SWEET HOURS WAY CULVERT DESIGN

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT D-1159

INDEX OF SHEETS

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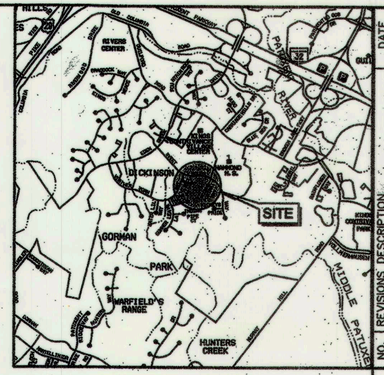
LEGEND

LIMIT OF DISTURBANCE — LOD —
EX. INDEX CONTOUR — 350 —
EX. INTERMEDIATE CONTOUR
PROPOSED CONTOUR — 350 —
EX. 100-YR FLOODPLAIN
PROP. 100-YR FLOODPLAIN
PROPERTY LINE
EASEMENT LINE
WETLAND LINE
WATERS OF U.S.
25' WETLAND BUFFER
50' STREAM BUFFER — SB —
EX. STORM DRAIN
EX. TREE
TREE SAVE
STABILIZED CONSTRUCTION ENTRANCE — SCE —
SUMP PIT — SP —
ORANGE SAFETY FENCE
SANDBAG DAM
PUMP — P —
FILTER BAG — FB —
DISCHARGE HOSE
EXISTING ROAD/ PARKING LOT
EXISTING WOODS



VICINITY MAP
SCALE: 1"=2000'

GENERAL NOTES

1. THE SUBJECT PROPERTIES ARE ZONED NEW TOWN PER FEBRUARY 2, 2004 COMPREHENSIVE ZONING PLAN AND THE COMP-LITE ZONING AMENDMENTS DATED 7/28/2006.
2. THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING AND 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 SITE IS WITHIN THE NEW TOWN DISTRICT AND THEREFORE IS NOT SUBJECT TO 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 1-600-257-7777 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. BENCHMARKS SHOWN HEREON WERE PROVIDED BY HOWARD COUNTY SURVEY DIVISION AND AB CONSULTANTS, INC. (PROJECT SURVEYOR).
10. WATER IS PUBLIC.
11. SEWER IS PUBLIC.
12. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
13. TOPOGRAPHIC SURVEY OF THE SITE WAS PERFORMED BY AB CONSULTANTS, INC. IN JULY 2007, WITH UPDATES IN JULY 2010 AND NOVEMBER 2012.
14. ALL WORK SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT (MDE TRACKING #201361199).
15. A TRAFFIC STUDY IS NOT REQUIRED FOR THIS PROJECT.
16. 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.
17. 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.
18. EXISTING GROUND AND/OR VEGETATION DISTURBED BY THE PROPOSED WORK SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS OR BETTER BY CONCLUSION OF THE PROJECT.
19. THE PROPOSED PROJECT IS LOCATED ALONG THE SWEET HOURS ROADWAY AND TO THE NORTH AND SOUTH SIDES OF SWEET HOURS WAY.
20. THE EXISTING STORMWATER POND WAS DESIGNED IN 1980 AS A DETENTION POND WITH NORMALLY DRY CONDITIONS. THE POND WAS CONSTRUCTED UNDER CONTRACT F-80-96.
21. THE EXISTING CHANNEL DOWNSTREAM OF THE EXISTING SWEET HOURS STORMWATER POND IS A TRIBUTARY TO THE MIDDLE PATUXENT RIVER. THIS STREAM IS DESIGNATED AS USE I-P. NO WORK SHALL BE CONDUCTED WITHIN THE STREAM CHANNEL BETWEEN MARCH 1ST AND JUNE 15TH, INCLUSIVE OF ANY YEAR (COMAR 26.08.02.11).
22. UPON COMPLETION OF THE WORK, THE SIDEWALK, CURB AND GUTTER AND ROADWAY SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION. THE CONTRACTOR SHALL INVENTORY AND NOTE ALL SITE CONDITIONS PRIOR TO COMMENCEMENT OF EXCAVATION.

ADC MAP NO. 19 GRID G2

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

HOWARD COUNTY SURVEY CONTROL

DESIGNATION	NORTHING	EASTING	ELEVATION
10IA	600995.1136	1345340.330	441.969
17AB	598435.249	1348615.249	508.469

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.
3. CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
4. 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. CONTRACTOR SHALL NOT STORE EQUIPMENT,MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
5. 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.
6. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
7. 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.
8. 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.

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 OF ENGINEER (PRINT NAME BELOW SIGNATURE) — P.E. # 25763 — DATE 9/9/2014
MATTHEW SNYDER, 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"

SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) — DATE 12/2/14
Mark S. Richmond

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. 25763, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

DIRECTOR OF PUBLIC WORKS — DATE 4/27/16
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE 12/2/14

DEPARTMENT OF RECREATION AND PARKS, HOWARD COUNTY, MD

DIRECTOR OF RECREATION AND PARKS — DATE 4/27/16

EP-13-040

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. 10/12/16
HOWARD SCD — DATE 9/23/14

DESIGN CERTIFICATION
"I hereby certify, by my seal, that to the best of my knowledge and belief the features shown on this plan were constructed as shown on this "AS-BUILT" plan meet the Approved Plans and Specifications."

Kathy Hoverman — Designer/Consultant (print name)
Seal & Signature
38311 — License Number
2/28/19 — Date

STATE OF MARYLAND — KATHY LYNN HOVERMAN — 38311 — PROFESSIONAL ENGINEER

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\2008\01081795.83\

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SPARKS, MARYLAND 21152
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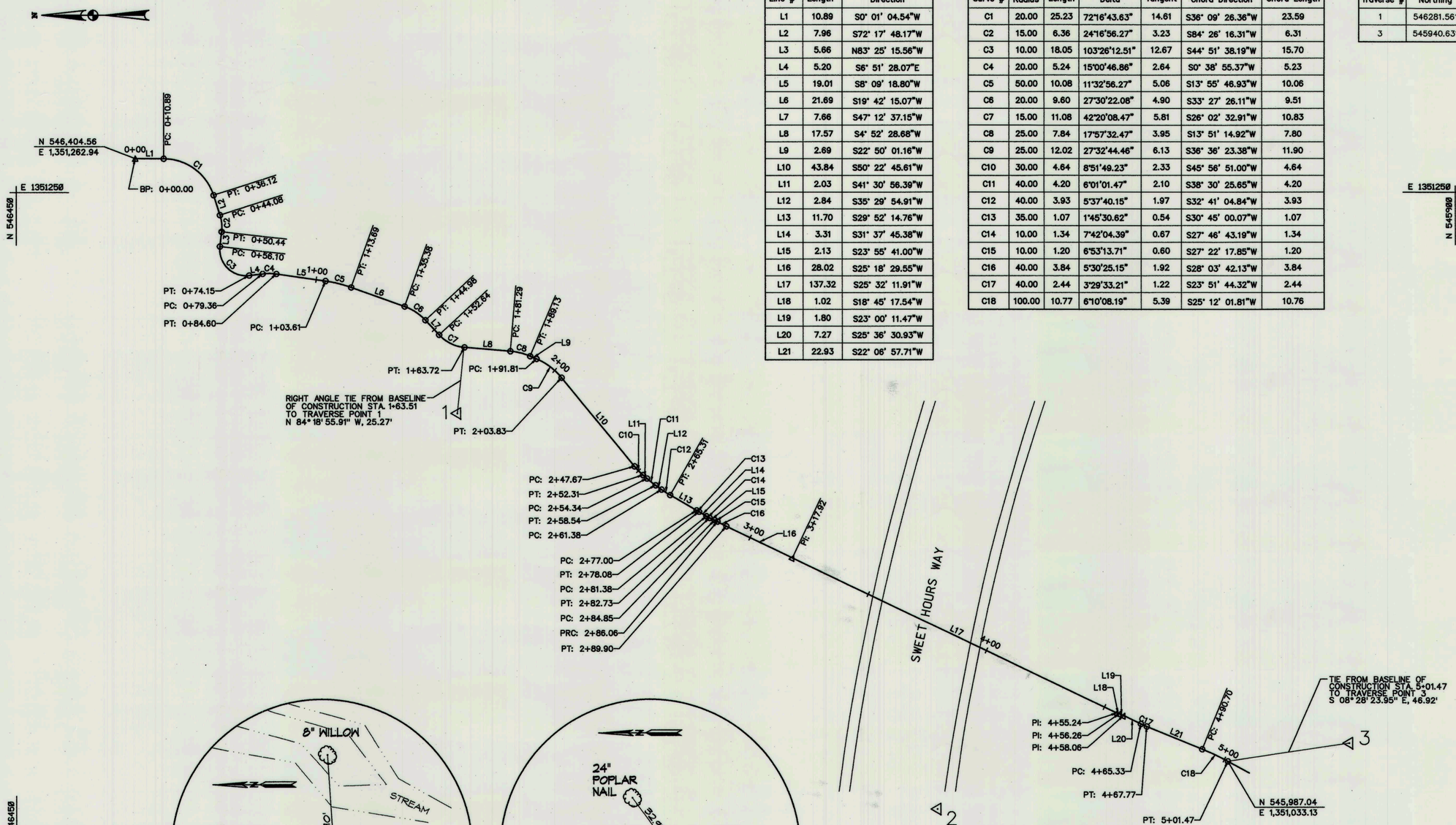
CULVERT DESIGN
CAPITAL PROJECT D-1159
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

TITLE SHEET

SCALE: AS SHOWN
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SHEET NO.: 1 OF 16

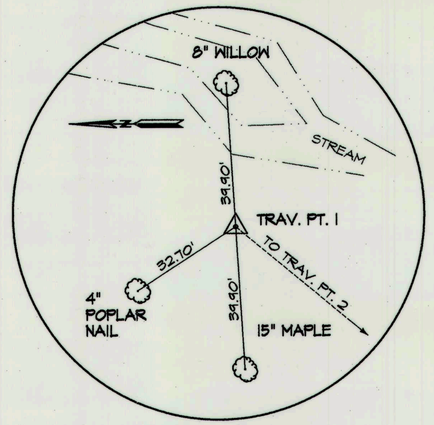
FILE: M:\2008\01081795.83\dgn\TD1_SWEET HOURS.dgn



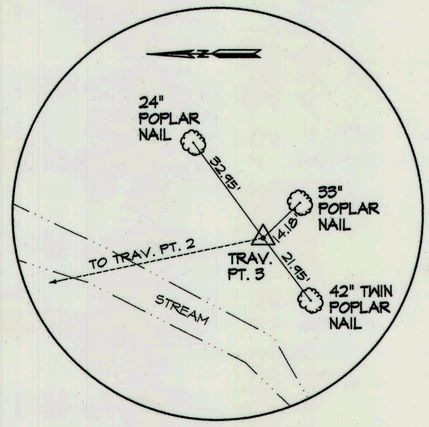
Line Table		
Line #	Length	Direction
L1	10.89	S0° 01' 04.54"W
L2	7.96	S72° 17' 48.17"W
L3	5.66	N83° 25' 15.56"W
L4	5.20	S6° 51' 28.07"E
L5	19.01	S8° 09' 18.80"W
L6	21.69	S19° 42' 15.07"W
L7	7.66	S47° 12' 37.15"W
L8	17.57	S4° 52' 28.68"W
L9	2.69	S22° 50' 01.16"W
L10	43.84	S50° 22' 45.61"W
L11	2.03	S41° 30' 56.39"W
L12	2.84	S35° 29' 54.91"W
L13	11.70	S29° 52' 14.76"W
L14	3.31	S31° 37' 45.38"W
L15	2.13	S23° 55' 41.00"W
L16	28.02	S25° 18' 29.55"W
L17	137.32	S25° 32' 11.91"W
L18	1.02	S18° 45' 17.54"W
L19	1.80	S23° 00' 11.47"W
L20	7.27	S25° 36' 30.93"W
L21	22.93	S22° 06' 57.71"W

Curve Table						
Curve #	Radius	Length	Delta	Tangent	Chord Direction	Chord Length
C1	20.00	25.23	72°16'43.63"	14.61	S36° 09' 26.36"W	23.59
C2	15.00	6.36	24°16'56.27"	3.23	S84° 26' 16.31"W	6.31
C3	10.00	18.05	103°26'12.51"	12.67	S44° 51' 38.19"W	15.70
C4	20.00	5.24	15°00'46.86"	2.64	S0° 38' 55.37"W	5.23
C5	50.00	10.08	11°32'56.27"	5.06	S13° 55' 46.93"W	10.06
C6	20.00	9.60	27°30'22.08"	4.90	S33° 27' 26.11"W	9.51
C7	15.00	11.08	42°20'08.47"	5.81	S26° 02' 32.91"W	10.83
C8	25.00	7.84	17°57'32.47"	3.95	S13° 51' 14.92"W	7.80
C9	25.00	12.02	27°32'44.46"	6.13	S36° 36' 23.38"W	11.90
C10	30.00	4.64	8°51'49.23"	2.33	S45° 56' 51.00"W	4.64
C11	40.00	4.20	6°01'01.47"	2.10	S38° 30' 25.65"W	4.20
C12	40.00	3.93	5°37'40.15"	1.97	S32° 41' 04.84"W	3.93
C13	35.00	1.07	1°45'30.62"	0.54	S30° 45' 00.07"W	1.07
C14	10.00	1.34	7°42'04.39"	0.67	S27° 46' 43.19"W	1.34
C15	10.00	1.20	6°53'13.71"	0.60	S27° 22' 17.85"W	1.20
C16	40.00	3.84	5°30'25.15"	1.92	S28° 03' 42.13"W	3.84
C17	40.00	2.44	3°29'33.21"	1.22	S23° 51' 44.32"W	2.44
C18	100.00	10.77	6°10'08.19"	5.39	S25° 12' 01.81"W	10.76

Traverse Coordinate Table			
Traverse #	Northing	Easting	Elevation
1	546281.561	1351165.842	280.220
3	545940.631	1351040.041	269.220



TRAVERSE POINT 1
PIN AND CAP
SCALE: 1"=20'



TRAVERSE POINT 3
PIN AND CAP
SCALE: 1"=20'

STATE OF MARYLAND
MATTHEW RALPH SNYDER
No. 25753
PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.83 \

