

SEQUENCE OF CONSTRUCTION

- NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION
1. OBTAIN GRADING PERMIT. (DAY 1)
 2. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND SUPER SILT FENCE. (DAY 2-4)
 3. UPON APPROVAL OF HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, DEVELOP PERIMETER BYPASS SWALES. (DAY 5-12)
 4. CLEAR AND GRUB REMAINDER OF SITE. (DAY 13-16)
 5. BRING SITE TO GRADE. (DAY 17-31)
 6. FINE GRADE UIC DRIVEWAY AND PAVES. (DAY 32-40)
 7. UPON STABILIZATION OF CONTRIBUTING AREAS, CONSTRUCT BIORETENTION FACILITY MB-A. (DAY 41-45)
 8. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES, AND STABILIZED DISTURBED AREAS IN ACCORDANCE TO THE PERMANENT SEEDBED NOTES. (DAY 46-48)

SITE ANALYSIS DATA/TABULATION

A) TOTAL PROJECT AREA.....	1.84± AC.
B) AREA OF WETLANDS AND BUFFER.....	0.00 AC.
C) AREA OF 100-YR. FLOODPLAIN.....	0.00 AC.
D) AREA OF FOREST.....	1.70 AC.
E) AREA OF STEEP SLOPES 15% OR GREATER.....	0.06 AC.
F) AREA OF DEDICATION.....	0.00 AC.
G) ERODIBLE SOILS.....	0.97 AC.
H) AREA OF PLAN SUBMISSION.....	1.84± AC.
I) LIMIT OF DISTURBED AREA.....	1.61± AC.
J) GREEN OPEN AREA.....	1.32± AC.
K) PRESENT ZONING DESIGNATION.....	R-SC
L) PROPOSED USES FOR THE SITE: RESIDENTIAL.....	
M) IMPERVIOUS COVER.....	28.1%

DESIGN NARRATIVE:

The site was analyzed as woods in good condition and a target RCN was determined. A target rainfall depth treatment (P_t) was determined based on the measured impervious areas and HSG soil types. The target P_t for this site is 1.9 inches. The target P_t was treated using Environmental Site Design practices as outlined in Chapter 5 of the 2000 Maryland Stormwater Design Manual, as amended by Maryland's Stormwater Management Act of 2007. The selected methods include Micro-bioretenion (M-6) and Landscape Infiltration facilities (M-7), Dry Wells (M-5), and a Grass Swale (M-8). The grass swale at the driveway entrance will provide water quality treatment for the portion of driveway which cannot be captured within the micro-bioretenion facility. The remaining facilities are somewhat oversized to provide storage volume for the full ESDV for the site.

This site is a wooded parcel surrounded by mostly developed land. To protect the natural resources in the area, it is important to delay release of stormwater runoff from new impervious areas to avoid increasing peak runoffs, and to adequately treat the stormwater to avoid damage to sensitive species. The design incorporates grass swales, landscape infiltration, dry wells and micro-bioretenion facilities to treat stormwater runoff and to delay stormwater release. The outfalls for the facilities will flow to an existing stormdrain system which currently collects the runoff from this area. The grass swale at the driveway entrance will provide water quality treatment for the portion of driveway which cannot be captured within the micro-bioretenion facility. The remaining facilities are somewhat oversized to provide storage volume for the full ESDV for the site. Some natural drainage patterns have been maintained; however, locally the natural drainage patterns have already been disrupted due to the density of development in this area, so the conveyance of a portion of the on-site runoff to the storm drain system should have no adverse effect on the environment. Placement of infiltration facilities may improve the groundwater recharge of the site.

Sediment and erosion controls have been designed based on the 2011 Maryland Specifications for Soil Erosion and Sediment Control. Erosion control matting and super silt fence will be used to prevent runoff containing unacceptable levels of TSS from leaving the site and entering the adjacent stream and wetlands during the construction. It will be the obligation of the contractor to install, inspect and maintain these practices.

The target P_t for this site is 1.9 inches. By using Environmental Site Design practices as outlined in Chapter 5 of the 2000 Maryland Stormwater Design Manual, as amended by Maryland Stormwater Management Act of 2007, full treatment of the target P_t of 1.9 was achieved, fully addressing the stormwater management requirements.

