

**SOILS TABLE**

SYMBOL	RATING	NAME	K FACTOR	MAP NO.
GnB	(B)	GLENELG-URBAN LAND COMPLEX 0 TO 8 PERCENT SLOPES	.37	23
GnB	(C)	GLENVILLE-BAILEY LOAMS (HIGHLY FRODIBLE SOIL) 0 TO 8 PERCENT SLOPES	.43	23
MaC	(B)	MANOR LOAM, 8-15% SLOPES	.32	23

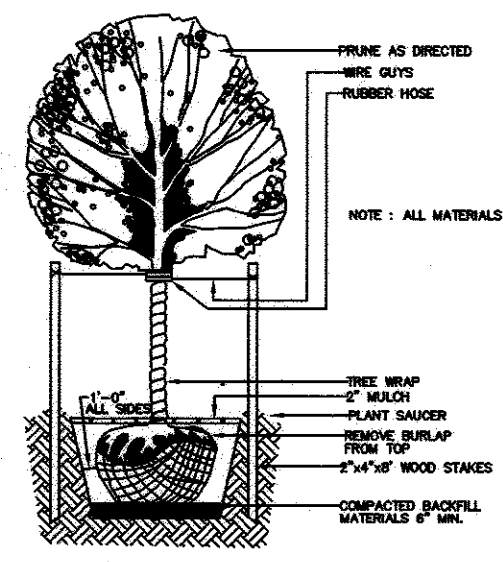
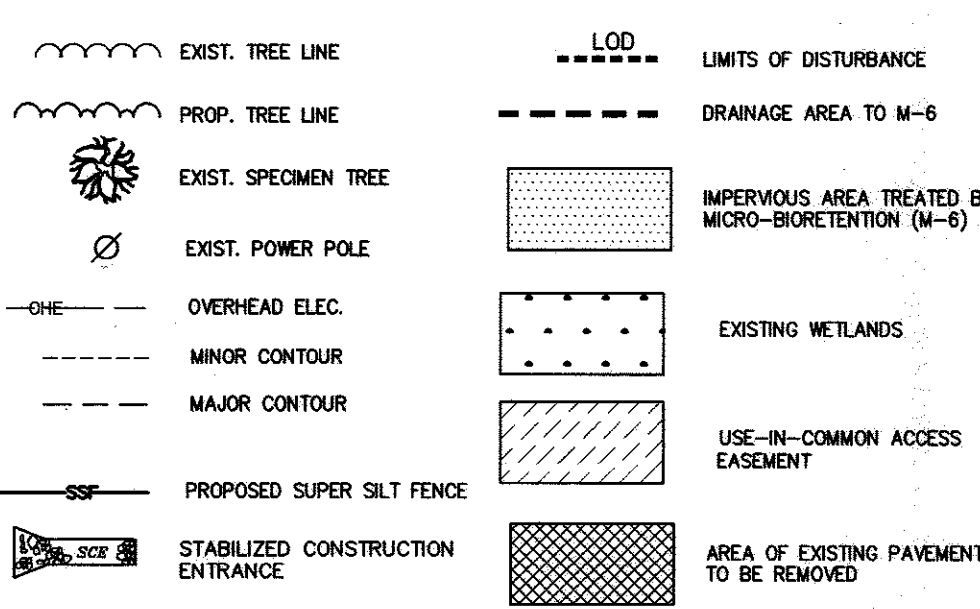
**SPECIMEN TREE**

KEY	SPECIES	SIZE	COMMENTS
ST 1	SILVER MAPLE	30'+	FAIR
ST 2	NORWAY MAPLE	30'+	FAIR
ST 3	NORWAY MAPLE	30'+	FAIR

**STORMWATER MANAGEMENT PRACTICES**

ADDRESS	MICRO-BIORETENTION M-6 (NUMBER)
10973 SCAGGSVILLE RD (LOT 1)	N/A (EXISTING HOUSE)
10969 SCAGGSVILLE RD (LOT 2)	1

**LEGEND**



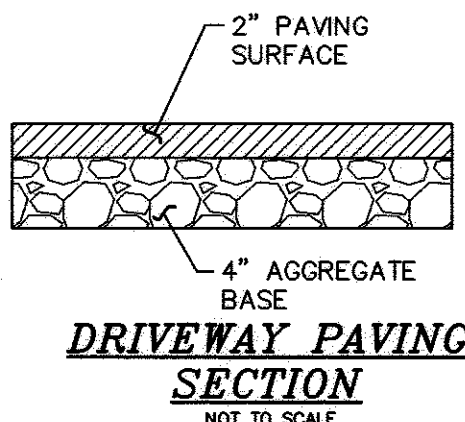
**DECIDUOUS TREE  
PLANTING DETAIL**  
NOT TO SCALE

