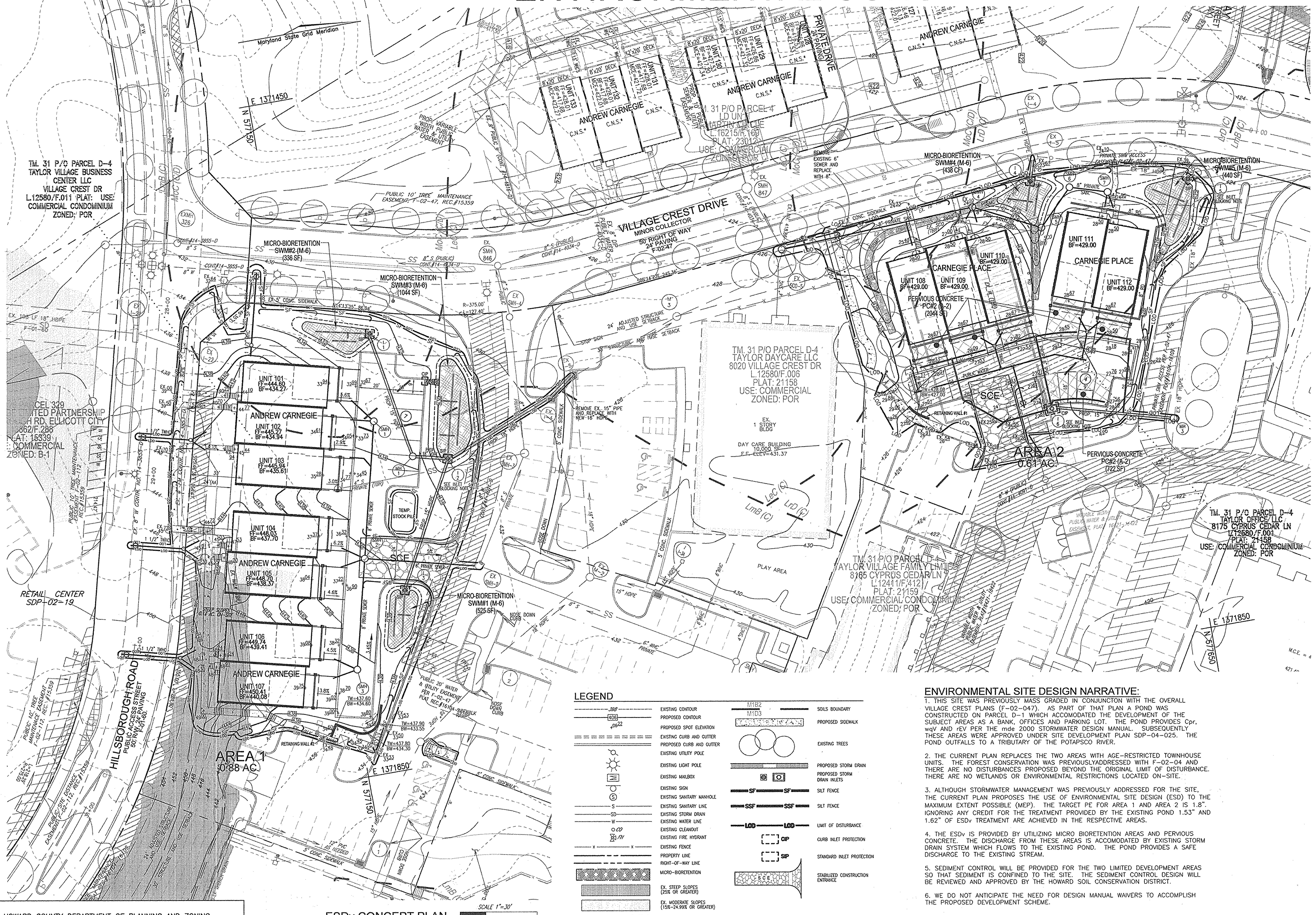
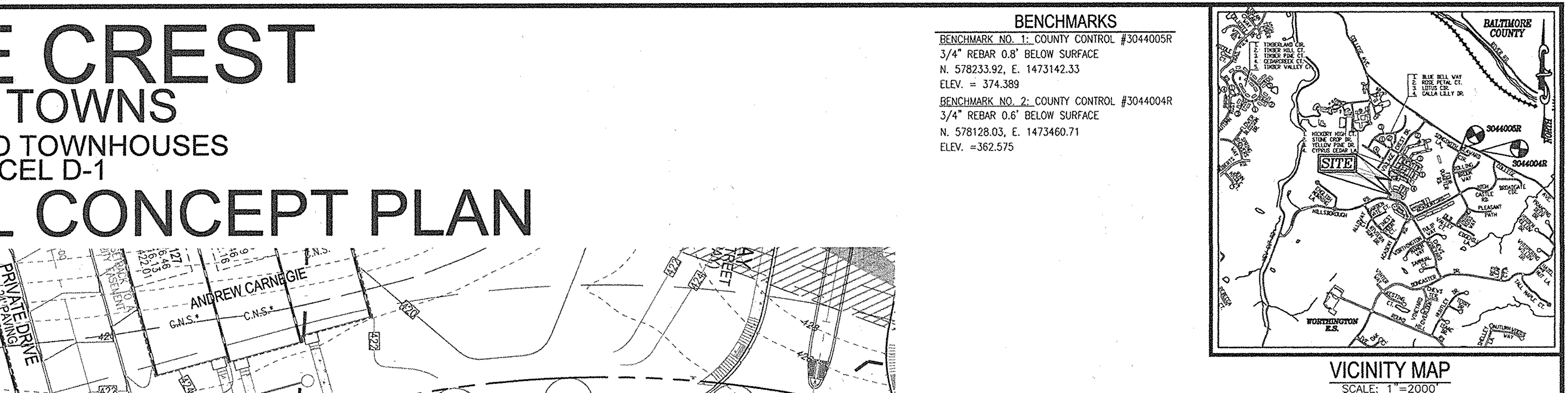
VILLAGE CREST
SENIOR TOWNS
AGE RESTRICTED TOWNHOUSES
P/O PARCEL D-1
ENVIRONMENTAL CONCEPT PLAN





