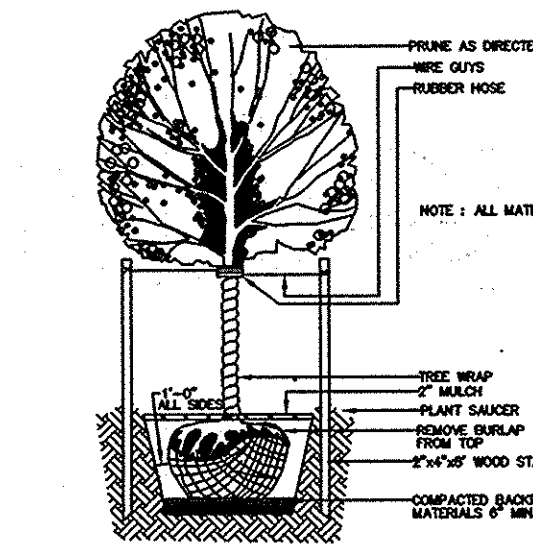


**SOILS DESCRIPTION**

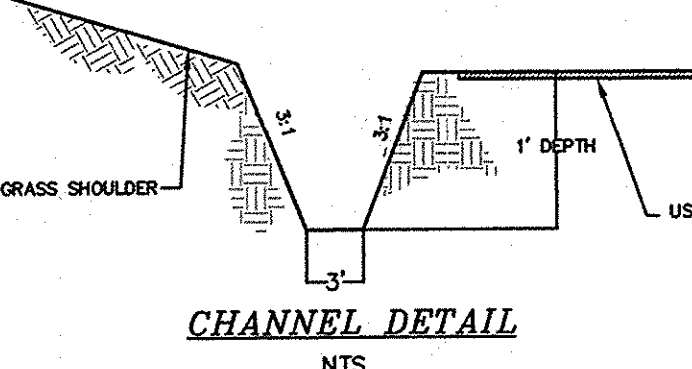
SYMBOL	HYDROLOGICAL DESCRIPTION	Kw	Kf	MAP
U3B	URBAN LAND - SASSAFRAS-BELTSVILLE-COMPLEX 0-5% SLOPE	0.37	0.37	19
U3D	URBAN LAND - SASSAFRAS-BELTSVILLE-COMPLEX 5-15% SLOPE	0.37	0.37	19

**FOREST CONSERVATION WORKSHEET**

- NET TRACT AREA:
  - A. Total tract area = 1.03
  - B. Area within 100 year floodplain & overhead transmission line = 0.00
  - C. Area to remain in agricultural production = 0.00
  - D. Net tract area = 1.03
- LAND USE CATEGORY:
  - Input the number "1" under the appropriate land use zoning, and limit to only one entry.
  - APA MDR IDA HDR MFD CIA: 0 1 0 0 0
- Afforestation Threshold: 20% x D = 0.21
- Conservation Threshold: 25% x D = 0.26
- EXISTING FOREST COVER:
  - G. Existing forest cover (excluding floodplain) = 0.00
  - H. Area of forest above afforestation threshold = 0.00
  - I. Area of forest above conservation threshold = 0.00
- BREAK EVEN POINT:
  - J. Forest retention above threshold with no mitigation = 0.00
  - K. Clearing permitted without mitigation = 0.00
- PROPOSED FOREST CLEARING:
  - L. Total area of forest to be cleared = 0.00
  - M. Total area of forest to be retained = 0.00
- PLANTING REQUIREMENTS:
  - N. Reforestation for clearing above conservation threshold = 0.00
  - P. Reforestation for clearing below conservation threshold = 0.00
  - O. Credit for retention above conservation threshold = 0.00
  - R. Total reforestation required = 0.00
  - S. Total afforestation required = 0.00
  - T. Total reforestation and afforestation required = 0.21
  - Total reforestation and afforestation provided = 0.21