**SCHEDULE A : PERIMETER LANDSCAPE EDGE**

CATEGORY	ADJACENT TO PERIMETER PROPERTIES					TOTAL
	A (PERIMETER 1)	D (PERIMETER 1-A)	A (PERIMETER 2)	A (PERIMETER 3)	B (PERIMETER 4)	
LINEAR FEET OF PERIMETER	469.54 LF	266.00 LF	189.52 LF	298.99 LF	192.92 LF	120.66 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	YES, 154 LF OF EXISTING TREES	NO	YES, 189.52 LF OF EXISTING TREES	YES, 298.99 LF OF EXISTING TREES	NO	NO
NUMBER OF PLANTS REQUIRED	8 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	4 SHADE TREES 27 EVERGREEN TREES 0 SHRUBS	3 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	5 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	3 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	2 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED	5 SHADE TREES 0 EVERGREEN TREES 0 OTHER TREES (2:1 SUBSTITUTION) 0 SHRUBS (10:1 SUBSTITUTION)	4 SHADE TREES 27 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	0 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	0 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	3 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	2 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS

**PERIMETER LANDSCAPE REQUIREMENT PLANTING SCHEDULE**

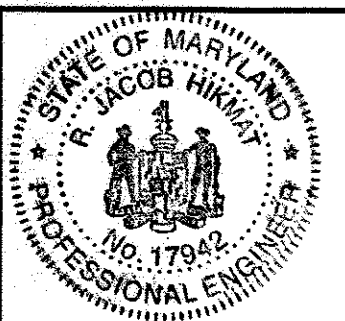
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
7	(Symbol)	PRUNUS SARGENTI	SARGENT CHERRY	2 1/2" - 3" CAL.
7	(Symbol)	ACER RUBRUM (AR)	RED MAPLE	2 1/2" - 3" CAL.
27	(Symbol)	THUJA OCCIDENTALIS 'ELEGANTISSIMA'	ELEGANTISSIMA ARBORVITAE	2" - 2 1/2" HGT.
<b>TOTAL</b>				<b>14 SHADE TREES, 27 EVERGREENS</b>



