

PERIMETER CATEGORY	SCHEDULE A - PERIMETER LANDSCAPE EDGE							TOTAL
	P-1	P-2	P-3	P-4	P-5	P-6	P-7	
ADJACENT TO PERIMETER PROPERTIES	A	A	N/A	A	A	N/A	A	
LANDSCAPE TYPE	A	A	N/A	A	A	N/A	A	
LINEAR FEET OF PERIMETER	428.22' L.F.	549.05' L.F.	372.10' L.F.	298.58' L.F.	476.31' L.F.	433.09' L.F.	1,723.69' L.F.	
NUMBER OF PLANTS REQUIRED	(428.22/60' = 7.13) = 7	(549.05/60' = 9.15) = 9	0	(298.58/60' = 4.97) = 5	(476.31/60' = 7.94) = 8	N/A	(1,723.69/60' = 28.73) = 29	
SHADE TREES	0	0	0	0	0	0	0	
EVERGREEN TREES	0	0	0	0	0	0	0	
CREDIT FOR WALL, FENCE OR BERM	0	0	0	0	0	0	0	
CREDIT FOR EXISTING VEGETATION	YES, FORESTED AREA (428.22') (428.22/60' = 7.13) = 7	YES, FORESTED AREA (102.27') (102.27/60' = 1.70) = 2	0	YES, FORESTED AREA (298.58') (298.58/60' = 4.97) = 5	0	N/A	YES, FORESTED AREA (635.18') (635.18/60' = 10.59) = 11	
SHADE TREES	0	0	0	0	0	0	0	
EVERGREEN TREES	0	0	0	0	0	0	0	
NUMBER OF PLANTS PROVIDED	0	(REQ'D - CREDITS) (9-2) = 7	0	(REQ'D - CREDITS) (5-5) = 0	0	N/A	(REQ'D - CREDITS) (29-11) = 18	
SHADE TREES	0	0	0	0	0	0	0	
EVERGREEN TREES	0	0	0	0	0	0	0	

TOTAL	KEY	LANDSCAPING PLANT LIST	
		NAME	SIZE
7		ACER SACCHARUM SUGAR MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&E
10		ACER RUBRUM RED SUNSET RED MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&E
8		QUERCUS RUBRA RED OAK	2 1/2" - 3" CALIPER FULL CROWN, B&E
8		TILIA CORDATA GREENSPICE LITTLELEAF LINDEN	2 1/2" - 3" CALIPER FULL CROWN, B&E

### Construction Period Protection Program

**A. Forest Protection Techniques**  
**Soil Protection Area (Critical Root Zone)**  
 The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface. Temporary fencing shall be placed around the critical root zone of the forest in areas where the forest limits occur within 25 feet of the limit of disturbance.

**Fencing and Signage**  
 Existing forest limits occurring within 25 feet of the limits of disturbance shall be protected using temporary protective fencing. Permanent signage shall be placed around the afforestation area prior to plant installation, as shown on the plan.

**B. Pre-Construction Meeting**  
 Upon staking of limits of disturbance a pre-construction meeting will be held between the developer, contractor and appropriate County inspector. The purpose of the meeting will be to verify that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.

**C. Storage Facilities/Equipment Cleaning**  
 All equipment storage, parking, sanitary facilities, material stockpiling, etc. associated with construction of the project will be restricted to those areas outside of the proposed Forest Conservation Easement. Cleaning of equipment will be limited to area within the LOD of the proposed homesites. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into environmentally sensitive areas.

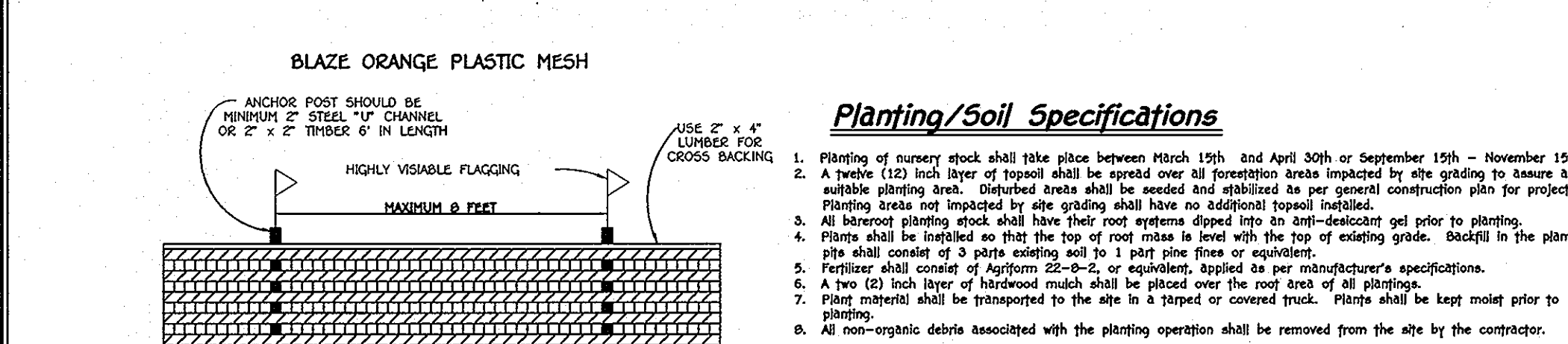
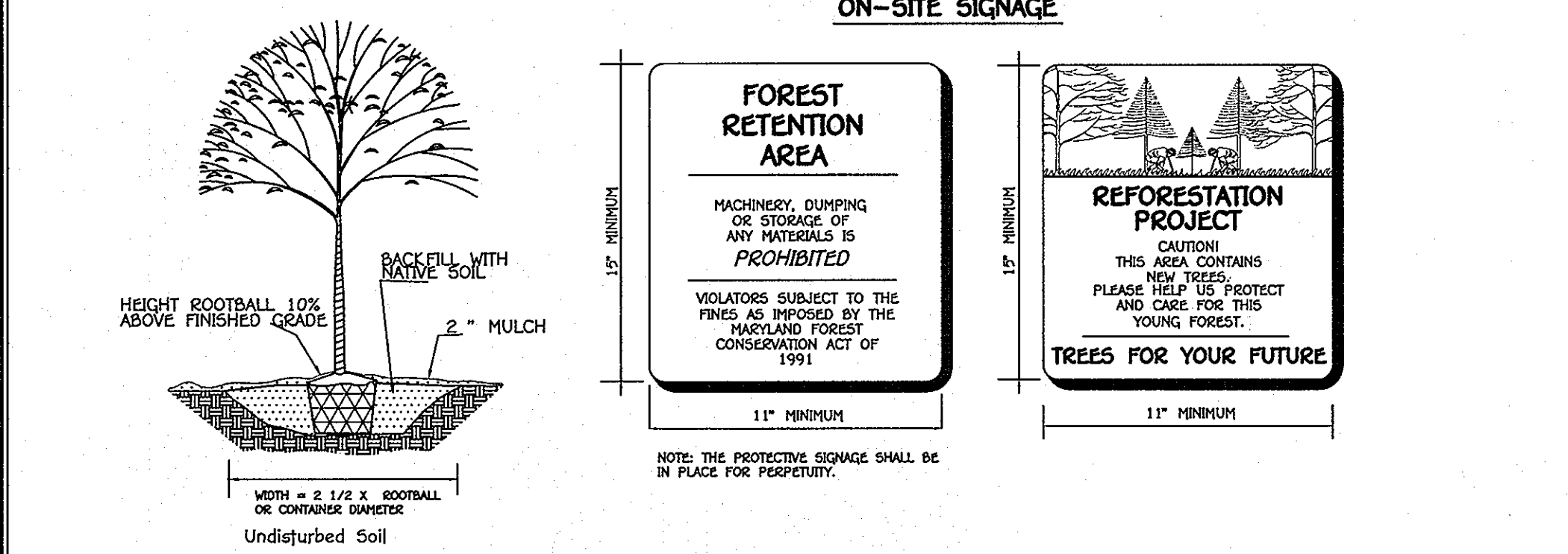
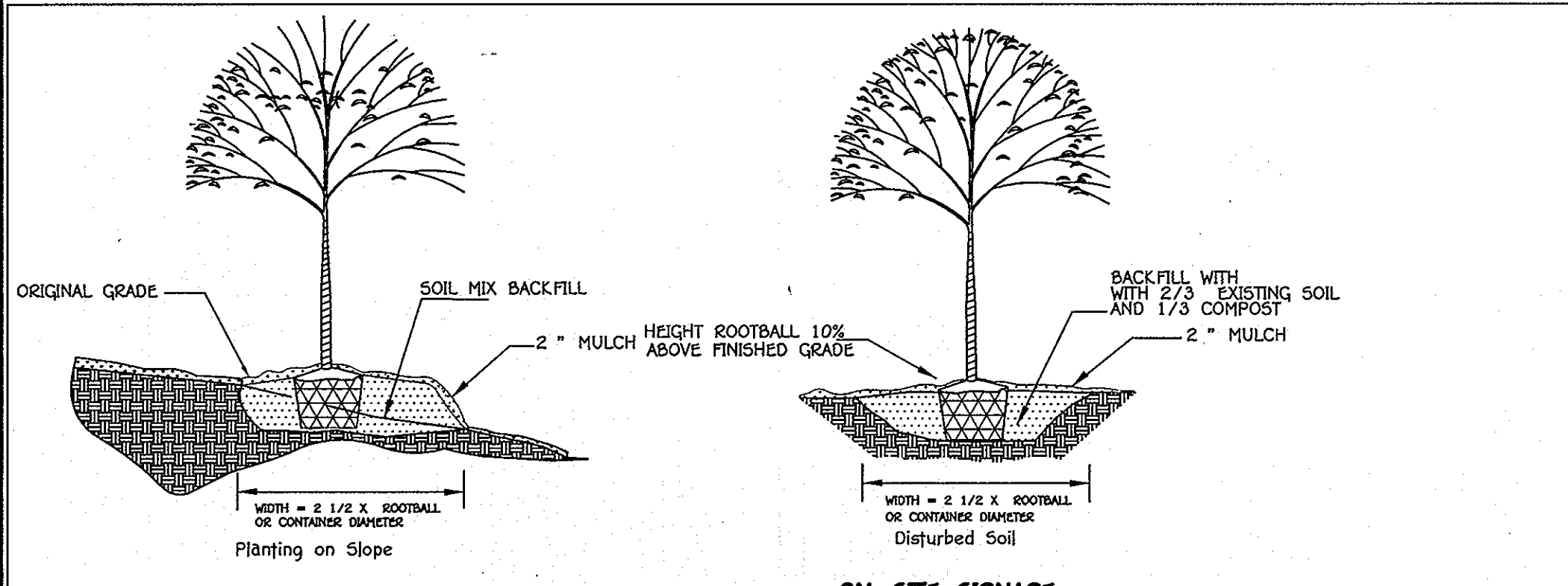
**D. Sequence of Construction**  
 The following timetable represents the proposed timetable for development. The items outlined in the Forest Conservation Plan will be enacted within two (2) years of subdivision approval.

