

# ENVIRONMENTAL CONCEPT PLAN

## STELLA GLEN

### LOTS 1-7

PARCELS 57, 58 & 417 (L. 8293 / F. 433)  
10580 SHAKER DRIVE  
COLUMBIA, MD 21046

#### SITE DATA

LOCATION: TAX MAP 36, BLOCK 19  
PARCEL: 57, 58 & 417  
6TH ELECTION DISTRICT  
PRESENT ZONING: R-20  
GROSS AREA OF PROJECT: 3.68 AC.  
LIMIT OF DISTURBANCE: 2.32 AC.  
PROPOSED USE OF SITE: RESIDENTIAL (SFD)  
NUMBER OF RESIDENTIAL LOTS PROPOSED: 7 LOTS  
AREA OF RESIDENTIAL LOTS PROPOSED: 3.68 AC.  
OPEN SPACE REQUIRED: 0.00 AC.  
OPEN SPACE PROVIDED: 0.00 AC.  
IMPERVIOUS AREA: 0.76 AC.  
AREA OF STREAM/BUFFER: 0.00 AC.  
AREA OF WETLANDS/BUFFER: 0.23 AC.  
AREA OF STEEP SLOPES (25% OR GREATER): 0.01 AC.  
AREA OF FLOOD PLAIN: 0.00 AC.  
NET PROJECT AREA: 3.44 AC.  
AREA OF EXISTING FOREST COVER: 0.64 AC.  
AREA OF ERODIBLE SOILS: 1.13 AC.

#### GENERAL NOTES

- THE TOPOGRAPHY SHOWN HEREON IS BASED ON AN A FIELD RUN TOPOGRAPHIC SURVEY WITH 2-FOOT CONTOURS PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JUNE 2012.
- THE PROJECT BOUNDARY SHOWN HEREON IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JUNE 2012.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
- ANY DAMAGE TO PUBLIC RIGHT-OF-WAY, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO CEMETERIES OR GRAVE SITES LOCATED ON THE SUBJECT PROPERTY.
- STORM WATER MANAGEMENT TO BE PROVIDED FOR THIS DEVELOPMENT BY ENVIRONMENTAL SITE DESIGN UTILIZING MICRO BIO-RETENTION FACILITIES (M-6), GRASS SWALES (M-8), ROOFTOP DISCONNECTS (N-1), NON-ROOFTOP DISCONNECTS (N-2), AND PERVIOUS CONCRETE (A-2) AT THE END OF THE USE-IN-COMMON DRIVEWAY. FACILITIES TO BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION OF THESE LOTS MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION, OR BUILDING AND GRADING PERMITS.
- THE SUBJECT PROPERTY IS ZONED "R-20" IN ACCORDANCE WITH THE 2/2/04 COMPREHENSIVE ZONING PLAN AND THE COMP. LITE ZONING REGULATIONS EFFECTIVE ON 7/28/06.
- THIS SITE IS NOT LOCATED IN A HISTORIC DISTRICT.
- THE PROPOSED SUBDIVISION AND RELATED CONSTRUCTION WILL HAVE MINIMAL AFFECT ON EXISTING ENVIRONMENTAL FEATURES AND BUFFERS.
- EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND SEWER EXTENSION PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 3513 AND 41CC WERE USED FOR THIS PROJECT.
- NO RARE, THREATENED OR ENDANGERED SPECIES WERE OBSERVED ON THE PROPERTY.
- THERE IS NO 100-YR FLOODPLAIN WITHIN THE LIMITS OF THIS SITE.
- SEDIMENT AND EROSION CONTROL WILL BE PROVIDED FOR THIS SITE.
- WETLANDS SHOWN ON-SITE ARE BASED ON A FIELD INVESTIGATION PREPARED BY ECO-SCIENCE PROFESSIONALS, INC., DATED SEPTEMBER 12, 2012. THERE ARE NO PROPOSED DISTURBANCES TO THE WETLANDS OR ASSOCIATED BUFFERS.
- FOREST STAND DELINEATION PLAN WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC., DATED SEPTEMBER 12, 2012. A TOTAL OF 7 LOTS ARE PROPOSED UNDER THIS PLAN.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAM(S), OR THEIR REQUIRED BUFFERS, FLOODPLAIN AND FOREST CONSERVATION EASEMENT AREAS.
- WETLANDS AND THEIR BUFFERS WILL NOT BE IMPACTED BY THE CONSTRUCTION OF THE SITE.
- APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
- A NOISE WALL IS REQUIRED FOR THIS SITE. IT WILL BE PROVIDED UNDER HO-3175170.
- THERE ARE NO SPECIMEN TREES LOCATED ON THIS SITE.
- FOREST CONSERVATION REQUIREMENTS AS SET FORTH IN SECTION 16.1202 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT. HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEC OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
- THE FOREST CONSERVATION OBLIGATION HAS BEEN FULFILLED BY THE RETENTION OF 0.26 AC. OF CREDITED EASEMENT AND 0.86 ACRES OF OPEN SPACE. A BOND FOR THE REQUIRED FOREST CONSERVATION SHALL BE PAID IN THE AMOUNT \$28,096.50 FEE-IN-LIEU - (0.86 AC.) 37,462 SF x .75 = \$28,096.50

