#### **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 PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JULY 2014. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JUNE 4,
- 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. 24BA AND 24CA WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "R-12" IN ACCORDANCE WITH THE 10 / 2013 COMPREHENSIVE ZONING PLAN AND AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING 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 SERVICE CONNECTIONS FROM CONTRACT NO. 14-4106.
- SEWER FOR THIS PROJECT IS TO BE SERVICE CONNECTIONS FROM CONTRACT NO. 14-4106.
- 10. 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
- 11. NO FLOODPLAIN IS LOCATED ONSITE.
- 12. NO STEEP SLOPES OVER 20,000 SF CONTIGUOUS ARE LOCATED ONSITE.
- 13. FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH A
- 14. WETLANDS AND STREAMS SHOWN ONSITE ARE BASED ON ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN
- 15. IN ACCORDANCE WITH SECTION 16.121(A)(2) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THE OPEN SPACE REQUIREMENTS FOR THIS R-12 PROJECT IS 30% OF GROSS AREA (3.13 AC. GROSS AREA x 30% = 0.94 AC.). REFER TO OPEN
- 16. GEOTECHNICAL INVESTIGATIONS SHALL COMPLETED AS PART OF THE FUTURE SUBDIVISION PLANS.
- 17. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
- 18. FOREST STAND DELINEATION PLAN PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, AUGUST 2014. MR. CANOLES NOTED 4 SPECIMENT TREES ON TEH PROJECT SITE. THIS PROPOSAL REQUIRES THE REMOVAL OF SPECIMENT TREES #1 & #3. THE REQUIRED WAIVER PETITION SHALL BE REQUESTED UNDER THE WITH A FUTURE SUBDIVISION PLAN.
- 19. ST JOHNS LANE IS CLASSIFIED AS A MINOR COLLECTOR. PROPOSED WIDENING SHALL BE IN CONFORMANCE WITH THE DESIGN MANUAL / ACCESS STREET.
- 20. TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON
- 21. THE EXISTING DWELLING AND STRUCTURES SHALL BE REMOVED.
- 22. THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- 23. STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF MICRO-SCALE AND NON STRUCTURAL PRACTICES PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIORETENTION (M-6), RAIN GARDEN (M-7) AND DRYWELL (M-5) FACILITIES AS WELL AS NON STRUCTURAL PRACTICES; DISCONNECTION OF ROOFTOP RUNOFF (N-1). THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- AS THE PROJECT IS LOCATED IN THE TIBER-HUDSON WATERSHED, 10 AND 100 YEAR QUANTITY MANAGEMENT IS REQUIRED AND SHALL BE MET THROUGH THE USE OF A QUANTITY TYPE STORMWATER MANAGEMENT FACILITY, SEE SHEET 3.
- 24. 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.
- 25. APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME.
- 26. A DESIGN ADVISORY PANEL (DAP) MEETING IS REQUIRED PRIOR TO THE SUBMISSION OF THIS PROJECTS PRELIMINARY EQUIVALENT