Below find a proposed sequence of construction.

1. Install all signage, and sediment control devices.
2. Hold pre-construction meeting between developer, contractor and County inspector.
3. Build access roads, site specific systems, and construct houses.
4. Install permanent protective signage for easements and initiate plantings in accordance with Forest Conservation Plan. Plantings will be completed within two (2) years of subdivision approval.
5. Remove sediment control.
6. Hold post-construction meeting with County inspectors to assure compliance with FCP. Submit Certification of Installation.
7. Monitor and maintain plantings for 2 years.

### GENERAL NOTES

1. Subject Property Zoned RC-DEO Per The 2/20/04 Comprehensive Zoning Plan And The Comp-Lite Zoning Amendments Dated 07-28-06.
2. Coordinates Based On NAD '83, Maryland Coordinate System As Projected By Howard County Geographic Control Station No. 15A And 15AB.
3. Station No. 15A North 598,658.3402 East 1,314,773.3674 Station No. 15AB North 598,658.9735 East 1,314,773.1147
4. This is Based On Final Monumented Boundary Survey Performed On Or About March, 2011 By Fisher, Collins & Carter, Inc.
5. B.R.L. Denotes Building Restriction Line.
6. Denotes Iron Pipe With Cap "F.C.C. 10F".
7. Denotes Iron Pipe Or Bar From Bar Foundation.
8. Denotes Angular Change In Bearing Of Boundary Or Right-of-Way.
9. Denotes Concrete Monument Set With Cap "F.C.C. 10F".
10. Denotes Concrete Monument Stone Found.
11. All Lot/Parcels Areas Are More Or Less (+).
12. Distances Shown Are Based On Surface Measurement And Not Reduced To Nad '83 Grid Measurement.
13. No Cemeteries Exist On This Site Based On A Visual Site Visit And Based On An Examination Of The Howard County Cemetery Inventory Map. No Historic Structures Exist On Site.
14. For Flag Or Pipestem Lot, Refuge Location, Surface Removal And Road Maintenance Are Provided To The Junction Of The Flag Or Pipestem And Road Right-Of-Way Line And Not To The Pipestem Lot Driveway.
15. Driveways Shall Be Provided Prior To Issuance Of A Use And Occupancy Permit For Any New Dwellings To Ensure Safe Access For Fire And Emergency Vehicles Per The Following (Minimum) Requirements:
  - a) Width - 12 Feet (16 Feet Serving More Than One Residence).
  - b) Surface - Six (6") Inches Of Compacted Crusher Run Base With Tar And Chip Coating. (1 - 1/2" Minimum).
  - c) Geometry - Maximum 15% Grade, Maximum 10% Grade Change And 45-Foot Turning Radius.
  - d) Structures (Culverts/Bridges) - Capable Of Supporting 25 Gross Tons (H25-Loading).
  - e) Drainage Elements - Capable Of Safely Passing 100 Year Flood With No More Than 1 Foot Depth Over Surface.
16. Maintenance - Sufficient To Ensure All Weather Use.
17. This Plan Is In Compliance With The Amended Fifth Edition Of The Subdivision And Land Development Regulations Per Council Bill 69-2003 And The Zoning Regulations As Amended By Council Bill 75-2003. Development Or Construction On These Lots Must Comply With Setback And Buffer Regulations In Effect At The Time Of Submission Of The Site Development Plan. Waiver Petition Application, Or Building/Grading Permit And For The Comp-Lite Zoning Regulations Dated July 28, 2006 And In Accordance With Preliminary Plan Development Criteria.
18. No Historic Structures Or Cemeteries Exist On The Subject Property.
19. There Is An Existing Dwelling/Structure(s) Located On Lot 3 To Remain. No New Buildings, Extensions Or Additions To The Existing Dwelling(s) Are To Be Constructed At A Distance Less Than The Zoning Regulation Requirements.
20. The Use-In-Common Driveway Maintenance Agreement For Lots 1 Thru 5 Has Been Recorded In The Howard County Land Records Office Simultaneously With The Recording Of This Subdivision Plan.
21. Final Plat Delineation And Wetland Delineation Was Prepared By Eco-Science Professionals, Inc. Dated April 5, 2012.
22. The Forest Conservation Requirements Of Section 16.1200 Of The Howard County Code And Forest Conservation Act For This Subdivision Total 5.0 Acres Consisting Of 3.7 Acres Of On-Site Forested Area, 1.3 Acres Of On-Site Afforestation And 0.4 Acres Of Off-Site Planting. There Is A 5.0 Acre Surety Required For On-Site Forest Retention. Surety For On-Site Afforestation Is \$28,314.00 Based On 1.3 Acres X \$3,560.54 Ft./Acres X 0.50/Sq. Ft. The Offsite 0.4 Acres Afforestation Obligation Is Provided By 0.9 Acres Of Forest Retention On Quartz Hill Tree Bank, SDP-10-104 (FC). Property Of Quartz Hill, LLC, Tax Map 40, Grid 5 Parcel 40.
23. This Property Is Located Within The Metropolitan District.
24. A Community Meeting Was Conducted On March 8, 2012 For The Purpose Of The Developer To Provide Information Regarding The Proposed Development And To Allow The Community To Ask Questions And To Make Comments. Per Section 16.128(d), Of The Subdivision Regulations.
25. No 100 Year Floodplain Exists Within Submission Limits Of This Final Plat.
26. Frederick Road (Maryland Route 144) Is Designated As A Scenic Road.
27. Landscaping For Lots 1, 2, 4 And 5 Is On File With This Plat Is Provided In Accordance With A Certified Landscaping Plan In Accordance With Section 16.1212 Of The Howard County Code And The Landscape Manual A Landscape Surety For (33) Shade Trees In The Amount Of (\$95,000.00) Is Provided With The Grading Permit.
  - Lot 1 Surety: 8 Shade Trees @ 300/Shade Tree = \$2,400.00
  - Lot 2 Surety: None
  - Lot 4 Surety: 4 Shade Trees @ 300/Shade Tree = \$1,200.00
  - Lot 5 Surety: 21 Shade Trees @ 300/Shade Tree = \$6,300.00
28. Plat Subject To WF-12-174 Which The Planning Director On August 1, 2012 And Reconsideration On September 17, 2012 Approved A Waiver From Section Section 16.1201(4)(iii)(B) Which Prohibits Floodplain, Wetland, Streams, Their Buffers And Forest Conservation Easements On Lots Or Parcels Less Than 10 Acres In Size; Section 16.144(b) Which Requires The Submission Of A Preliminary Equivalent Sketch Plan To Begin The Subdivision Process, And Section 16.116(a) And (c) Which Prohibits Grading Within A Stream Or Wetlands. Approval Is Subject To The Following Conditions:
  - 1) Forest Conservation Signs Must Be Posted Along The Entire Perimeter Of The Forest Conservation Easement With No More Than 50' Of Spacing Between Each Sign.
  - 2) The Waiver Petition Number And Its Conditions Of Approval Must Be Added To The Plat.
  - 3) No Grading, Removal Of Vegetative Cover And Trees, Paving And New Structures Are Permitted Within The Wetlands, Forest Conservation Easement And Required Buffers With The Exception Of The Disturbance Needed For The Widening Of The Driveway, If The Existing Driveway Requires Widening Based On A Review Of The Final Subdivision Plan, Be Advised That An MDE Wetlands Permit May Be Necessary.
  - 4) Distributing Educational Material To Each Lot Purchaser Explaining The Restrictions On Encroachment Into The Forest Conservation Easement, Wetland And Their Buffers.
  - 5) Submission Of A Final Subdivision Plat Is Required.
  - 6) Compliance With The Enclosed Comments From The Development Engineering Division Dated June 21, 2012.
29. The Lot/Parcels Show Hereon Comply With The Minimum Lot Width And Lot Areas Is Required By Maryland State Department Of The Environment.
30. This Area Designates A Private Sewerage Easement Of At Least 10,000 Square Feet As Required By The Maryland State Department Of The Environment For Individual Sewerage Improvements Of Any Nature In This Area Area Shaded In Public Sewerage Is Available. These Easements Shall Become Null And Void Upon Connection To A Public Sewerage System. The County Health Officer Shall Have The Authority To Grant Adjustments To The Private Sewerage Easement, Recognition Of A Modified Sewerage Easement Shall Not Be Necessary.
31. No Grading, Removal Of Vegetative Cover Or New Structures Shall Be Permitted Within The Required Wetlands, Stream(s) Or Buffers, Forest Conservation Easement Areas And 100 Year Floodplain, Except As Listed In Waiver Petition, WF-12-174; Approval Condition #3.
32. Previous Department Of Planning And Zoning File Numbers: ECP-12-051 And WF-12-174.
33. Stormwater Management Is In Accordance With The MDE Stormwater Design Manual, Volumes 1 & 1.8, Revised 2009. The Proposed Practices Will Be Located On The Individual Lots As Follows:
  - Lot 1: Micro-bioretenion (M-6), For The Proposed House And Non-roof-top Disconnection (N-2) For The Proposed Driveway.
  - Lot 2: Roof-top Disconnection (N-1) For The Proposed House And Driveway. And Non-roof-top Disconnection (N-2) For The Proposed Driveway.
  - Lot 3: Micro-bioretenion (M-6) For The Proposed House. And Non-roof-top Disconnection (N-2) For The Proposed Driveway.
  - Lot 4: Micro-bioretenion (M-6) For The Proposed House. And Non-roof-top Disconnection (N-2) For The Proposed Driveway.
  - Lot 5: Micro-bioretenion (M-6) For The Proposed House. And Non-roof-top Disconnection (N-2) For The Proposed Driveway.
34. These Practices Shall Be Privately Owned And Maintained In Accordance With Individual Declarations Of Covenants.
35. Noise Report Is Not Required In Accordance With Howard County Design Manual III Section 5.2.F.2(i).
36. Topography Shown Is Based On Field Survey By Fisher, Collins & Carter, Inc. During Construction.
37. Environmental Concept Plan (ECP-12-051) Approved In Technically Complete Letter. The House On Lot 1 Must Be Located Within The Front Facing MD 144 To Ensure That A Noise Study Is Not Required.



### Planting/Soil Specifications

1. Planting of nursery stock shall take place between March 15th and April 30th or September 15th - November 15th.
2. A twelve (12) inch layer of topsoil shall be spread over all forestation areas impacted by site grading to assure a suitable planting level. Disturbed areas shall be seeded and stabilized by per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil installed.
3. All bare-root planting stock shall have their root systems dipped into an anti-desiccant gel prior to planting.
4. Plants shall be installed so that the top of root balls is level with the top of existing grade. Backfill in the planting pits shall consist of a parts ending soil to 1 part fine loam or equivalent.
5. Fertilizer consisting of Aqfium 22-8-2 or equivalent, applied as per manufacturer's specifications.
6. A two (2) inch layer of hardwood mulch shall be placed over the root area of all plantings.
7. Plant material shall be transported to the site in a tarp or covered truck. Plants shall be kept moist prior to planting.
8. All non-organic debris associated with the planting operation shall be removed from the site by the contractor.

### REFORESTATION PLAN

The reforestation area will be placed into a Forest Conservation Easement.

**A. Planting Plan and Methods**  
 Plant species selection was based on our knowledge regarding plant communities in Maryland's Piedmont Plateau and information provided in the soil survey on typical vegetation for the soil type on the planting site. Species selection was also based on our knowledge of plant availability in the nursery industry.

Reforestation will be accomplished through a mixed planting of wide and branched transplants. Container grown stock is recommended but bare-root stock may be used to help control afforestation costs. If bare-root stock is used the root systems of all plants will be dipped in an anti-desiccant gel prior to planting to improve moisture retention in the root systems.

Prior to planting the proposed Forest Conservation Easements all multi-trunk rose in the planting area shall be removed. Control of the rose may be performed with mowing and herbicide treatments. Physical removal of all top growing plants following by a periodic herbicide treatment of stump sprouts is recommended. Native tree and shrub species occurring within the rose thickets should be retained wherever possible. Herbicide treatments shall occur on 2 month intervals during the first growing season and once each in the spring and fall for subsequent years. Herbicide used shall be made specifically to address woody plant material and shall be applied as per manufacturers specifications. Care should be taken not to spray planted trees or naturally occurring native tree/shrub seedlings. It is recommended that initiation of rose removal begin at least six months prior to planting.

