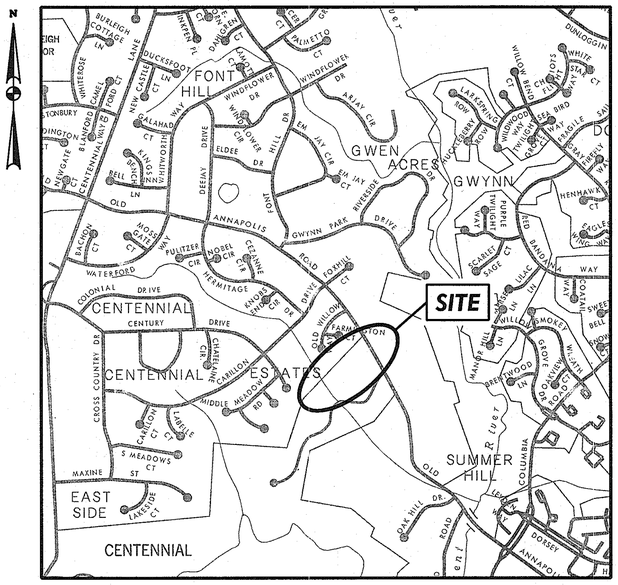
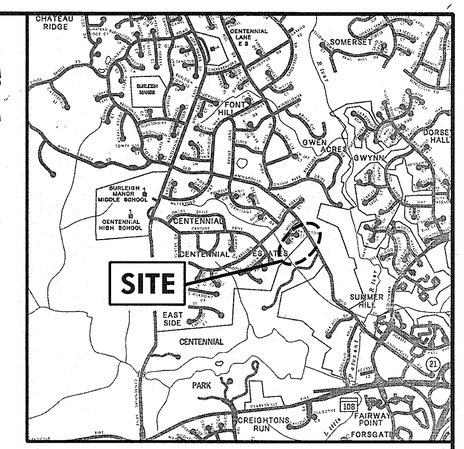
FARMINGTON COURT DRAINAGE IMPROVEMENT

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT NO.: D-1147



LOCATION MAP
SCALE: 1" = 1000'



VICINITY MAP
SCALE: 1" = 2000'

SEQUENCE OF CONSTRUCTION

1 DAY	1. POST SIGNS NOTIFYING PUBLIC TRAIL TO BE DISTURBED AS SHOWN ON SITE PLAN SHEET 3 WEEKS PRIOR TO START OF CONSTRUCTION.
0 DAYS	2. NOTIFY HOWARD COUNTY SEDIMENT AND EROSION CONTROL INSPECTOR AT LEAST 48 HOURS IN ADVANCE OF ANY CONSTRUCTION AND SCHEDULE A PRE-CONSTRUCTION WALK-THROUGH OF THE SITE.
1 DAY	3. REMOVE CENTENNIAL PARK'S SPLIT RAIL FENCE ALONG OLD ANNAPOLIS ROAD AND CLEAR AND GRUB FOR THE INSTALLATION OF SEDIMENT AND EROSION CONTROL DEVICES AND STABLIZE ALL DISTURBED AREAS.
3 DAYS	4. INSTALL ALL SEDIMENT AND EROSION CONTROL DEVICES.
2 DAYS	5. CLEAR AND GRUB FOR ALL GRADING.
15 DAYS	6. CONSTRUCT CLOSED STORM DRAIN SYSTEM AND SIDEWALK ALONG OLD ANNAPOLIS ROAD FROM 1-1 TO ES-1 AND PROVIDE FINAL STABILIZATION OF DISTURBED AREAS. INSTALL SUPER SILT FENCE AROUND 1-1 AND 1-2 AFTER STRUCTURES HAVE BEEN CONSTRUCTED.
20 DAYS	7. CONSTRUCT THE BIORETENTION FILTER AND PROVIDE FINAL STABILIZATION OF DISTURBED AREAS.
12 DAYS	8. CONSTRUCT CULVERTS AND RIPRAP OUTFALLS DOWNSTREAM TO UPSTREAM BEGINNING WITH CULVERT ES-7 TO ES-6.
1 DAY	9. REPLACE REMOVED SECTIONS OF BITUMINOUS PAVEMENT ALONG PATH.
6 DAYS	10. CONSTRUCT SWALES FROM DOWNSTREAM TO UPSTREAM AND PROVIDE PERMANENT STABILIZATION AS SHOWN ON PLANS.
2 DAYS	11. PLACE TOPSOIL, SEED AND MULCH IN ANY REMAINING DISTURBED AREAS. REINSTALL SPLIT RAIL FENCE ALONG OLD ANNAPOLIS ROAD.
4 DAYS	12. ONCE ALL DISTURBED AREAS ARE STABILIZED AND WITH APPROVAL BY THE SEDIMENT AND EROSION CONTROL INSPECTOR, SEDIMENT CONTROL DEVICES MAY BE REMOVED. STONE FROM TSOS BELOW ES-7 SHOULD BE SPREAD OUT IN SWALE. ALL OTHER TSOS AND TGOS STONE SHOULD BE REMOVED FROM SITE.
TOTAL 67 DAYS	

GENERAL NOTES

1. INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM THE BEST AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATIONS AND ELEVATIONS OF THE UTILITIES BY DIGGING TEST PITS AT ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF CLEARANCES ARE LESS THAN SPECIFIED ON THIS PLAN OR LESS THAN 12 INCHES WHEN NOT SPECIFIED, CONTACT THE ENGINEER AND THE OWNER OF INVOLVED UTILITY.
2. CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

   MISS UTILITY 1-800-257-7777,

   CONSTRUCTION INSPECTION DIVISION, HOWARD COUNTY (410) 313-1880,

   BALTIMORE GAS & ELECTRIC COMPANY - UNDERGROUND ELECTRIC DISTRIBUTION CUSTOMER SERVICE (410) 685-0123,

   VERIZON 1 (410) 224-9285,

   AMERICAN TELEPHONE & TELEGRAPH CABLE LOCATION DIVISION (410) 393-3553,

   BUREAU OF UTILITIES, HOWARD COUNTY (410) 313-2040,

   HOWARD COUNTY SOIL CONSERVATION DISTRICT (410) 489-7987
3. THE SITE SURVEY WAS PERFORMED BY HOWARD COUNTY SURVEY DEPT. IN JANUARY, 2008. THE HORIZONTAL IS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 MARYLAND STATE PLANE GRID SYSTEM WITH THE 1991 HARNS ADJUSTMENT (NAD 83/91). THE VERTICAL IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). THE HORIZONTAL AND VERTICAL ARE BASED ON AND ESTABLISHED FROM HOWARD COUNTY GEODETIC CONTROL.
4. AVOID DAMAGE TO TREES ON THE SITE TO MAXIMUM EXTENT POSSIBLE. OTHER TREES WITHIN LIMITS OF CONSTRUCTION SHALL NOT BE DESTROYED WITHOUT APPROVAL OF THE ENGINEER. TREES > 12" DBH WITHIN LOD SHALL BE PROTECTED USING TREE PROTECTIVE FENCING.
5. FOR DETAILS NOT SHOWN ON THESE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD CO. DESIGN MANUAL, VOL. IV STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOL. IV ON THE JOB.
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
7. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE PLACED PRIOR TO THE PLACEMENT OF ANY ASPHALT.
8. PROTECT BOARD FENCE ALONG OLD ANNAPOLIS ROAD. REPAIR ANY DAMAGE TO FENCE OR GATE.
9. RESTORE ALL DISTURBED AREAS TO ORIGINAL CONDITION.

INDEX

LEGEND

EX. CONTOURS	400
EX. TREES	
EX. UTILITY POLE	
EX. FIRE HYDRANT	
EX. SANITARY MAIN	SAN
EX. STORM DRAIN PIPE	
EX. STORM DRAIN STRUCTURE	
EX. WATER MAIN	
EX. FENCE	
PROPERTY LINE	
PROPOSED CONTOURS	400
PROPOSED STORM DRAIN PIPE	
PROPOSED STORM DRAIN STRUCTURE	
TREES TO BE REMOVED	
CONCRETE SIDEWALK	
LIMIT OF DISTURBANCE	LOD
STABILIZED CONSTRUCTION ENTRANCE	SCE
TYPE A SOIL STABILIZATION MATTING	
TYPE B SOIL STABILIZATION MATTING	
SILT FENCE	SF
SUPER SILT FENCE	SSF
TEMPORARY STONE OUTFALL STRUCTURE	TSOS
TEMPORARY GABION OUTFALL STRUCTURE	TGOS
DIVERSION FENCE	DF
BLAZE ORANGE FENCE	BOF

AS-BUILT CERTIFICATION

I hereby certify that the facility shown on this plan was constructed as shown on the "as-built" plans and meets the approved plans and specifications.

Signature — 24322 P.E. NO. — 29 APR 2011 Date

BY THE DEVELOPER

"I/We certify that all development and construction will be done according to this plan, and that any responsible personnel involved in the construction project will have a Certificate of Attendance at a Department of the Environmental approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District."

Signature of Developer — 8/25/09 Date

Ronald G. Lepson
Print name

BY THE ENGINEER

"I certify that this plan for erosion and sediment 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 — 8/20/09 Date

CHARLES Mc CULLOCH
Print name

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

Howard SCD — 9/2/09 Date

DEPARTMENT OF RECREATION AND PARKS
HOWARD COUNTY, MARYLAND

Director — 8-25-09 Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — 8/28/09 DATE
CHIEF, BUREAU OF ENGINEERING — 8/25/09 DATE
CHIEF, BUREAU OF HIGHWAYS — 8-25-09 DATE
CHIEF, DIVISION OF TRANSPORTATION AND SPECIAL PROJECTS — 8/25/09 DATE

GPI GREENMAN-PEDERSEN, INC.
ENGINEERS, ARCHITECTS, PLANNERS, CONSTRUCTION ENGINEERS & INSPECTORS
10977 GUILFORD RD., ANNAPOLIS JUNCTION, MD. 20701
WASH. (301) 470-2772 BALT. (410) 880-3055
FAX: (301) 490-2649 www.gpinet.com

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. 11007, Expiration Date: 07/09/2010.