**DRIVEWAY PAVING  
SECTION**  
NOT TO SCALE

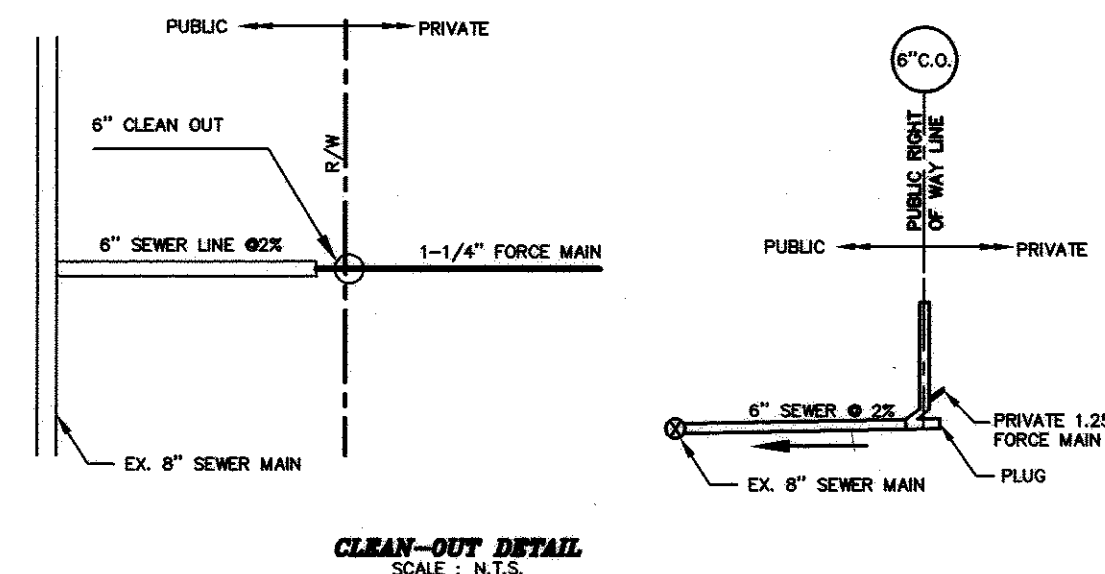
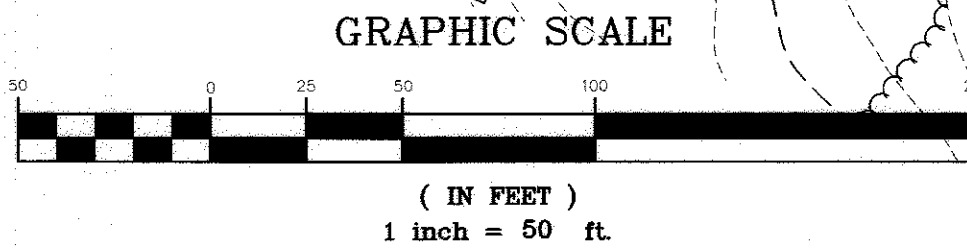
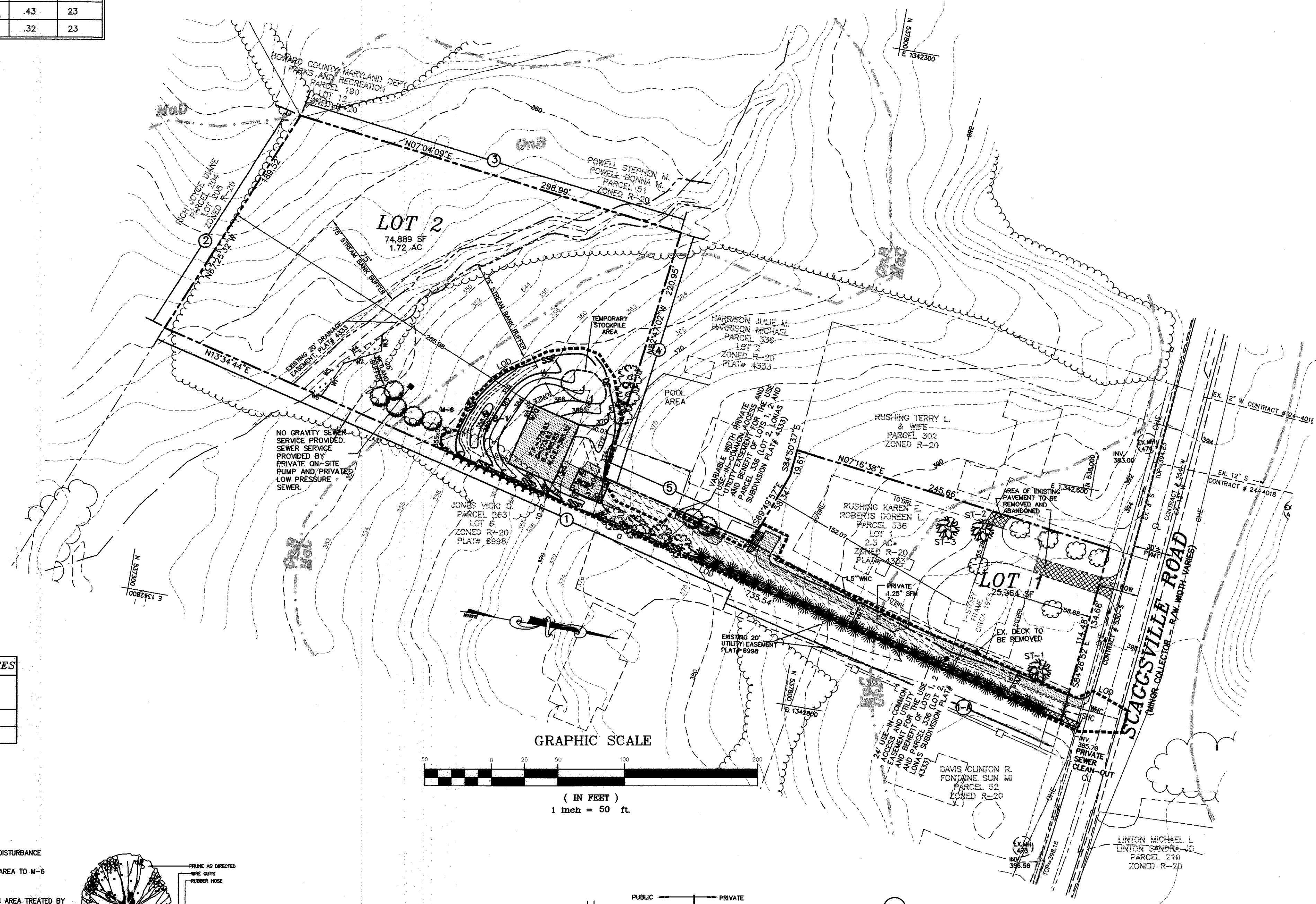
P: 2004/15-014/DWG/RUSHING PROPERTY

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 5-9-17 DATE  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 5-10-17 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT

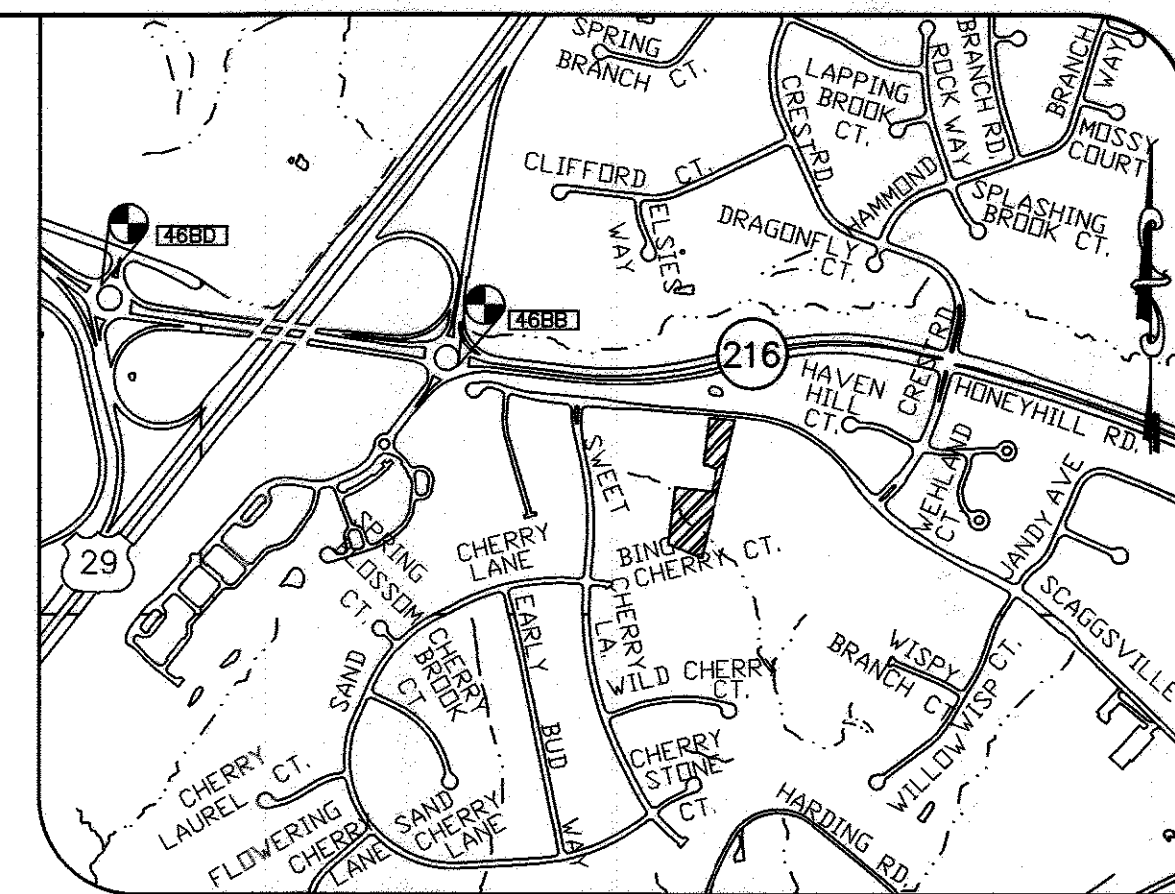


I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 17942, EXPIRATION DATE: 09/03/2018  
 [Signature] 4/27/17  
 R. JACOB HIKMAT, P.E. DATE