**B. Planting and Soil Specifications**  
 Plant material will be installed in accordance with the Planting Detail and Planting Specifications shown on the Forest Conservation Plan.

Amendments to existing soil will be in accordance with the Planting Specifications shown on the Forest Conservation Plan. Soil disturbance will be limited to individual planting locations.

**C. Maintenance of Plantings**  
 See Post Construction Notes

**D. Guarantee Requirements**  
 A 90 percent survival rate of the reforestation plantings will be required after one growing season. All plant material below the 90 percent survival threshold will be replaced at the beginning of the second growing season. At the end of the second growing season, a 75 percent survival rate will be required. All plant material below the 75 percent survival threshold will be replaced by the beginning of the next growing season.

**E. Security for Reforestation**  
 Section 16-1209 of the Howard County Forest Conservation Act requires that a developer shall post a security (bond, letter of credit, etc.) with the County to insure that all work is done in accordance with the FCP.

### Developer's/Builder's Certificate

I/We certify that the landscaping shown on this plan will be done according to Section 16.124 of the Howard County Code and the Howard County Landscape Manual. I/We further certify that upon completion a letter of notice of Landscape Installation accompanied by an inventory of plant materials will be submitted to the Department of Planning and Zoning.

Harold E. Renfro, Jr. 2-18-13  
 Developer/Builder Date

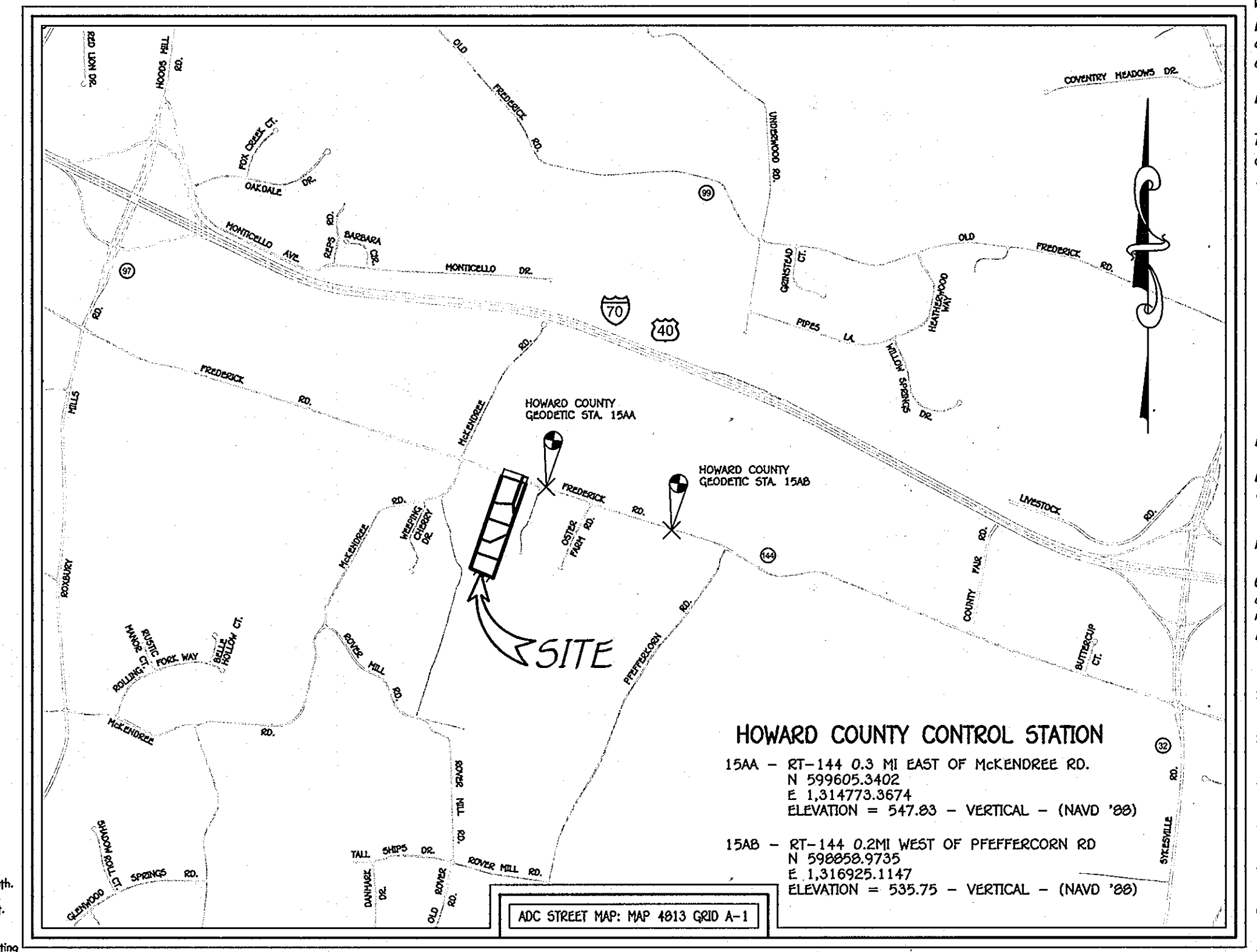
NO DNR Qualified Professional USACE Wetland Delineator Certification # WDCP9300010048

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Harold E. Renfro, Jr. and Marilyn S. Renfro 3/12/13  
 13765 Frederick Road West Friendship, Maryland 21794 Phone# 301-854-6782  
 Chief, Division of Land Development DATE  
 Chief, Development Engineering Division DATE

**Eco-Science Professionals, Inc.**  
 CONSULTING ECOLOGISTS

**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS

CENTRAL SQUARE OFFICE PARK - 10727 BALTIMORE NATIONAL PIKE ELICOTT CITY, MARYLAND 21116 (410) 461-2255



### Post-Construction Management Plan

### FOREST CONSERVATION WORKSHEET

Howard County requires a two year post-construction management plan to be prepared as part of the forest conservation plan. The plan goes into effect upon acceptance of the construction certification of completion by the County. Eco-Science Professionals, or another qualified professional designated by the developer, will be responsible for implementation of the post-construction management plan.

The following items will be incorporated into the plan:

**A. Fencing and Signage**  
 Permanent signage indicating the limits of the retention/reforestation area shall be maintained.

**B. General Site Inspections/Maintenance of Plantings**  
 Site inspections will be performed a minimum of three times during the growing season. The purpose of the inspections will be to assess the health of the afforestation plantings. Appropriate measures will be taken to rectify any problems which may arise.

In addition, maintenance of the afforestation plantings will involve the following steps:

1. Watering All plant material shall be watered twice a month during the 1st growing season, more or less frequently depending on weather conditions. During the second growing season, once a month during May-September, if needed.
2. Removal of invasive exotics and noxious weeds Old field successional species will be retained.
3. Identification of serious plant pests and diseases, treatment with appropriate agent.
4. Pruning of dead branches.

**C. Education**  
 The developer will provide appropriate materials to property owners informing them of the location and purpose of the afforestation area. Materials may include site plans and information regarding the intent of the forest conservation law.

**D. Final Inspection**  
 At the end of the two year post-construction management period, Eco-Science Professionals, or another qualified professional, will submit to the administrator of the Howard County Forest Conservation Program certification that all retention/afforestation requirements have been met. Upon acceptance of this certification, the County will release the developer from all future obligations and release the developer's bond. After each lot is established, install stormwater management practices.