DES: M.M.G.				
DRN: K.L.F.				
CHK: C.L.M.				
DATE: APRIL, 2009	BY	NO	REVISION	DATE

TITLE SHEET

SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT DRAINAGE IMPROVEMENT
HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 1 OF 8

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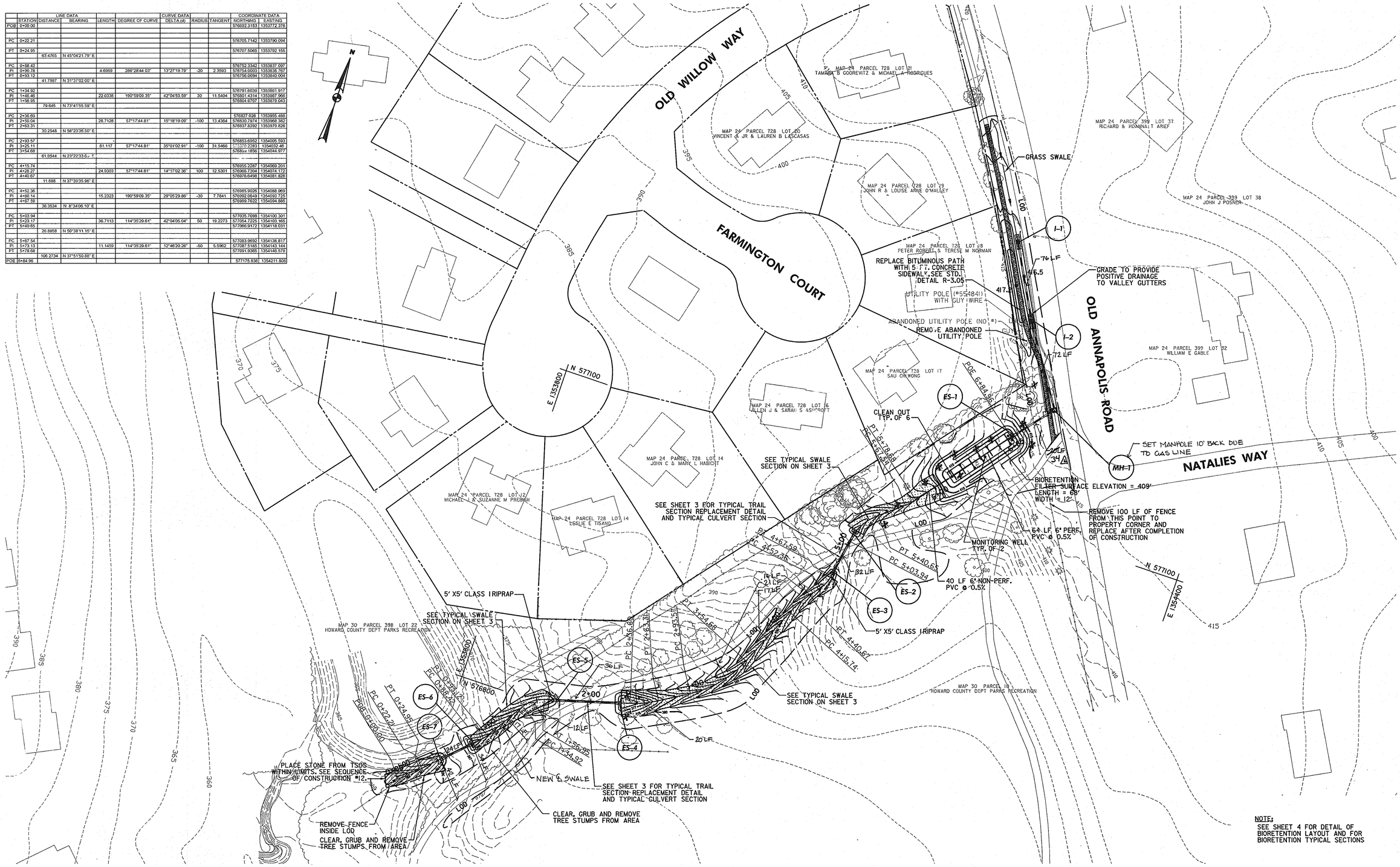
	LINE DATA				CURVE DATA				COORDINATE DATA	
	STATION	DISTANCE	BEARING	LENGTH	DEGREE OF CURVE	DELTA (d)	RADIUS	TANGENT	NORTHING	EASTING
POB	0+00.00								576692.3153	1353772.376
PC	0+22.21								576705.7142	1353790.094
PT	0+24.95								576707.5065	1353792.155
		63.4765	N 45°04'21.79" E							
PC	0+88.42								576752.3342	1353837.097
PI	0+90.78			4.6969	286°28'44.03"	13°27'19.79"	-20	2.3593	576754.6003	1353838.767
PT	0+93.12								576756.0094	1353840.004
		41.7987	N 31°37'02.00" E							
PC	1+34.92								576791.8039	1353851.917
PI	1+46.46			22.0338	190°59'09.35"	42°04'53.59"	30	11.5404	576801.4314	1353867.966
PT	1+56.95								576804.6707	1353879.043
		79.645	N 73°41'55.59" E							
PC	2+36.60								576827.026	1353955.466
PI	2+50.04			26.7128	57°17'44.81"	15°18'19.09"	-100	13.4364	576830.7974	1353968.382
PT	2+63.31								576837.8392	1353979.626
		30.2548	N 58°23'26.50" E							
PC	2+93.57								576853.6952	1354005.593
PI	3+25.11			61.117	57°17'44.81"	35°01'02.91"	-100	31.5466	576870.2283	1354032.46
PT	3+54.68								576884.1856	1354044.977
		61.0544	N 23°22'33.6							
PC	4+15.74								576955.2287	1354069.201
PI	4+26.27			24.9303	57°17'44.81"	14°17'02.36"	100	12.5301	576966.7304	1354074.172
PT	4+40.67								576976.6496	1354081.828
		11.688	N 37°39'35.96" E							
PC	4+52.36								576985.9026	1354088.969
PI	4+60.14			15.2323	190°59'09.35"	29°05'29.86"	-30	7.7841	576992.0649	1354093.725
PT	4+67.59								576999.7622	1354094.885
		36.3534	N 8°34'06.10" E							
PC	5+03.94								577035.7098	1354100.301
PI	5+23.17			36.7113	114°35'29.61"	42°04'05.04"	50	19.2273	577054.7225	1354103.165
PT	5+40.65								577066.9172	1354118.031
		26.8858	N 50°38'11.15" E							
PC	5+67.54								577083.9692	1354138.817
PI	5+73.13			11.1459	114°35'29.61"	12°46'20.26"	-50	5.5962	577087.5185	1354143.144
PT	5+78.68								577091.9385	1354146.579
		106.2734	N 37°51'50.88" E							
POE	6+84.96								577175.836	1354211.808



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 8/25/09
CHIEF, BUREAU OF ENGINEERING — DATE 8/25/09
CHIEF, BUREAU OF HIGHWAYS — DATE 8-25-09
CHIEF, DIVISION OF TRANSPORTATION AND SPECIAL PROJECTS — DATE 8/25/09 (Steve Sharar)

GPI GREENMAN-PEDERSEN, INC.
ENGINEERS, ARCHITECTS, PLANNERS, CONSTRUCTION ENGINEERS & INSPECTORS
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DES: M.M.G.
DRN: K.L.F.
CHK: C.L.M.
DATE: APRIL, 2009

BY	NO	REVISION	DATE
KLS	2	AS-BUILT CORRECTION	29 APR 2011
KCL	1	AS-BUILT REVISIONS	3-16-11

SITE PLAN SHEET

SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT
DRAINAGE IMPROVEMENT
HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 2 OF 8

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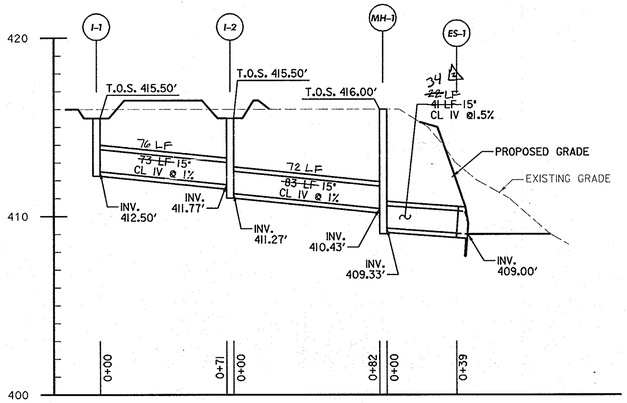
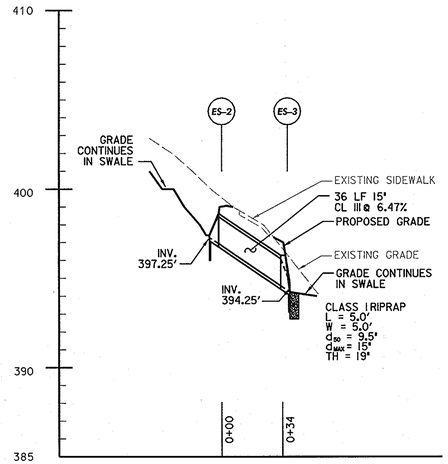
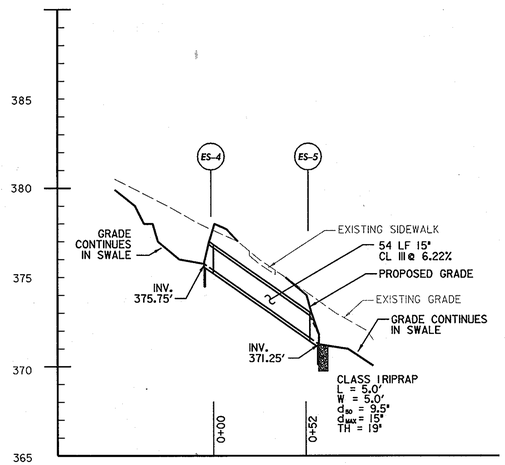
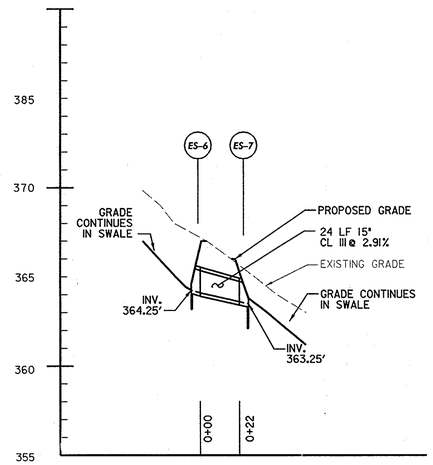