#### STELLA GLEN ENVIRONMENTAL CONCEPT PLAN STORM WATER MANAGEMENT REPORT

#### INTRODUCTION

The subject property is located on the east side of Shaker Drive and north of Seneca Drive and south of A View Drive in Columbia, Maryland. The site is approximately 3.7 acres and currently contains one residential single-family detached residence. The existing house is served by a private driveway which is located in a private right-of-way which serves the subject property and adjacent property. The soils are Gladstone (Gfb, HSG B) and Glenville (Gub, HSG C). The existing grading generally slopes from northeast to southwest ranging between 3% and 13%. There is a wetland and 25' buffer located in the southern portion of the site. Since this project is considered an in-fill development the environmental features are permitted to be on the lots. An additional 35' environmental building setback is applied to these lots. A forest conservation easement is also to overlay the wetland and wetland buffer area. The site contains individual proposed trees (no specimen trees) and a majority of the site is maintained lawn.

Route 29 is located west of the site and the State Highway Administration has designed and funded the construction of a noise wall (HO3175170). Therefore, this project is not required to perform a noise study or noise mitigation plan.

#### METHODOLOGY

The site is proposed to be developed in accordance with the in-fill development criteria for the R-20 zoning district and the minimum lot size is 20,000 sf. Environmental Site Design has been utilized for the storm water management design. The  $P_e$  was computed for the developable area (3.36 ac). For this project the wetland, wetland buffer and forest conservation easement was removed from the gross site area. Subareas were established based on the proposed limits of disturbance and individual house sitings. The impervious areas including houses, driveways and use-in-common on driveway are predominantly treated to the maximum extent possible by non-rooftop disconnects, grass channels, rain gardens, rooftop disconnects and pervious concrete.

Generally the ESDv requirement for each subarea is satisfied by deducting the non-rooftop and rooftop credits and the grass swale credit from the total required. The balance of the ESDv is provided by the micro-bioretention facilities (rain garden). The preliminary computations do not account for the allowance to reduce the volume for the micro-bioretention to 75% of the ESDv. The micro-bioretention facility has been checked to assure that it is not accommodating more than the maximum allowed for its specific drainage area (2.6').

The on-site wetland is protected and enhanced by the implementation of a 25' wetland buffer and an additional 35' building setback which is located on a buildable lot. In addition, a forest conservation easement will be established in the environmental area. The existing drainage patterns have been preserved which will continue to provide hydrology to the wetlands. The 2011 Sediment and Erosion Control Standards will be utilized to protect existing environmental features which will be predominantly achieved through the use of silt fence and other techniques.

#### CONCLUSION

The preliminary Environmental Site Design computations illustrate that ESD can be adequately accomplished to the maximum extent possible for the proposed project. Currently, there are no disturbances proposed to environmental features. The natural drainage patterns have been preserved with the site drainage discharging to the swale and wetland located at the southwest side of the site. Soil test will be performed in conjunction with the Preliminary Equivalent Sketch Plan to verify that road and groundwater are not present at the proposed micro-bioretention locations.

