

FOREST CONSERVATION WORKSHEET *Version 4.0

Note: 1. Use 0.00 acres for all negative numbers that result from the calculations.
 2. Carry all calculations to the nearest 0.1 acre. (Field measurements may be to the nearest 1/8 inch, but shall be expressed to the nearest 0.1 acre. Example: 0.125 acres of existing forest shall be expressed as 0.13 acres.)
 3. For Afforestation and Conservation Threshold values, use 1/24 of the FRO.

- Net Tract Area**
- A. Total "Gross" Tract Area $A = 7.03$ ac.
 - B. Deductions (Critical Area, "100 yr. floodplain, Road dedication for existing roads and easements") $B = 0.07$ ac.
 - C. Net Tract Area $C = A - B = 6.96$ ac.
 - D. Land Use Category: GENERAL COMMERCIAL (GC) Afforestation Threshold (Net Tract Area $C \times 15\%$) $D = 1.04$ ac.
 - E. Conservation Threshold (Net Tract Area $C \times 15\%$) Use "Standard Method" values. (Standard Method % values are those established by the Maryland State Forest Conservation Act of 1991) $E = 1.04$ ac.
- Existing Forest Cover**
- F. Existing Forest Cover within the Net Tract Area $F = 0.00$ ac.
 - G. Area of Forest Above Conservation Threshold. If the Existing Forest Cover (F) is greater than the Conservation Threshold (E), then $G = F - E$; Otherwise $G = 0.00$
- Breakeven Point**
- H. Breakeven Point (Amount of forest that must be retained so that no mitigation is required) $H = 0.00$ ac.
 - (1) If the Area of Forest Above the Conservation Threshold (G) is greater than 0, then $H = (0.2 \times \text{Area of Forest Above Conservation Threshold (G)}) + \text{Conservation Threshold (E)}$.
 - (2) If the Area of Forest Above the Conservation Threshold (G) is equal to 0, then $H = \text{Existing Forest Cover (F)}$.
- Forest Clearing Permitted Without Mitigation** $I = \text{Existing Forest Cover (F)} - \text{Breakeven Point (H)}$ $I = 0.00$ ac.

Proposed Forest Clearing & Retention:

 - J. Total Area of Forest to be Cleared (All forest areas not protected by easement) $J = 0.00$ ac.
 - K. Total Area of Forest to be Retained $K = \text{Existing Forest Cover (F)} + \text{Forest to be Cleared (J)}$ $K = 0.00$ ac.

Planting Calculations If the Total Area of Forest to be "Retained (K)" is at or above the Breakeven Point (H), no planting and no further calculations are necessary. ($L = 0.00$ acres, $M = 0.00$ acres, $N = 0.00$ acres and $P = 0.00$ acres). Otherwise, calculate the planting requirements as follows:

 - L. Reforestation for Clearing Above the Conservation Threshold (If the Total Area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then $L = \text{Area of Forest to be Cleared (J)} \times 0.25$; (If the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then $L = \text{Area of Forest Above Conservation Threshold (G)} \times 0.25$) $L = 0.00$ ac.
 - M. Reforestation for Clearing Below the Conservation Threshold (If Existing Forest Cover (F) is greater than the Conservation Threshold (E) and the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then $M = 2.0 \times \text{Conservation Threshold (E)} - \text{Forest to be Retained (K)}$; (If Existing Forest Cover (F) is less than or equal to the Conservation Threshold (E), then $M = 2.0 \times \text{Forest to be Cleared (J)}$) $M = 0.00$ ac.
 - N. Credit for Retention Above the Conservation Threshold (If the area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then then $N = \text{Total Area of Forest to be Retained (K)} - \text{Existing Forest Cover (E)}$) $N = 0.00$ ac.

Planting Requirements

 - P. Total Reforestation Required: $P = L + M - N$ $P = 0.00$ ac.
 - Q. Total Afforestation Required (If Existing Forest Cover (F) is less than the Afforestation threshold (D), then $Q = \text{Afforestation Threshold (D)} - \text{Existing Forest Cover (F)}$) $Q = 1.04$ ac.
 - R. Total Reforestation Requirement $R = P + Q$ $R = 1.04$ ac.