**DECIDUOUS TREE PLANTING DETAIL**  
NOT TO SCALE



**CHANNEL DETAIL**  
NTS

**LEGEND**

- PROPOSED USE-IN-COMMON ACCESS, DRAINAGE AND UTILITY EASEMENT FOR THE USE AND BENEFIT OF LOTS 1, 2 & 3
- PUBLIC WATER AND UTILITY EASEMENT
- PROPOSED DRIVEWAY
- LIMIT OF DISTURBANCE
- SUPER SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- ROOF DRAIN LEADER
- EXISTING TREELINE
- PROPOSED TREELINE
- SEWER HOUSE CONNECTION
- WATER HOUSE CONNECTION

**OWNER / DEVELOPER**

FARAMARZ SADEGH-BAGJIRAN  
6043 MAJORS LANE, APT 5  
COLUMBIA, MARYLAND 21045  
(443)825-8507



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. 17842, EXP DATE 09/03/2016

R. JACOB HIKMAT P.E. DATE: 11/2/15

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
CHEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 1-14-15

CHEF, DIVISION OF LAND DEVELOPMENT  
DATE: 1-14-15

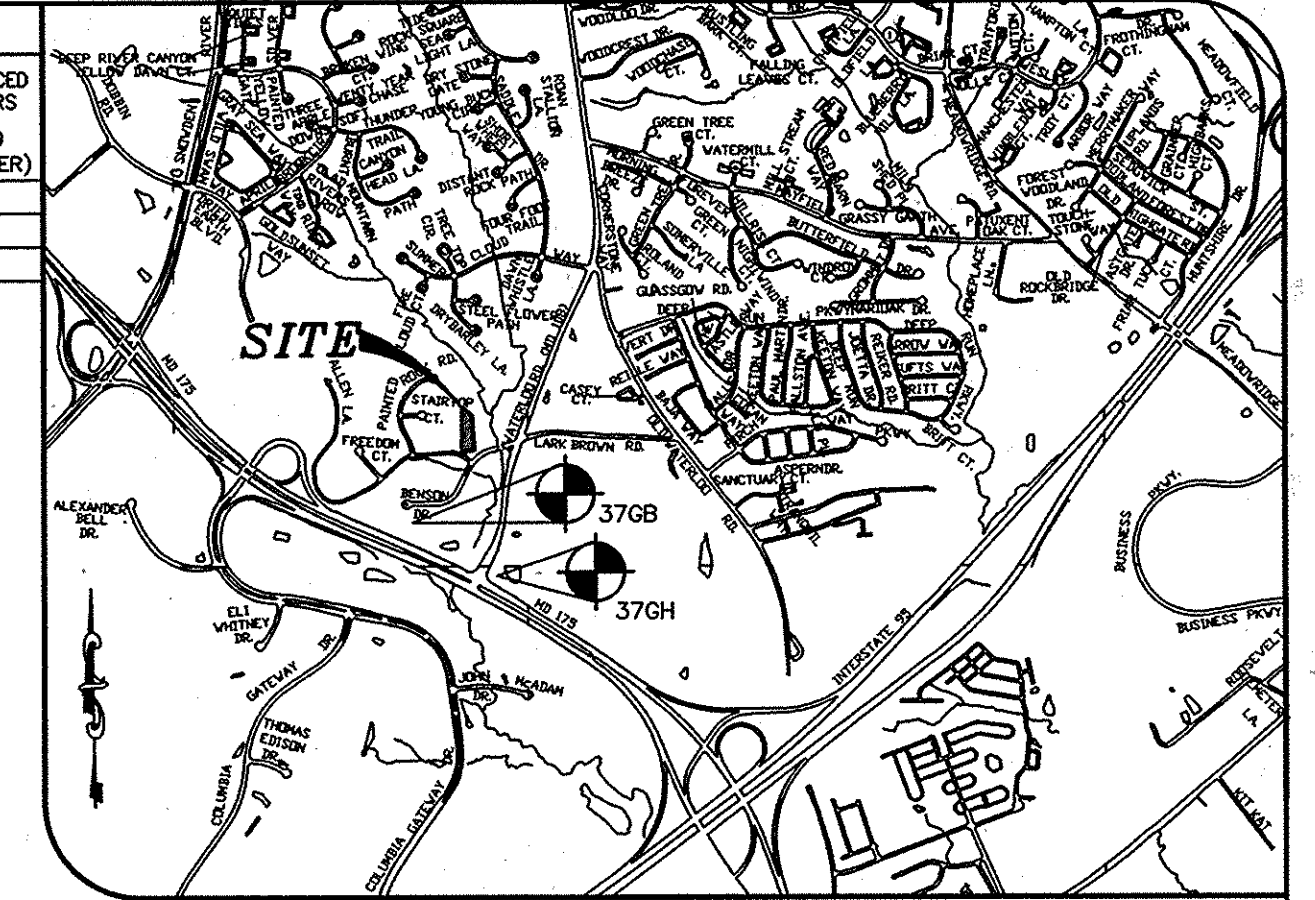
