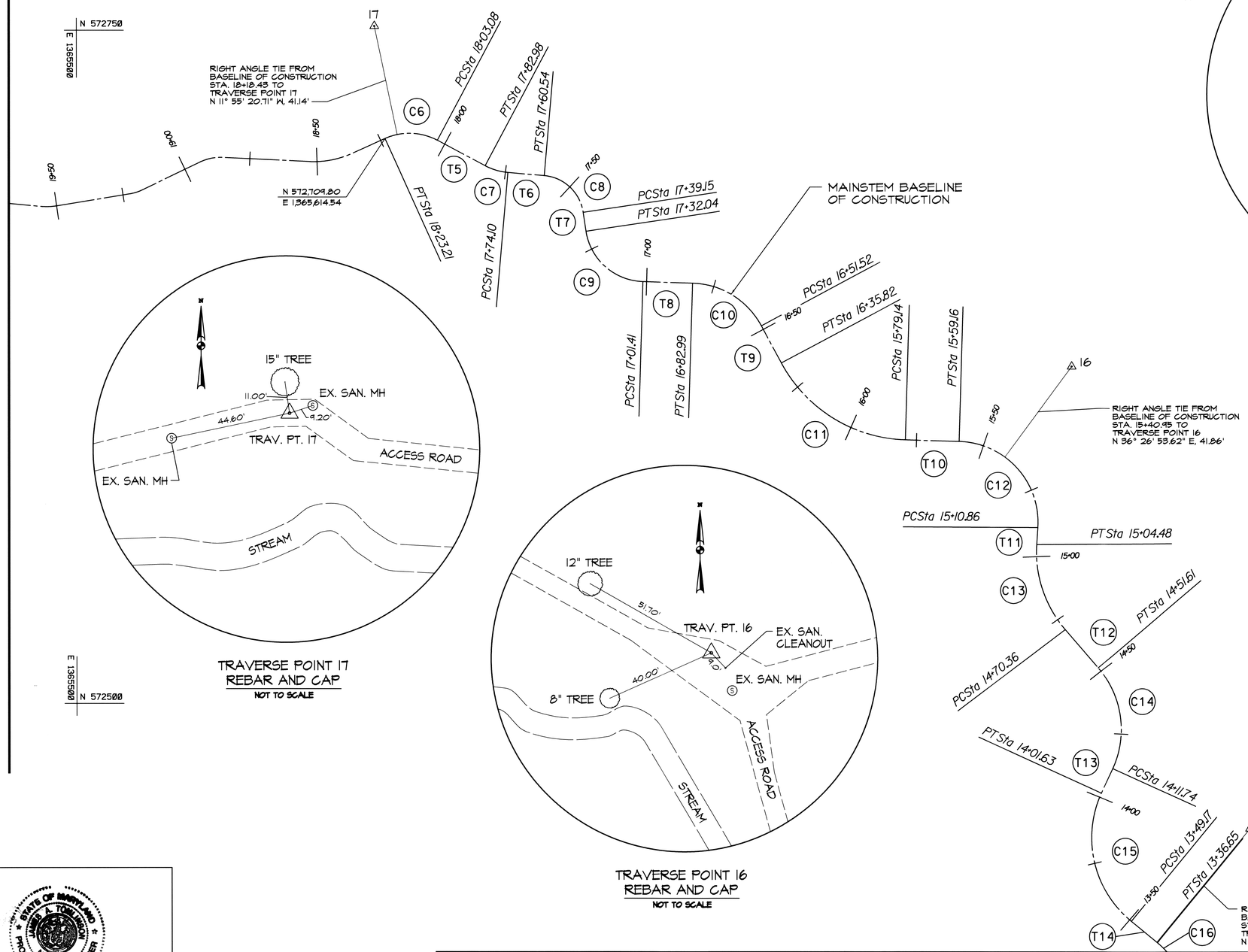
SHEET NO.: 3 OF 27

EP-12-005

CURVE DATA						
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	
C6	22.00'	20.13'	52°24'47.62"	10.83'	N 88°09'21.02" W	19.43'
C7	22.00'	8.88'	23°07'13.92"	4.50'	N 73°30'34.17" W	8.82'
C8	16.00'	21.39'	76°35'37.82"	12.63'	N 46°46'22.21" W	19.83'
C9	22.00'	30.63'	79°46'09.62"	18.38'	N 48°21'38.11" W	28.21'
C10	30.00'	31.46'	60°05'16.87"	17.35'	N 58°12'04.49" W	30.04'
C11	54.00'	56.67'	60°07'44.09"	31.26'	N 58°13'18.09" W	54.11'
C12	30.00'	48.16'	91°59'07.69"	31.06'	N 42°17'36.29" W	43.16'
C13	44.00'	34.12'	44°26'07.60"	17.97'	N 18°31'06.25" W	33.28'
C14	35.00'	39.87'	65°15'56.42"	22.41'	N 08°06'11.84" W	37.75'
C15	40.00'	52.46'	75°08'21.85"	30.77'	N 13°02'24.56" W	48.78'
C16	31.00'	44.85'	82°53'12.55"	27.37'	N 09°09'59.21" W	41.04'

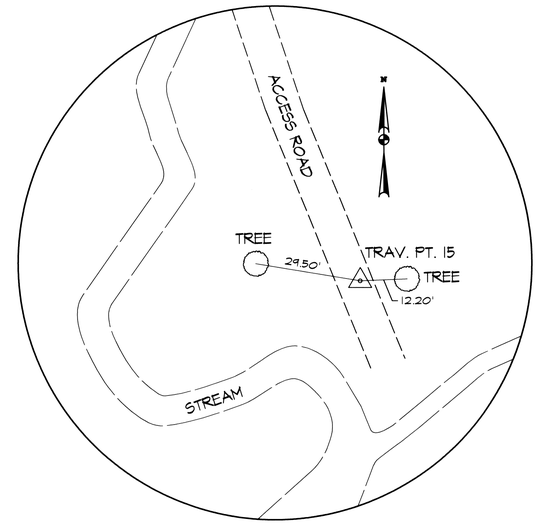
TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T5	N 61°56'57.21" W	20.10'
T6	N 85°04'11.13" W	13.57'
T7	N 08°28'33.30" W	7.11'
T8	N 88°14'42.92" W	18.42'
T9	N 28°09'26.05" W	15.71'
T10	N 88°17'10.14" W	19.99'
T11	N 03°41'57.55" E	6.38'
T12	N 40°44'10.05" W	18.75'
T13	N 24°31'46.37" E	10.11'
T14	N 50°36'35.48" W	12.53'

TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
15	N 572,453.60	E 1,365,935.39	389.62
16	N 572,625.17	E 1,365,869.38	388.60
17	N 572,751.54	E 1,365,610.57	385.10



TRAVERSE POINT 17
REBAR AND CAP
NOT TO SCALE

TRAVERSE POINT 16
REBAR AND CAP
NOT TO SCALE



TRAVERSE POINT 15
REBAR AND CAP
NOT TO SCALE

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

STATE OF MARYLAND · JAMES A. TOWLSON · No. 31201 · PROFESSIONAL ENGINEER

9/29/11

PLOTTED: 09:36 AM on Thursday, September 29, 2011
BY: Kristy Potter Division: P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\gs5-P002_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
9701 COLONIAL HIGHWAY DRIVE
COLUMBIA, MD 21046

GEOMETRY SHEET

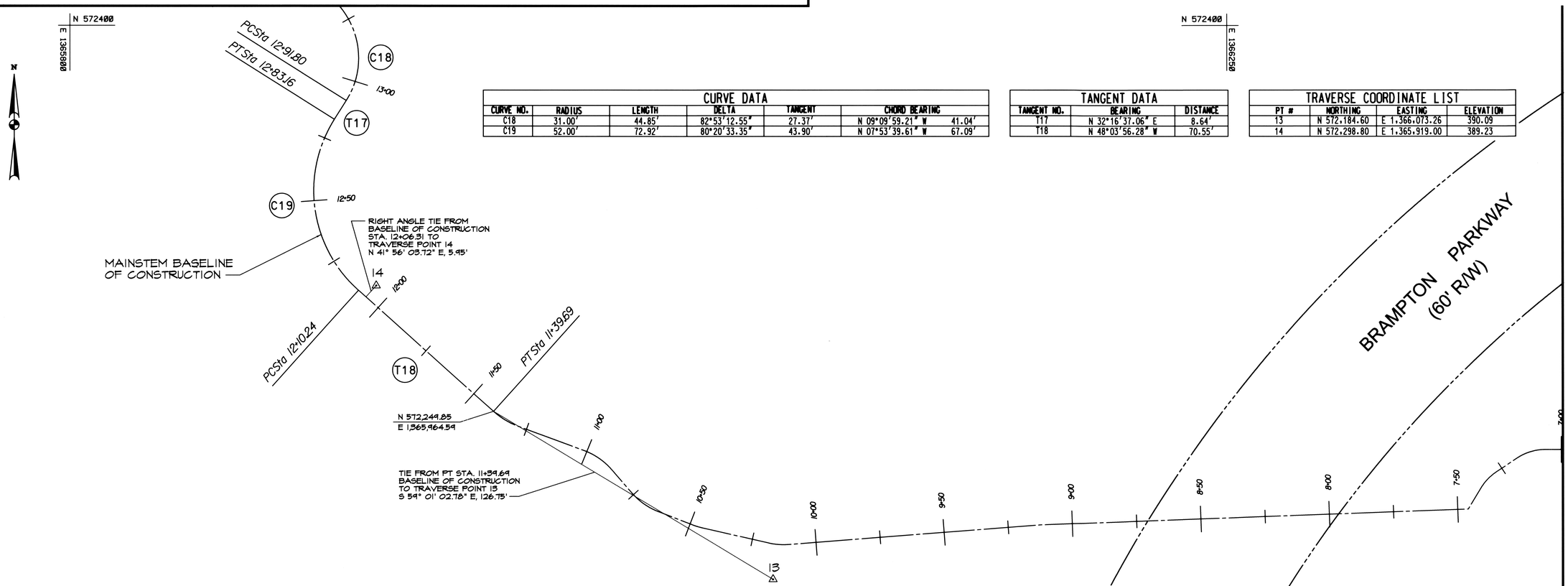
SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GS02

SHEET NO.: 4 OF 27

EP-12-005

MATCHLINE (SEE SHEET GS02)

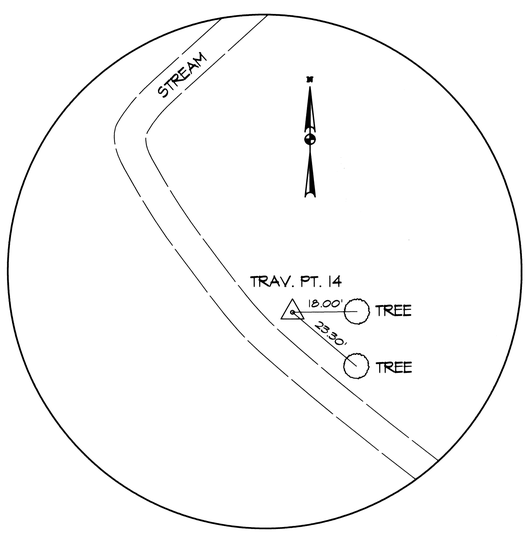


MATCHLINE (SEE SHEET GS04)

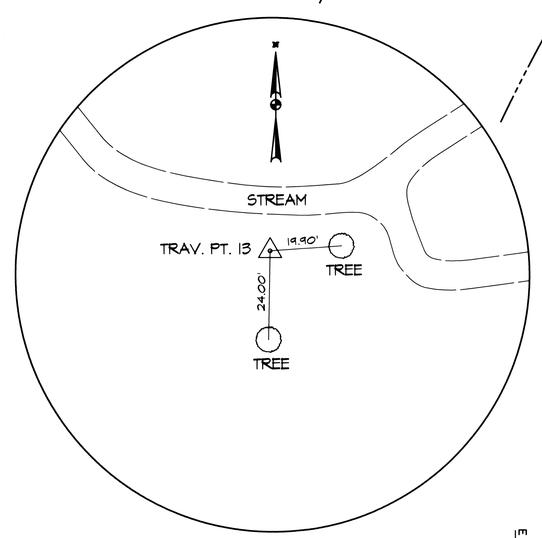
CURVE DATA						
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	
C18	31.00'	44.85'	82°53'12.55"	27.37'	N 09°09'59.21" W	41.04'
C19	52.00'	72.92'	80°20'33.35"	43.90'	N 07°53'39.61" W	67.09'

TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T17	N 32°16'37.06" E	8.64'
T18	N 48°03'56.28" W	70.55'

TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
13	N 572,184.60	E 1,366,073.26	390.09
14	N 572,298.80	E 1,365,919.00	389.23



TRAVERSE POINT 14
REBAR AND CAP
NOT TO SCALE



TRAVERSE POINT 13
REBAR AND CAP
NOT TO SCALE

N 572000
E 1366250

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

9/28/11

PLOTTED: '09:37 AM on Thursday, September 29, 2011'
BY: Kristy Potter Division: P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\DS-P003_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

GEOMETRY SHEET

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GS03

SHEET NO.: 5 OF 27

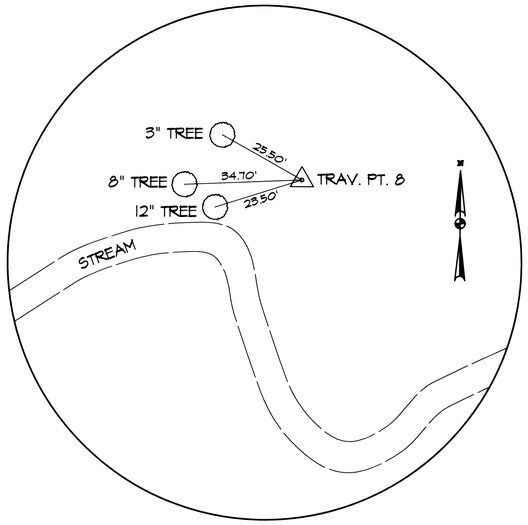
EP-12-005

MATCHLINE (SEE SHEET GS03)

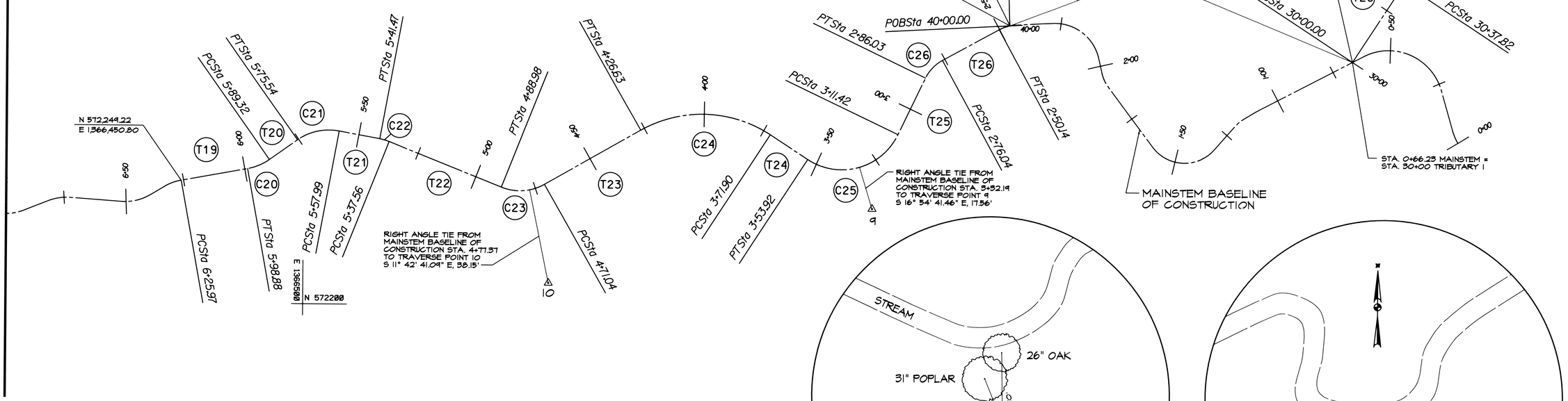
CURVE DATA						
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	
C20	22.00'	9.56'	24°54'07.50"	4.86'	S 67°04'59.13" W	9.49'
C21	22.00'	17.55'	45°42'55.66"	9.27'	S 77°29'23.22" W	17.09'
C22	20.00'	3.91'	11°11'36.47"	1.96'	N 74°03'20.72" W	3.90'
C23	20.00'	17.94'	51°23'12.87"	9.62'	S 85°50'51.08" W	17.34'
C24	50.00'	54.73'	62°43'16.73"	30.47'	N 88°29'06.99" W	52.04'
C25	25.00'	42.50'	97°24'27.84"	28.46'	S 74°10'17.45" W	37.57'
C26	16.00'	9.99'	35°46'30.83"	5.16'	S 43°21'18.95" W	9.83'
C27	272.00'	166.81'	35°08'19.44"	86.12'	N 14°21'48.26" E	164.21'
C28	49.00'	22.40'	26°11'17.95"	11.40'	N 19°59'05.98" E	22.20'
C29	109.00'	60.29'	31°41'35.20"	30.94'	N 22°44'14.61" E	59.53'

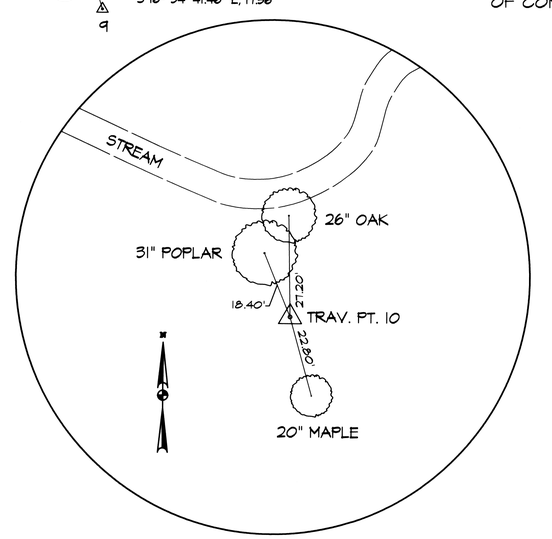
TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T19	S 79°32'02.88" W	27.09'
T20	S 54°37'55.38" W	13.78'
T21	N 79°39'08.95" W	16.53'
T22	N 68°27'32.49" W	48.58'
T23	S 60°09'14.64" W	44.41'
T24	N 57°07'28.63" W	17.98'
T25	S 25°28'03.53" W	25.38'
T26	S 61°14'34.36" W	25.90'
T27	N 31°55'57.98" E	4.90'
T28	N 33°04'44.95" E	37.82'
T29	N 06°53'27.01" E	6.10'
T30	N 38°35'02.21" E	14.46'

TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
8	N 572,335.22	E 1,366,836.90	399.74
9	N 572,240.14	E 1,366,728.19	398.34
10	N 572,209.30	E 1,366,598.44	398.11

