

SITE DATA
 LOCATION: TAX MAP 41, GRID 6, PARCEL 220
 DEED REFERENCE: L.3563 F.341
 5TH ELECTION DISTRICT
 EXISTING ZONING: R-20
 PER THE COMPREHENSIVE ZONING PLAN DATED 2/02/04.
 GROSS AREA OF PARCELS: 1,0031 AC.
 AREA OF RIGHT OF WAY: 0.00000 AC.
 AREA OF FLOODPLAIN: N/A
 AREA OF STEEP SLOPES: N/A
 NET AREA OF PROJECT: 1.0031 AC
 NUMBER OF RESIDENTIAL LOTS PROPOSED: 2 LOTS
 AREA OF PROPOSED RESIDENTIAL LOTS: 43,692 SF (1.00 AC)
 AREA OF SMALLEST BUILDABLE LOT PROPOSED: 21,846 SF
 NUMBER OF PROPOSED OPEN SPACE LOTS: 0
 NUMBER OF NON-BUILDABLE BULK PARCELS: 0

GRADING DATA
 TOTAL DISTURBED AREA = 0.683 AC
 IMPERVIOUS COVER = 0.219 AC
 AREA TO BE STABILIZED = 0.464 AC

SUPPLEMENTAL STORM WATER MANAGEMENT, FOREST CONSERVATION & LANDSCAPE PLAN

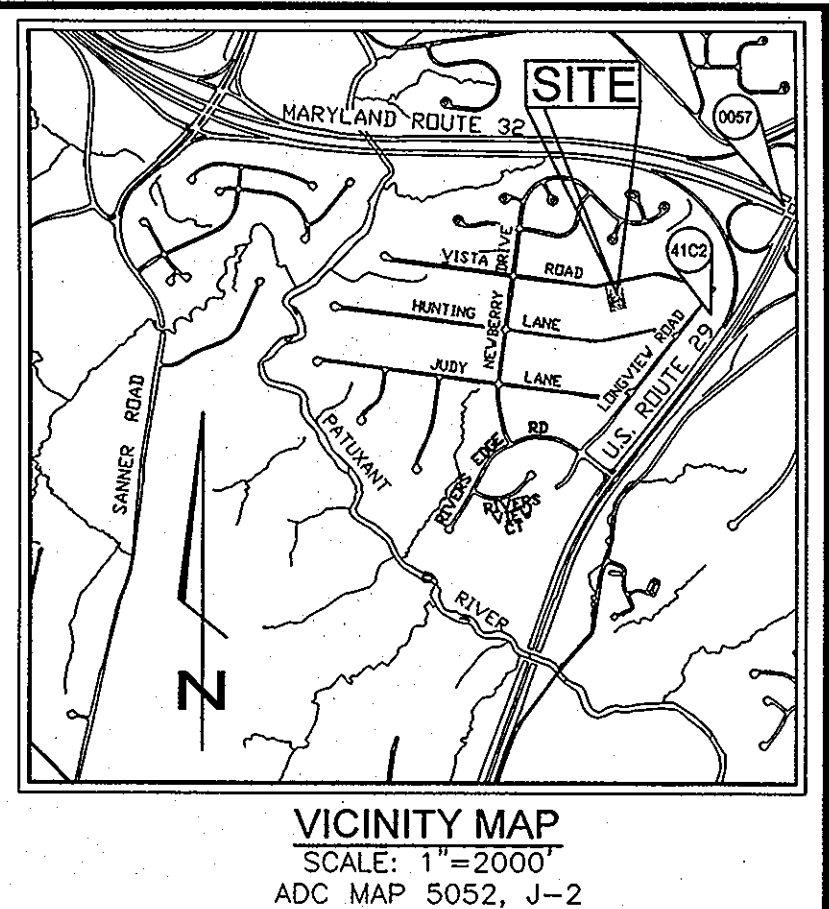
F-10-111

HOLIDAY HILLS LOTS 103 & 104

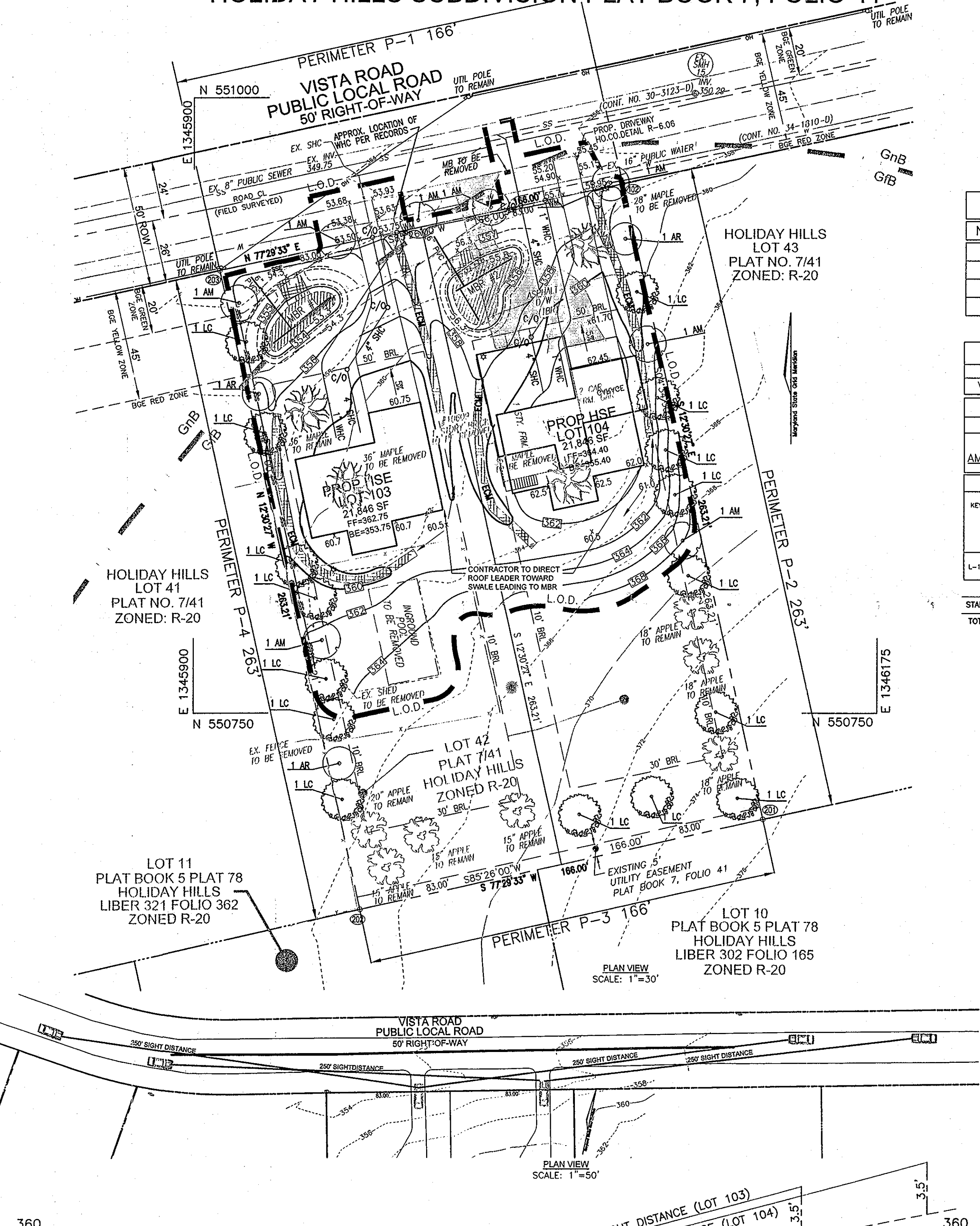
A RESUBDIVISION LOT 42 SECOND ADDITION TO
 HOLIDAY HILLS SUBDIVISION PLAT BOOK 7, FOLIO 41

LEGEND
 - - - - - LIMIT OF DISTURBANCE
 [Hatched Box] EX. DRIVEWAY TO BE REMOVED
 [Dotted Box] PROPOSED MICRO BIORETENTION FACILITY
 [Stippled Box] PROPOSED EROSION CONTROL MATTING

BENCHMARKS
 HOWARD COUNTY BENCHMARK 41C2N
 N 551,616.4187 E 1,348,104.2341
 HOWARD COUNTY BENCHMARK 0057N
 N 550,835.2139 E 1,347,017.6897



- GENERAL NOTES**
- THE PROJECT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. IN FEBRUARY 2010.
 - THE TOPOGRAPHY SHOWN HEREON IS BASED ON FIELD RUN TOPOGRAPHY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC. IN FEBRUARY 2010.
 - PUBLIC WATER AVAILABLE THROUGH CONTRACT 34-1810-D AND PUBLIC SEWER AVAILABLE THROUGH CONTRACT 30-3123-D. WATER AND SEWER SERVICE WILL BE GRANTED UNDER THE PROVISIONS OF SECTION 18.122B OF THE HOWARD COUNTY CODE.
 - THIS PROJECT IS EXEMPT FROM Cpv STORM WATER MANAGEMENT SINCE THE SITE P_e IS LESS THAN 1".
 - THIS SITE IS NOT LOCATED IN A HISTORIC DISTRICT.
 - NO STREAMS EXIST ON SITE.
 - NO 100-YEAR FLOODPLAIN EXIST ON SITE.
 - SUBJECT PROPERTY ZONED R-20 PER 2/02/04 COMPREHENSIVE ZONING ZONING PLAN AND AMENDED BY THE COMPREHENSIVE LITE AMENDMENT DATED 07/28/06.
 - 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 REQUIRED PERIMETER LANDSCAPE TREES AND STREET TREES (\$6,010.00) WILL BE POSTED AS PART OF THE BUILDERS GRADING PERMIT UNDER THE SITE DEVELOPMENT PLAN.
 - THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS (COUNCIL BILL 45-2003). 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.
 - "DRIVEWAY(S) SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
 - WIDTH - 12 FEET (14 FEET SERVING MORE THAN ONE RESIDENCE).
 - SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CLIP COATING.
 - GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% CHANGE AND MINIMUM OF 45-FOOT DEPTH TURNING RADII.
 - STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
 - DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE.
 - STRUCTURE CLEARANCES - MINIMUM 12 FEET.
 - MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
 - DPZ FILE NUMBERS: WP-10-151
 - THE EXISTING DWELLING/STRUCTURE AND IN-GROUND POOL LOCATED ON THIS SITE ARE TO BE REMOVED PRIOR TO RECORDATION OF THIS PLAN.
 - THIS PROJECT COMPLIES WITH THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT. TO FULFILL THE 0.15 ACRES OF AFFORESTATION REQUIREMENT, THE DEVELOPER HAS PAID A FEE-IN-LIEU IN THE AMOUNT OF \$4,900.50.
 - STORM WATER MANAGEMENT ADDRESSED FOR SITE USING 2007 MARYLAND STORMWATER DESIGN MANUAL (CHAPTER 5).
 - CHANNEL PROTECTION VOLUME (CPV) IS NOT REQUIRED (P_e FOR ENTIRE SITE IS UNDER 1.0")
 - WATER QUALITY VOLUME (WQV) AND RECHARGE VOLUME (REV) TO BE PROVIDED BY MICRO BIORETENTION FACILITIES. OPEN CHANNEL FLOW (WHEN IMPERVIOUS AREAS CAN NOT BE DIRECTED TO ONE OF THE MICRO BIORETENTION FACILITIES) AND (N-2) DISCONNECT OF NON-ROOFTOP DISCHARGE.
 - THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS PER COUNCIL BILL 45-2003 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.
 - SITE DEVELOPMENT PLAN APPROVAL BY THE DEPARTMENT OF PLANNING AND ZONING IS REQUIRED PRIOR TO BUILDING PERMITS BEING ISSUED FOR THE CONSTRUCTION OF RESIDENTIAL DWELLINGS ON THESE LOTS.
 - THIS DEVELOPMENT IS DESIGNED TO BE IN ACCORDANCE WITH SECTION 16.127 RESIDENTIAL INFILL DEVELOPMENT OF SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DEVELOPER OF THIS PROJECT SHALL CREATE COMPATIBILITY WITH THE EXISTING NEIGHBORHOOD THROUGH THE USE OF ENHANCED PERIMETER LANDSCAPING, BERMS, FENCES, SIMILAR HOUSING UNIT TYPES AND THE DIRECTIONAL ORIENTATION OF THE PROPOSED HOUSES.
 - NO CLEARING OF EXISTING VEGETATION IS PERMITTED WITHIN THE LANDSCAPE EDGE FOR WHICH CREDIT IS BEING TAKEN, HOWEVER, LANDSCAPE MAINTENANCE IS AUTHORIZED.
 - SHOULD ANY TREE DESIGNATED FOR PRESERVATION, FOR WHICH CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE LANDSCAPE MANUAL.
 - AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR REPLACEMENT OF REQUIRED PLANTING MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS 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 REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
 - REFERENCE WAIVER PETITION WP 10-151 APPROVED 00/00/2010
 - SECTION 16.1205(o) TO ALLOW REMOVAL OF 2 SPECIMEN TREES AND REPLACE THEM WITH 4 ADDITIONAL PERIMETER TREES.
 - SECTION 16.134(b)(2) TO ALLOW A FEE-IN-LIEU OF SIDEWALK CONSTRUCTION (\$2368.00)
 - SECTION 16.132(a)(2)(i)(o) TO ALLOW A FEE-IN-LIEU OF ROAD CONSTRUCTION (\$2324.00)
 - SECTION 16.135(a) TO NOT PROVIDE STREET LIGHTING
 - A FOREST STAND DELINEATION WAS PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC., DATED MAY 2010. FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL SHALL BE COMPLIED WITH.