**STORMWATER MANAGEMENT PRACTICES**

LOT #	ADDRESS	GREEN ROOF (Y/N)	PERMEABLE PAVEMENTS (Y/N)	REINFORCED TURF (Y/N)	DISCONNECTION OF ROOFTOP RUNOFF (NUMBER)	DISCONNECTION OF NON-ROOFTOP RUNOFF (Y/N)	SHEETFLOW TO CONSERVATION AREAS (Y/N)	RAINFLOWER HARVESTING (NUMBER)	SUBMERGED GRAVEL WETLANDS (NUMBER)	LANDSCAPE INFILTRATION (NUMBER)	INFILTRATION BERMS (NUMBER)	DRY WELLS (NUMBER)	MICRO-BIORETENTION (NUMBER)	RAIN GARDENS (NUMBER)	SWALES (NUMBER)	ENHANCED FILTERS (NUMBER)
1	8304 LARK BROWN ROAD															
2	8306 LARK BROWN ROAD															
3	8308 LARK BROWN ROAD															

**MICRO-BIORETENTION (M-6) DESIGN DATA**

FACILITY LOT#	TOP EL.	SIZE	PONDING DEPTH	TOP OF BERM	UNDERDRAIN INV.	INV. OUT
MB-A1 (LOT 1)	306.0	210.0 S.F.	12"	307.0	303.6	303.45
MB-A2 (LOT 1)	307.0	210.0 S.F.	12"	308.0	304.6	304.45
MB-B1 (LOT 2)	311.0	215.0 S.F.	12"	312.0	308.6	308.45
MB-B2 (LOT 2)	314.0	215.0 S.F.	12"	315.0	311.6	311.40
MB-C1 (LOT 3)	311.0	130.0 S.F.	12"	312.0	308.6	308.0
MB-C2 (LOT 3)	312.0	130.0 S.F.	12"	313.0	309.6	309.40

NOTE- FOR ALL DETAILS SEE SHEET 2.