VICINITY MAP
SCALE: 1"=2000'
ADC MAP COORDINATE: PAGE 4816 D10

BENCHMARKS
BENCHMARK NO. 1: COUNTY CONTROL #3044005R
3/4" REBAR 0.8' BELOW SURFACE
N. 578233.92, E. 1473142.33
ELEV. = 374.389

BENCHMARK NO. 2: COUNTY CONTROL #3044004R
3/4" REBAR 0.6' BELOW SURFACE
N. 578128.03, E. 1473460.71
ELEV. =362.575

GENERAL NOTES

1. ALL CONSTRUCTION, WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY, O.S.H.A. AND MARYLAND STATE HIGHWAY ADMINISTRATION AS APPLICABLE.
2. SITE ANALYSIS:
   TOTAL DEVELOPMENT AREA (PADCEL 'D-1'): 38.94 AC.
   GROSS PROJECT AREA (AREA 1 AND 2): 1.55 AC.
   AREA 1: 0.63 AC.
   AREA 2: 0.92 AC.
   NET PROJECT AREA (MINUS FLOODPLAIN AND STEEP SLOPES): 1.48 AC.
   PRESENT ZONING: POR
   USE OF STRUCTURE: AGE RESTRICTED TOWNHOUSES
   TOTAL BUILDING COVERAGE (FOOTPRINT AREA): 14,513 SF (0.333 AC. OR 22.35% OF GROSS AREA)
   PAVED PARKING LOT/AREA ON SITE: 15,264 SF (0.35 AC. OR 22.58% OF GROSS AREA)
   AREA OF LANDSCAPE ISLAND: 1,114 SF (0.03 AC. OR 1.94% OF GROSS AREA)
   AREA OF STEEP SLOPES: 0.07 AC.
   AREA OF FLOODPLAIN: 0.0 AC.
   LIMIT OF DISTURBED AREA: 1.486 AC.
   CUT: 1,500 CY FILL: 1,500 CY (SUBJECT TO CONTRACTOR CONFIRMATION)
3. PROJECT BACKGROUND:
   LOCATION : ELLICOTT CITY, MD.; TAX MAP 31, BLOCK 03, PARCEL D-1, PARCEL 4, LAND UNITS 2 AND 4.
   ZONING : POR
   SUBDIVISION : VILLAGE CREST
   SECTION/AREA : N/A
   SITE AREA : 1.55 AC.
   DPZ REFERENCES : P-00-07, S-99-18, S-00-05, F-01-60, P-01-20, F-02-47, F-02-112, F-04-077, SDP-04-25
4. EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND 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.
5. COORDINATES AND ELEVATIONS ARE BASED ON MARYLAND COORDINATE SYSTEM – NAD83(1991) AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS #3044005R AND #3044004.
6. THE PROPERTY LINES SHOWN HEREON IS BASED ON A FIELD-RUN BOUNDARY SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC., DATED SEPTEMBER 19, 2014.
7. EXISTING TOPOGRAPHY SHOWN HEREON IS TAKEN FROM A FIELD RUN TOPOGRAPHIC SURVEY WITH TWO FOOT CONTOUR INTERVALS WAS PREPARED BY ROBERT H. VOGEL ENGINEERING, INC.; DATED JUNE 2010.
8. OFFSITE TOPOGRAPHY IS FROM HOWARD COUNTY GIS AND AVAILABLE RECORD DRAWINGS.
9. ALL ELEVATIONS ARE TO FLOWLINE/BOTTOM OF CURB UNLESS OTHERWISE NOTED.
10. THE PROPOSED BUILDINGS TO HAVE ROOF LEADERS WHICH EMPTY INTO THE STORMWATER MANAGEMENT FACILITES, WHICH ULTIMATELY COLLECT INTO THE STORM DRAIN SYSTEM.
11. PUBLIC SEWER AVAILABLE THROUGH CONT. 14-4034-D. PUBLIC WATER IS AVAILABLE THROUGH CONT. 14-3855 AND 44-4091-D.
12. THE SUBJECT PROPERTY IS ZONED POR IN ACCORDANCE WITH THE 10/06/13 COMPREHENSIVE ZONING PLAN.
13. THIS PROJECT IS SUBJECT TO COMPLIANCE WITH THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY 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 APPLICATIONS.
14. THE EXISTING HILLSBOROUGH ROAD IS CLASSIFIED AS A PUBLIC ACCESS ROAD AND VILLAGE CREST DRIVE IS CLASSIFIED AS A MINOR COLLECTOR.
15. THE ENVIRONMENTAL LETTER WAS PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. DATED NOVEMBER 8, 2015.
16. THERE ARE NO WETLANDS, STREAMS, THEIR BUFFERS, AND 100-YEAR FLOODPLAIN LOCATED ON-SITE.
17. THERE ARE STEEP SLOPES LOCATED ON-SITE.
18. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE, AND THE LANDSCAPE MANUAL.
19. THE FOREST CONSERVATION OBLIGATION FOR THIS PROJECT HAVE BEEN PREVIOUSLY ADDRESSED BY THE VILLAGE CREST ROAD PLAN (F-02-047).
20. THERE ARE NO SPECIMEN TREES WITHIN THE LOD.
21. STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIORETENTIONS AND PERVIOUS CONCRETE. THESE FACILITIES SHALL BE PRIVATELY OWNED AND MAINTAINED. STORMWATER MANAGEMENT Cpv, WQv AND Rev WAS PREVIOUSLY PROVIDED IN CONJUNCTION WITH F-02-47.
22. THE COMMUNITY MEETING FOR THIS PROJECT WAS CONDUCTED ON OCTOBER 28, 2015 AT HOWARD COUNTY PUBLIC LIBRARY, ELLICOTT CITY.
23. THE TOTAL ACREAGE OF THIS PROJECT IS 1.49 AC, WHICH INCLUCES AREA 1 (0.61 AC.) AND AREA 2 (0.88 AC.).
24. AS REQUIRED BY SECTION 115.0.E.1 OF THE ZONING REGULATIONS, UNIVERSAL DESIGN FEATURES HAVE BEEN INCORPORATED TO MAKE INDIVIDUAL DWELLINGS ADAPTABLE TO PERSONS WITH MOBILITY OR FUNCTIONAL LIMITATIONS AND TO PROVIDE ACCESSIBLE ROUTES BETWEEN PARKING AREAS, SIDEWALKS, DWELLING UNITS AND COMMON AREAS. DWELLING FEATURES INCLUDE ELEVATORS AND ZERO-THRESHOLD GARAGES IN EACH UNIT. SITE ACCESSIBILITY IS ENSURED BY PLACEMENT OF ACCESSIBLE PARKING DISTRIBUTED THROUGHOUT THE SITE ALONG ACCESSIBLE ROUTES IN CLOSE PROXIMITY TO COMMON USE AREAS.
25. 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 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.