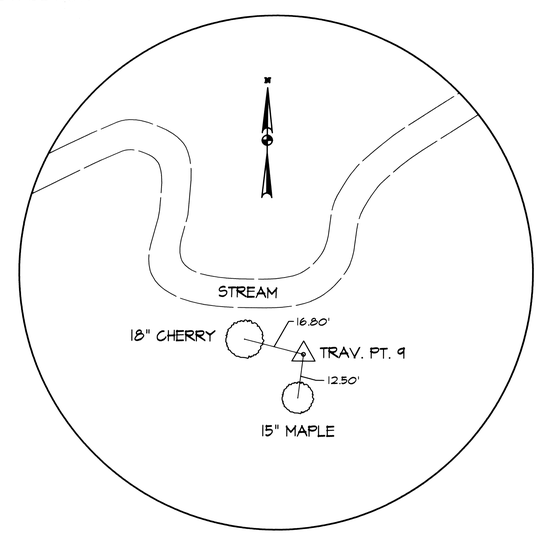


TRAVERSE POINT 8
REBAR AND CAP
NOT TO SCALE





TRAVERSE POINT 10
REBAR AND CAP
NOT TO SCALE



TRAVERSE POINT 9
REBAR AND CAP
NOT TO SCALE

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

9/29/11

PLOTTED: '09:37 AM on Thursday, September 29, 2011'
BY: Kristy Potter Division PA03 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\GS3-P004_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
8985 GUILFORD ROAD, SUITE 200
COLUMBIA, MD 21046

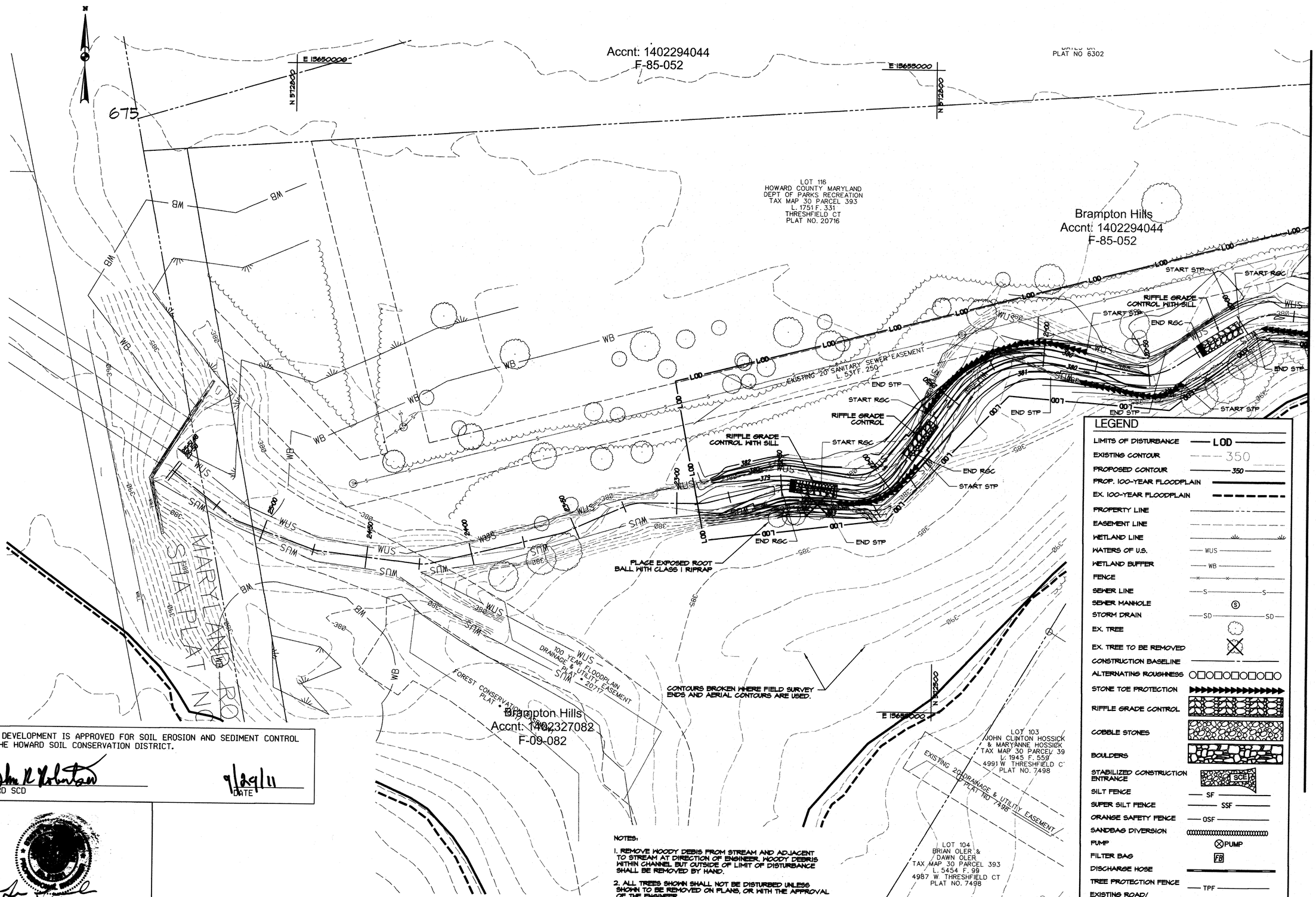
GEOMETRY
SHEET

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GS04

SHEET NO.: 6 OF 27

EP-12-005



NOTES:

1. REMOVE WOODY DEBIS FROM STREAM AND ADJACENT TO STREAM AT DIRECTION OF ENGINEER. WOODY DEBRIS WITHIN CHANNEL BUT OUTSIDE OF LIMIT OF DISTURBANCE SHALL BE REMOVED BY HAND.

2. ALL TREES SHOWN SHALL NOT BE DISTURBED UNLESS SHOWN TO BE REMOVED ON PLANS, OR WITH THE APPROVAL OF THE ENGINEER.

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

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. 31281, EXPIRATION DATE: JANUARY 24, 2013

9/29/11

LEGEND

LIMITS OF DISTURBANCE	LOD
EXISTING CONTOUR	350
PROPOSED CONTOUR	350
PROP. 100-YEAR FLOODPLAIN	
EX. 100-YEAR FLOODPLAIN	
PROPERTY LINE	
EASEMENT LINE	
WETLAND LINE	
WATERS OF U.S.	WUS
WETLAND BUFFER	WB
FENCE	
SEWER LINE	S
SEWER MANHOLE	S
STORM DRAIN	SD
EX. TREE	
EX. TREE TO BE REMOVED	
CONSTRUCTION BASELINE	
ALTERNATING ROUGHNESS	
STONE TOE PROTECTION	
RIFFLE GRADE CONTROL	
COBBLE STONES	
BOULDERS	
STABILIZED CONSTRUCTION ENTRANCE	SCE
SILT FENCE	SF
SUPER SILT FENCE	SSF
ORANGE SAFETY FENCE	OSF
SANDBAG DIVERSION	
PUMP	PUMP
FILTER BAG	FB
DISCHARGE HOSE	
TREE PROTECTION FENCE	TPF
EXISTING ROAD/ PARKING LOT	
EXISTING WOODS	
HO. CO. DEPT. OF REC. & PARKS FOREST CONSERVATION EASEMENT	FCE

NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

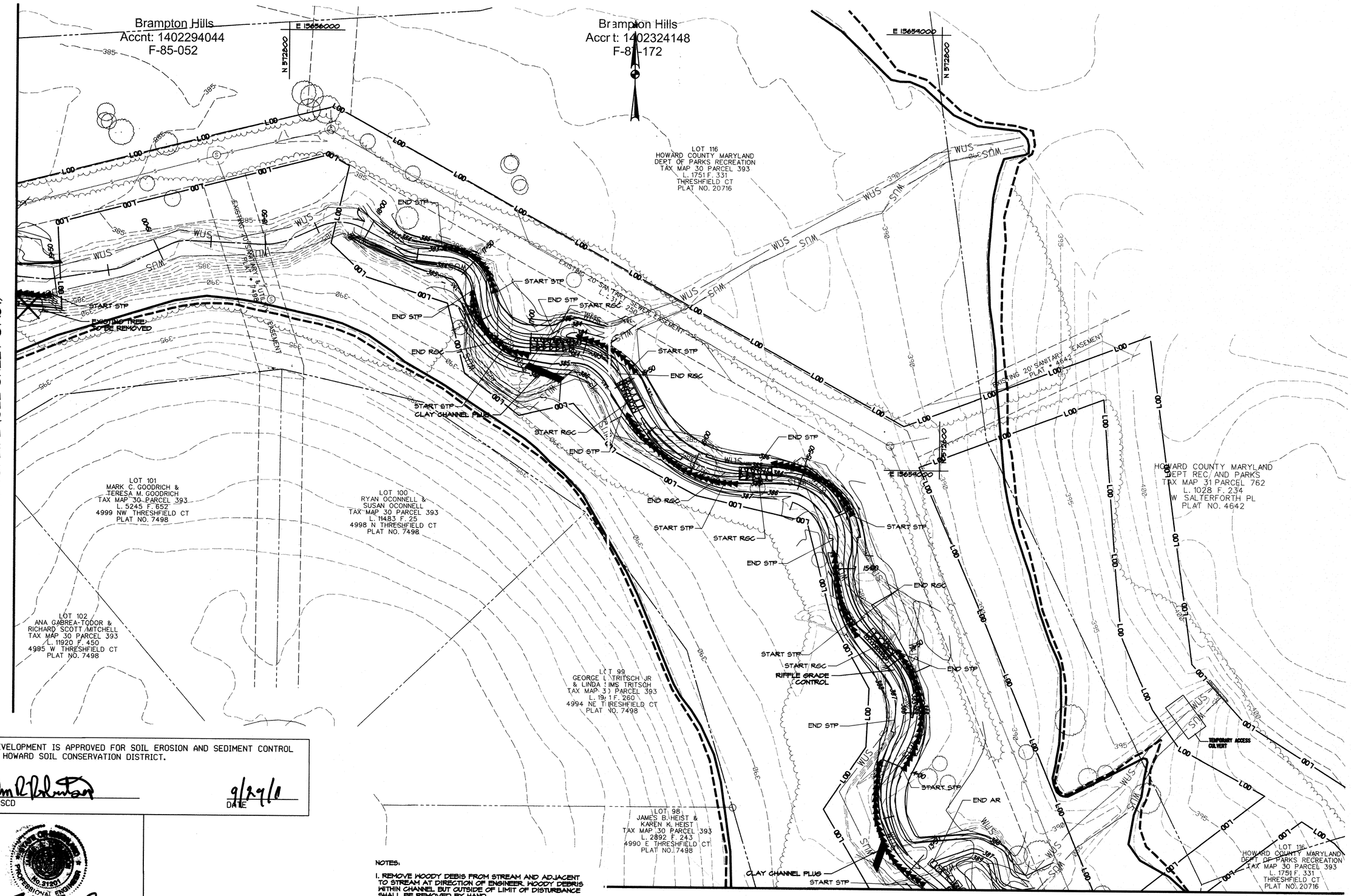
GRADING PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GR01

SHEET NO.: 7 OF 27

BY: Kirby Potter Division: P053 Water Resources GMA Emp
J:\2008\01081795.53\drawings\GDR-PDOL\threshfield.dgn



THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

9/29/11

NOTES:

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NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING, MANAGEMENT DIVISION
9770 CLARIDGE CENTER DRIVE
COLUMBIA, MD 21046

GRADING PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GR02

SHEET NO.: 8 OF 27

BY: Kristy Fotter Division: P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\CR-PD02_Threshfield.dgn

EP-12-005

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 31201

9/29/11

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

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2. ALL TREES SHOWN SHALL NOT BE DISTURBED UNLESS SHOWN TO BE REMOVED ON PLANS, OR WITH THE APPROVAL OF THE ENGINEER.

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING - CONSTRUCTION MANAGEMENT
6751 COLUMBIA GATEWAY DRIVE
SUITE 300
COLUMBIA, MD 21046

GRADING PLAN

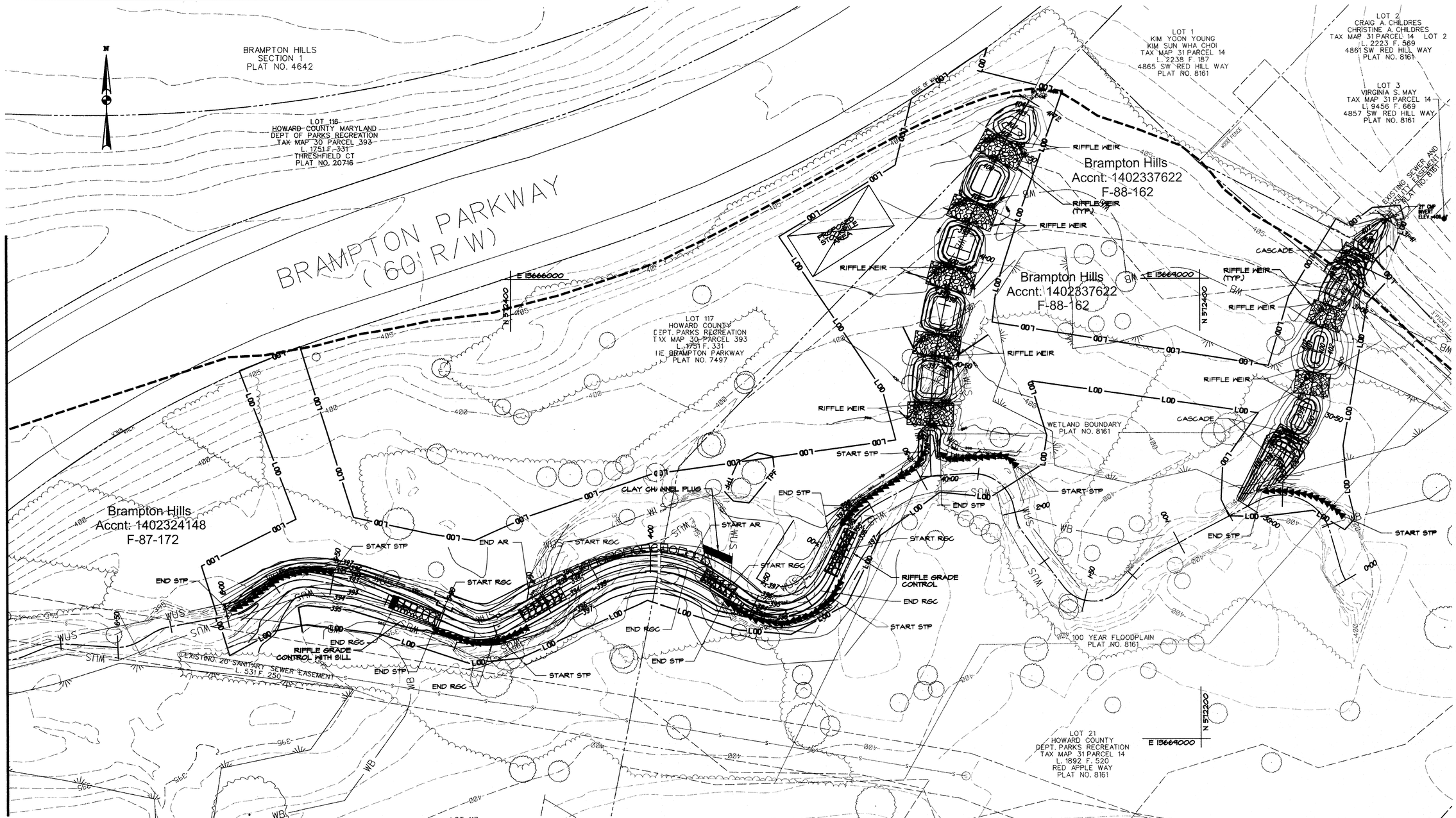
SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GR03

SHEET NO.: 9 OF 27

F.P-12-005

BY: Kirby, Peter Division: F053 Water Resources GMA Eng.
FILE: P:\2008\01081795.53\drawings\SPP-F053_Threshfield.dgn



THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JOHN A. TOWNSEND — NO. 31201 — PROFESSIONAL ENGINEER

9/29/11

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NOTES:

1. NOTE: REMOVE WOODY DEBIS FROM STREAM AND ADJACENT TO STREAM AT DIRECTION OF ENGINEER. WOODY DEBRIS WITHIN CHANNEL BUT OUTSIDE OF LIMIT OF DISTURBANCE SHALL BE REMOVED BY HAND. NO TREES SHALL BE CLEARED UNLESS ABSOLUTELY NECESSARY TO ACCESS OR PERFORM WORK. TREES WITH FENCING AS SHOWN SHALL NOT BE REMOVED.

2. ALL TREES SHOWN SHALL NOT BE DISTURBED UNLESS SHOWN TO BE REMOVED ON PLANS, OR WITH THE APPROVAL OF THE ENGINEER.

NO.	REVISIONS DESCRIPTION	DATE

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CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
9250 BOBBY JONES STATION DRIVE
COLUMBIA, MD 21046

GRADING PLAN

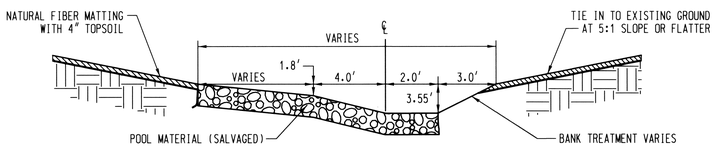
SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GR04

SHEET NO.: 10 OF 27

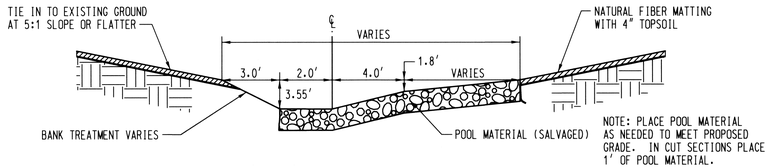
BY: Kisty, Peter Division: F003 Water Resources GNA Emp
FILE: M:\2008\01081795.53\drawings\gdr\F004_threshfield.dgn

FD-12-006



TYPICAL SECTION – POOL RIGHT

NOT TO SCALE



TYPICAL SECTION – POOL LEFT

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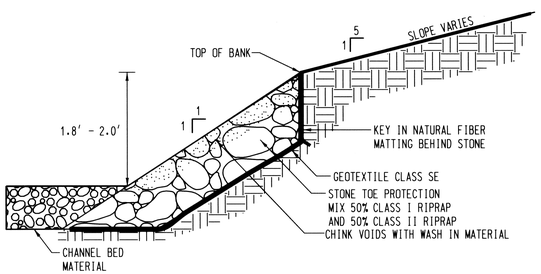
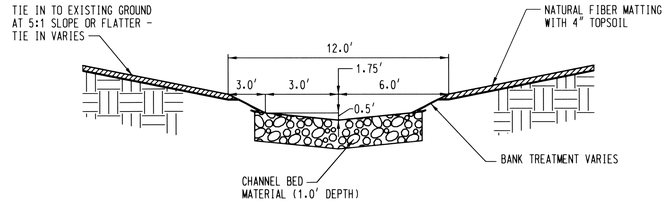


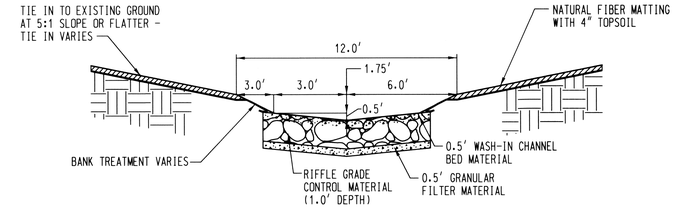
STONE TOE PROTECTION

NOT TO SCALE



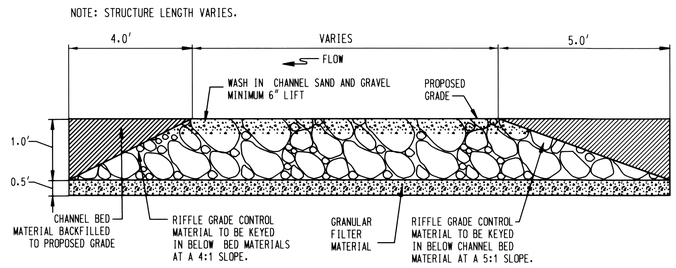
TYPICAL SECTION – RIFFLE

NOT TO SCALE



RIFFLE GRADE CONTROL

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.