**VICINITY MAP**

ADC MAP: 34 GRID: B4, B5

**GENERAL NOTES:**

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- PROJECT BACKGROUND:
  - LOCATION: TAX MAP: 37 GRID: 20 PARCEL: 508
  - ELECTION DISTRICT: SIXTH
  - ZONING: R-12
  - PROPOSED USE FOR SITE: RESIDENTIAL
  - TYPE OF PROPOSED UNIT: SFD
  - DEED REFERENCE: L 15408, F 409
  - DPZ FILE NOS: ECP-14-075
- AREA TABULATION:
  - A. TOTAL TRACT AREA: 1.03 AC.±
  - B. NUMBER OF PROPOSED BUILDABLE LOTS: 3
  - C. NUMBER OF OPEN SPACE LOTS: 0
  - D. AREA OF PUBLIC RIGHT-OF-WAY: 0 S.F.±
  - E. AREA OF BUILDABLE LOTS: 1.03 AC.±
- ON-SITE TOPOGRAPHY SHOWN HEREON IS BASED ON A FIELD RUN SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOCIATES ON OR ABOUT MARCH 2014.
- HORIZONTAL AND VERTICAL DATUMS ARE RELATED TO THE MARYLAND STATE PLANE COORDINATE SYSTEM AS PROJECTED FROM HOWARD COUNTY CONTROL STATIONS NO. 3768 & 376H.
- STA. No. 3768 N 553,452.821 E 1,368,503.169 EL. 325.209
- STA. No. 376H N 552,861.799 E 1,369,532.680 EL. 283.769
- PROJECT BOUNDARY IS BASED ON A FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED BY MILDENBERG, BOENDER & ASSOC., INC. ON OR ABOUT MARCH 2014.
- SUBJECT PROPERTY ZONED R-12 IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING REGULATIONS.
- THE SUBDIVISION IS IN THE METROPOLITAN DISTRICT.
- STEEP SLOPES OVER 20,000 SQ. FT. IN AREA DO NOT EXIST ON SITE.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
  - A) WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE).
  - B) SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING.
  - C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM OF 45-FOOT TURNING RADIUS.
  - D) STRUCTURES (CHILVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (425,000 LBS) LOADING.
  - E) DRAINAGE ELEVATIONS - CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE.
  - F) STRUCTURE CLEARANCES - MINIMUM 12 FEET.
  - G) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
- THE FOREST CONSERVATION OBLIGATION FOR THIS RESUBDIVISION IS PROVIDED BY A PAYMENT OF FEE-IN-LIEU IN THE AMOUNT OF \$6,880.70 FOR 0.21 ACRES (9,147.60 SQ. FT.) OF AFFORESTATION.
- THIS SUBDIVISION IS IN COMPLIANCE WITH SECTION 16.124 OF HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- LANDSCAPING FOR THIS SUBDIVISION WILL BE DEFERRED UNTIL THE SITE DEVELOPMENT PLAN STATE FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED WITH THE GRADING PERMIT.
- THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES, AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
- AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
- SHOULD ANY TREE DESIGNATED FOR PRESERVATION, FOR WHICH LANDSCAPING CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD, AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST MEET SIZE AND INSTALLATION REQUIREMENTS AS SPECIFIED IN THE LANDSCAPE MANUAL.
- NO CLEARING OF EXISTING VEGETATION IS PERMITTED WITHIN THE LANDSCAPED EDGE; HOWEVER, LANDSCAPE MAINTENANCE IS AUTHORIZED.
- DRIVEWAY ENTRANCE IS PER HOWARD COUNTY STANDARD DETAIL R-6.06.
- FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM LOT AND ROAD RIGHT-OF-WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.
- STORMWATER MANAGEMENT IS PROVIDED VIA MICRO-BIORETENTION FACILITIES (M-6). ALL SWM PRACTICES WILL BE PRIVATELY OWNED AND MAINTAINED.
- A SITE DEVELOPMENT PLAN APPROVAL BY THE DEPARTMENT OF PLANNING AND ZONING IS REQUIRED PRIOR TO BUILDING PERMITS BEING ISSUED FOR THE CONSTRUCTION OF RESIDENTIAL DWELLINGS ON LOTS 2 & 3.
- THE OPEN SPACE REQUIREMENT FOR THIS SUBDIVISION IS MET BY A PAYMENT OF FEE-IN-LIEU IN THE AMOUNT OF \$3,000.00.
- THERE IS AN EXISTING GARAGE ON LOT 1 TO BE REMOVED.
- NO FOREST STAND OR WETLAND EXISTS ON SITE AS CERTIFIED BY MILDENBERG, BOENDER & ASSOC., INC.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- EXISTING UTILITIES ARE BASED ON AS-BUILT PLANS FOR WATER AND SEWER CONTRACTS 671-W AND 20-1264, VERIFIED BY FIELD RUN SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOC., INC.
- FLOODPLAIN STUDY IS NOT REQUIRED FOR THIS SITE.
- NOISE STUDY IS NOT REQUIRED FOR THIS SITE.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT. IN ACCORDANCE WITH SECTION 16.1107(c)(2) MINOR SUBDIVISIONS ARE EXEMPT FROM THE REQUIREMENT TO PASS THE TEST FOR ADEQUATE ROAD FACILITIES.
- THE PROPOSED SUBDIVISION WILL CONSIST OF SINGLE FAMILY DETACHED DWELLINGS.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL AREAS" (JUNE 1993) WITH A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE."
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 30' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.

