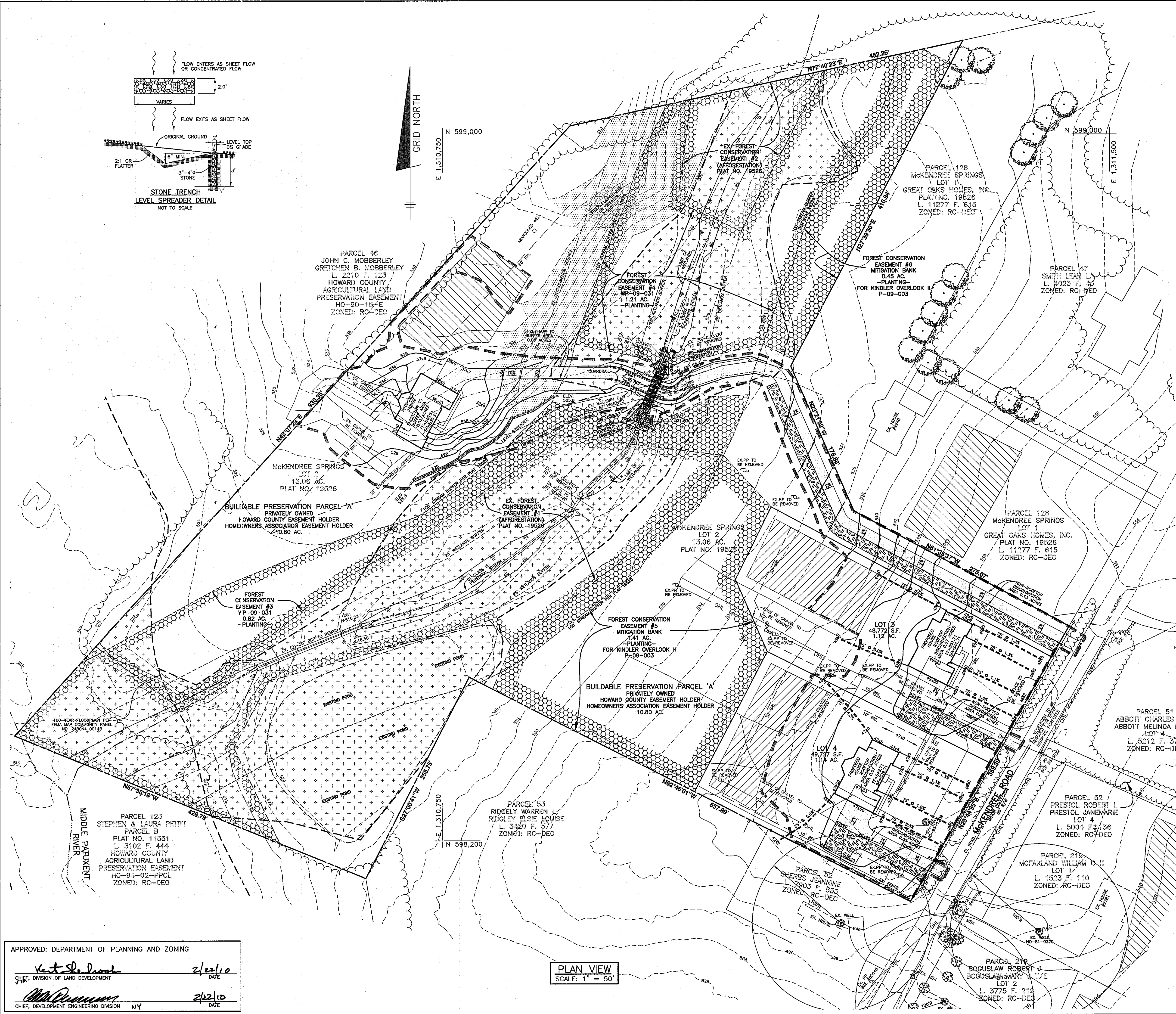


- LEGEND**
- EXISTING CONTOURS
 - SLOPES 25% OR GREATER
 - SLOPES 15% TO 24.9%
 - EXISTING TREELINE
 - LIMIT OF 100-YR FLOODPLAIN
 - EXISTING STREAM
 - LIMIT OF WETLANDS
 - FOREST CONSERVATION EASEMENT
 - SEWAGE DISPOSAL AREA
 - NON-ROOFTOP DISCONNECTION AREA (FILTER STRIP)
 - ROOFTOP DISCONNECTION LENGTH (FILTER STRIP)
 - ROOF DOWNSPOUTS
 - LIMIT OF DISTURBANCE



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent DeLoach 2/22/10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Michael D. ... 2/22/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

BENCHMARK ENGINEERING, INC.
ENGINEERS • LAND SURVEYORS • PLANNERS
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BED-ENGINEERING.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. 28559, Expiration Date: 7-22-2011.

OWNER/DEVELOPER:
McKendree Associates LLC
2331 YORK ROAD, SUITE 301
TIMONUM, MARYLAND 20193

McKENDREE SPRINGS
LOTS 3 & 4
AND BUILDABLE PRESERVATION PARCEL 'A'

TAX MAP: 14 GRID: 6 PARCEL: 128
ZONED: RC-DEC
ELECTION DISTRICT NO. 4
HOWARD COUNTY, MARYLAND

SUPPLEMENTAL GRADING/SWM PLAN

DATE: FEBRUARY, 2010 BEI PROJECT NO. 2081
SCALE: AS SHOWN SHEET 1 OF 4

2/19/2010

REFORESTATION NOTES

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 whips and branched transplants. Container grown stock is recommended but bareroot stock may be used to help control afforestation costs. If bareroot 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 multiflora rose in the planting area shall be removed. Removal of the rose may be performed with mowing and herbicide treatments. Physical removal of all top growth 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 manufacturer's specifications, as needed. 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. Guarantee Requirements

A 90 percent survival rate of the reforestation plantings will be required after one growing season. All plant material below the 50 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.

D. 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.

- 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.
- 5. After 12 and 24 months, replacement of plants, if required, in accordance with the Guarantee Requirements shown on the FCP.

- 6. Education