A Waiver Petition will be submitted requesting approval to remove specimen trees, and to proceed to Final Construction plans.

PROJECT	Hilltop Landing	DATE	03/17/15
DETAILED SIZING OF PRACTICES			
Pe: 1.9 inches			
Raw: Raw has been calculated for the site, then averaged by the total of the filter areas of the micro-bioretenion facilities. A single depth of raw storage will be applied to all MB facilities.			
Total Raw for MBR drainage on	387 cf		
Total filter area:	1413 sf		
Depth of raw storage for each:	0.27 ft, or 3.3 inches - use	4"	
Total Raw provided in MBR:	471 cf		
Storage Computation:			
Drainage Area MB-A: Micro-Bioretenion (M-6)	17633 s.f.	Storage Area	390.0
Total Drainage Area:	6970 s.f.	Average Area	101.2
Impervious Area:	302.0	Contour Interval	0.0
Impervious:	40%	Volume	0
Rv =	0.40	Volume	0
ESDV =	944.0 c.f.	Volume	872
75% Rec'd Storage:	715	Min. Area of Filter (@ 2% DA):	352.60 OK
Treated ESD Volume:	1162 (Storage Volume/0.75)		
Pe Treated:	1.95 inches		
Lot 1 Drywells			
Drainage Area MB-4: Micro-Bioretenion (M-6)	17633 s.f.	Storage Area	390.0
Total Drainage Area:	6970 s.f.	Average Area	101.2
Impervious Area:	302.0	Contour Interval	0.0
Impervious:	40%	Volume	0
Rv =	0.40	Volume	0
ESDV =	944.0 c.f.	Volume	872
75% Rec'd Storage:	715	Min. Area of Filter (@ 2% DA):	352.60 OK
Treated ESD Volume:	1162 (Storage Volume/0.75)		
Pe Treated:	1.95 inches		
Drainage Area LK-2: Landscape Infiltration (M-5)			
Total Drainage Area:	9768 s.f.	Storage Area	390.0
Impervious Area:	3538 s.f.	Average Area	101.2
Impervious:	36%	Contour Interval	0.0
Rv =	0.36	Volume	0
ESDV =	469.7 c.f.	Volume	339
75% Rec'd Storage:	352	Min. Area of Filter (@ 2% DA):	156.30 OK
Treated ESD Volume:	574		
Pe Treated:	2.40 inches		
Drainage Area LK-3: Landscape Infiltration (M-5)			
Total Drainage Area:	9677 s.f.	Storage Area	390.0
Impervious Area:	3628 s.f.	Average Area	101.2
Impervious:	37%	Contour Interval	0.0
Rv =	0.37	Volume	0
ESDV =	499.9 c.f.	Volume	338
75% Rec'd Storage:	352	Min. Area of Filter (@ 2% DA):	153.54 OK
Treated ESD Volume:	572		
Pe Treated:	2.44 inches		
Drainage Area MB-6: Micro-Bioretenion (M-6)			
Total Drainage Area:	4094 s.f.	Storage Area	390.0
Impervious Area:	2000 s.f.	Average Area	101.2
Impervious:	49%	Contour Interval	0.0
Rv =	0.49	Volume	0
ESDV =	287.3 c.f.	Volume	214
75% Rec'd Storage:	200	Min. Area of Filter (@ 2% DA):	81.88 OK
Treated ESD Volume:	285 (Storage Volume/0.75)		
Pe Treated:	1.70 inches		
Drainage Area MB-6: Micro-Bioretenion (M-6)			
Total Drainage Area:	4400 s.f.	Storage Area	390.0
Impervious Area:	2000 s.f.	Average Area	101.2
Impervious:	45%	Contour Interval	0.0
Rv =	0.45	Volume	0
ESDV =	268.4 c.f.	Volume	209
75% Rec'd Storage:	200	Min. Area of Filter (@ 2% DA):	88.18 OK
Treated ESD Volume:	279 (Storage Volume/0.75)		
Pe Treated:	1.66 inches		
Drainage Area MB-7: Micro-Bioretenion (M-6)			
Total Drainage Area:	2514 s.f.	Storage Area	390.0
Impervious Area:	2000 s.f.	Average Area	101.2
Impervious:	80%	Contour Interval	0.0
Rv =	0.76	Volume	0
ESDV =	258.8 c.f.	Volume	214
75% Rec'd Storage:	193	Min. Area of Filter (@ 2% DA):	50.28 OK
Treated ESD Volume:	285 (Storage Volume/0.75)		
Pe Treated:	1.77 inches		
Drainage Area SW-B: Grass Swale (M-8)			
Total Drainage Area:	3758	Swale Slope	0.04 ft
Impervious Area:	1112	Swale length:	96 ft
Impervious:	30%	Bottom width:	2.5 ft
Rv =	0.30	Side Slopes:	3:1
ESDV =	158.5	Average Depth:	0.334 ft, or 4.0 inches
WQ Treatment:	99.1	Cross Sec. Area:	1.17
		ESDV Provided:	112.3
		Total ESDV provided:	3590