**PERIMETER LANDSCAPE REQUIREMENT PLANTING SCHEDULE**

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
4		ACER RUBRUM (AR)	RED MAPLE	2 1/2" - 3" CAL.
2*		ACER RUBRUM (AR)	RED MAPLE	3" - 4" CAL.
10		PRUNUS SARGENTII (PS)	SARGENT CHERRY	2 1/2" - 3" CAL.
5		CIRCS CANADENSIS (CC)	EASTERN REDBUD	2 1/2" - 3" CAL.

TOTAL  
21 TREES (16 SHADE TREES, 5 ORNAMENTAL)  
\* 2 ADDITIONAL RED MAPLES PROVIDED AS PER APPROVAL CONDITION OF WP-15-018 FOR REMOVAL OF ONE SPECIMEN TREE.

**SCHEDULE A : PERIMETER LANDSCAPED EDGE**

CATEGORY	ADJACENT TO PERIMETER PROPERTIES				TOTAL
	A (PERIMETER 1)	A (PERIMETER 2)	A (PERIMETER 3)	A (PERIMETER 4)	
LANDSCAPE TYPE					
LINEAR FEET OF PERIMETER	367 LF	121 LF	382 LF	105 LF	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	NO	NO	NO	NO	N/A
NUMBER OF PLANTS REQUIRED	8 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	2 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	6 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	2 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	16 SHADE TREES 0 EVERGREEN TREE 0 SHRUBS
CREDIT FOR EXISTING VEGETATION	0 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	N/A	0 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS	N/A	0 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED	8 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	4 SHADE TREE 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	5 SHADE TREES 1 EVERGREEN TREES 1 SUBSTITUTION TREES 0 SHRUBS	0 SHADE TREES 0 EVERGREEN TREES 4 SUBSTITUTION TREES 0 SHRUBS	15 SHADE TREES 1 EVERGREEN TREES 1 SUBSTITUTION TREES 0 SHRUB

project date: 14-005 DEC. 2014  
illustration: JLS/JMT  
scale: 1"=30'  
approval: MAM

description: LOT 3, SINGLE FAMILY DETACHED  
revisions: 1 OF 2

FAZ PROPERTY  
LOTS 1 THRU 3, SINGLE FAMILY DETACHED  
TAX MAP 37, PARCEL 508, GRID 20  
SIXTH ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND  
SUPPLEMENTAL AND LANDSCAPE PLAN

**MILDENBERG, BOENDER & ASSOC., INC.**  
Engineers Planners Surveyors  
7850-B Grace Drive, Columbia, Maryland 21044  
(410) 997-0286, Fax: (410) 997-0288

**GEOTECHNICAL ENVIRONMENTAL INVESTING CONSULTANTS, INC.**  
 P.O. Box 2071  
 Columbia, MD 21045-2071  
 Phone: (410) 381-5330  
 Fax: (410) 381-1064  
 e-mail: mouni54@yahoo.com

August 10, 2014  
 Mildenberg, Boender & Associates, Inc.  
 7350-B Grace Drive  
 Columbia, Maryland 21044  
 Attn: Ms. Maya M. Mildenberg  
 Vice President  
 Ref: Limited Subsurface Exploration  
 Proposed Development  
 Faz Property  
 N. Larkcrown Road  
 Tax Map: 37, Grid: 20, Parcel: 508  
 Columbia, Maryland 21073  
 GE&T Project No. G-236



Dear Ms. Mildenberg:  
 On August 9th, 2014, GE&T Consultants, Inc. utilized a hand auger to bore three (3) soil borings at the locations shown on the attached Hand-Augers Location Map. The purpose of the hand augers was to evaluate the presence/absence of bedrock and local groundwater at the location shown, within 5-ft below existing site grades. The number, location, and depth of the borings were determined by others and the borings were staked-out in the field by others.  
 Our field observations are summarized in Table 1 below:

Hand Auger No.	Depth to Groundwater (in)	Depth to Hand-Auger Refusal (in)	Boring Termination Depth (in)	Remarks
HA-1	N/A	N/A	24.0	
HA-2	N/A	N/A	60.0	
HA-3	N/A	N/A	60.0	

Note: All depths are below existing site grades

It should be noted that the actual level of groundwater and the amount and level of perched water should be anticipated to fluctuate through the year, depending on variations in precipitation, surface run-off, infiltration, site topography, drainage, and other factors not evident at the time of our exploration. GE&T can not be responsible for changes in groundwater conditions at the site due to seasonal variations and changes caused by other factors such as grading operations at the site.