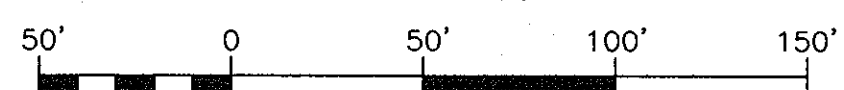
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/20/13  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

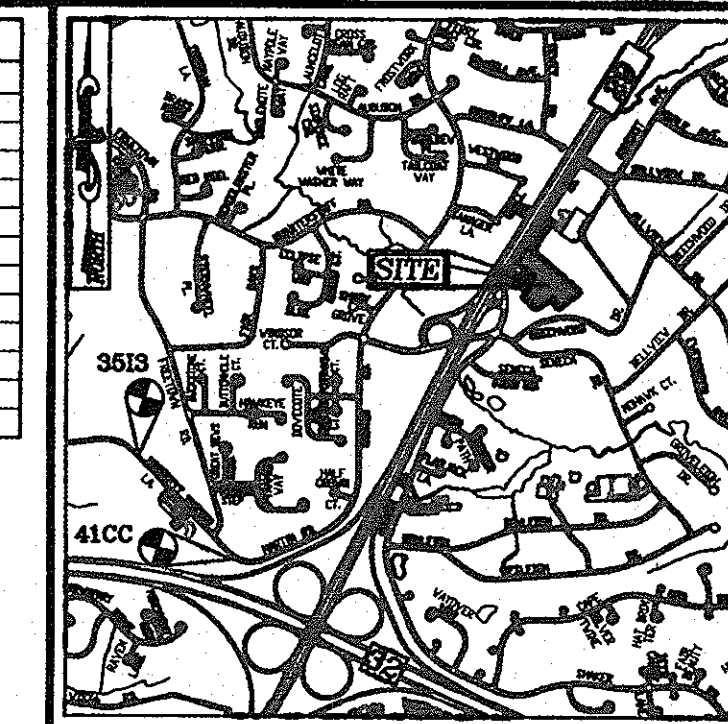
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CHIEF, DIVISION OF LAND DEVELOPMENT DATE

SHEET INDEX	
DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 4
SITE LAYOUT PLAN	2 OF 4
SOILS MAP, GRADING, EROSION AND SEDIMENT CONTROL PLAN	3 OF 4
DRAINAGE AREA MAP	4 OF 4

COVER SHEET  
SCALE: 1"=50'



COORDINATE TABLE	
NO.	EAST
104	1350052.82
109	1350132.98
106	1350561.37
107	1350571.44
108	1350414.60
109	1350230.26
110	1350112.46
301	1350374.55
302	1350227.35
305	1350461.46
308	1350674.22
314	1350163.84



VICINITY MAP  
SCALE: 1"=2,000'

ADC MAP COORDINATE: 4935, B-10

#### BENCHMARKS

HOWARD COUNTY BENCHMARK 3513 (CONC. MON.)  
N 553573.69 E 1346098.09 ELEV. 415.34  
HARRIET TUBMAN LA. BY ATHOLTON HS

HOWARD COUNTY BENCHMARK 41CC (CONC. MON.)  
MARTIN RD. NEAR CORNER OF FREETOWN RD.  
N 552494.26 E 1347062.39 ELEV. 399.95

#### LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF PAVING
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- PROP. 24' USE-IN-COMMON ACCESS EASEMENT
- PROP. 30' PUBLIC SEWER, WATER, & UTILITY EASEMENT
- PROP. FOREST CONSERVATION EASEMENT (RETENTION)
- EX. PUBLIC SEWER & UTILITY EASEMENT PLAT MOR 9987
- NON-ROOFTOP DISCONNECT (N-2)
- ROOFTOP DISCONNECT (N-1)
- PERVIOUS CONCRETE (A-2)
- ROOFTOP DISCONNECT
- PROPOSED RAIN GARDEN (M-6)