4' 0 4' 8'
VERTICAL SCALE: 1"=4'

40' 0 40' 80'
HORIZONTAL SCALE: 1"=40'

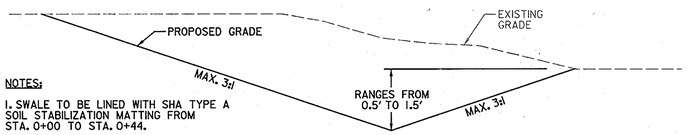
Pipe Schedule

FROM	TO	TYPE	LENGTH	
I-1	I-2	15" R.C.P. CL. III	~~73 L.F.~~	76 LF
I-2	MH-1	15" R.C.P. CL. III	~~84 L.F.~~	72 LF
MH-1	ES-1	15" R.C.P. CL. III	~~39 L.F.~~	~~22~~ LF 34 (2)
ES-2	ES-3	15" R.C.P. CL. III	~~36 L.F.~~	32 LF
ES-4	ES-5	15" R.C.P. CL. III	~~54 L.F.~~	36 LF
ES-6	ES-7	15" R.C.P. CL. III	24 L.F.	

Structure Schedule

STRUCTURE	STD.	TYPE	LOCATION	INVERT
I-1	MD 378.05•	INLET	N 577349.17 E 1354159.18	412.25'
I-2	MD 378.05•	INLET	N 577283.55 E 1354195.01	411.02'
MH-1	HO G 5.11	MH	N 577212.01 E 1354241.86	409.02'
ES-1	HO D 5.51	ES	N 577175.79 E 1354211.81	408.63'
ES-2	HO D 5.51	ES	N 577046.88 E 1354102.88	397.25'
ES-3	HO D 5.51	ES	N 577001.03 E 1354094.95	394.25'
ES-4	HO D 5.51	ES	N 576824.50 E 1353947.82	375.75'
ES-5	HO D 5.51	ES	N 576806.49 E 1353885.97	371.25'
ES-6	HO D 5.51	ES	N 576744.78 E 1353829.95	364.25'
ES-7	HO D 5.51	ES	N 576720.84 E 1353805.80	363.25'

•MD 378.05 DOUBLE OPENING TYPE 'K' INLET OPEN-END GRATE WITH 5' LONG VALLEY GUTTER, MD 389.01, ON EITHER SIDE OF INLET. VALLEY GUTTER TO BE INCLUDED IN COST OF INLET



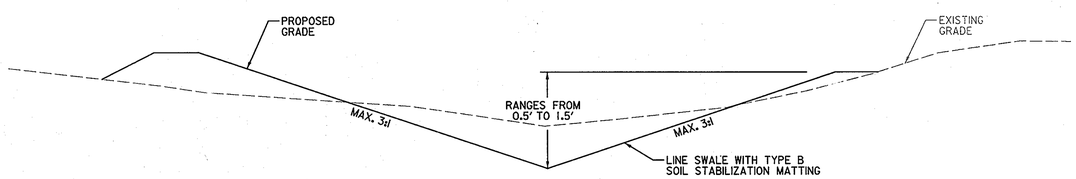
NOTES:

1. SWALE TO BE LINED WITH SHA TYPE A SOIL STABILIZATION MATTING FROM STA. 0+00 TO STA. 0+44.

2. LINE SWALE WITH SHA TYPE B SOIL STABILIZATION MATTING FROM STA. 0+78 TO STA. 1+23, STA. 2+22 TO STA. 2+29, AND STA. 5+08 TO STA. 5+83.

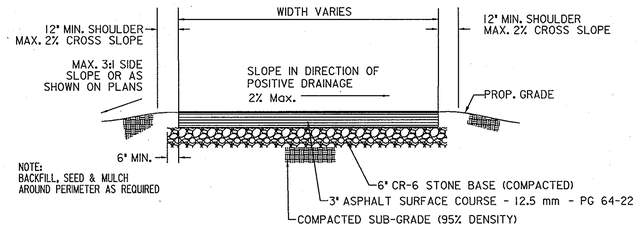
STA 0+00 TO STA 0+49
STA 0+77 TO STA 1+23
STA 2+22 TO STA 2+42
STA 5+09 TO STA 5+83

TYPICAL SWALE SECTION A
NOT TO SCALE



STA 1+23 TO STA 1+68
STA 2+42 TO STA 4+74
STA 5+83 TO STA 6+05

TYPICAL SWALE SECTION B
NOT TO SCALE



NOTE:
BACKFILL, SEED & MULCH AROUND PERIMETER AS REQUIRED

TRAIL TYPICAL SECTION
NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 8/25/09
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BY	NO	REVISION	DATE
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PIPE PROFILE SHEET AND TYPICAL SECTIONS

SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT DRAINAGE IMPROVEMENT
HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 3 OF 8

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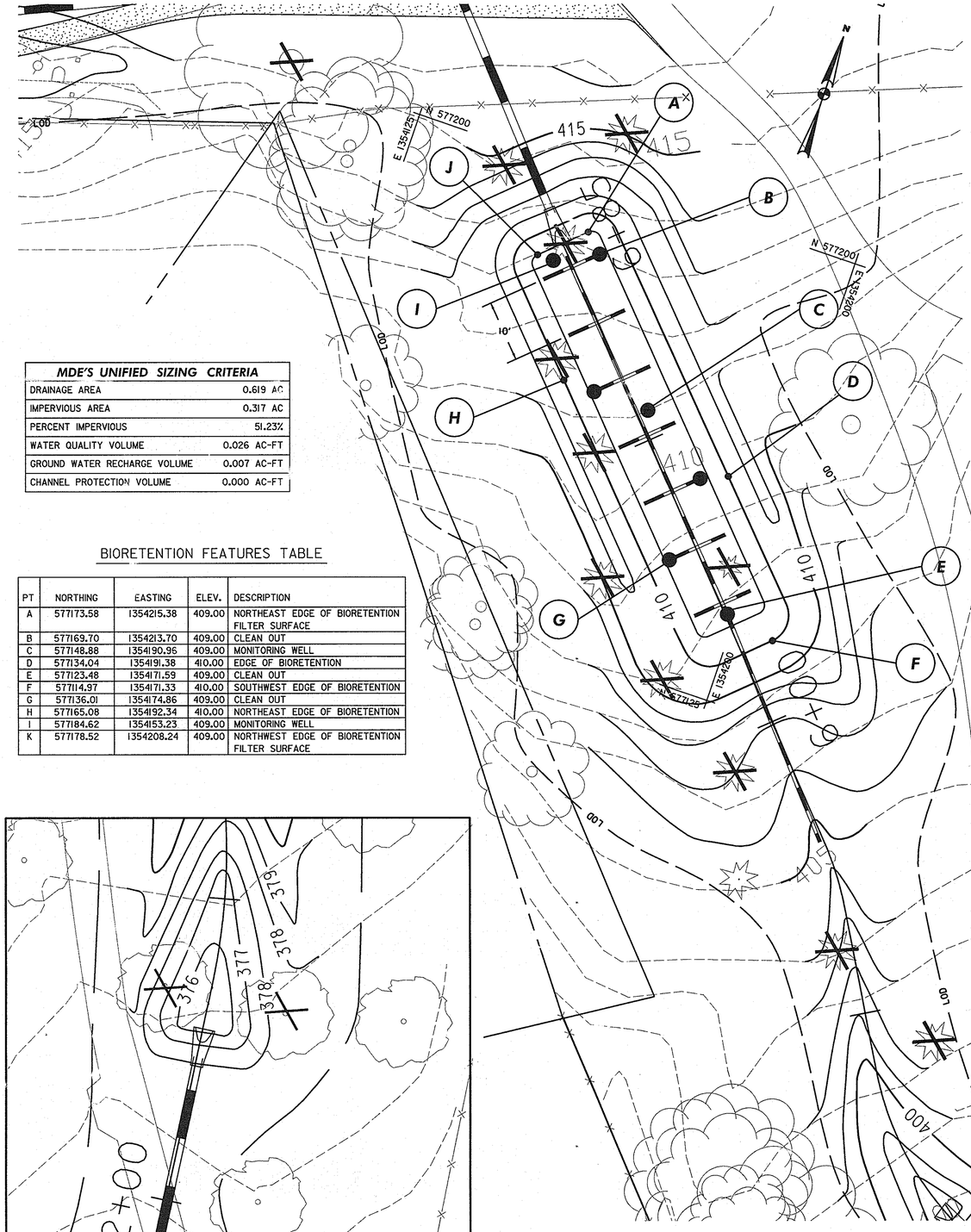
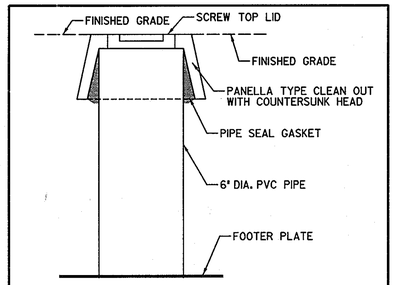