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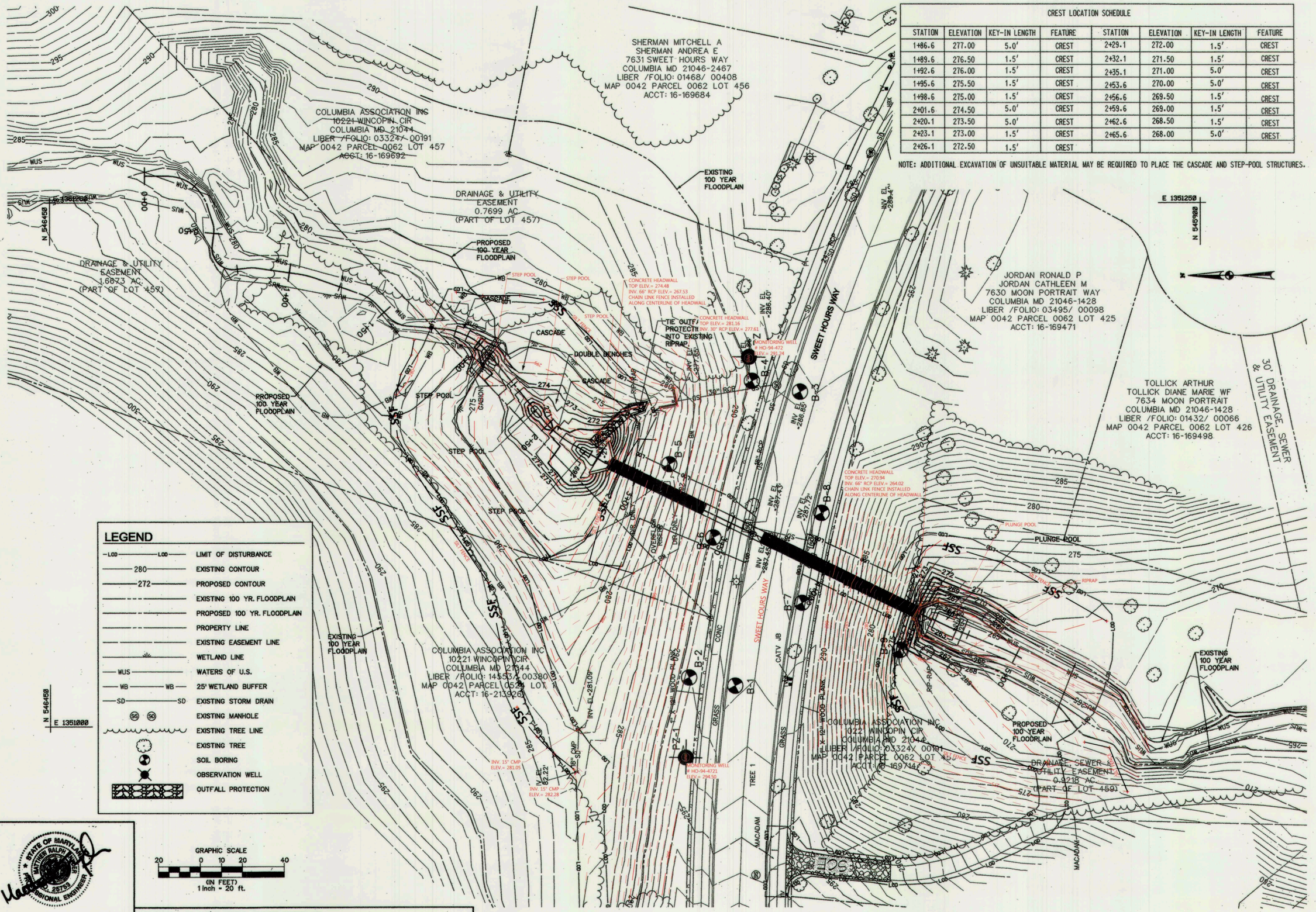
GEOMETRY PLAN

SCALE: 1" = 20'
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:

PLOTTED FROM DWG FILE: M:\2008\01081795.83\drawings\geotsweet.dwg
BY: Matthew Snyder Division: P053 Water Res GMA Emp
FILE: M:\2008\01081795.83\drawings\geotsweet.dgn

CREST LOCATION SCHEDULE							
STATION	ELEVATION	KEY-IN LENGTH	FEATURE	STATION	ELEVATION	KEY-IN LENGTH	FEATURE
1+86.6	277.00	5.0'	CREST	2+29.1	272.00	1.5'	CREST
1+89.6	276.50	1.5'	CREST	2+32.1	271.50	1.5'	CREST
1+92.6	276.00	1.5'	CREST	2+35.1	271.00	5.0'	CREST
1+95.6	275.50	1.5'	CREST	2+53.6	270.00	5.0'	CREST
1+98.6	275.00	1.5'	CREST	2+56.6	269.50	1.5'	CREST
2+01.6	274.50	5.0'	CREST	2+59.6	269.00	1.5'	CREST
2+20.1	273.50	5.0'	CREST	2+62.6	268.50	1.5'	CREST
2+23.1	273.00	1.5'	CREST	2+65.6	268.00	5.0'	CREST
2+26.1	272.50	1.5'	CREST				

NOTE: ADDITIONAL EXCAVATION OF UNSUITABLE MATERIAL MAY BE REQUIRED TO PLACE THE CASCADE AND STEP-POOL STRUCTURES.



LEGEND

LOD	LIMIT OF DISTURBANCE
280	EXISTING CONTOUR
272	PROPOSED CONTOUR
	EXISTING 100 YR. FLOODPLAIN
	PROPOSED 100 YR. FLOODPLAIN
	PROPERTY LINE
	EXISTING EASEMENT LINE
	WETLAND LINE
WUS	WATERS OF U.S.
WB	25' WETLAND BUFFER
SD	EXISTING STORM DRAIN
SS SD	EXISTING MANHOLE
	EXISTING TREE LINE
	EXISTING TREE
	SOIL BORING
	OBSERVATION WELL
	OUTFALL PROTECTION

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

STATE OF MARYLAND
MATTHEW RALPH HEER
No. 25753
PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

NO.	REVISIONS DESCRIPTION	DATE

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STORMWATER MANAGEMENT DIVISION
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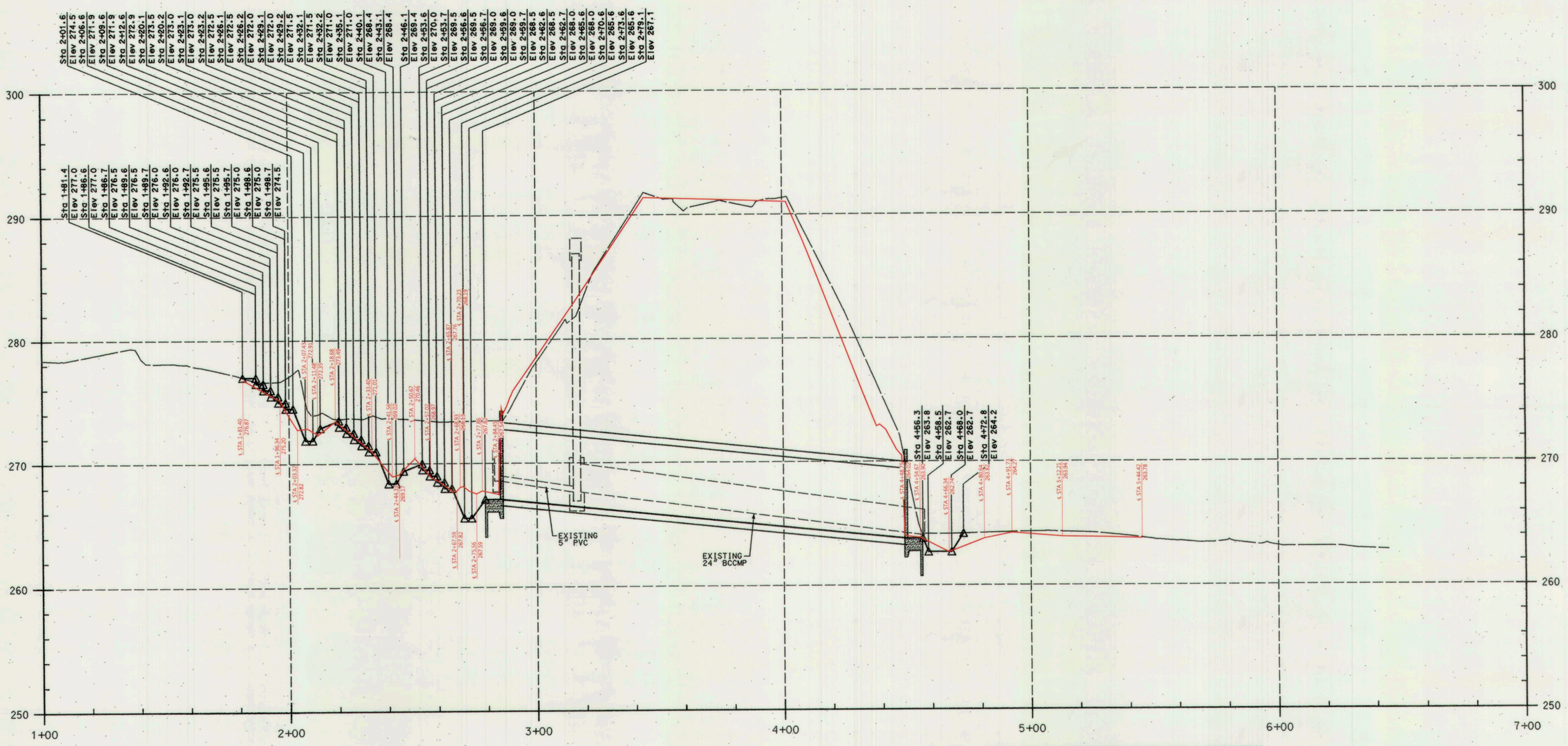
GRADING PLAN

SCALE: 1" = 20'
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:

AS-BUILT

SHEET NO.: 3 OF 16



LEGEND

EXISTING GROUND

PROPOSED GRADE

PROPOSED 66" RCP

AS-BUILT

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. 25753, EXPIRATION DATE: 01-16-2015

STATE OF MARYLAND · MATTHEW RALPH PETERS · NO. 25753 · PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

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

HOWARD SCD — DATE 9/23/14

NO.	REVISIONS DESCRIPTION	DATE

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CAPITAL PROJECT D-1159

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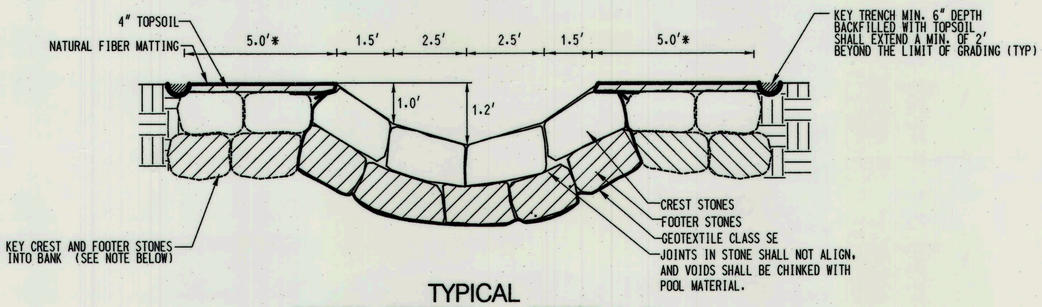
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

PROFILE

SCALE:	HOR: 1" = 20' VERT. 1" = 4'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

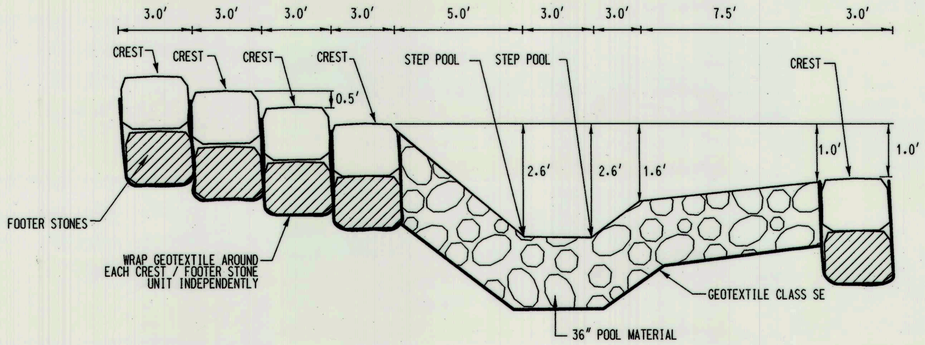
SHEET NO.: 4 OF 16



TYPICAL CROSS SECTION – CREST A–A'

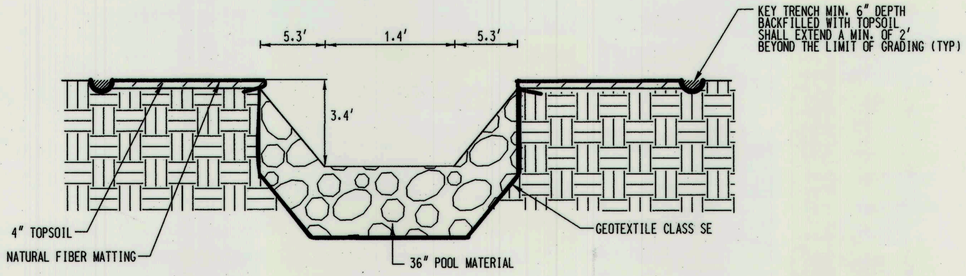
NOT TO SCALE

* KEY CREST AND FOOTER STONES 5.0' INTO BANKS ON FIRST AND LAST CRESTS. ALL OTHER CRESTS SHALL BE KEYED 1.5' INTO BANKS.



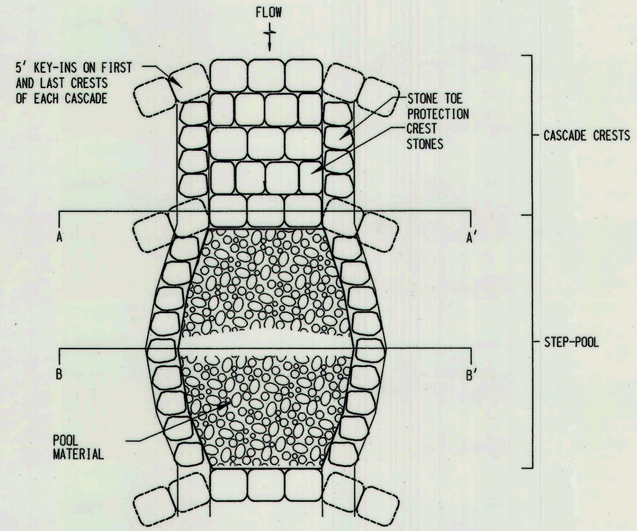
TYPICAL PROFILE – CASCADE WITH STEP POOL

NOT TO SCALE



TYPICAL CROSS SECTION – STEP POOL B–B'

NOT TO SCALE



NOTE: WASH IN CHANNEL SAND & GRAVEL TO FILL VOID SPACE OF POOL PAVEMENT

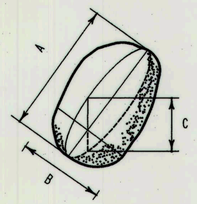
TYPICAL PLAN VIEW OF CASCADE WITH STEP–POOL

NOT TO SCALE

CHANNEL SAND & GRAVEL	
% 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

* CHANNEL SAND & GRAVEL SHALL BE SALVAGED WHERE POSSIBLE.

20% OF THE STONE VOLUME SHALL BE CALCULATED AS CHANNEL SAND & GRAVEL VOLUME TO BE USED FOR FILLING VOID SPACE.