OWNERS
TAYLOR VILLAGE BUSINESS CENTER, LLC
AND TAYLOR OFFICE, LLC
C/O TAYLOR VILLAGE FAMILY
LIMITED PARTNERSHIP
4100 COLLAGE AVE
ELLICOTT CITY, MD 21043

DEVELOPER
TAYLOR PROPERTIES
DEVELOPMENT CORPORATION
4100 COLLEGE AVENUE
P.O. BOX 396
ELLICOTT CITY, MD 21043
PHONE: 410-465-3500

ENVIRONMENTAL SITE DESIGN NARRATIVE:

1. THIS SITE WAS PREVIOUSLY MASS GRADED IN CONJUNCTON WITH THE OVERALL VILLAGE CREST PLANS (F-02-047). AS PART OF THAT PLAN A POND WAS CONSTRUCTED ON PARCEL D-1 WHICH ACCOMODATED THE DEVELOPMENT OF THE SUBJECT AREAS AS A BANK, OFFICES AND PARKING LOT. THE POND PROVIDES Cpr, wqV AND rEV PER THE mde 2000 STORMWATER DESIGN MANUAL. SUBSEQUENTLY THESE AREAS WERE APPROVED UNDER SITE DEVELOPMENT PLAN SDP-04-025. THE POND OUTFALLS TO A TRIBUTARY OF THE POTAPSCO RIVER.

2. THE CURRENT PLAN REPLACES THE TWO AREAS WITH AGE-RESTRICTED TOWNHOUSE UNITS. THE FOREST CONSERVATION WAS PREVIOUSLYADDRESSED WITH F-02-04 AND THERE ARE NO DISTURBANCES PROPOSED BEYOND THE ORIGINAL LIMIT OF DISTURBANCE. THERE ARE NO WETLANDS OR ENVIRONMENTAL RESTRICTIONS LOCATED ON-SITE.