MDE'S UNIFIED SIZING CRITERIA	
DRAINAGE AREA	0.619 AC
IMPERVIOUS AREA	0.317 AC
PERCENT IMPERVIOUS	51.23%
WATER QUALITY VOLUME	0.026 AC-FT
GROUND WATER RECHARGE VOLUME	0.007 AC-FT
CHANNEL PROTECTION VOLUME	0.000 AC-FT

BIORETENTION FEATURES TABLE

PT	NORTHING	EASTING	ELEV.	DESCRIPTION
A	577173.58	1354215.38	409.00	NORTHEAST EDGE OF BIORETENTION FILTER SURFACE
B	577169.70	1354213.70	409.00	CLEAN OUT
C	577148.88	1354190.96	409.00	MONITORING WELL
D	577134.04	1354191.38	410.00	EDGE OF BIORETENTION
E	577123.48	1354171.59	409.00	CLEAN OUT
F	577114.97	1354171.33	410.00	SOUTHWEST EDGE OF BIORETENTION
G	577136.01	1354174.86	409.00	CLEAN OUT
H	577165.08	1354192.34	410.00	NORTHEAST EDGE OF BIORETENTION
I	577184.62	1354153.23	409.00	MONITORING WELL
K	577178.52	1354208.24	409.00	NORTHWEST EDGE OF BIORETENTION FILTER SURFACE

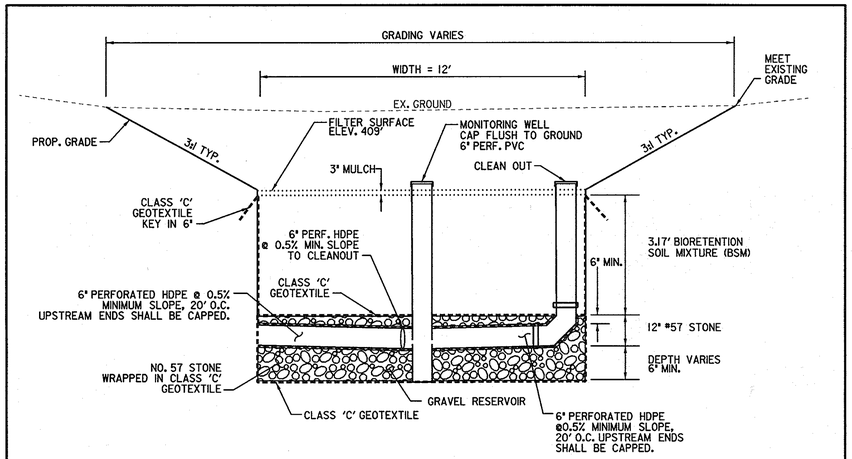


EACH OBSERVATION WELL SHALL INCLUDE THE FOLLOWING:

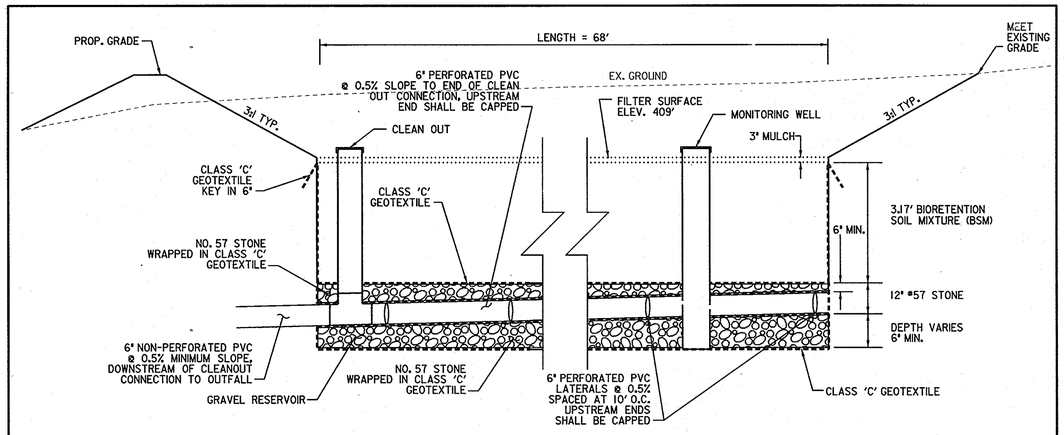
1. FOR AN UNDERGROUND FLUSH MOUNTED OBSERVATION WELL PROVIDE A TUBEMADE OF NON-CORROSIVE MATERIAL, SCHEDULE 40 PVC OR EQUAL, WITH AN INSIDE DIAMETER OF AT LEAST 6 INCHES.

2. THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL WITHSTAND ULTRA-VIOLET RAYS. THE LID SHALL BE VENTED. THE LID SHALL BE MARKED WITH BOTH "MONITORING WELL/CLEAN OUT" AND THE DEPTH TO THE INVERT. MARKINGS SHALL BE VISIBLE UPON COMPLETION OF THE PROJECT AND MUST BE RESISTANT TO WEATHERING.

MONITORING WELL AND CAP
N.T.S. SECTION (TYP.)



BIORETENTION TRANVERSE TYPICAL SECTION
NOT TO SCALE



BIORETENTION LONGITUDE TYPICAL SECTION
NOT TO SCALE

Material Specifications for Bioretentions

Material	*Specification*	*Size*	*Notes*
plantings	see appendix a, table a.4	n/a	plantings are site-specific
planting soil (2.5' to 4' deep)	sand 35-60% silt 30-55% clay 10-25%	n/a	USDA soil types, loamy sand, sandy loam or loam
mulch	shredded hardwood		aged 6 months, min.
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448 ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
geotextile	Class 'C'- apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @6" on center, 4 holes per row; min. of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix no. 3; psi @ 28 days, normal weight air-entrained; reinforcing to meet ASTM 615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) no using previously approved State of local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading (H-10 or H-20); allowable horizontal loading (based on soil pressures); and analysis of potential cracking
sand (1" deep)	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomite sand substitutions are acceptable. No "rock dust" can be used for sand

From MDE 2000 Maryland Stormwater Design Manual Vol I & II, Table B.3.2, pg B.3.7

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HOWARD COUNTY, MARYLAND

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CHIEF, DIVISION OF TRANSPORTATION AND SPECIAL PROJECTS — DATE 8/26/09

GPI GREENMAN-PEDERSEN, INC.
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STATE OF MARYLAND — CHARLES L. BROUILLET — No. 11007 — 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. 11007, Expiration Date: 07/09/2010.