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

ROCK AXIS DEFINITION

NOT TO SCALE

SIZES FOR STONE TYPES			
AXIS	A (LONGEST)	B (INTERMEDIATE)	C (SHORTEST)
	MAX.	RANGE	MIN.
CREST AND FOOTER STONES*	4.5'	2.8' - 3.3'	2.5'
POOL MATERIAL	80% CLASS III 20% GABION STONE		

* CREST AND FOOTER STONES SHALL BE BLOCKY IN SHAPE AND GREY OR BROWN IN COLOR.
** CHANNEL SAND AND GRAVEL SHALL BE SALVAGED WHERE POSSIBLE

STATE OF MARYLAND
MATTHEW RALPH SNYDER
No. 25753
PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

PLOT SCALE: 1:1
PLOT DATE: TUESDAY, OCTOBER 15, 2013
BY: Matthew Snyder Division: PG53 Water Res GMA Emp
FILE: M:\2008\01081795.83\drawings\detlsweet.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.83 \

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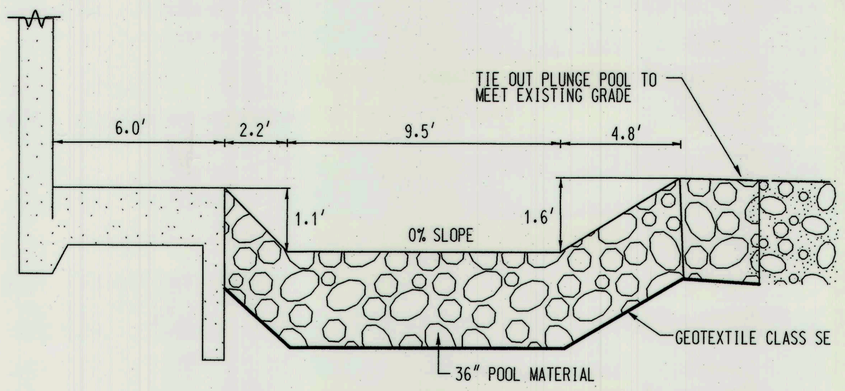
KCI TECHNOLOGIES

SWEET HOURS WAY CULVERT DESIGN
CAPITAL PROJECT D-1159
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

STREAM DETAILS

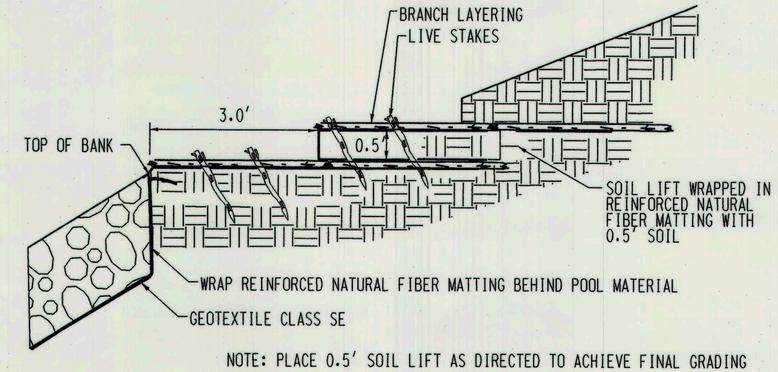
SCALE:
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SHEET NO.: 5 OF 16



PLUNGE POOL PROFILE

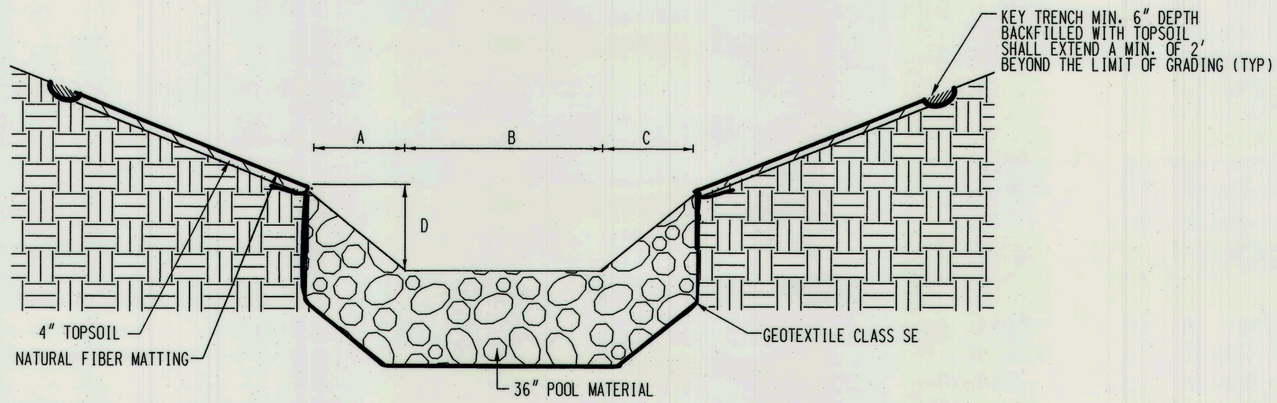
NOT TO SCALE



NOTE: PLACE 0.5' SOIL LIFT AS DIRECTED TO ACHIEVE FINAL GRADING

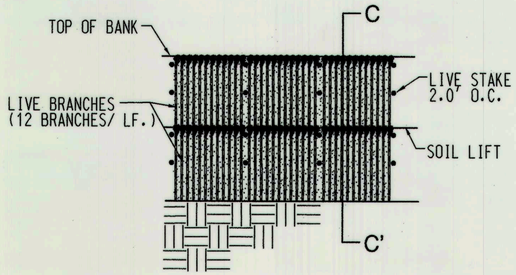
DOUBLE BENCH PROFILE C–C'

NOT TO SCALE



TYPICAL PLUNGE POOL CROSS SECTION

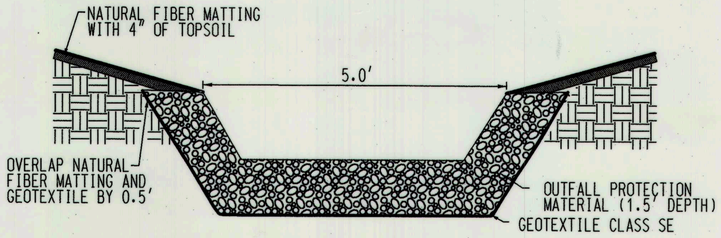
NOT TO SCALE
NOT TO SCALE



LIVE BRANCH PLAN FOR DOUBLE BENCHES

NOT TO SCALE

PLUNGE POOL DIMENSIONS					
STATION	TYPE	A	B	C	D
4+58.5	PLUNGE POOL 1	4.6'	8.6'	4.6'	2.3'
4+68	PLUNGE POOL 2	4.6'	9.6'	4.6'	2.3'



OUTFALL PROTECTION TO STORM DRAIN AT STA. 2+73

NOT TO SCALE

STATE OF MARYLAND
MATTHEW RALPH SNYDER
No. 25753
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION.
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LICENSE NO. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

BY: Matthew Snyder Division: PUB3 Water Res GMA Emp
FILE: M:\2008\01081795.83\drawings\de02sweet.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.83 \

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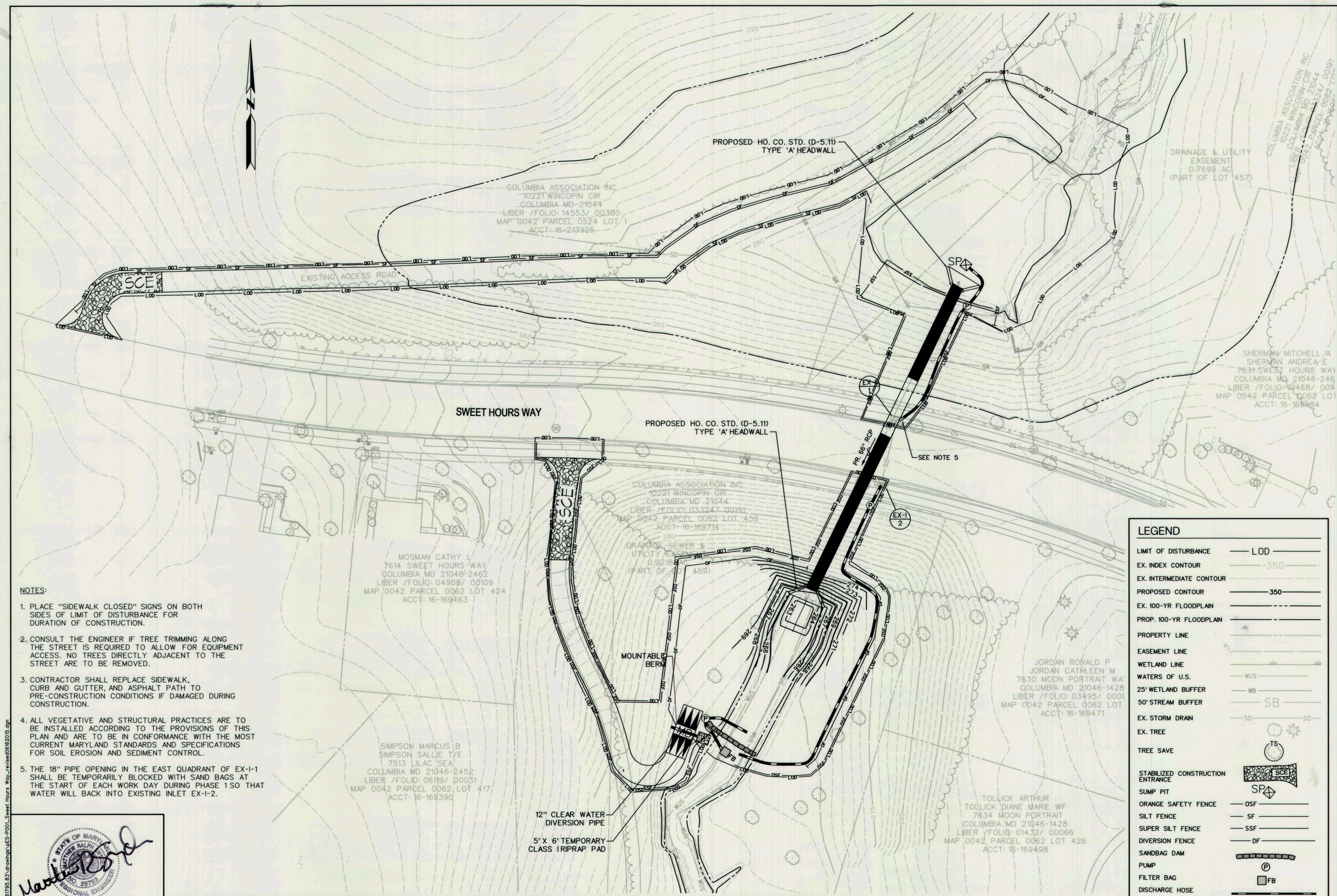
SWEET HOURS WAY CULVERT DESIGN
CAPITAL PROJECT D-1159
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

STREAM DETAILS

SCALE:
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:



NOTES:

1. PLACE "SIDEWALK CLOSED" SIGNS ON BOTH SIDES OF LIMIT OF DISTURBANCE FOR DURATION OF CONSTRUCTION.
2. CONSULT THE ENGINEER IF TREE TRIMMING ALONG THE STREET IS REQUIRED TO ALLOW FOR EQUIPMENT ACCESS. NO TREES DIRECTLY ADJACENT TO THE STREET ARE TO BE REMOVED.
3. CONTRACTOR SHALL REPLACE SIDEWALK, CURB AND GUTTER, AND ASPHALT PATH TO PRE-CONSTRUCTION CONDITIONS IF DAMAGED DURING CONSTRUCTION.
4. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
5. THE 18" PIPE OPENING IN THE EAST QUADRANT OF EX-I-1 SHALL BE TEMPORARILY BLOCKED WITH SAND BAGS AT THE START OF EACH WORK DAY DURING PHASE 1 SO THAT WATER WILL BACK INTO EXISTING INLET EX-I-2.

LEGEND

LIMIT OF DISTURBANCE	LOD
EX. INDEX CONTOUR	350
EX. INTERMEDIATE CONTOUR	
PROPOSED CONTOUR	350
EX. 100-YR FLOODPLAIN	
PROP. 100-YR FLOODPLAIN	
PROPERTY LINE	
EASEMENT LINE	
WETLAND LINE	
WATERS OF U.S.	WUS
25' WETLAND BUFFER	WB
50' STREAM BUFFER	SB
EX. STORM DRAIN	SD
EX. TREE	
TREE SAVE	TS
STABILIZED CONSTRUCTION ENTRANCE	SCE
SUMP PIT	SP
ORANGE SAFETY FENCE	OSF
SILT FENCE	SF
SUPER SILT FENCE	SSF
DIVERSION FENCE	DF
SANDBAG DAM	
PUMP	P
FILTER BAG	FB
DISCHARGE HOSE	
EXISTING ROAD/ PARKING LOT	
EXISTING WOODS	

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. 25753, EXPIRATION DATE: 01-16-2015

STATE OF MARYLAND · MATTHEW RALPH · NO. 25753 · PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 6/16/16

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

HOWARD SCD — DATE 6/23/15

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.83 \

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SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

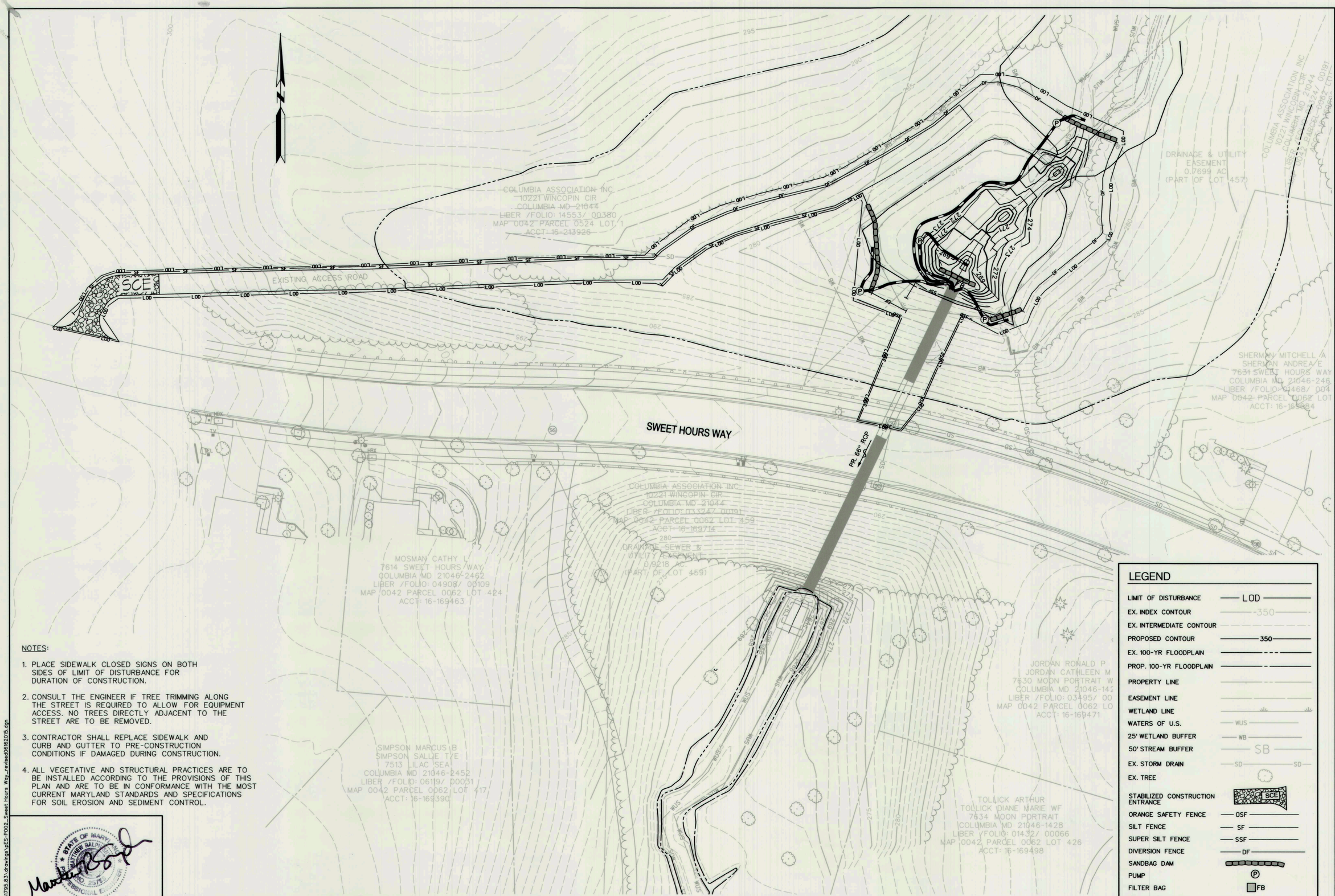
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