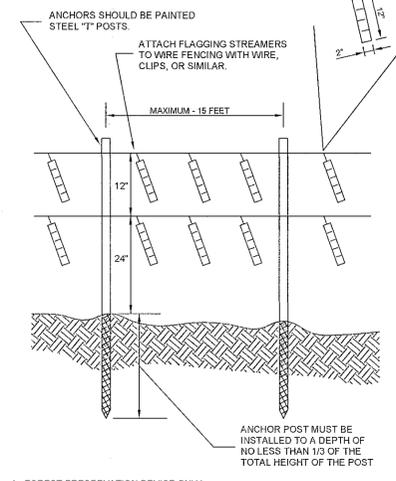
Miscellaneous These credits are allowed as per the criteria and limitations listed in § 1-21-44 MISCELLANEOUS CREDITS OF THE FRO

 - *S1. Street Tree/Landscape $S1 = 1/4$ [Canopy area of each planted tree + planted shrub coverage], where a standard street/landscape tree is measured @ 30" mature diameter
 - *S2. "Tree Save" Credits $S2 = 1/2$ [Canopy area of existing trees and non-priority forest saved during construction, but not protected by easement]
 - *S3. SWM and Rain Gardens $S3 = 20$ -yr. growth canopy/area of SWM Facilities and Rain Gardens
 - *S4. Total Miscellaneous Credits $S4 = S1 + S2 + S3$; however, Total Miscellaneous Credits (S4) may not exceed 25% of Total Reforestation Requirement (R).

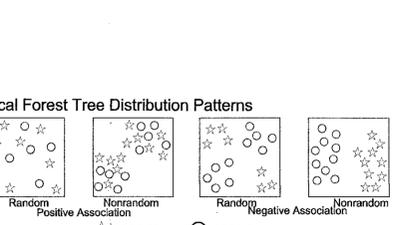
Mitigation Summary:

 - T. Area of Existing Forest under Easement $T = \text{Total Area of Forest to be Retained (K)}$ $T = 0.00$ ac.
 - U. Area of Planted Forest (Afforestation) under Easement (Total acres to be planted in forest) $U = 0.00$ ac.
 - V. Total Miscellaneous Credits (S4) $V = 0.00$ ac.
 - W. Total on-site mitigation owed ($W = T + U + V$) $W = 0.00$ ac.
 - X. Balance of mitigation owed: $X = W - R$ $X = 0.00$ ac.
 - Y. Method of providing balance of mitigation owed: $Y = 1.04$ ac.
 - Z. Total Mitigation Provided ($Z = W + Y$) (for Y2, use acres of mitigation provided via fee): $Z = 1.04$ ac.