DES: M.M.G.
DRN: K.L.F.
CHK: C.L.M.
DATE: APRIL, 2009

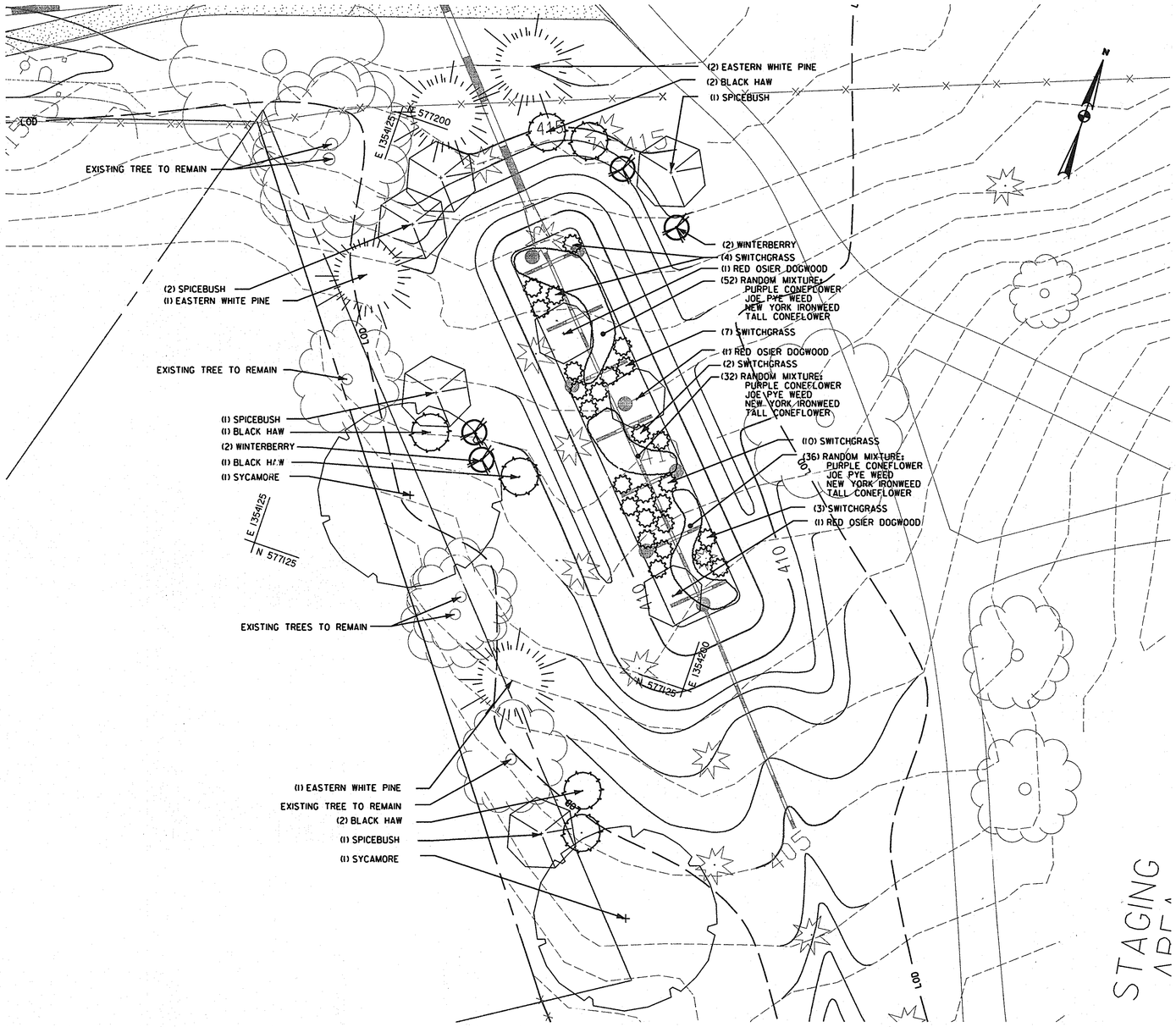
BY	NO	REVISION	DATE

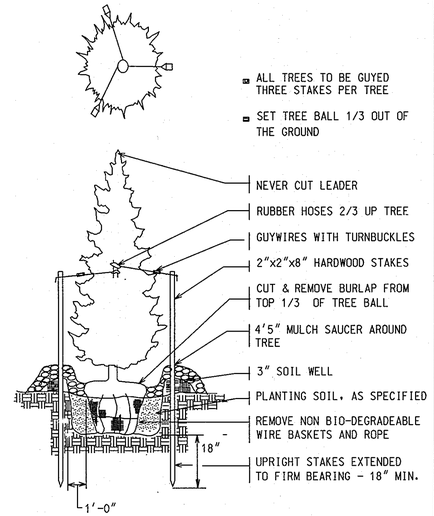
BIORETENTION DETAILS AND TREE REMOVAL
SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT DRAINAGE IMPROVEMENT
HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN
SHEET 4 OF 8

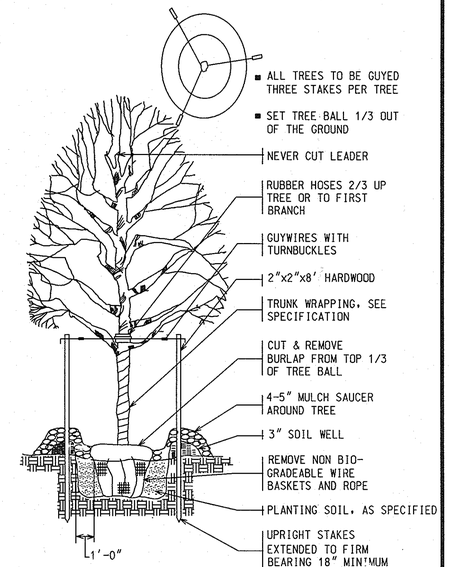
FILE: N:\2005\2005019\2005019_13\dgn\pDD-D001_farmington.dgn
DATE: Thursday, August 20, 2009 AT 08:09 AM





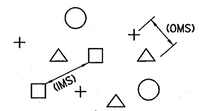
EVERGREEN TREE PLANTING DETAIL

N.T.S.



DECIDUOUS TREE PLANTING DETAIL

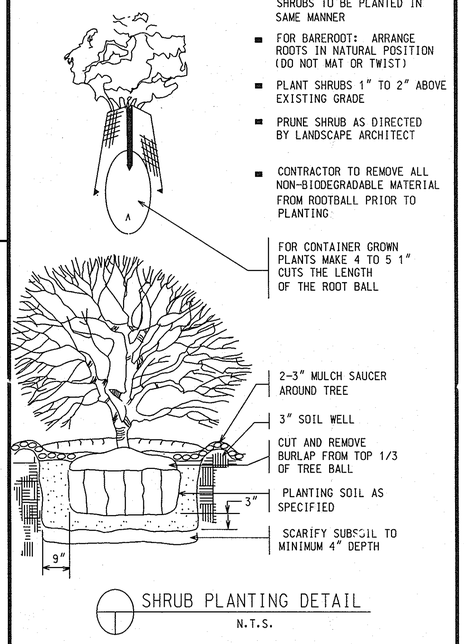
N.T.S.



1. An overall minimum spacing distance (OMS) is assigned to the planting configuration (see plant schedule).
2. An individual minimum spacing distances (IMS) is assigned to each individual species (see plant schedule).

RANDOM PLANT SPACING DETAIL

PLAN VIEW Not To Scale



SHRUB PLANTING DETAIL

N.T.S.

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING	
Linear Feet of Perimeter	140
Number of Trees Required	
Shade Trees	1.4
Evergreen Trees	1.75
Credit for Existing Vegetation	yes 50%
Credit for Other Landscaping	no
Number of Trees Provided	
Shade Trees	2
Evergreen Trees	3
Other Trees (2:1 substitution)	10 shrubs

PLANTING NOTES

1. Plants shall conform to current 'American Standards for Nursery Stock' by American Association of Nurseryman (AAN), particularly with regards to size, growth, size of ball, and density of branch structure.
2. All plants (B&B or container) shall be properly identified by weather-proof labels securely attached thereto before delivery to project site. Labels shall identify plants by name, species, and size. Labels shall not be removed until the final inspection by the Landscape Architect.
3. The Contractor shall furnish all plants in quantities and sizes to complete the work as specified in the plant schedule.
4. The Landscape Contractor shall be responsible to verify all plant quantities prior to commencement of work. Quantities in the schedule are for the Contractor's convenience.

FARMINGTON COURT BIORETENTION AND BUFFER PLANT SCHEDULE

Item	Botanical Name	Common Name	Unit	Size	Root	Spacng	Quantity
Tree	Pinus strobus	Eastern White Pine	each	6'-8'	Cont.	as shown	4
Tree	Plantanus occidentalis	Sycamore	each	1.0" cal.	B&B	as shown	2
Shrub	Comus stolonifera	Red Osier Dogwood	each	2-3 ft. ht.	Cont.	as shown	3
Shrub	Ilex verticulata	Winterberry Holly	each	2-3 ft. ht.	Cont.	as shown	4
Shrub	Lindera benzoin	Spicebush	each	2-3 ft. ht.	Cont.	as shown	5
Shrub	Viburnum prunifolium	Black Haw	each	2.5'-3'	Cont.	as shown	6
Grass	Panicum virgatum	Switchgrass	each	Quart	Cont.	3'	26
Wild Flower	Echinacea purpurea	Purple Coneflower	each	Quart	Cont.	1.25 IMS/1.75 OMS	30
Wild Flower	Eupatorium fistulosum	Joe Pye Weed	each	Quart	Cont.	1.25 IMS/1.75 OMS	30
Wild Flower	Veronia noveboracensis	New York Ironweed	each	Quart	Cont.	1.25 IMS/1.75 OMS	30
Wild Flower	Rudbeckia laciniata	Tall Coneflower	each	Quart	Cont.	1.25 IMS/1.75 OMS	30

NOTE: SEE EROSION & SEDIMENT CONTROL NOTES SHEET FOR GROUNDCOVER PLANTING.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 8/26/09
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DES: C.S.P.
DRN: C.S.P.
CHK: CLM
DATE: APRIL, 2009

BY	NO	REVISION	DATE

LANDSCAPE DESIGN

SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT
DRAINAGE IMPROVEMENT

HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 5 OF 8

FILE: N:\2005\2005019\2005019.13\dgn\pLD-0001_farmington.dgn
DATE: Thursday, August 20, 2009 AT 08:09 AM

NOTES:

1. PATH IS TO BE REPLACED UNDER STABILIZED CONSTRUCTION ENTRANCE AND ALL AREAS WITHIN IN LOD THAT ARE DAMAGED DURING CONSTRUCTION.
2. INSTALL SUPER SILT FENCE AROUND I-1 AND I-2 AFTER THEY HAVE BEEN INSTALLED.