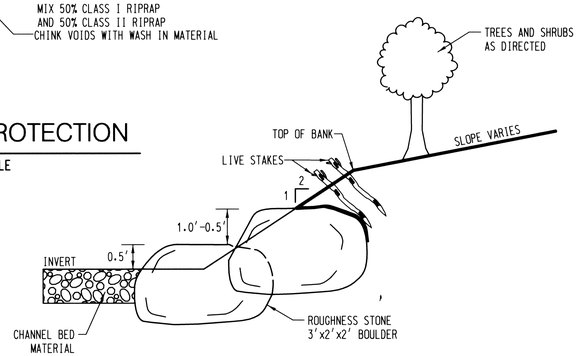
TYPICAL RIFFLE GRADE CONTROL PROFILE

NOT TO SCALE

GRANULAR FILTER MATERIAL	
% LESS THAN	US STD SIEVE
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

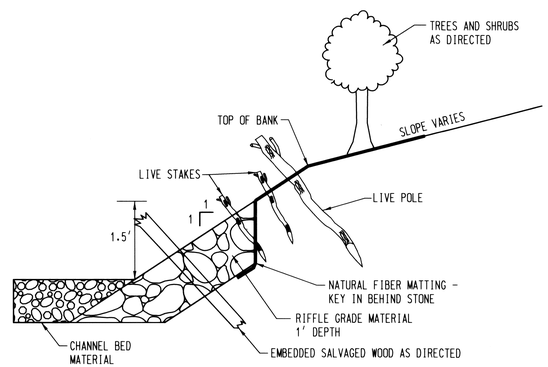
SIZES FOR STONE TYPES	
STONE TYPE	STONE SIZE
RIFFLE GRADE CONTROL MATERIAL	6" NATURAL COBBLES (NOT RIPRAP) (6" IS MINIMUM SIZE)
CHANNEL BED MATERIAL	1"-3" NATURAL STONE
STONE TOE PROTECTION	50% CLASS I AND 50% CLASS II
ROUGHNESS/WEIR STONE	3'x2'x2'

NOTE: CHANNEL BED MATERIAL SHALL BE SALVAGED WHEN POSSIBLE. ONLY FURNISH CHANNEL BED MATERIAL WHEN SALVAGED MATERIAL IS NOT AVAILABLE. ALL POOL MATERIAL SHALL BE SALVAGED ON SITE.



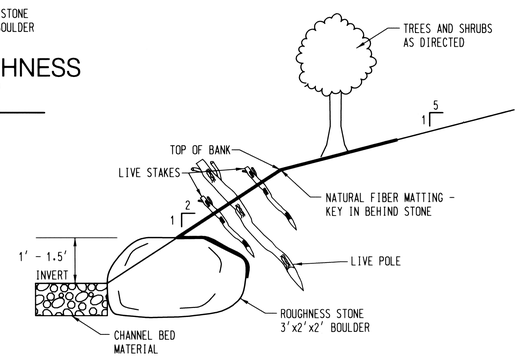
ALTERNATING ROUGHNESS SECTION A–A'

NOT TO SCALE



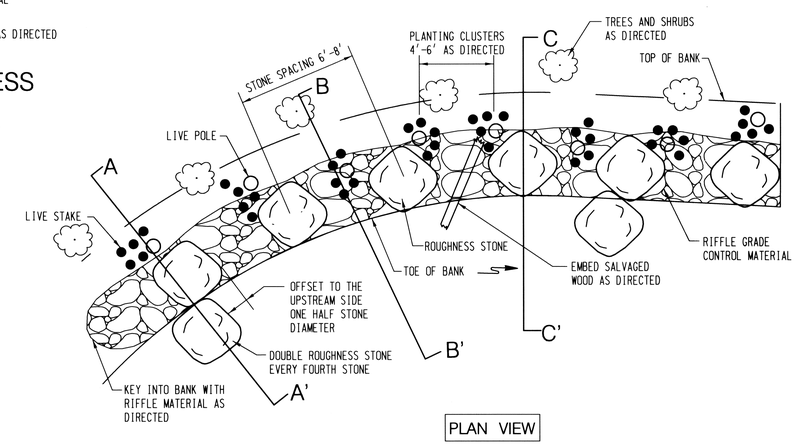
ALTERNATING ROUGHNESS SECTION B–B'

NOT TO SCALE



ALTERNATING ROUGHNESS SECTION C–C'

NOT TO SCALE



ALTERNATING ROUGHNESS

NOT TO SCALE

STATE OF MARYLAND
JAMES A. TOWLEN
No. 31201
PROFESSIONAL ENGINEER

9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: 11:00 AM on Thursday, September 29, 2011
By: Wilson, Paul on Thursday, September 29, 2011 Workspace: PW_WORK
FILE: M:\2008\01081795.53\drawings\DE-P001_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.53 \

936 Ridgebrook Road
Sparks, Maryland 21152
Telephone: (410) 316-7800
Fax: (410) 316-7818
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KCI TECHNOLOGIES

THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

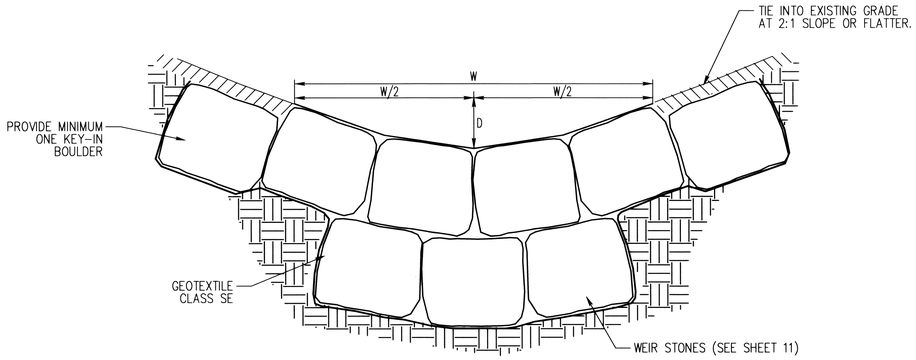
STREAM DETAILS

SCALE:	NTS
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

DE01

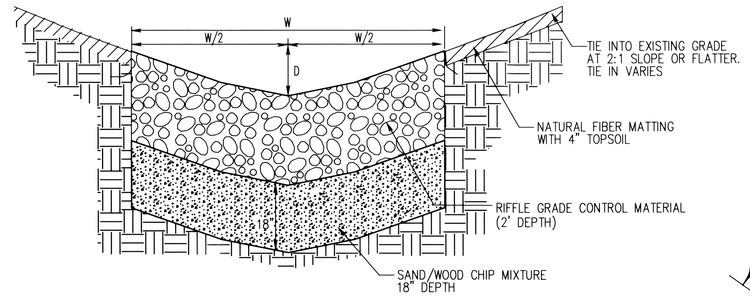
SHEET NO.: 11 OF 27

EP-12-005



TYPICAL SECTION - WEIR STONE

NOT TO SCALE



TYPICAL SECTION - COBBLE WEIR

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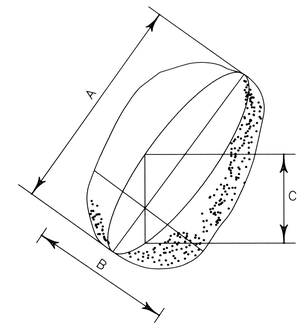
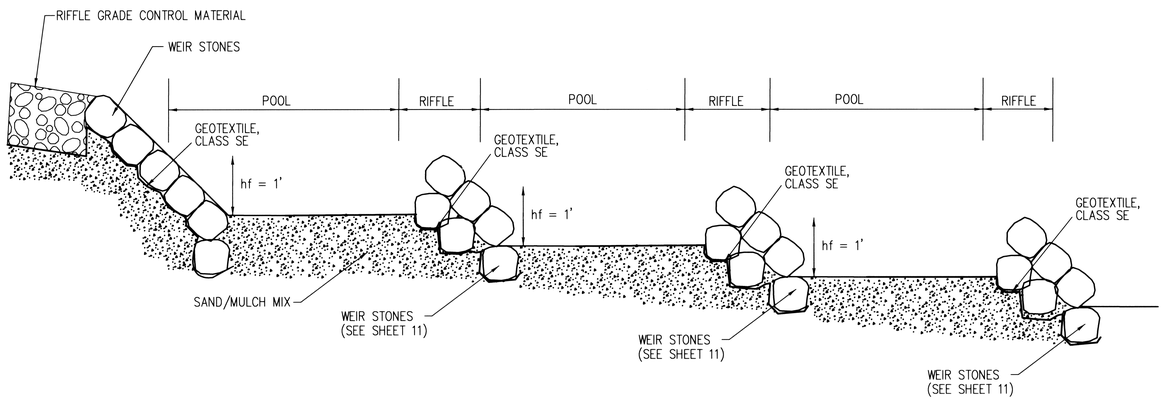


A = LONGEST AXIS (LENGTH)
B = INTERMEDIATE AXIS (WIDTH)
C = SHORTEST AXIS (THICKNESS)

ROCK AXIS DEFINITION

NOT TO SCALE
SEE SHEET 11 FOR STONE SIZES

SAND / WOODCHIP MIXTURE	
80%	SAND (0.02" TO 0.04")
20%	WOODCHIPS



CASCADE DETAIL

NOT TO SCALE

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

STREAM
DETAILS

SCALE:	NTS
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

DE02

SHEET NO.: 12 OF 27

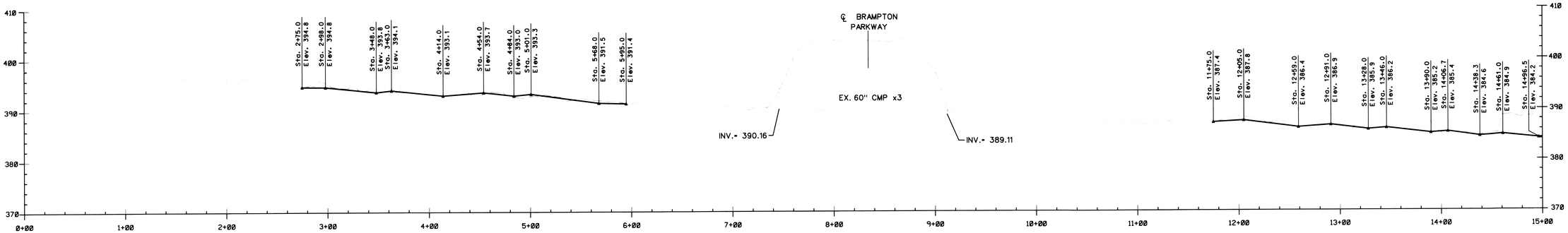
STATE OF MARYLAND
JAMES A. TOWLINSON
No. 31201
PROFESSIONAL ENGINEER

9/29/11

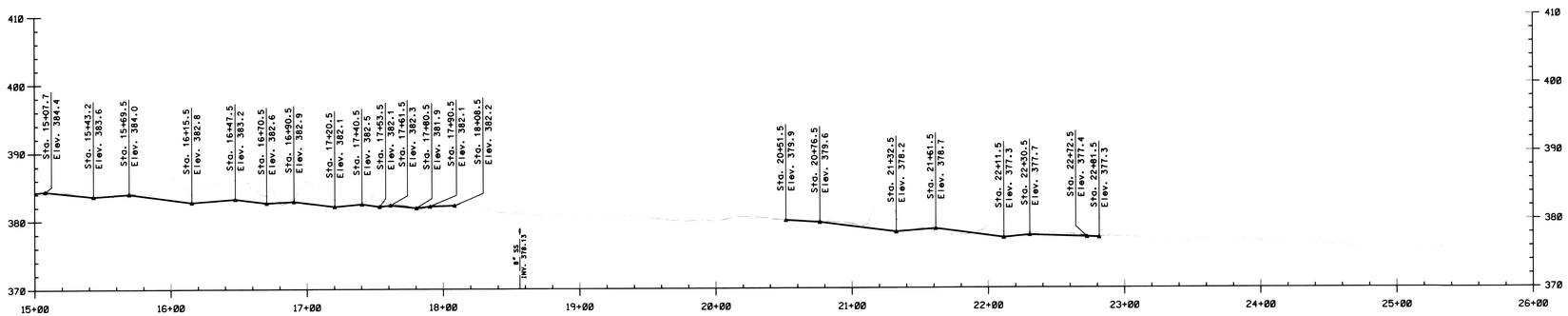
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 31201, EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: "11:10 AM on Thursday, September 29, 2011"
BY: KEVIN Patterson FOR: Howard County Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\pDE-PP002_Threshfield.dgn

EP-12-005



STA. 0+00 TO 15+00
SCALE: H: 1"=50'
V: 1"=10'



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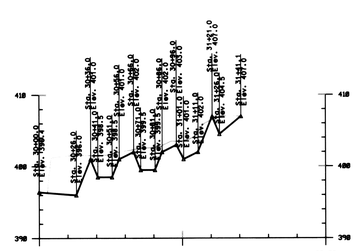

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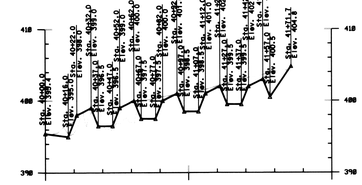

STA. 40+00 TO 41+71.7
SCALE: H: 1"=50'
V: 1"=10'

LEGEND

EXISTING GROUND

PROPOSED GRADE

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JAMES A. TOM JACKSON — No. 31201 — PROFESSIONAL ENGINEER

9/29/11

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. 31201 , EXPIRATION DATE:JANUARY 24, 2013

By:Kim Potter Division:P053 Water Resources CAA Emp
FILE: M:\2008\01081795.53\drawings\PR-P001_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

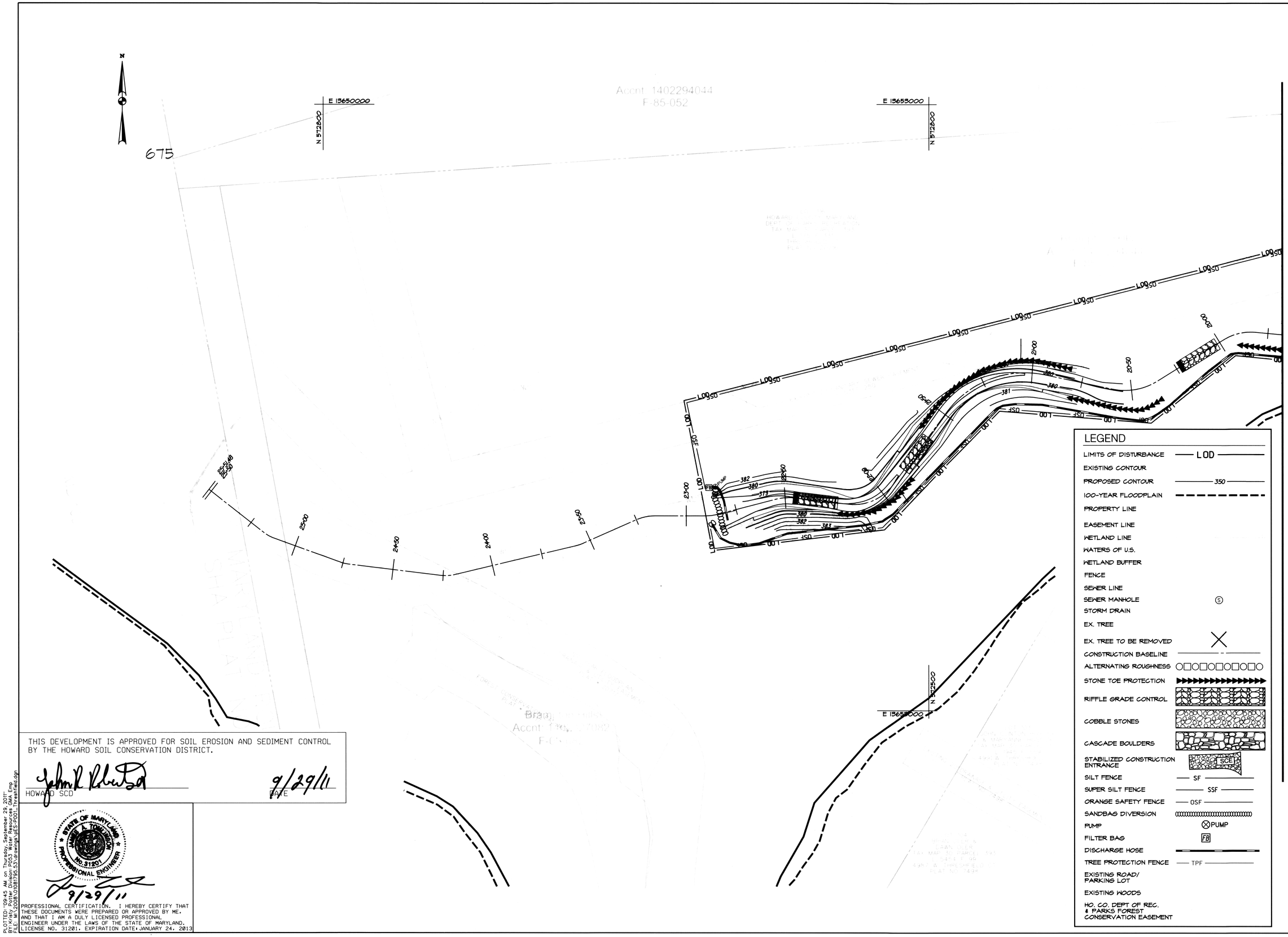
PROFILE SHEET

SCALE:	AS SHOWN
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PR01

SHEET NO.: 13 OF 27

EP-12-005



THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JAMES A. TOWNSON — NO. 31201 — PROFESSIONAL ENGINEER

9/29/11

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: 10:45 AM on Thursday, September 29, 2011
BY: Kristy Potter Division: PDS3 Water Resources CMA Emp
FILENAME: C:\Projects\01081795.53\drawings\ES-ES02_threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
3430 COURTHOUSE DRIVE
COLUMBIA, MD 21046