COORDINATE TABLE

NUMBER	NORTHING	EASTING
102	550963.9756	1346072.3252
201	550707.0123	1346129.3282
202	550671.0619	1345967.2678
203	550928.0253	1345910.2649

SOILS LEGEND

SYMBOL	NAME/DESCRIPTION	TYPE
GnB	GLENNVILLE-BALE SILT LOAM 0 TO 8 PERCENT SLOPES	C
GfB	GLADSTONE-URBAN LAND COMPLEX 0 TO 8 PERCENT SLOPES	B

STREET TREE CALCULATION

ROAD NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
VISTA ROAD	166'/40	4	4

STREET TREE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	REM.
AM	4	AMUR MAPLE ACER GINNALA	(SHADE TREES - GROWTH HEIGHT=20') 2 1/2"-3" CAL.	B & B

FOREST STAND ANALYSIS TABLE

KEY	TYPE OF COMMUNITY	AREA	SOILS INFORMATION				EXISTING VEGETATION	STAND CHARACTERISTICS			FOREST AREA IN SEN. ENV.
			1	2	3	4		1	2	3	
L-1	LAWN AND OPEN FIELD	1.00 AC	GfB	MIXED UPLAND WOODLAND, MAINLY OAKS	12	1	MAINTAINED LAWN MAPLE & APPLE	12-27'	30%	FAIR	0.00 AC

FOREST STAND TOTALS

STAND L-1	1.00 ACRES
TOTAL	1.00 ACRES (ENTIRE SITE)

SCHEDULE 'A'- PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS		ADJACENT TO PERIMETER PROPERTIES		TOTAL
	P-1	P-2	P-3	P-4	
PERIMETER NUMBER	N/A	B	A	B	
LANDSCAPE TYPE	N/A	166 LF	263 LF	263 LF	
LF OF ROADWAY FRONTAGE / PERIMETER					
NUMBER OF PLANTS REQUIRED					
SHADE TREES	N/A	5	3	5	13
EVERGREEN TREES					14
CREDIT FOR EXISTING VEGETATION YES/NO	N/A	YES	YES	YES	
SHADE TREES		3	2	2	
ORNAMENTAL (2:1 SUB FOR SHADE)		-	-	-	
EVERGREEN TREES		-	-	-	
NUMBER OF PLANTS PROVIDED	N/A	1	-	2	3
SHADE TREES		2*	-	2***	4
ORNAMENTAL (2:1 SUB FOR SHADE)		7	-	2**	7
EVERGREEN TREES (2:1 SUB FOR SHADE)					16

*P-2 - SUBSTITUTION: 2 ORNAMENTAL FOR 1 SHADE TREE
 **P-3 - SUBSTITUTION: 2 EVERGREEN FOR 1 SHADE TREE
 ***P-4 - SUBSTITUTION: 2 ORNAMENTAL FOR 1 SHADE TREE