3. ALTHOUGH STORMWATER MANAGEMENT WAS PREVIOUSLY ADDRESSED FOR THE SITE, THE CURRENT PLAN PROPOSES THE USE OF ENVIRONMENTAL SITE DESIGN (ESD) TO THE MAXIMUM EXTENT POSSIBLE (MEP). THE TARGET PE FOR AREA 1 AND AREA 2 IS 1.8". IGNORING ANY CREDIT FOR THE TREATMENT PROVIDED BY THE EXISTING POND 1.53" AND 1.62" OF ESDv TREATMENT ARE ACHIEVED IN THE RESPECTIVE AREAS.

4. THE ESDv IS PROVIDED BY UTILIZING MICRO BIORETENTION AREAS AND PERVIOUS CONCRETE. THE DISCHARGE FROM THESE AREAS IS ACCOMODATED BY EXISTING STORM DRAIN SYSTEM WHICH FLOWS TO THE EXISTING POND. THE POND PROVIDES A SAFE DISCHARGE TO THE EXISTING STREAM.

5. SEDIMENT CONTROL WILL BE PROVIDED FOR THE TWO LIMITED DEVELOPMENT AREAS SO THAT SEDIMENT IS CONFINED TO THE SITE. THE SEDIMENT CONTROL DESIGN WILL BE REVIEWED AND APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT.

6. WE DO NOT ANTICIPATE THE NEED FOR DESIGN MANUAL WAIVERS TO ACCOMPLISH THE PROPOSED DEVELOPMENT SCHEME.

LEGEND

398	EXISTING CONTOUR	M1B2 / M1D3	SOILS BOUNDARY
406	PROPOSED CONTOUR	▨	PROPOSED SIDEWALK
+06²²	PROPOSED SPOT ELEVATION	○○○	EXISTING TREES
═ ═ ═	EXISTING CURB AND GUTTER	▬	PROPOSED STORM DRAIN
═══	PROPOSED CURB AND GUTTER	▣	PROPOSED STORM DRAIN INLETS
○	EXISTING UTILITY POLE	SF	SILT FENCE
☼	EXISTING LIGHT POLE	SSF	SILT FENCE
M	EXISTING MAILBOX	LOD	LIMIT OF DISTURBANCE
○	EXISTING SIGN	CIP	CURB INLET PROTECTION
Ⓢ	EXISTING SANITARY MANHOLE	SIP	STANDARD INLET PROTECTION
S	EXISTING SANITARY LINE	SCE	STABILIZED CONSTRUCTION ENTRANCE
SD	EXISTING STORM DRAIN		
W	EXISTING WATER LINE		
CO	EXISTING CLEANOUT		
FH	EXISTING FIRE HYDRANT		
x	EXISTING FENCE		
— —	PROPERTY LINE		
— — —	RIGHT-OF-WAY LINE		
▩	MICRO-BIORETENTION		
▓	EX. STEEP SLOPES (25% OR GREATER)		
░	EX. MODERATE SLOPES (15%-24.99% OR GREATER)		
▩	PERVIOUS PAVING		
▨	EXISTING UTILITY EASEMENT (SEE PLAN FOR SIZE AND TYPE)		
▨	EXISTING ACCESS EASEMENT (SEE PLAN FOR SIZE AND TYPE)		
▨	EXISTING UTILITY EASEMENT TO BE ABANDONED		
▨	PROPOSED UTILITY EASEMENT		

ESDv CONCEPT PLAN
SCALE: 1"=30'

SCALE 1"=30'
15' 0' 30'

INLET BLOCKING NOTE
BLOCK PIPES LEAVING I-2, I-5 AND I-6 UNTIL CONTRIBUTING AREAS ARE TREATED OR PERMANENTLY STABILIZED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edmondson 6·28.16
CHIEF, DEVELOPMENT ENGINEERING DIVISION HSI DATE

Kent Sheubrooks 6-23-16
CHIEF, DIVISION OF LAND DEVELOPMENT JWF DATE

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET AND ESDv CONCEPT PLAN	1 OF 2
STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS	2 OF 2

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

COVER SHEET AND ENVIRONMENTAL CONCEPT PLAN

VILLAGE CREST SENIOR TOWNS
AGE RESTRICTED TOWNHOUSES
ZONED: P.O.R.