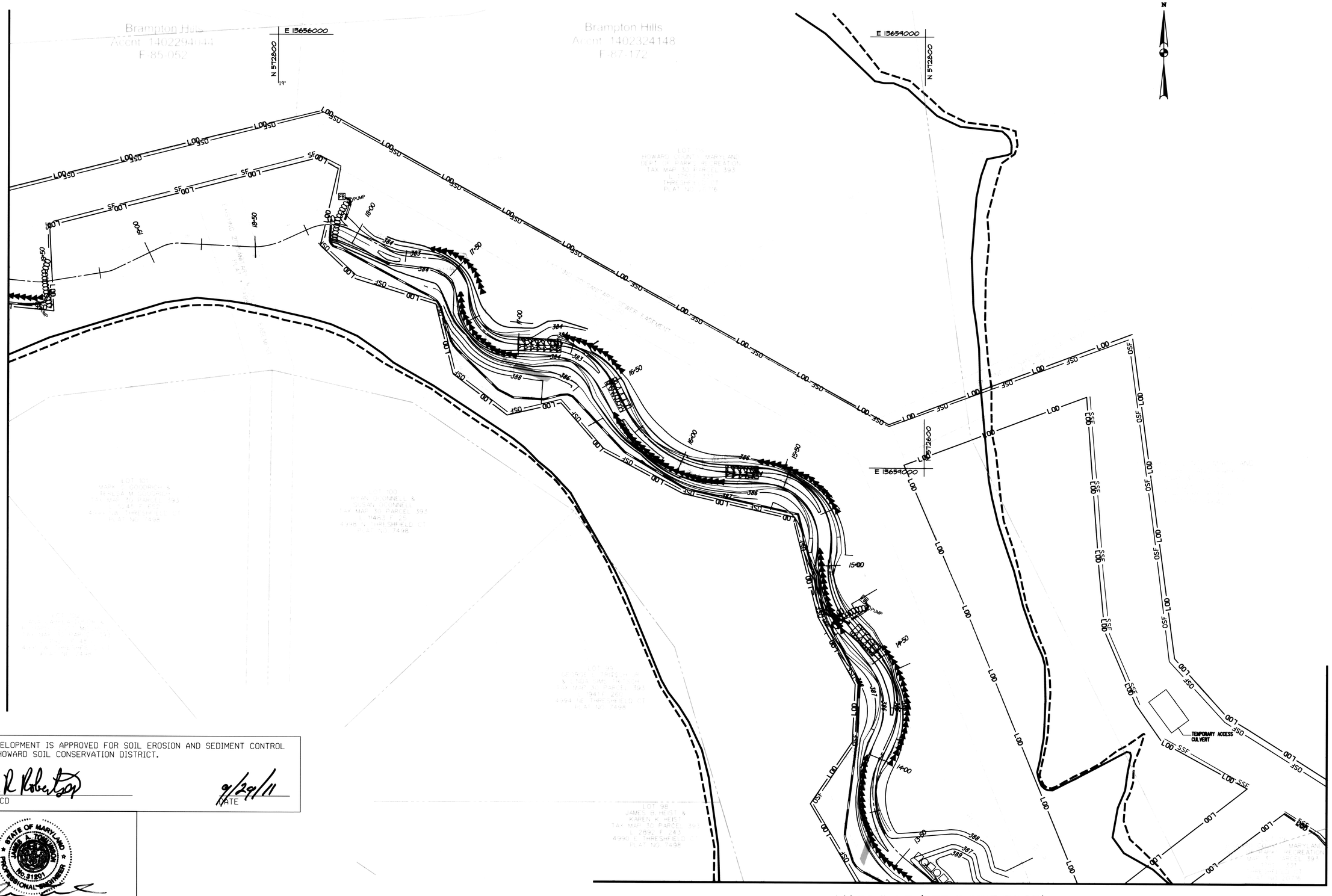
EROSION AND SEDIMENT CONTROL PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

ES01

SHEET NO.: 14 OF 27

EP-12-005



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HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JAMES A. TOMLINSON — No. 31201 — PROFESSIONAL ENGINEER

9/29/11

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: 09:46 AM on Thursday, September 29, 2011
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FILE: M:\2008\081795.53\drawings\ES-P002_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORM DRAINAGE DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

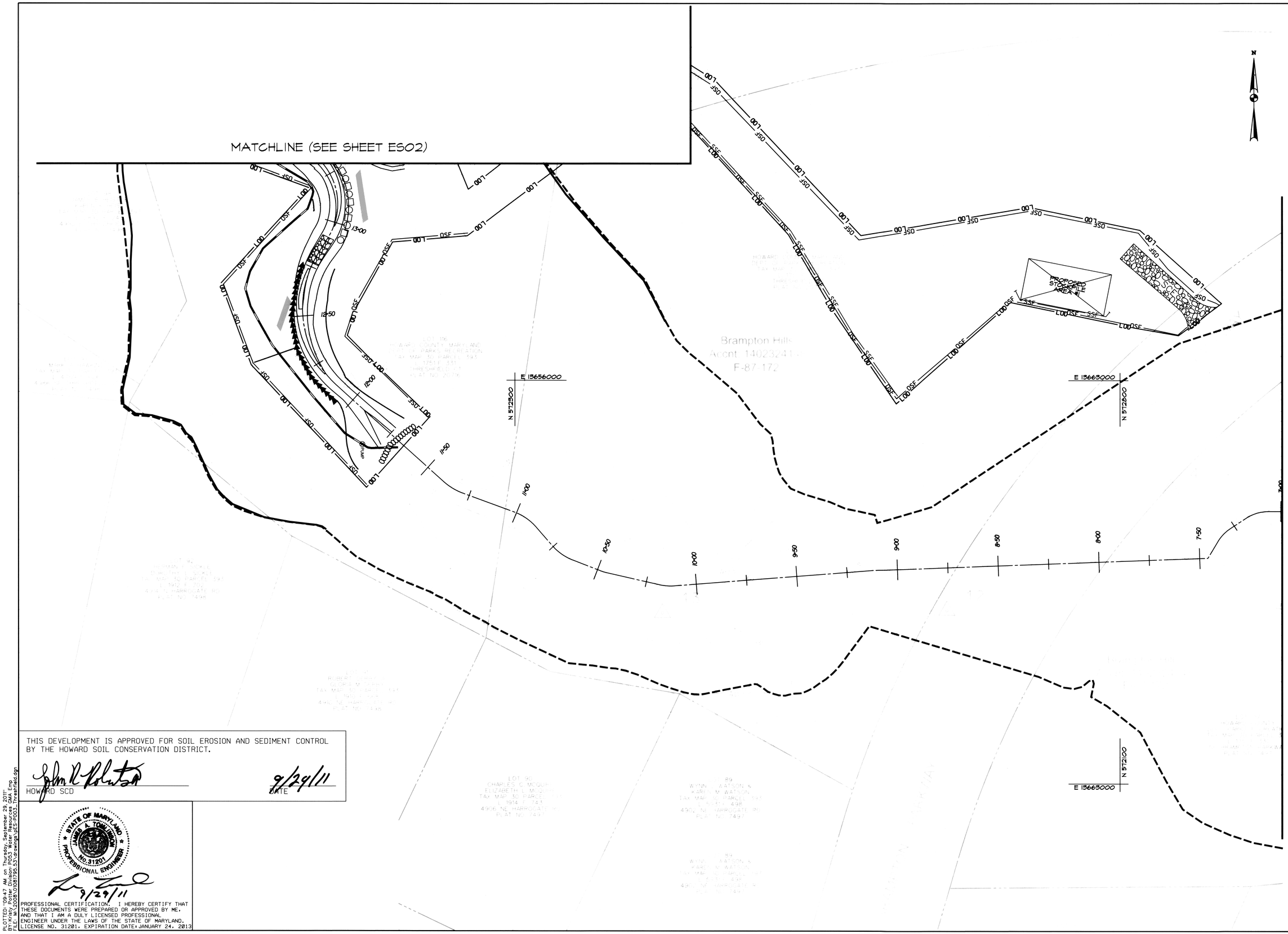
EROSION AND SEDIMENT CONTROL PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

ES02

SHEET NO.: 15 OF 27

EP-12-005



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HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JAMES A. TOWLESON — No. 31201 — PROFESSIONAL ENGINEER

9/29/11

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PLOTTED: '09-47 AM on Thursday, September 29, 2011'
BY: Kirby Porter (Water Quality Specialist) GMA Emp
FILE: M:\2008\01081795.53\drawings\ES-P003_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BOND COMMISSIONER DRIVE
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

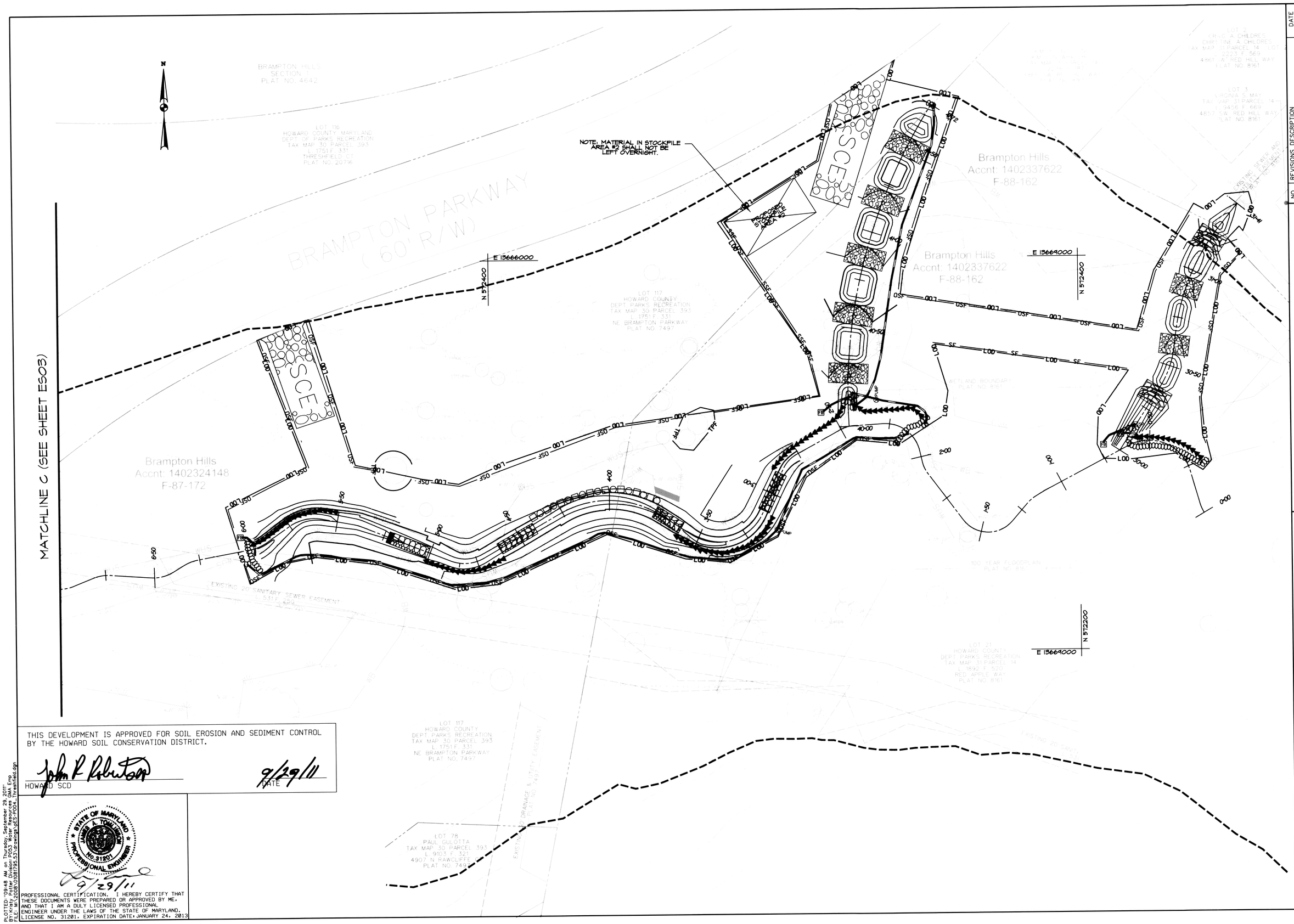
EROSION AND SEDIMENT CONTROL PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

ES03

SHEET NO.: 16 OF 27

EP-12-005



THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JOHN R. POTTER — No. 31201 — PROFESSIONAL ENGINEER

9/29/11

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: 09:48 AM on Thursday, September 29, 2011
BY: Kristy Potter Division PD35 Water Resources GNA Eng.
FILE: M:\2008\01081795.53\sewerage\es2-7004_threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.53 \

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORM DRAINAGE IMPROVEMENTS DIVISION
8765 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

EROSION AND SEDIMENT CONTROL PLAN

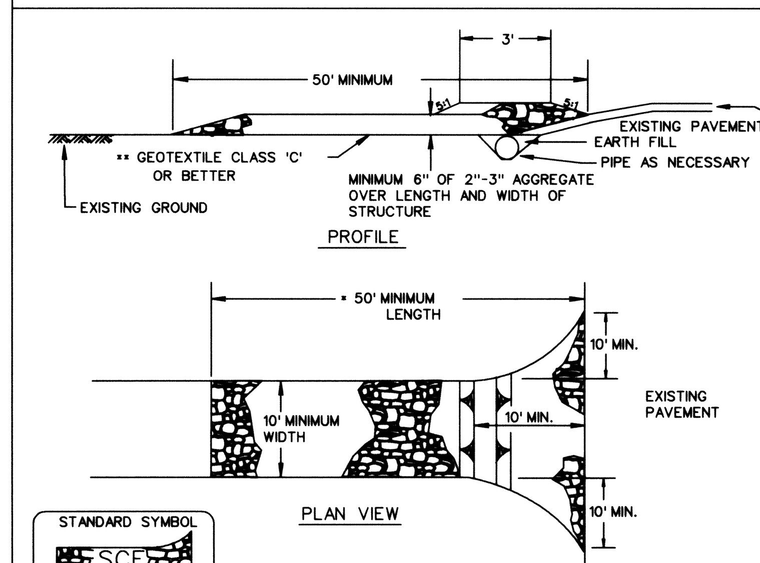
SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

ES04

SHEET NO.: 17 OF 27

EP-12-005

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).

2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

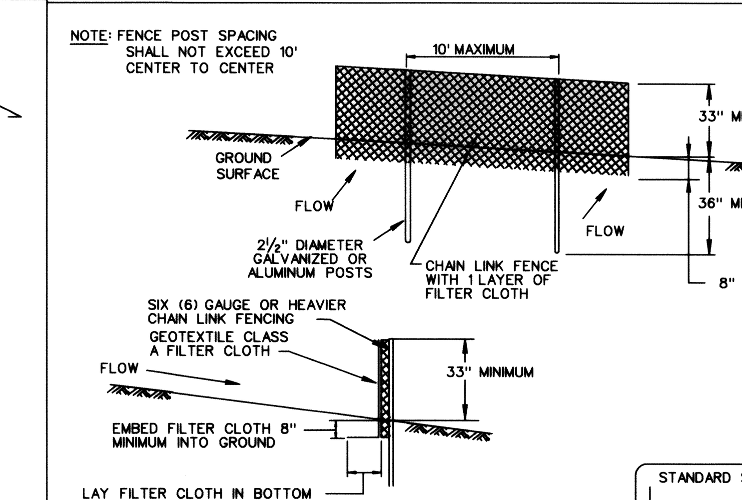
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 33 - SUPER SILT FENCE



Construction Specifications

1. Fencing shall be 42 inches in height and constructed in accordance with the latest Maryland State Highway (SHA) Details for Chain Link Fencing. The (SHA) specification for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts.

2. The posts do not need to be set in concrete.

3. Chain link fence shall be fastened securely to the fence posts with wire ties or staples. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence. The chain link fencing shall be six (6) guage or heavier.

4. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

5. Filter cloth shall be embedded a minimum of 8" into the ground.

6. When two sections of geotextile fabric adjoin each other, they shall be overlapped by 6" and folded.

7. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	MODIFIED	

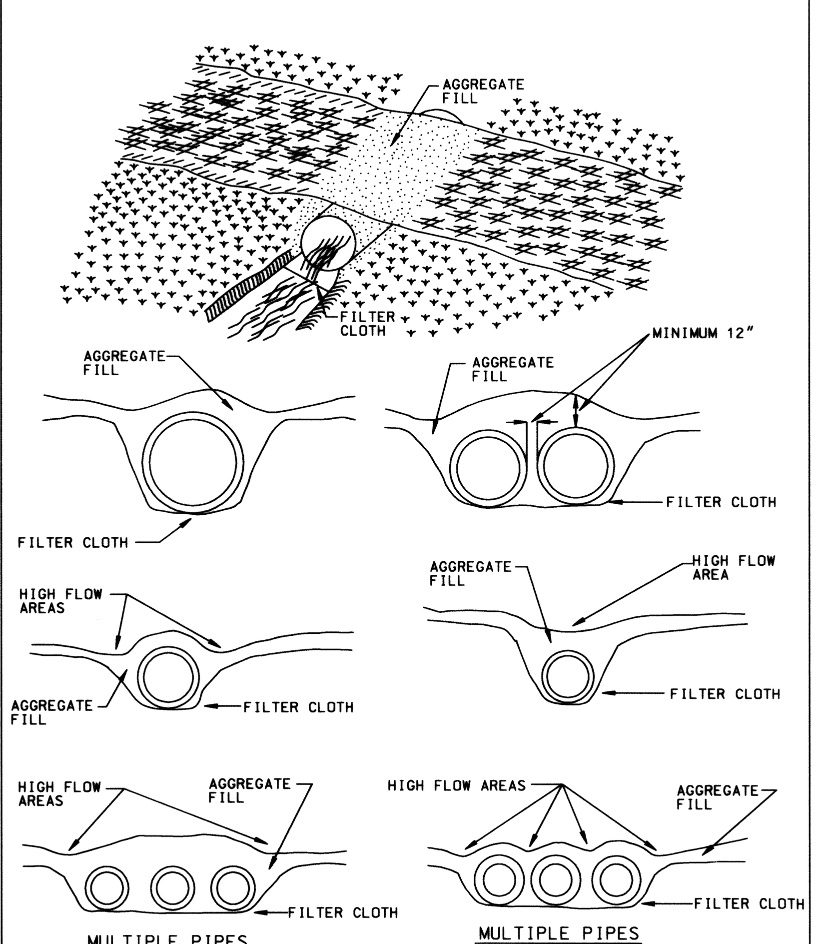
SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 36 - TEMPORARY ACCESS CULVERT



U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 29 - 12	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

TEMPORARY ACCESS CULVERT

Construction Specifications

1. Restrictions - No Construction or removal of a temporary access culvert will be permitted between October 1 through April 30 for Class III and Class IV Trout Waters or between March 1 through June 15 for non-trout waterways.

2. Culvert Strength - All culverts shall be strong enough to support their cross sectional area under maximum expected loads.

3. Culvert Size - The size of the culvert pipe shall be the largest pipe diameter that will fit into the existing channel without major excavation of the waterway channel or without major approach fills. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes is greater than 60 percent of the cross sectional area of the existing channel. The minimum size culvert that may be used is a 12" diameter pipe. In all cases, the pipe(s) shall be large enough to convey normal stream flows.

4. Culvert Length - The culvert(s) shall extend a minimum of one foot beyond the upstream and downstream toe to the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.
5. Filter Cloth - Filter cloth shall be placed on the streambed and streambanks prior to placement of the pipe culvert(s) and aggregate. The filter cloth shall cover the streambed and extend a minimum six inches and a maximum one foot beyond the end of the culvert and bedding material. Filter cloth reduces settlement and improves crossing stability.

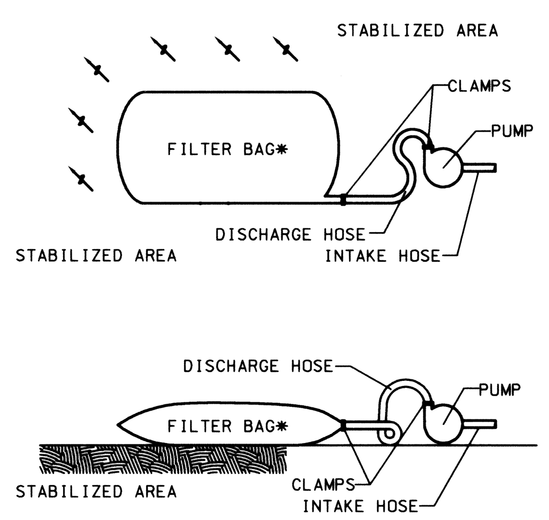
6. Culvert Placement - The invert elevation of the culvert shall be installed on the natural streambed grade to minimize interference with fish migration (free passage of fish).

7. Culvert Protection - The culvert(s) shall be covered with a minimum of one foot of aggregate. If multiple culverts are used they shall be separated by at least 12" of compacted aggregate fill.

8. Stabilization - All areas disturbed during culvert installation shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for "Critical Area Stabilization With Permanent Seeding."