EROSION & SEDIMENT CONTROL PLAN PHASE I

SCALE:	1" = 20'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

SHEET NO.: 8 OF 16

BY: Division:
FILE: M:\2008\01081795.83\drawings\pES-P001_Sweet Hours Way_revised06162015.dgn



NOTES:

1. PLACE SIDEWALK CLOSED SIGNS ON BOTH SIDES OF LIMIT OF DISTURBANCE FOR DURATION OF CONSTRUCTION.
2. CONSULT THE ENGINEER IF TREE TRIMMING ALONG THE STREET IS REQUIRED TO ALLOW FOR EQUIPMENT ACCESS. NO TREES DIRECTLY ADJACENT TO THE STREET ARE TO BE REMOVED.
3. CONTRACTOR SHALL REPLACE SIDEWALK AND CURB AND GUTTER TO PRE-CONSTRUCTION CONDITIONS IF DAMAGED DURING CONSTRUCTION.
4. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

LEGEND

LIMIT OF DISTURBANCE	LOD
EX. INDEX CONTOUR	350
EX. INTERMEDIATE CONTOUR	
PROPOSED CONTOUR	350
EX. 100-YR FLOODPLAIN	
PROP. 100-YR FLOODPLAIN	
PROPERTY LINE	
EASEMENT LINE	
WETLAND LINE	
WATERS OF U.S.	WUS
25' WETLAND BUFFER	WB
50' STREAM BUFFER	SB
EX. STORM DRAIN	SD SD
EX. TREE	
STABILIZED CONSTRUCTION ENTRANCE	SCE
ORANGE SAFETY FENCE	OSF
SILT FENCE	SF
SUPER SILT FENCE	SSF
DIVERSION FENCE	DF
SANDBAG DAM	
PUMP	P
FILTER BAG	FB
DISCHARGE HOSE	
EXISTING ROAD/ PARKING LOT	
EXISTING WOODS	

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 6/16/15

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

HOWARD SCD — DATE 6/23/15

NO.	REVISIONS DESCRIPTION	DATE

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SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

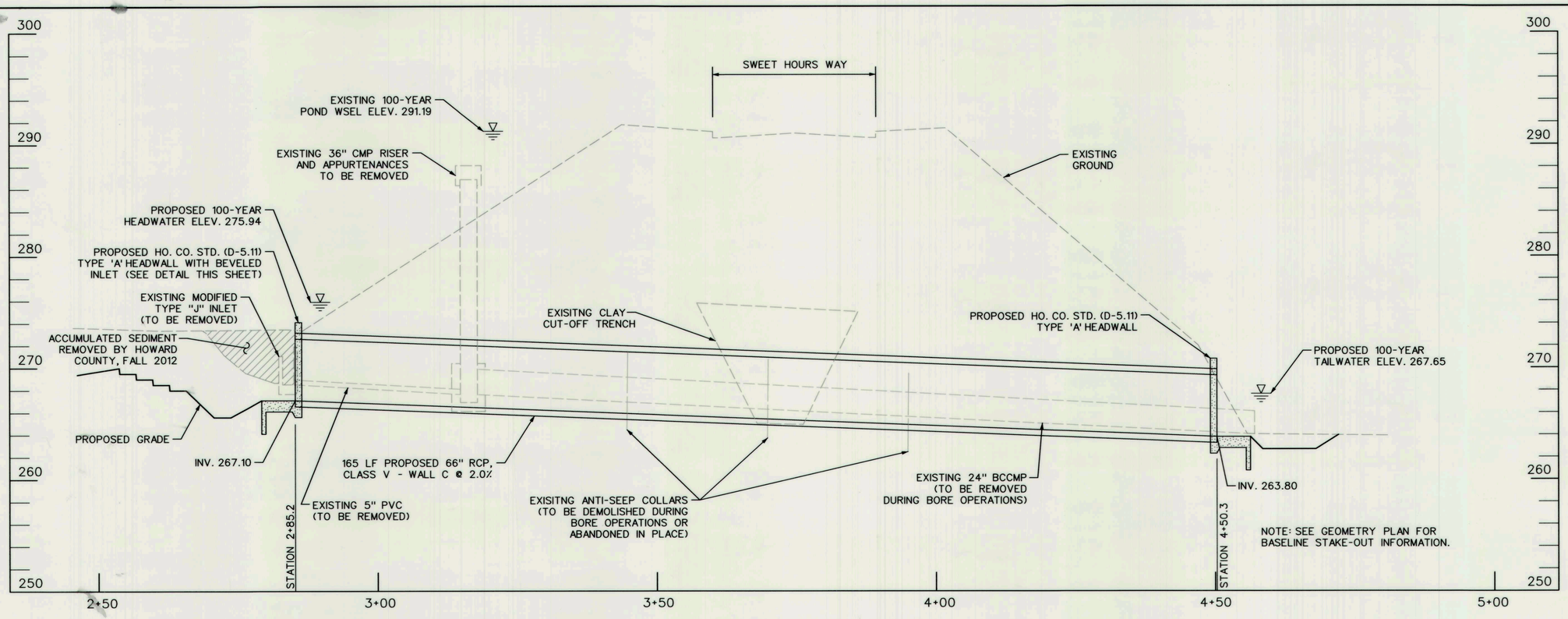
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

EROSION & SEDIMENT CONTROL PLAN PHASE II

SCALE:	1"= 20'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

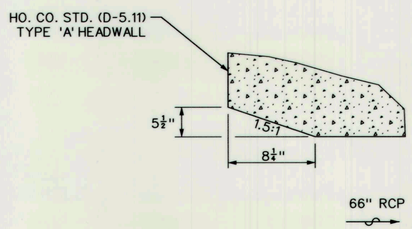
SHEET NO.: OF 15

DGN FILE: M:\2008\01081795.83\drawings\ES-P002_Sweet Hours Way_revised06152015.dgn
BY: Division:
FILE: M:\2008\ 01081795.83 \ drawings \ES-P002_Sweet Hours Way_revised06152015.dgn



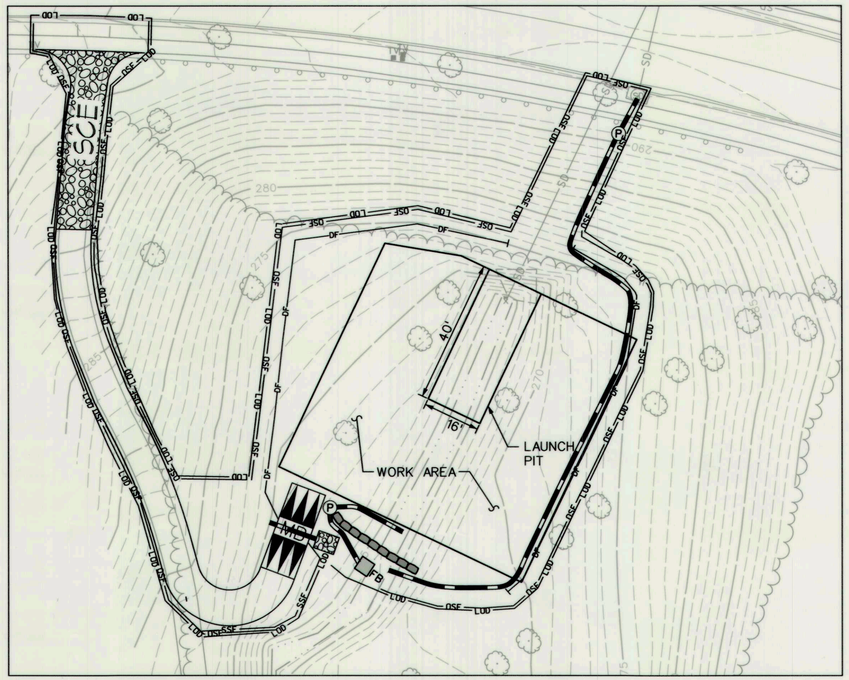
PROFILE OF PROPOSED CULVERT

SCALE: HOR: 1"= 10'
VERT: 1"= 5'



BEVELED INLET DETAIL

NOT TO SCALE



BORE WORK AREA PLAN

SCALE: 1"= 20'

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.83 \

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SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

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

CULVERT PROFILE AND DETAILS

SCALE:	AS SHOWN
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

SHEET NO. 7 OF 16

STATE OF MARYLAND
MATTHEW R. SOYD
NO. 25753
PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 6/16/16

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

HOWARD SCD — DATE 6/23/15

BY: Division:
FILE: M:\2008\01081795.83\drawings\pDD-P001_Sweet Hours Way_revised06162015.dgn

SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT. STREAM CLOSURE PERIOD IS MARCH 1-JUNE 15, INCLUSIVE. MDE PERMIT TRACKING #201361199. 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 THAT SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, 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. (3 DAYS)

5. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND DEVICES. INSTALL STABILIZED CONSTRUCTION ENTRANCES AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. THE ACCESS PATH SHALL BE STABILIZED WITH STONE OR PROTECTED WITH SILT FENCE AT THE INSPECTOR'S DISCRETION. WITH PERMISSION FROM INSPECTOR, CONTRACTOR SHALL PROCEED WITH PHASE 1. (3 DAYS)

PHASE 1

6. INSTALL SUMP PIT, SUPER SILT FENCE, MOUNTABLE BERM, AND DIVERSION FENCE AS SHOWN ON THE PHASE 1 PLANS. THE WORK AREA UPSTREAM OF SWEET HOURS WAY SHALL BE DEWATERED THROUGH THE SUMP PIT AND PUMPED INTO EXISTING INLET EX-I-1. THE 18" PIPE OPENING IN THE EAST QUADRANT OF EX-I-1 SHALL BE TEMPORARILY BLOCKED WITH SAND BAGS AT THE START OF EACH WORK DAY SO THAT WATER WILL BACK FLOW INTO EXISTING INLET EX-I-2. WATER IN EX-I-2 SHALL BE PUMPED AROUND THE DOWNSTREAM WORK AREA AS SHOWN ON THE PLANS. THE SAND BAGS IN EX-I-1 SHALL BE REMOVED AT THE END OF EACH WORK DAY. (1 DAY)

7. INSTALL PUMP-AROUND PRACTICE AS SHOWN ON THE PHASE 1 PLANS. WITH APPROVAL OF INSPECTOR, COMMENCE INSTALLATION OF CULVERT. (1 DAY)

8. EXCAVATE LAUNCHING PIT AND INSTALL SHORING AS NECESSARY. (3 DAYS)

9. INSTALL 66" RCP CULVERT. (2 WEEKS)

10. INSTALL HOWARD COUNTY TYPE 'A' HEADWALLS AT BOTH THE UPSTREAM AND DOWNSTREAM ENDS OF THE 66" RCP CULVERT. THE 66" OPENING OF THE HEADWALL AT THE UPSTREAM END OF THE CULVERT SHALL HAVE A BEVELED EDGE AT A 1.5:1 BEVEL. (1 WEEK)

11. COMPLETE STREAM STABILIZATION MEASURES ON THE DOWNSTREAM SIDE OF SWEET HOURS WAY AS SHOWN ON THE PHASE I PLANS. (3 DAYS)

12. PERMANENTLY STABILIZE ALL DISTURBED AREAS ON THE DOWNSTREAM SIDE OF SWEET HOURS WAY PER THE PERMANENT SEEDING NOTES. (2 DAYS)

13. WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE PUMP-AROUND PRACTICE AND STABILIZED CONSTRUCTION ENTRANCE ON THE DOWNSTREAM SIDE OF SWEET HOURS WAY AND PERMANENTLY STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS. (2 DAYS)

PHASE 2

14. INSTALL SILT FENCE, DIVERSION FENCE, AND PUMP-AROUND PRACTICES ON THE UPSTREAM SIDE OF SWEET HOURS WAY AS SHOWN ON THE PHASE 2 PLANS. REMOVE SUMP PIT INSTALLED DURING PHASE 1. WITH APPROVAL OF INSPECTOR COMMENCE IN STREAM WORK.(2 DAYS)

15. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON CHANNEL, WORKING DOWNSTREAM TO UPSTREAM, AND STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA THAT CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY. (2 WEEKS)

16. PERMANENTLY STABILIZE WORK AREA WITHIN PHASE 2 AND WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE PUMP-AROUND PRACTICES. (3 DAYS)

17. 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. (2 DAYS)

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

HOWARD SOIL 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 (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) 3 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 7 days as to all other disturbed or graded areas on the project site.

4. All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec.B-4-3). Temporary stabilization with mulch alone can only be 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	0.78	Acres
Area Disturbed	0.78	Acres
Area to be roofed or paved	0.00	Acres
Area to be vegetatively stabilized	0.68	Acres
Total Cut	328	Cu. Yds.
Total Fill	3	Cu. Yds.
Offsite waste/borrow area location	To Be Determined*	

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

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

9. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.

10. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each workday, whichever is shorter.

11. Any changes or revisions to the sequence of construction must be reviewed and approved by the plan approval authority prior to proceeding with construction.

12. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has be stabilized and approved by the enforcement authority. Unless otherwise specified and approved by the approval authority, no more than 30 acres cumulatively may be disturbed at a given time.

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

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

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

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

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

Criteria
1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.

2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.

3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition
To stabilize disturbed soils with permanent vegetation.