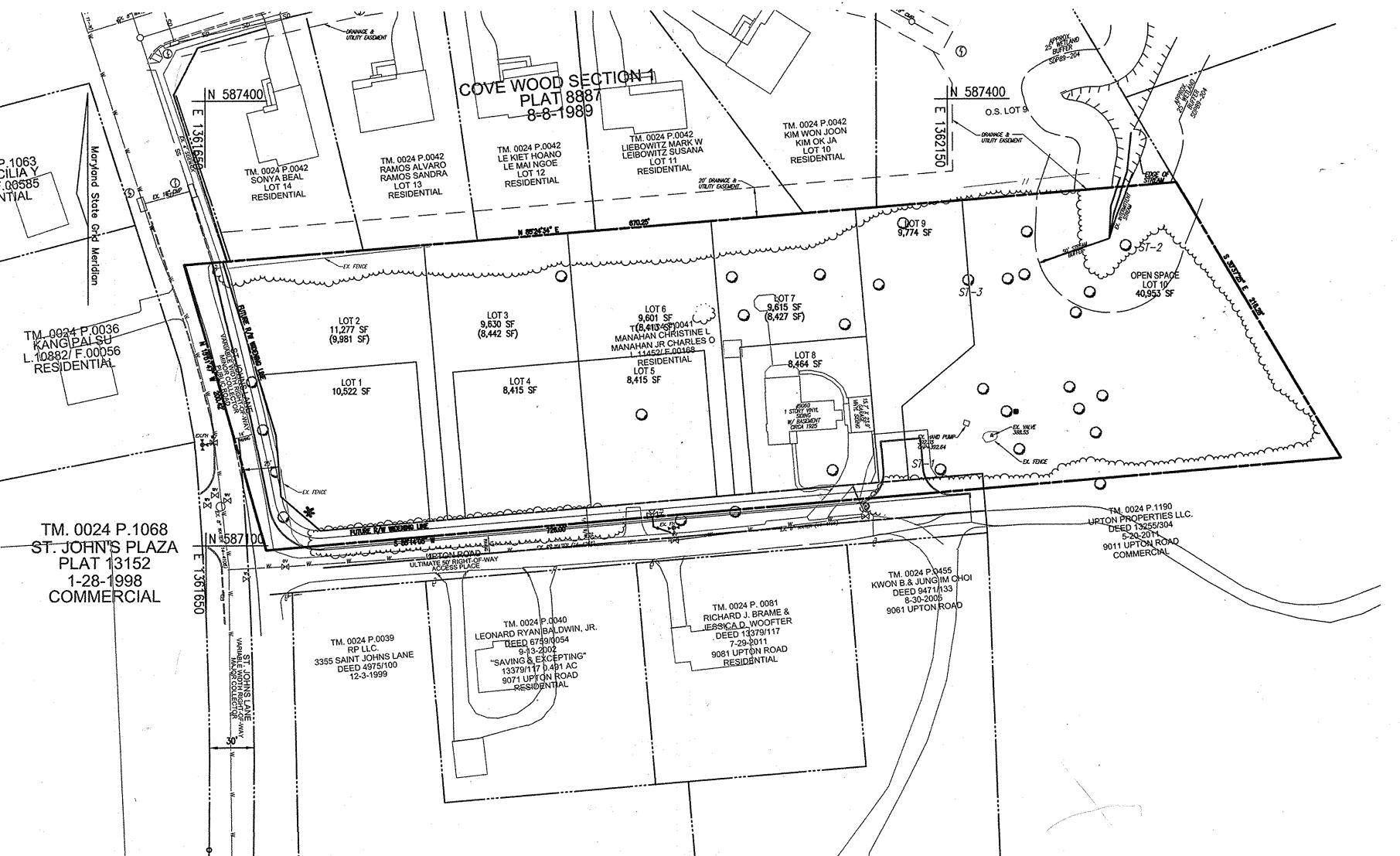
## **ENVIRONMENTAL SITE DESIGN NARRATIVE:**

- IN ACCORDANCE WITH CHECKLIST ITEM III.K.
- A. THE NATURAL AREAS ON THE PROJECT SITE ARE LOCATED IN THE EASTERNMOST PORTION OF THE SITE. NO DISTURBANCE TO THE STREAM AND STREAM BUFFER, WETLAND AND WETLAND BUFFER OR THEIR WOODED
- B. NO DRAMATIC DISTURBANCE TO THE NATURAL DRAINAGE PATTERNS ARE PROPOSED, PLEASE REFER TO THE PROPOSED GRADING, SHEET 2.
- C. 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 MICRO-SCALE PRACTICES TO INCLUDE MICRO-BIORETENTION (M-6) AND RAIN GARDEN (M-7) FACILITIES AND DRYWELLS (M-5) AS WELL AS NON STRUCTURAL PRACTICES; DISCONNECTION OF ROOFTOP RUNOFF (N-1).
- D. SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE A PROPOSED SEDIMENT TRAP (TO BE CONVERTED TO A (M-6) MICRO-BIORETENTION FACILITY, 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.
- E. STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-BIORETENTION (M-6) FACILITIES, DRYWELLS (M-5) AND DISCONNECTION OF ROOFTOP RUNOFF AT
- AS THE PROJECT IS LOCATED IN THE TIBER-HUDSON WATERSHED, 10 AND 100 YEAR QUANTITY MANAGEMENT IS REQUIRED AND SHALL BE MET THROUGH THE USE OF A QUANTITY TYPE STORMWATER MANAGEMENT FACILITY,
- F. THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD
- AT THIS CONCEPT STAGE OF DEVELOPMENT, NO DESIGN MANUAL WAIVERS AND/OR WAIVER PETITIONS FOR ENVIRONMENTAL AND STORMWATER MANAGEMENT DESIGN ARE REQUIRED.
- AT THIS CONCEPT STAGE OF DEVELOPMENT, THIS ITEM IS NOT APPLICABLE TO THIS PROJECT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