TAX MAP 25 BLOCK 20
2ND ELECTION DISTRICT

PARCEL 98, P/O PARCEL D-1
HOWARD COUNTY, MARYLAND

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

ROBERT HARRIS VOGEL
NO. 16193
6/14/16

ROBERT H. VOGEL, PE No.16193

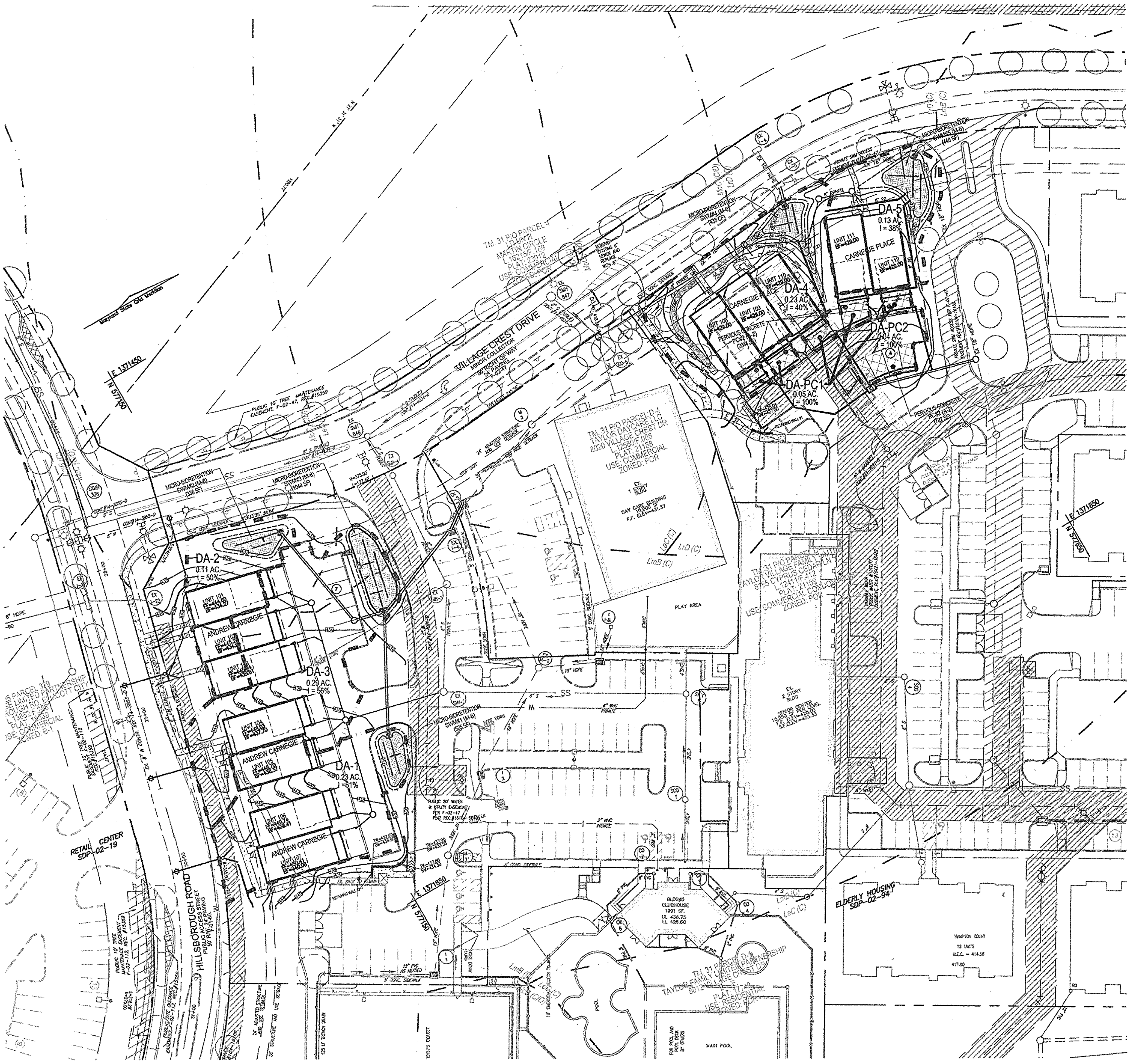
DESIGN BY: RV
DRAWN BY: RV/MR
CHECKED BY: RHV
DATE: JUNE 2016
SCALE: AS SHOWN
W.O. NO.: 15-33

PROFESSIONAL CERTIFICATE

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: 09-27-2016

1 SHEET OF 2

ECP-16-031



PLAN VIEW

SCALE: 1"=50'

SCALE 1"=50'
25' 0' 50'

SOILS LEGEND

HOWARD COUNTY SOILS MAP #14

SYMBOL	NAME / DESCRIPTION	GROUP	K FACTOR	ERODIBLE
LeC	LEGORE SILT LOAM, 8 TO 15 PERCENT SLOPES, STONY	C	0.02	NO
LmB	LEGORE-MONTALTO SILT LOAMS, 3 TO 8 PERCENT SLOPES	C	0.32	NO
LrD	LEGORE-RELAY GRAVELLY LOAMS, 15 TO 25 PERCENT SLOPES, VERY STONY	C	0.20	YES
MoC	MOUNT LUCAS SILT LOAM, 8 TO 15 PERCENT SLOPES, STONY	C/D	0.32	YES

PROJECT TAYLOR VILLAGE PART OF PARCEL D-1
DESIGNER RHV
DATE 02/29/16

ROBERT H. VOGEL ENGINEERING, INC.

