

SHEET INDEX	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	ENVIRONMENTAL CONCEPT PLAN
3	PRELIMINARY SEDIMENT AND EROSION CONTROL PLAN

STORMWATER MANAGEMENT SUMMARY			
AREA ID.	ESDv REQUIRED CU.FT.	ESDv PROVIDED CU.FT.	REMARKS
SITE	2,710	2,795	MICRO-BIORETENTION (M-6)
TOTAL	2,710	2,795	

GROSS AREA = 10.633 ACRES
 SITE AREA / LOD = 1.01 ACRES
 RCN = 55
 TARGET Pe = 1.6%

DESIGN NARRATIVE

Introduction:
 This report will demonstrate how the criteria set forth in the Maryland Stormwater Design Manual, Volumes I and II (effective October 2000, revised May 2009) will be satisfied on this project. The goal of creating hydrology similar to that of Woods in Good Condition will be accomplished through the use of the practices contained within Chapter 5 of said manual. The achievement of this goal will remove the requirement of providing Channel Protection Volume.

General Site Conditions:
 Larimore Property is a two lot single family lot subdivision. Property is zoned RC-DEO and located on Tax Map 13, Grid 10, Parcel No. 124 of the Howard County, Maryland Tax Map Database System. The property is an existing parcel of land located along the southwest side of Duvall Road. Subdivision will utilize a private well and septic. The property is located in the Woodbine area of Howard County draining to an unnamed tributary of Cattail Creek in the Brighton Dam - Patuxent River watershed (02131108). This property is relatively rectangular in shape and majority of runoff on-site is mainly from north to south to a stream located in the lower portion of the property. Majority of the site is forested and contains wetlands, wetland buffers, stream, stream buffers, steep slopes, and 100 year floodplain. Per a field inspection conducted by Eco-Science Professionals (ESP) dated April, 2014, wetlands and stream are present on-site. The Web Soil Survey shows soils on the site consist of Harbor-Codorus silt loams (Ha), Type "D" Soils and Glenville silt loam, Type "C" soils, both located in the floodplain area and Galla loam (Gac), Glenelg loam (Ggb, Gbc), and Manor loam (Mad, Mcd), Type "B" soils which exist for the majority of the property which is located outside of the floodplain area. Type "B" soils are within the limits of disturbance. The runoff from the roofs of the proposed houses is to be directed overland or through roof leaders to two (2) micro-bio-retention facilities to be located on each lot and one located on Lot 1 near Duvall Road to treat runoff from a portion of the proposed use-in-common driveway.

- Natural Resource Protection:**
 Environmentally sensitive areas do exist on-site (steep slopes, wetlands, wetland buffer, floodplain, stream, and stream buffer), therefore development has been proposed outside of the floodplain and buffer areas in an effort to protect this natural resource on-site.
- Maintenance of Natural Flow Patterns:**
 It is the intent of the proposed design to discharge runoff similar to the characteristics and direction of this site prior to any of the proposed improvements.
- Reduction of impervious areas through better site design, alternative surfaces and Nonstructural Practices:**
 The design of this project utilizes a common driveway and individual driveways for the two lots. Non-structural practices as permitted in Chapter 5, three (3) Micro-bio-retention Areas (M-6) will be used to address ESD to the MEP requirements.
- Integration of Erosion and Sediment Controls into Stormwater Strategy:**
 The majority of the site runoff sheet flows from north to south to a stream located in the lower portion of the property. Silt fence, super silt fence, and erosion control matting will be utilized for erosion and sediment control. There is no direct discharge of runoff directly to a stream. All site runoff will discharge to the existing stream channel and eventually to Cattail Creek within the Brighton Dam - Patuxent River. Only Public 100 year floodplain, drainage & utility easement will be required. It is anticipated that all cut will be utilized on-site for construction at time of Grading Plan.
- Implementation of ESD Planning Techniques and practices to the Maximum Extent Practicable (MEP):**
 The full required ESD volume is being provided.
- Request for a Design Manual Waiver:**
 No Waivers related to stormwater management are being requested in this project. A formal waiver to disturb steep slopes will be submitted at the time of Final Plans.