40' 0 40' 80'

SCALE: 1"=40'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 8/25/09
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BY	NO	REVISION	DATE
KCL	1	AS-BUILT REVISIONS	3-16-11

EROSION AND SEDIMENT CONTROL PLAN SHEET

SCALE: MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT DRAINAGE IMPROVEMENT

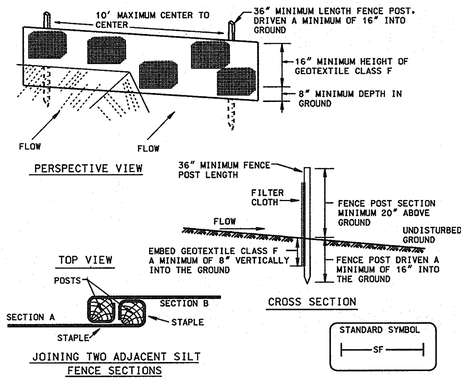
HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 6 OF 8

FILE: N:\2005\2005019\2005019.13\dgn\pES-0001_farmington.dgn
DATE: Thursday, August 20, 2009 AT 08:08 AM

DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be $1\frac{1}{2}$" x $1\frac{1}{2}$" square (minimum) cut, or $1\frac{3}{4}$" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

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

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft²/ minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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

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

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

SILT FENCE

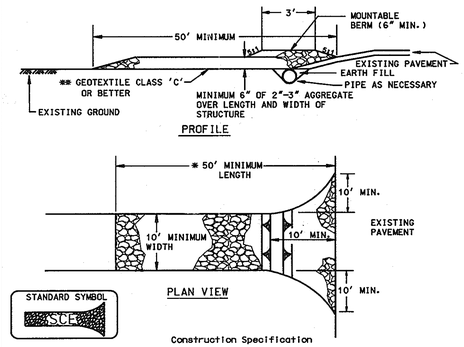
Silt Fence Design Criteria

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

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

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

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

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

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

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

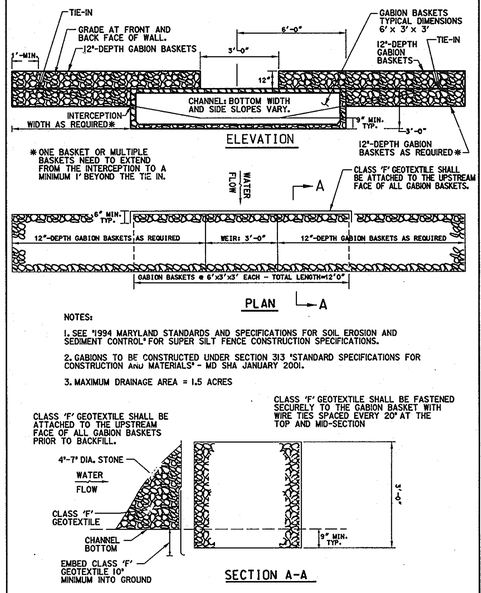
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

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

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

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

TEMPORARY GABION OUTLET STRUCTURE



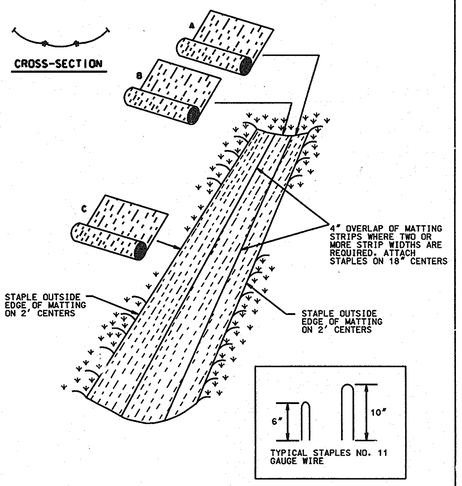
NOTES:

1. SEE "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR SUPER SILT FENCE CONSTRUCTION SPECIFICATIONS.

2. GABIONS TO BE CONSTRUCTED UNDER SECTION 313 "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS" - MD SHA JANUARY 2001.

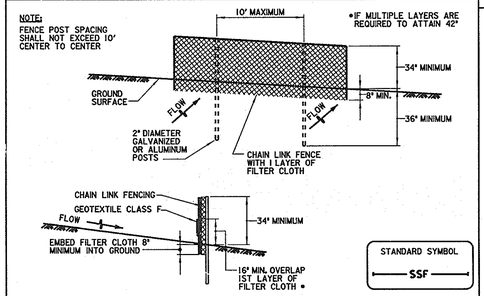
3. MAXIMUM DRAINAGE AREA = 1.5 ACRES

DETAIL 30 - EROSION CONTROL MATTING



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G - 22 - 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 28 - SUPER SILT FENCE



DESIGN CRITERIA

SLOPE	SLOPE STEEPNESS	SLOPE LENGTH (MAXIMUM)	SILT FENCE LENGTH (MAXIMUM)
LESS THAN - 10%	FLATTER THAN 10:1	UNLIMITED	UNLIMITED
10 - 20%	10:1 - 5:1	200 FEET	1,500 FEET
>20 - 33%	>5:1 - 3:1	100 FEET	1,000 FEET
>33 - 50%	>3:1 - 2:1	100 FEET	500 FEET
>50%+	>2:1+	50 FEET	250 FEET

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	PAGE E - 15 - 7	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SUPER SILT FENCE

CONSTRUCTION SPECIFICATIONS

1. FENCING SHALL BE 42" IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY (SHA) SPECIFICATION, SECTIONS 615-AND 914-CHAIN LINK FENCE. THE SHA SPECIFICATION FOR A 6 FOOT FENCE SHALL BE USED WITH THE FOLLOWING SUBSTITUTIONS:

   FABRIC: 42" HEIGHT MIN., 9 GAUGE (3.767 MM) MIN.
   WIRE POSTS: 2" DIAMETER, 6 FOOT LENGTH GALVANIZE STEEL OR ALUMINUM
   POST SPACING: 10 FOOT MAX.

   EXCLUSIONS: LOWER TENSION WIRE, BRACE AND TRUSTS RODS, DRIVE ANCHORS, POST CAPS, 1' GROUND CLEARANCE, CONCRETE FOOTINGS.

2. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES. GEOTEXTILE CLASS F SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES ON 24" CENTERS AT THE TOP AND MID SECTION.

3. GEOTEXTILE SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND. WHEN TWO SECTIONS OF GEOTEXTILE ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 16", FOLDED, AND SECURED TO PREVENT BREACH.

4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF THE FENCE HEIGHT.

5. GEOTEXTILE SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F WITH THE PROPERTIES DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

   (4" X 8" SPECIMEN, 1" X 2" CLAMPS, 12"/MIN. STRAIN RATE IN BOTH PRINCIPAL DIRECTIONS OF GEOTEXTILE FABRIC.)

APPARENT OPENING SIZE:	0.40-0.80 (US STD. SIEVE CW-02215)	TEST: ASTM D-4751
GRAB TENSILE STRENGTH:	90 LB. (MIN.)	TEST: ASTM D-4632
PUNCTURE RESISTANCE	190 PSI (MIN.)	TEST: ASTM D-4833
TENSILE STRENGTH	50 LBS./IN (MIN.)	TEST: ASTM D-4595
TENSILE MODULUS:	20 LBS./IN (MIN.)	TEST: ASTM D-4595
FLOW RATE:	0.3 GAL./SF/MINUTE (MIN.)	TEST: ASTM D-5141
FILTERING EFFICIENCY	75% (MIN.)	TEST: ASTM D-5141

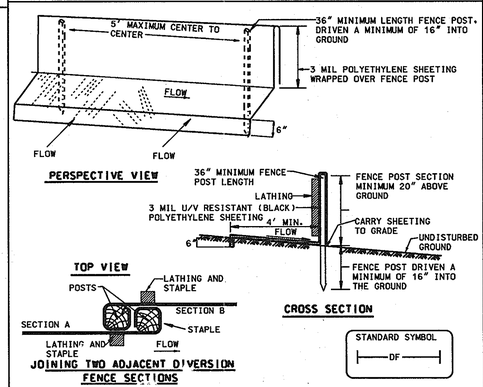
   GEOTEXTILE FABRIC SHALL BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDROCARBONS, AND WILL BE ROT AND MILDEW RESISTANT. IT SHALL BE MANUFACTURED FROM FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS AND COMPOSED OF A MINIMUM OF 85% BY WEIGHT OF POLYOLEPHINS, POLYESTERS, OR POLYAMIDES. THE GEOTEXTILE FABRIC SHALL CONTAIN SUFFICIENT AMOUNTS OF ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 12 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120 DEGREES F.

6. MANUFACTURER CERTIFICATION THAT GEOTEXTILE AND FENCING USED AT THE SITE MEETS REQUIREMENTS SET FORTH IN THIS SPECIFICATION SHALL BE AVAILABLE ON SITE FOR INSPECTION BY AN AUTHORIZED REPRESENTATIVE OF THE APPROVAL AUTHORITY.

7. ENDS OF FENCE SHALL BE TURNED UPHILL AT SUFFICIENT LENGTH (3' MINIMUM) TO PREVENT "END AROUND" RUNOFF.

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	PAGE E - 15 - 8	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DIVERSION FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Posts shall be 2 " x 2 " square (minimum) cut, and shall be of sound quality hardwood. Maximum post spacing shall be 5 feet center to center.

2. 3 mil polyethylene sheeting shall be fastened securely to each fence post with lathing and staples at top and mid-section.

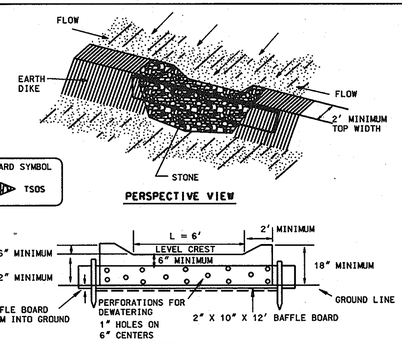
3. Ends of polyethylene sheeting shall come together only at posts. Ends shall be overlapped, folded and stapled to prevent runoff bypass. The upgrade section shall overlap the downgrade section.

4. Diversion fence shall have an uninterrupted positive grade to a stable outlet.

5. The contributing drainage area measured to the outlet shall not exceed 2 acres.

6. Diversion Fence shall be inspected after each rainfall event and maintained when necessary.

DETAIL 19 - STONE OUTLET STRUCTURE



Construction Specifications

1. Crushed stone shall be used. Gravel may be used if crushed stone is not available. The stone shall be 2"-3" in size.

2. The crest of the stone dike shall be at least 6" lower than the lowest elevation of the top of the earth dike and shall be level.

3. The stone outlet structure shall be embedded into the soil a minimum of 4".

4. The minimum length of the crest of the stone outlet structure shall be 6'.

5. The stone outlet structure shall be inspected after each rain. Stone shall be replaced when the structure ceases to function and ponding results.