Updated November, 2011

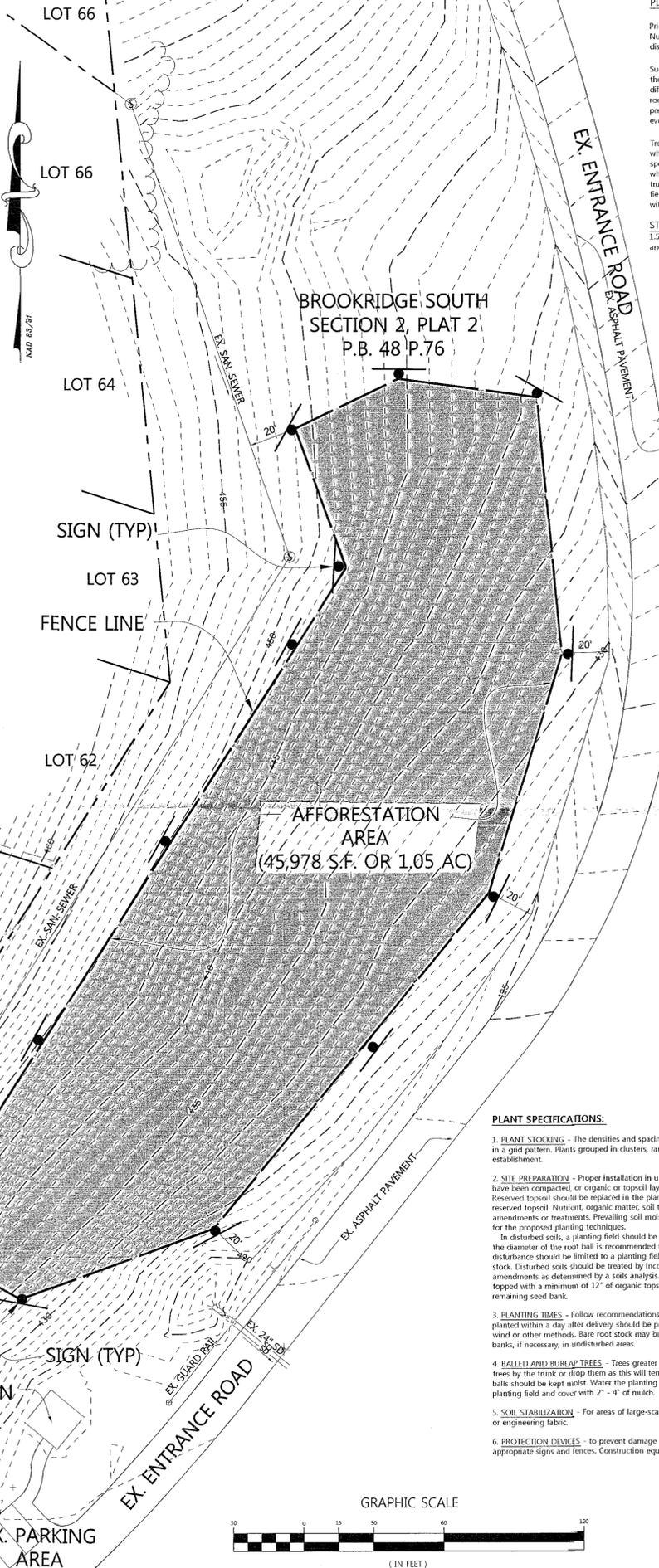
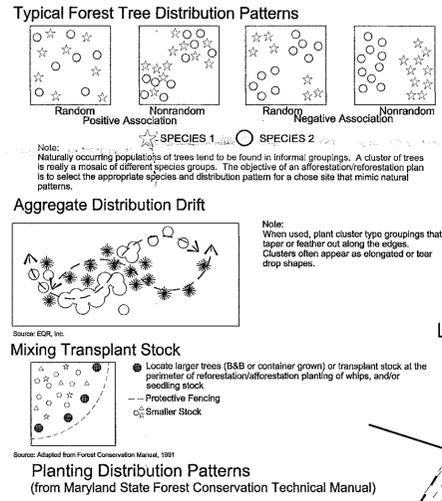


- Two (2) Strand Wire Fence (Tree Preservation Fence)**
1. FOREST PRESERVATION DEVICE ONLY.
 2. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING THE DEVICE.
 3. AVOID ROOT DAMAGE WHEN PLACING ANCHOR POSTS.
 4. TERMINAL AND CORNER POSTS PLUS FIRST LINE POST MUST BE A MINIMUM OF 4" x 4" PRESSURE TREATED WOOD AND DIAGONALLY BRACED WITH A 4" x 4" POST. ALL OTHER POSTS SHOULD BE PAINTED STEEL T-POSTS.
 5. No. 14 GALVANIZED SMOOTH WIRE SHOULD BE SECURELY ATTACHED TO THE POSTS.
 6. THE DEVICE SHOULD BE PROPERLY MAINTAINED DURING CONSTRUCTION.
 7. PROTECTIVE SIGNAGE IS ALSO RECOMMENDED.
 8. BLAZE ORANGE "PROTECTIVE FENCING" MAY BE SUBSTITUTED.



FOREST CONSERVATION PLAN - GENERAL NOTES:

1. THIS FOREST CONSERVATION PLAN HAS BEEN PREPARED PURSUANT TO TOWN OF MIDDLETOWN FOREST RESOURCE ORDINANCE. ANY DEVIATION FROM THIS APPROVED PLAN MAY MAKE THE OWNER/DEVELOPER SUBJECT TO FINES AND PENALTIES PURSUANT TO ENFORCEMENT ACTION TAKEN BY THE APPROVING AUTHORITY.
2. NO DISTURBANCE OF ANY EXISTING FOREST SHALL BE PERMITTED EXCEPT AS SHOWN ON THIS PLAN.
3. PROTECTION DEVICES:
 - A. ALL DESIGNATED PROTECTIVE DEVICES SHALL BE HIGHLY VISIBLE, WELL ANCHORED, TEMPORARY PROTECTIVE DEVICES, AND SHALL BE IN PLACE PRIOR TO ANY GRADING OR LAND CLEARING.
 - (1) INSTALLATION OF PROTECTIVE FENCING IN PLANTING AREAS MAY BE DELAYED UNTIL THE COMPLETION OF ALL NECESSARY PLANTING.
 - B. ALL PROTECTION DEVICES SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE AND ALL GRADED AREAS ARE STABILIZED AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
 - C. NO EQUIPMENT, MACHINERY, VEHICLES, MATERIALS OR EXCESSIVE PEDESTRIAN TRAFFIC SHALL BE PERMITTED WITHIN PROTECTED AREAS DURING CONSTRUCTION.
 - D. SIGNAGE TO REMAIN UNTIL END-USER REMOVES OR THE 2-YEAR PWA PERIOD, WHICHEVER IS LONGER.
4. HOLD A PRE-CONSTRUCTION MEETING AT THE SITE AFTER PLACING PROTECTIVE DEVICES AND BEFORE THE START OF CONSTRUCTION AND/OR CLEARING. ATTENDEES SHOULD INCLUDE THE OWNER/DEVELOPER, HIS QUALIFIED PROFESSIONAL, THE CONTRACTOR(S) AND ALL LOCAL INSPECTOR(S).
5. ANY CHANGES MADE TO THE PLAN DUE TO ON-SITE CONDITIONS OR PLANT STOCK AVAILABILITY SHALL BE MADE IN CONSULTATION WITH THE QUALIFIED PROFESSIONAL AND THE APPROVING AUTHORITY.
6. AFTER CONSTRUCTION, THE FOLLOWING MEASURES SHALL BE TAKEN WHEN APPROPRIATE:
 - A. CORRECTIVE MEASURES IF DAMAGES WERE INCURRED, INCLUDING STRESS REDUCTION MEASURES AND REMOVAL OF DEAD OR DYING TREES WHICH MAY POSE A SAFETY HAZARD.
 - B. REMOVAL OF TEMPORARY FOREST PROTECTION DEVICES AND DISPOSAL AS APPROPRIATE.
 - C. WEED MATS AND FERTILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE FOREST PLANT SCHEDULE NOTES.
 - D. REMOVE INVASIVE SPECIES, ESPECIALLY MULTIFLORA ROSE, BY MECHANICAL MEANS SUCH AS MOWING OR GRUBBING PRIOR TO SEEDLING PLANTING.
 - E. MOWING AND/OR HERBICIDE APPLICATION SHALL BE DONE AS NEEDED TO CONTROL WEEDS, INVASIVE SPECIES AND COMPETING VEGETATION. AT A MINIMUM, MOWING SHOULD OCCUR ONCE PER YEAR UNTIL TREES AVERAGE OVER 5 FEET TALL.
 - F. DURING THE FIRST TWO GROWING SEASONS FOLLOWING PLANTING, STOCK SHOULD BE LIBERALLY WATERED IF RAINFALL IS LESS THAN 1/2 INCH FOR ANY 2 WEEK PERIOD.
7. FOLLOWING COMPLETION OF CONSTRUCTION, THE LOCAL INSPECTOR SHALL INSPECT THE ENTIRE SITE.
8. ALL CONSTRUCTION METHODS AND MATERIALS SHALL BE IN STRICT ACCORDANCE WITH TOWN OF MIDDLETOWN STANDARDS AND SPECIFICATIONS.
9. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO THE START OF CONSTRUCTION.
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE UTILIZATION OF MEN, MATERIALS, EQUIPMENT AND SAFETY MEASURES IN THE PERFORMANCE OF ANY WORK ON THIS PROJECT. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR PERFORMING THE WORK CORRECTLY AND IN CONFORMANCE WITH ALL APPLICABLE CODES AND REGULATIONS, LOCATION AND EXTENT OF ROCK, WATER TABLES, UTILITIES, ETC. ARE THE FULL RESPONSIBILITY OF THE CONTRACTOR.
11. PRIORITY AREAS FOR FORESTATION ARE IDENTIFIED ADJACENT TO EXISTING FOREST AND WETLANDS AND ON STEEP, HIGHLY ERODIBLE SOILS.
12. THE OWNER/DEVELOPER SHALL EXECUTE A THREE (3) YEAR FOREST IMPROVEMENTS PUBLIC WORKS AGREEMENT (FIPA) WITH THE APPROVING AUTHORITY. A LONG TERM PROTECTIVE FOREST CONSERVATION EASEMENT SHALL BE EXECUTED WITH THE TOWN OF MIDDLETOWN.
13. NOTHING IN THIS PLAN WILL PROHIBIT THE USE OF FOREST EASEMENT AREAS FOR THOSE RECREATIONAL USES ALLOWED UNDER COMAR 08.19.01.03 PARAGRAPH 6.3B(5)(B). THE TOWN OF MIDDLETOWN FOREST RESOURCE ORDINANCE AND/OR THE FIPA.



