

**GENERAL NOTES**

- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
  - THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY CONFIRMED BY ROBERT H. VOGEL ENGINEERING, INC. DATED JANUARY 2014 AND ENGINEERING DRAWINGS OF RECORD OFFSITE TOPOGRAPHY AND HOWARD COUNTY GIS.
  - THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JANUARY 2014.
  - 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. 37C3 AND 38A4 WERE USED FOR THIS PROJECT.
  - THE SUBJECT PROPERTY IS ZONED "R-20" IN ACCORDANCE WITH THE 10/6/13 ZONING REGULATIONS, AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNTY BILL 75-2003.
  - NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAWING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAM(S) OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
  - THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
  - WATER FOR THIS PROJECT IS TO BE PUBLIC EXTENSIONS OF CONTRACT NO. 14-3529-D.
  - SEWER FOR THIS PROJECT IS TO BE PUBLIC EXTENSIONS OF CONTRACT NO. 14-3529-D.
  - EXISTING UTILITIES LOCATED FROM TOPOGRAPHIC SURVEY AND AS-BUILT DRAWINGS. 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.
  - NO FLOODPLAIN IS LOCATED ONSITE.
  - NO STEEP SLOPES OVER 20,000 SF ARE LOCATED ON THE PROJECT SITE.
  - FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH THE SUBDIVISION PLANS.
  - WETLANDS AND STREAMS SHOWN ONSITE ARE BASED ON THE DELINEATION BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, DATED OCTOBER 2014.
- A WAIVER TO ALLOW ENVIRONMENTAL FEATURES ON-LOT WILL BE REQUIRED
- IN ACCORDANCE WITH SECTION 16.121(A)(2) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THE OPEN SPACE REQUIREMENTS FOR THIS R-20 PROJECT IS 5% OF GROSS AREA (4.20 AC. GROSS AREA X 5% = 0.25 AC.). REFER TO PROPOSED OPEN SPACE SHOWN HEREON.
  - GEOTECHNICAL INVESTIGATIONS SHALL COMPLETED AND SUBMITTED WITH THE FUTURE SUBDIVISION PLANS.
  - A NOISE STUDY SHALL BE PREPARED BY ROBERT H. VOGEL ENGINEERING AND SUBMITTED WITH THE FUTURE SUBDIVISION PLANS.
  - FOREST STAND DELINEATION PLAN PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, DATED OCTOBER 2014.
  - RUXTON DRIVE IS CLASSIFIED AS A LOCAL ROAD - 50' R/W. FOR THIS MINOR SUBDIVISION, NO PUBLIC ROAD EXTENSION IS REQUIRED. USE IN COMMON DRIVEWAYS ARE PROPOSED FOR ACCESS TO THE PROPOSED LOTS.
  - TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
  - THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
  - STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF ALTERNATIVE SURFACE PRACTICES (PERMEABLE SURFACE) & MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIOTENTION, BIO SWALES, RAIN GARDENS, GRAVEL TRENCH AND DRYWELLS. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED. MAINTENANCE INCLUDES OUTLET STRUCTURES AND PIPES, MULCH, WEEDING, PLANTINGS, PERFORATED UNDERDRAINS, FEEDER PIPES, AND ROUTINE SOIL REPLACEMENT.
  - APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (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 AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN 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.
  - APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING AND ADDRESS THE PROJECT TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.

**ENVIRONMENTAL SITE DESIGN NARRATIVE:**

- IN ACCORDANCE WITH THE DEVELOPMENT ENGINEERING DIVISION ECP CHECKLIST ITEM III.K.
- THE NATURAL AREAS ON THE PROJECT SITE ARE LOCATED NEAR THE CENTER AND TRAVEL SOUTH. NO DISTURBANCE TO THE STREAM AND STREAM BUFFER, WETLAND AND WETLAND BUFFER RESOURCES IS PROPOSED.
  - NO DRAMATIC DISTURBANCE TO THE NATURAL DRAINAGE PATTERNS ARE PROPOSED, PLEASE REFER TO THE PROPOSED GRADING.
  - THE CONCEPTUAL REDUCTION IN IMPERVIOUS AREA THROUGH BETTER SITE DESIGN IS ACHIEVED THROUGH THE ENVIRONMENTAL SITE DESIGN (ESD) FOR THE PROJECT. THE ESD CONCEPT INCLUDES THE USE OF ALTERNATIVE SURFACE PRACTICES (PERMEABLE SURFACE) & MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIOTENTION, BIO SWALES, RAIN GARDENS, GRAVEL TRENCH AND DRYWELLS. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
  - SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE A PROPOSED SEDIMENT BASIN(S), EARTH DIKES, AND SILT FENCE PERIMETER CONTROLS. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT.
  - STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF ALTERNATIVE SURFACE PRACTICES (PERMEABLE SURFACE) & MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIOTENTION, BIO SWALES, RAIN GARDENS, GRAVEL TRENCH AND DRYWELLS. THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION".
- TARGET PE = 1.04" PROVIDED PE = 1.04"  
 TARGET ESDv = 2,289 CUFT PROVIDED = 2,466 +/- CUFT
- AT THIS CONCEPT STAGE OF DEVELOPMENT, DESIGN MANUAL WAIVER IS REQUIRED FOR SEWER SERVICE AND A WAIVER PETITION IS REQUIRED TO CONSTRUCT A DRIVEWAY, STORMWATER FEATURE AND PUBLIC WATER SERVICE CONNECTIONS FOR LOTS 5 & 6 ACROSS A WETLAND AND ITS BUFFER.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*John P. Canoles* 8-10-15  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

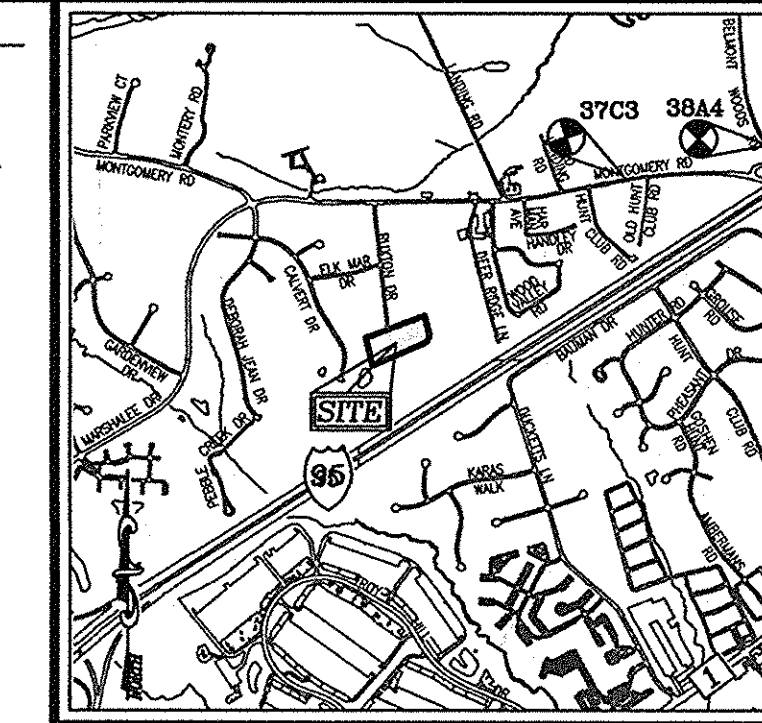
*John P. Canoles* 7-02-15  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