#### OWNER

MARY THERESA PFAU  
3675 PARK AVE., SUITE 301  
ELLCOTT CITY, MD 21043  
(410) 480-0023

#### DEVELOPER

TRINITY QUALITY HOMES, INC.  
3675 PARK AVE., SUITE 301  
ELLCOTT CITY, MD 21043  
(410) 480-0023

NO.	REVISION	DATE

#### ENVIRONMENTAL CONCEPT PLAN

#### COVER SHEET

#### STELLA GLEN

#### LOTS 1-7

PARCELS 57, 58 & 417 (L. 8293 / F. 433)

10580 SHAKER DRIVE

COLUMBIA, MD 21046

ZONED: R-20  
PARCELS: 57, 58 & 417  
HOWARD COUNTY, MARYLAND

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

DESIGN BY: RHV  
DRAWN BY: JMR  
CHECKED BY: RHV  
DATE: MARCH 2013  
SCALE: AS SHOWN  
W.O. NO.: 12-23

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18183, EXPIRATION DATE 09-27-2014.

1 SHEET OF 4

#### LOT AREA TABULATION

LOT	GROSS AREA	PIPESTEM AREA	NET AREA
1	24,944 SF	NA	24,944 SF
2	23,789 SF	765 SF	23,024 SF
3	24,152 SF	1,484 SF	22,668 SF
4	22,583 SF	2,530 SF	20,053 SF
5	22,068 SF	1,869 SF	20,199 SF
6	21,958 SF	1,439 SF	20,519 SF
7	21,016 SF	889 SF	20,127 SF

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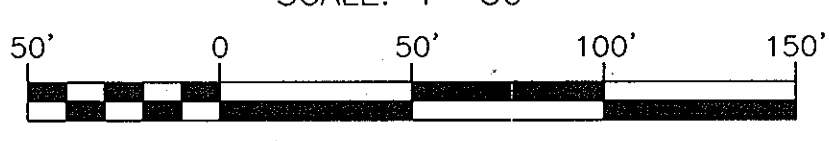


- LEGEND:**
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  - PROP. FOREST CONSERVATION EASEMENT (RETENTION)
  - EX. PUBLIC SEWER & UTILITY EASEMENT PLAT MOR 9987
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - EXISTING TREELINE
  - EXISTING TREES
  - EXISTING FENCE
  - PROPOSED STORMDRAIN
  - PROPOSED SIDEWALK
  - PROPOSED TREELINE

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LAYOUT PLAN  
 SCALE: 1"=50'



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 3/19/13  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 3/19/13  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**SITE LAYOUT PLAN**  
**STELLA GLEN**  
 LOTS 1-7  
 PARCELS 57, 58 & 417 (L. 8293 / F. 433)  
 10580 SHAKER DRIVE  
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 ZONED: R-20  
 PARCELS: 57, 58 & 417  
 HOWARD COUNTY, MARYLAND

TAX MAP: 36 GRID: 19  
 6TH ELECTION DISTRICT

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2 SHEET OF 4

**APPENDIX B.3. 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.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 COMBINED WITH THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH OR PROVE AN OBSTACLE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERBERIS GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOODS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- PH RANGE: 6.2-7.0
- ORGANIC MATTER: 1.5-4% (BY WEIGHT)
- MAGNESIUM: 30 LB/AC
- PHOSPHORUS (PHOSPHATE - P2O5): 17.5 LB/AC
- POTASSIUM (POTASH - K2O): 85 LB/AC
- SOLUBLE SALTS: NOT 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 SOLUBLE 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 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 TOOLS TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE LOCATED USING UNDER, THE CONTRACTOR SHOULD USE WIDE TRACK OR WASH TRUCK EQUIPMENT, OR LIGHT EQUIPMENT WITH TIRE TYPE 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 REFRACURE 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 PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 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/DOZER WITH WASH TRUCKS.