LOT NUMBER	ADDRESS	DISCONNECTION OF ROOFTOP RUN-OFF N-1 (NUMBER)	DISCONNECTION OF NON-ROOFTOP RUN-OFF N-2 (Y/N)	MICRO-BIO-RETENTION M-6 (NUMBER)
1	13787 FREDERICK ROAD	0	Y	2
2	13783 FREDERICK ROAD	6	Y	2
3a	13785 FREDERICK ROAD	0	Y	N/A
4	13775 FREDERICK ROAD	0	Y	1
5	13771 FREDERICK ROAD	0	Y	1

### FCP NOTES:

1. Any Forest Conservation Easement (FCE) area shown hereon is subject to protective covenants which may be found in the Land Records of Howard County which restrict the disturbance and use of these areas.
2. Forested areas occurring outside of the FCE shall not be considered part of the FCE and shall not be subject to protective covenants.
3. Limits of disturbance shall be restricted to areas outside the limit of temporary fencing or the FCE boundary, whichever is greater.
4. There shall be no clearing, grading, construction or disturbance of vegetation in the Forest Conservation Easement except as permitted by Howard County DPZ.
5. No stockpiles, parking areas, equipment cleaning areas, etc. shall occur within areas designated as Forest Conservation Easements.
6. Temporary fencing shall be used to protect forest resources during construction. Fencing shall be installed along limits of disturbance occurring within 50 feet of the proposed FCE limits.
7. Permanent signage will be posted at a 50-100 foot intervals along all FCE limits.
8. The Forest Conservation Act requirements for this project will be met through the retention of 3.7 acres of net forest area forest within the limits of a Forest Conservation Easement and a reforestation obligation of 1.7 acres. The reforestation obligation will be met with 1.3 acres of on-site planting and 0.4 acres of off-site reforestation or with the purchase of credit in a Forest Conservation Bank.

### LANDSCAPE NOTES

The Owner, Tenants And/Or Their Agents Shall Be Responsible For Maintenance Of The Required Landscaping Including Both Plant Materials And Berms, Fences And Walls. All Plant Materials Shall Be Maintained In Good And When Necessary, Replaced With New Materials To Ensure Continued Compliance With Applicable Regulations. All Other Required Landscaping Shall Be Permanently Maintained In Good Condition, And When Necessary, Replaced Or Replaced.

No Clearing Of Existing Vegetation Is Permitted Within The Landscape Edge For Which Credit Is Being Taken; However, Landscape Maintenance Is Authorized.

At The Time Of Plant Installation All Shrubs And Trees Listed And Approved On The Landscape Plan, Shall Comply With The Proper Height Requirement In Accordance With The Howard County Landscape Manual. In Addition, No Substitutions Of The Required Plantings May Be Made Without Prior Review And Approval From The Department Of Planning And Zoning. Any Deviation From The Approved Landscape Plan May Result In Denial Or Delay In The Release Of Landscape Surety Until Such Time As All Required Materials Are Planted And/Or Revision Are Made To Applicable Plans Or Certifications.

**Guarantee Requirements**  
 A 75 percent survival rate of reforestation plantings will be required at the end of the 24 month maintenance period. All plant material below the 75 percent threshold will be replaced at the beginning of the next growing season.

**Surety for Reforestation**  
 The developer shall post a surety (bond, letter of credit) to ensure that reforestation plantings are completed. Upon acceptance of the plantings by the County, the bond shall be released.

**Maintenance Of Plantings**  
 Maintenance of plantings shall last for a period of 24 months.

**Sequence Of Construction**  
 1. Sediment control and tree protection devices shall be installed in accordance with general construction plan for site. Site shall be graded in accordance with general construction plan.  
 2. Proposed reforestation areas impacted by site grading shall be topsoiled and stabilized as per #2 of Planting/Soil Specifications for project.  
 3. Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.  
 4. Upon completion of the planting, signage shall be installed as per the Forest Protection Devices shown on the Forest Conservation Plan.  
 5. Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

### PLANTING SCHEDULE

Qty	Species	Size	Spacing
125	Acer rubrum - Red Maple	2-3"	11' o.c.
20	Liriodendron tulipifera - Tulip poplar	2-3"	11' o.c.
75	Nyssa sylvatica - Black Gum	2-3"	11' o.c.
55	Platanus occidentalis - Sycamore	2-3"	11' o.c.
75	Quercus palustris - Pin Oak	2-3"	11' o.c.
75	Salix nigra - Black Willow	2-3"	11' o.c.
90	Ulmus americana - American Elm	2-3"	11' o.c.
400	total plantings @ 25% trees=100 with credit		total lot Credit

Planting units Required: 910  
 Planting units Provided: 910

SCALE: 1" = 50'

### SUPPLEMENTAL PLAN

### LANDSCAPE, FOREST CONSERVATION, TOPOGRAPHIC, SOILS, AND STORMWATER MANAGEMENT

### RENFRO PROPERTY

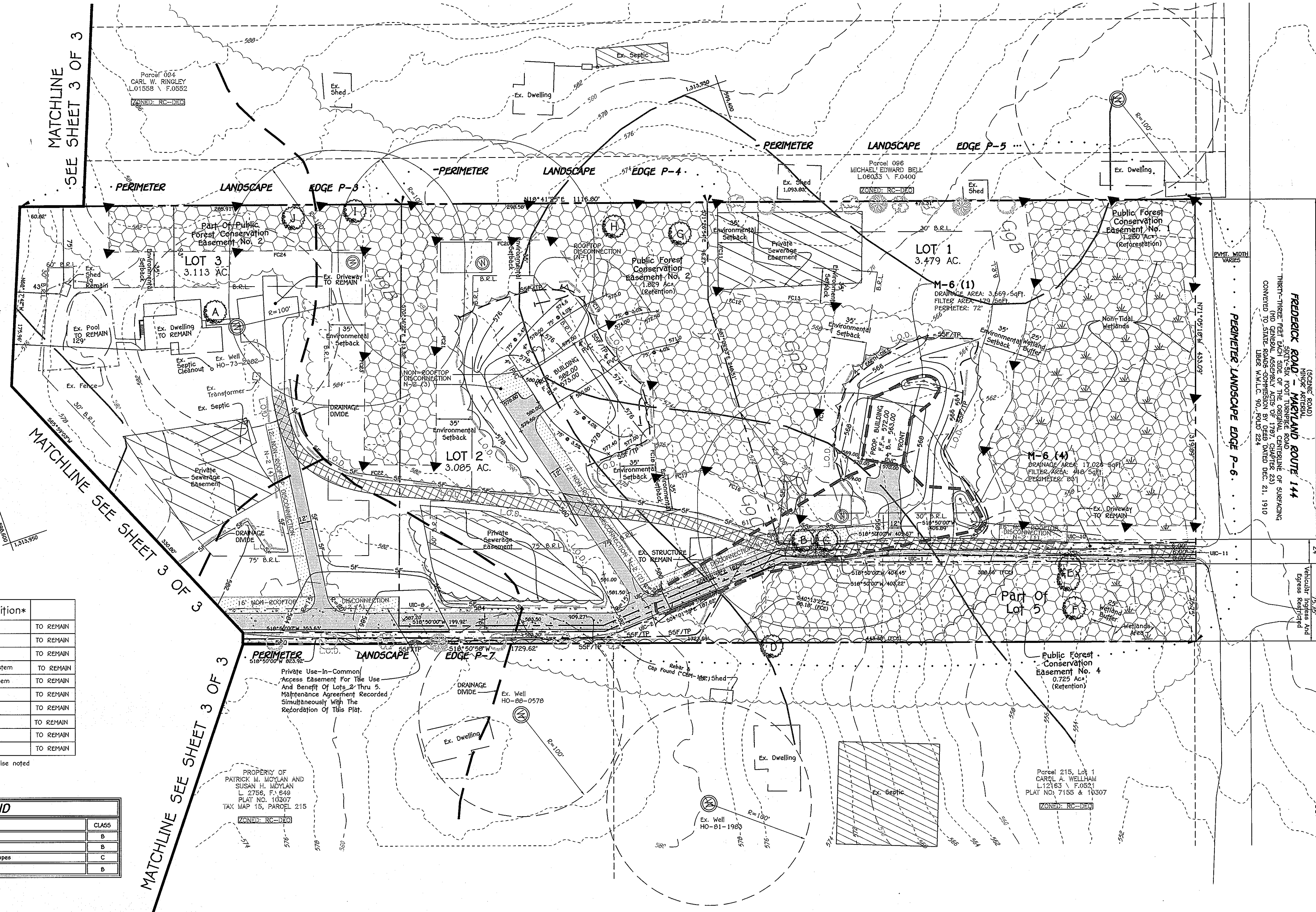
LOTS 1 THRU 5  
 13765 FREDERICK ROAD  
 WEST FRIENDSHIP, MD 21794-9703