# ENVIRONMENTAL CONCEPT PLAN

## FERRON PROPERTY

### LOTS 5 - 7, OPEN SPACE LOT 8 AND NON-BUILDABLE BULK PARCELS 'A' AND 'B'

**BENCHMARKS**  
 HOWARD COUNTY BENCHMARK 37C3  
 N 562916.003 E 1384556.679 ELEV: 258.497'  
 HOWARD COUNTY BENCHMARK 38A4  
 N 562977.821 E 1386288.112 ELEV: 224.176'



**VICINITY MAP**  
 SCALE: 1"=2000'  
 ADC MAP COORDINATE: 4935/H14

SHEET INDEX	
DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 3
CONCEPTUAL LAYOUT, GRADING SOILS EROSION & SEDIMENT CONTROL PLAN	2 OF 3
SWM DRAINAGE AREA MAP, SWM DETAILS	3 OF 3

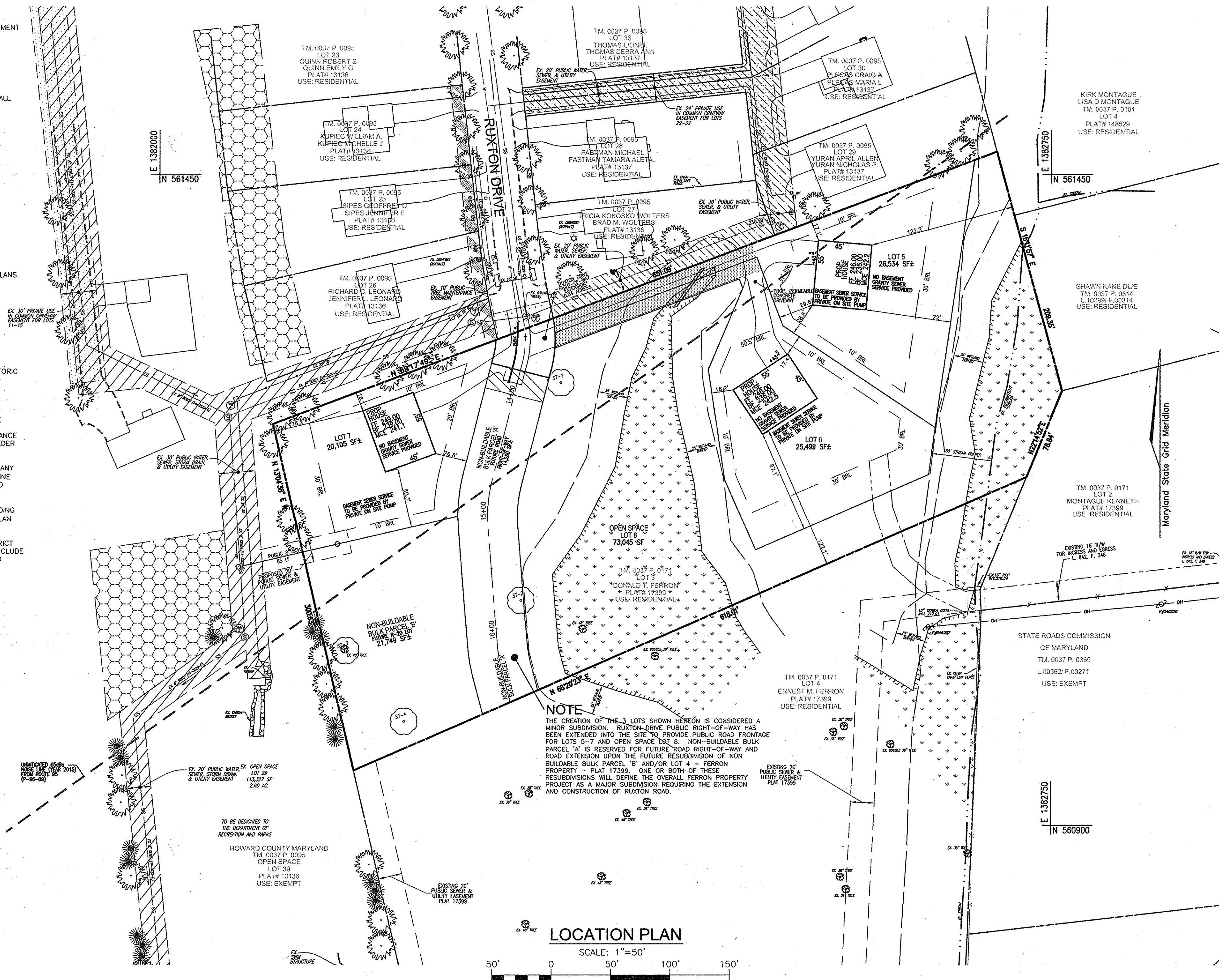
**LEGEND**

- ===== EXISTING CURB AND GUTTER
- 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 FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE

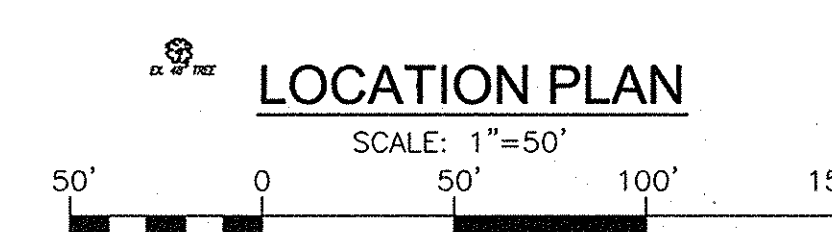
SPECIMEN TREE CHART				
KEY	SPECIES	SIZE	CRZ	COMMENTS
ST-1	RED MAPLE	30	45	FAIR, LIMB DIEBACK OBSERVED
ST-2	TULIP POPLAR	35.5	53.25	GOOD
ST-3	RED MAPLE	40	60	ESTIMATED SIZE, COVERED IN GREEN BIRCH BRUSH, TRUNK ROT AND LIMBS
ST-4	TULIP POPLAR	30.5	45.75	GOOD