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 29 - 12A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

FILTER BAG



* NON-WOVEN GEOTEXTILE FILTER BAG WHICH RETAINS ALL SEDIMENT PARTICLES LARGER THAN 150 MICRONS.

SILT BAG DEWATERING DEVICE FOR PUMPED WATER
NOT TO SCALE

NOTES:
1. PLACE FILTER BAGS ON STABLE OR WELL VEGETATED AREAS WHICH ARE FLATTER THAN 5% AND WILL NOT ERODE WHEN SUBJECTED TO BAG DISCHARGES.
2. CLAMP PUMP DISCHARGE HOSES SECURELY INTO FILTER BAGS.
3. LIMIT PUMPING RATE TO ½ THE MANUFACTURER'S MAXIMUM PUMPING RATE.
4. WHEN SEDIMENTS FILL ½ THE VOLUME OF A FILTER BAG, IMMEDIATELY REMOVE THAT BAG FROM SERVICE. PROPERLY DISPOSE OF SPENT BAGS WITH THEIR SEDIMENTS.

FILTER BAG SPECIFICATIONS

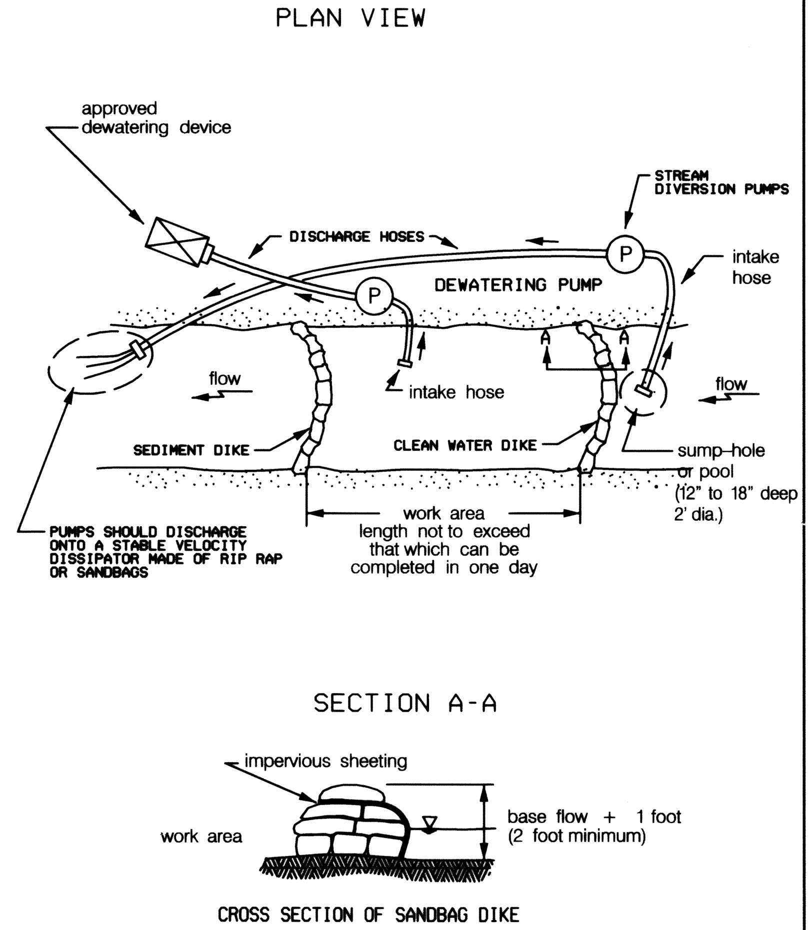
1. FILTER BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MINIMUM SURFACE AREA OF 225 SQUARE FEET PER SIDE.
2. ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD. SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884 TEST METHOD.
3. FILTER BAG SHALL HAVE A NOZZLE LARGE ENOUGH TO ACCOMMODATE A FOUR(4) INCH DIAMETER PUMP DISCHARGE HOSE.
4. NOZZLE SHALL BE SEALED TIGHTLY AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE TO PREVENT UNFILTERED WATER FROM ESCAPING.
5. FILTER BAG SHALL BE PLACED ON A LEVEL OR GENTLY SLOPING (5% MAXIMUM) AREA.
6. FILTER BAG SHALL BE PLACED UPON A BASE OF STRAW BALES OR THREE (3) INCHES OF CLEAN STONE TO PROMOTE DEWATERING THROUGH BOTTOM SURFACE OF THE FILTER BAG.
7. PUMPING RATES SHALL BE CONTROLLED TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG. AS THE BAG BECOMES FILLED WITH SEDIMENT THE PUMPING RATE SHALL BE REDUCED.
8. THE FILTER BAG SHALL BE DEWATERED, REMOVED AND DISPOSED OF UPON COMPLETION OF PUMPING OPERATIONS OR AFTER IT HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. THE DEWATERED SEDIMENT FROM THE BAG SHALL BE SPREAD IN AN UPLAND AREA AND STABILIZED WITHIN 24 HOURS.
9. THE GEOTEXTILE FABRIC SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS WITH PROPERTIES DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

WEIGHT	10 OZ/YD	ASTM D-3776
GRAB TENSILE	210 LBS.	ASTM D-4632
PUNCTURE	150 LBS.	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT2	ASTM D-4491
PERMITIVITY (SEC)	1.3	ASTM D-4991
UV RESISTANCE	70%	ASTM D-4355
APPARENT OPENING SIZE (AOS)	40-80	ASTM D-4751

NOTE: ALL WATER COLLECTED WITHIN THE LIMIT OF DISTURBANCE (WITH THE EXCEPTION OF WATER DIVERTED AROUND THE WORK AREA) SHALL BE PUMPED THROUGH THE FILTER BAG.

MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION
DETAIL 1.2: PUMP-AROUND PRACTICE

PLAN VIEW



CROSS SECTION OF SANDBAG DIKE

* filter fabric shall be used in place of impervious sheeting at the downstream sand bag for each stage of work.

TEMPORARY INSTREAM CONSTRUCTION MEASURES	REVISED NOVEMBER 2000 PAGE 1.2 - 3	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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's or utility company's satisfaction.

2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.

3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out 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 riprap or sandbags.

7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.

8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then 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).

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. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.

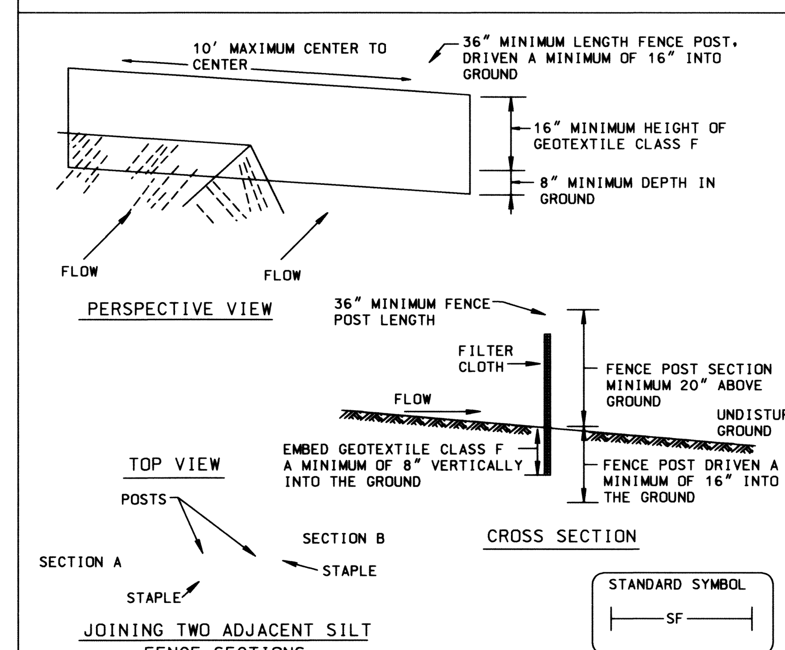
11. A pump around must be installed on any tributary or storm drain outfall, which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity 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 steam 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.

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 22. - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1½" x 1½" square (minimum) cut, or 1¾" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SILT FENCE

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson — HOWARD SCD   7/29/11 — DATE

9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: "09:49 AM on Thursday, September 29, 2011"
BY: Kristy Potter Division: P053 Water Resources GMA Emp
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NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

EROSION & SEDIMENT CONTROL NOTES & DETAILS

SCALE: AS SHOWN
DATE: SEPTEMBER 2011
KCI JOB NO.: 01-081795.53
CAPITAL PROJECT NO.: D-1158
PERMIT ISSUE:
CONSTRUCTION ISSUE:

ES05

SHEET NO.: 18 OF 27

EP-12-005

SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT. STREAM CLOSURE PERIOD IS MARCH 1-JUNE 15, INCLUSIVE. MDE PERMIT TRACKING *201161171/11-NT-0283. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, A VIDEOTAPE AND PHOTOGRAPHS OF THE PROPOSED WORK AREA SHALL BE TAKEN. (1 DAY)

2. CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, A REPRESENTATIVE FROM MDE, AND A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION. THE LIMIT OF DISTURBANCE SHALL BE STAKED PRIOR TO THE MEETING. (1 DAY)

3. NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S NONTIDAL WETLANDS AND WATERWAYS INSPECTIONS AND COMPLIANCE DIVISION AT LEAST FIVE (5) DAYS PRIOR TO ANY EARTH MOVING CONSTRUCTION WITHIN NONTIDAL WETLANDS AND/OR THEIR BUFFERS. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410-313-1880) A MINIMUM OF 24 HOURS PRIOR TO THE START OF ANY CONSTRUCTION. (5 DAYS)

4. CONSTRUCT ORANGE SAFETY FENCE AS SHOWN ON THE PLANS. HOWARD COUNTY STORMWATER MANAGEMENT DIVISION SHALL REVIEW AND APPROVE THE LOCATION OF THE ORANGE SAFETY FENCE PRIOR TO ANY EARTH MOVING OR REMOVING OF EXISTING TREES OR SHRUBS. (1 WEEK)

5. WORK WILL PROCEED FROM UPSTREAM TO DOWNSTREAM. PERFORM ITEMS 6-11 BELOW FOR EACH OF THE WORK AREAS AS SHOWN ON THE PLANS. WORK AREAS ARE THOSE AREAS ISOLATED FROM THE REMAINING CHANNEL BY A PUMP AROUND PRACTICE, INCLUDING THE WESTERN TRIBUTARY.

6. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES AS NEEDED FOR THE ACTIVE WORK AREAS AND ESTABLISH CONTROLS AROUND THE TEMPORARY STOCKPILE/STAGING AREAS. (5 DAYS)

7. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND DEVICES FOR THE ACTIVE WORK AREA, INCLUDING PUMP AROUND PRACTICES. INSTALL TEMPORARY CULVERT ACCESS AND STABILIZE THE AREA DISTURBED BY THE INSTALLATION. SEDIMENT-LADEN WATER SHALL NOT BE DISCHARGED DIRECTLY INTO THE STREAM. (5 DAYS)

8. CONSTRUCT UPSTREAM SAND BAG DAM WITHIN THE ACTIVE WORK AREA. THIS INCLUDES SAND BAG DAMS WITHIN THE TRIBUTARIES. PLACE PUMP AROUND HOSE ON THE CHANNEL BANK AS SHOWN ON THE PLANS. BEGIN PUMP AROUND OPERATION FOR ACTIVE WORK AREA ONLY, DISCHARGING ONTO SAND BAGS AT OUTFALL. (EACH WORK DAY)

9. CONSTRUCT DOWNSTREAM SAND BAG DAM WITHIN THE ACTIVE WORK AREA. SEDIMENT-LADEN WATER SHALL NOT BE DISCHARGED DIRECTLY INTO THE STREAM. DEWATER ENTRAPPED AREA BEHIND SAND BAGS TO A FILTER BAG DEWATERING DEVICE PRIOR TO DISCHARGE IN TO THE STREAM. (EACH WORK DAY)

10. CONSTRUCT GRADING AND RESTORATION STRUCTURES FROM UPSTREAM TO DOWNSTREAM WITHIN EACH WORK AREA. STABILIZE DISTURBED AREAS AT THE END OF EACH DAY. REMOVE SAND BAG DIVERSIONS AT THE END OF EACH WORKING DAY. (2 WEEKS EACH WORK AREA; TOTAL OF 8 WEEKS)

11. CONSTRUCT DOWNSTREAM SAND BAG DAM WITH DEWATERING DEVICE BEHIND SAND BAGS WITHIN THE EASTERN TRIBUTARY. CONSTRUCT GRADING AND RESTORATION STRUCTURES FROM UPSTREAM TO DOWNSTREAM . STABILIZE DISTURBED AREAS AT THE END OF EACH DAY. (10 DAYS)

12. INSTALL LANDSCAPING AS SPECIFIED ON THE PLAN. (5 DAYS)

13. UPON COMPLETION OF CONSTRUCTION ACTIVITIES IN EACH WORK AREA, AND WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE PUMP AROUND PRACTICES AND BEGIN WORK IN THE NEXT WORK AREA. (1 DAY)

14. WHEN VEGETATION IS ESTABLISHED AND WITH PERMISSION OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING EROSION AND SEDIMENT CONTROL MEASURES AND PERMANENTLY STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS. (3 DAYS)

15. CONDUCT FINAL "AS-BUILT" SURVEY OF STREAM RESTORATION MEASURES AND STREAM PROFILE WITHIN RESTORATION AREAS AND SUBMIT "AS-BUILT" PLANS TO THE DEPARTMENT OF PUBLIC WORKS, STORMWATER MANAGEMENT DIVISION WITHIN 30 DAYS OF COMPLETION OF CONSTRUCTION. (30 DAYS)

NOTE: HARVESTING AND INSTALLATION OF LIVE STAKES SHALL ONLY OCCUR DURING THE DORMANT SEASON, I.E. NOVEMBER 1 THROUGH MARCH 1.

HOWARD COUNTY CONSERVATION DISTRICT
STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspections. Licenses and Permits, Sediment Control Division prior to the start of any construction (410 313-1855).

2. All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the most current MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.

3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.

4. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.

5. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.

6. Site Analysis:

Total Area of Site	2.99	Acres
Area Disturbed	2.99	Acres
Area to be roofed or paved	0.00	Acres
Area to be vegetatively stabilized	2.99	Acres
Total Cut	575	Cu. Yds.
Total Fill	1257	Cu. Yds.
Offsite waste/borrow area location	To Be Determined*	

7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

8. Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.

* Offsite waste/ borrow area, if needed, shall have an approved erosion and sediment control plan and active permit.

HOWARD SOIL CONSERVATION DISTRICT
TEMPORARY SEEDING NOTES

Apply to graded or cleared areas likely to be re-disturbed where a short-term vegetative cover is needed.

Seedbed preparation: -- Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously loosened.

Soil Amendments: -- Apply 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.).

Seeding: -- For periods March 1 - April 30 and from August 15 - October 15, seed with 2-1/2 bushel per acre of annual rye (3.2 lbs/1000 sq. ft.). For the period May 1 - August 14, seed with 3 lbs/acre of weeping lovegrass (.07 lbs/1000 ft.). For the period November 16 - February 28, protect site by applying 2 tons/acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.

Mulching: -- Apply 1-1/2 to 2 tons/acre (70 to 90 lbs/1000 sq. ft.) of unrotted weed-free, small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool. No asphalt emulsion shall be used for anchoring. Only a non-toxic, latex backing material is allowed.

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods not covered.

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

Definition

Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

Purpose

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.

Conditions Where Practice Applies

I. This practice 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.

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that 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-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications - Soil to be used as topsoil must meet the following:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixutre of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be disturbed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following proceures.

III. For sites having disturbed areas under 5 acres:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:

i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.

b. Organic content of topsoil shall be not less than 1.5 percent by weight.

c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.

d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time as elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

Note: 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.

ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.

iii. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minmum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that my otherwise be detrimental to proper grading and seedbed preparation.

HOWARD SOIL CONSERVATION DISTRICT
PERMANENT SEEDING NOTES

(For areas within LOD with no designated planting area symbol use permanent seeding below. For all areas denoted by symbol see Sheet 21 for permanent seeding.)

Apply to graded or cleared areas not subject to immediate further disturbance where a permanent long-lived vegetative cover is needed.

Seedbed Preparation: Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously loosened.

Soil Amendments: In lieu of soil test recommendations, use one of the following schedules:

1. Preferred -- Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs/acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq. ft.)

2. Acceptable -- Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 1000 lbs/acre 10-10-10 fertilizer (23 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil.

Seeding - For the periods March 1 - April 30, and August 1 - October 15, seed with 60 lbs/acre (1.4 lbs/1000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 - July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs/acre (.05 lbs/100sq. ft.) of weeping lovegrass. During the period of October 16 - February 28, protect site by: Option 1 - Two tons per acre of well anchored straw mulch and seed as soon as possible in the spring. Option 2 - Use sod. Option 3 - Seed with 60 lbs/acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

Mulching - Apply 1-1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool. No asphalt emulsion shall be used for anchoring. Only a non-toxic, latex backing material is allowed.

Maintenance - Inspect all seeding areas and make needed repairs, replacements and reseedings.

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

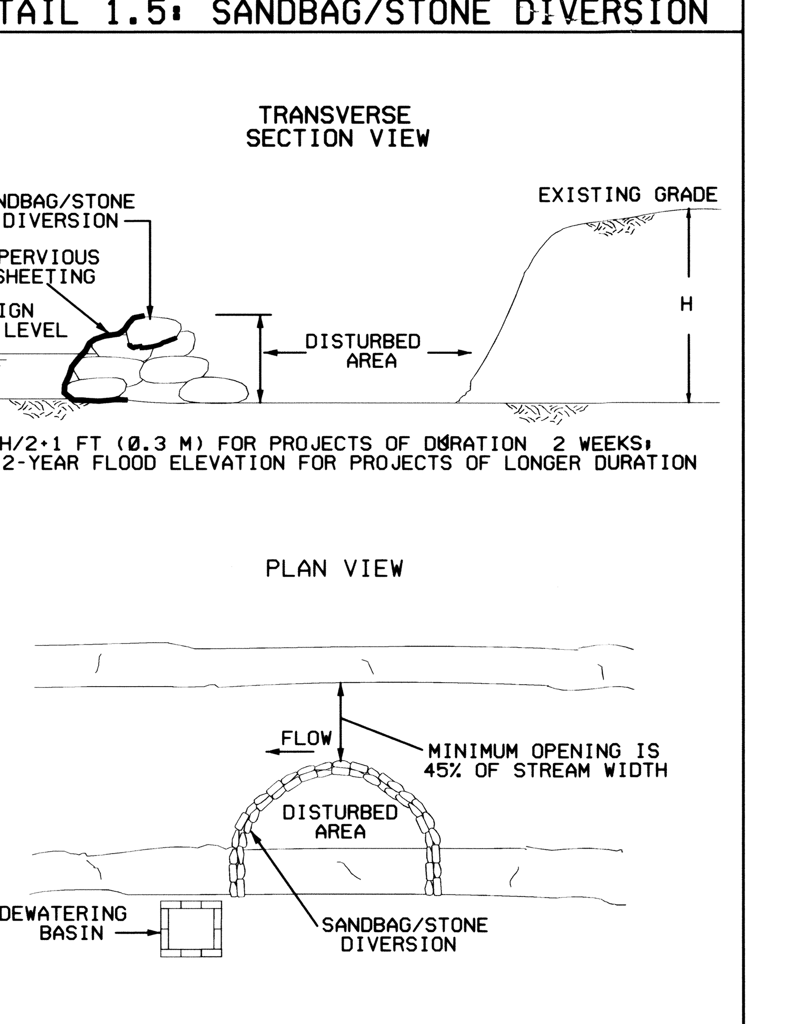
HOWARD SCD — DATE 9/29/11

STATE OF MARYLAND — JAMES A. TOMLINSON — No. 31201 — PROFESSIONAL ENGINEER — 9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION

DETAIL 1.5: SANDBAG/STONE DIVERSION



MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

DESCRIPTION

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

EFFECTIVE USES & LIMITATIONS

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

MATERIAL SPECIFICATIONS

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

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

INSTALLATION GUIDELINES

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

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

1. The diversion structure should be installed from upstream to downstream.

2. The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration less than 2 weeks, the height of the diversion should be one half the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.

3. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.

4. Sediment-laden water from the construction area should be pumped to a dewatering basin.

5. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.

6. Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project time is expected to last more than 2 weeks.

7. Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.

8. Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

NO.	REVISIONS DESCRIPTION	DATE

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www.kci.com
KCI TECHNOLOGIES

KCI FILE: M:\ 2008 \ 01081795.53 \

THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

EROSION & SEDIMENT CONTROL NOTES & DETAILS

SCALE:	AS SHOWN
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

ES06

EP-12-005

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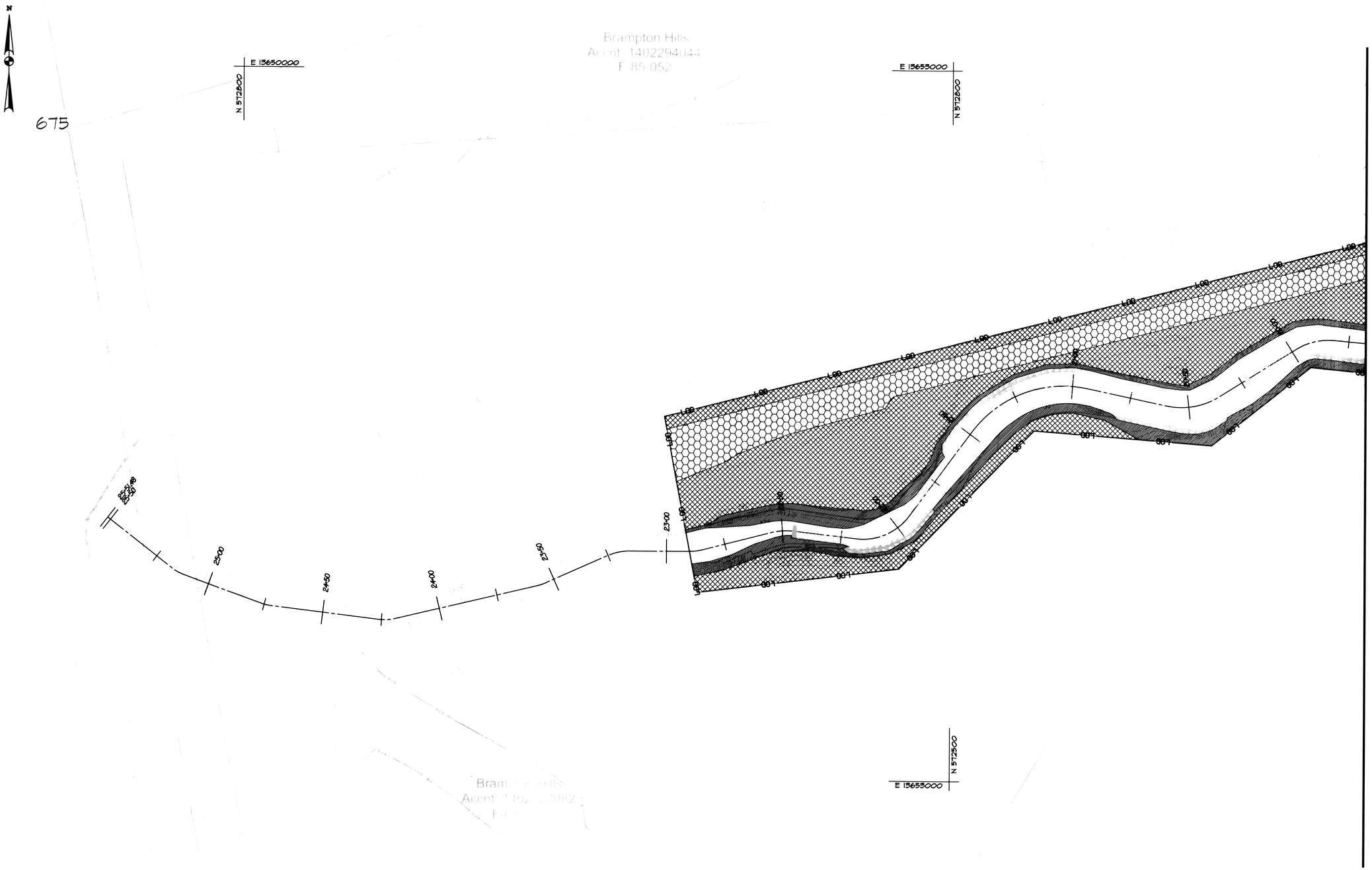

MATCHLINE (SEE SHEET LS02)

LEGEND

LIVE STAKE ZONE 2,376 SF / 0.055 AC	
HERBACEOUS ZONE 3,644 SF / 0.084 AC	
RIPARIAN FOREST ZONE 8,855 SF / 0.203 AC	

STATE OF MARYLAND
JAMES A. TOWNSEND
No. 31201
PROFESSIONAL ENGINEER

9/29/11

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. 31201 , EXPIRATION DATE:JANUARY 24, 2013

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

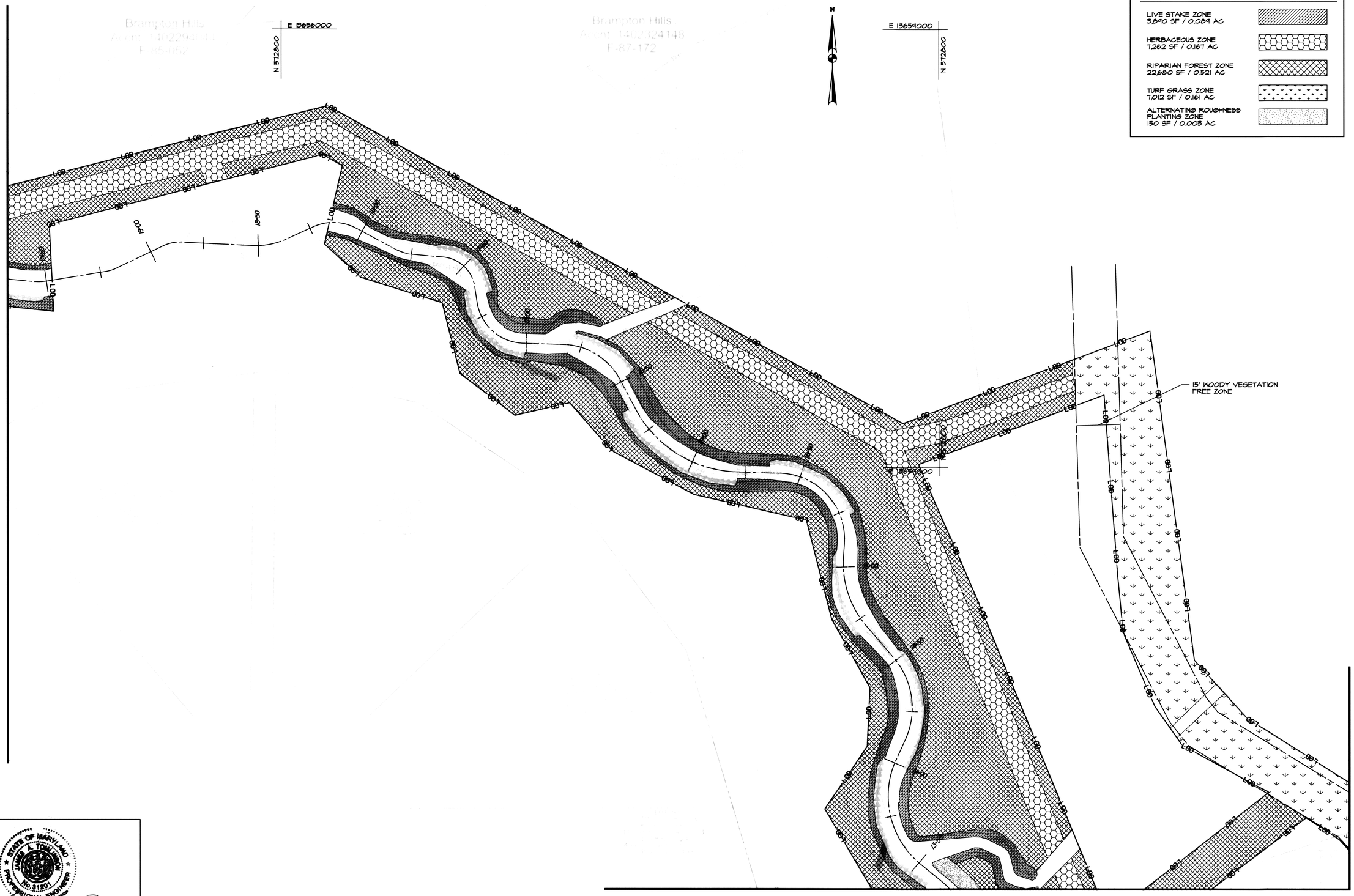
LANDSCAPE PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

LS01

SHEET NO.: 20 OF 27

EP-12-005



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. 31201. EXPIRATION DATE: JANUARY 24, 2013

STATE OF MARYLAND · JAMES A. TOWLSON · NO. 31201 · PROFESSIONAL ENGINEER

9/29/11

PLOTTED: "09:53 AM on Thursday, September 29, 2011"
BY: Kristy Potter Division: FD53 Water Resources GMA Emp
FILE: L:\2008\081795.53\drawings\LS-P002_threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

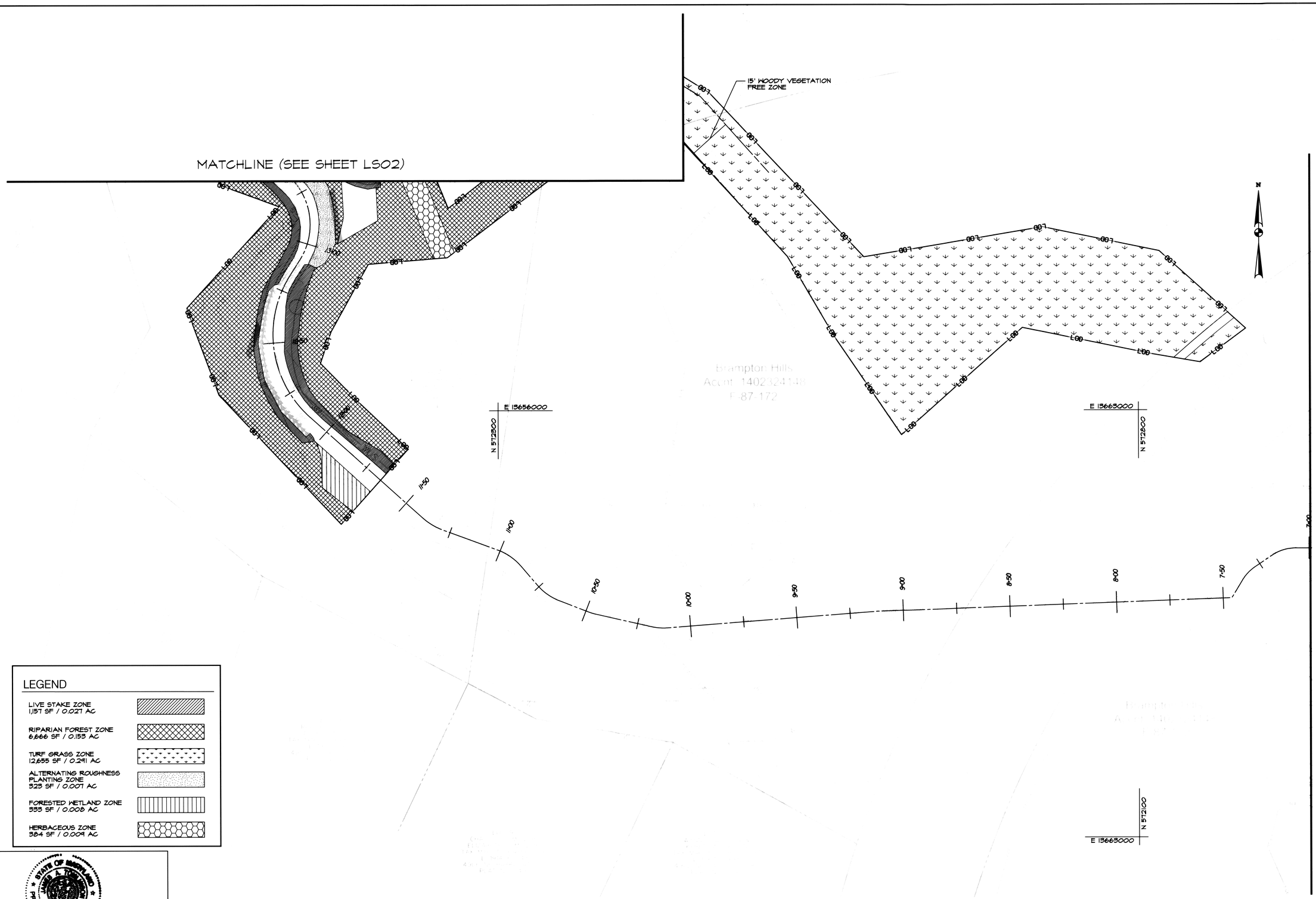
LANDSCAPE PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

LS02

SHEET NO.: 21 OF 27

EP-12-005



LEGEND

LIVE STAKE ZONE 1,157 SF / 0.027 AC	
RIPARIAN FOREST ZONE 6,666 SF / 0.153 AC	
TURF GRASS ZONE 12,655 SF / 0.291 AC	
ALTERNATING ROUGHNESS PLANTING ZONE 323 SF / 0.007 AC	
FORESTED WETLAND ZONE 333 SF / 0.008 AC	
HERBACEOUS ZONE 384 SF / 0.009 AC	

STATE OF MARYLAND
JAMES A. TOMLINSON
No. 31201
PROFESSIONAL ENGINEER

9/29/11

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PLOTTED: 09:54 AM on Thursday, September 29, 2011
BY: Kevin Parker Allowin PZ3 Water Resources Div.Emp.
FILE: M:\2008\01081795.53\drawings\LS-P003_Threshfield.dgn

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

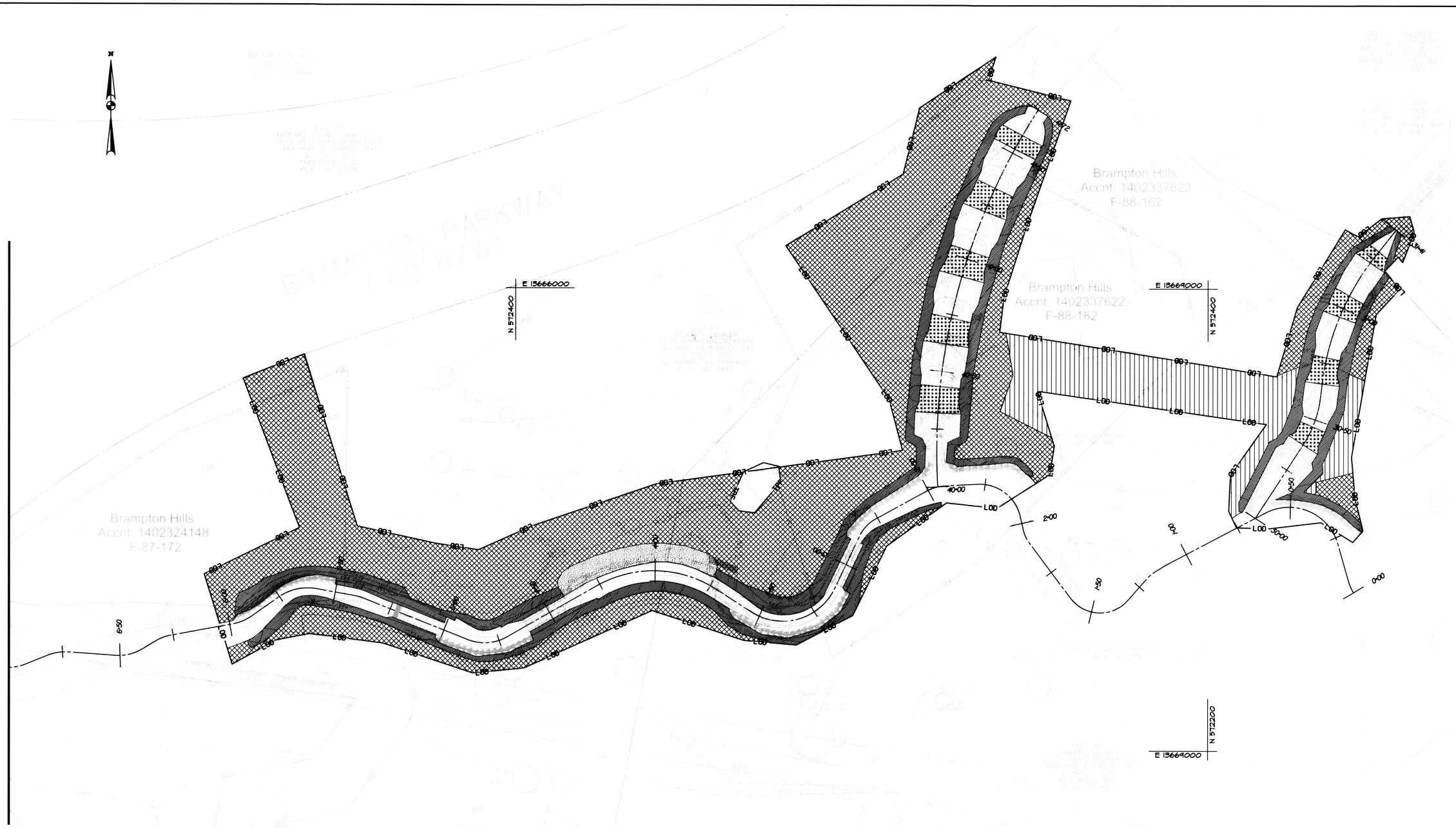
LANDSCAPE PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

LS03

SHEET NO.: 22 OF 27

EP-12-005



LEGEND

LIVE STAKE ZONE 5,416 SF / 0.124 AC	
RIPARIAN FOREST ZONE 20,475 SF / 0.470 AC	
ALTERNATING ROUGHNESS PLANTING ZONE 616 SF / 0.014 AC	
FORESTED WETLAND ZONE 4,285 SF / 0.098 AC	
HERBACEOUS PERENNIAL ZONE 1,396 SF / 0.032 AC	

STATE OF MARYLAND
JAMES A. TOWNSON
No. 31201
PROFESSIONAL ENGINEER

9/29/11

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. 31201. EXPIRATION DATE: JANUARY 24, 2013

PLOTTED: '09-54 AM on Thursday, September 29, 2011
BY: Kevin Porter Williams/ZZZ\Work Projects\Eng
FILE: M:\2008\01081795.53\drawings\LS-P004_Threshfield.dgn

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING, DIVISION
8765 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

LANDSCAPE PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

LS04

SHEET NO.: 23 OF 27

EP-12-005

MASTER PLANT SCHEDULE

LIVE STAKES (SHEETS 20-23 OF 27)

(12,839 SQ FT /0.29 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
803	Cornus racemosa	Gray Dogwood	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.
803	Cornus amomum	Silky Dogwood	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.
803	Alnus incana ssp. rugosa	Speckled Alder	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.
803	Salix nigra	Black Willow	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.