 - a. 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 explaining the intent of the forest conservation law.
 - b. Final Inspection
 - 1. 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.

Planting /Soil Specifications

1. Installation of bareroot/whip plant stock shall take place between March 15 - April 20 (Bareroot stock March 15 - May 30 or September 15 - November 15. Fall planting of B&B stock is not recommended).
2. Disturbed areas shall be seeded and stabilized as per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil added.
3. Bareroot plants shall be installed so that the top of root mass is level with the top of existing grade. Roots shall be dipped in an anti-desiccant gel prior to planting. Backfill in the planting pits shall consist of 3 parts existing soil to 1 part tree fines or equivalent.
4. Mulch shall consist of Aggrifilm 23-8-2, or equivalent, applied as per manufacturer's specifications, for woody plants. Herbaceous plant shall be fertilized with Cosmocote 8-6-12.
5. Plant material shall be transported to the site in a banded or covered truck. Plants shall be kept moist prior to planting.
6. The contractor shall remove all non-organic debris associated with the planting operation from the site.

Sequence of Construction

1. Sediment control shall be installed in accordance with general construction plan for site.
2. Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.
3. Upon completion of the planting, signage shall be installed as shown.
4. Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

Maintenance of Plantings

1. Maintenance of plantings shall last for a period of (3) years.
2. Plantings must receive 2 gallons of water, either through precipitation or watering, weekly during the 1st growing season, as needed. During second growing season, once a month during May-September, if needed.
3. Invasive exotics and noxious weeds will be removed, as required, from planting areas mechanically and/or with limited herbicide. Old field successional species will be retained. Plants shall be examined a minimum two times during the growing season for serious plant pests and diseases. Serious problems will be treated with the appropriate agent.
4. Dead branches will be pruned from plantings.