6. The baffle board shall be extended one foot into the dike, staked and embedded 4" into the existing ground.

7. The drainage area to this structure shall be less than ½ acre.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 11 - 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

EROSION CONTROL MATTING

Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".

2. Staple the 4" overlap in the channel center using an 18" spacing between staples.

3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G - 22 - 2A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 8/26/09
CHIEF, BUREAU OF ENGINEERING — DATE 8/25/09
CHIEF, BUREAU OF HIGHWAYS — DATE 8.25.09
CHIEF, DIVISION OF TRANSPORTATION AND SPECIAL PROJECTS — DATE 8/25/09

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DES: M.M.G.
DRN: K.L.F.
CHK: C.L.M.
DATE: APRIL, 2009

BY	NO	REVISION	DATE

SEDIMENT AND EROSION CONTROL DETAILS

SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT DRAINAGE IMPROVEMENT

HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 7 OF 8

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DATE: Thursday, August 20, 2009 AT 08:07 AM

19.0 STANDARDS AND SPECIFICATIONS FOR LAND GRADING

Design Criteria

The grading plan should be based upon the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surroundings to avoid extreme grade modifications. Information submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, effect on adjacent properties and drainage patterns, measures for drainage and water removal and vegetative treatment, etc.

Many counties have regulations and design procedures already established for land grading and cut and fill slopes. Where these requirements exist, they shall be followed. The plan must show existing and proposed contours of the area(s) to be graded. The plan shall also include practices for erosion control, slope stabilization, safe disposal of runoff water and drainage, such as waterways, lined ditches, reverse slope benches (include grade and cross section), grade stabilization structures, retaining walls, and surface and subsurface drains. The plan shall also include phasing of these practices. The following shall be incorporated into the plan:

I. Provisions shall be made to safely conduct surface runoff to storm drains, protected outlets or to stable water courses to insure that surface runoff will not damage slopes or other graded

II. Cut and fill slopes that are to be stabilized with grasses shall not be steeper than 2:1. (Where the slope is to be mowed the slope should be no steeper than 3:1. 4:1 is preferred because of safety factors related to mowing steep slopes.) Slopes exceeding 2:1 shall require special design and stabilization considerations that shall be adequately shown on the plans.

III. Reverse benches shall be provided whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet. For 3:1 slope it shall be increased to 30 feet and for 4:1 to 40 feet. Benches shall be located to divide the slope face as equally as possible and shall convey the water to a stable outlet. Soils, seeps, rock outcrops, etc., shall also be taken into consideration when designing benches.

A. Benches shall be a minimum of six-feet wide to provide for ease of maintenance.

B. Benches shall be designed with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth. Bench gradient to the outlet shall be between 2 percent and 5 percent, unless accompanied by appropriate design and computations.

C. The flow length within a bench shall not exceed 800' unless accompanied by appropriate design and computations. For flow channel stabilization see temporary swales.

IV. Surface water shall be diverted from the face of all cut and/or fill slopes by the use of earth dikes, ditches and swales or conveyed downslope by the use of a designed structure, except where:

A. The face of the slope is or shall be stabilized and the face of all graded slopes shall be protected from surface runoff until they are stabilized.

B. The face of the slope shall not be subject to any concentrated flows of surface water such as from natural drainageways, graded swales, downspouts, etc.

C. The face of the slope will be protected by special erosion control materials, to include, but not limited to: approved vegetative stabilization practices (see section G), rip-rap or other approved stabilization methods.

V. Cut slopes occurring in capable rock shall be serrated as shown on the following diagram. These serrations shall be made with conventional equipment as the excavation is made. Each step or serration shall be constructed on the contour and will have steps cut at nominal two-foot intervals with nominal three-foot horizontal shelves. These steps will vary depending on the slope or the cut slope. The nominal slope ratio of the 1'-2' these steps will weather and act to hold moisture, lime, fertilizer and seed thus producing a much quicker and longer lived vegetative cover and better slope stabilization. Overland flow shall be diverted from the top of all serrated cut slopes and carries to a suitable outlet.

VI. Subsurface drainage shall be provided where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

VII Slopes shall not be created so close to property lines as to endanger adjoining properties without adequately protecting such properties against sedimentation, erosion, slippage, settlement, subsidence or other related damages.

VIII. Fill material shall be free of brush, rubbish, rocks, logs, stumps, building debris, and other objectionable material. It should be free of stones over two (2) inches in diameter where compacted by hand or mechanical tampers or over eight (8) inches in diameter where compacted by rollers or other equipment. Frozen material shall not be placed in the fill nor shall the fill material be placed on a frozen foundation.

IX. Stockpiles, borrow areas and spoil shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

X. All disturbed areas shall be stabilized structurally or vegetatively in compliance with 20.0 Standards and Specifications for Vegetative Stabilization.

STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspections, Licenses and Permits, Construction InspectionDivision prior to start of any construction (410-313-1855).
2. All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within:
   A) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes steeper than 3:1
   B) 14 calendar days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol. 1, Chapter 7 of the HOWARD COUNTY DESIGN MANUAL, Storm drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding and mulching (section g). Temporary stabilization with mulch alone shall only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
6. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for there removal has been obtained from the Howard County Sediment Control Inspector.
7. Site Analysis:
   Total Area of Site = 0.41 Acres
   Area Disturbed = 0.41 Acres
   Area to be Roofed or Paved = 0.05 Acres
   Area to be Vegetatively Stabilized = 0.36 Acres
   Total Fill = ____ Cu. Yds.
   Offsite waste/borrow area location: To be determined by the contractor
   _____ permit is needed for offsite waste/borrow Site plan grading permit or waiver may be necessary
8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. On 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.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

FILTERING MAINTENANCE CRITERIA

1. The sediment chamber outlet devices shall be cleaned/repaired when drawdown times within the chamber exceed 36 hours. Trash and debris shall be removed as necessary.
2. When the filtering capacity of the filter diminishes substantially (e.g., when water ponds on the surface of the filter bed for more than 72 hours), the top few inches of discolored material shall be removed and shall be replaced with fresh material. The removed sediments should be disposed in an acceptable manner (e.f., landfill). Silt/sediments should be removed from the filter bed when the accumulation exceeds one inch.

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

Definition

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

Purpose

To provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:

A. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.

B. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.

C. The original soil to be vegetated contains material toxic to plant growth.

D. The soil is so acidic that treatment with limestone is not feasible.

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

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.

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

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

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

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

III. For sites having disturbed areas under 5 acres place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I– Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:

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

1. pH for no soil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
2. Organic content of topsoil shall be not less than 1.5 percent by weight.
3. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
4. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

Note: Topsoil substitutes or amendments, as recommends by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

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

V. Topsoil Application

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

1. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" – 8" higher in elevation.
2. Topsoil shall be uniformly distributed in a 4" – 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
3. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

VI. Alternative for Permanent Seeding – Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:

A. Composted Sludge Material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following, requirements:

1. "Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
2. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a PH of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.
3. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.

B. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 sqare feet, and 1/3 the normal lime application rate.

References: Guideline Specifications, Soil Preparation and Sodding MD-VA Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes. Revised 1973.

VEGETATIVE STABILIZATION

PERMANENT AND TEMPORARY SEEDING, SODDING AND MULCHING

I. SITE PREPARATION

PERMANENT OR TEMPORARY VEGETATION SHALL BE ESTABLISHED WITHIN SEVEN (7) DAYS ON THE SURFACE OF ALL SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BERMS, WATERWAYS, SEDIMENT CONTROL BASINS, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND WITHIN 14 DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE. MULCHING MAY ONLY BE USED ON DISTURBED AREAS AS TEMPORARY COVER WHERE VEGETATION IS NOT FEASIBLE OR WHERE SEEDING CANNOT BE COMPLETED BECAUSE OF WEATHER.

II. SEEDBED PREPARATION AND SEEDING APPLICATION

LOOSEN THE TOP LAYER OF THE SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT SUCH AS DISC HARROWS, CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. INCORPORATE THE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF THE SOIL BY DISCING OR BY OTHER SUITABLE MEANS. ROUGH AREAS SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN A ROUGHENED CONDITION. STEEP SLOPES GREATER THAN 3:1 SHOULD BE TRACKED BY A DOZER, LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP 1 TO 3 INCHES OF SOIL SHOULD BE LOOSE AND FRIABLE. PERMANENT COVER MAY REQUIRE AN APPLICATION OF TOPSOIL. IF SO, IT MUST MEET THE REQUIREMENTS SET FORTH IN SECTION 21.0 STANDARDS AND SPECIFICATIONS FOR TOPSOIL FROM THE 1994 STANDARDS AND SPECIFICATIONS.

III. SOIL AMENDMENTS

SOIL TESTS SHALL BE MADE ON SITES OVER FIVE ACRES TO DETERMINE THE EXACT REQUIREMENTS FOR BOTH LIME AND FERTILIZER. FOR SITES UNDER 5 ACRES, IN LIEU OF A SOIL TEST, APPLY THE FOLLOWING:

FERTILIZER	NITROGEN	2.0 LBS/SQ.FT. (90 LBS/AC)
	P2O5	4 LBS/SQ.FT. (175 LBS/AC)
	K2O	4 LBS/1000 SQ. FT. (175 LBS/AC)

FOR LOW MAINTENANCE AREAS APPLY 150 LBS/AC UREAFORM FERTILIZER (38-0-0) AT 3.5 LBS/1000 SQ.FT. IN ADDITION TO THE ABOVE FERTILIZER AT THE TIME OF SEEDING.