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

Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

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

      Notes:
      Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

      Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line
   c. Ideal Times of Seeding for Turf Grass Mixtures
      Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
      Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
      Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
   d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
   e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (1/2 to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate 1/		Seeding Depth 2/ (inches)	Recommended Seeding Dates by Plant Hardiness Zone 3/		
	lb/ac	lb/1000 ft²		5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (Lolium perenne ssp. multiflorum)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Barley (Hordeum vulgare)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Oats (Avena sativa)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Wheat (Triticum aestivum)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Cereal Rye (Secale cereale)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 15 to Dec 15
Warm-Season Grasses						
Foxtail Millet (Setaria italica)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (Pennisetum glaucum)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

NOTES:
1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.
Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above. Oats are the recommended nurse crop for warm-season grasses.
2/ For sandy soils, plant seeds at twice the depth listed above.
3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

PROFESSIONAL CERTIFICATION.
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

6/16/15
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE

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

6/23/15
HOWARD SCD — DATE

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.83 \

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CAPITAL PROJECT D-1159
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

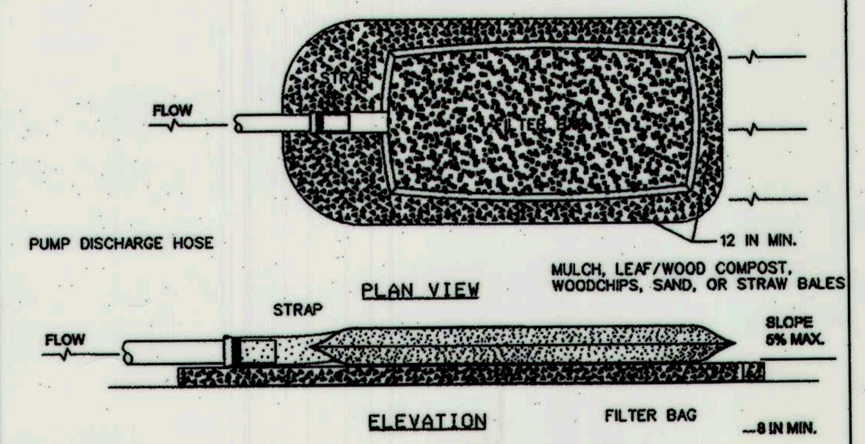
EROSION & SEDIMENT CONTROL NOTES

SCALE:	1"= 20'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

BY: Division
FILE: M:\2008\01081795.83\drawings\ES-NOTL_Sweet Hours Way_revised06162015.dgn

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: ⊠FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT*	ASTM D-4491
PERMITTIVITY (SEC-1)	1.2 SEC-1	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

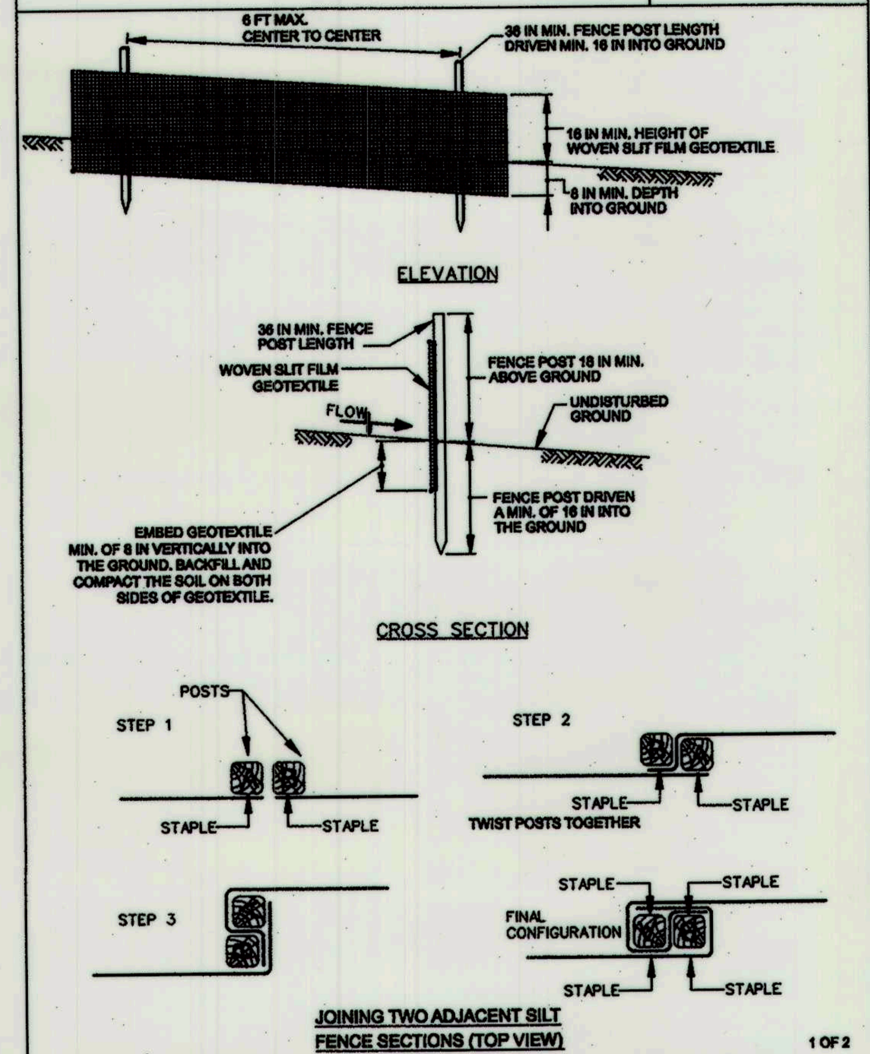
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ├—SF—┤



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ├—SF—┤

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

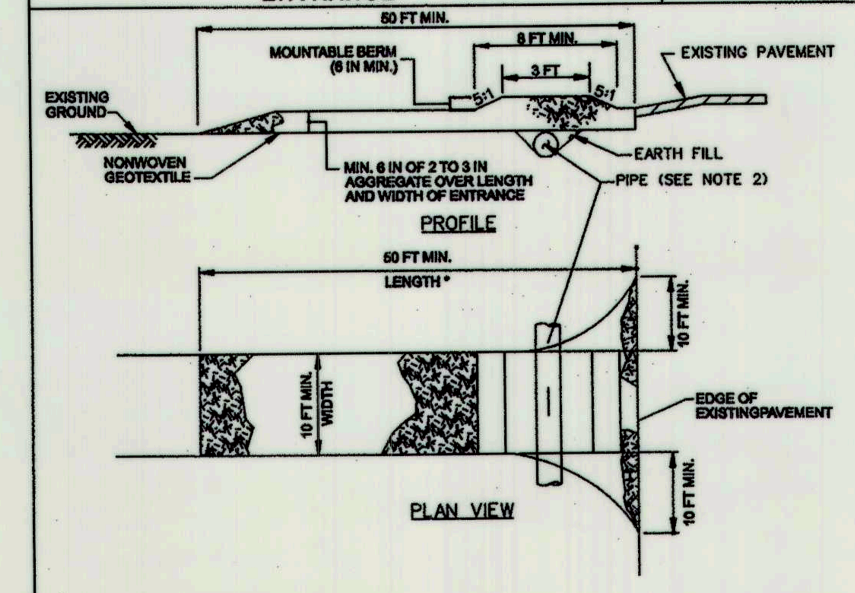
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

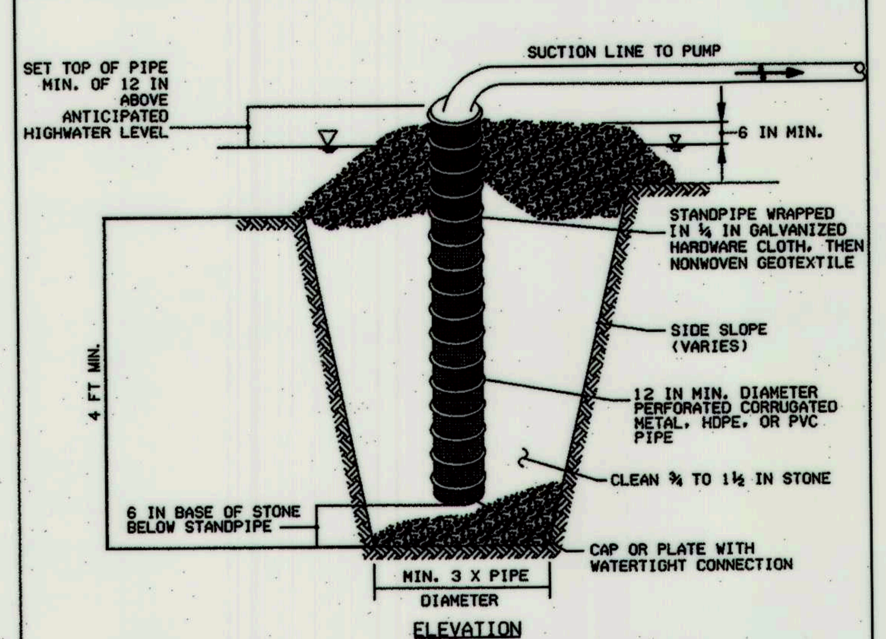
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-2 SUMP PIT

STANDARD SYMBOL: ⊠SP

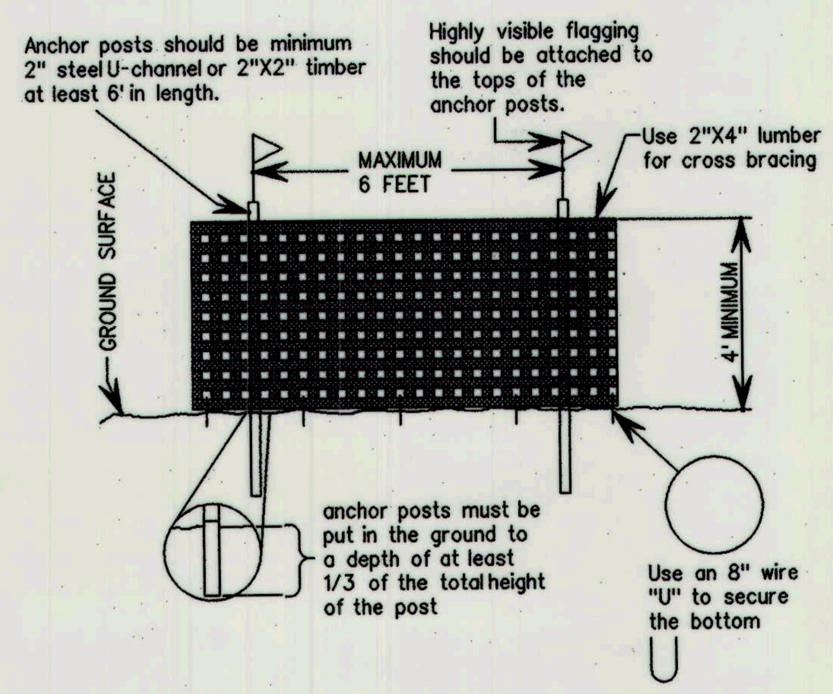


CONSTRUCTION SPECIFICATIONS

1. USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
2. WRAP PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
3. EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
4. SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
5. BACKFILL PIT AROUND THE PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
6. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
7. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

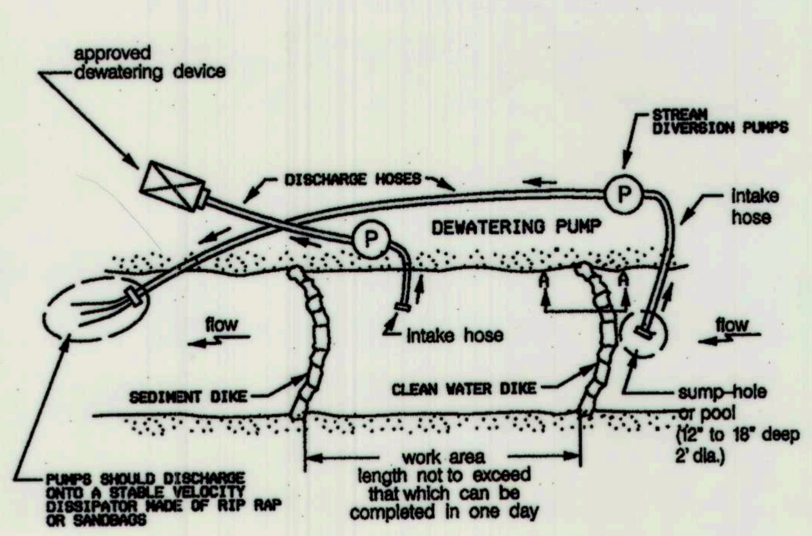


DETAIL FOR
BLAZE ORANGE PLASTIC
MESH SAFETY FENCE
NOT TO SCALE

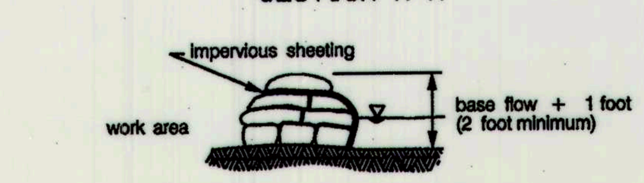
STANDARD SYMBOLS
├— OSF —┤
├— TPF —┤

DETAIL 1.2: PUMP-AROUND PRACTICE

PLAN VIEW



SECTION A-A



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.

REVISED NOVEMBER 2000
PAGE 1.2 - 3

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.