PLANT LIST

KEY	QUAN.	BOTANICAL NAME	SIZE	REM.
AR	3	ACER RUBRUM 'AUTUMN FLAME' AUTUMN FLAME RED MAPLE	2 1/2"-3" CAL.	B & B
AM	4	AMUR MAPLE ACER GINNALA (SHADE TREES - GROWTH HEIGHT=20')	2 1/2"-3" CAL.	B & B
LC	16	LEYLAND CYPRESS CUPRESSOCYPARIS LEYLANDI	5'-6' HT	B & B

NOTE: 2 ADDITIONAL SHADE TREES PROVIDED FOR EACH SPECIMAN TREE REMOVED (2X2=4 ADDITIONAL TREES) PER WP-10-151

FOREST CONSERVATION WORKSHEET 2.2

NET TRACT AREA
 A. TOTAL TRACT AREA C = 1.00
 B. DEDUCTIONS B = 0.00
 C. NET TRACT AREA C = 1.00

LAND USE CATEGORY
 INPUT THE NUMBER "1" UNDER THE APPROPRIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY
 ARA MDR IDA HDR MPO CIA
 0 0 0 0 1 0 0 0

D. AFFORESTATION THRESHOLD (NET TRACT AREA X 15%) D = 0.15
 E. CONSERVATION THRESHOLD (NET TRACT AREA X 20%) E = 0.19

EXISTING FOREST COVER
 F. EXISTING FOREST COVER WITHIN THE NET TRACT AREA F = 0.00
 G. AREA OF FOREST ABOVE CONSERVATION THRESHOLD G = 0.00
 H. BREAK EVEN POINT H = 0.00
 I. FOREST CLEARING PERMITTED WITHOUT MITIGATION I = 0.00
 J. TOTAL AREA OF FOREST TO BE CLEARED J = 0.00
 K. TOTAL AREA OF FOREST TO BE RETAINED K = 0.00
 L. REFORESTATION FOR CLEARING ABOVE THE CONSERVATION THRESHOLD L = 0.00
 M. REFORESTATION FOR CLEARING BELOW THE CONSERVATION THRESHOLD M = 0.00
 N. CREDIT FOR RETENTION ABOVE THE CONSERVATION THRESHOLD N = 0.00
 O. TOTAL REFORESTATION REQUIRED O = 0.00
 P. TOTAL AFFORESTATION REQUIRED P = 0.15
 Q. TOTAL PLANTING REQUIRED Q = 0.15
 R. TOTAL PLANTING REQUIRED R = 0.15

OWNERS
 SD PROPERTIES
 3138 ROGERS AVENUE
 ELLICOTT CITY, MARYLAND 21043
 (410-203-2460)

NO.	REVISION	DATE

**SUPPLEMENTAL STORM WATER MANAGEMENT,
 FOREST CONSERVATION & LANDSCAPE PLAN**

F-10-111
**HOLIDAY HILLS
 LOTS 103 & 104**

A RESUBDIVISION OF LOT 42 OF
 HOLIDAY HILLS PLAT BOOK 7, FOLIO 41
 DPZ FILES: WP-10-151, ECP-11-013

TAX MAP 41, GRID 6 PARCEL 220
 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL
 ENGINEERING, INC.**
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET TEL: 410-461-7666
 ELLICOTT CITY, MD 21043 FAX: 410-461-8961

DESIGN BY: RHV
DRAWN BY: JTD
CHECKED BY: RHV
DATE: OCTOBER 21, 2010
SCALE: AS SHOWN
W.O. NO.: 09-42

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. 21438 EXPIRATION DATE: 12-16-2012.