Guarantee Requirements

1. A 75 percent survival rate of reforestation plantings will be required at the end of two growing seasons. All plant material below the 75 percent threshold will be replaced at the beginning of the next growing season. Wild trees arising from natural regeneration may be counted up to 50 percent towards the total survival number if they are healthy, native species, at least 12 inches tall.

Education of New Occupants

1. The developer shall provide educational information to all property owners within the new development/home about the proper use of forest conservation areas.

Final Inspection and Release of Obligations

1. At the end of the post-construction management and protection period the developer shall submit certification to the County that all forest conservation areas have remained intact or have been restored to appropriate condition, that the stipulated survival rates have been achieved, and that any permanent protection measures required by the plan are in place. Upon review and acceptance, the County will inform the developer of their release of the development of future obligations related to the Forest Conservation Act.

CONSTRUCTION PERIOD PROTECTION PROGRAM

A. Forest Protection Techniques

1. 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 50 feet of the limit of disturbance.

2. Fencing and Signage

Existing forest limits occurring within 50 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 areas 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, install well and septic systems, and construct houses. Stabilize all disturbed areas accordingly.
4. Begin multiflora rose/invasive species removal, as needed. 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.

E. Construction Monitoring

Eco-Science Professionals, or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan.

F. Post-Construction Meeting

Upon completion of construction, Eco-Science Professionals, or another qualified professional designated by the developer, will notify the County that construction has been completed and arrange for a post-construction meeting to review the project site. The meeting will allow the County inspector to verify that afforestation plantings have been installed.

POST-CONSTRUCTION MANAGEMENT PLAN

Howard County requires a two year post-construction management plan 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/afforestation 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:

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Shulman 4/11/10
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

John P. G. Miller 2/22/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Qty	Species	Size	Spacing	Total FCA Units
18	Liriodendron tulipifera - Tulip Poplar	1" cal.	20' o.c.	
14	Platanus occidentalis - Sycamore	1" cal.	20' o.c.	
7	Quercus alba - White Oak	1" cal.	20' o.c.	
7	Robinia pseudo-acacia - Black Locust	1" cal.	20' o.c.	
46	total 1" caliper trees x 3.5 units/tree = FCA unit credit			161
60	Liriodendron tulipifera - Tulip Poplar	2-3' whip	11' o.c.	
25	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
40	Prunus serotina - Black Cherry	2-3' whip	11' o.c.	
18	Quercus alba - White Oak	2-3' whip	11' o.c.	
32	Robinia pseudo-acacia - Black Locust	2-3' whip	11' o.c.	
32	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
207	total 1" whip plantings x 2 units/tree = FCA unit credit			414
Total Unit Credit:				575

Qty	Species	Size	Spacing	Total FCA Units
6	Liriodendron tulipifera - Tulip Poplar	1" cal.	20' o.c.	
6	Platanus occidentalis - Sycamore	1" cal.	20' o.c.	
6	Quercus alba - White Oak	1" cal.	20' o.c.	
6	Robinia pseudo-acacia - Black Locust	1" cal.	20' o.c.	
24	total 1" caliper trees x 3.5 units/tree = FCA unit credit			84
125	Liriodendron tulipifera - Tulip Poplar	2-3' whip	11' o.c.	
90	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
95	Prunus serotina - Black Cherry	2-3' whip	11' o.c.	
45	Quercus alba - White Oak	2-3' whip	11' o.c.	
50	Robinia pseudo-acacia - Black Locust	2-3' whip	11' o.c.	
50	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
455	total 1" whip plantings x 2 units/tree = FCA unit credit			910
Total Unit Credit:				994