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. 25753, EXPIRATION DATE: 01-16-2015

STATE OF MARYLAND · MATTHEW RALPH SNYDER · NO. 25753 · PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SCD — DATE 9/23/14

BY: Matthew Snyder Division: P053 Water Res GMA Emp
FILE: M:\2008\01081795.83\drawings\pES-N002_Sweet Hours Way.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.83 \

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SWEET HOURS WAY
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CAPITAL PROJECT D-1159

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

EROSION & SEDIMENT CONTROL NOTES & DETAILS

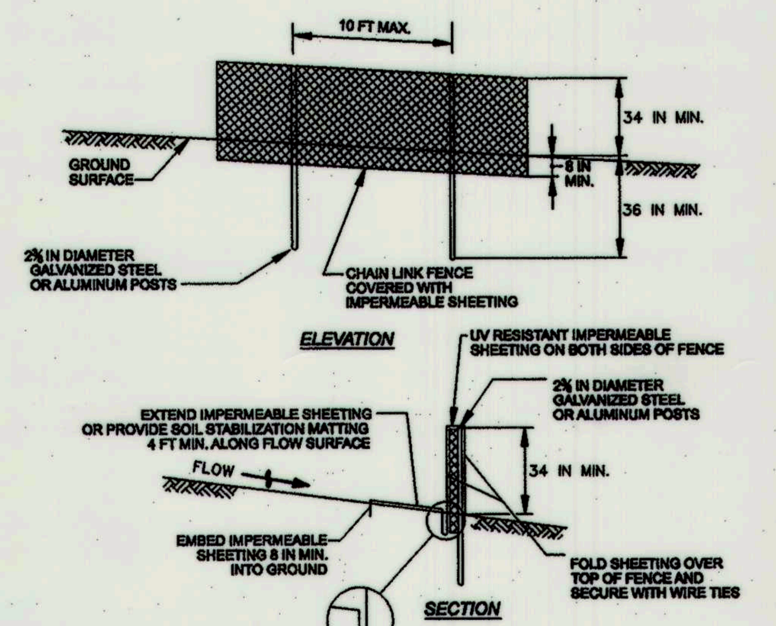
SCALE:	1"= 20'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

SHEET NO.: 11 OF 16

DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: |—— DF ——|

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

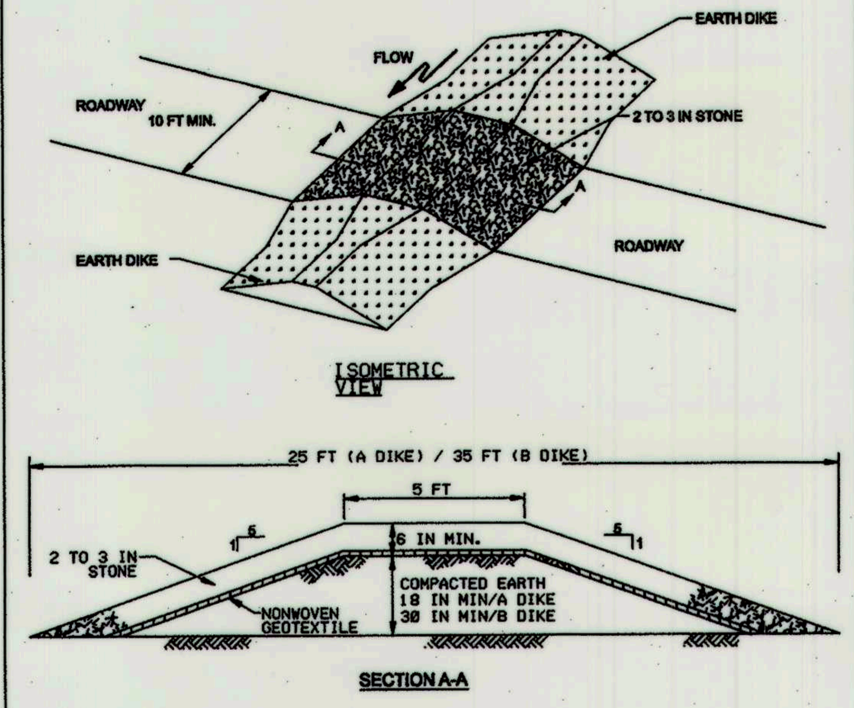
1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL C-8 MOUNTABLE BERM

STANDARD SYMBOL: MB



CONSTRUCTION SPECIFICATIONS

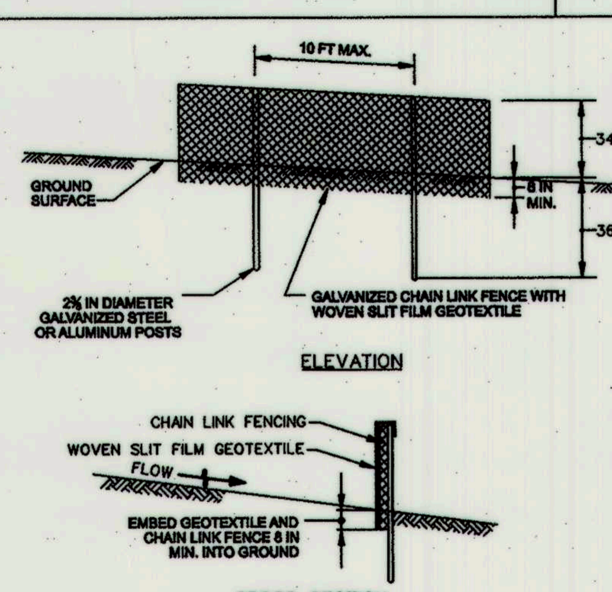
1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: |——SSF——|



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

KCI TECHNOLOGIES — TEST BORING LOG B-1 (SHEET 1 OF 3)

PROJECT: Sweet Hours Dam — PROJECT NO. 01081795.29 — Surface Elevation: 291.92 (ft)

Driller: FSDI (Nadal) — Method: HSA — Casing Length: 48.6 ft — Date Begun: 6/23/2010
KCI Representative: RA — Hammer Type: Automatic — Casing Diameter: 3 1/4" — Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 30 — 24 hours: ____

SOIL CLASSIFICATION AND REMARKS — SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

Soil Classification and Remarks	IDNET	N-Count / REC
7" Asphalt		
3" Aggregate Base course		
FILL: Sampled as moist, loose, reddish brown and brown, micaceous Sandy Elastic SILT, trace Gravel (MH)	S-1	3-3-4, N = 7, REC=17
FILL: Sampled as moist, medium dense, reddish brown and brown, micaceous Sandy SILT, trace quartz Gravel fragments (ML)	S-2	5-5-6, N = 11, REC=9
FILL: Sampled as moist, loose to medium dense, tan and brown, micaceous Sandy SILT (ML)	S-3	3-4-4, N = 8, REC=16
-with reddish brown color below 8.5 feet	S-4	4-6-7, N = 13, REC=18
FILL: Sampled as moist, medium dense, gray, micaceous Silty SAND, trace rootlets (SM)	S-5	3-6-5, N = 11, REC=12
-color changes to tan, brown and gray-brown below 18.5 feet with trace quartz Gravel fragments	S-6	3-5-6, N = 11, REC=9

TEST BORING LOG B-1 (SHEET 2 OF 3)

PROJECT: Sweet Hours Dam — PROJECT NO. 01081795.29 — Surface Elevation: 291.92 (ft)

Driller: FSDI (Nadal) — Method: HSA — Casing Length: 48.6 ft — Date Begun: 6/23/2010
KCI Representative: RA — Hammer Type: Automatic — Casing Diameter: 3 1/4" — Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 30 — 24 hours: ____

Soil Classification and Remarks	IDNET	N-Count / REC
FILL: Sampled as moist, medium dense, gray, micaceous Silty SAND, trace rootlets (SM)		
Moist to dry, medium dense, light gray, tan Silty SAND, little Mica, trace quartz Gravel fragments (SM)	S-7	12-15-13, N = 28, REC=9
Moist to dry, very dense, light gray and tan, micaceous Silty SAND (SM)	S-8	13-32-39, N = 71, REC=18
-with trace quartz Gravel fragments below 33.5 feet	S-9	17-21-35, N = 56, REC=17
Moist to dry, very dense, gray and tan, micaceous Silty SAND (SM)	S-10	32-50/5", N = > 100, REC=11

TEST BORING LOG B-1 (SHEET 3 OF 3)

PROJECT: Sweet Hours Dam — PROJECT NO. 01081795.29 — Surface Elevation: 291.92 (ft)

Driller: FSDI (Nadal) — Method: HSA — Casing Length: 48.6 ft — Date Begun: 6/23/2010
KCI Representative: RA — Hammer Type: Automatic — Casing Diameter: 3 1/4" — Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 30 — 24 hours: ____

Soil Classification and Remarks	IDNET	N-Count / REC
Moist to dry, very dense, gray and tan, micaceous Silty SAND (SM)		
Moist, very dense, yellowish brown and tan, micaceous Silty SAND (SM)	S-11	50/4", N = > 100, REC=4
Dry, very dense, gray, weathered Rock Fragments	S-12	50/1", N = > 100, REC=1

Boring terminated at 48.6 ft. bgs

1. Borehole offset 3 feet north due to existing utilities.
2. Ground water/wet spoon encountered inside augers at 24 ft bgs during drilling, and at 30 ft at completion of drilling.
3. Ground water not encountered in hole after pulling augers.
4. Hole caved-in at 19 ft bgs after pulling augers.
5. Spoon refusals (SPT N=50/5", etc.) occurred between 38.5 and 48.6 ft.
6. Hole backfilled and grouted with bentonite at completion of drilling.

TEST BORING LOG B-2 (SHEET 1 OF 3)

PROJECT: Sweet Hours Dam — PROJECT NO. 01081795.29 — Surface Elevation: 292.7440 (ft)

Driller: FSDI (Nadal) — Method: HSA — Casing Length: 48.5 ft — Date Begun: 6/24/2010
KCI Representative: RA — Hammer Type: Automatic — Casing Diameter: 3 1/4" — Date Completed: 6/24/2010
Groundwater Levels (feet): 0 hour: 21 — 24 hours: 17.5

Soil Classification and Remarks	IDNET	N-Count / REC
4" Topsoil		
FILL: Sampled as moist, loose, reddish brown and brown, micaceous Sandy SILT (ML)	S-1	4-4-4, N = 8, REC=16
-color changes to gray and brown below 4 feet with trace organics	S-2	3-3-5, N = 8, REC=18
FILL: Sampled as moist, loose, gray, micaceous Sandy SILT, trace organics (ML)	S-3	3-3-3, N = 6, REC=18
-with brown and gray color below 8.5 feet	S-4	2-3-4, N = 7, REC=18
FILL: Sampled as moist, medium dense, gray and tan, micaceous Silty SAND, some quartz Gravel fragments (SM)	S-5	3-8-8, N = 16, REC=16
Moist, medium dense, gray, brown, micaceous Silty SAND (SM)	S-6	6-7-8, N = 15, REC=18

TEST BORING LOG B-2 (SHEET 2 OF 3)

PROJECT: Sweet Hours Dam — PROJECT NO. 01081795.29 — Surface Elevation: 292.7440 (ft)

Driller: FSDI (Nadal) — Method: HSA — Casing Length: 48.5 ft — Date Begun: 6/24/2010
KCI Representative: RA — Hammer Type: Automatic — Casing Diameter: 3 1/4" — Date Completed: 6/24/2010
Groundwater Levels (feet): 0 hour: 21 — 24 hours: 17.5

Soil Classification and Remarks	IDNET	N-Count / REC
Moist, medium dense, gray, brown, micaceous Silty SAND (SM)		
Moist to wet, loose, reddish brown and gray, Silty SAND with Mica (SM)	S-7	2-3-3, N = 6, REC=16
Moist to wet, very dense, brown and gray-brown, Silty SAND with Mica, trace quartz Gravel fragments (SM)	S-8	13-26-31, N = 57, REC=3
Moist, very dense, tan and gray-brown, micaceous Silty SAND, trace quartz Gravel fragments (SM)	S-9	18-29-50, N = 79, REC=18
	S-10	50/5", N = > 100, REC=5

TEST BORING LOG B-2 (SHEET 3 OF 3)

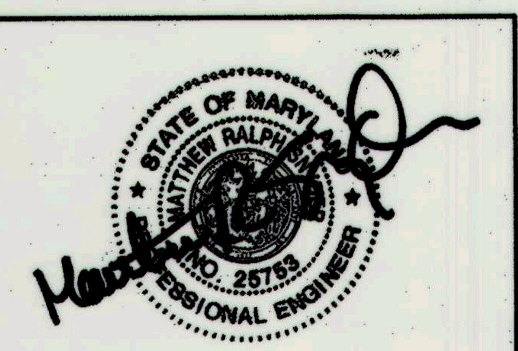
PROJECT: Sweet Hours Dam — PROJECT NO. 01081795.29 — Surface Elevation: 292.7440 (ft)

Driller: FSDI (Nadal) — Method: HSA — Casing Length: 48.5 ft — Date Begun: 6/24/2010
KCI Representative: RA — Hammer Type: Automatic — Casing Diameter: 3 1/4" — Date Completed: 6/24/2010
Groundwater Levels (feet): 0 hour: 21 — 24 hours: 17.5

Soil Classification and Remarks	IDNET	N-Count / REC
Moist, very dense, tan and gray-brown, micaceous Silty SAND, trace quartz Gravel fragments (SM)		
Completely Weathered Rock: Moist, very dense, gray and dark gray, micaceous Silty SAND (SM)	S-11	50/4", N = > 100, REC=4
-no sample recovery below 48.5 feet	S-12	50/0", N = > 100, REC=0

Boring terminated at 48.5 ft. bgs

1. Ground water/wet spoon encountered inside augers at depth 24 feet (ft) during drilling, and at 32 ft at completion of drilling.
2. Ground water encountered at 21 ft deep after pulling augers at completion of drilling; and at 17.5 ft after 24-hr of completion of drilling.
3. Borehole caved-in at a depth of 38.5 ft after pulling augers at end of drilling; and at 25.5 ft deep 24-hr after completion of drilling.
4. Spoon refusals (SPT N=50/5", etc.) occurred between 38.5 and 48.5 feet bgs.
5. Borehole backfilled and grouted with bentonite at completion of drilling.



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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SCD — DATE 9/23/14

PLOTTED: "02:08 PM on Tuesday, September 09, 2014"
BY: Matthew Snyder Division: P053 Water Res GMA Emp
FILE: M:\2008\01081795.83\drawings\pES-N003_Sweet Hours Way.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.83 \

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

SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

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

DETAILS AND SOIL BORING LOGS

SCALE: 1"= 20'
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:

TEST BORING LOG B-3 (Sheet 1 of 2)

KCI TECHNOLOGIES

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 291.8868 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 27 ft | Date Begun: 6/23/2010

KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/23/2010

Groundwater Levels (feet): 0 hour: 19; 24 hours: ___

SOIL CLASSIFICATION AND REMARKS — SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

- 6" Asphalt
- 4" Aggregate Base Course
- FILL: Sampled as moist, loose, brown, micaceous Silty SAND (SM)
- -color changes to reddish brown and brown below 3 feet
- -with trace Clay and quartz Gravel fragments below 5 feet
- FILL: Sampled as moist, loose, reddish brown and brown, micaceous Silty SAND, trace quartz Gravel fragments (SM)
- -with light gray color below 9 feet
- Moist, loose, reddish brown, brown and light gray, micaceous Silty SAND, trace Gravel (SM)
- Moist to wet, dense to very dense, brown and tan, micaceous Silty SAND, trace quartz Gravel (SM)
- -color changes to light gray and tan below 23.5 feet

IDNET	N-COUNT	N	REC
S-1	4-4-3-4	7	20
S-2	4-4-4-4	8	19
S-3	3-6-6-7	12	18
S-4	2-3-3-5	6	21
S-5	3-3-4-5	7	19
S-6	2-3-5	8	17
S-7	11-20-26	46	16
S-8	50/5.5"	>100	5.5

TEST BORING LOG B-3 (Sheet 2 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 291.8868 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 27 ft | Date Begun: 6/23/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/23/2010

Groundwater Levels (feet): 0 hour: 19; 24 hours: ___

- Moist to wet, dense to very dense, brown and tan, micaceous Silty SAND, trace quartz Gravel (SM)
- Moist, very dense, light gray and tan, Weathered Rock Fragments, trace Mica

Boring terminated at 27.1 ft. bgs

1. Borehole offset about 8 feet west due to existing utilities and a tree.
2. Ground water/wet spoon encountered inside augers at depth of 19 feet bgs during drilling.
3. Groundwater not encountered inside augers at completion of drilling.
4. Spoon refusals (SPT N=50/5", etc.) occurred from 23.5 to 27 feet; Auger refusal at 27.1 feet bgs.
5. Hole caved-in at depth 9 feet after pulling augers at completion of drilling.
6. Borehole backfilled and grouted with bentonite, and cold patched at completion of drilling.