**OWNER/DEVELOPER**  
 KAREN RUSHING  
 10973 SCAGGSVILLE ROAD  
 LAUREL, MD. 20723  
 (703) 464-4766



**CLEAN-OUT DETAIL**  
SCALE: N.T.S.



**VICINITY MAP**  
SCALE: 1" = 1000'

- GENERAL NOTES:**
- SUBJECT PROPERTY ZONED "R-20" PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
  - ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS.
  - PROJECT BACKGROUND:**  
 ADDRESS: 10973 SCAGGSVILLE ROAD LAUREL, MD 20723  
 LOCATION: TAX MAP : 46 PARCEL: 336 GRID: 5 LOT: 1  
 ELECTION DISTRICT: SIXTH  
 ZONING: R-20  
 DPZ FILE NUMBERS: ECP-16-062
  - AREA TABULATION**  
 A. TOTAL TRACT AREA: 2.30 AC ±  
 B. NUMBER OF PROPOSED BUILDABLE LOTS : 2  
 C. NUMBER OF OPEN SPACE LOTS : 0 AC ±  
 D. AREA OF THE ROAD DEDICATION : 0 AC ±  
 E. AREA OF BUILDABLE LOTS : 2.30 AC ±
  - ON-SITE TOPOGRAPHY SHOWN HEREIN IS BASED ON A FIELD RUN SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOCIATES ON OR ABOUT FEBRUARY 2016.
  - COORDINATES BASED ON NAD '83 MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 46BB & 46BD  
 STA. No. 46BB N 538306.5015 ELEV. 422.637  
 N 1341329.1564  
 STA. No. 46BD N 538656.7632 ELEV. 431.169  
 E 1339461.5542
  - THE PROPOSED SUBDIVISION WILL CONSIST OF SINGLE FAMILY DETACHED DWELLINGS.
  - STEEP SLOPES GREATER THAN 25% AND 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 (1-1/2").  
 C) GEOMETRY - MAX. 15% GRADE, MAX. 10% GRADE CHANGE AND MIN. OF 45 FOOT TURNING RADIUS.  
 D) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).  
 E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOOD PLAIN WITH NO MORE THAN 1 FOOT OF DEPTH OVER DRIVEWAY SURFACE.  
 F) STRUCTURE CLEARANCES - MINIMUM 12 INCHES.  
 G) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
  - THIS PLAN IS EXEMPT FROM FOREST CONSERVATION OBLIGATION REQUIREMENTS. IT IS A MINOR SUBDIVISION THAT CREATES ONE LOT AND HAS NO FUTURE SUBDIVISION POTENTIAL.
  - LANDSCAPING FOR LOT 2 IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. SURETY FOR THE REQUIRED LANDSCAPING WILL BE PROVIDED WITH THE GRADING PERMIT FOR LOT 2 AT SDP STAGE.
  - 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 SUBSTITUTION 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.
  - THERE IS AN EXISTING DWELLING/STRUCTURE(S) LOCATED ON LOT 1 TO REMAIN. NO NEW BUILDINGS, EXTENSIONS OR ADDITIONS TO THE EXISTING DWELLING ARE TO BE CONSTRUCTED AT A DISTANCE LESS THAN THE ZONING REGULATIONS ALLOW.
  - 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 TO THE PIPESTEM LOT DRIVEWAY.
  - STORMWATER MANAGEMENT REQUIREMENTS WILL BE SATISFIED VIA A MICRO-BIORETENTION FACILITY AND WILL BE PRIVATELY OWNED AND MAINTAINED.
  - THE OPEN SPACE REQUIREMENT FOR THIS SUBDIVISION IS MET BY A PAYMENT OF FEE-IN-LIEU IN THE AMOUNT OF \$1,500.00.
  - THIS SUBDIVISION IS IN THE METROPOLITAN DISTRICT. WATER AND SEWER ARE PUBLIC (CONTRACT # 354-W AND CONTRACT # 530-S).
  - THIS DEVELOPMENT IS DESIGNED TO BE IN ACCORDANCE WITH SECTION 16.127 RESIDENTIAL INFILL DEVELOPMENT OF SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DEVELOPER OF THIS PROJECT SHALL CREATE COMPATIBILITY WITH THE EXISTING NEIGHBORHOOD THROUGH THE USE OF ENHANCED PERIMETER LANDSCAPING, BERMS, FENCES, SIMILAR HOUSE TYPES AND THE DIRECTIONAL ORIENTATION OF THE PROPOSED HOUSES.
  - WETLANDS AND ITS BUFFER EXIST ON SITE AS CERTIFIED IN THE WETLAND AND FSD LETTER PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. IN FEBRUARY 25, 2016.
  - THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS (COUNCIL BILL 45-2003). DEVELOPMENT OR CONSTRUCTION OF THESE LOTS MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION OR BUILDING/GRADING PERMIT.
  - ALL LOTS/RESIDENTIAL UNITS IN THIS SUBDIVISION ARE SUBJECT TO THE MIHU FEE-IN-LIEU REQUIREMENT THAT IS TO BE CALCULATED AND PAID TO THE DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS AT THE TIME OF BUILDING PERMIT ISSUANCE BY THE PERMIT APPLICANT.
  - ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MARYLAND STATE HIGHWAY ADMINISTRATION STANDARDS AND SPECIFICATIONS IF APPLICABLE.
  - 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.
  - NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
  - NO 100 YEAR FLOODPLAIN EXISTS ON THIS SITE. DRAINAGE AREA IS LESS THAN 30 ACRES.
  - ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARED TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE)- 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
  - EXISTING UTILITIES ARE BASED ON AS-BUILT PLANS FOR WATER AND SEWER CONTRACTS AND ARE VERIFIED BY FIELD RUN SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOC., INC.
  - PAYMENT CONNECTING LOT 1 AND PARCEL 302 WILL BE REMOVED AND THE DRIVEWAY ENTRANCE FOR LOT 1 ON TO SCAGGSVILLE ROAD WILL BE REMOVED.

**KAREN RUSHING PROPERTY**  
 TAX MAP 46 GRID 5 PARCEL 336  
 LOTS 1 AND 2  
 HOWARD COUNTY, MARYLAND  
 6TH ELECTION DISTRICT  
**SUPPLEMENTAL PLAN**

Project: 15-014  
 Date: APR. 2017  
 Illustration: engineering  
 MAM/MAT MAM  
 Scale: 1"=50'  
 Description: RJK  
 Revisions: [None]