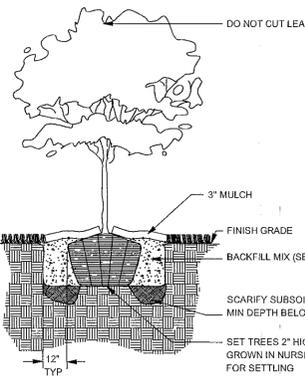
PLANTING INSTRUCTIONS/SPECIFICATIONS

Onsite Inspection
 Prior to planting, inspect planting stock. Plants not conforming to the American Standard Nursery Stock specifications for size, form vigor or roots or due to trunk wounds, insects and disease should be replaced.

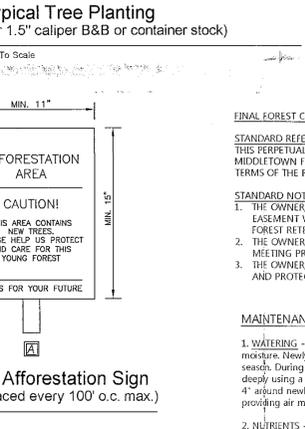
Container Grown Stock
 Successful planting of container grown stock requires careful site preparation and inspection of the root system. Caution is recommended when selecting plants grown in a soils medium differing from that of the planting site. The plant should be removed from the container and the roots gently loosened. If the roots encircle the root ball or if "J"-shaped or linked roots are present, replace the plant. After preparation of a planting field, backfill stockpiled soils. Rake soils evenly over the planting field and cover with 2 to 4 inches of mulch.

Balled and Burlapped Trees
 Trees greater than 2-inch caliper are usually planted using tree spades. This is particularly useful when transplanting onsite or with local plant materials. For trees larger than 6-inch caliper, specialized equipment is recommended. Balled and burlapped trees must be handled with care while planting. Do not pick up trees by the trunk or drop them as this will tend to separate the trunk from the root ball. Prior to planting, root balls should be kept moist. Water the planting field to settle soil backfilled around trees. Rake soils evenly over the planting field and cover with 2 to 4 inches of mulch.

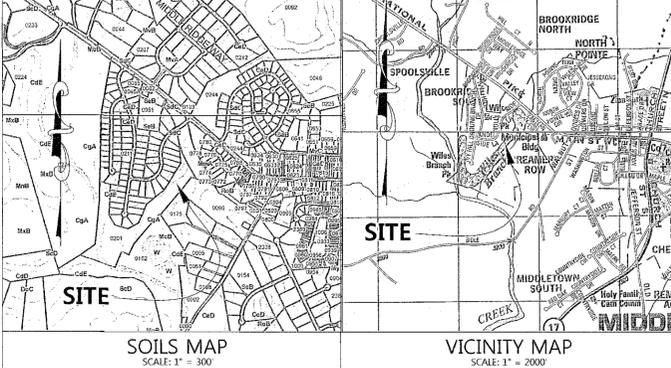
STOCKING AND SURVIVAL RATES
 1.5 inch caliper balled & burlapped (B&B) trees shall have a minimum stocking ratio of 150/acre and shall have a 75 percent survival rate, or at least 113/acre.



- PLANTING PROCEDURES FOR ALL CONTAINER GROWN TREES AND SHRUBS:**
1. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER.
 2. GENTLY LOOSEN ROOTS FROM SOILS. ROOTS MAY NOT BE CUT OR TRIMMED ON SITE.
 3. PLANT SHRUB OR TREE 1 TO 2 INCHES ABOVE THE EXISTING GRADE.
 4. APPLY 2 TO 3 INCH THICK LAYER OF SHREDDED HARDWOOD MULCH.