PART OF PARCEL D-1

DRAINAGE AREA #	AREA TREATED	FACILITY NUMBER	ENVIRONMENTAL SITE DESIGN PRACTICE (CF) PERMEABLE PAVEMENT	GRAVEL BELOW PP	MICRO BIORTENTION	GRAVEL BELOW MBR	SAND FILTER	GRAVEL BELOW SF	DRY WELL	X X	ESDv VOLUME
MBR1	10625	MBR1	0	0	700	0	0	0	0	0	700
MBR2	4780	MBR2	0	0	447	0	0	0	0	0	447
MBR3	14150	MBR3	0	0	1392	0	0	0	0	0	1392
MBR4	9100	MBR4	0	0	583	0	0	0	0	0	583
MBR5	6600	MBR5	0	0	586	0	0	0	0	0	586
PC1	2044	PC1	327	0	0	0	0	0	0	0	327
PC2	1858	PC2	115	150	0	0	0	0	0	0	265

TOTAL AREA 49157 SF
TREATED 1.13 AC
ESDv

TOTAL ESDv PROVIDED PARCEL D-1 4300

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

6.28.16
CHIEF, DEVELOPMENT ENGINEERING DIVISION HSP DATE

6-23-16
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

SEDIMENT CONTROL NOTES:

1. EITHER PERMANENT OR TEMPORARY STABILIZATION IS TO BE APPLIED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF DAYS/DATES IN THE STANDARD SEDIMENT CONTROL NOTES AND/OR SEEDING SPECIFICATIONS.
2. ALL AREAS OF DISTURBANCE TO BE STABILIZED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND/OR BY THE SEDIMENT CONTROL INSPECTOR, WHICHEVER IS MORE STRINGENT.

PROJECT: TAYLOR VILLAGE P/O PARCEL D-1, 12 NEW UNITS

AREA 1:	38283	SF	LOD
TARGET Pe:	1.8	IN	
ESDv	2986	CF	REQUIRED
ESDv	2539	CF	PROVIDED
ACTUAL Pe	1.53	IN	
AREA 2:	26442	SF	LOD
TARGET Pe:	1.8	IN	
ESDv	1864	CF	REQUIRED
ESDv	1761	CF	PROVIDED
ACTUAL Pe	1.7	IN	

DRAINAGE AREA	IMPERVIOUS AREA	GRASS AREA	TOTAL AREA	PERCENT IMPERVIOUS	RV	ESDv MIN	ESDv MAX	ESDv PROVIDED
MBR1	2725	2445	5170	0.53	0.52	226	587	700
MBR2	2670	1725	4395	0.61	0.60	219	568	447
MBR3	5892	618	6510	0.91	0.86	469	1219	1392
MBR4	442	4283	4725	0.09	0.13	53	137	583
MBR5	10100	445	10545	0.96	0.91	801	2084	586
PC1	2044	0	2044	1.00	0.95	162	421	327
PC2	1858	0	1858	1.00	0.95	147	382	265
TOTAL ESDv REQUIRED								4850
TOTAL ESDv PROVIDED								4300

ESDv TO THE MAXIMUM EXTENT POSSIBLE

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION. RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR 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 DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- * SOIL COMPONENT – LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
- * ORGANIC CONTEN – MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
- * CLAY CONTENT – MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
- * PH RANGE – SHOULD BE BETWEEN 5.5 – 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. 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 REFRACTURE 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 BIORETENION FACILITY BEFORE BACKFILLING THE OPTIONAL 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/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL

RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION

COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED 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.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH 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. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. 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 DEFEATS, 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 PER 1000 SQUARE FEET.

6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

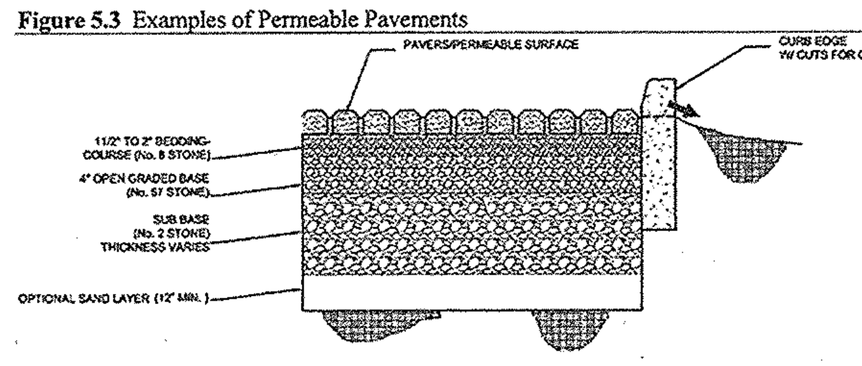
- * PIPE – SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTMF 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
- * PERFORATIONS – IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.
- * GRAVEL – THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- * THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
- * A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,0000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
- * A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