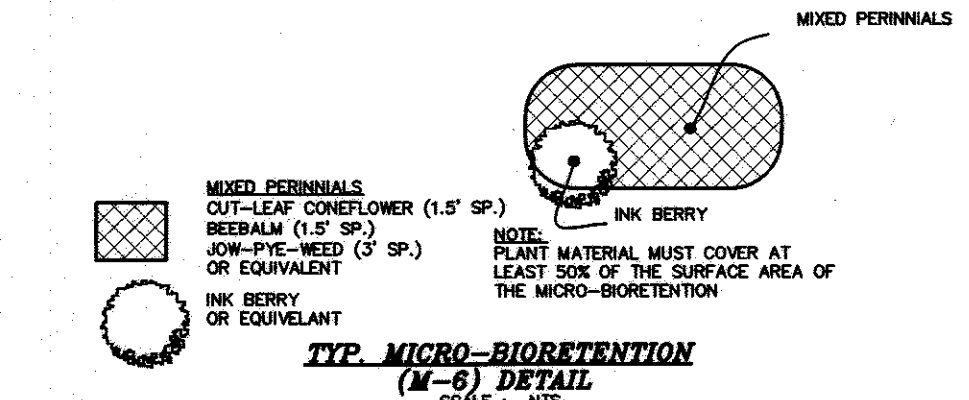
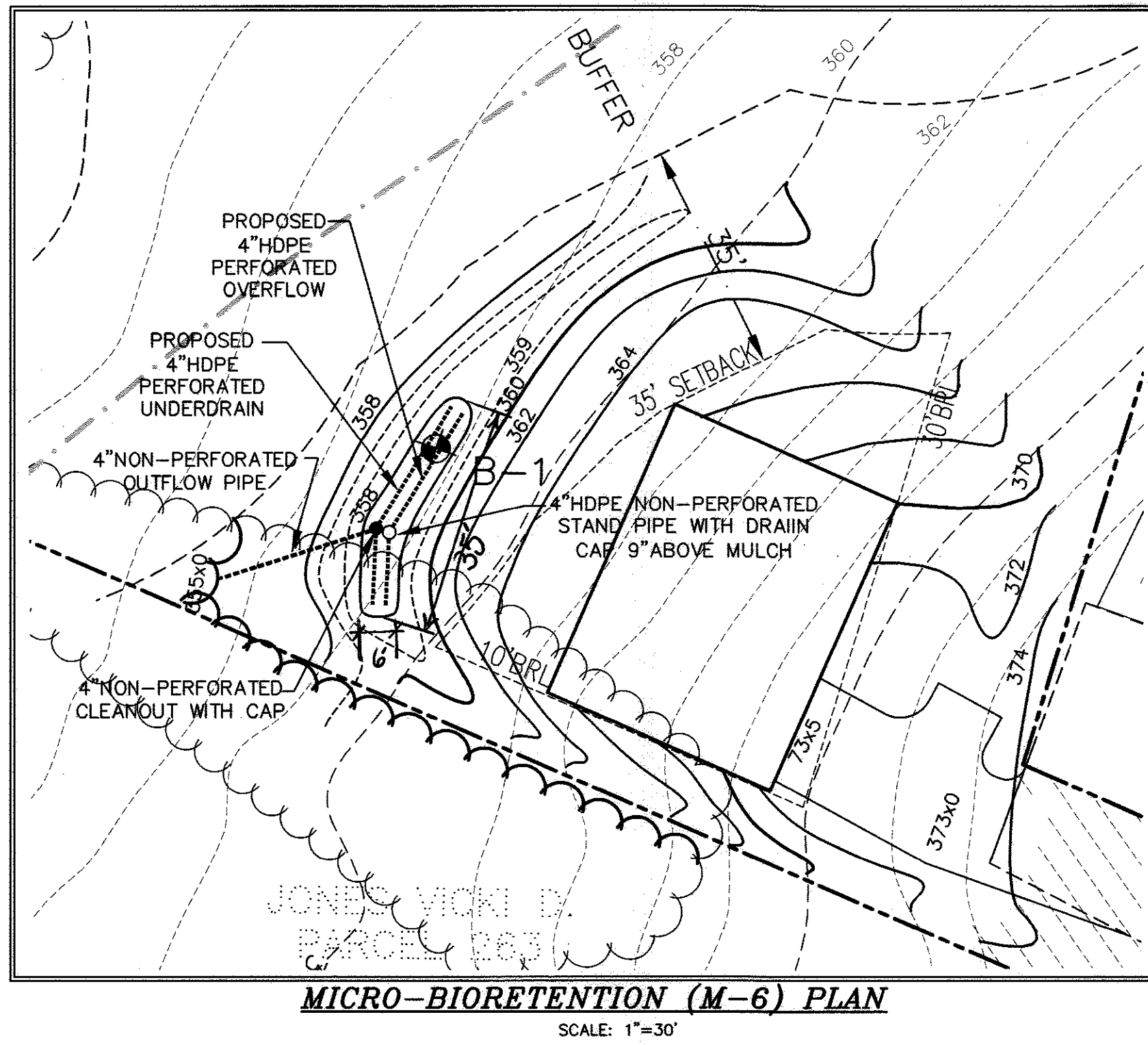
**MILDENBERG, BOENDER & ASSOC., INC.**  
 Surveyors  
 Engineers Planners  
 7350-B Grace Drive, Columbia, Maryland 21044  
 (410) 997-0286 Tel. (410) 997-0288 Fax.