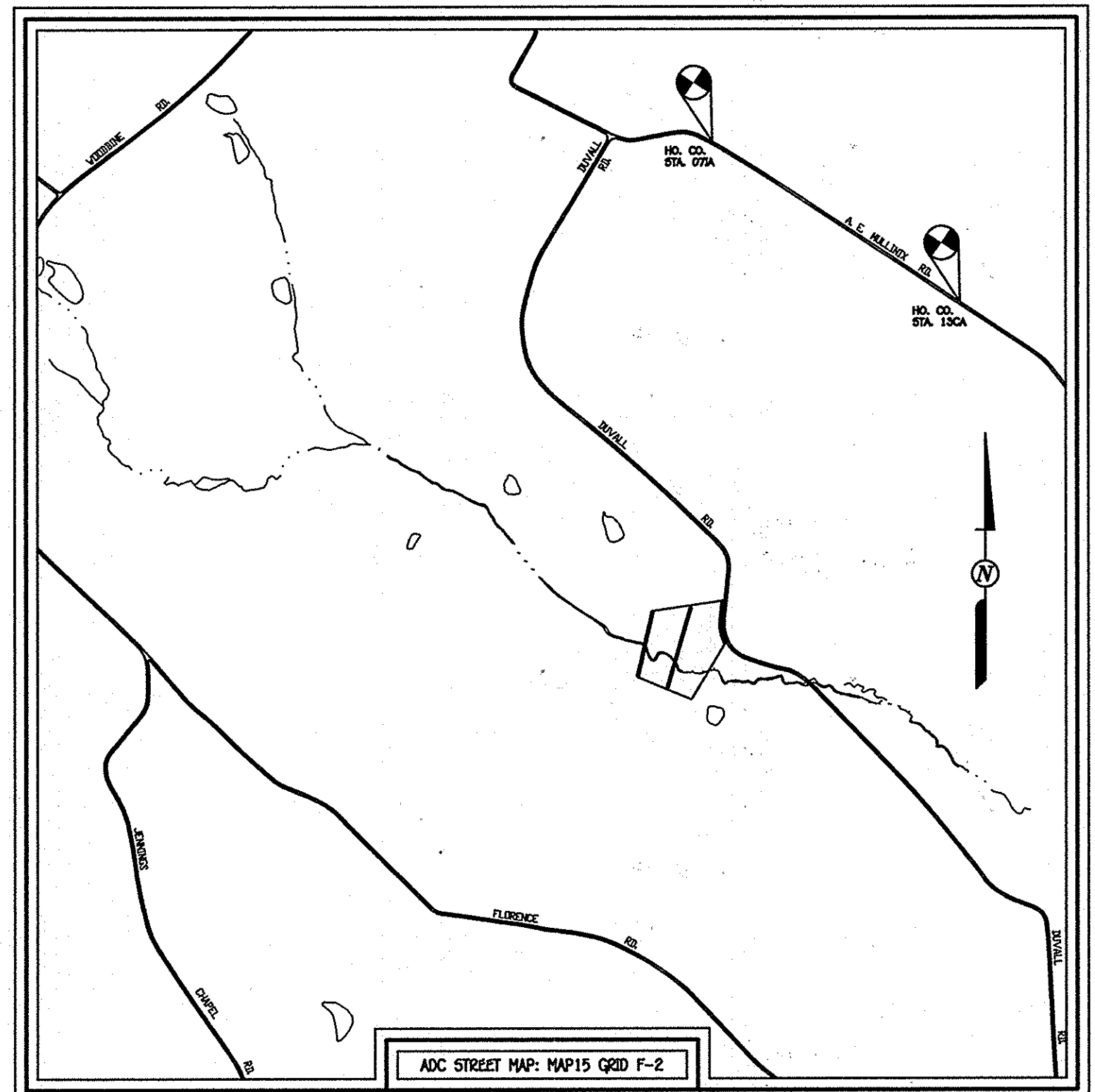
Table B.4. Materials Specifications for Micro-Bio-retention, Rain Gardens & Landscape Infiltration

Material	Specification	Size	Notes
Plantings	see Appendix A: Table A.4	n/a	plantings are site-specific
Planting soil (2" to 4" deep)	loamy sand 60-65% compost 35-40% or sandy loam 30% course sand 30% compost 40%		USDA soil types loamy sand or sandy loam; clay content <5%
Organic Content	Min. 10% by dry weight (ASTM D 5974)		
Mulch	shredded hardwood		aged 6 months, minimum
Pea gravel diaphragm	pea gravel: ASTM-D-440	No. 8 or No. 9 (1/8" to 3/8")	
Curbin drain	ornamental stone: washed cobble	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	ASHTO M-43	No. 57 or No. Aggregates (3/8" to 3/4")	
Underdrain piping	1/2" Type PS 20 or ASHTO M-270	1" to 6" rigid schedule 40 PVC or SDR25	Slotted or perforated pipe: 3/8" perf. @ 8" on center. 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4 inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f = 3500 psi at 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) not using previously approved site or 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 308.2R-09; vertical loading 10-10 or H-20S; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	ASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (ASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

ENVIRONMENTAL CONCEPT PLAN

LARIMORE PROPERTY
 LOTS 1 AND 2

TAX MAP No. 13 GRID No. 10 PARCEL Nos. 124
 FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND



BENCHMARK INFORMATION	
B.M.# 13CA - HOWARD COUNTY CONTROL STATION #13CA - HORIZONTAL - NAD '83	N 599,676.042 E 1,230,346.965 ELEVATION = 586.716 - VERTICAL - (NAVD '86)
B.M.# 071A - HOWARD COUNTY CONTROL STATION #071A - HORIZONTAL - (NAD '83)	N 601,099.942 E 1,228,753.577 ELEVATION = 584.300 - VERTICAL - (NAVD '86)

LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
---492---	EXISTING 2' CONTOURS	---	PROPOSED CONTOUR
---490---	EXISTING 10' CONTOURS	+	SPOT ELEVATION
---	SOILS LINES AND TYPE	---	LOD
---	EXISTING TREELINE	---	LIMITS OF DISTURBANCE
---	15% TO 24.9% STEEP SLOPES	---	PROPOSED TREELINE
---	25% AND GREATER STEEP SLOPES	---	EXISTING & PROPOSED PAVING
---	100 YEAR PUBLIC FLOODPLAIN, DRAINAGE AND UTILITY EASEMENT	○5033	BORING (PERC) TEST HOLE
---	WETLAND AREA	--- <td>SILT FENCE</td>	SILT FENCE
WB	25' WETLAND BUFFER	--- <td>EROSION CONTROL MATTING</td>	EROSION CONTROL MATTING
SB	STREAM BANK BUFFER	--- <td>SUPER SILT FENCE</td>	SUPER SILT FENCE
--- </td <td>100 YEAR FLOODPLAIN LINE</td> <td>---<!--</td--> <td>STABILIZES CONSTRUCTION ENTRANCE</td> </td>	100 YEAR FLOODPLAIN LINE	--- </td <td>STABILIZES CONSTRUCTION ENTRANCE</td>	STABILIZES CONSTRUCTION ENTRANCE
--- </td <td>LIMIT OF EXISTING WETLANDS</td> <td>--- <td>TREE PROTECTION</td> </td>	LIMIT OF EXISTING WETLANDS	--- <td>TREE PROTECTION</td>	TREE PROTECTION
--- </td <td>EXISTING CENTERLINE OF STREAM</td> <td>○ST1</td> <td>SPECIMEN TREE</td>	EXISTING CENTERLINE OF STREAM	○ST1	SPECIMEN TREE

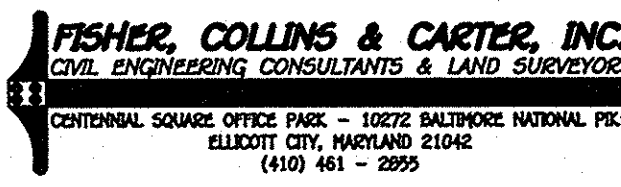
GENERAL NOTES

- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-513-1860 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY (MSS UTILITY) AT 1-800-297-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- BOUNDARY SHOWN HEREON IS BASED ON FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED BY FISHER, COLLINS & CARTER, INC. DATED DECEMBER 2013. TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY FISHER, COLLINS & CARTER, INC. IN MARCH 2014 AND SUPPLEMENTED WITH HOWARD COUNTY QS TOPOGRAPHY AT 5' CONTOUR INTERVAL INTERPOLATED FOR 2' CONTOUR INTERVAL.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM, HOWARD COUNTY MONUMENT NOS. 218A AND 0042 WERE USED FOR THIS PROJECT.
- PREVIOUS DTP FILE NUMBERS: N/A.
- STORM WATER MANAGEMENT IS IN ACCORDANCE WITH THE M.D.E. STORM WATER DESIGN MANUAL, VOLUMES I & II, REVISED 2009. NON-STRUCTURAL PRACTICES IN ACCORDANCE WITH CHAPTER 5 ARE BEING UTILIZED.
- THIS PROPERTY IS LOCATED OUTSIDE THE METROPOLITAN DISTRICT. LOTS TO BE SERVED PRIVATE WATER AND PRIVATE SEWERAGE.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- THIS SUBJECT PROPERTY IS ZONED RC-DEO (PER DATE 10/06/2013 COMPREHENSIVE ZONING PLAN).
- THIS AREA DESIGNATES A PRIVATE SEWERAGE EASEMENT OF 10,000 SQUARE FEET AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWERAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THESE EASEMENTS SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICES SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE EASEMENT. RECORDATION OF A MODIFIED SEWERAGE EASEMENT SHALL NOT BE NECESSARY.
- NO CHANGES OR HISTORIC STRUCTURES EXIST ON-SITE.
- STEEP SLOPES, 100 YEAR FLOODPLAIN, STREAM(S), STREAM BUFFERS, WETLAND(S), WETLAND BUFFER(S), AND FOREST STAND DELINEATION HAVE BEEN SHOWN.
- SOILS SHOWN HEREON ARE BASED ON NRCS WESSON SURVEY. SITE IS LOCATED ON HOWARD COUNTY SOILS MAP #9.
- NO CLEARING, GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF STREAM BUFFERS AND FOREST CONSERVATION EASEMENT AREAS.
- LANDSCAPING WILL BE PROVIDED AT THE FINAL PLAN STAGE OF THIS PROJECT. TREES SHOWN ARE EXISTING.
- THIS SUBDIVISION IS EXEMPT FROM THE FOREST CONSERVATION REQUIREMENT PER SECTION 16.12(2)(1)(VI) OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL, SINCE THIS IS A MINOR SUBDIVISION CREATING ONE ADDITIONAL LOT AND HAS NO FURTHER SUBDIVISION POTENTIAL.
- ONE SOIL BORING WILL BE REQUIRED FOR THIS PROJECT. PERCOLATION TESTS WERE CONDUCTED IN CLOSE PROXIMITY TO TWO OF THE PROPOSED MICRO-BIORETENTION LOCATIONS. THE MICRO-BIORETENTION PROPOSED NEAR DUVALL ROAD WILL REQUIRE A BORING.
- APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.