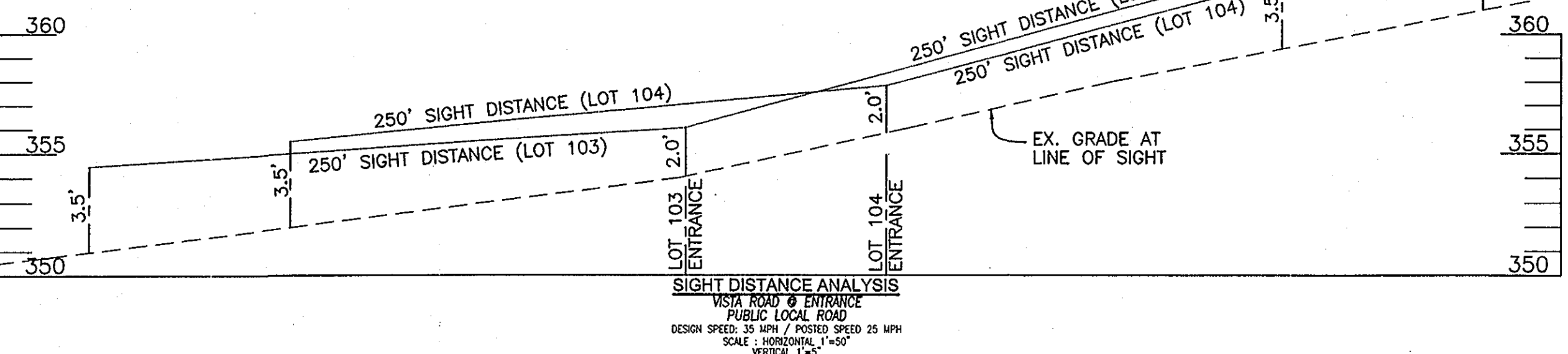
JOHN T. DIGATE, PE No. 21438

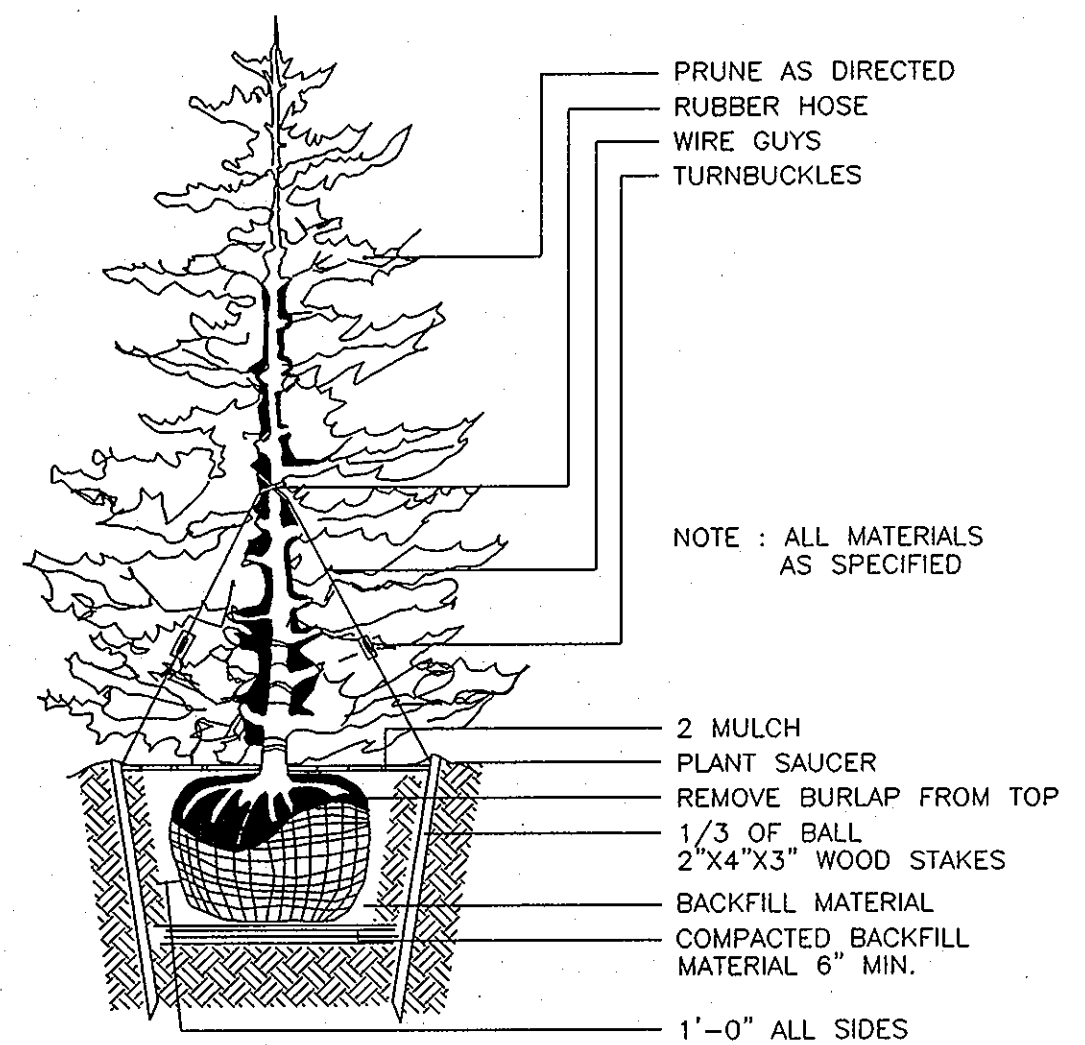
1 SHEET OF 2

DEVELOPER'S BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

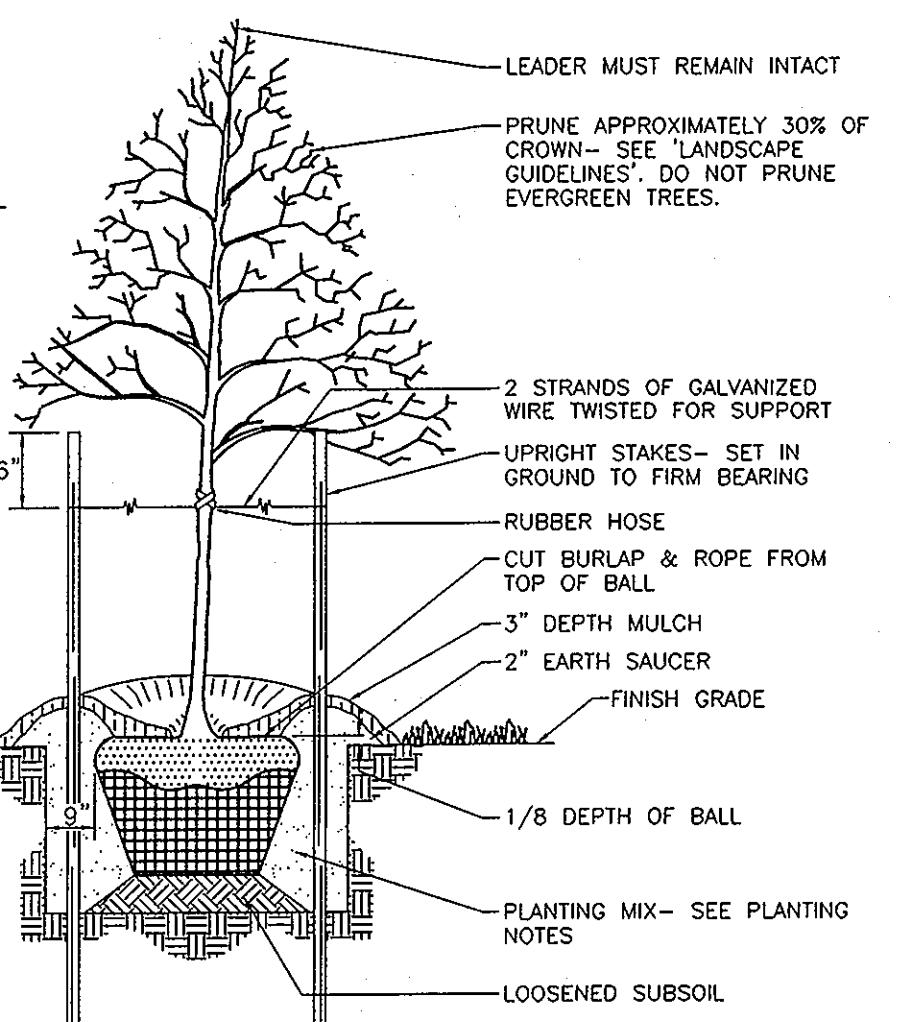
SD Properties LLC by: *[Signature]* member 5/14/10
 SIGNATURE OF DEVELOPER DATE