SPECIMEN TREE CHART

KEY	SPECIES	SIZE (IN. DBH)	CRZ (FT. RADII)	COMMENTS
1	WHITE OAK	33	49.5	GOOD CONDITION - TO REMAIN - OFF SITE
2	TULIP POPLAR	32.5	48.75	GOOD CONDITION - TO BE REMOVED
3	TULIP POPLAR	35	52.5	GOOD CONDITION - TO REMAIN
4	TULIP POPLAR	30.54	45.75	GOOD CONDITION - TO BE REMOVED

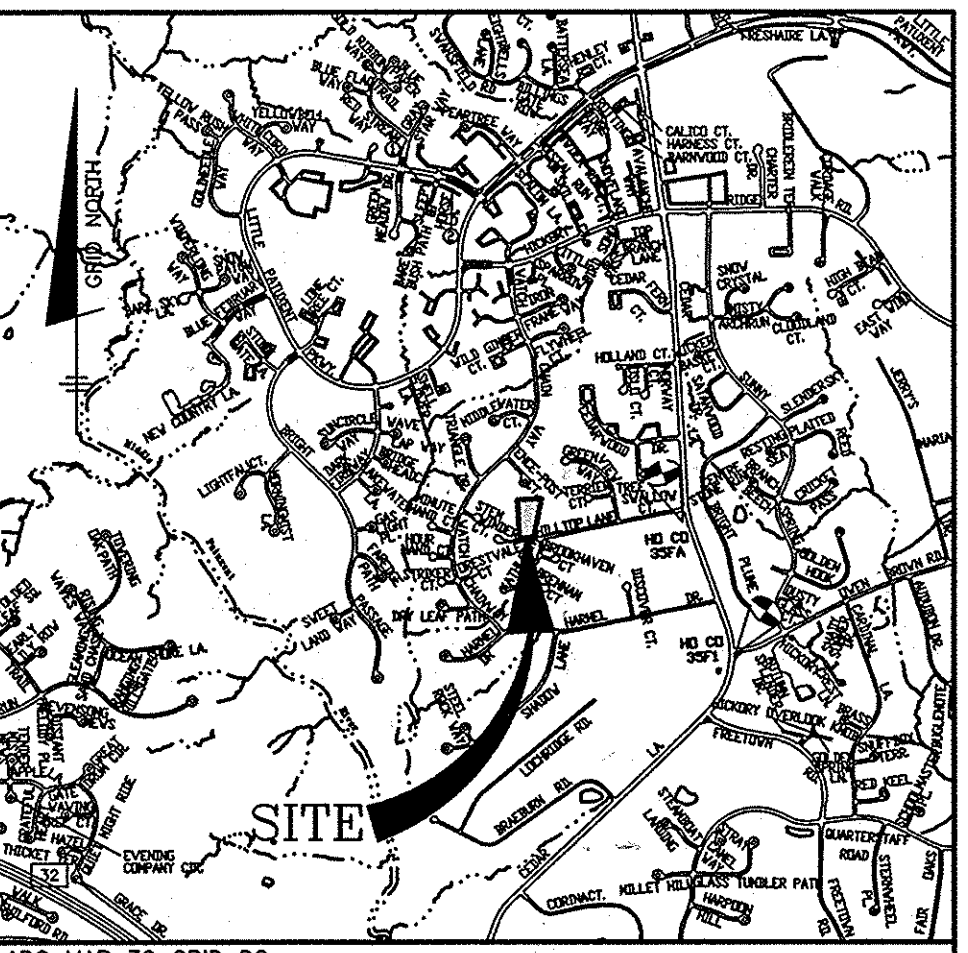
GENERAL NOTES

1. SUBJECT PROPERTY ZONED M-2 PER THE COMPREHENSIVE ZONING PLAN EFFECTIVE 10-6-2013.
2. THIS PROJECT 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 OF 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.
3. PROJECT BOUNDARY AND TOPOGRAPHY WITHIN THE SUBDIVISION AREA ARE BASED ON FIELD RUN BOUNDARY SURVEY AND TOPO PERFORMED BY FISHER, COLLINS & CARTER, INC. IN APRIL, 2014.
4. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAM, OR THEIR REQUIRED BUFFERS UNLESS DEEMED NECESSARY BY THE DEPARTMENT OF PLANNING AND ZONING.
5. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERIES LOCATED ON THIS SITE.
6. THE FOREST CONSERVATION ACT OBLIGATION FOR THIS PROJECT WILL BE ADDRESSED BY PAYMENT OF FEE-IN-LIEU, BASED ON A REQUIREMENT OF LESS THAN ONE ACRE. THE FOREST CONSERVATION WILL BE FURTHER REVIEWED AND DETERMINED WITH THE SUBMISSION OF THE SUBDIVISION PLAN FOR THIS PROJECT.
7. THERE ARE NO STEEP SLOPES (25% OR GREATER) ON THIS SITE.
8. THERE ARE NO WETLANDS ON THE SITE, AS CONCLUDED IN THE REPORT BY ECO-SCIENCE PROFESSIONALS DATED SEPTEMBER, 2014.
9. A FOREST STAND DELINEATION WAS PERFORMED BY ECO-SCIENCE PROFESSIONALS, AND IS DOCUMENTED IN A REPORT DATED SEPTEMBER, 2014.