1 OF 2  
 F-17-047



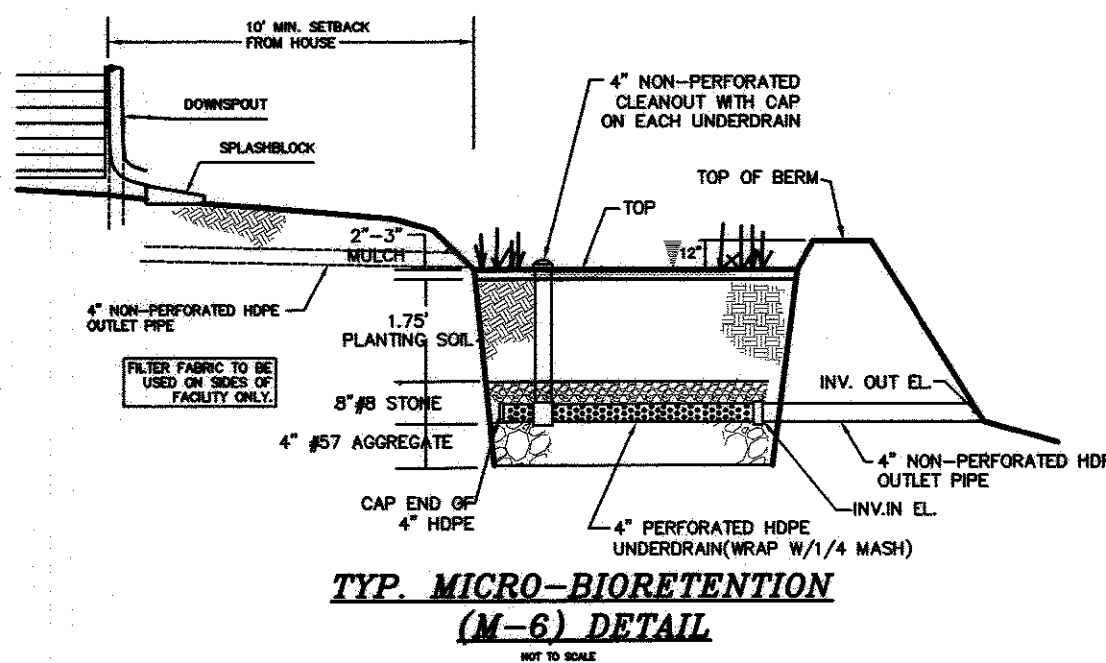
**SWM PRACTICES TABLE**

ADDRESS	ESD METHOD	TREATED AREA TYPE	REQUIRED ESDv	PROVIDED ESDv
10973 SCAGGSVILLE RD. (LOT 1)	N/A	N/A	N/A	N/A
10969 SCAGGSVILLE RD. (LOT 2)	M-6, MICRO-BIORETENTION	PROPOSED HOUSE AND PROPOSED PAVEMENT	269 C.F.	445 C.F.



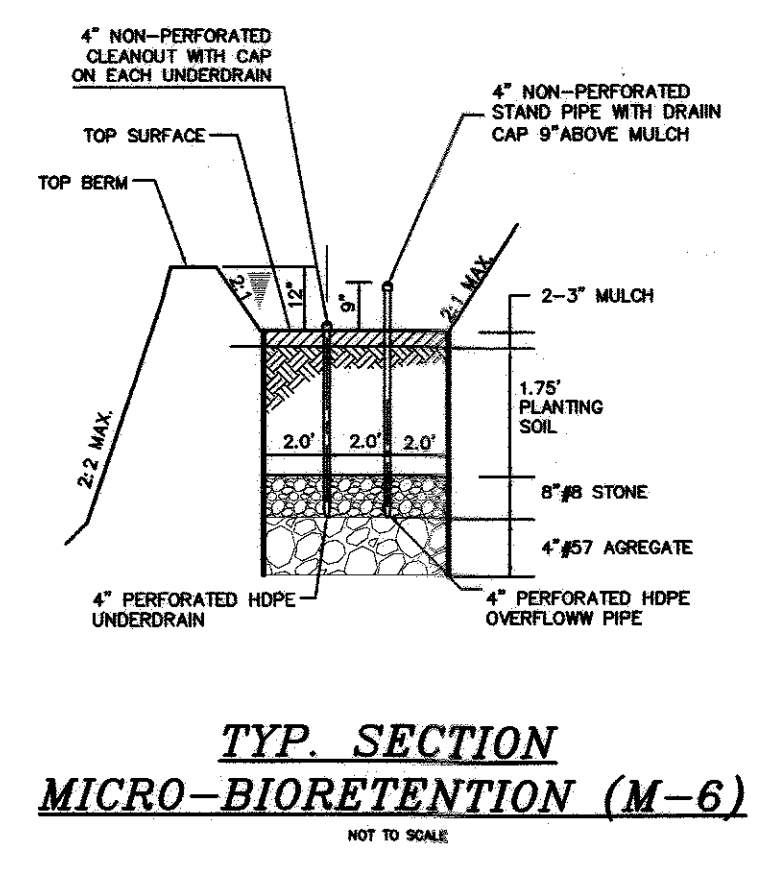
**MICRO-BIORETENTION SCHEDULE**

FACILITY	TOP EL.	TOP OF BERM	INV. IN UNDERDRAIN	INV. OUT UNDERDRAIN	AREA AT TOP EL.	AREA AT BERM EL.
LOT 2	358.00	359.00	355.33	355.00	208 SF	510 SF



**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 INSPECTION 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.
- 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.