**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. 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 PLANTED SO BOTH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST 20% HIGHER 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-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 EXCESSIVE DEBRIS OR AT ALL MINIMUM IMPROVES THE SOIL. 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.

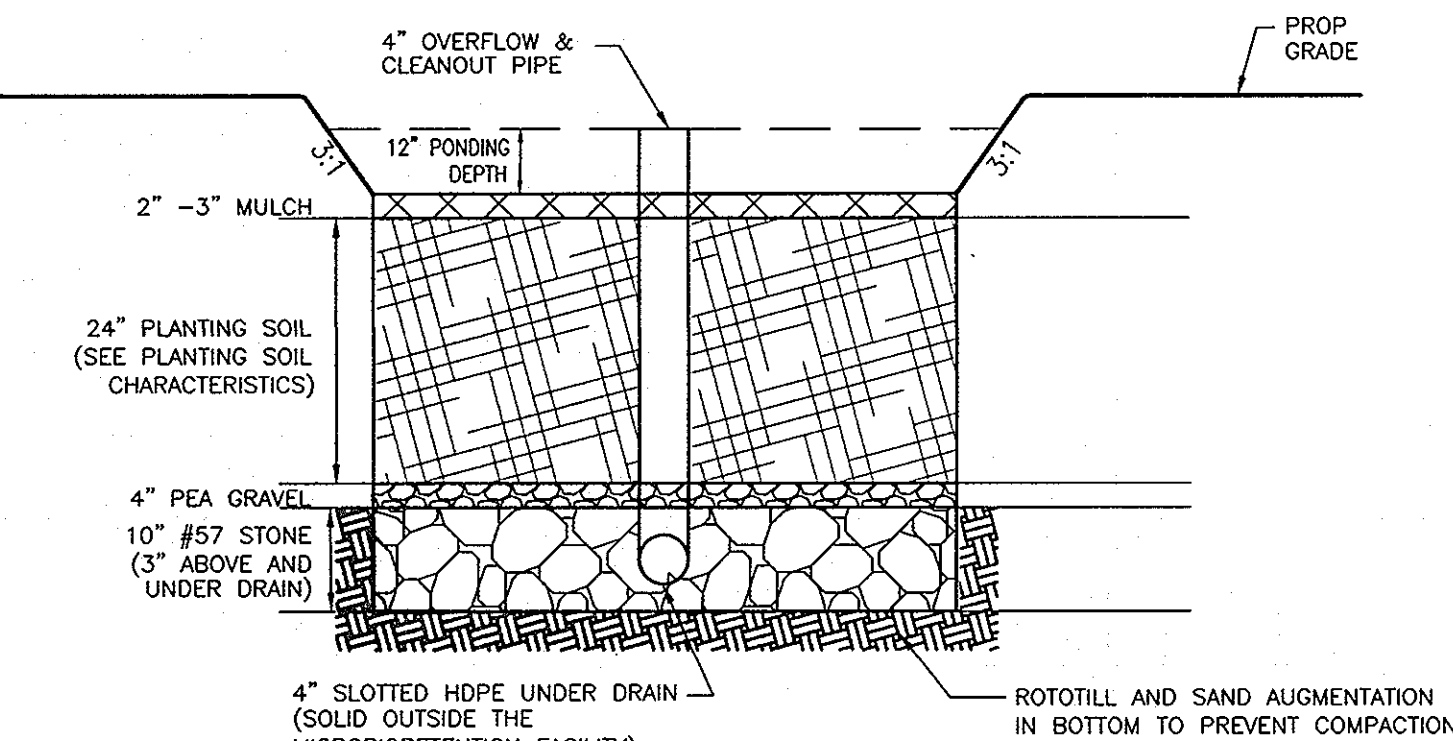
**6. UNDERDRAINS**

UNDERDRAINS ARE TO BE PLACED ON A 3'-2" 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 CLEANOUT PIPES MUST BE PROVIDED ONE ANCHOR 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.