- PLANT SPECIFICATIONS:**
1. **PLANT STOCKING** - The densities and spacing of the proposed stock do not imply that plants should be installed in a grid pattern. Plants grouped in clusters, random or associated patterns may imitate natural forest establishment.
 2. **SITE PREPARATION** - Proper installation in undisturbed soils may not require extensive preparation, when soils have been compacted, or organic or topsoil layers have been removed by grading, treatment will be necessary. Reserved topsoil should be replaced in the planting area. If supplemental fill is required, it may be mixed with the reserved topsoil. Nutrient, organic matter, soil texture and other analyses may be required to evaluate soil amendments or treatments. Prevailing soil moisture conditions and changes in hydrology should also be evaluated for the proposed planting techniques. In disturbed soils, a planting field should be prepared for each plant. A planting field with a radius of 3 to 5 times the diameter of the root ball is recommended for nursery stock. In areas of steep slopes or erodible soils, soil disturbance should be limited to a planting field with a radius of 2.5 times the diameter of the root ball or nursery stock. Disturbed soils should be treated by incorporating composted organic material within the top 12" and other amendments as determined by a soils analysis. If fill material is used at the planting site, it should be clean fill topped with a minimum of 12" of organic topsoil. Stockpiling of native topsoils should not compact or damage the remaining seed bank.
 3. **PLANTING TIMES** - Follow recommendations from supplier for specific planting schedule. Plants which are not planted within a day after delivery should be protected from desiccation through shading, watering, shielding from wind or other methods. Bare root stock may be heeled in. Transplanted or delivered materials may be stored in tree banks, if necessary, in undisturbed areas.
 4. **BALLED AND BURLAP TREES** - Trees greater than 2" caliper are usually planted using tree spades. Do not pick up trees by the trunk or drop them as this will tend to separate the trunk from the root ball. Prior to planting, root balls should be kept moist. Water the planting field to settle soil backfilled around trees. Rake soils evenly over the planting field and cover with 2" - 4" of mulch.
 5. **SOIL STABILIZATION** - For areas of large-scale disturbance, stabilize soils with a non-turf building ground cover or engineering fabric.
 6. **PROTECTION DEVICES** - To prevent damage to planted areas, post all reforestation and afforestation sites with appropriate signs and fences. Construction equipment must not enter planting areas.



SOILS:

- CgC - CATOCTIN-HIGHFIELD COMPLEX, 8 TO 15 PERCENT SLOPES, VERY ROCKY
- CgE - CATOCTIN-HIGHFIELD COMPLEX, 15 TO 45 PERCENT SLOPE, VERY ROCKY
- CgB - CATOCTIN-SPOOLSVILLE COMPLEX, 3 TO 8 PERCENT SLOPES
- CgA - CORDORUS AND HARBOR SILT LOAMS, 0 TO 3 PERCENT SLOPES

OVERALL AFFORESTATION PLANTING SCHEDULE

(1.0 Ac. @ 150 1.5" caliper Trees per Acre = 150 Units)

85% OVERSTORY PLANTING

Qnty.	Pct. %	Common Name / Scientific Name	Size	Root	Remarks
30	24%	Red Maple / <i>Acer rubrum</i>	1.5" cal.	B&B/Cont.	
26	20%	Sweetgum / <i>Liquidambar styraciflua</i>	1.5" cal.	B&B/Cont.	
23	18%	Black Gum / <i>Absys sylvatica</i>	1.5" cal.	B&B/Cont.	
23	18%	White Oak / <i>Quercus alba</i>	1.5" cal.	B&B/Cont.	
26	20%	Pin Oak / <i>Quercus palustris</i>	1.5" cal.	B&B/Cont.	
128	100%	SUBTOTAL			

15% UNDERSTORY PLANTING

Qnty.	Pct. %	Common Name / Scientific Name	Size	Root	Remarks
11	50%	Serviceberry / <i>Amelanchier canadensis</i>	1.5" cal.	B&B/Cont.	
11	50%	Red bud / <i>Cercis canadensis</i>	1.5" cal.	B&B/Cont.	
22	100%	SUBTOTAL			
150	100%	TOTAL			

* APPROXIMATE SPACING FOR MATERIAL IS 15' O.C.

FINAL FOREST CONSERVATION PLAN STANDARD NOTES:

STANDARD REFERENCE NOTE:
 THIS PERPETUAL FOREST EASEMENT IS ESTABLISHED IN ACCORDANCE WITH THE TOWN OF MIDDLETOWN FOREST RESOURCE ORDINANCE (FRO), AS SPECIFICALLY SET FORTH IN THE TERMS OF THE RECORD FOR EASEMENTS.