SITE ANALYSIS DATA CHART

- TOTAL AREA OF THIS SUBMISSION = 10.633 AC.*
- LIMIT OF DISTURBED AREA = 1.51 AC.*
- PRESENT ZONING DESIGNATION = RC-DEO (PER 10/06/2013 COMPREHENSIVE ZONING PLAN)
- PROPOSED USE: RESIDENTIAL
- PREVIOUS HOWARD COUNTY FILES: N/A
- TOTAL AREA OF FLOODPLAIN LOCATED ON SITE = 3.10 AC*
- TOTAL AREA OF SLOPES IN EXCESS OF 15% = 3.28 AC* (1.69 AC* 15% TO 25%, 1.59 AC* 25% OR GREATER)
- TOTAL AREA OF WETLANDS (INCLUDING BUFFER, LOCATED OUTSIDE OF THE FLOODPLAIN) = 0.43 AC* (2.64 AC* LOCATED WITHIN FLOODPLAIN)
- TOTAL AREA OF STREAM (INCLUDING BUFFER, LOCATED OUTSIDE OF THE FLOODPLAIN) = 0.47 AC.*
- TOTAL AREA OF EXISTING FOREST = 7.20 AC* (EXCLUDES FLOODPLAIN)
- TOTAL AREA OF FOREST TO BE RETAINED = 5.39 AC* (NO EASEMENT REQUIRED; EXEMPT FROM FOREST CONSERVATION REQUIREMENTS)
- TOTAL GREEN OPEN AREA = 10.21 AC*
- TOTAL IMPERVIOUS AREA = 0.42 AC*
- TOTAL AREA OF ERODIBLE SOILS = 3.43 AC.*

NO.	REVISION	DATE	X



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. 38386, EXPIRATION DATE: 01/15/2016.

Stephanie Lante 6/30/14
 Signature of Professional Engineer DATE

OWNER / DEVELOPER
 THOMAS AND BARBARA LARIMORE
 825 IRON RAIL COURT
 WOODBINE MD, 21797
 410-960-3967

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Kathleen 7/27/14
 Chief, Division of Land Development Date