**DETAIL - MICROBIORETENTION**  
NOT TO SCALE

**OPERATION AND MAINTENANCE**

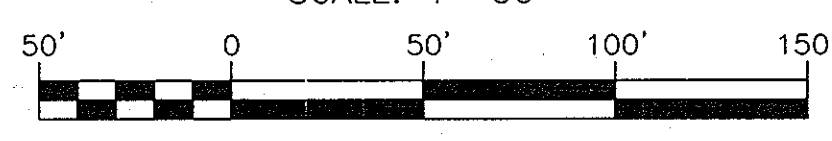
**SCHEDULE FOR BIO-RETENTION AREAS**

1. 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. 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.
  2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DEFICIENT STAKES AND WIRES.
  3. MULCH SHALL BE INSPECTED 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 WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

**NOTE:**  
DUE TO CLOSE PROXIMITY OF THE WETLANDS PROVIDE A DOUBLE ROW OF "SUPER SILT FENCE" ALONG THE DOWNHILL SIDE OF LOTS 6 & 7.

**GRADING PLAN**

SCALE: 1"=50'



**LEGEND:**

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF PAVING
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- PROP. USE-IN-COMMON ACCESS EASEMENT
- PROP. 30' PUBLIC SEWER, WATER, & UTILITY EASEMENT
- PROP. FOREST CONSERVATION EASEMENT (RETENTION)
- EX. PUBLIC SEWER & UTILITY EASEMENT PLAT MOR 9987
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREELINE
- EXISTING TREES
- EXISTING FENCE
- PROPOSED STORMDRAIN
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING STEEP SLOPES
- EXISTING MODERATE SLOPES
- PROPOSED SUPER SILT FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED EROSION CONTROL MATTING
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED RAIN GARDEN
- PROPOSED INLET PROTECTION

**OWNER**

MARY THERESE PAU  
3675 PARK AVE., SUITE 301  
ELLCOTT CITY, MD 21043  
(410) 480-0023

**DEVELOPER**

TRINITY QUALITY HOMES, INC.  
3675 PARK AVE SUITE 301  
ELLCOTT CITY, MD 21043  
(410) 480-0023

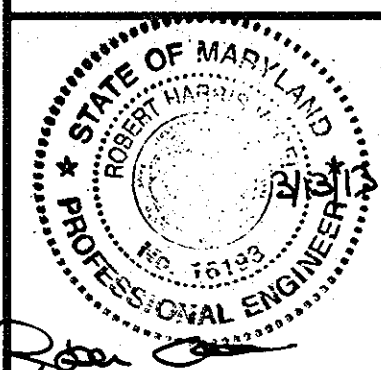
NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN  
SOILS MAP, GRADING, EROSION, AND  
SEDIMENT CONTROL PLAN  
STELLA GLEN**

LOTS 1-7  
PARCELS 57, 58 & 417 (L. 8293 / F. 433) ZONED: R-20  
10580 SHAKER DRIVE  
COLUMBIA, MD 21046 PARCELS: 57, 58 & 417  
HOWARD COUNTY, MARYLAND

TAX MAP: 36 GRID: 19  
6TH ELECTION DISTRICT

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET TEL: 410.461.7666  
ELLCOTT CITY, MD 21043 FAX: 410.461.8911



**PROFESSIONAL CERTIFICATE**  
DESIGN BY: RHV  
DRAWN BY: JMR  
CHECKED BY: RHV  
DATE: MARCH 2013  
SCALE: AS SHOWN  
W.O. NO.: 12-23