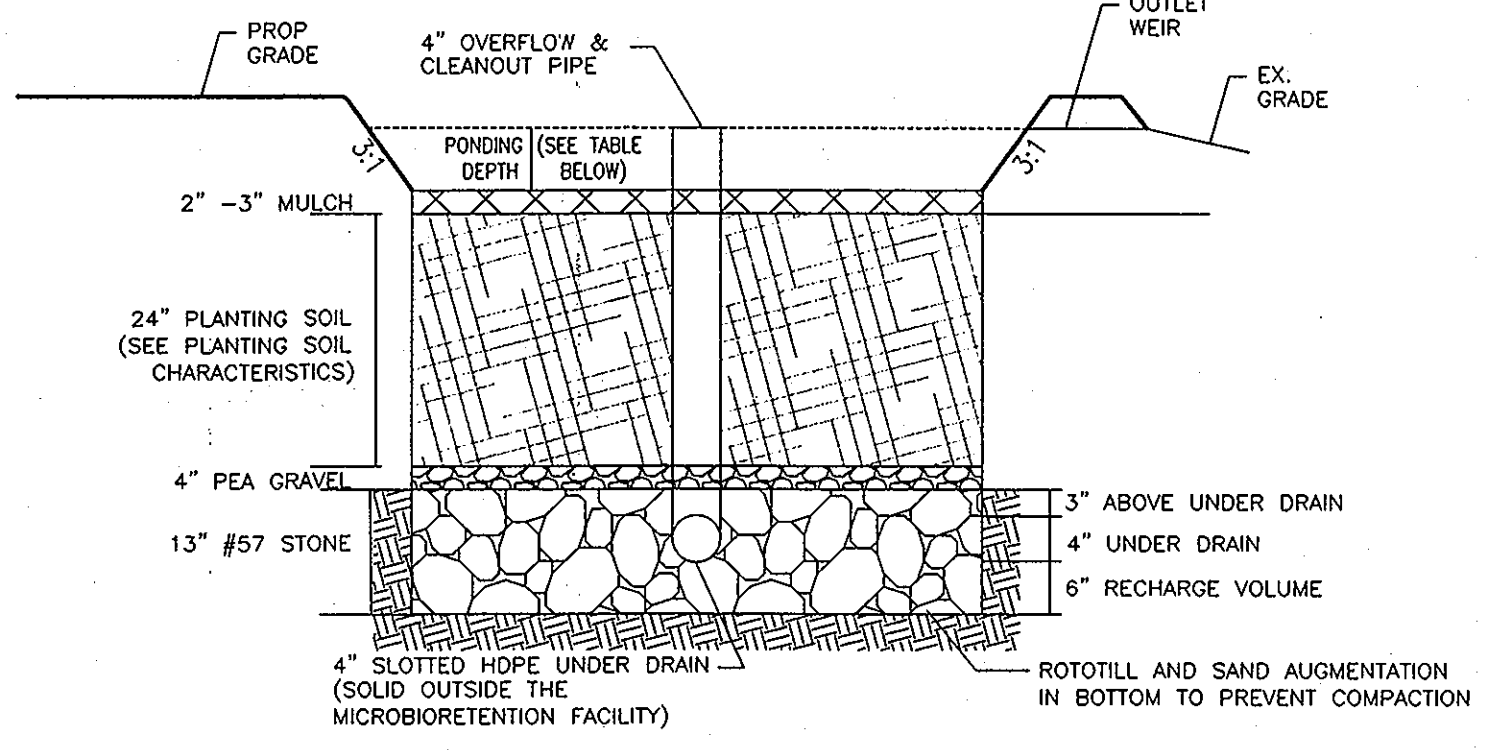


TYPICAL EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

- NOTES**
- SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
 - SEE "LANDSCAPE GUIDELINES" FOR SUPPORTING TREES LARGER THAN 2-1/2" CALIPER.
 - PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
 - KEEP MULCH 1" FROM TRUNK.
 - SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
 - TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.