John 7-9-14
 Chief, Development Engineering Division NY Date

PROJECT	SECTION	PARCEL NO.
LARIMORE PROPERTY	-	124

DEED	BLOCK NO.	ZONE	TAX/ZONE	ELEC. DIST.	CENSUS TR.
14685/412	10	RC-DEO	13	FOURTH	604002

TITLE SHEET

LARIMORE PROPERTY
 LOTS 1 AND 2

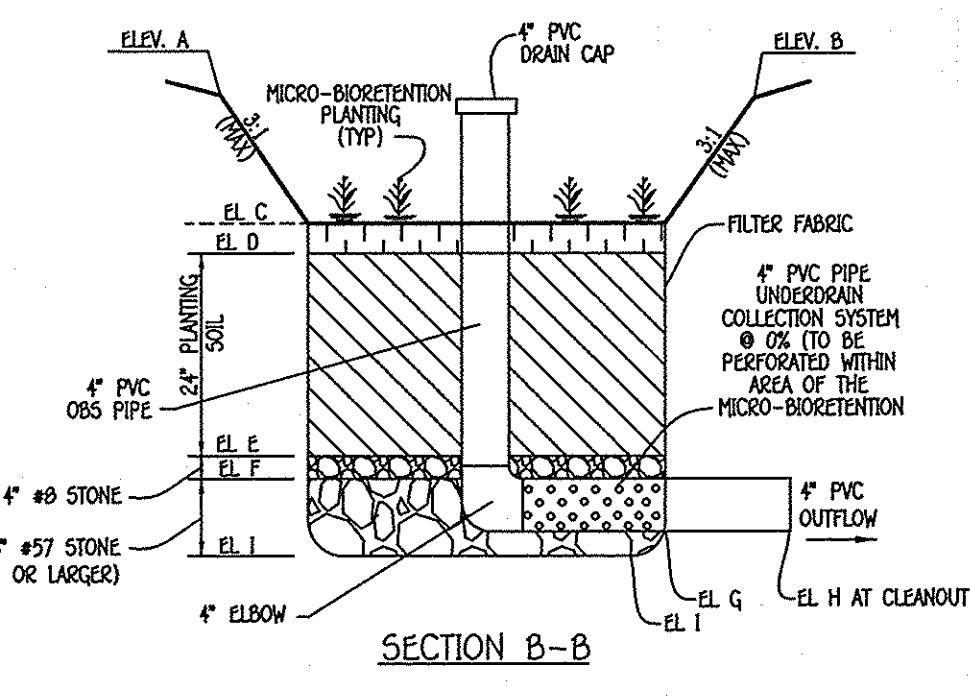
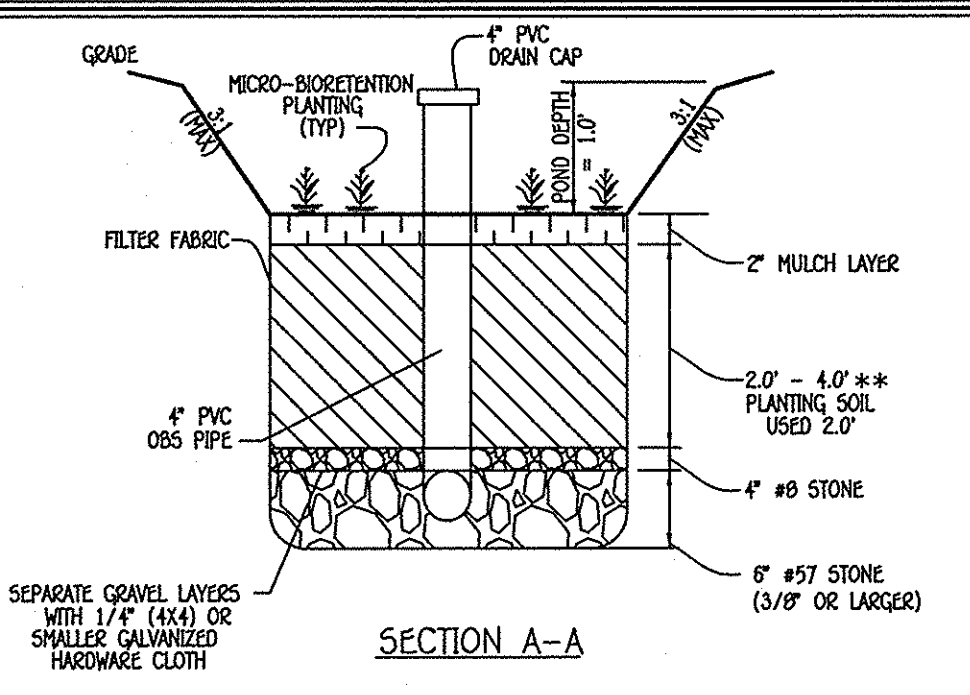
ZONED RC-DEO

TAX MAP No. 13 GRID No. 10 PARCEL No. 124

FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

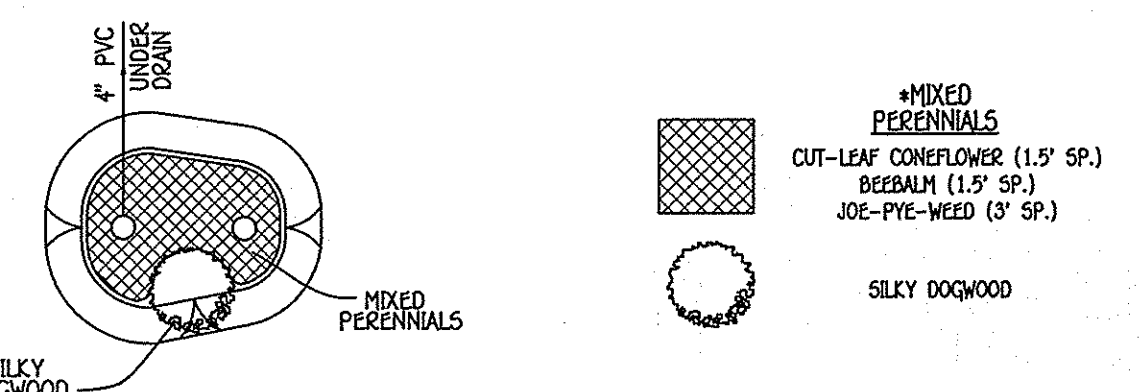
SCALE: AS SHOWN DATE: JUNE, 2014

SHEET 1 OF 3 **ECP-14-076**



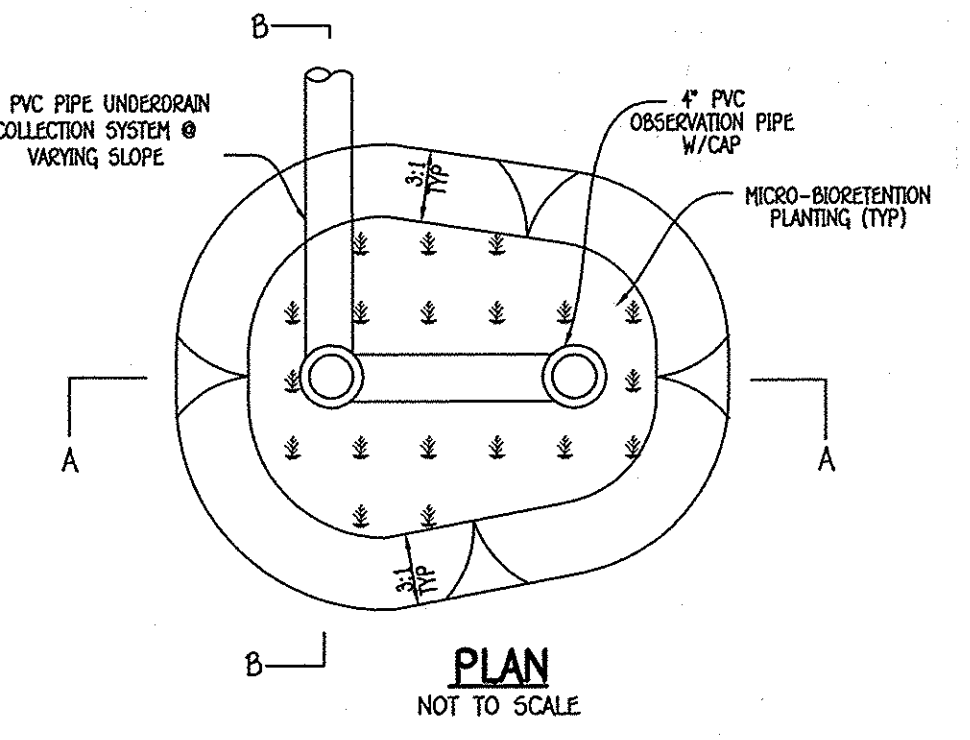
MICRO-BIORETENTION DETAIL (M-6)
NOT TO SCALE

MICRO-BIORETENTION									
BIORETENTION FILTER	A	B	C	D	E	F	G	H	I
1 (LOT 1)	552.00	552.00	551.00	550.83	548.83	548.50	548.17	547.86	548.00
2 (LOT 2)	530.00	530.00	529.00	528.83	526.83	526.50	526.17	525.86	526.00
3 (USE-IN-COMMON)	533.00	533.00	532.50	532.33	530.33	530.00	529.67	529.34	529.50