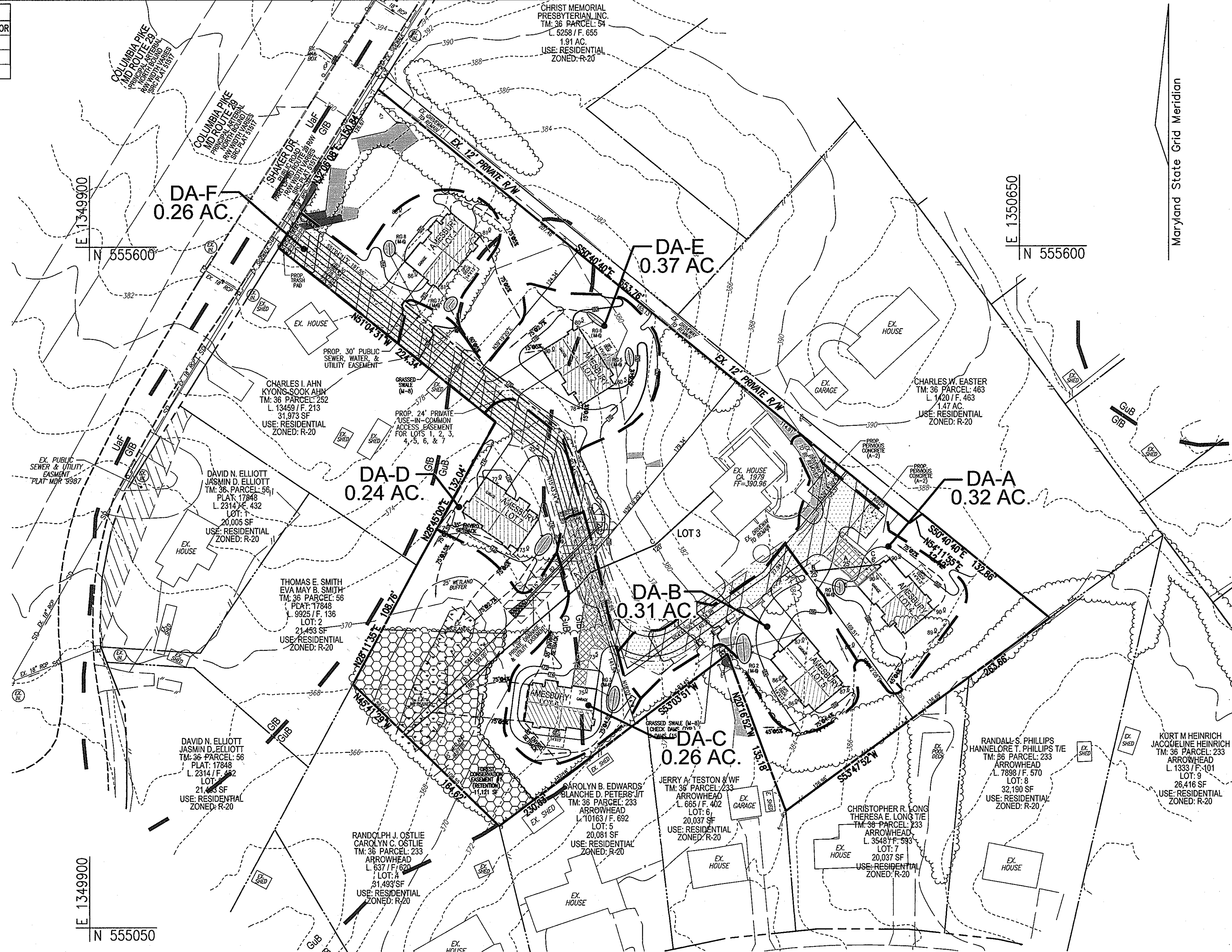
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 06-27-2014.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 3/20/13  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 3/19/13  
CHIEF, DIVISION OF LAND DEVELOPMENT

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR
GfB	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B	0.20
GwB	GLENVILLE-URBAN LAND-UDORTMENTS COMPLEX, 0 TO 8 PERCENT SLOPES	C	0.37
UoF	UDORTMENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR
G1B	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B	0.20
G6B	GLENVILLE-URBAN LAND-UDORTHERTS COMPLEX, 0 TO 8 PERCENT SLOPES	C	0.37
U6F	UDORTHERTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-