PER PLAN PROPOSAL, SPECIMEN TREES #1 & #2 SHALL BE REMOVED. REQUIRED WAIVER SHALL BE SUBMITTED WITH FUTURE SUBDIVISION PLAN

**OWNER/DEVELOPER**  
 DONALD FERRON  
 5864 DEER RIDGE LANE  
 ELKBRIDGE, MARYLAND 21075



**NOTE**  
 THE CREATION OF THE 3 LOTS SHOWN HEREON IS CONSIDERED A MINOR SUBDIVISION. RUXTON DRIVE PUBLIC RIGHT-OF-WAY HAS BEEN EXTENDED INTO THE SITE TO PROVIDE PUBLIC ROAD FRONTAGE FOR LOTS 5-7 AND OPEN SPACE LOT 8. NON-BUILDABLE BULK PARCEL 'A' IS RESERVED FOR FUTURE ROAD RIGHT-OF-WAY AND ROAD EXTENSION UPON THE FUTURE RESUBDIVISION OF NON-BUILDABLE BULK PARCEL 'B' AND/OR LOT 4 - FERRON PROPERTY - PLAT 17399. ONE OR BOTH OF THESE RESUBDIVISIONS WILL DEFINE THE OVERALL FERRON PROPERTY PROJECT AS A MAJOR SUBDIVISION REQUIRING THE EXTENSION AND CONSTRUCTION OF RUXTON ROAD.



**SITE ANALYSIS DATA CHART**

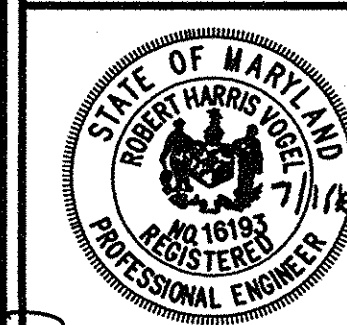
A. TOTAL PROJECT AREA:	4.20 AC.
B. AREA OF PLAN SUBMISSION:	4.20 AC.
C. AREA OF WETLANDS AND BUFFERS:	1.3 AC +/-
D. AREA OF FLOODPLAIN:	0 S.F. OR 0.00 AC.
E. AREA OF FOREST:	4.20 AC. (REFER TO FSD)
F. AREA OF STEEP SLOPES (15% & GREATER):	0 S.F. OR 0.00 AC.
G. ERODIBLE SOILS:	N/A
H. LIMIT OF DISTURBED AREA:	2.1 AC +/-
I. PROPOSED USES FOR SITE AND STRUCTURES:	RESIDENTIAL SINGLE FAMILY DETACHED (SFD) HOMES
J. GREEN OPEN AREA:	3.7 AC +/-
K. PROPOSED IMPERVIOUS AREA:	0.50 AC.
L. PRESENT ZONING DESIGNATION:	R-20
M. OPEN SPACE REQUIRED:	0.90 ACRES (30%)
N. TOTAL NUMBER OF UNITS ALLOWED:	8
O. TOTAL NUMBER OF UNITS PROPOSED:	3
P. DPZ FILE REFERENCES:	WP 99-139, WP 04-095, F 05-040

**Eco-Science Professionals, Inc.**  
 Consulting Ecologists  
 P.O. Box 5006 Glen Arm, Maryland 21057 Telephone (410) 832-2488 Fax (410) 832-2488

**MD DNR Qualified Professional**  
**USACOE Wetland Delineator**  
 Certification # WDCP93MD0610044B2  
 John P. Canoles

- NO RARE, THREATENED OR ENDANGERED SPECIES OR THEIR HABITATS WERE OBSERVED ON THE PROPERTY.
- SURROUNDING LAND USE INCLUDES HIGH DENSITY RESIDENTIAL DEVELOPMENT.
- APPROXIMATELY 2.1 ACRES OF FOREST IS PRESENT WITHIN 100 FEET OF THE SUBJECT PROPERTY.
- THE WETLANDS AND STREAMS ARE PART OF THE PATUXENT RIVER WATERSHED (02-13-11) AND ARE CLASSIFIED AS USE 1-P. PERENNIAL STREAMS WILL REQUIRE 75 FOOT BUFFERS, INTERMITTENT STREAMS WILL REQUIRE 50 FOOT BUFFERS AND WETLANDS WILL REQUIRE 25 FOOT BUFFERS.
- NO HISTORIC ELEMENTS OR CEMETERIES ARE KNOWN TO OCCUR ON THIS PROPERTY.
- THE SITE DOES NOT CONTAIN ANY 100 YEAR FLOODPLAIN.

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



**PROFESSIONAL CERTIFICATE**  
 DESIGN BY: RHV  
 DRAWN BY: KO  
 CHECKED BY: RHV  
 DATE: JULY 2015  
 SCALE: AS SHOWN  
 W.O. NO.: 13-28

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 OF 3



**LEGEND**

	EXISTING CONTOUR		SOILS BOUNDARY
	PROPOSED CONTOUR		PROPOSED SIDEWALK
	EXISTING CURB AND GUTTER		EXISTING TREELINE
	PROPOSED CURB AND GUTTER		PROPOSED TREELINE
	EXISTING UTILITY POLE		PROPOSED STORM DRAIN
	EXISTING LIGHT POLE		PROPOSED STORM DRAIN INLET
	EXISTING MAILBOX		SUPER SILT FENCE
	EXISTING SIGN		LIMIT OF DISTURBANCE
	EXISTING SANITARY MANHOLE		CURB INLET PROTECTION
	EXISTING SANITARY LINE		AT GRADE INLET PROTECTION
	EXISTING CLEANOUT		STABILIZED CONSTRUCTION ENTRANCE
	EXISTING FIRE HYDRANT		PROPOSED PERMEABLE PAVEMENT
	EXISTING WATER LINE		
	PROPERTY LINE		
	RIGHT-OF-WAY LINE		

**FERRON PROPERTY - ECP ESDv COMPUTATIONS**

SITE DEVELOPABLE AREA: 2.08 AC 90800 SF 3 Lots / UIC Drive & Open Space

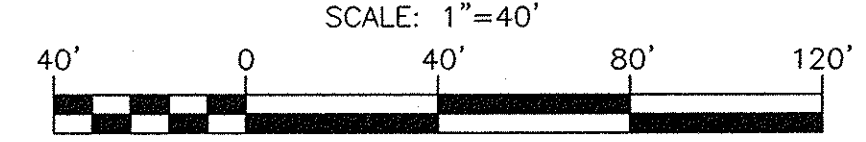
TARGET P: 1.03 IN  
 SITE IMPERVIOUS: 35.36 PERCENT  
 SITE Rv: 0.2006  
 SITE ESDv: 1576 CF +/-