IDNET	N-COUNT	N	REC
S-9	50/1"	>100	1

TEST BORING LOG B-4 (Sheet 1 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 291.4407 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 29 ft | Date Begun: 6/24/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/24/2010

Groundwater Levels (feet): 0 hour: 13; 24 hours: 13.5

- 6" Topsoil
- FILL: Sampled as dry, medium dense to loose to medium dense, brown and tan, Silty SAND with Mica, trace Gravel (SM)
- -with trace rock fragments and organics below 6 feet
- FILL: Sampled as moist, loose, gray and brown, micaceous Silty SAND, trace Gravel (SM)
- Moist, medium dense, gray brown, micaceous Silty SAND, trace quartz Gravel fragments (SM)
- Dry to moist, very dense, light gray, tan, Silty SAND, trace Mica (SM)

IDNET	N-COUNT	N	REC
S-1	5-6-6	12	16
S-2	3-2-3	5	16
S-3	6-6-5	11	3
S-4	3-3-3	6	17
S-5	6-11-8	19	15
S-6	38-50/3"	> 100	9
S-7	50/3"	> 100	2

TEST BORING LOG B-4 (Sheet 2 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 291.4407 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 29 ft | Date Begun: 6/24/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/24/2010

Groundwater Levels (feet): 0 hour: 13; 24 hours: 13.5

- Dry to moist, very dense, light gray, tan, Silty SAND, trace Mica (SM)
- Completely Weathered Rock: Dry, very dense, light gray, weathered rock fragments with Mica

Boring terminated at 29 ft. bgs

1. Ground water/wet spoon encountered inside augers at 19 feet bgs during drilling, and at 16 ft at completion of drilling.
2. Ground water encountered at 13 ft bgs after pulling augers; and at 13.5 ft bgs 24 hours after completion of drilling.
3. Hole caved-in at 19.5 ft after pulling augers; and at 18.5 ft bgs 24 hours after completion of drilling.
4. Spoon refusals (SPT N=50/3", etc.) occurred between 19 and 29 feet bgs. Auger refusal at depth of 29 ft.
5. Borehole backfilled and grouted with bentonite at completion of drilling.

IDNET	N-COUNT	N	REC
S-8	50/1"	> 100	1

TEST BORING LOG B-5 (Sheet 1 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 282.3182 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 24.5 ft | Date Begun: 6/24/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/24/2010

Groundwater Levels (feet): 0 hour: 17; 24 hours: 8.3

- 6" Topsoil
- FILL: Sampled as moist, very loose, dark brown, micaceous Sandy SILT, trace organics (ML)
- FILL: Sampled as moist, very loose, gray, micaceous Sandy SILT (ML)
- -color changes to gray and brown below 6 feet with trace organics
- FILL: Sampled as moist to wet, very loose, gray and brown, Silty SAND with Mica (SM)
- Moist, medium dense, dark gray, micaceous Silty SAND (SM)
- Completely Weathered Rock: Dry to moist, very dense, brown and tan, micaceous Silty SAND (SM)

IDNET	N-COUNT	N	REC
S-1	2-1-1	2	1
S-2	2-2-2	4	16
S-3	2-4-5	9	6
S-4	2-2-1	3	17
S-5	5-6-8	14	13
S-6	43-50/3"	> 100	9

TEST BORING LOG B-5 (Sheet 2 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 282.3182 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 24.5 ft | Date Begun: 6/24/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/24/2010

Groundwater Levels (feet): 0 hour: 17; 24 hours: 8.3

- Completely Weathered Rock: Dry to moist, very dense, brown and tan, micaceous Silty SAND (SM)

Boring terminated at 24.5 ft. bgs

1. Ground water/wet spoon encountered inside augers at 9 feet bgs during drilling, and dry at completion of drilling.
2. Ground water encountered at 17 ft bgs after pulling augers at completion of drilling; and at 8.3 ft bgs 24 hours after completion of drilling.
3. Hole caved-in at 18 ft bgs after pulling augers; and at 13.3 ft bgs 24 hours after completion of drilling.
4. Spoon refusals (SPT N=50/3", > 100, etc.) occurred at 19.2 to 24 feet bgs. Auger refusal at depth of 24.5 ft.
5. Bulk sample taken at 1 to 10 feet bgs.
6. Borehole backfilled and grouted with bentonite at completion of drilling.

IDNET	N-COUNT	N	REC
S-7	50/4"	>100	4

TEST BORING LOG B-6 (Sheet 1 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 291.9451 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 41 ft | Date Begun: 6/24/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/24/2010

Groundwater Levels (feet): 0 hour: 22; 24 hours: 19.3

- 5" Topsoil
- FILL: Sampled as moist, loose, reddish brown and brown, micaceous Silty SAND (SM)
- FILL: Sampled as moist, loose, gray and brown, Sandy SILT with Mica, trace organics (ML)
- - Shelby Tube ST-1 8' - 10'
- FILL: Sampled as moist, loose, brown and gray, micaceous Silty SAND, trace Gravel (SM)
- Moist, medium dense, gray, micaceous Silty SAND (SM)

IDNET	N-COUNT	N	REC
S-1	3-4-5	9	17
S-2	4-5-4	9	18
S-3	3-3-3	6	16
ST-1			24
S-4	2-2-3	5	18
S-5	2-3-4	7	18
S-6	4-8-10	18	14
S-7	16-43-50/3"	> 100	

TEST BORING LOG B-6 (Sheet 2 of 2)

PROJECT: Sweet Hours Dam | PROJECT NO.: 01081795.29 | Surface Elevation: 291.9451 (ft)

Driller: FSDI (Nadal) | Method: HSA | Casing Length: 41 ft | Date Begun: 6/24/2010 | KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4" | Date Completed: 6/24/2010

Groundwater Levels (feet): 0 hour: 22; 24 hours: 19.3

- Completely Weathered Rock: Moist, very dense, yellowish brown, brown, micaceous Silty SAND (SM)
- -with trace quartz Gravel fragments below 38.5 feet

Boring terminated at 41 ft. bgs

1. Ground water/wet spoon encountered inside augers at depth 23 ft bgs during drilling.
2. Ground water encountered at 22 ft bgs after pulling augers; and at 19.3 ft bgs 24 hours after completion of drilling.
3. Borehole caved-in at a depth of 25 ft after pulling augers at end of drilling; and at 25.3 ft deep 24 hours after completion of drilling.
4. Spoon refusals (SPT N=50/2", etc.) encountered at 33.5 to 41 feet bgs. Auger refusal at 41 ft bgs.
5. Bulk samples taken at 1 to 8 ft, and 10 to 20 ft bgs.
6. Shelby Tube sample taken at 8 to 10 ft bgs.
7. Borehole backfilled and grouted with bentonite 24-hrs after completion of drilling.

IDNET	N-COUNT	N	REC
(S-7 cont.)			13
S-8	50/6"	> 100	5
S-9	50/2"	> 100	2
S-10	50/0"	> 100	0

PLOTTED: "02:13 PM on Tuesday, October 15, 2013"
BY: Matthew Snyder Division: P053 Water Res GMA Emp
FILE: M:\2008\01081795.83\drawings\pES-N004_Sweet Hours Way.dgn

STATE OF MARYLAND — MATTHEW RALPH — No. 25753 — PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SCD — DATE 9/23/14

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2008 \ 01081795.83 \

936 Ridgebrook Road
Sparks, Maryland 21152
Telephone: (410) 316-7800
Fax: (410) 316-7818
www.kci.com

KCI TECHNOLOGIES

SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

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

SOIL BORING LOGS

SCALE: 1"= 20'
DATE: OCTOBER 2013
KCI JOB NO.: 01-081795.83
CAPITAL PROJECT NO.:
PERMIT ISSUE:
CONSTRUCTION ISSUE:

KCI TECHNOLOGIES

PROJECT: Sweet Hours Dam
PROJECT NO.: 01081795.29

TEST BORING LOG B-7 (SHEET 1 OF 2)

Surface Elevation: 291.4264 (ft)
Driller: FSDI (Nadal) | Method: HSA | Casing Length: 40 ft
KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4"
Date Begun: 6/23/2010 | Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 24 | 24 hours:

SOIL CLASSIFICATION AND REMARKS — SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

Depth (ft)	Elev (ft)	Samples (IDNET, TYPE)	N-count (1st 6" / 2nd 6" / 3rd 6" / 4th 6")	RQD/REC
		6" Asphalt; 3" Aggregate Base course		
	290	FILL: Sampled as moist, loose, reddish brown, micaceous Sandy SILT, trace Gravel (ML) — S-1	3-3-4 / N = 7	REC=16
		S-2	3-3-4 / N = 7	REC=18
5		FILL: Sampled as moist, loose, tan and brown, micaceous Sandy SILT (ML)		
	285	S-3	4-4-4 / N = 8	REC=18
		S-4	3-4-6 / N = 10	REC=18
10	280	FILL: Sampled as moist, medium dense, brown and light gray, micaceous Silty SAND (SM)		
		ST-1		REC=24
		S-5	5-7-6 / N = 13	REC=0
15	275	FILL: Sampled as moist, medium dense, gray, Silty SAND with Mica, trace quartz Gravel fragments (SM)		
		S-6	2-2-2 / N = 4	REC=12
20	270	FILL: Sampled as moist, very loose, gray and brown, micaceous Sandy SILT, trace organics (ML)		
		S-7	2-1-3 / N = 4	
		Moist to wet, very loose, dark gray, Silty SAND with Mica, trace Gravel (SM)		

Groundwater Levels (feet): 0 hour: 24 | 24 hours:

TEST BORING LOG B-7 (SHEET 2 OF 2)

Surface Elevation: 291.4264 (ft)
Driller: FSDI (Nadal) | Method: HSA | Casing Length: 40 ft
KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4"
Date Begun: 6/23/2010 | Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 24 | 24 hours:

Depth (ft)	Elev (ft)	Samples (IDNET, TYPE)	N-count	RQD/REC
		Moist to wet, very loose, dark gray, Silty SAND with Mica, trace Gravel (SM)		REC=10
30	265	S-8	50/3" / N = >100	REC=0
		No sample recovery at 28.5 feet		
35	260	S-9	50/3" / N = >100	REC=0
		Completely Weathered Rock: Dry to moist, very dense, light gray, Silty SAND with Mica, some quartz fragments (SM)		
	255	S-10	50/3" / N = >100	REC=2
40		Dry, very dense, light gray, Weathered Rock Fragments with Mica		
45	250	Boring terminated at 40 ft. bgs		
	245			

1. Hole offset 5 feet north due to utilities.
2. Ground water encountered inside augers at 24 feet bgs during drilling.
3. No groundwater after completion of drilling.
4. Borehole caved-in at 21 feet bgs after pulling augers at completion of drilling.
5. Bulk samples taken at depths of 1 to 10 feet and 12 to 20 feet bgs.
6. Shelby tube sample at 10 to 12 ft bgs.
7. Spoon refusals (SPT N=50/3", etc.) occurred at 29 to 38.5 feet bgs. Auger refusal at depth of 40 ft.
8. Borehole backfilled and grouted with bentonite after completion of drilling.

TEST BORING LOG B-8 (SHEET 1 OF 2)

Surface Elevation: 291.2261 (ft)
Driller: FSDI (Nadal) | Method: HSA | Casing Length: 28.5 ft
KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4"
Date Begun: 6/24/2010 | Date Completed: 6/24/2010
Groundwater Levels (feet): 0 hour: 29 | 24 hours:

Depth (ft)	Elev (ft)	Samples (IDNET, TYPE)	N-count	RQD/REC
		5" Asphalt; 4" Aggregate Base course		
	290	FILL: Sampled as moist, loose to medium dense to loose, brown and reddish brown, micaceous Sandy SILT (ML) — S-1	3-3-3 / N = 6	REC=18
		S-2	3-4-7 / N = 11	REC=18
5				
	285	S-3	3-3-4 / N = 7	REC=18
		S-4	1-4-6 / N = 10	REC=0
10	280	FILL: Sampled as moist, loose, brown, micaceous Silty SAND, trace quartz Gravel fragments (SM)		
		S-5	3-4-7 / N = 11	REC=18
15	275	FILL: Sampled as moist, medium dense, gray, micaceous Silty SAND, trace organics, trace Gravel (SM)		
		S-6	1-1-2 / N = 3	REC=18
20	270	FILL: Sampled as moist, very loose, tan and gray, Silty SAND with Mica (SM)		
		ST-1		REC=24
		S-7	8-11-12 / N = 23	
		Dry, medium dense, brown, Silty SAND with Mica, some quartz Gravel fragments (SM)		

Groundwater Levels (feet): 0 hour: 29 | 24 hours:

TEST BORING LOG B-8 (SHEET 2 OF 2)

Surface Elevation: 291.2261 (ft)
Driller: FSDI (Nadal) | Method: HSA | Casing Length: 28.5 ft
KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4"
Date Begun: 6/24/2010 | Date Completed: 6/24/2010
Groundwater Levels (feet): 0 hour: 29 | 24 hours:

Depth (ft)	Elev (ft)	Samples (IDNET, TYPE)	N-count	RQD/REC
		Dry, medium dense, brown, Silty SAND with Mica, some quartz Gravel fragments (SM)		REC=5
30	265	S-8	12-18-27 / N = 45	REC=18
		Completely Weathered Rock: Dry, dense, yellowish brown and gray, micaceous Silty SAND (SM)		
35	260			
	255			
40	250			
45	245			

Boring terminated at 30 ft. bgs

1. Hole offset 5 feet north due to existing utilities.
2. Ground water encountered inside augers at 28 feet bgs. during drilling, and at 29 feet after completion of drilling.
3. Ground water not encountered after pulling augers.
4. Borehole caved-in at 14.2 feet bgs after pulling augers at completion of drilling.
5. Bulk samples taken at depths of 1 to 10 feet and 10 to 20 feet bgs.
6. Shelby tube sample taken at a depth of 20 to 22 feet bgs.
7. Borehole backfilled and grouted with bentonite after completion of drilling.