LEGEND:	
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ADJACENT PROPERTY LINE
	EXISTING CURB AND GUTTER
	EXISTING EDGE OF PAVING
	EXISTING WETLANDS
	EXISTING WETLAND BUFFER
	PROP. USE-IN-COMMON ACCESS EASEMENT
	PROP. 30' PUBLIC SEWER, WATER, & UTILITY EASEMENT
	PROP. FOREST CONSERVATION EASEMENT (RETENTION)
	EX. PUBLIC SEWER & UTILITY EASEMENT PLAT MDR 9987
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
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	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
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	EXISTING FENCE
	PROPOSED STORMDRAIN
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	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	PROPOSED 10' CONTOUR
	PROPOSED 2' CONTOUR
	PROPOSED SPOT ELEVATION
	EXISTING STEEP SLOPES
	EXISTING MODERATE SLOPES
	DRAINAGE AREA DV/DV
	NON-ROOFTOP DISCONNECT (N-2)
	ROOFTOP DISCONNECT (N-1)
	PERMEABLE CONCRETE (A-2)
	ROOFTOP DISCONNECT
	PROPOSED RAIN GARDEN (M-6)

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**ESDv PRACTICES BY DRAINAGE AREA**

<b>Drainage Area A</b>	
Rooftop Disconnect N-1	962 sf
Non-rooftop Disconnect N-2	1100 sf
Micro Bioretention M-6	962 sf
Permeable Concrete A-2	1440 sf
<b>Drainage Area B</b>	
Rooftop Disconnect N-1	962 sf
Grass Swale M-8	2100 sf
Micro Bioretention M-6	962 sf
<b>Drainage Area C</b>	
Rooftop Disconnect N-1	1441 sf
Non-rooftop Disconnect N-2	1100 sf
Micro Bioretention M-6	782 sf
<b>Drainage Area D</b>	
Rooftop Disconnect N-1	1925 sf
Grass Swale M-8	1600 sf
Micro Bioretention M-6	1001 sf
<b>Drainage Area E</b>	
Rooftop Disconnect N-1	1925 sf
Grass Swale M-8	1600 sf
Micro Bioretention M-6	962 sf
<b>Drainage Area F</b>	
Rooftop Disconnect N-1	1445 sf
Grass Swale M-8	1920 sf
Micro Bioretention M-6	962 sf

**PROJECT STELLA GLEN**  
DESIGNER RHV  
DATE 01/04/13

**ROBERT H. VOGEL ENGINEERING, INC.**

**PROJECT: STELLA GLEN**  
TOTAL AREA: 3.68 AC  
NET DEVELOPABLE AREA: 3.36 AC  
TARGET Pe: 1.20 IN

DRAINAGE AREA #	AREA TREATED	FACILITY NUMBER	ENVIRONMENTAL SITE DESIGN PRACTICE						ESDv VOLUME		
			ROOFTOP DISCONNECT N-1	NONROOFTOP DISCONNECT N-2	GRASS SWALE M-8	MICRO BIORETENTION M-6	PERVIOUS CONCRETE A-2	ESDv			
A	13504	1	64	73	0	79	282	0	0	0	498
B	13939	2	64	0	166	245	0	0	0	0	475
C	11000	3	120	92	0	140	0	0	0	0	352
D	10817	4	160	0	158	158	0	0	0	0	476
E	12210	5	79	0	158	190	0	0	0	0	427
F	11781	6	112	0	106	253	0	0	0	0	471

TOTAL AREA 73251 SF  
1.68 AC

TOTAL ESDv PROVIDED 2699

DRAINAGE AREA	IMPERVIOUS AREA	GRASS AREA	TOTAL AREA	PERCENT IMPERVIOUS	RV	ESDv MIN	ESDv MAX	ESDv COMPUTED
A	4789	8665	13454	0.36	0.37	415	1080	498
B	4405	9565	13970	0.32	0.33	389	1010	466
C	3326	7674	11000	0.30	0.32	295	768	354
D	2700	8117	10817	0.25	0.27	248	644	297
E	4125	8085	12210	0.34	0.35	360	937	432
F	4545	7236	11781	0.39	0.40	390	1014	468
<b>TOTAL AREA</b>			<b>73232 SF</b>					<b>2516 CF</b>
								<b>1.68 AC</b>

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 3/20/13  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 3/19/13  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**DRAINAGE AREA MAP**  
**STELLA GLEN**  
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4 SHEET OF 4