Qty	Species	Size	Spacing	Total FCA Units
6	Liriodendron tulipifera - Tulip Poplar	1" cal.	20' o.c.	
4	Platanus occidentalis - Sycamore	1" cal.	20' o.c.	
4	Quercus alba - White Oak	1" cal.	20' o.c.	
6	Robinia pseudo-acacia - Black Locust	1" cal.	20' o.c.	
20	total 1" caliper trees x 3.5 units/tree = FCA unit credit			70
100	Liriodendron tulipifera - Tulip Poplar	2-3' whip	11' o.c.	
90	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
70	Prunus serotina - Black Cherry	2-3' whip	11' o.c.	
40	Quercus alba - White Oak	2-3' whip	11' o.c.	
30	Robinia pseudo-acacia - Black Locust	2-3' whip	11' o.c.	
60	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
390	total 1" whip plantings x 2 units/tree = FCA unit credit			780
Total Unit Credit:				850

Qty	Species	Size	Spacing	Total FCA Units
6	Liriodendron tulipifera - Tulip Poplar	1" cal.	20' o.c.	
5	Platanus occidentalis - Sycamore	1" cal.	20' o.c.	
3	Quercus alba - White Oak	1" cal.	20' o.c.	
6	Robinia pseudo-acacia - Black Locust	1" cal.	20' o.c.	
20	total 1" caliper trees x 3.5 units/tree = FCA unit credit			70
35	Liriodendron tulipifera - Tulip Poplar	2-3' whip	11' o.c.	
23	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
15	Prunus serotina - Black Cherry	2-3' whip	11' o.c.	
15	Quercus alba - White Oak	2-3' whip	11' o.c.	
10	Robinia pseudo-acacia - Black Locust	2-3' whip	11' o.c.	
25	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
123	total 1" whip plantings x 2 units/tree = FCA unit credit			246
Total Unit Credit:				316

Planting Notes:

Three planting options are provided so allow flexibility for the property owner. Only one planting option schedule needs to be followed.

Planting density based spacing requirements: 1" caliper trees @ 15' on center, whips with shelter @ 11' on center.

1" caliper trees should be staggered along the perimeter of the planting area to serve as demarcation of the boundary. The trees should be no closer than 15 foot spacing.

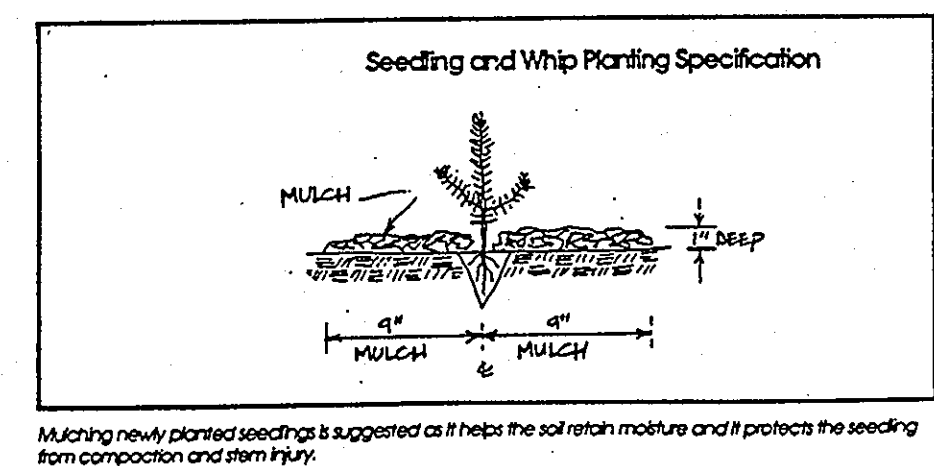
Planting may be made in a curvilinear fashion along contour. The planting should avoid a grid appearance but should be spaced to facilitate maintenance.

Multiflora rose/heavy brush removal/control may be required prior to installation of planting.