STANDARD NOTES FOR ALL FIPCS:

1. THE OWNER/DEVELOPER AGREES TO EXECUTE A LONG-TERM PROTECTIVE FRO DEED OF EASEMENT WITH THE TOWN OF MIDDLETOWN FOR THE AREAS SHOWN HERON AS FOREST RETENTION AND/OR FORESTATION.
2. THE OWNER/DEVELOPER AGREES TO SCHEDULE AND HOLD A PRE-CONSTRUCTION MEETING PRIOR TO ANY GRADING OR SITE DISTURBANCE.
3. THE OWNER/DEVELOPER AGREES TO EXECUTE A TWO (2) YEAR FOREST IMPROVEMENTS AND PROTECTION AGREEMENT (FIPA) WITH THE TOWN OF MIDDLETOWN.

MAINTENANCE SCHEDULE AND NOTES:

1. **WATERING** - A watering plan should compensate for inadequate local rainfall and soil moisture. Newly planted trees may need water as much as once a week for the entire growing season. During the next two years, they may require watering only a few times a year. Water deeply using a garden hose, a soaker hose or drip irrigation. A layer of mulch not thicker than 4" around newly transplanted trees insulates surface roots from drying too quickly while still preventing air movement to the roots.
2. **NUTRIENTS** - Do not add nitrogen within the first growing season after planting. It is best to wait until after the end of the first growing season and apply either in the early fall or early spring.
3. **FERTILIZER** - Nitrogen may be of several forms such as nitrates and ammonium. Slow release fertilizers, especially organic fertilizers, often minimize effects on adjacent systems where fertilizer is not desired.
4. **CONTROL OF COMPETING VEGETATION** - In some cases, unwanted vegetation, especially exotic vines and shrubs growing near newly planted trees, can take over a site. Mulch is one of the best deterrents to competitors gaining a foothold. Spread a 2" - 4" layer of mulch over the area of the newly planted trees avoiding direct contact with the trunk, a prime spot for fungal growth. Controlling competing vegetation with herbicides should be carefully assessed so that the effects on desirable plants, including those that self seed or colonize the site, soils and surface waters are carefully monitored and minimized.
5. **PROTECTION** - An Integrated Pest Management program (IPM) is one of the most effective and safe approaches for maintaining a health forest. IPM's include proper species selection for the site, effective pruning, mulching and fertilizing, regular monitoring and proper timing of necessary spray.

FOREST CONSERVATION PLAN CERTIFICATION

I certify that I am qualified to prepare in accordance with the requirements of the Forest Conservation Act pursuant to Comar 08.19.05.01b and that, to the best of my knowledge, the information herein satisfies the requirements of the Town of Middletown Forest Resource Ordinance.

[Signature]
 J. H. [Name], Maryland State Approved Forest Resource Qualified Professional

APPROVED
 MIDDLETOWN
 PLANNING COMMISSION

[Signature]
 APPROVING AUTHORITY

5/20/2014
 DATE

DATE	BY	REVISIONS
MAY 15 2014		

ISSUE DATES	BASE:
REVIEW: 5/16/14	DRAWN: JNS
BID:	DESIGNED: MSC
PERMIT:	CHECKED BY: MSC
CONSTRUCTION:	DATE CHECKED:
SCALE: AS SHOWN	DRAWING:
PROJECT NO: 12706	1 of 1

CALL "MISS UTILITY" AT 1-800-257-7777 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

DMW
 DAFT MCCUNE WALKER INC
 8 EAST SECOND STREET, SUITE 201, FREDERICK, MD 21701
 P: 301.696.9040 F: 301.696.9041 WWW.DMW.COM
 A TEAM OF LAND PLANNERS, LANDSCAPE ARCHITECTS, ENGINEERS, SURVEYORS & ENVIRONMENTAL PROFESSIONALS

OFFSITE FOREST CONSERVATION PLAN FOR CROSS STONE COMMONS AT WILES BRANCH PARK
 TOWN OF MIDDLETOWN
 MIDDLETOWN ELECTION DISTRICT NO. 3
 FREDERICK COUNTY, MARYLAND

OWNER
 TOWN OF MIDDLETOWN
 31 WEST MAIN STREET
 MIDDLETOWN, MD 21769
 (301) 371-6171

DEVELOPER
 MIDDLETOWN VALLEY INVESTMENT PARTNERS, LLC
 2661 RVA ROAD, SUITE 300
 ANNAPOLIS, MD 21401
 (410) 266-5100

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