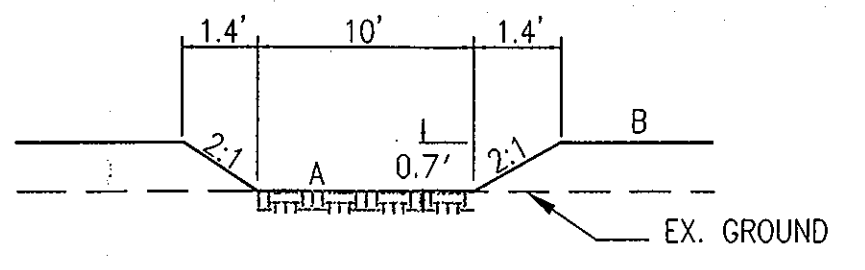
TREE PLANTING AND STAKING
NOT TO SCALE



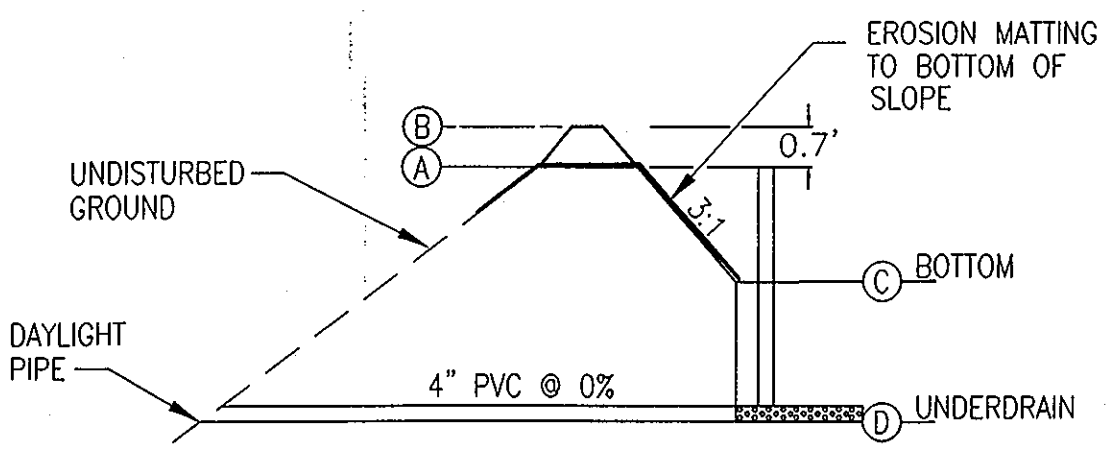
DETAIL - MICROBIORETENTION
NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3) MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), ENHANCED FILTERS (M-9)

- 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.
- 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.
- 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 is applied.
- The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.



TYPICAL SPILLWAY PROFILE
NOT TO SCALE



TYPICAL SPILLWAY SECTION
NOT TO SCALE

MBR FACILITY	A	B	C	D
MBR #1	354.3	355.0	353.6	350.8
MBR #2	356.3	357.0	355.8	353.1

STORMWATER MANAGEMENT CALCULATIONS

DRAINAGE AREA	METHOD	VOL. REQUIRED	VOL. PROVIDED	REV. REQUIRED	REV. PROVIDED
MBR #1	M-6	243 CF	299 CF	62 CF	62 CF
MBR #2	M-6	272 CF	294 CF	72 CF	90 CF

M-6 IS A MICRO BIORETENTION FACILITY. SEE DETAIL THIS SHEET.

APPENDIX B.1. CONSTRUCTION SPECIFICATIONS FOR SAND FILTERS, BIORETENTION AND OPEN CHANNELS

SPECIFICATIONS FOR BIORETENTION

1. MATERIAL SPECIFICATIONS
THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREA ARE DETAILED IN TABLE B.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 DAMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE AN OBSTACLE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERBERIS GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER WOODS WEEDS AS SPECIFIED UNDER COMAR 16.06.01.05.
THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
PRIMARIES 42-70
ORGANIC MATTER 15-4 % (BY WEIGHT)
MAGNESIUM 58 LB/AC
PHOSPHORUS (PHOSPHATE - P) 205) 75 LB/AC
POTASSIUM (POTASH - K) 20) 85 LB/AC
SULFUR SALTS 160 TO EXCEED 500 PPM

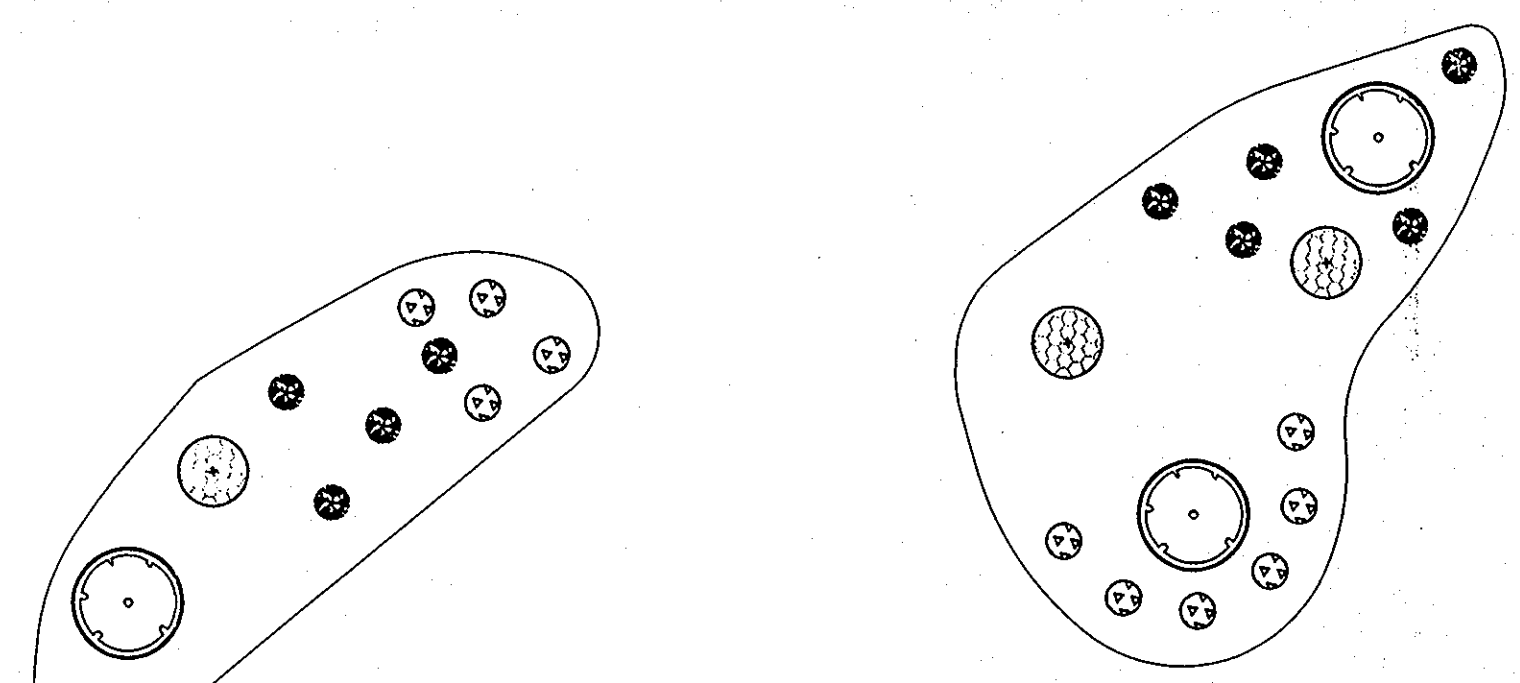
ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TEST OF ORGANIC MATTER, AND SULFUR SALTS. A TEXTURAL ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL WAS EXCAVATED.
SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY. SHOULD THE TEST 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 HOSES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE. 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 ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACATURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED SAND LAYER. PUMP ANY POOLED WATER BEFORE PREPARING (ROTOTILLING) BASE.
WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 1 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL 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.2.3. OF THE 2000 MARYLAND STORMWATER DESIGN MANUAL.