GE&T appreciates the opportunity to provide this geotechnical engineering service to you. Should you have any questions regarding this letter report, or require additional services, please feel free to contact our office.

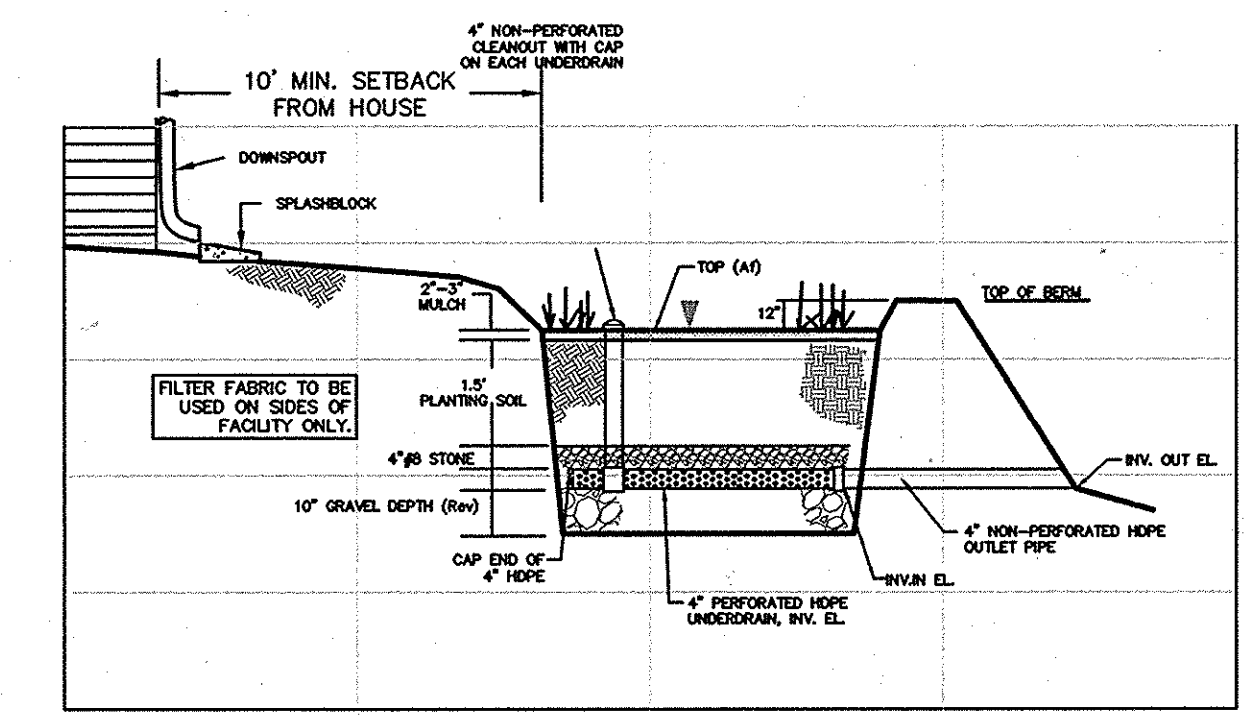
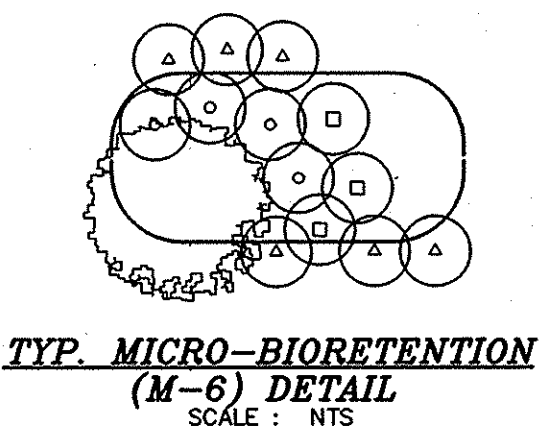
Sincerely,  
 GE&T Consultants, Inc.  
  