*(Long: 95x11)2 (2.6x: 95x11)12*

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	MINIMUM VOLUME	MAXIMUM VOLUME	100' VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS	
WATER DRIVE UIC EXTENSION	21.55	0.2421	14216	0.33	287	746	295	287	3035	0.07	0.26	MICROSCALE BROWLADE @ 6.5 POND 287 432 SF MULCH 4.6 X 90
LOT 6 HOUSE	46.96	0.4727	5270.0	0.12	208	540	214	220	2475	0.06	0.06	MICROSCALE - RAIN GARDEN 320 165 SF MBR
LOT 6 DRIVEWAY	77.87	0.7508	1220.0	0.03	76	198	79	152	950	0.02	0.01	ALTERNATIVE SURFACE - PERMEABLE SURFACE W/ 12" BASE 590 SF @ 0.16 ESDv/SF PG- 2
UIC TO LOTS 5 & 6	61.71	0.6254	3630	0.08	183	476	189	48	2240	0.05	0.03	GRAVEL TRENCH/LEVEL SPREADER 68 2' X 80' TRENCH Overmanagement at On-Lot Perm Surface
LOT 5 HOUSE	46.96	0.4727	5270.0	0.12	208	540	214	220	2475	0.06	0.06	MICROSCALE - RAIN GARDEN 320 165 SF MBR
LOT 5 DRIVEWAY	49.82	0.4984	1365.0	0.03	57	147	58	109	680	0.02	0.02	ALTERNATIVE SURFACE - PERMEABLE SURFACE W/ 12" BASE 590 SF @ 0.16 ESDv/SF PG- 2
LOT 7 REAR HSE 1	100.00	0.9500	619.0	0.01	49	127	50	59	619	0.01	0.00	MICROSCALE - DRYWELL 59 7 7 4 WIDE LONG DEEP
LOT 7 REAR HSE 2	100.00	0.9500	619.0	0.01	49	127	50	59	619	0.01	0.00	MICROSCALE - DRYWELL 59 7 7 4 WIDE LONG DEEP
LOT 7 DRIVEWAY	85.24	0.8171	1050.0	0.02	72	186	74	110	895	0.02	0.00	ALTERNATIVE SURFACE - PERMEABLE SURFACE W/ 12" BASE 600 SF @ 0.16 ESDv/SF PG- 2
LOT 7 FRONT HSE	36.38	0.3774	3400.0	0.08	107	278	110	120	1237	0.03	0.05	MICROSCALE - RAIN GARDEN 120 90 SF MBR
<b>PROJECT TOTALS</b>	<b>41.5</b>	<b>0.4238</b>	<b>36559</b>	<b>0.84</b>	<b>1295</b>	<b>3366</b>	<b>1333</b>	<b>1384</b>	<b>15225</b>	<b>0.35</b>	<b>0.49</b>	

**OWNER/DEVELOPER**  
 DONALD FERRON  
 5864 DEER RIDGE LANE  
 ELK RIDGE, MARYLAND 21075

**SITE LAYOUT, CONCEPT GRADING, SOIL EROSION AND SEDIMENT CONTROL PLAN**



**HSCD NOTE:**  
 APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING AND ADDRESS THE PROJECT TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.

**UTILITY NOTES:**  
 1. ALL WATER CONNECTIONS SHALL BE 1-1/2" WITH 1" OUTSIDE METER SETTINGS, UNLESS OTHERWISE NOTED. REFER TO HOWARD COUNTY DETAILS W-3.28 OUTSIDE METER SETTINGS.

- 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. AT NO TIME DURING CONSTRUCTION WILL FENCING BE ALLOWED TO INTERCEPT CONCENTRATED FLOWS
  3. A DOUBLE ROW OF SSF MAY BE REQUIRED IN THE PROXIMITY OF THE ENVIRONMENTAL AREAS
  4. SOILS ONSITE ARE WOULD BE CONSIDERED HIGHLY ERODIBLE BY THE HOWARD SOIL CONSERVATION DISTRICT. MORE STRINGENT SEEDING AND STABILIZATION METHODS MAY BE EXPECTED AT SITE DEVELOPMENT STAGE

**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.

**MAPPED SOILS TYPES - SAVAGE NE MAP #19**

SYMBOL NAME / DESCRIPTION	GROUP	HYDRIC	HYDROPHOBIC	K FACTOR	PERCENT ERODIBLE	CRITICAL SLOPE
ESC EYEBROW LOAMY SAND, 2 TO 10 PERCENT SLOPES	A	NO	NO	0.15	NO	NO
Fs FALLSINGHAM SANDY LOAM, 0 TO 2 PERCENT SLOPES	D	YES	YES	0.02	YES	NO
RuB RUSSETT FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	C	NO	NO	0.24	YES	NO
RuC RUSSETT FINE SANDY LOAM, 5 TO 10 PERCENT SLOPES	C	NO	NO	0.24	YES	NO
RuBd RUSSETT AND BELTSVILLE SOILS, 2 TO 5 PERCENT SLOPES	C	NO	NO	0.37	YES	NO
RuCd RUSSETT AND BELTSVILLE SOILS, 5 TO 10 PERCENT SLOPES	C	NO	NO	0.24	YES	NO

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY  
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chief, Development Engineering Division* 8-10-15  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Chief, Division of Land Development* 7-02-15  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**ENVIRONMENTAL CONCEPT PLAN**  
 CONCEPTUAL LAYOUT & GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN  
**FERRON PROPERTY**  
 LOTS 5 - 7, OPEN SPACE LOT 8 AND NON-BUILDABLE BULK PARCELS 'A' AND 'B'  
 A RESUBDIVISION OF FERRON PROPERTY LOT 3, PLAT 17399