TEST BORING LOG B-9 (SHEET 1 OF 2)

Surface Elevation: 272.2871 (ft)
Driller: FSDI (Nadal) | Method: HSA | Casing Length: 28.5 ft
KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4"
Date Begun: 6/23/2010 | Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 12 | 24 hours: 3.7

Depth (ft)	Elev (ft)	Samples (IDNET, TYPE)	N-count	RQD/REC
		4" Topsoil		
	270	FILL: Sampled as moist, loose, dark gray, reddish brown and tan, micaceous Silty SAND, trace rootlets (SM) — S-1	3-2-3 / N = 5	REC=17
		S-2	3-3-6 / N = 9	REC=55
5		– trace Gravel below 3.5 feet		
	265	S-3	4-8-10 / N = 18	REC=14
		Moist, medium dense, reddish brown and tan, micaceous Silty SAND, trace Gravel (SM)		
10		S-4	32-44-50/4" / N = 100	REC=16
		Dry, very dense, gray and tan, micaceous Silty SAND (SM)		
	260			
15		S-5	25-40-50 / N = 90	REC=15
	255			
		S-6	50/4" / N = > 100	REC=2
		Completely Weathered Rock; Dry, very dense, gray and tan, micaceous Silty SAND and weathered rock fragments (SM)		

Groundwater Levels (feet): 0 hour: 12 | 24 hours: 3.7

TEST BORING LOG B-9 (SHEET 2 OF 2)

Surface Elevation: 272.2871 (ft)
Driller: FSDI (Nadal) | Method: HSA | Casing Length: 28.5 ft
KCI Representative: RA | Hammer Type: Automatic | Casing Diameter: 3 1/4"
Date Begun: 6/23/2010 | Date Completed: 6/23/2010
Groundwater Levels (feet): 0 hour: 12 | 24 hours: 3.7

Depth (ft)	Elev (ft)	Samples (IDNET, TYPE)	N-count	RQD/REC
		Completely Weathered Rock; Dry, very dense, gray and tan, micaceous Silty SAND and weathered rock fragments (SM)		
25	250	S-7	50/1.5" / N = > 100	REC=1.5
	245			
		S-8	50/1" / N = > 100	REC=1
30				
	240			
35	235			

Boring terminated at 28.6 ft. bgs

1. Borehole offset about 8 feet south due to existing trees.
2. Ground water/wet spoon encountered inside augers at 6.5 feet bgs. during drilling.
3. Ground water encountered at 12 ft bgs fter pulling augers at completion of drilling; and at 3.7 ft bgs 24 hours after drilling.
4. Borehole caved-in at 15 feet bgs. after pulling augers at completion of drilling; and at 6.7 ft bgs 24 hours after completion of drilling.
5. Spoon refusals (SPT N=5/3", etc.) occurred at 18.8 to 28.6 feet bgs.
6. Borehole backfilled and grouted with bentonite 24-hrs after completion of drilling.

STATE OF MARYLAND — MATTHEW RALPH SNYDER — NO. 25753 — PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SCD — DATE 9/23/14

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2008 \ 01081795.83 \

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

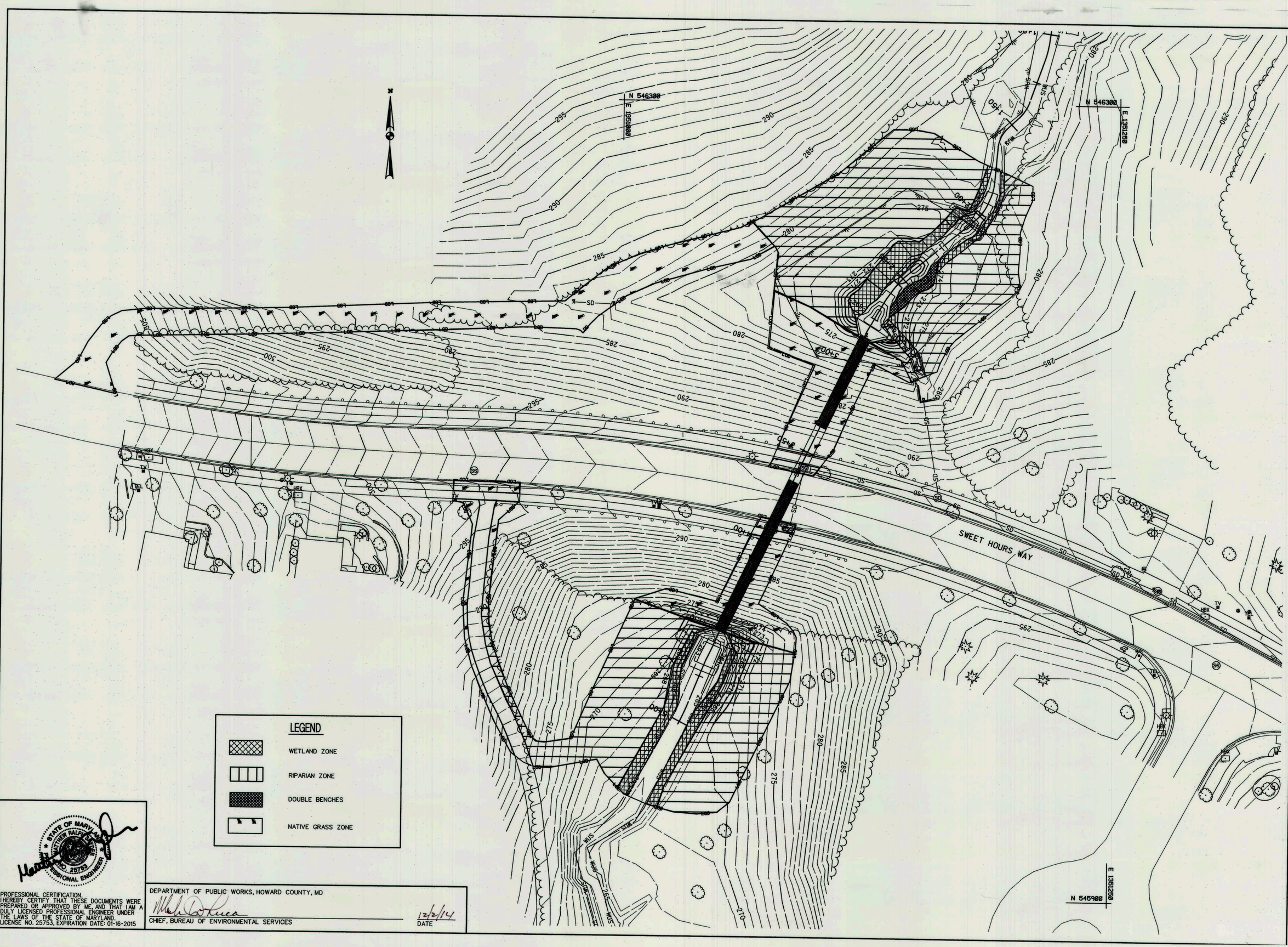
SWEET HOURS WAY CULVERT DESIGN
CAPITAL PROJECT D-1159
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046

SOIL BORING LOGS

SCALE:	1"= 20'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

SHEET NO.: 14 OF 16

PLOTTED: Nov 04, 2013 BY: Matthew Snyder Division: PG53 Water Res GMA Emp FILE: M:\2008\01081795.83\drawings\DES-HO05_Sweet Hours Way.dgn



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LICENSE NO. 25753, EXPIRATION DATE: 01-16-2015

STATE OF MARYLAND
MATTHEW RALPH SNYDER
No. 25753
PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

12/2/14
DATE

NO.	REVISIONS DESCRIPTION	DATE

KCI TECHNOLOGIES
936 Ridgebrook Road
Sparks, Maryland 21152
Telephone: (410) 316-7800
Fax: (410) 316-7818
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SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

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

LANDSCAPE PLAN

SCALE:	1" = 20'
DATE:	OCTOBER 2013
KCI JOB NO.:	01-081795.83
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

MASTER PLANT SCHEDULE

RIPARIAN ZONE (SHEET 15 OF 16)

(14812 SF/0.34 AC)

Quantity	Botanical Name	Common Name	Size	Form	Spacing/Rate
SHRUBS					
21	Cephalanthus occidentalis	Button bush	4' Height	Container	6'-8' O.C.
21	Ilex vreticillata	Winterberry holly	4' Height	Container	6'-8' O.C.
21	Cornus racemosa	Gray Dogwood	4' Height	Container	6'-8' O.C.
21	Cornus amomum	Silky Dogwood	4' Height	Container	6'-8' O.C.
21	Sambucus canadensis	Elderberry	4' Height	Container	6'-8' O.C.
TREES					
27	Platanus occidentalis	Sycamore	2" Caliper	Container	10'-12' O.C.
27	Quercus palustris	Pin oak	2" Caliper	Container	10'-12' O.C.
27	Liriodendron tulipifera	Tulip poplar	2" Caliper	Container	10'-12' O.C.

WETLAND ZONE (SHEET 15 OF 16)

(1736 SF/0.04 AC)

Quantity	Botanical Name	Common Name	Size	Form	Spacing/Rate
LIVE STAKES					
14	Cornus racemosa	Gray Dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	4' O.C.
14	Cornus amomum	Silky Dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	4' O.C.
14	Salix sericea	Silky Willow	3' Length 0.5"-1.5" dia.	Dormant stems	4' O.C.
14	Salix nigra	Black Willow	3' Length 0.5"-1.5" dia.	Dormant stems	4' O.C.
PLUGS					
71	Dicanthelium scoparium	Broom Panic Grass	2.5" Cell diameter	Rooted cells	18"-24" O.C.
71	Scirpus cypernius	Woolgrass	2.5" Cell diameter	Rooted cells	18"-24" O.C.
71	Verbena hastata	Blue Vervain	2.5" Cell diameter	Rooted cells	18"-24" O.C.
71	Vernonia noveboracensis	New York Ironweed	2.5" Cell diameter	Rooted cells	18"-24" O.C.

DOUBLE BENCHES (SHEET 15 OF 16)

(174 SF/0.004 AC)

Quantity	Botanical Name	Common Name	Size	Form	Spacing/Rate
LIVE STAKES					
22	Salix sericea	Silky willow	3' Length 0.5"-1.5" dia.	Dormant stems	2' O.C.
22	Cornus racemosa	Gray dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	2' O.C.
LIVE BRANCH LAYERING					
60 LF	Platanus occidentalis	American Sycamore	6' length, 0.5"-1.0" dia.	Dormant stems	12 BRANCHES/LF
	Salix sericea	Silky willow			

PERMANENT SEEDING FOR NATIVE GRASSES AND RIPARIAN ZONE (SHEET 15 OF 16)

(25468 SF/0.58 AC)

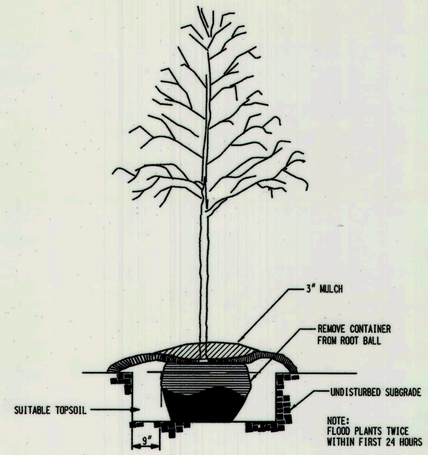
Botanical Name	Common Name	Application Rate (lbs/ac)	% of Mix	Quantity (lbs)
Panicum virgatum	Switchgrass	18.0	24%	10.4
Poa palustris	Fowl bluegrass	30.0	40%	17.4
Panicum clandestinum	Deer tongue grass	18.0	24%	10.4
Bromus ciliatus	Fringed brome	9.0	12%	5.2
	TOTALS	75.0 lbs/ac		43.5

PERMANENT SEEDING FOR WETLAND ZONE, AND DOUBLE BENCHES (SHEET 15 OF 16)

(1910 SF/0.04 AC)

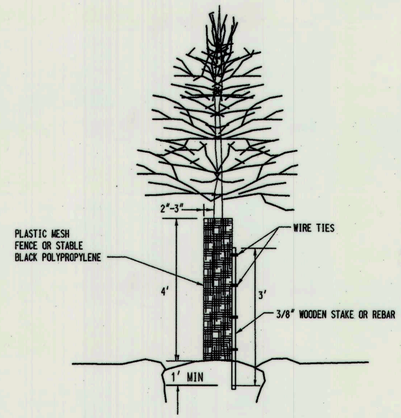
% OF MIX	Botanical Name	Common Name
23	Carex vulpinoidea	Fox sedge
20	Elmyus virginica	Virginia wild rye
10	Sparganium eurycarpum	Giant bur reed
5	Carex crinita	Fringed (nodding) sedge
5	Carex gynandra	Nodding sedge
5	Carex lurida	Lurid (shallow) sedge
5	Juncus effusus	Soft rush
5	Scirpus cyperinus	Wool grass
5	Sparganium americanum	Eastern bur reed
4	Carex scoparia	Blunt broom sedge
4	Glyceria grandis	American mannagrass
3	Verbena hastata	Blue vervain
2	Carex comosa	Cosmos (bristly) sedge
2	Carex lupulina	Hop sedge
1	Glyceria canadensis	Rattlesnake grass
1	Leersia oryzoides	Rice cutgrass
TOTAL QUANTITY: 1.0 LB		

Application rate of 0.5 LBS/1,000 SF



TREE PLANTING DETAIL

NOT TO SCALE



TREE SHELTER DETAIL

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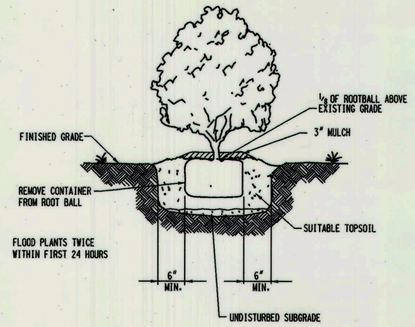

SHRUB PLANTING DETAIL

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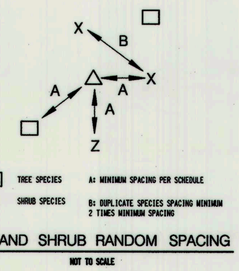
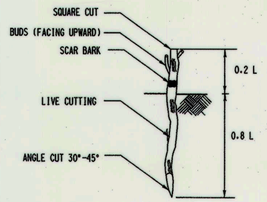


TREE AND SHRUB RANDOM SPACING

NOT TO SCALE



LIVE STAKE DETAIL

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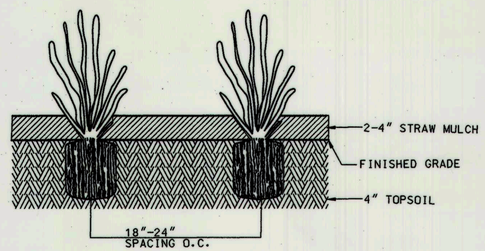

PLUG PLANTING DETAIL

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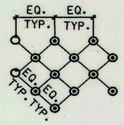
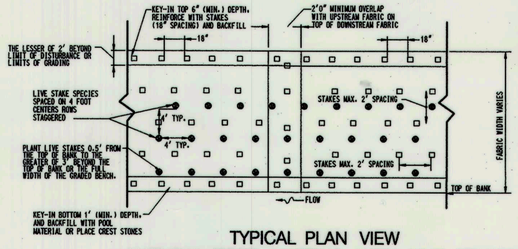


TYPICAL PLUG SPACING

NOT TO SCALE



TYPICAL PLAN VIEW
NATURAL FIBER MATTING WITH LIVE STAKES

NOT TO SCALE

NOTES:
1. NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF TOE PROTECTION AND A MINIMUM OF ONE FOOT 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)
2. NATURAL FIBER MATTING IS TO BE INSTALLED ON ALL GRADED BANK SLOPES THAT ARE NOT PROTECTED BY STONE TOE, IMBRICATED BANK PROTECTIONS, OR BRUSH MATTRESS.

STATE OF MARYLAND
MATTHEW RALPH HAUPT
NO. 25753
PROFESSIONAL ENGINEER

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. 25753, EXPIRATION DATE: 01-16-2015

FILE: M:\2008\01081795.83\drawings\601sweet.dgn

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/2/14

NO.	REVISIONS DESCRIPTION	DATE

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SWEET HOURS WAY CULVERT DESIGN

CAPITAL PROJECT D-1159

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STORMWATER MANAGEMENT DIVISION
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STREAM LANDSCAPE DETAILS

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