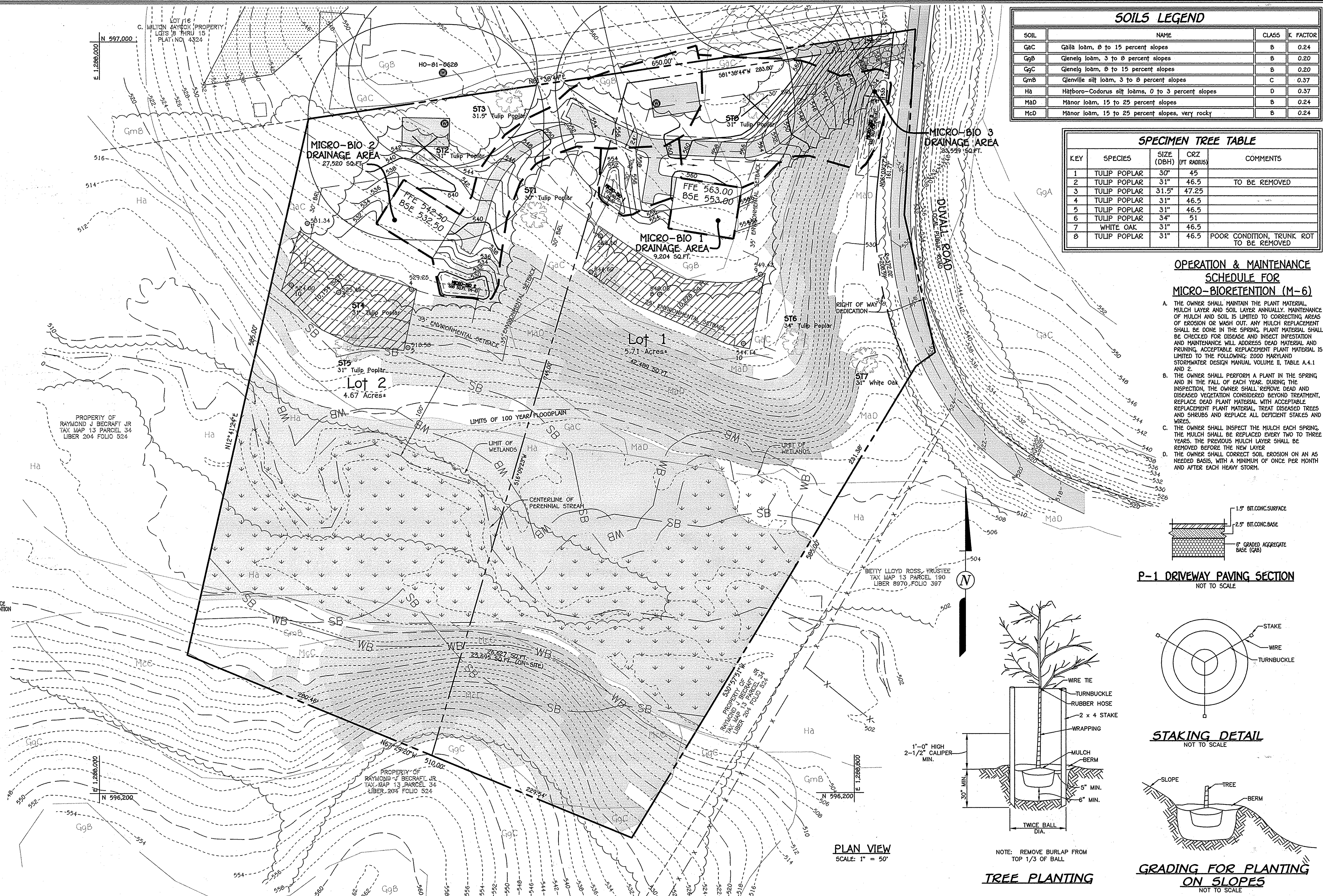


MICRO-BIORETENTION PLANTING DETAIL
NOT TO SCALE

MICRO-BIORETENTION & BIORETENTION PLANT MATERIAL			
MICRO-BIO QUANTITY	MICRO-BIO 2 QUANTITY	NAME	MAXIMUM SPACING (FT.)
10	50	MIXED PERENNIALS	1.5 TO 3.0 FT.
1	1	SILKY DOGWOOD	PLANT AWAY FROM BELOW LOCATION



PLAN
NOT TO SCALE



PLAN VIEW
SCALE: 1" = 50'

SOILS LEGEND			
SOIL	NAME	CLASS	K FACTOR
GgC	Galla loam, 0 to 15 percent slopes	B	0.24
GgB	Gleneig loam, 3 to 8 percent slopes	B	0.20
GgC	Gleneig loam, 8 to 15 percent slopes	B	0.20
GmB	Glenville silt loam, 3 to 8 percent slopes	C	0.37
Ha	Hatboro-Codorus silt loams, 0 to 3 percent slopes	D	0.37
MaD	Manor loam, 15 to 25 percent slopes	B	0.24
MaC	Manor loam, 15 to 25 percent slopes, very rocky	B	0.24

SPECIMEN TREE TABLE			
KEY	SPECIES	SIZE (DBH) (INCHES)	CRZ (FT. RADIUS)
1	TULIP POPLAR	30"	45
2	TULIP POPLAR	31"	46.5
3	TULIP POPLAR	31.5"	47.25
4	TULIP POPLAR	31"	46.5
5	TULIP POPLAR	31"	46.5
6	TULIP POPLAR	34"	51
7	WHITE OAK	31"	46.5
8	TULIP POPLAR	31"	46.5

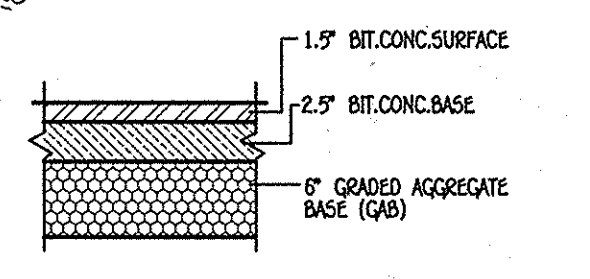
OPERATION & MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.

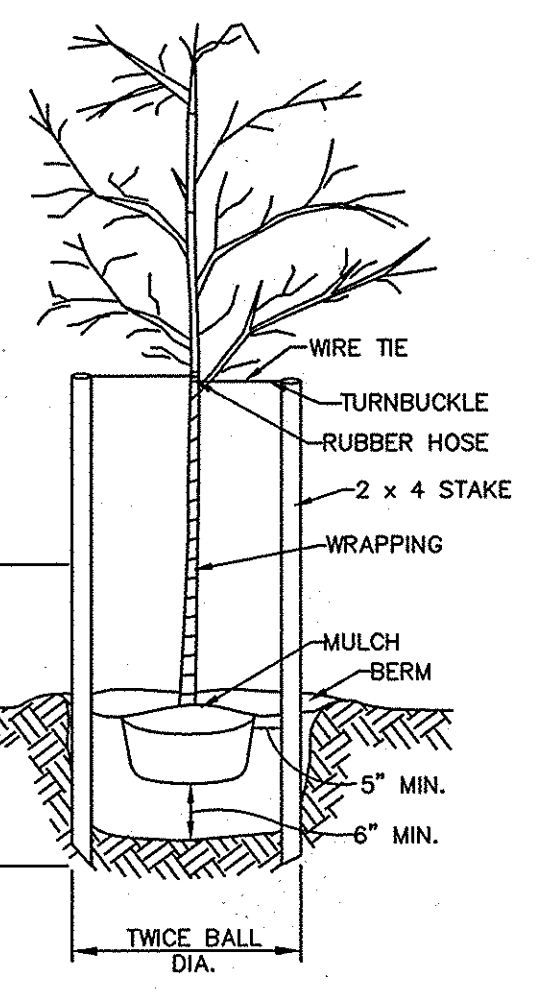
B. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT. REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER.