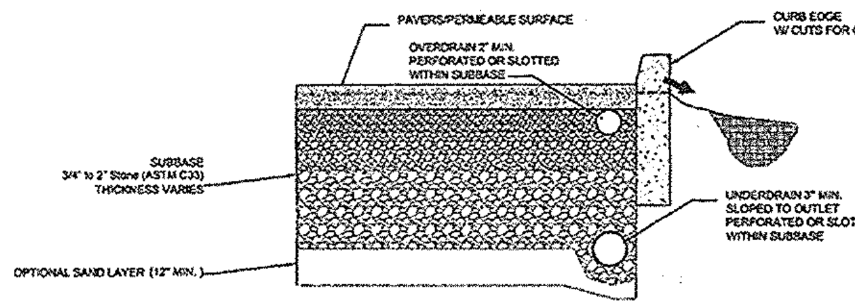
7. MISCELLANEOUS

THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

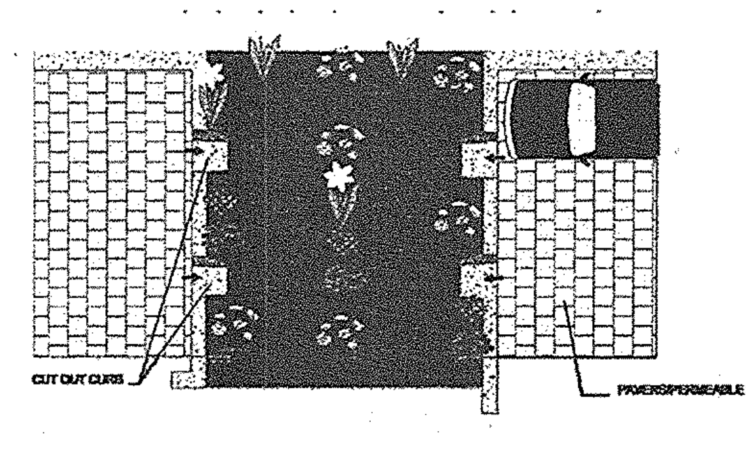
Figure 5.3 Examples of Permeable Pavements



Typical Section



Typical Section w/Overdrain & Underdrain



Permeable Pavement w/Micro-Bioretention - Plan View

PERMEABLE PAVEMENT DETAIL

NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)

1. THE OWNER SHALL PERIODICALLY SWEEP (OR VACUUM POROUS CONCRETE PAVEMENT) THE PAVEMENT SURFACES TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING OR COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.

2. THE OWNER SHALL PERIODICALLY CLEAN DRAINAGE PIPES, INLETS, STONE EDGE DRAINS AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE.

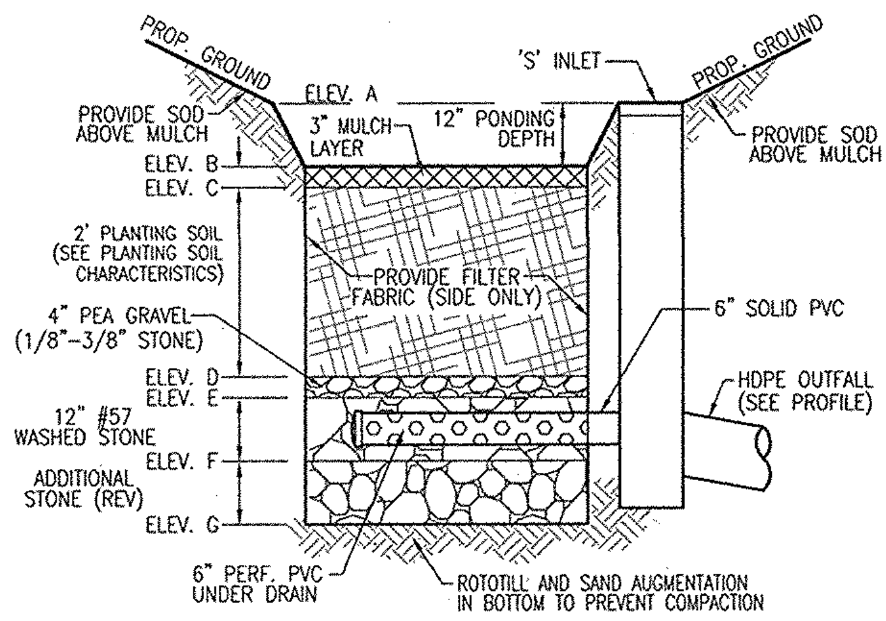
3. THE OWNER SHALL USE DEICERS IN MODERATION. DEICERS SHOULD BE NON-TOXIC AND BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT.

4. THE OWNER SHALL ENSURE SNOW PLOWING IS PERFORMED CAREFULLY WITH BLADES SET ONE INCH ABOVE THE SURFACE. PLOWED SNOW PILES AND SNOWMELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

Appendix B.4. Construction Specifications for Environmental Site Design Practices

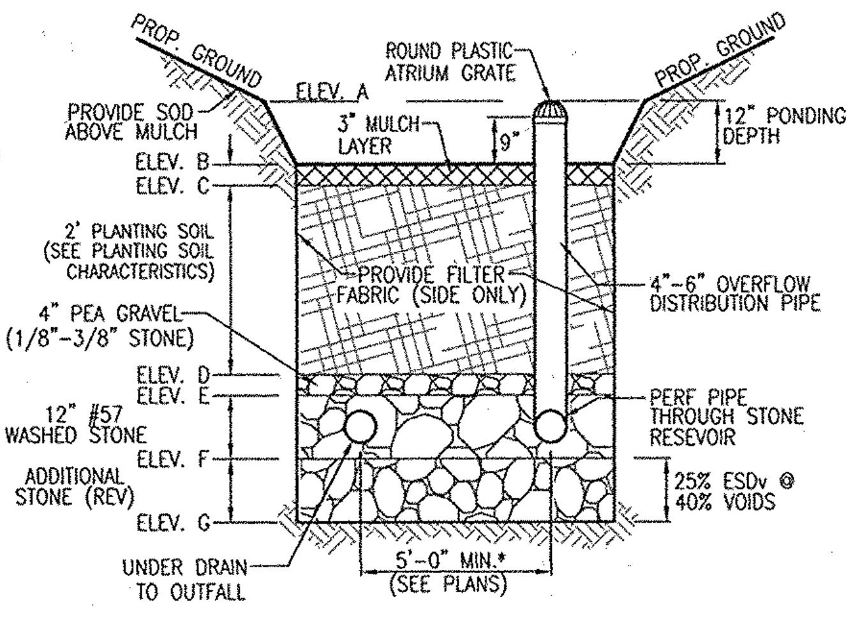
Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration-