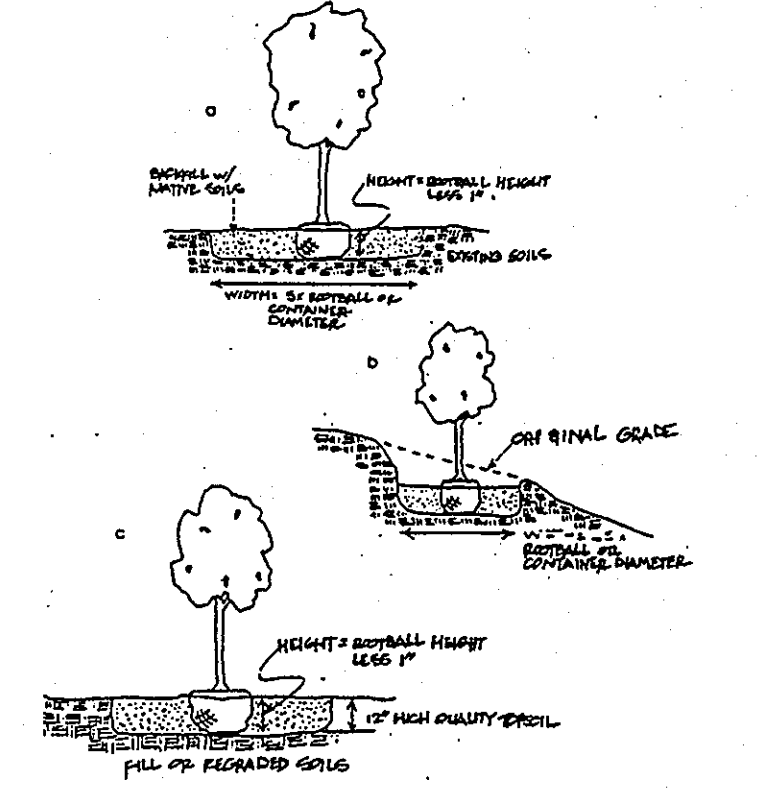
All whips are required to be installed with tree shelters per Howard County FCA requirements.

Planting units defined by the spacing requirements established in the FCA Manual. One plant unit is defined as 1 seedling or whip without shelter. The Manual states that 700 seedlings/whips without shelters are required per acre, or 350 whips w/shelters, or 200 1" caliper trees, or 100 2" caliper trees. By conversion it has been determined that a seedling or whip without shelter = 1 unit, whip with shelter = 2 units, 1" caliper tree = 3.5 units and 2" caliper tree = 7 units. The use of plant units simplifies the plant density calculations when mixing stock size.

Planting Specifications:
 Container Grown and Balled and Burlapped Stock



Mulching newly planted seedlings is suggested as it helps the soil retain moisture and it protects the seedling from compaction and stem injury.



Eco-Science Professionals, Inc.
 CONSULTING ECOLOGISTS
 P.O. Box 5066 Glen Arm, MD 21057 (410) 592-6752

MD Dept. of Professional Regulation
 USDC - Professional Register
 Certified Professional Ecologist
 John P. G. Miller
 2/19/10

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELICOTT CITY, MARYLAND 21043 PHONE: 410-465-8155 FAX: 410-465-6644 WWW.BE-ENR.ENGINEERING.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. 28359, Expiration Date: 7-22-2011.
OWNER/DEVELOPER:		McKENDREE SPRINGS LOTS 3 & 4 AND BUILDABLE PRESERVATION PARCEL 'A' TAX MAP: 14 GRID: 6 PARCEL: 128 ZONED: RC-BEO ELECTION DISTRICT NO. 4 HOWARD COUNTY, MARYLAND
McKENDREE ASSOCIATES LLC 2331 YORK ROAD, SUITE 301 TIMONUM, MARYLAND 20193		FOREST CONSERVATION PLAN AND FOREST MITIGATION BANK
DATE: FEBRUARY, 2010	BEI PROJECT NO. 2081	
SCALE: AS SHOWN	SHEET 3 OF 4	