TAX MAP 37 BLOCK 12 ZONED: R-20  
 1 ST ELECTION DISTRICT PARCEL 171  
 HOWARD COUNTY, MARYLAND

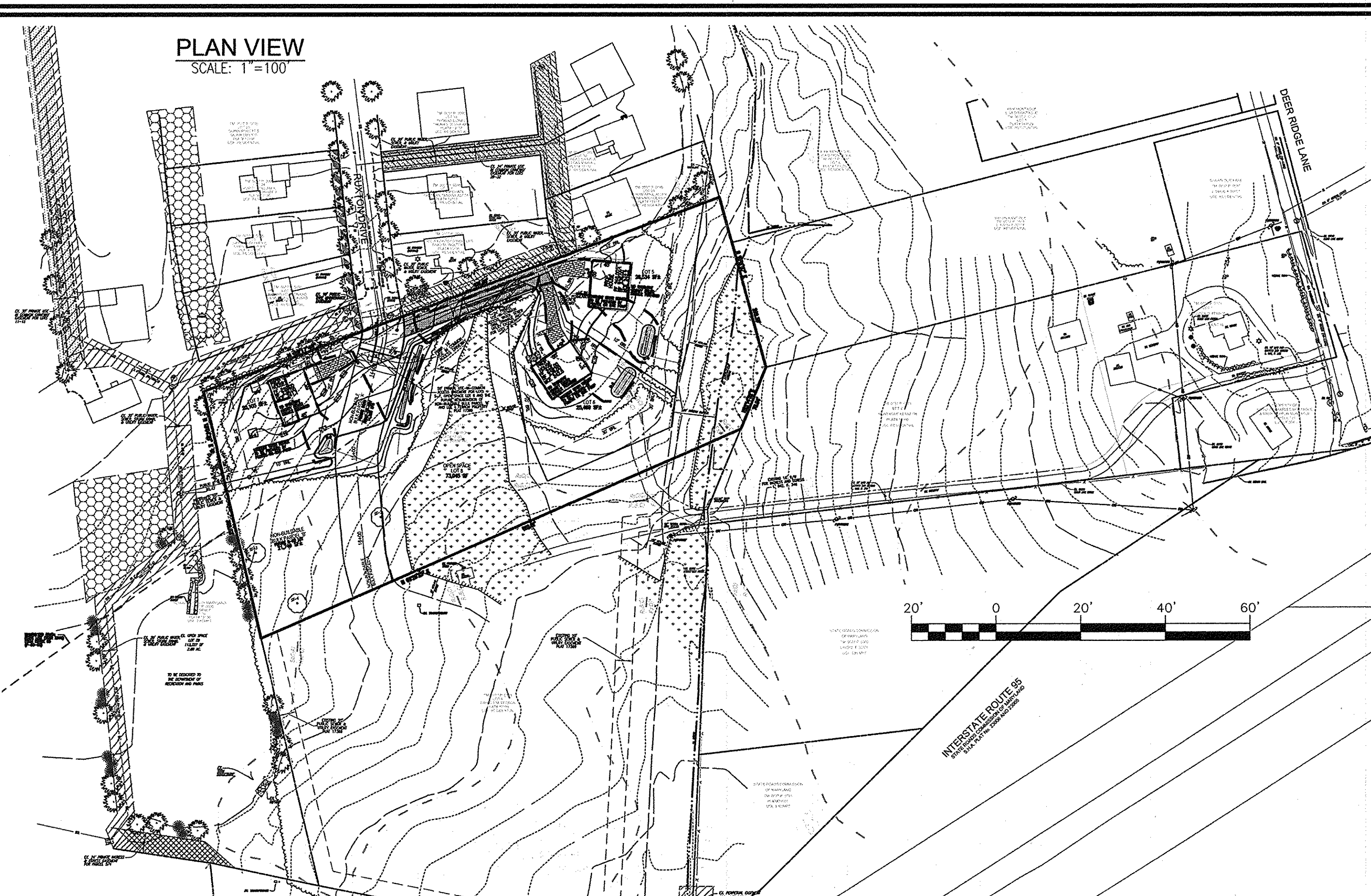
**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 8407 MAIN STREET TEL: 410.461.7666  
 ELLICOTT CITY, MD 21043 FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**

DESIGN BY: RHV  
 DRAWN BY: KC  
 CHECKED BY: RHV  
 DATE: JULY 2015  
 SCALE: AS SHOWN  
 W.O. NO.: 13-28

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

2 SHEET OF 3



**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 USED EXCEPT WITHIN THE MICRO-BIORETENTION PRACTICES THAT MAY BE HARMFUL TO PLANT GROWTH OR PROVIDE A BARRIER TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMOUDA 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 CONTENT - 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 (LOAM), COARSE SAND (30%), AND COMPOST (40%).  
 \* CLAY CONTENT - METAL SHALL HAVE A CLAY CONTENT OF LESS THAN 2%.  
 \* 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.

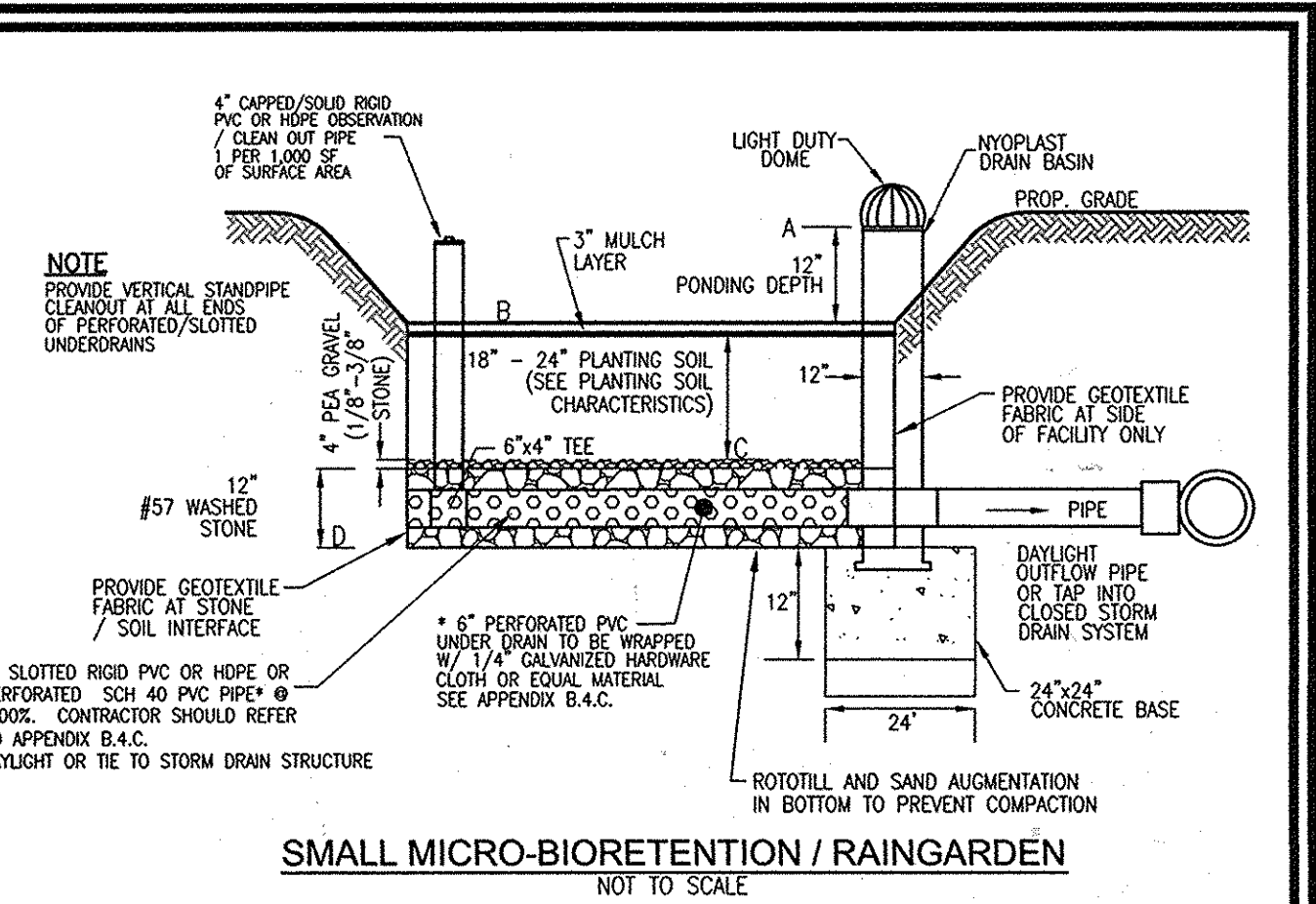
**3. COMPACTION**  
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL WHEN POSSIBLE. USE EXCAVATION TRUCKS TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARCH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE 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 AVOIDED 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 THROUGHOUT 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 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 SURFY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH WASH TRACKS.