GROUND LIMESTONE 2 TONS/AC

IV. SEDIMENT CONTROL PRACTICE SEEDING

SELECT A SEEDING MIXTURE FROM TABLES 25 OR 26 IN SECTION G OF THE 1994 STANDARDS AND SPECIFICATIONS. DOCUMENT SEEDING ON THE EROSION AND SEDIMENT CONTROL PLAN USING APPROPRIATE CHART TO THE RIGHT. NOTE: IF SEDIMENT CONTROL PRACTICES ARE IN FOR LONGER THAN 12 MONTHS PERMANENT SEEDING IS REQUIRED.

V. TEMPORARY/PERMANENT SEEDING MIXTURES AND RATES

SELECT A SEEDING MIXTURE FROM APPROPRIATE TABLE 25 OR 26 IN SECTION G OF THE 1994 STANDARDS AND SPECIFICATIONS. DOCUMENT SEEDING ON THE EROSION AND SEDIMENT CONTROL PLAN USING APPROPRIATE CHART TO THE RIGHT.

VI. TURFGRASS ESTABLISHMENT

THIS INCLUDES LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM OF HIGH LEVEL OF MAINTENANCE. AREAS TO RECEIVE SEED SHALL BE TILLED BY DISCING OR BY OTHER APPROVED METHODS TO A DEPTH OF 3 TO 5 INCHES, LEVELED AND RAKED TO PREPARE A PROPER SEEDBED. STONES AND DEBRIS OVER 1 1/2" INCHES IN DIAMETER SHALL BE REMOVED. THE RESULTING SEEDBED SHALL BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY. USE CERTIFIED MATERIAL AND CHOOSE A TURF GRASS MIXTURE FROM PAGE G-20 OF THE 1994 STANDARDS AND SPECIFICATIONS OF SELECT FROM THE LIST IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MIMEO #77, "TURF GRASS CULTIVATE RECOMMENDATIONS FOR MARYLAND".

VII. MULCHING

ALL SEEDINGS REQUIRE MULCHING. ALSO MULCH DURING NON-SEEDING DATES UNTIL SEEDING CAN BE DONE.

MULCH SHALL BE UNROTTED, UNCHOPPED, SMALL GRAIN STRAW APPLIED AT A RATE OF 2 TONS/ACRE OR 90 LBS/1000 SQ. FT. (2 BALES). IF A MULCH ANCHORING TOOL IS USED, APPLY 2.5 TONS /ACRE. MULCH MATERIALS SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE COMPLETELY FREE OF PROHIBITED NOXIOUS WEEDS. SPREAD MULCH UNIFORMLY, MECHANICALLY OR BY HAND, TO A DEPTH OF 1 – 2 INCHES. MULCH ANCHORING SHALL BE ACCOMPLISHED IMMEDIATELY AFTER MULCH PLACEMENT TO MINIMIZED LOSS BY WIND OR WATER. THIS MAY BE DONE BY MULCH NETTINGS, MULCH ANCHORING TOOL, WOOD CELLULOSE FIBER OR LIQUID MULCH BINDERS.
APPLY WOOD CELLULOSE FIBER AT A DRY WEIGHT OF 1,500 LBS/ACRE. IF MIXED WITH WATER, USED 50 LBS. OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
LIQUID BINDER SHOULD BE APPLIED HEAVIER AT THE EDGE, WHERE WIND CATCHES MULCH IN VALLEYS, AND ON CREST OF BANKS. THE REMAINDER OF THE AREA SHOULD APPEAR UNIFORM AFTER BINDER APPLICATION. APPLY RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR AND MULCH. STAPLE LIGHT WEIGHT, PLASTIC NETTING OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

VIII. SODDING

CLASS OF TURF GRASS SOD SHALL BE MARYLAND OR VIRGINIA STATE CERTIFIED OR MARYLAND OR VIRGINIA STATE APPROVED SOD. SOD SHALL BE HARVESTED, DELIVERED AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD IS TO BE LAID WITH THE LONG EDGES PARALLEL TO THE CONTOUR USING STAGGERED JOINTS WITH ALL ENDS TIGHTLY ABUTTED AND NOT OVER LAPPING. SOD SHALL BE ROLLED AND THOROUGHLY WATERED AFTER INSTALLATION. DAILY WATERING TO MAINTAIN 4 INCH DEPTH OF MOISTURE FOR THE FIRST WEEK IS REQUIRED IN THE ABSENCE OF RAINFALL. SOD IS NOT TO BE APPLIED ON FROZEN GROUND.

IX. MAINTENANCE

A. IRRIGATE – APPLY MINIMUM 1" OF WATER EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE, WHEN SOIL MOISTURE BECOMES DEFICIENT TO PREVENT LOSS OF STAND OF PROTECTIVE VEGETATION.

B. REPAIRS – IF STAND PROVIDES BETWEEN 40% AND 90% GROUND COVERAGE, OVERSEED AND FERTILIZE USING HALF OF THE RATES ORIGINALLY APPLIED. IF STAND PROVIDES LESS THAN 40% COVERAGE, REESTABLISH STAND FOLLOWING ORIGINAL RATES AND PROCEDURES.

PERMANENT SEEDING NOTES

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

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

Soil Amendments: In lieu of soil test recommendations, use one of the following schedules:
1. Preferred – Apply 2 tons/ac dolomitic limestone (92 lbs/1000 sq. ft.) And 600 lbs/acre 10–10–10 fertilizer (14 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs/acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq. ft.)
2. Acceptable – Apply 2 tons/acres dolomitic limestone (92 lbs/1000 sq. ft.)and 1000 lbs/acre 10–10–10 fertilizer (23 lbs/1000 sq. ft.) Before seeding. Harrow or disk into upper three inches of soil.

Seeding: For the periods March 1 – April 30, and August 1 – October 15, seed with 60 lbs/acres (1.4 lbs/1000 sq. ft.) Of Kentucky 31 Tall Fescue per acres and 2 lbs/acre (0.05 lbs/1000 sq. ft.) Of weeping lovegrass. During the period of October 16 – February 28, protect site by:
Option 1 – Two tons per acres of well anchored straw mulch and seed as soon as possible in the spring.
Option 2 – use sod.
Option 3 – seed with 60 lbs/acres Kentucky 30 tall fescue and mulch with 2 tons/acre well anchored straw.

Mulching: Apply 1–1/2 to 2 tons per acre (70 – 90 lbs/1000 sq. ft.)of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slope 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq. ft.) for anchoring.

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

TEMPORARY SEEDING NOTES

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

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

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

Seeding: For periods March 1 – April 30 and from August 15 – October 15, seed with 2–1/2 bushel per acre of annual rye (3.2 lbs/1000 sq. ft.). For the period May 1 – August 14, seed with 3 lbs/acre of weeping lovegrass (0.07 lbs/1000 lbs/sq. ft.). For the period November 16 – February 28, protect site by applying 2 tons/acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.

Mulching: Apply 1–1/2 to 2 tons per acre (70 – 90 lbs/1000 sq. ft.)of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slope 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq. ft.) for anchoring.

PERMANENT SEEDING SUMMARY
= 900lbs. 10–20–20

Seed Mixture (For Hardiness Zone 7a, From Table 25)					Fertilizer Rate (10–20–20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P205	K20	
	CONSTITUTION TALL FESCUE (24.5K)	125	3/1 – 5/15	1/4" – 1/2"	90 lb/ac (2.0 lb/ 1000 sf)	175 lb/ac (4 lb/ 1000 sf)	175 lb/ac (4 lb/ 1000 sf)	2 tons/ac (100 lb/ 1000 sf)
	RAPTOR TALL FESCUE (24.91K)	110	3/1 – 11/15	1/4" – 1/2"				
	TITANIUM TALL FESCUE (24.65K)	120	3/1 – 5/15	1/4" – 1/2"				
	AFFIRMED PERENNIAL RYEGRASS (19.69K)	30	3/1 – 5/15	1/4" – 1/2"				

TEMPORARY SEEDING SUMMARY

Seed Mixture (For Hardiness Zone 7a, From Table 28)					Fertilizer Rate (10–10–10)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
	RYE PLUS FOXTAIL MILLET	150 lb./ac.	2/1 – 10/15	1"	600 lb/ac (15 lb/ 1000 sf)	2 tons/ac (100 lb/ 1000 sf)
	ANNUAL RYEGRASS	50 lb./ac.	2/1 – 4/20 8/15 – 11/1	1/4" – 1/2"		
	FOXTAIL MILLET	50 lb./ac.	5/1 – 8/14	1/2"		

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 8/25/09
CHIEF, BUREAU OF ENGINEERING — DATE 8/25/09
CHIEF, BUREAU OF HIGHWAYS — DATE 8-25-09
CHIEF, DIVISION OF TRANSPORTATION AND SPECIAL PROJECTS — DATE 8/20/09

GPI — GREENMAN-PEDERSEN, INC.
ENGINEERS, ARCHITECTS, PLANNERS, CONSTRUCTION ENGINEERS & INSPECTORS
10977 GUILFORD RD., ANNAPOLIS JUNCTION, MD. 20701
WASH. (301) 470-2772 BALT. (410) 880-3055
FAX: (301) 490-2649 www.gpinet.com

STATE OF MARYLAND — CLIFFORD L. MCCULLOUGH — No. 11007 — REGISTERED 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. 11007, Expiration Date: 07/09/2010.

DES: M.M.G.
DRN: K.L.F.
CHK: C.L.M.
DATE: APRIL, 2009

BY	NO	REVISION	DATE

SEDIMENT AND EROSION CONTROL NOTES

SCALE MAP NO. _____ BLOCK NO. _____

FARMINGTON COURT
DRAINAGE IMPROVEMENT
HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1147

SCALE: AS SHOWN

SHEET 8 OF 8

FILE: N:\2005\20050I9\20050I9.I3\dgn\pES-N00I_FarmingtonCt.dgn
DATE: Thursday, August 20, 2009 AT 08:05 AM