RIPARIAN ZONE (SHEETS 20-23 OF 27)

(58,676 SQ FT /1.35 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
97	Amelancheir canadensis	Serviceberry	3'-5' Height	Container	10'-12' O.C.
97	Betula nigra	River Birch	5'-6' Height	5 Gal. Container	10'-12' O.C.
97	Acer rubrum	Red Maple	5'-6' Height	5 Gal. Container	10'-12' O.C.
97	Quercus bicolor	Swamp White Oak	5'-6' Height	3 Gal. Container	10'-12' O.C.
97	Platanus occidentalis	American Sycamore	5'-6' Height	3 Gal. Container	10'-12' O.C.

PERMANENT SEEDING FOR LIVE STAKES, HERBACEOUS SEED, ALTERNATING ROUGHNESS, AND RIPARIAN ZONE, AND HERBACEOUS PERENNIAL (SHEETS 20-23 OF 27)

(83,894 SQ FT /1.93 AC)

Botanical Name	Common Name	Application Rate (lbs/ac)	% of Mix	Quantity (lbs)	Remarks
Panicum virgatum	Switchgrass	18.0	24%	34.7	-
Poa palustris	Fowl Bluegrass	30.0	40%	57.9	-
Panicum clandestinum	Deer Tongue Grass	18.0	24%	34.7	-
Bromus ciliatus	Fringed Brome	9.0	12%	17.4	-

Total Application Rate of 75 lbs / ac — SEED TOTAL 144.7 lbs

ALTERNATING ROUGHNESS PLANTINGS (SHEETS 21-23 OF 27)

(1,089 SQ FT /0.03 AC /120 LF)

Qty	Botanical Name	Common Name	Size	Type	Form	Spacing/Rate
4	Platanus occidentalis	American Sycamore	7' - 9' Height	Tree	Container	10' O.C.
4	Acer rubrum	Red Maple	7' - 9' Height	Tree	Container	10' O.C.
5	Alnus incana ssp rugosa	Speckled Alder	3' Height	Shrub	Container	6' O.C.
5	Viburnum dentatum	Southern Arrowwood	3' Height	Shrub	Container	6' O.C.
150	Cornus amomum	Silky Dogwood	3' Length 1"-1.5" dia.	Live Stake	Dormant stems	5/cluster
150	Cornus sericea	Redosier Dogwood	3' Length 1"-1.5" dia.	Live Stake	Dormant stems	5/cluster
150	Salix sericea	Silky Willow	3' Length 0.5"-1.5" dia.	Live Stake	Dormant stems	5/cluster
150	Salix nigra	Black Willow	3' Length 0.5"-1.5" dia.	Live Stake	Dormant stems	5/cluster
60	Alnus incana ssp. rugosa	Speckled Alder	6' Length 2.5"-5.5" dia.	Live Pole	Dormant stems	1/cluster
60	Salix sericea	Silky Willow	6' Length 2.5"-5.5" dia.	Live Pole	Dormant stems	1/cluster

Note: Alternate Roughness Planting locations shall be staked for approval by the engineer, prior to installation.

FORESTED NONTIDAL WETLAND ZONE (SHEETS 22-23 OF 27)

(4,618 SQ FT /0.11 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
19	Salix nigra	Black Willow	5' Height	Container	10'-12' O.C.
19	Acer rubrum	Red Maple	5' Height	Container	10'-12' O.C.

PERMANENT WETLAND SEED MIX (to be used within Wetland Planting Zone) (SHEETS 22-23 OF 27)

(4,618 SQ FT /0.11 AC)

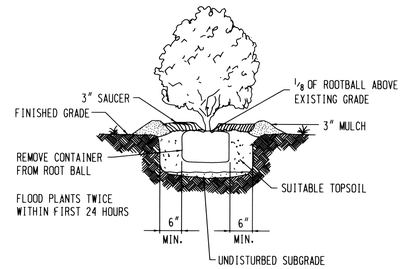
Botanical Name	Common Name	Application Rate (lbs/ac)	% of Mix	Quantity (lbs)	Remarks
Carex vulpinoidea	Fox Sedge	5	25	0.55	-
Elymus virginicus	Virginia Wild Rye	6.6	33	0.73	-
Carex scoparia	Blunt Broom Sedge	2	10	0.22	-
Carex lurida	Lurid Sedge	2	10	0.22	-
Scirpus atrovirens	Green Bulrush	1.6	8	0.18	-
Verbena hastata	Swamp Verbena	1	5	0.11	-
Onoclea sensibilis	Sensitive Fern	0.6	3	0.07	-
Scirpus pungens	Common Three-Square	0.4	2	0.04	-
Eupatorium fistulosum	Joe Pye Weed	0.4	2	0.04	-
Lobelia cardinalis	Cardinal Flower	0.4	2	0.04	-

*Seed at 20 lbs per acre — SEED TOTAL 2.20 lbs

HERBACEOUS PERENNIAL (SHEET 23 OF 27)

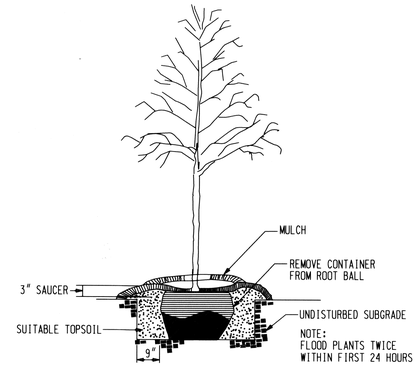
(1,396 SQ FT /0.03 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
155	Carex blanda	Common Woodland Sedge	1-quart	Container	18-24" O.C.
155	Carex vulpinoidea	Fox Sedge	1-quart	Container	18-24" O.C.
155	Chrismanthium latifalium	Wild Oats	1-quart	Container	18-24" O.C.
155	Iris virginica	Virginia Iris	1-quart	Container	18-24" O.C.



SHRUB PLANTING DETAIL

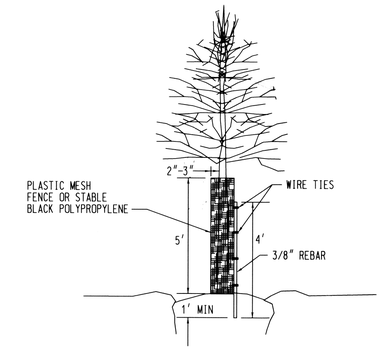
NOT TO SCALE



TREE PLANTING DETAIL

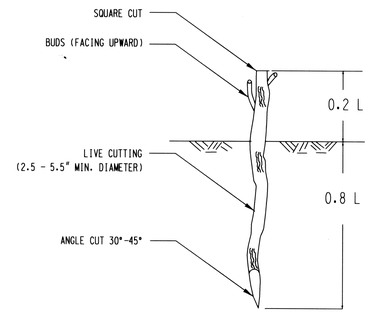
NOT TO SCALE

NOTE: TREE SHELTERS TO BE ADDED TO ALL TREES PLANTED



TREE SHELTER

NOT TO SCALE

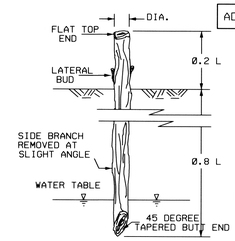


POST PLANTING DETAIL

NOT TO SCALE

DETAIL 2.4: LIVE STAKES

ADAPTED FROM USDA-SCS (1994)



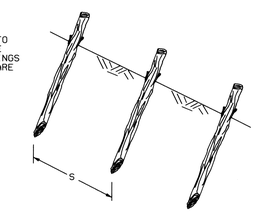
DETAIL

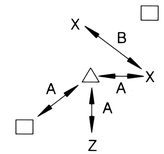
LIVE STOUT STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE. (GENERALLY, A LENGTH OF 2 TO 3 FEET, OR 0.6 TO 0.9 METERS, IS SUFFICIENT.) ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.5 TO 1.5 INCHES (2 TO 4 CENTIMETERS).

NOTE: SEE TABLE FOR SPECIFIC SIZE INFORMATION

SECTION VIEW

LIVE STAKES SHALL BE SPACED 2 TO 3 FEET (0.6 TO 0.9 METERS) APART TO GIVE A DENSITY OF 2 TO 4 CUTTINGS PER SQUARE YARD (0.8 SQUARE METERS).



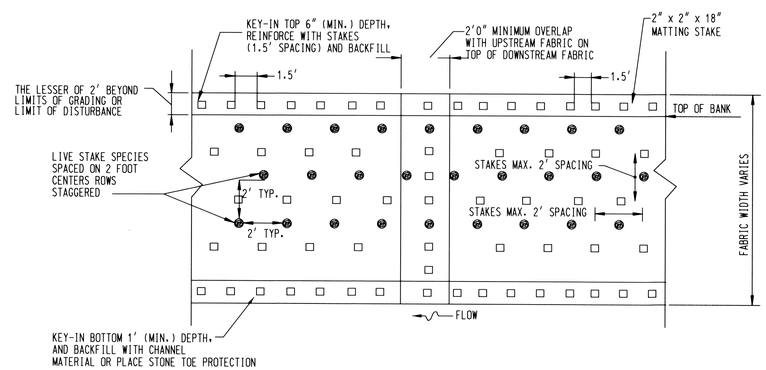


△, □ TREE SPECIES — A: MINIMUM SPACING PER SCHEDULE

X, Z SHRUB SPECIES — B: DUPLICATE SPECIES SPACING MINIMUM 2 TIMES MINIMUM SPACING

TREE AND SHRUB RANDOM SPACING

NOT TO SCALE



TYPICAL PLAN VIEW
NATURAL FIBER MATTING WITH LIVE STAKES

NOT TO SCALE

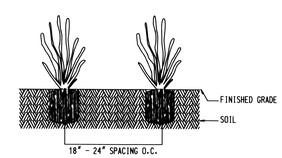
NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF TOE PROTECTION AND A MINIMUM OF TWO FEET PAST TOP OF BANK. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES. (SEE SPECIFICATIONS FOR MATERIALS)

TURF GRASS ZONE (SHEETS 21-22 OF 27)

(19,667 SQ FT /0.45 AC)

Qty(lbs)	Botanical Name
90	SHA Special Purpose Seed Mix 920.06.07 (b)

Application Rate of 200 lbs / ac



HERBACEOUS PERENNIAL DETAIL

NOT TO SCALE

STATE OF MARYLAND — LYNDA TOWLSON — No. 31201 — PROFESSIONAL ENGINEER

9/29/11

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PLOTTED: '09-55 AM on Thursday, September 29, 2011'
BY: Kristy Potter Division P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\LD-P005_Threshfield.dgn

NO.	REVISIONS DESCRIPTION	DATE
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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
8251 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

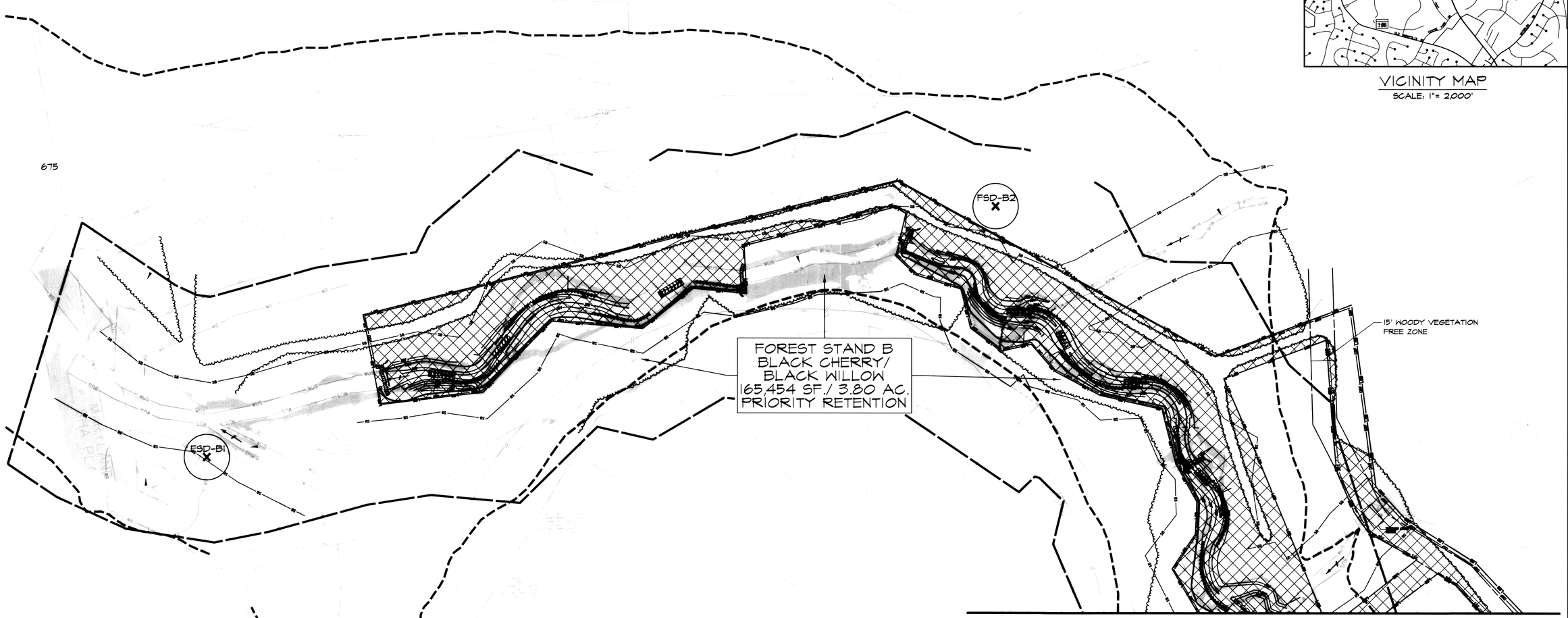
LANDSCAPE NOTES AND DETAILS

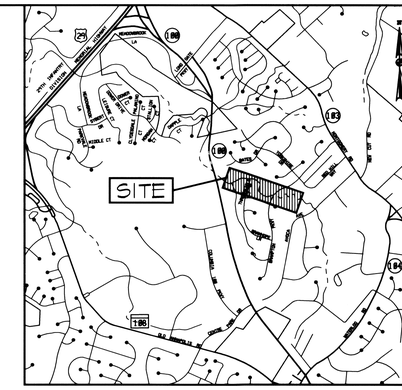
SCALE:
DATE: SEPTEMBER 2011
KCI JOB NO.: 01-081795.53
CAPITAL PROJECT NO.: D-1158
PERMIT ISSUE:
CONSTRUCTION ISSUE:

LD01

SHEET NO.: 24 OF 27

EP-12-005





VICINITY MAP
SCALE: 1"= 2,000'

NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY, DEPARTMENT OF PUBLIC WORKS
ELLICOTT CITY, HOWARD COUNTY
ERIE COLUMBIA, METRO, ZONE
COLUMBIA, MD. 21044

FOREST CONSERVATION PLAN

0 40 80
SCALE: 1"= 40'

LEGEND

EXISTING CONTOURS	
PROPOSED CONTOURS	300
WATERS OF THE U.S.	WUS
50' STREAM BUFFER	SB
NONTIDAL WETLAND EDGE	
25' NONTIDAL WETLAND BUFFER	
PROPERTY LINE	
100-YR FLOODPLAIN LINE	
SOILS BOUNDARY	
EXISTING TREE LINE	
SPECIMEN TREE	SP-1
SAMPLE PLOT (1/10 ACRE)	FSD-A1
HO. CO. DEPT. OF REC. & PARKS FOREST CONSERVATION EASEMENT	
CRITICAL ROOT ZONE	CRZ
15% TO 25% SLOPES	
25% OR GREATER SLOPES	
STUDY AREA BOUNDARY	
EXISTING STORM DRAIN	
EXISTING SANITARY SEWER	
EXISTING FENCE	
LIMIT OF DISTURBANCE	LOD
ORANGE SAFETY (TREE PROTECTION) FENCE	OSF
SANDBAG DIVERSION	
DISCHARGE HOSE	
FOREST TO BE REMOVED	
15' WOODY VEGETATION FREE ZONE	

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

SIGNATURE

DATE

SCALE:	1" = 40'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

FCP1

SHEET NO.: 25 OF 27

PLOTTED: 1:09:57 AM on Thursday, September 29, 2011
BY: Kristy Potter Division: P053 Water Resources GMA Emp.
FILE: M:\2008\01081795.53\drawings\FCP01_Threshfield.dgn

EP-12-005

LEGEND

EXISTING CONTOURS	
PROPOSED CONTOURS	300
WATERS OF THE U.S.	WUS
50' STREAM BUFFER	SB
NONTIDAL WETLAND EDGE	
25' NONTIDAL WETLAND BUFFER	
PROPERTY LINE	
100-YR FLOODPLAIN LINE	
SOILS BOUNDARY	
EXISTING TREE LINE	
SPECIMEN TREE	SP-1
SPECIMEN TREE TO BE REMOVED	
SAMPLE PLOT (1/10 ACRE)	FSD-A1
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CRITICAL ROOT ZONE	CRZ
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EXISTING SANITARY SEWER	
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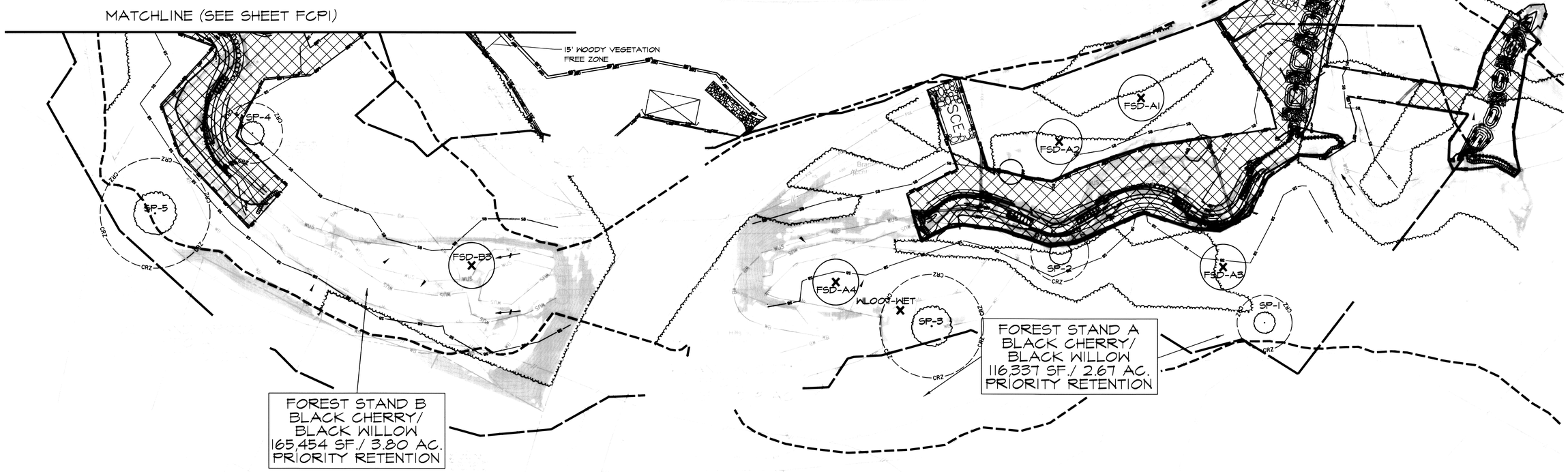
LIMIT OF DISTURBANCE	LOD
ORANGE SAFETY (TREE PROTECTION) FENCE	OSF
SANDBAG DIVERSION	
DISCHARGE HOSE	
FOREST TO BE REMOVED	
PROPOSED DPR FOREST CONSERVATION EASEMENT	
15' WOODY VEGETATION FREE ZONE	



N

0 40 80
SCALE: 1"= 40'

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

SIGNATURE

DATE

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THRESHFIELD COURT
STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
3430 COURTHOUSE DRIVE
COLUMBIA, MD 21046

FOREST CONSERVATION PLAN

SCALE:	1" = 40'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

FCP2

SHEET NO.: 26 OF 27

EP-12-005

PLOTTED: "09:58 AM on Thursday, September 29, 2011"
BY: Kristy Potter Division: P053 Water Resources GMA Emp
FILE: M:\2008\01081795.53\drawings\CP02_threshfield.dgn

Specimen Trees			
ID	Species	Size	Condition
SP-1	White oak (*Quercus alba*)	30"	Excellent
SP-2	Tulip poplar (*Liriodendron tulipifera*)	31.5"	Excellent
SP-3	Red maple (*Acer rubrum*)	56.5"	Fair
SP-4	Pin oak (*Quercus prinus*)	33"	Good
SP-5	Tulip poplar (*Liriodendron tulipifera*)	60"	Excellent

Soils			
Mapping Unit	Description	Hydric (Y/N)	Kf Value
Ha	Hatboro-Codorus silt loam, 0-3% slopes	Yes	0.37
LaC	Legore silt loam, 8-15% slopes	No	0.02
UfA	Urban land-Fallsington complex, 0-2% slopes	Yes	None
GhB	Glenelg-Urban land complex, 0-8% slopes	No	None
MoB	Mount Lucas silt loam, 3-8% slopes	Yes	0.32

FOREST CONSERVATION NOTES

1. The LOD was used as the total tract area and as the net tract area (NTA) for forest conservation calculations as approved under waiver petition WP- - .
2. 2.08 acres of clearing will be within the 100-year floodplain. These areas will be replanted as seen on the landscape plans, sheets 20, 21, 22, and 23 of 24 and the landscape notes and details on sheet 24 of 24.
3. All efforts to minimize the area of disturbance will be made.
4. The 0.36 acres of forest mitigation will be satisfied through fee-in-lieu. Fee-in-lieu will be paid at $0.75/sf. (15,682 sf. x $0.75 = $11,761.50).