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

**5. PLANT INSTALLATION**  
 DESIGNING AN ORGANIC MATERIAL SOURCE IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDINGS TO UNIFORM THICKNESS OF 2" TO 3". SHREDED 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. SHREDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.  
 ROOTS OF THE PLANT MATERIAL SHALL BE KEPT SHORT DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/3RD 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.

**6. UNDERDRAINS**  
 UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:  
 \* PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F758, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED 1/2" DIA. PVC OF HOPE.  
 \* 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 444) 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 1,000 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" STONES) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THE 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 WELLS MUST BE PROVIDED (ONE MINIMUM PER EVERY 1,000 SQUARE FEET OF SURFACE AREA).

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



**OPERATION AND MAINTENANCE SCHEDULE FOR MICROBIORETENTION (M-6) / BIO-SWALE (M-8) 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 EXPOSURE 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 4, TABLE A.4.1 AND 2.

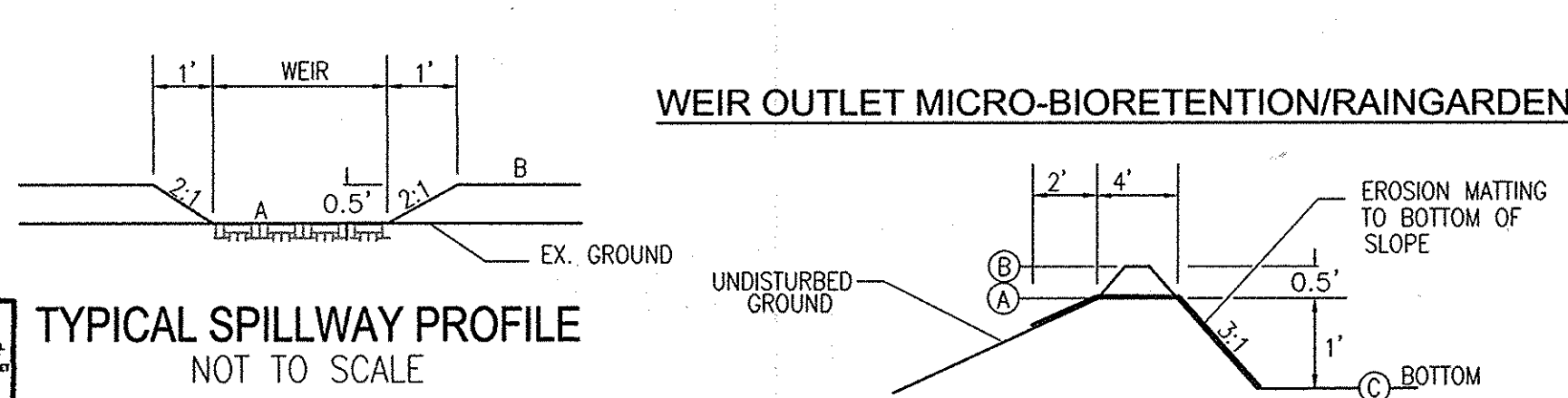
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERING BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.

3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.

4. SOIL RESOURCES TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

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

Material	Specification	Units	Plantings are site-specific
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil	see Appendix A, Table A.4	n/a	USDA soil types loamy sand or sandy loam; clay content < 5% (2" to 4" deep)
Planting soil	see Appendix A, Table A.4	n/a	USDA soil types loamy sand or sandy loam; clay content < 5% (2" to 4" deep)
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	
Mulch	shredded hardwood	sqyd	6 months, minimum no pine or wood chips
Pea gravel distribution	see Appendix A, Table A.4	n/a	
Curtain drain	ornamental stone, washed cobbles	stone	2" to 5"
Concrete		n/a	see Appendix A, Table A.4
Gravel (underdrains and infiltration berms)	AASHTO M-43	n/a	see Appendix A, Table A.4
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	n/a	see Appendix A, Table A.4
Placed in place concrete (if required)	MSHA Mix No. 3; F = 3500 psi @ 28 days, normal weight, air-entrained, conforming to most ASTM A615-60	n/a	see Appendix A, Table A.4
Sand	AASHTO M-6 or ASTM C-33	n/a	see Appendix A, Table A.4