**GEOTECHNICAL CONSULTANTS, INC.**  
 100, Box 2071  
 Columbia, MD 21046-2071  
 Phone: (410) 381-5330  
 Fax: (410) 381-1064  
 e-mail: moad@geotek.com

November 5, 2016

Mildenberg, Boender & Associates, Inc.  
 7708A Green Drive  
 Columbia, Maryland 21044

Attn: Mr. Mark M. Mildeberg  
 Vice President

Re: Limited Subsurface Exploration  
 Proposed Development  
 Karen Building Property  
 The map 46, grid 5, Parcel 536  
 10973 Scaggsville Road, Laurel, MD 20723  
 CEA7 Project No. 0248

Dear Mr. Mildeberg:

On October 29th, 2016, GEAT Consultants, Inc. utilized a hand auger to bore one (1) soil boring at the location shown on the attached Hand-Auger Location Map. The purpose of the hand auger was to determine the presence/absence of bedrock and local geowater at the location shown, within six (6) feet below existing site grade. The number, location, and depth of the boring were determined by others and the boring was marked out in the field by others.

Our field observations are summarized below:

Boring No.	Depth to Groundwater (ft)	Depth to Hardpan/Algae Bed(s) (ft)	Boring Termination Depth (ft)	Remarks
HA-1	N/A	1.0	5.0	

Note: All depths are below existing site grade.

I should be noted that the actual level of groundwater and the amount and level of ponded 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. GEAT was not 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.

GEAT 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,  
 GEAT Consultants, Inc.  
 Mousir Abouarkab, PE

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

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 1/2" thick with a load capacity capable of supporting the traffic and vehicle types that will be carried.

B.4.C. Specifications for Micro-Bioretenment, Rain Gardens, Landscape Infiltration & Infiltration Basins

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-bioretenment 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 15.08.01.02.

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 (50%), 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 into 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 textual 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 hoers to remove original soil. If practices are

Supp. 1 B.4.4

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

excavated using a 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 a chisel plow, ripper, or subsoiler. These tilling operations are to restructure the soil profile through the 12 inch compaction zone. Subsoiler 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 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-bioretenment 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. Fine 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 1/8" 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.

B.4.5 Supp. 1

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

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

Material	Specification	Size	Notes
Filtering	see Appendix A, Table A.4	n/a	filtering are site-specific
Planting soil (2' to 4' deep)	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (50%), coarse sand (30%), and 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)	n/a	aged 6 months, minimum no pine or wood chips
Mulch	shredded hardwood	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curbs/Drain	ornamental stone: washed cobble	stone: 2" to 5"	PE Type 1 nonwoven
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration basins)	AASHTO M-43	NO. 57 OR NO. 6 (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 24 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or DDB35	Slotted or perforated pipe, 3/8" perf. @ 6" on center, 4 holes per row; minimum of 2" of gravel over pipe; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/2-inch polyethylene landscape cloth.
Poured in place concrete (if required)	MSHA Mix No. 3; F <sub>c</sub> = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing re most ASTM-A615-60	n/a	60-day testing of poured-in-place concrete required; 28 day strength and slump test; all concrete design (cast-in-place or precast) not using previously approved design 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 308.8B; vertical loading [11-10 or 14-20] allowable horizontal loading (based on soil penetration) and analysis of potential cracks
Sand	AASHTO-M-6 or ASTM-C-33	0.075 to 0.08"	Sand substitutions such as Diabase and Gneiss (AASHTO #10) are not acceptable. No calcium sulfonated or dibromic sand substitutions are acceptable. No "rock dust" can be used for sand.

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

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, nutrients, or a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill area fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains

Underdrains should meet the following criteria:

- Pipes - Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTM F 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or 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 1/2" (No. 4 or 4w) galvanized hardware cloth.
- 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 (1/4" 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 exceeds 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 every 1000 square feet of surface area).

7. Miscellaneous

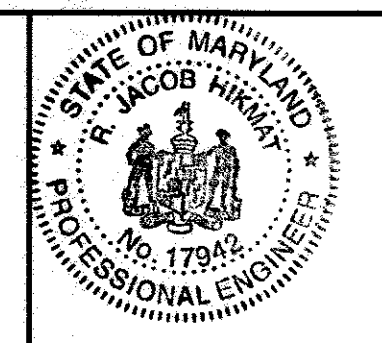
These practices may not be constructed until all contributing drainage area has been stabilized

Supp. 1 B.4.6

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*Chad Chubb* 5-9-17  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

*Keith DeLuca* 5-10-17  
 CHIEF, DIVISION OF LAND DEVELOPMENT



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, EXPIRATION DATE: 09/03/2018

*R. Jacob Hikmat* 4/27/17  
 R. JACOB HIKMAT, P.E. DATE

**OWNER/DEVELOPER**

KAREN RUSHING  
 10973 SCAGGSVILLE ROAD  
 LAUREL, MD. 20723  
 (703) 464-4766

project	date	approval	scale
15-014	APR. 2017	MMM	1" = 60'
illustration	engineering	MMM	
MMM/MMT			

no.	description	revisions

**KAREN RUSHING PROPERTY**  
 LOTS 1 AND 2  
 TAX MAP 46 GRID 5 PARCEL 536  
 HOWARD COUNTY, MARYLAND  
 6TH ELECTION DISTRICT  
**SUPPLEMENTAL PLAN**

**MILDENBERG, BOENDER & ASSOC., INC.**  
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