GENERAL NOTES

1. Project area is located on one property owned by Howard County Recreation and Parks (Map 30 & 31, Grid 12 & 7, Parcel 393 & 014).
2. Existing Zoning: Howard open space
3. Existing land use: Residential - Rural Medium Density
4. Waters of the U.S. were delineated by KCI Technologies, Inc. on January 3 and 5, 2011. Waters of the U.S. shown represent the verified USACE/MDE water resource boundaries.
5. Total area of nontidal wetlands within the project area: 0.63 AC.
6. Total linear feet of perennial and intermittent streams: 2,895 LF
7. Total forested area within limits of disturbance: 2.17 acres
8. There are no Critical Habitat Areas within the project area. No rare, threatened or endangered species were encountered during the field investigations. In addition, correspondence with the Maryland Historic Trust, the U.S. Fish and Wildlife Service, and the Maryland Department of Natural Resources indicate there are no records of historic resources or sensitive natural resources within the affected area.
9. No specimen trees will be removed.
10. Tree Save is shown on trees within the LOD because an attempt will be made to save these trees. Trees will only be removed if necessary for grading or access.
11. The coordinates shown hereon are based on Howard County geodetic control, which is based upon the Maryland State Plane Coordinate System. Howard County monument numbers 30EC and 31GB were used for this site. The existing topography is taken from field run survey with one foot contour intervals prepared by KCI Technologies, Inc., in January 2011.
12. All wetland and WUS systems denoted with an asterisk (*) continue beyond the limits of the study area.

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

SIGNATURE

DATE

KCI Technologies, Inc. 9/23/2011

Forest Conservation Worksheet

Threshfield Stream Restoration Project

Net Tract Area

A.	Total Tract Area	A= 2.99 ac.
B.	Area within 100-year Floodplain	B= 1.68 ac.
C.	Area to Remain In Agricultural Production	C= 0.00 ac.
D.	Net Tract Area (D=(A-B-C))	D= 1.31 ac.

Land Use Category : Institutional Development Areas

E.	Afforestation Threshold (D x 15%)	E= 0.20 ac.
F.	Conservation Threshold (D x 20%)	F= 0.20 ac.

Existing Forest Cover

G.	Existing Forest Cover (excluding floodplain)	G= 0.16 ac.
H.	Area of Forest Above Afforestation Threshold (1) If G<=E then H=0 and I=0, go to L (2) If G>E then H=G-E, go to I	H= 0.00 ac.
I.	Area of Forest Above Conservation Threshold (1) If G<=F then I=0, go to L (2) If G>F then I=G-F, go to J	I= 0.00 ac.

Break Even Point

J.	Forest Retention Above Threshold with no Mitigation (1) If I>0 then J=(0.2 xI)+F, go to K (2) If I=0, J=0, go to L	J= 0.00 ac.
K.	Clearing Permitted Without Mitigation (K=G-J)	K= 0.00 ac.

Proposed Forest Clearing

L.	Total Area of Forest to be Cleared	L= 0.16 ac.
M.	Total Area of Forest to be Retained (M=G-L)	M= 0.00 ac.

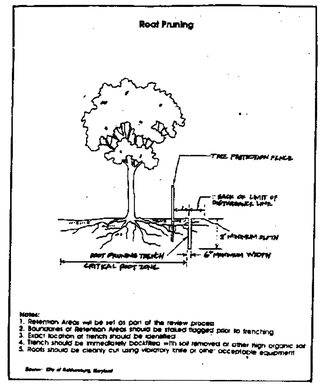
Planting Requirements

N.	Reforestation for Clearing Above the Conservation Threshold (1) If L=K then N=0, P=0, Q=0, R=0, S=0, go to T (2) If M>F then N=L x 0.25, P=0, go to Q (3) If M<=F then N=L x .025, go to P	N= 0.00 ac.
P.	Reforestation for Clearing Below the Conservation Threshold (1) If G>F and M>F then P=0, Q=0, go to R (2) If G>F and M<=F then P=2.0 x (F-M), Q=0, go to R (3) If G<=F then P=2.0 x L, Q=0, go to R	P= 0.32 ac.
Q.	Credit for Retention Above the Conservation Threshold (1) If M>F then Q=M-F, go to R (2) If M<=F then Q=0, go to R	Q= 0.00 ac.
R.	Total Reforestation Required (1) If Q>N and M>E then R=0, S=0, go to T (2) If Q<=N and M>E then R=(N-P)-Q, S=0, go to T (3) If Q<=N and M<=E then R=N+P, go to S	R= 0.32 ac.
S.	Total Afforestation Required (1) If G<E and M<E then S=E-G, go to T (2) If G<E and M>E then S=0, go to T	S= 0.04 ac.
T.	Total Reforestation and Afforestation Requirement T=(R+S)	T= 0.36 ac.

Note: Use 0 for all negative numbers that result from the calculations.

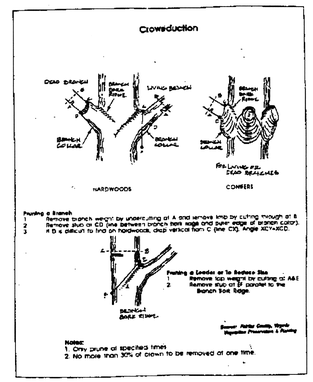
StateFCW.xls Page 1 of 1

EXHIBIT G - 15

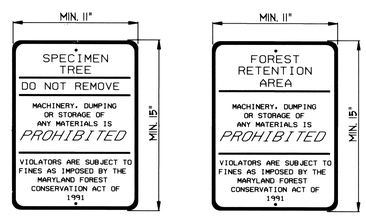


ROOT PRUNING
NOT TO SCLAE

EXHIBIT G - 14



CROWN REDUCTION
NOT TO SCLAE

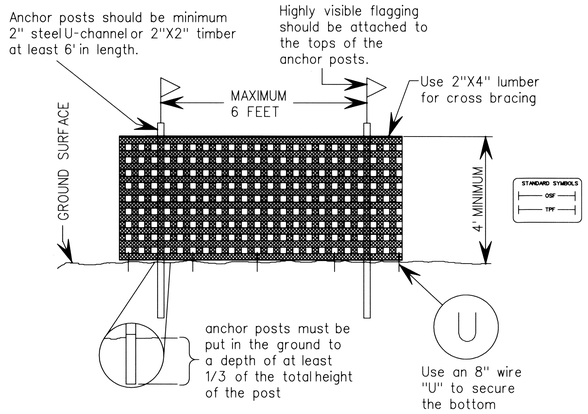


FOREST CONSERVATION SIGNAGE

NOT TO SCALE

NOTES:

1. BOTTOM OF SIGN TO BE HIGHER THAN TREE PROTECTION FENCE.
2. SIGNS TO BE PLACED 50 TO 100' APART. CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART WITHIN THE ACCEPTABLE NOTED RANGE.
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
4. SIGNS MAY BE REMOVED FROM RESIDENTIAL LOTS UPON ISSUANCE OF USE AND OCCUPANCY RETENTION FOREST ONLY.
5. ALL SIGNAGE MUST REMAIN DURING THE MAINTENANCE PERIOD.
6. THE SIGNS NOTIFY CONSTRUCTION WORKERS AND FUTURE RESIDENTS OF THE NEWLY PLANTED MATERIAL, IMPROVING THE TREES' SURVIVAL RATES.
7. SIGNS MAY BE ADAPTED BY RESIDENTS FOR IDENTIFICATION OF FOREST RETENTION AREAS.



BLAZE ORANGE PLASTIC MESH SAFETY FENCE/TREE PROTECTION DETAIL

NOT TO SCALE

PLACEMENT OF ORANGE HIGH VISIBILITY FENCE:

1. ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMITS OF DISTURBANCE, WHERE THAT LIMIT IS WITHIN 50' OF THE FOREST CONSERVATION/ FOREST BUFFER EASEMENTS AND SHALL FUNCTION AS A FOREST PROTECTION DEVICE.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF THE RETENTION AREA SHALL BE STAKES AND FLAGGED PRIOR TO INSTALLING THE DEVICE.
4. ROOT DAMAGE SHALL BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.53 \

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

THRESHFIELD COURT STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

FOREST CONSERVATION PLAN NOTES AND DETAILS

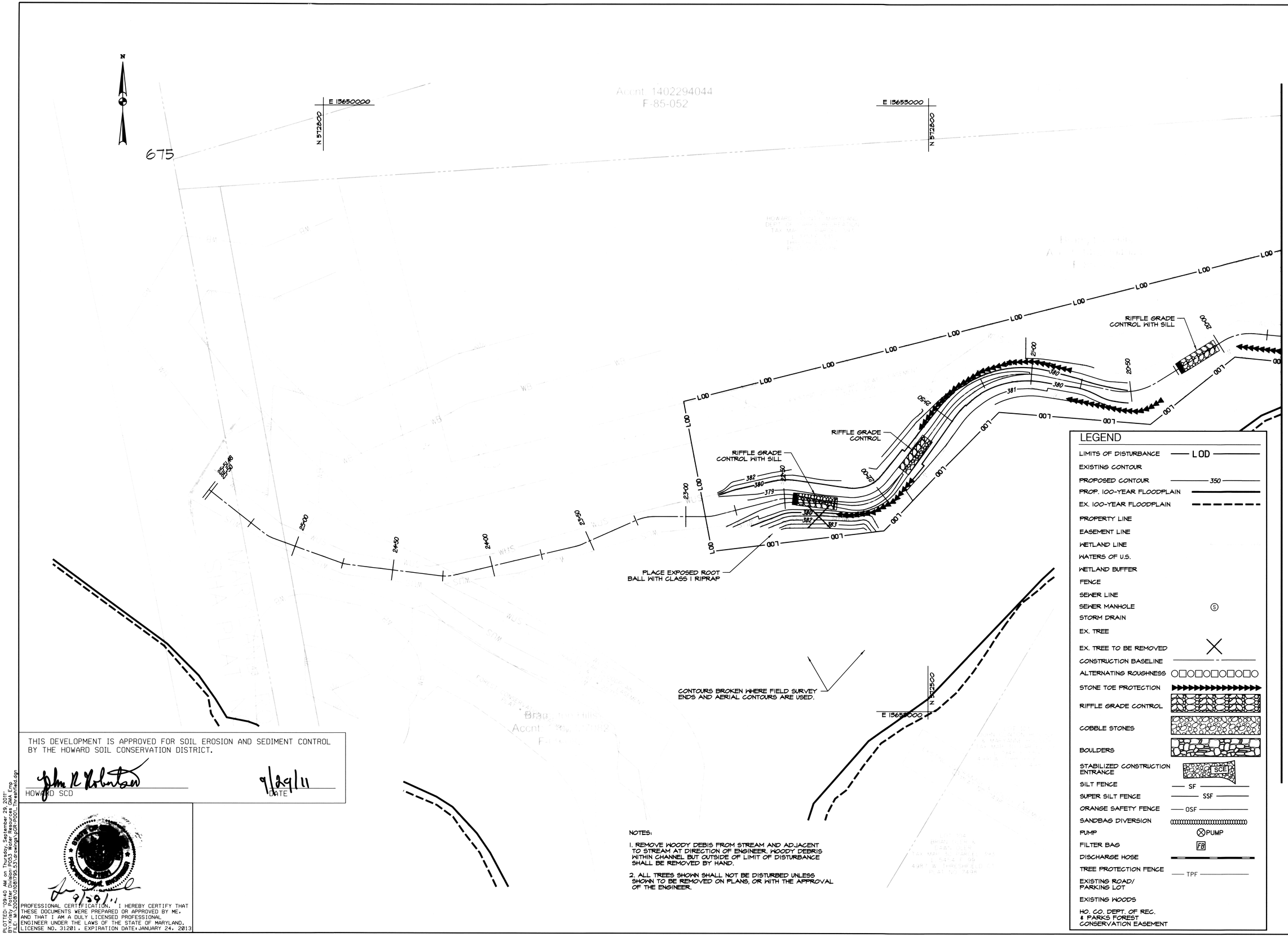
SCALE:	AS SHOWN
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

FCP3

SHEET NO.: 27 OF 27

EP-12-005

PLOTTED: 09:59 AM on Thursday, September 29, 2011
BY: Kristy Potter Division: F053 Water Resources QMA Emp
FILE: M:\2008\01081795.53\drawings\FCP-Notes&Details.dgn



THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 9/29/11

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. 31201, EXPIRATION DATE: JANUARY 24, 2013

9/29/11

NOTES:

1. REMOVE WOODY DEBIS FROM STREAM AND ADJACENT TO STREAM AT DIRECTION OF ENGINEER. WOODY DEBRIS WITHIN CHANNEL BUT OUTSIDE OF LIMIT OF DISTURBANCE SHALL BE REMOVED BY HAND.

2. ALL TREES SHOWN SHALL NOT BE DISTURBED UNLESS SHOWN TO BE REMOVED ON PLANS, OR WITH THE APPROVAL OF THE ENGINEER.

NO.	REVISIONS DESCRIPTION	DATE

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THRESHFIELD COURT STREAM RESTORATION PROJECT

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HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING - CONTRACTS
6751 COLUMBIA GATEWAY DRIVE
SUITE 300
COLUMBIA, MD 21046

GRADING PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2011
KCI JOB NO.:	01-081795.53
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

GR01

SHEET NO.: 7 OF 27

PLOTTED: "09:40 AM on Thursday, September 29, 2011"
BY: Kristy Potter Division P053 Water Resources GMA Emp
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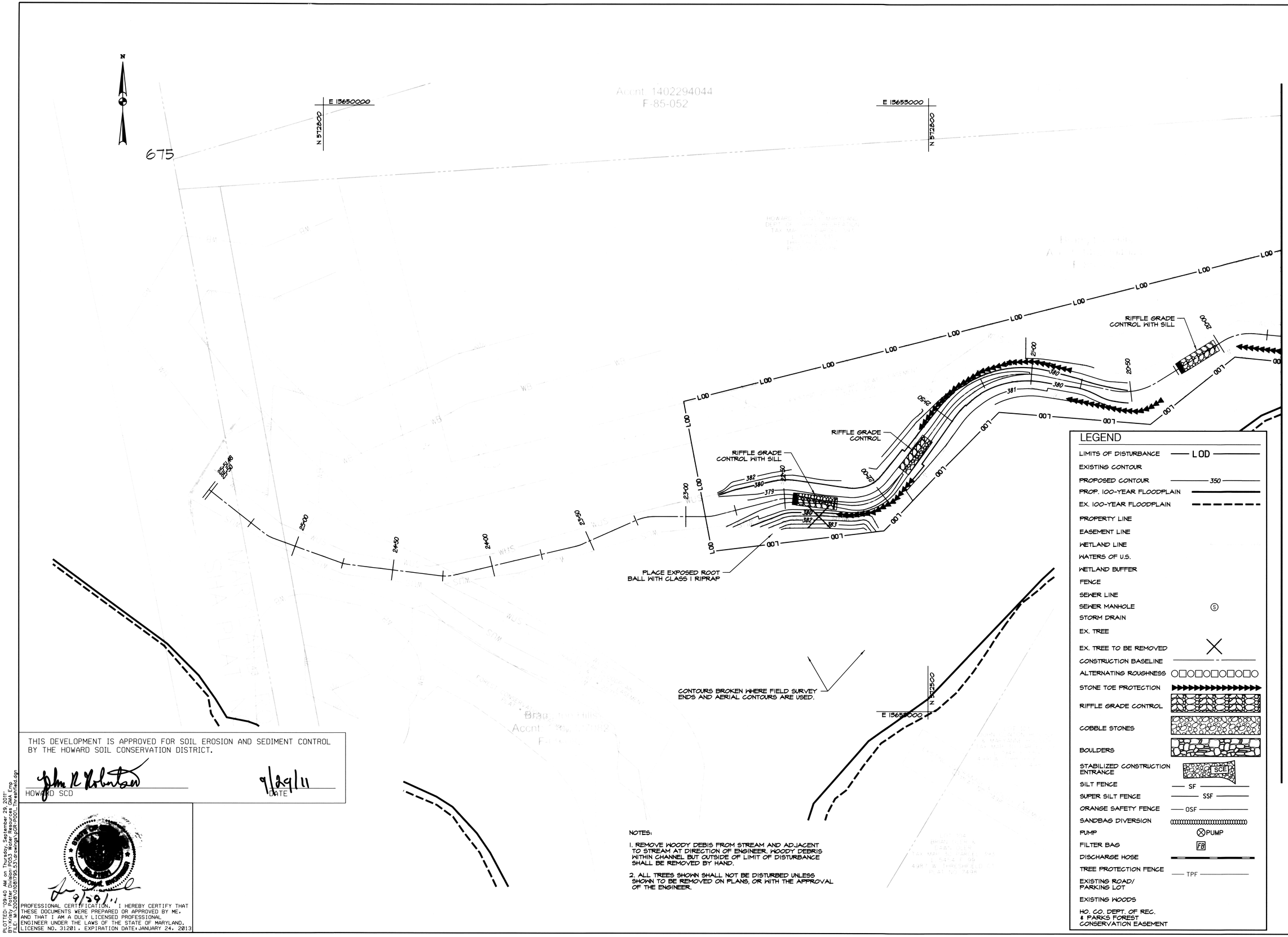
EP-12-005



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HOWARD SCD — DATE 9/29/11

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