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 – 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'_c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (**AASHTO**) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.



MICRO-BIORETENTION (UNDERDRAIN)

NOT TO SCALE



MICRO-BIORETENTION (OVERFLOW)

NOT TO SCALE

MICROBIORETENTION NOTES:

1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETNTION WILL CAUSE THE MBR TO FAIL, AND THERFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.
3. PROVIDE 5' MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFERATED PIPE THROUGH STONE RESIVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS. (SEE PLANS)

NOTE: LOCATE STOCKPILE AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. STOCKPILES EXCEEDING 15 FEET IN HEIGHT SHALL BE BENCHED.

NOTE:
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
- SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

APPENDIX B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF

THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

1. PERVIOUS CONCRETE SPECIFICATIONS

DESIGN THICKNESS – PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, ACI 325.9R, ACI 330R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.

MIX & INSTALLATION – TRADITIONAL PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TRIAL BATCHING) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTLING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.

AGGREGATE – PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4 IN. TO NO. 4), NO. 8 (3/8 IN. TO NO.16) AND NO. 89 (3/8 IN. TO NO.50) SIEVES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.

WATER CONTENT – WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET ACI 30A. AS A GENERAL RULE, POTABLE WATER SHOULD BE USED ALTHOUGH RECYCLED CONCRETE PRODUCTION WATER MEETING ASTM C 94 OR AASHTO M 157 MAY ALSO BE USED.

ADMIXTURES – CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERVIOUS CONCRETE. USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 260 (AIR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS. BASE COURSE – THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)

PAVER BLOCKS – BLOCKS SHOULD BE EITHER 3? IN. OR 4 IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (40% PREFERRED) OF THE SURFACE AREA OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INFILL AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.

INFILL MATERIALS AND LEVELING COURSE – OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.

BASE COURSE – THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

3. REINFORCED TURF

REINFORCED GRASS PAVEMENT (RGP) – WHETHER USED WITH GRASS OR GRAVEL, THE RGP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.

LEGEND

398	EXISTING CONTOUR
406	PROPOSED CONTOUR
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
☼	EXISTING LIGHT POLE
M	EXISTING MAILBOX
	EXISTING SIGN
S	EXISTING SANITARY MANHOLE
S	EXISTING SANITARY LINE
SD	EXISTING STORM DRAIN
W	EXISTING WATER LINE
CO	EXISTING CLEANOUT
FH	EXISTING FIRE HYDRANT
x x	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
▩	MICRO-BIORETENTION
▓	EX. STEEP SLOPES (25% OR GREATER)
░	EX. MODERATE SLOPES (15%-24.99% OR GREATER)
▦	PERVIOUS PAVING
▨	UTILITY EASEMENT (SEE PLAN FOR SIZE AND TYPE)
▨	ACCESS EASEMENT (SEE PLAN FOR SIZE AND TYPE)
M1B2 M1D3	SOILS BOUNDARY
░	PROPOSED SIDEWALK
○	EXISTING TREES
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLETS
	DRAINAGE AREA BOUNDARY

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

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULTCH 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 PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.

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.

3. 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.

4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

OWNERS

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AND TAYLOR OFFICE, LLC
C/O TAYLOR VILLAGE FAMILY
LIMITED PARTNERSHIP
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DEVELOPER

TAYLOR PROPERTIES
DEVELOPMENT CORPORATION
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P.O. BOX 396
ELLICOTT CITY, MD 21043
PHONE: 410-465-3500

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

STORMWATER MANAGEMENT DRAINAGE AREA MAP; SWM DETAILS

VILLAGE CREST SENIOR TOWNS

AGE RESTRICTED TOWNHOUSES
ZONED: P.O.R.

TAX MAP 25 BLOCK 20
2ND ELECTION DISTRICT

PARCEL 98, P/O PARCEL D-1
HOWARD COUNTY, MARYLAND

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ROBERT HARRIS VOGEL
NO. 16193
6/14/16
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RV
DRAWN BY: RV/MR
CHECKED BY: RHV
DATE: JUNE 2016
SCALE: AS SHOWN
W.O. NO.: 15-33

PROFESSIONAL CERTIFICATE

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: 09-27-2016

SHEET 2 OF 2

ECP-16-031