TAX MAP #15 GRID NO. 1 PARCEL #178  
 THIRD ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 ZONED: RC-DEO  
 SCALE: 1"=50' DATE: FEBRUARY 6, 2013  
 SHEET 1 OF 3

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Harold E. Renfro, Jr. and Marilyn S. Renfro 3/12/13  
 Chief, Division of Land Development DATE  
 Chief, Development Engineering Division DATE

F-13-040

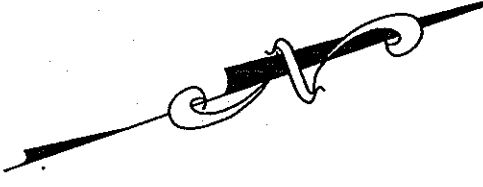
LEGEND	
SYMBOL	DESCRIPTION
	EXISTING 2' CONTOURS
	EXISTING 10' CONTOURS
	PROPOSED 2' CONTOURS
	PROPOSED 10' CONTOURS
	SPOT ELEVATION
	LIMITS OF DISTURBANCE
	EXISTING TREELINE
	PROPOSED TREELINE
	EXISTING PAVING
	EXISTING SOILS LINES AND TYPE
	SUPER SILT FENCE
	A-1 EARTH DIKE
	NON-ROOFTOP DISCONNECTION (N-2)
	DRAINAGE AREA FOR MICRO BIORETENTION FACILITIES
	DRAINAGE DIVIDE
	WETLAND AREA
	FOREST RETENTION AREA
	SPECIMEN TREE
	PERMANENT FOREST CONSERVATION FENCE
	SUPER SILT FENCE



MATCHLINE SEE SHEET 3 OF 3

MATCHLINE SEE SHEET 3 OF 3

MATCHLINE SEE SHEET 3 OF 3



Specimen Tree Chart

Key	Species, Size	Condition*
A	Quercus rubra, 33.5"	TO REMAIN
B	Acer saccharinum, 34.5"	TO REMAIN
C	Acer saccharinum, 37"	TO REMAIN
D	Acer saccharinum, 57"	multi-stem TO REMAIN
E	Platanus occidentalis, 31"	twi-stem TO REMAIN
F	Platanus occidentalis, 30"	TO REMAIN
G	Quercus velutina, 37.5"	TO REMAIN
H	Quercus velutina, 31"	TO REMAIN
I	Quercus rubra, 41"	TO REMAIN
J	Quercus alba, 34.5"	TO REMAIN

\*good unless otherwise noted  
Critical roof zone shall be 1.5":1" dbh

SOILS LEGEND		
SOIL	NAME	CLASS
GqB	Glenelg loam, 3 to 8 percent slopes	B
GqC	Glenelg loam, 8 to 15 percent slopes	B
GqB	Glenville-Balle silt loams, 0 to 8 percent slopes	C
MnC	Honor loam, 8 to 15 percent slopes	B

NOTES:  
 \* Hydric soils and/or contains hydric inclusions  
 \*\* May contain hydric inclusions  
 † Generally only within 100-year floodplain areas

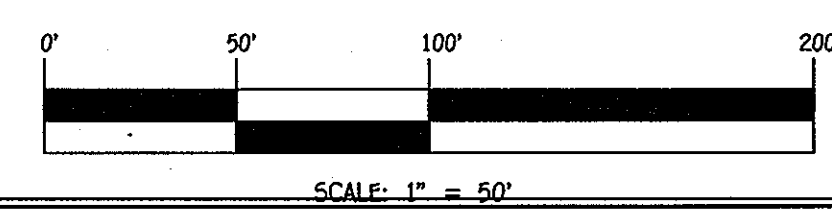
FISHER, COLLINS & CARTER, INC.  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 CENTRAL SQUARE OFFICE PARK - 10722 BALDWIN NATIONAL PIKE  
 ELICOTT CITY, MARYLAND 21042  
 (410) 461-2925

Owner/Developer  
 Harold E. Renfro, Jr. and  
 Marilyn S. Renfro  
 13765 Frederick Road  
 West Friendship, Maryland 21794  
 Phone# 301-934-6782

HO DNR Qualified Professional  
 USACOE Wetland Designer  
 Certification # WDCP930006100448  
  
 JOHN P. DANIELS

PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THE PLANS WERE PREPARED OR APPROVED BY  
 ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE  
 LAWS OF THE STATE OF MARYLAND LICENSE NO. 40892, EXPIRATION DATE: 12/12/13.  
  
 DATE 2/13/13

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
  
 Vatsal Shah 3/2/13  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
  
 John P. Daniels 3/2/13  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

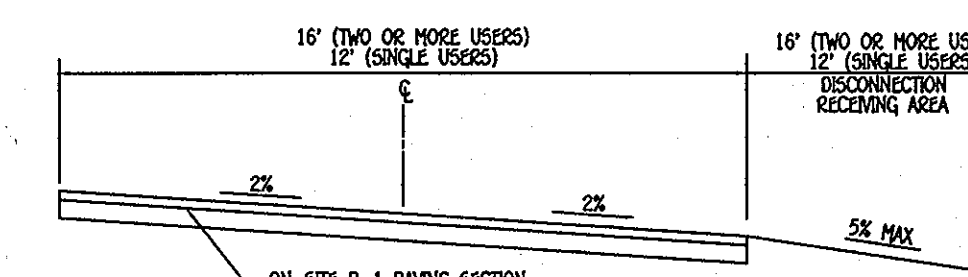
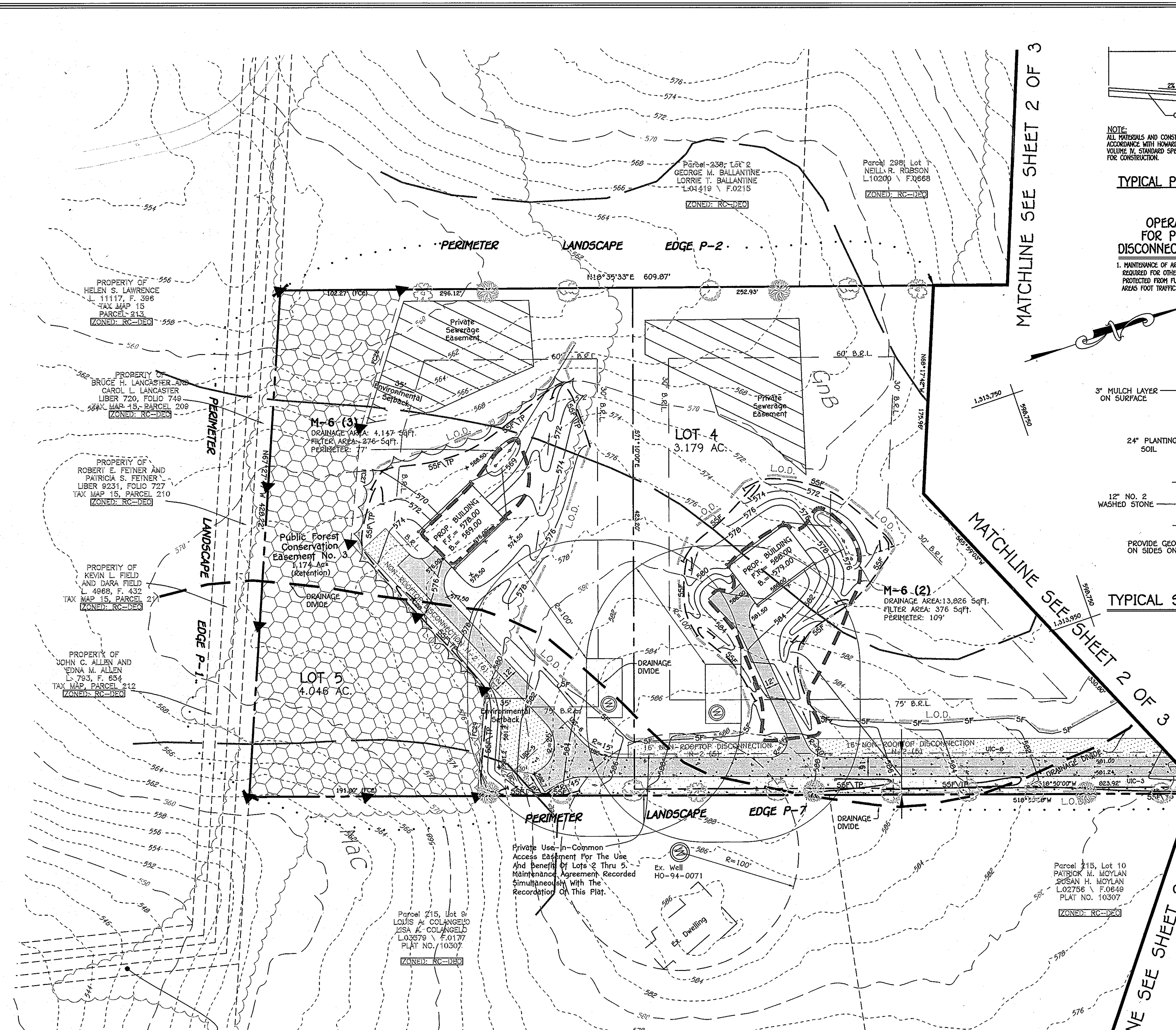