# ENVIRONMENTAL CONCEPT PLAN MAPLE GROVE

9060 UPTON ROAD PARCEL 41 L. 11452/F. 0168 ELLICOTT CITY, MARYLAND



**PLAN VIEW** 

SCALE: 1"=50

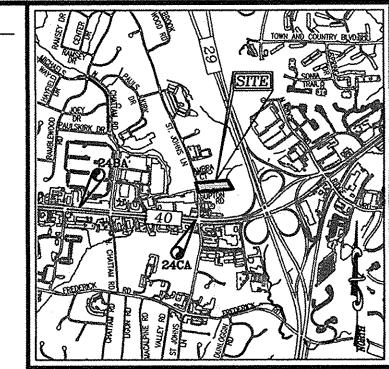
# SITE ANALYSIS DATA CHART

- A. TOTAL PROJECT AREA: B. AREA OF PLAN SUBMISSION: C. AREA OF WETLANDS AND BUFFERS: D. AREA OF FLOODPLAIN:
- E. AREA OF FOREST: F. AREA OF STEEP SLOPES (15% & GREATER): G. ERODIBLE SOILS: H. LIMIT OF DISTURBED AREA:
- I. PROPOSED USES FOR SITE AND STRUCTURES: J. GREEN OPEN AREA: K. PROPOSED IMPERVIOUS AREA: L. PRESENT ZONING DESIGNATION:
- M. OPEN SPACE REQUIRED: O. TOTAL NUMBER OF UNITS PROPOSED: P. DPZ FILE REFERENCES:
- 136,517 S.F. OR 3.134 AC. 136,517 S.F. OR 3.134 AC. 0 S.F. OR 0.00 AC. O S.F. OR 0.00 AC. (REFER TO FSD) 0 S.F. OR 0.00 AC.
- 119910 S.F. OR 2.75 AC. RESIDENTIAL SINGLE FAMILY DETACHED (SFD) HOMES 0.94 AC. (INCLDES ROAD WIDENING)
- 0.90 ACRES (30%)

### **BENCHMARKS**

HOWARD COUNTY BENCHMARK - 24BA N 586783.2418 E 1359211.6558 ELEV. 385.66 LOCATION: MD ROUTE 40 NEAR PLUM TREE DR

HOWARD COUNTY BENCHMARK - 24CA N 586506.1767 E 1361634.2891 ELEV. 398.314 LOCATION: MEDIAN ON MD ROUTE 40 AT ST JOHNS LANE



VICINITY MAP SCALE: 1"=2000' ADC MAP/GRID = 12/B7

SHEET INDEX							
DESCRIPTION	SHEET NO.						
COVER SHEET	1 OF 4						
SITE LAYOUT	2 OF 4						
GRADING PLAN	3 OF 4						
SWM DRAINAGE AREA MAP, NOTES & DETAILS	4 OF 4						

LEGEND				
	PROPERTY LINE			
	RIGHT-OF-WAY LINE			
	ADJACENT PROPERTY LINE			
• • • •	CENTERLINE OF EXISTING STREAM			
· mmmm.	EXISTING TREELINE			
	EXISTING CURB AND GUTTER PROPOSED CURB AND GUTTER			

	PERM	ΛIT	INFO	RMA	<b>NTIO</b>	N CH	<b>ART</b>	,	
SUBDIVISION NAME MAPLE GROVE		SECTION/ AREA -		LOT/ PARCEL PARCEL 41					
PLAT REF.	BLOCK	NO	ZONE	TAX	MAP	ELECT	DIST.	CENSUS	TR.
N/A	41	*	R-12	2	<u>?</u> 4	2N	D	602800	)