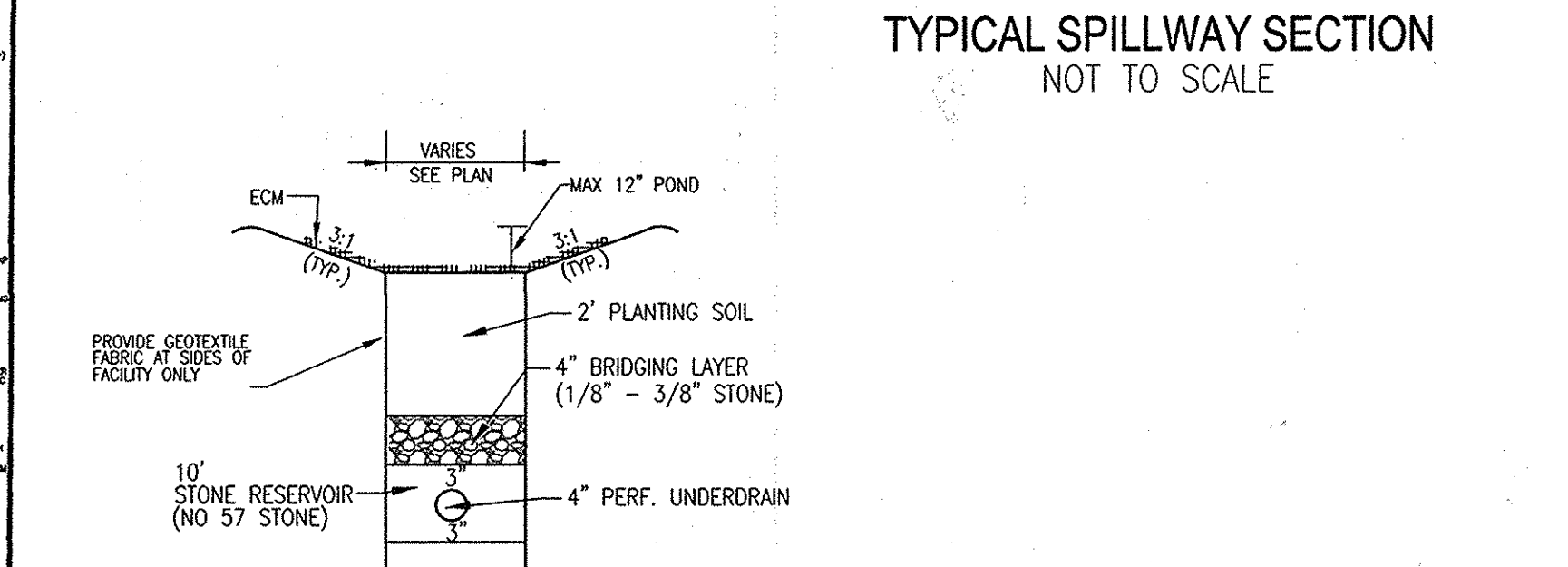


**B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF**  
 THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

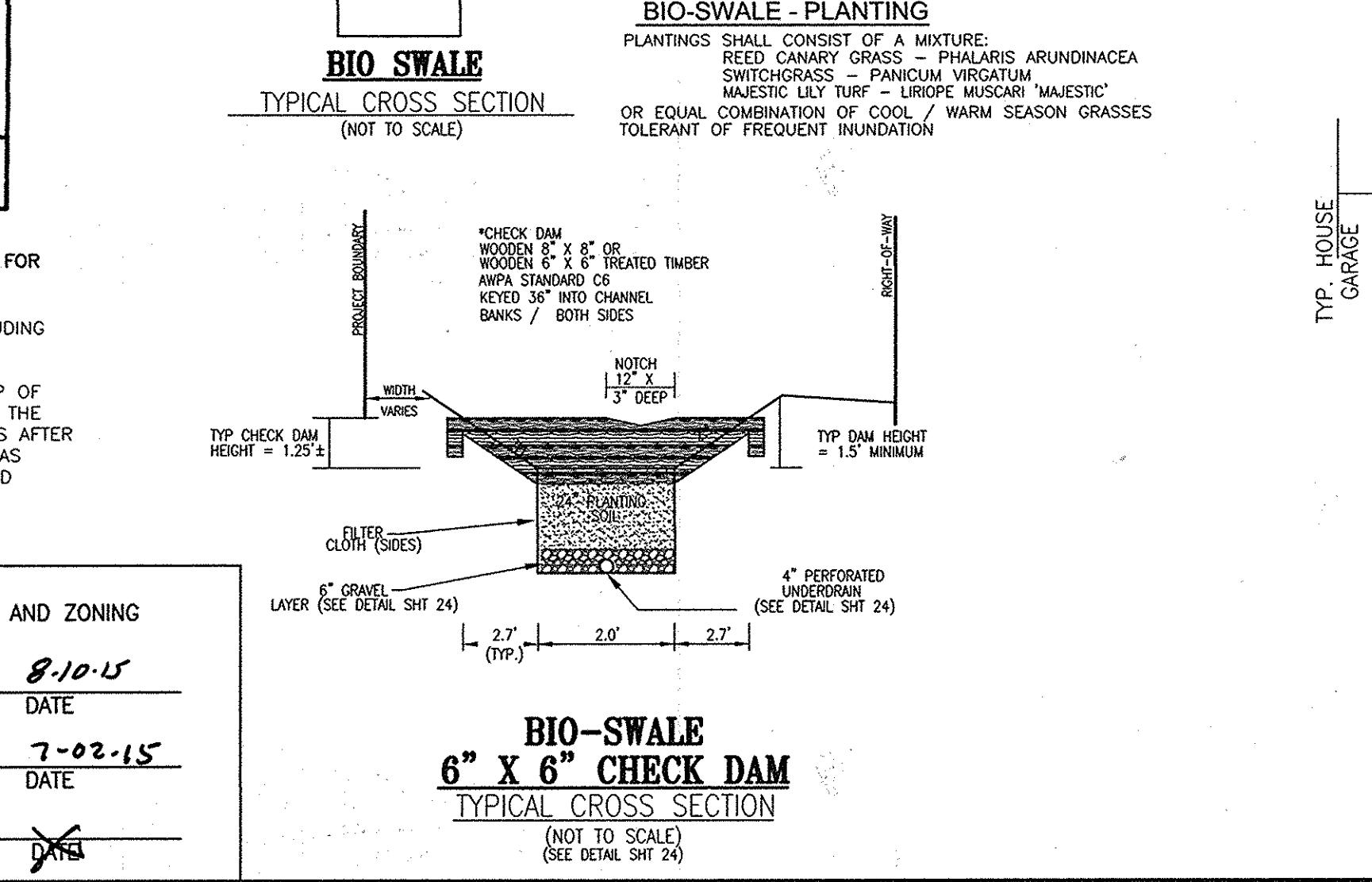
**1. PERVIOUS CONCRETE SPECIFICATIONS**  
 DESIGN THICKNESS - PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, ACI 325.5R, 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 SHALL 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.60) 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 308. 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)**  
 BLOCKS SHOULD BE EITHER 3/4 IN. OR 4 IN. THICK, AND MEET ASTM C 938 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 GRAD 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.



**BIO-SWALE - PLANTING**  
 PLANTINGS SHALL CONSIST OF A MIXTURE:  
 REED CANARY GRASS - PHALARIS ARUNDINACEA  
 SWITCHGRASS - PANICUM VIRGATUM  
 MAJESTIC LILY TURF - LIRIOPE MUSCARI 'MAJESTIC'  
 OR EQUAL COMBINATION OF COOL / WARM SEASON GRASSES TOLERANT OF FREQUENT INUNDATION



**DETAIL - PERMEABLE CONCRETE DRIVEWAY - 5% OR LESS**  
 NOT TO SCALE  
 \*ALL PERMEABLE CONCRETE THICKNESS, MIX AND SUB-BASE TO BE DETERMINED BY GEOTECHNICAL ENGINEER ON-SITE.

**A-2. PERMEABLE PAVEMENTS**

**CONSTRUCTION CRITERIA:**

- THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING CONSTRUCTION OF PROJECTS WITH PERMEABLE PAVEMENT:
  - EROSION AND SEDIMENT CONTROL - FINAL GRADING FOR INSTALLATION SHOULD NOT TAKE PLACE UNTIL THE SURROUNDING SITE IS STABILIZED. IF THIS CANNOT BE ACCOMPLISHED, RUNOFF FROM DISTURBED AREAS SHALL BE DIVERTED AROUND PROPOSED PAVEMENT LOCATIONS.
  - SOIL COMPACTION - SUB SOILS SHALL NOT BE COMPACTED. CONSTRUCTION SHOULD BE PERFORMED WITH LIGHTWEIGHT, WIDE TRACKED EQUIPMENT TO MINIMIZE COMPACTION. EXCAVATED MATERIALS SHOULD BE PLACED IN A CONTAINED AREA.
  - DISTRIBUTION SYSTEMS - OVERDRAIN, UNDERDRAIN, AND DISTRIBUTION PIPES SHALL BE CHECKED TO ENSURE THAT BOTH THE MATERIAL AND PERFORATIONS MEET SPECIFICATIONS (SEE APPENDIX B.4). THE UPSTREAM ENDS OF PIPES SHOULD BE CAPPED PRIOR TO INSTALLATION. ALL UNDERDRAIN OR DISTRIBUTION PIPES USED SHOULD BE INSTALLED FLAT ALONG THE BED BOTTOM.
  - SUBBASE INSTALLATION - SUBBASE AGGREGATE SHALL BE CLEAN AND FREE OF FINES. THE SUBBASE SHALL BE PLACED IN LIFTS AND LIGHTLY ROLLED ACCORDING TO THE SPECIFICATIONS (SEE APPENDIX B.4).

**INSPECTION:**  
 REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:

- DURING EXCAVATION TO SUB GRADE.
- DURING PLACEMENT AND BACKFILL OF ANY DRAINAGE OR DISTRIBUTION SYSTEM(S).
- DURING PLACEMENT OF THE CRUSHED STONE SUBBASE MATERIAL.
- DURING PLACEMENT OF THE SURFACE MATERIAL.
- UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

**MAINTENANCE CRITERIA:**  
 THE FOLLOWING PROCEDURES SHOULD BE CONSIDERED ESSENTIAL FOR MAINTAINING PERMEABLE PAVEMENT SYSTEMS:

- PAVEMENTS SHOULD BE USED ONLY WHERE REGULAR MAINTENANCE CAN BE PERFORMED. MAINTENANCE AGREEMENTS SHOULD CLEARLY SPECIFY HOW TO CONDUCT ROUTINE TASKS TO ENSURE LONG-TERM PERFORMANCE.
- PAVEMENT SURFACES SHOULD BE SWEEPED AND VACUUMED TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING SYSTEMS AND COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
- DRAINAGE PIPES, INLETS, STONE EDGE DRAINS, AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE SHOULD BE CLEANED OUT AT REGULAR INTERVALS.
- TRUCKS AND OTHER HEAVY VEHICLES CAN GRIND DIRT AND GRIT INTO THE POROUS SURFACES, LEADING TO CLOGGING AND PREMATURE FAILURE. THESE VEHICLES SHOULD BE PREVENTED FROM TRACKING AND SPILLING MATERIAL ONTO THE PAVEMENT.
- DECIDERS SHOULD BE USED IN MODERATION. WHEN USED, DECIDERS SHOULD BE NON-TOXIC AND ORGANIC AND CAN BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT. SNOW PLOWING SHOULD BE DONE CAREFULLY WITH BLADES SET ONE-INCH HIGHER THAN NORMAL. PLOWED SNOW PILES AND SNOW MELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

**NOTES:**

1. APPROVAL OF THIS SIMPLIFIED ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED BUILDING AND/OR GRADING PERMIT
2. REVIEW OF THIS PLAN FOR COMPLIANCE WITH ZONING AND SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE PERMIT STAGES, AND THEREFORE, THIS PLAN IS SUBJECT TO ADDITIONAL AND MORE DETAILED COMMENTS AS THE PLAN PROGRESSES THROUGH THE PERMIT PROCESS.

**OWNER/DEVELOPER**  
 DONALD FERRON  
 5864 DEER RIDGE LANE  
 ELK RIDGE, MARYLAND 21075

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**STORMWATER MANAGEMENT**  
**DRAINAGE AREA MAP, SWM DETAILS**  
**FERRON PROPERTY**  
 LOTS 5 - 7, OPEN SPACE LOT 8 AND  
 NON-BUILDABLE BULK PARCELS 'A' AND 'B'  
 A RESUBDIVISION OF FERRON PROPERTY LOT 3, PLAT 17399  
 TAX MAP 37 BLOCK 12  
 1ST ELECTION DISTRICT  
 ZONED: R-20  
 PARCEL 171  
 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

**PROFESSIONAL CERTIFICATE**

DESIGN BY: RHV  
 DRAWN BY: KG  
 CHECKED BY: RHV  
 DATE: JULY 2015  
 SCALE: AS SHOWN  
 W.D. NO.: 13-28

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. MY LICENSE NUMBER IS 17193. MY EXPIRATION DATE IS 09-27-2018.

3 OF 3

**HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRYWELL (M-5)**

A. THE OWNER SHALL INSPECT & CLEAN ANNUALLY, INCLUDING PIPES, GUTTERS, DOWNSPOUTS AND FILTERS.

B. PONDING STANDING WATER OR ALGAL GROWTH ON THE TOP OF A DRYWELL MAY INDICATE FAILURE DUE TO SEDIMENTATION IN THE GRAVEL MEDIA. IF WATER POUNDS FOR MORE THAN 48 HOURS AFTER A MAJOR STORM OR MORE THAN SIX INCHES OF SEDIMENT HAS ACCUMULATED, THE GRAVEL MEDIA SHOULD BE EXCAVATED AND REPLACED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division: 8-10-15  
 Chief, Division of Land Development: 7-02-15  
 Director: [Signature]

HOWARD COUNTY, Maryland  
 Department of Public Works  
 Stormwater Management  
 Detail D-9.01