 Mounir Abouzakhin, PE  


**OWNER / DEVELOPER**  
 FARAMARZ SADEGHI-BAJGIRAN  
 6043 MAJORS LANE, APT 5  
 COLUMBIA, MARYLAND 21045  
 (443)825-8507

**MICRO-BIORETENTION (M-6) PLANT LIST**

QUANTITY	QUANTITY	QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME
LOT 1	LOT 2	LOT 3			
2	2	2	⊙	ILEX GLABRA	INK BERRY
16	16	10	⊙	LOBELIA SPICULIFLORA	GREAT BLUE LOBELIA
10	10	10	⊙	CNOCLEA SENSIBILIS	SENSITIVE FERN
10	10	10	⊙	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER

TOTAL: 102 PERENNIALS, 6 SHRUB  
 NOTE- EQUIVALENT PLANT MATERIAL IN ACCORDANCE WITH HOWARD COUNTY LANDSCAPE MANUAL CAN BE USED.



**MICRO-BIORETENTION (M-6) DETAIL**  
 NOT TO SCALE



**OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)**

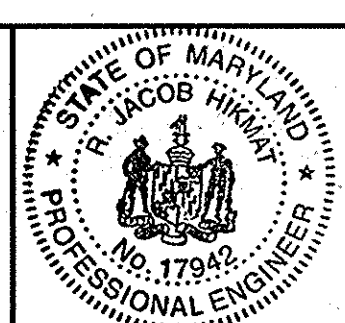
- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A-4.1 AND 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 WRES.
- 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.
- THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

**B.A.C. SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDENS, LANDSCAPE INFILTRATION & INFILTRATION BERMS**

- MATERIAL SPECIFICATIONS**  
 THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.A.1.  
 1. FILLING MEDIA OR PLANTING SOIL  
 THE MEDIA SHALL BE UNIFORM, 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 PROVIDE A HINDBARRE 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 CODE 15.06.01.05.  
 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 (50%-65%) AND COMPOST (35%-40%) OR SANDY LOAM (50% COARSE SAND (20%), 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 INTO THE SOIL TO INCREASE OR DECREASE PH.  
 THERE SHALL BE AT LEAST ONE SOIL TEST FOR PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TEST OF ORGANIC MATTER AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL, IF TOPSOIL IS IMPORTED, THEN A TEXTURAL ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.
- COMPACTION**  
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE EXCAVATION USING A LOADER. THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH 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 ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHisel, PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE 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 2-3 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 3-4 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 SANDS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.**
- PLANT MATERIAL**  
 RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.
- 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"-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 (6-12 MONTHS) FOR ACCEPTANCE.  
 ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOTS SHOULD BE PLANTED SO 1/3RD OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST 6" 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, IMPOTES 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.
- UNDERDRAINS**  
 UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:  
 - PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 756, TYPE PS 28 OR AASHTO-M-278) IN A GRAVEL LAYER. THE PERFORATED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G. PVC OR HDPE).  
 - PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE AT LEAST 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 #4) 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" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEED 24".  
 THE 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 1,000 SQUARE FEET OF SURFACE AREA).
- MISCELLANEOUS**  
 THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

14-005 (Rev) 005--FINAL--JUL 2014--REVISED

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 1-12-15  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 1-14-15



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. 17942, EXP DATE 09/03/2016  
 R. JACOB HIKMAT P.E. 12/9/14 DATE:

project	14-005	date	DEC. 2014
illustration	JLS/MMT	engineering	JLS
scale	1"=30'	approval	MMM

no.	description	revisions	date
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**FAZ PROPERTY**  
 LOTS 1 THRU 3, SINGLE FAMILY DETACHED  
 TAX MAP 37, PARCEL 508, GRID 20  
 HOWARD COUNTY, MARYLAND  
 SIXTH ELECTION DISTRICT  
 NOTES AND DETAILS

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