LANDSCAPING PLANT LIST			
TOTAL	KEY	NAME	SIZE
7		ACER SACCHARUM SUGAR MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&B
10		ACER RUBRUM RED SUNSET RED MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&B
8		QUERCUS RUBRA RED OAK	2 1/2" - 3" CALIPER FULL CROWN, B&B
8		TILIA CORDATA GREENSPERE LITTLELEAF LINDEN	2 1/2" - 3" CALIPER FULL CROWN, B&B

\*THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE 33 TOTAL REQUIRED LANDSCAPE TREES HAS BEEN POSTED AS PART OF THE BUILDERS GRADING PERMIT IN THE AMOUNT OF \$9,900.00.

SUPPLEMENTAL PLAN  
 LANDSCAPE, FOREST CONSERVATION, TOPOGRAPHIC,  
 SOILS, AND STORMWATER MANAGEMENT  
**RENFRO PROPERTY**  
 LOTS 1 THRU 5  
 13765 FREDERICK ROAD  
 WEST FRIENDSHIP, MD 21794-9703  
 TAX MAP #15 GRID NO. 1 PARCEL #178  
 THIRD ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 ZONED: RC-DEO DATE: FEBRUARY 6, 2013  
 SCALE: 1"=50' SHEET 2 OF 3

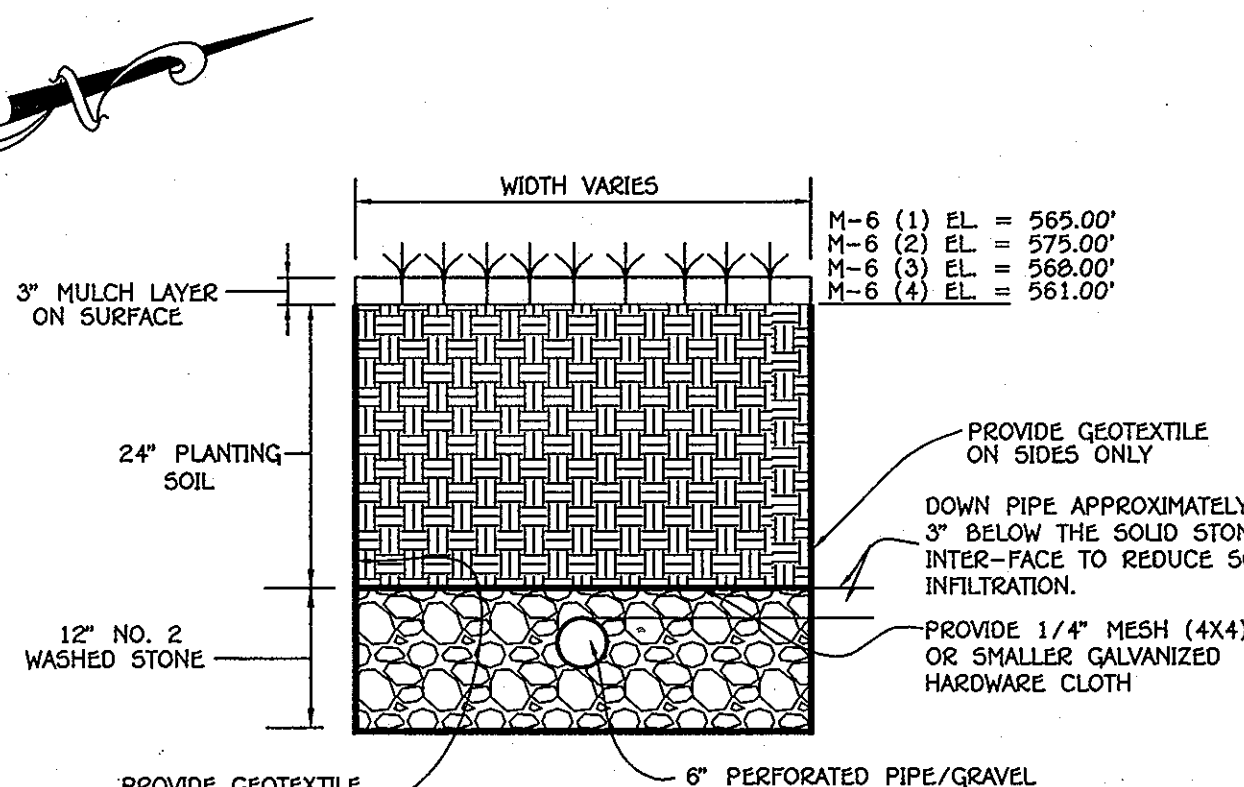
F-13-040



**TYPICAL PRIVATE DRIVE CROSS SLOPE SECTION**  
NOT TO SCALE

**OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED, DISCONNECTION OF NONROOFTOP RUNOFF (N-2)**

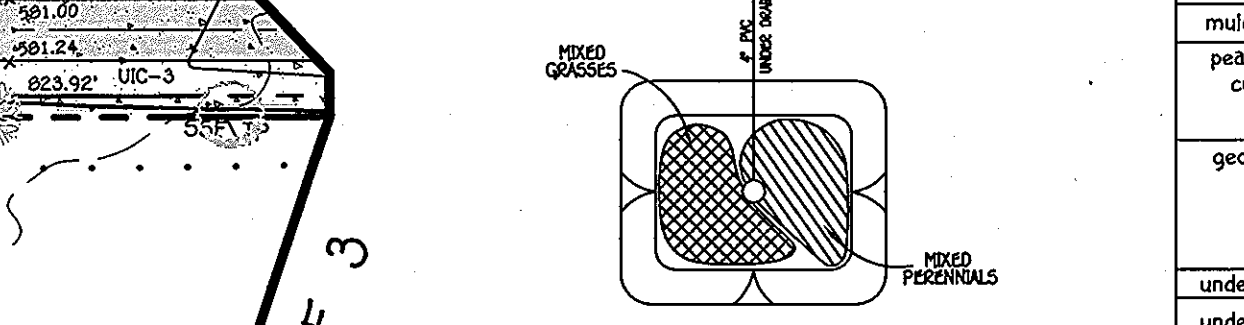
1. MAINTENANCE OF AREAS RECEIVING DISCONNECTION RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPE AREAS. THE AREAS RECEIVING RUNOFF SHOULD BE PROTECTED FROM FUTURE CONSTRUCTION OR DEVELOPMENT OF IMPERVIOUS AREA IN CONCRESSION. AREAS FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.