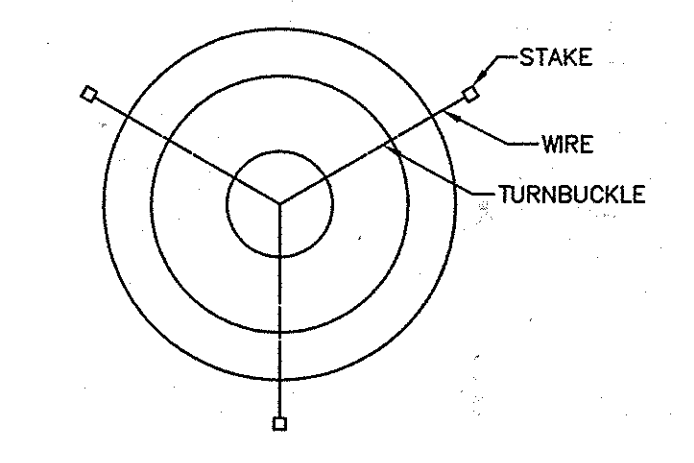
D. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.



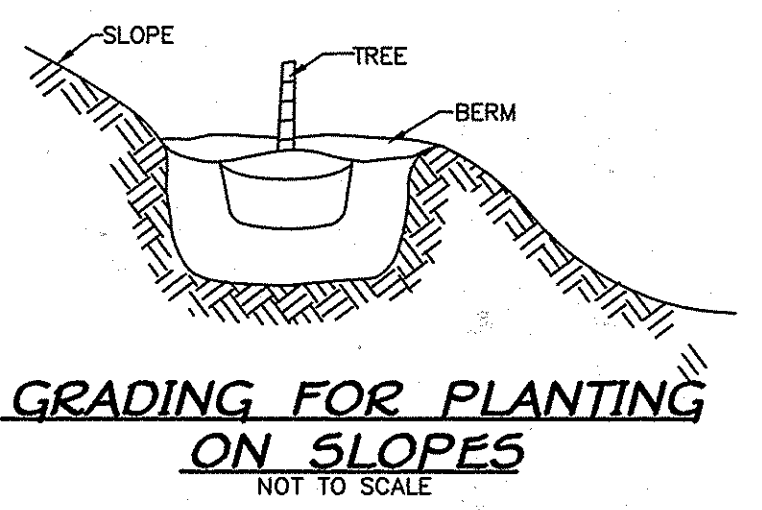
P-1 DRIVEWAY PAVING SECTION
NOT TO SCALE



TREE PLANTING
NOTE: REMOVE BURLAP FROM TOP 1/3 OF BALL



STAKING DETAIL
NOT TO SCALE



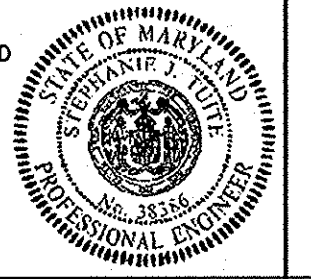
GRADING FOR PLANTING ON SLOPES
NOT TO SCALE

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLCOTT CITY, MARYLAND 21042
(410) 461-2295

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. 36366, EXPIRATION DATE: 01/12/2016.

Thomas J. Larimore
Signature of Professional Engineer DATE: 6/30/14



OWNER / DEVELOPER

THOMAS AND BARBARA LARIMORE
825 IRON RAIL COURT
WOODBINE MD, 21797
410-960-3967

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Kevin J. Decker
Chief, Division of Land Development 28 7/27/14 Date
Chad E. Smith
Chief, Development Engineering Division NY 7-9-14 Date

DEED	BLOCK NO.	ZONE	TAX/ZONE	ELEC. DIST.	CENSUS TR.
14685/412	10	RC-DEO	13	FOURTH	604002

ENVIRONMENTAL CONCEPT PLAN

LARIMORE PROPERTY
LOTS 1 AND 2

ZONED RC-DEO

TAX MAP No. 13 GRID No. 10 PARCEL No. 124

FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JUNE, 2014
SHEET 2 OF 3

ECP-14-076

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