**DEVELOPER** TRINITY QUALITY HOMES, INC 3675 PARK AVE., SUITE 30 ELLICOTT CITY, MD 21043 (410) 480-0023

OWNER CHRISTINE AND CHARLES MANAHAN 6098 LA JOLLA MESA DRIVE LA JOLLA, CA 92037-7853 858-551-7551 C/O MR. DAVID CARNEY 410-740-4600

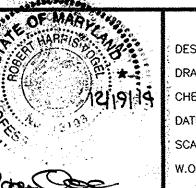
C/O MR. TIM KEANE

ENVIRONMENTAL CONCEPT PLAN **COVER SHEET** 

MAPLE GROVE 9060 UPTON ROAD ELLICOTT CITY, MARYLAND

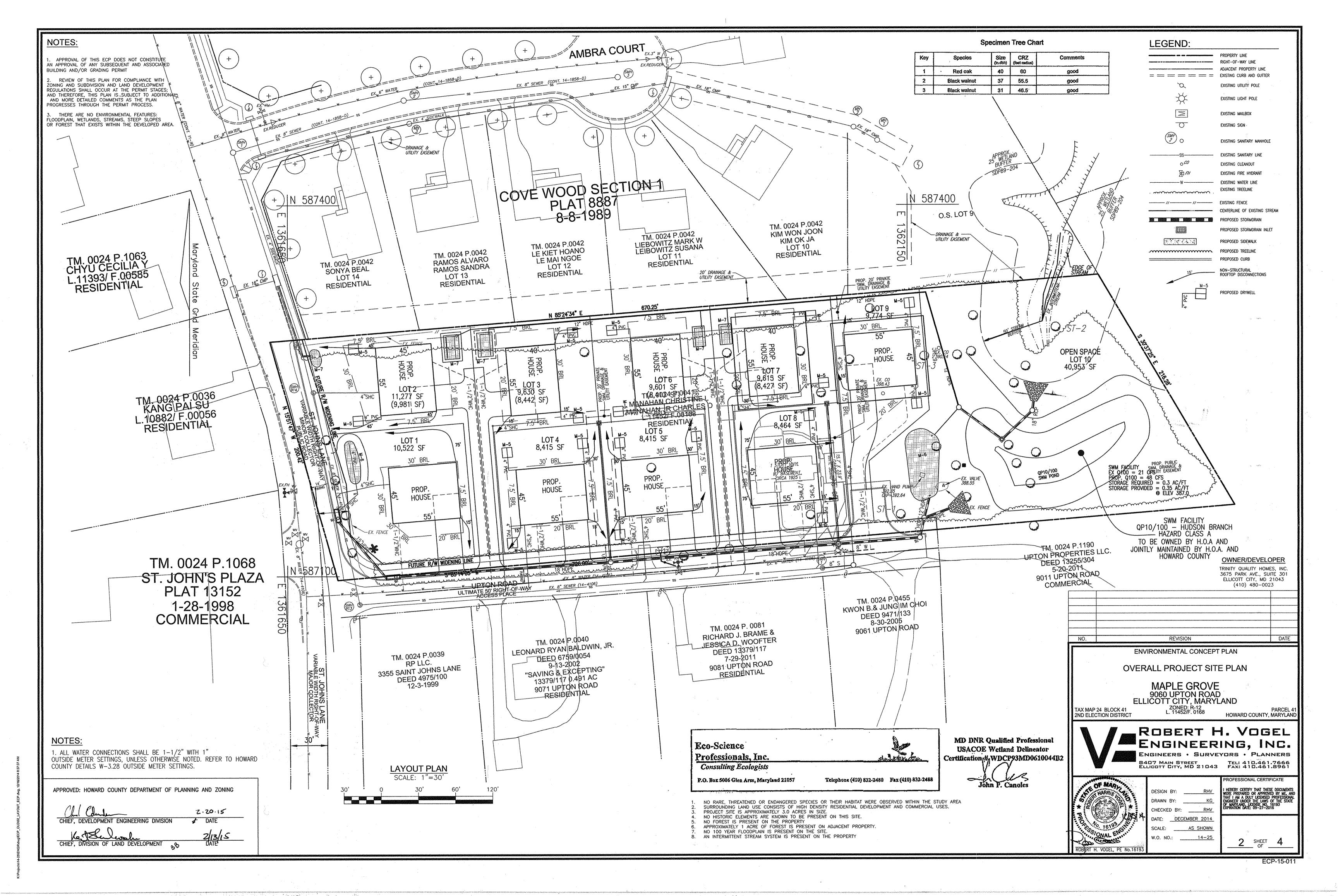
TAX MAP 24 BLOCK 41 2ND ELECTION DISTRICT HOWARD COUNTY, MARYLANI