**TYPICAL SECTION - BIO-RETENTION FACILITY (M-6)**  
NO SCALE

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

- ANNUAL MAINTENANCE OF PLANT MATERIAL MULCH LAYER AND SOIL LAYER IS REQUIRED. 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.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDER BEYOND TREATMENT. TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRCH.
- MULCH SHALL BE INSPECTED TO EACH SPRING REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS. WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.



**MICRO-BIORETENTION PLANTING DETAIL**  
NOT TO SCALE

DRAINAGE AREA M-6 (1) MICRO-BIORETENTION PLANT MATERIAL			
QUANTITY	NAME	MAJOR SPACING (FT.)	
22	PERENNIALS	1 FT.	
11	SHRUBS	2 FT.	

DRAINAGE AREA M-6 (2) MICRO-BIORETENTION PLANT MATERIAL			
QUANTITY	NAME	MAJOR SPACING (FT.)	
52	PERENNIALS	1 FT.	
26	SHRUBS	2 FT.	

DRAINAGE AREA M-6 (3) MICRO-BIORETENTION PLANT MATERIAL			
QUANTITY	NAME	MAJOR SPACING (FT.)	
47	PERENNIALS	1 FT.	
23	SHRUBS	2 FT.	

DRAINAGE AREA M-6 (4) MICRO-BIORETENTION PLANT MATERIAL			
QUANTITY	NAME	MAJOR SPACING (FT.)	
34	PERENNIALS	1 FT.	
17	SHRUBS	2 FT.	

**B.3.B Specifications for Bioretention**

1. Material Specifications  
The allowable materials to be used in bioretention area are detailed in Table B.3.2.

2. Planting Soil  
The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COM-15.04.01.09.

The planting soil shall be tested and shall meet the following criteria:

pH range	5.2-7.0
organic matter	1.5 - 4% (by weight)
magnesium	35 lb./ac
phosphorus (phosphate - P <sub>2</sub> O <sub>5</sub> )	75 lb./ac
potassium (potash - K <sub>2</sub> O)	65 lb./ac

nitrate shall not be exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the untreated soil test for pH, phosphorus, and potassium and additional tests of organic matter, and soluble salts. A textual analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

3. Compaction  
It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use equipment to remove original soil. If bioretention areas are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be identified at the base of the bioretention facility by using a primary filling operation such as a closed pipe, pipes, or subsoiler. These filling operations are to restructure the soil profile through the 12 inch compaction zone. Subsoiler methods must be approved by the engineer. Rollers typically do not fill deep enough to reduce the effects of compaction from heavy equipment.

Rollers 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Run any ponded water before performing this base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then retille the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material  
Recommended plant material for bioretention areas can be found in Appendix A, Section A.2.5.

5. Plant Installation  
Mulch should be placed to a uniform thickness of 2" to 3". Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Root stock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be stored no 1/4" of the ball above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be banded using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be placed following the non-grass ground cover planting specifications. The topsoil specifications provide enough organic material to adequately supply nutrients from natural origins. The primary function of the bioretention structure is to improve water quality. Adding fertilizer deposits, or at a minimum, inorganic phosphorus, may be used around the perimeter of the basin to amend the soil. Rollout urea fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains  
Underdrains are to be placed on a 2'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes not terminating in an observation well shall be capped. The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

7. Miscellaneous  
The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

**Table B.3.2 Materials Specifications for Bioretention**

Material	Specification	Size	Notes
plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil	sand 35-60% silt 30-55% clay 10-25%	n/a	USDA soil types loamy sand, sandy loam or loam (2.5' to 4' deep)
mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448	pea gravel: No. 6 stone: 2" to 3"	
geotextile	environmental stone: washed cobbles Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D), puncture resistance ASTM-D-4833	n/a	for use as necessary beneath underdrains only
underdrain gravel	MSHTO M-43	0.375" to 0.75"	
underdrain piping	F 750, Type P5 20 or MSHTO M-270	4" to 6" rigid schedule 40 PVC or SDR35	3'/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mx No. 3; f' <= 3500	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (load-in-place or pre-cast) using previously approved State 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 350.8.2.9; vertical loading (H-10 or H-20); allowable horizontal loading (based on soil pressure); and analysis of potential cracking
sand (1' deep)	MSHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Geyserstone H10 are not acceptable. No carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

**LANDSCAPING PLANT LIST**

TOTAL	KEY	NAME	SIZE
7		ACER SACCHARUM SUGAR MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&E
10		ACER RUBRUM RED SUNSET RED MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&E
8		QUERCUS RUBRA RED OAK	2 1/2" - 3" CALIPER FULL CROWN, B&E
8		TILIA CORDATA GREENSPIRE LITTLELEAF LINDEN	2 1/2" - 3" CALIPER FULL CROWN, B&E

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*Keith S. DeLoach* 3/12/13  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*John P. Ciolek* 3/12/13  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

**SUPPLEMENTAL PLAN**  
LANDSCAPE, FOREST CONSERVATION, TOPOGRAPHIC, SOILS, AND STORMWATER MANAGEMENT  
**RENFRO PROPERTY**  
LOTS 1 THRU 5  
13765 FREDERICK ROAD  
WEST FRIENDSHIP, MD 21794-9703

TAX MAP #15 GRID NO. 1 PARCEL #178  
THIRD ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
ZONED: RC-DEO  
SCALE: 1"=50' DATE: FEBRUARY 6, 2013  
SHEET 3 OF 3

**LANDSCAPING PLANT LIST**

TOTAL	KEY	NAME	SIZE
7		ACER SACCHARUM SUGAR MAPLE	2 1/2" - 3" CALIPER FULL CROWN, B&E
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"THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.12.4 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE 33 TOTAL REQUIRED LANDSCAPE TREES HAS BEEN POSTED AS PART OF THE BUILDERS GRADING PERMIT IN THE AMOUNT OF \$9,900.00.

**Owner/Developer**  
Harold E. Renfro, Jr. and Marilyn S. Renfro  
13765 Frederick Road  
West Friendship, Maryland 21794  
Phone# 301-854-6782

**PROFESSIONAL CERTIFICATION**  
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME AND THAT I AM A LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 10692, EXPIRATION DATE 12/12/13.  
2/13/13  
DATE

**DRAINAGE AREA M-6 (1) MICRO-BIORETENTION PLANT MATERIAL**

QUANTITY	NAME	MAJOR SPACING (FT.)	
22	PERENNIALS	1 FT.	
11	SHRUBS	2 FT.	

**DRAINAGE AREA M-6 (2) MICRO-BIORETENTION PLANT MATERIAL**

QUANTITY	NAME	MAJOR SPACING (FT.)	
52	PERENNIALS	1 FT.	
26	SHRUBS	2 FT.	

**DRAINAGE AREA M-6 (3) MICRO-BIORETENTION PLANT MATERIAL**

QUANTITY	NAME	MAJOR SPACING (FT.)	
47	PERENNIALS	1 FT.	
23	SHRUBS	2 FT.	

**DRAINAGE AREA M-6 (4) MICRO-BIORETENTION PLANT MATERIAL**

QUANTITY	NAME	MAJOR SPACING (FT.)	
34	PERENNIALS	1 FT.	
17	SHRUBS	2 FT.	

NO DNR Qualified Professional  
USACOE Wetland Determiner  
Certification # WCD000000100148

*John P. Ciolek*  
JOHN P. CIOLEK

**Eco-Science Professionals, Inc.**  
CONSULTING ECOLOGISTS

**FISHER, COLLINS & CARTER, INC.**  
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
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F-13-040