10. PREVIOUS DPZ FILES: NONE
11. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN, SITE DEVELOPMENT PLAN, OR GRADING OR BUILDING PERMIT PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION, SITE DEVELOPMENT PLAN, OR GRADING AND BUILDING PERMIT STAGES.

BENCHMARKS NAD'83 HORIZONTAL

HO. CO. #35FA
STAMPED BRASS DISK SET ON TOP OF CONCRETE BASE.
N 559266.1334' E 1344682.6389'
ELEVATION: 410.329'

HO. CO. #35F1
STAMPED BRASS DISK SET ON TOP OF CONCRETE BASE
N 557787.3788' E 1345217.2645'
ELEVATION: 400.439'



VICINITY MAP
SCALE: 1" = 2000'

SOILS LEGEND

MAP SYMBOL	SOIL GROUP	"K" FACTOR	SOIL TYPE
GuB	C	0.43	GLENVILLE-URBAN LAND-URDORTHERS COMPLEX, 0 TO 8 PERCENT SLOPES
GfB	B	0.28	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES

TAKEN FROM NRCS WEB SOIL SURVEY, AUGUST 2014, HOWARD SOIL SURVEY MAP NO. 17

BENCHMARK ENGINEERING, INC.

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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. 28376, Expiration Date: 1-1-2017.

NO.	DATE	REVISION
PROJECT: HILLTOP LANDING LOTS 1-7 AND OPEN SPACE LOT 8 A RESUBDIVISION OF CEDAR ACRES BLOCK A, LOT 12 PLAT BOOK 4, FOLIO 11, 10932 HILLTOP LANE		
LOCATION: TAX MAP 35 GRID 11 PARCEL 41 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE: ENVIRONMENTAL CONCEPT PLAN		
DATE: MARCH, 2015	PROJECT NO. 2615	
DRAFT: AM	DESIGN: AM	CHECK: CAM
SCALE: AS SHOWN	SHEET 1 OF 1	

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 3-31-15
CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-21-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION