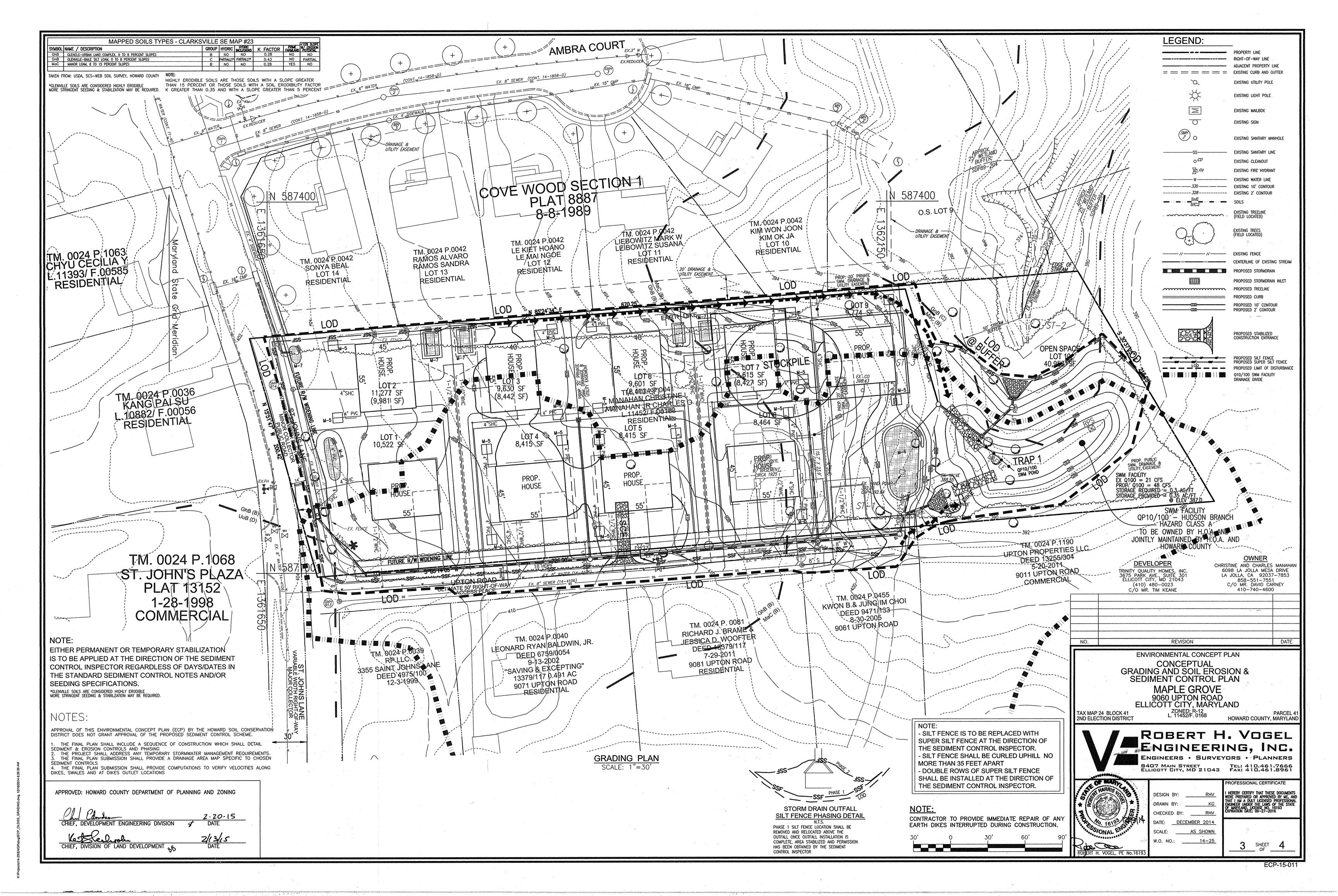




CHECKED BY:

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, UCHNSE NO, 16193 EXPIRATION DATE: 09-27-2016





NOTE: AS THE PROJECT IS LOCATED IN THE TIBER-HUDSON WATERSHED, 10 AND 100 YEAR QUANTITY MANAGEMENT IS REQUIRED AND SHALL BE MET THROUGH THE USE OF A QUANTITY TYPE STORMWATER MANAGEMENT FACILITY, SEE SHEET 3 TO BE OWNED BY H.O.A AND JOINTLY MAINTAINED BY H.O.A. AND HOWARD COUNTY

SWM FACILITY  $EX \ Q10 = 10 \ CFS$ 100 YR STORAGE REQUIRED = 0.3 AC/FT 100 YR STORAGE PROVIDED = 0.35 AC/FT • ELEV 387.0

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIÉF, DEVELOPMENT ENGINEERING DIVISION

CHIEF, DIVISION OF LAND DEVELOPMENT

2.20.15

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.

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.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED

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. HE 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.

OPERATION AND MAINTENANCE SCHEDULE FOR (M-6) MICROBIORETENTION 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. 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

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 DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES

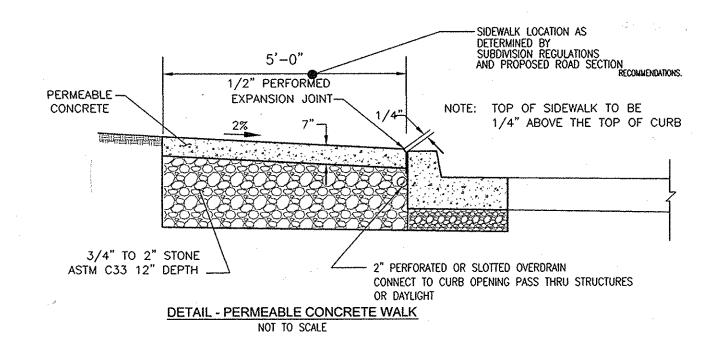
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.

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

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.

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 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

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).



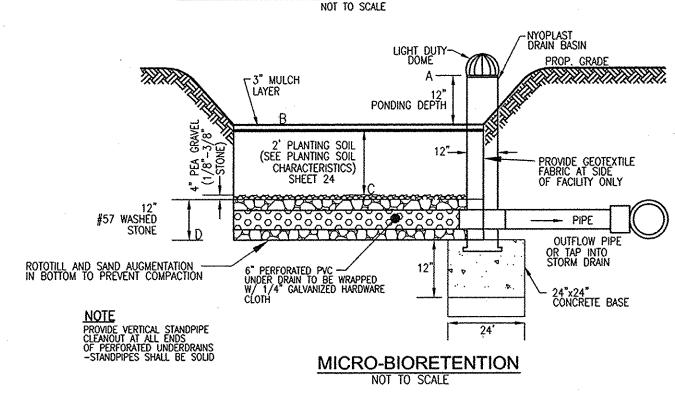
1. SIDEWALK TO BE SCRIBED IN 5'-0" MAXIMUM SQUARES. 2. EXPANSION JOINTS ACROSS THE SIDEWALK NOT TO BE MORE THAN 15' APART. 3. 1/2" PREFORMED EXPANSION MATERIAL IN EXPANSION JOINTS TO BE KEPT 1/4" BELOW SURFACE OF SIDEWALK. 4. WHEN SIDEWALK ABUTS CURB, SIDEWALK SHALL BE 1/4' ABOVE CURB WITH 1/2" PREFORMED EXPANSION JOINT BETWEEN SIDEWALK AND CURB. 5, ON LONGITUDINAL SIDEWALK GRADES OF 5 OR CREATER, A CONCRETE HEADER, 6 THICK AND 6" DEEP BELOW THE NORMAL 4" SIDEWAL CKNESS SHALL BE CONSTRUCTED FOR THE FULL WIDTH OF THE SIDEWALK AT INTERVALS OF 48 FEET. THE HEADERS SHALL BE PLACED AT THE EXPANSION JOINT LOCATIONS AND SHALL BE MONOLITHIC WITH THE SIDEWALK. 6. SIDEWALK WIDTH ADJACENT TO CURB SHALL BE 5 MINIMUM EXCEPT SIDEWALK ADJACENT TO CURB IN CUL-DE-SAC BULBS MAY BE 4'-O WIDE. 7. Cement shall be per AASHTO M85 Air Entraining - Type II Portland type, gray color. Mix and Deliver concrete in accordance with ASTM C94/C94M, Option C with the following criteria: Tensile Strength: 500 psi at 28 days, Compressive Strength: 3000 psi at 28 days, Unit Weight: 130 pounds/cf. Stoen shall be No. 8 coarse aggregate per ASTM C33

8. CONCRETE MIX SHALL BE DESIGNED BY GEO TECHNICAL CONSULTANT.

9. BASE BELOW THE CURB SHALL CONSIST OF GRADED AGGREGATE BASE(GAB).

VARIES - SEE PLAN 4" CLEANOUT PONDING DEPTH TOP MULCH BOTTOM MULCH 2.5' PLANTING SOIL (SEE PLANTING SOIL CHARACTERISTICS) - GEOTEXTILE -CLASS 'C' FILTER CLOTH GRAVEL CURTAIN DRAIN (PEA GRAVEL) 6" WASHED #57
AGGREGATE FOR REV. — 6"x4" WYE -TYP. 6" PVC SCH 40 PERFORATED PIPE (5' OF S REQUIRED FOR THE SIDES OF SOIL LAYER. SEAMS SHOULD NOT ALLOW PIPE INTO BIORETENTION AREA TO BE SOLID) @ 0.00% SLOPE. MANUFACTURER'S SPECIFICATIONS

TYP. M-6 MICRO-BIORETENTION DETAIL



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

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 <		
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 I 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 ho row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1 galvanized hardware cloth		
Poured in place concrete (if required)	MSHA Mix No. 3; Γ <sub>c</sub> = 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-pla or pre-ass) not using previously approved State or local standards requires design drawings scaled and approved by a professional structural engineer licensed in the State of Maryla - design to include meeting ACI Code 350.R/89; vertical loadii [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 sa substitutions are acceptable. No "rock dust" can be used for sa		

DISCONNECTION OF ROOFTOP RUNOFF

IN VEGETATED AREAS RECEIVING DISCONNECTED RUNOFF

CONSTRUCTION CRITERIA:

THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING THE CONSTRUCTION OF

PROJECTS WITH PLANNED ROOFTOP DISCONNECTIONS: - EROSION AND SEDIMENT CONTROL: EROSION AND SEDIMENT CONTROL PRACTICES (E.G., SEDIMENT TRAPS) SHALL NOT BE LOCATED

 SITE DISTURBANCE: CONSTRUCTION VEHICLES AND EQUIPMENT SHOULD AVOID AREAS RECEIVING DISCONNECTED RUNOFF TO MINIMIZE DISTURBANCE AND COMPACTION. SHOULD AREAS RECEIVING DISCONNECTED RUNOFF BECOME COMPACTED, SCARIFYING THE SURFACE OR ROTOTILLING THE SOIL TO A DEPTH OF FOUR TO SIX INCHES SHALL BE PERFORMED TO ENSURE PERMEABILITY. ADDITIONALLY, AMENDMENTS MAY BE NEEDED FOR TIGHT, CLAYEY SOILS.

A FINAL INSPECTION SHALL BE CONDUCTED BEFORE USE AND OCCUPANCY APPROVAL TO ENSURE THAT SIZING FOR TREATMENT AREAS HAVE BEEN MET AND PERMANENT STABILIZATION HAS BEEN ESTABLISHED.

MAINTENANCE CRITERIA:

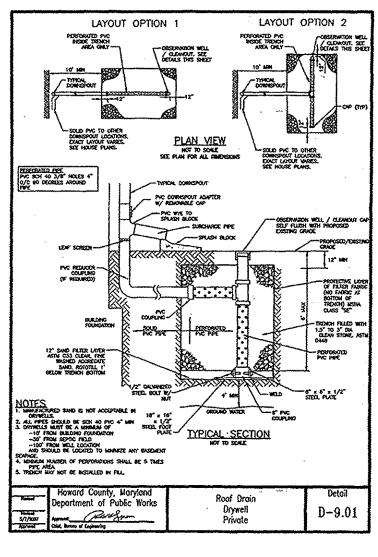
INSPECTION:

MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE AREAS RECEIVING RUNOFF SHOULD BE PROTECTED FROM FUTURE COMPACTION (E.G., BY PLANTING TREES OR SHRUBS ALONG THE PERIMETER). IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

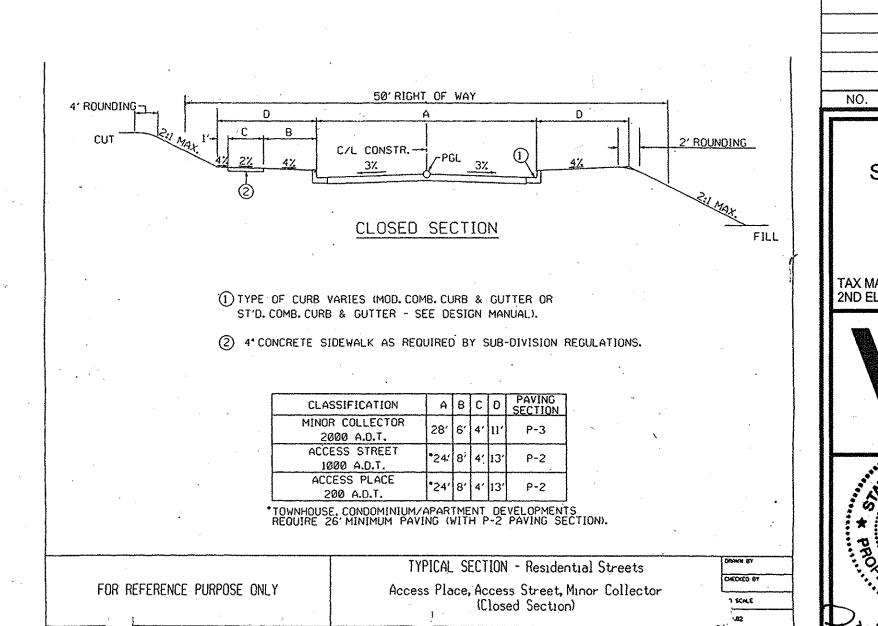
> OPERATION AND MAINTENANCE SCHEDULE FOR Privately owned and maintained drywell (m-5)

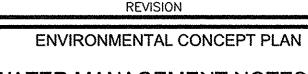
THE OWNER SHALL INSPECT & CLEAN ANNUALLY, INCLUDING PIPES GUTTERS DOWNSPOUTS AND FILTERS. B. PONDING STANDING WATER OR ALGAL GROWTH ON THE TOP OF

A DRYWELL MAY INDICATE FAILURE DUE TO SEDIMENTATION IN THE GRAVEL MEDIA. IF WATER PONDS 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



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





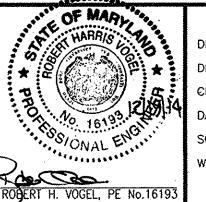
STORMWATER MANAGEMENT NOTES & DETAILS

MAPLE GROVE 9060 UPTON ROAD ELLICOTT CITY, MARYLAND

ZONED: R-12 L. 11452/F. 0168 FAX MAP 24 BLOCK 41 HOWARD COUNTY, MARYLAND 2ND ELECTION DISTRICT



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



DESIGN BY: CHECKED BY: DATE: DECEMBER 2014 SCALE: W.O. NO.:

SHEET

DATE

PARCEL 4