5. PLANT INSTALLATION
MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. FINE 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 AERATED (9 TO 12 INCHES) FOR ACCEPTANCE.
ROOT STOKS OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED 80 PERCENT OF THE BALL IS 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.
TREES SHALL BE BRACED 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 PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFLEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS OF NITROGEN PER 1000 SQUARE FEET.
6. UNDERDRAINS
UNDERDRAINS ARE TO BE PLACED ON A 3/4" WIDE SECTION 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 WELL 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.



BIORETENTION PLANTING LAYOUT
N.T.S.

TYPICAL BIORETENTION PLANTING SCHEDULE PER 250 SF AREA

KEY	QTY	BOTANICAL NAME / COMMON NAME	SIZE	REMARKS	PER FACILITY	
					MBR 1	MBR 2
1	1	ACER RUBRUM RED MAPLE	1 1/2"-2" CAL	B & B	1	2
1	1	ILEX GLABRA HAWTHORN	3 GALLON	CONT	1	2
3	3	VACCINIUM CORYMBOSUM HIGHBUSH BLUEBERRY	3 GALLON	CONT	4	6
3	3	LOBELIA SIPHILITICA GREAT BLUE LOBELIA	3 GALLON	CONT	4	6
50	50	LIRIOPE MUSCARI 'MAJESTIC' MAJESTIC LILY TURF	2" POT	1' O.C.	65	100

A MINIMUM DENSITY OF 1000 STEMS PER PLANTED BIORETENTION AREAS ARE TO BE PLANTED BASED ON ACRE (0.229 STEMS PER SQUARE FOOT). ABOVE PLANTING RATIOS ARE TO BE APPLIED TO THE AREAS PROVIDED IN THE ESDV SUMMARY. ROUND UP FOR QUANTITY.

- BIORETENTION PLANTING SCHEDULE NOTES:**
- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HRO PLANTING SPECIFICATIONS.
 - CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
 - FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
 - CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.
 - SEE THIS SHEET FOR TYPICAL PLANTING DETAILS.

LEGEND

- LOD LIMIT OF DISTURBANCE
- EX - DRIVEWAY TO BE REMOVED
- PROPOSED MICRO BIORETENTION FACILITY
- PROPOSED EROSION CONTROL MATTING

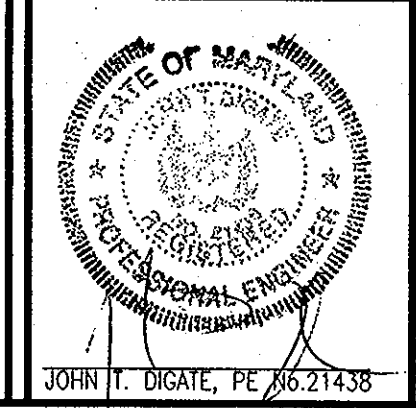
OWNERS
SD PROPERTIES
3138 ROGERS AVENUE
ELLICOTT CITY, MARYLAND 21043
(410-203-2460)

NO.	REVISION	DATE

SUPPLEMENTAL STORM WATER MANAGEMENT, & LANDSCAPE DETAIL PLAN

F-10-111
HOLIDAY HILLS
LOTS 103 & 104
A RESUBDIVISION OF LOT 42 OF
HOLIDAY HILLS, PLAT BOOK 7 FOLIO 41
TAX MAP 41, GRID 6 PARCEL 220
5TH ELECTION DISTRICT DPZ FILES: VP-10-151, ECP-11-013 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET TEL: 410.461.7666
ELLICOTT CITY, MD 21043 FAX: 410.461.8961



DESIGN BY: RHV
DRAWN BY: JTD
CHECKED BY: RHV
DATE: OCTOBER 21, 2010
SCALE: AS SHOWN
W.O. NO.: 09-42

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. 21458 EXPIRATION DATE: 12-16-2012.

2 SHEET OF 2

DEVELOPER'S BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

SD Properties LLC by [Signature] Date