

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAY	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	N/A	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	N/A	100.20'
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	N/A	YES, 100.20' * SEE SUBSTITUTION SCHEDULE BELOW
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	N/A	N/A
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	N/A	2 0 0
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	N/A	

COMMENTS: * SUBSTITUTION SCHEDULE: 1. RED MAPLE, ACER RUBROM - 8" DBH HARDWOOD SHADE TREE
2. RED MAPLE, ACER RUBROM - 8" DBH HARDWOOD SHADE TREE
3. RED MAPLE, ACER RUBROM - 8" DBH HARDWOOD SHADE TREE
4. RED OAK, QUERCUS RUBRA - 8" DBH HARDWOOD SHADE TREE
5. RED MAPLE, ACER RUBROM - 1.8" DBH HARDWOOD SHADE TREE
6. DOG WOOD, CORNUS FLORIDA - 4" (2) DBH UNDERSTORY DECIDUOUS TREE

NOTES: COMPLEX PROJECTS MAY REQUIRE EXPANSION OF THE SCHEDULE TO ACCOMMODATE MULTIPLE LAND USES ON-SITE OR ON ADJACENT PROPERTIES.

PRACTICE	DRAINAGE AREA	IMPERVIOUS AREA TREATED	METHODOLOGY	VOLUME (ESD _v) REQUIRED	VOLUME (ESD _v) PROVIDED
M-3 LANDSCAPE INFILTRATION (HOUSE AND DRIVEWAY)	14,000 S.F.	4,734 S.F.	ESD _v = P _e * R _y * A ₁ / 2 where P _e = 1.0 * R _y = 0.35	429 c.f.	616 c.f.
TOTAL ESD _v PROVIDED				429 c.f.	616 c.f.

EXISTING SITE USE	RESIDENTIAL
WETLANDS	0.00
WETLANDS BUFFER	0.00
FLOODPLAIN	0.00
FORESTS	0.00
STEEP SLOPES (15-24%)	0.00
STEEP SLOPES (25% OR GREATER)	0.00
TOTAL PROJECT AREA	0.73
LOD AREA	0.42
GREEN OPEN SPACE AREA	0.00
EX. IMPERVIOUS AREA	0.11
PROP. IMPERVIOUS AREA	0.11
TOTAL IMPERVIOUS AREA	0.22
HIGHLY ERODIBLE SOILS IN PROJECT AREA	0.729
ZONING	R-20
TOTAL UNITS ALLOWED	1
TOTAL UNITS PROPOSED	1
PARKING REQUIRED	2.5
PARKING PROVIDED	2.5
DPZ FILE REFERENCES	ECP-19-052

LOT/PARCEL #	STREET ADDRESS
4/217	3028, MULLINEAUX LANE, ELLICOTT CITY MD. 21042

SUBDIVISION NAME	SECTION/AREA	LOT/PARCEL No.
MULLINEAUX HEIGHTS	LOT 4	P.217
PLAT #	GRID #	ZONING
P.5 B.1	19	R-20
WATER CODE	TAX MAP #	ELECT. DISTRICT
	17	2
	SEWER CODE	CENSUS TRACT
		602201

#1	CAPPED REBAR	N. 590535.799	E. 1350173.747	EL = 409.749
#2	CAPPED REBAR	N. 590652.300	E. 1350576.669	EL = 400.772

1	# 24AC DISK SET ON TOP OF CONCRETE MONUMENT.	N 587389.550	E 1351173.252	EL = 429.369
2	# 23CA DISK SET ON TOP OF CONCRETE MONUMENT	N 588035.645	E 1348385.607	EL = 482.187

APPROVED
HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 10-7-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 10-9-19
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 10-9-19
DIRECTOR DATE

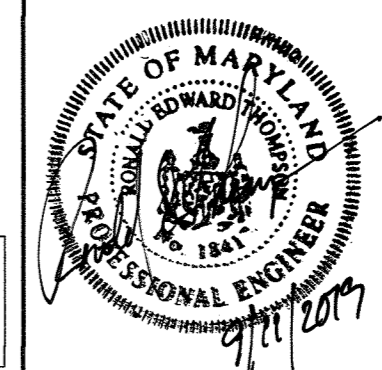
MAP SYMBOL	MAPPING UNIT	HYDROLOGIC SOIL GROUP	HYDRIC COMPONENTS	Kw	SLOPE
GhC	GLADSTONE SILT LOAM	A	NO	0.32	8-15%
GhB	GLENELG - URBAN LAND COMPLEX	B	NO	0.43	0-8%

NO.	TITLE
1	GRADING, STORMWATER MANAGEMENT, LANDSCAPE PLAN
2	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
3	PRIVATE LANDSCAPE INFILTRATION NOTES, DETAILS AND SPECIFICATIONS

CALL "MISS UTILITY" AT
1-800-257-7777
48 HOURS BEFORE START OF CONSTRUCTION

PROFESSIONAL CERTIFICATION
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. 18417, Expiration Date: 9-18-21.

DATE	REVISIONS
07/30/19	COUNTY COMMENTS



SITE DEVELOPMENT PLAN
GRADING, STORMWATER MANAGEMENT & LANDSCAPE PLAN
3028 MULLINEAUX LANE, LOT 4
MULLINEAUX HEIGHTS

TAX MAP: 17 GRID NO: 19 PARCEL NO: 217 ELECTION DISTRICT: No. 2 HOWARD COUNTY, MARYLAND DATE: MAY 2019 SHEET 1 OF 3

RELATED DPZ FILES: ECP-19-052

VANMAR ASSOCIATES, INC.
Engineers Surveyors Planners
310 South Main Street Mount Airy, Maryland 21771
(301) 829-2890 (301) 831-5015 (410) 549-2751
Fax (301) 831-5603 ©Copyright, Latest Date Shown

DEVELOPER'S CERTIFICATE:
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS PER TO THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 9/10/19
DEVELOPER DATE

ENGINEER'S CERTIFICATE:
I HEREBY CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY CONSERVATION DISTRICT AND THE 2011 MARYLAND STANDARDS & SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

[Signature] 9/10/2019
RONALD E. THOMPSON, P.E. DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 10/1/19
HOWARD SOIL CONSERVATION DISTRICT DATE

Specifications for Micro-Bioretenion, Rain Gardens, Landscape Infiltration & Infiltration Berms

1. Material Specifications

The allowable materials to be used in these practices are detailed in Table B.4.1.

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-bioretenion 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 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 (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 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 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.

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 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. 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 supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

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.

MAINTENANCE CRITERIA

- The following items should be addressed to ensure proper maintenance and long-term performance of landscape infiltration:
- Privately owned practices shall have a maintenance plan and shall be protected by easement, deed restriction, ordinance, or other legal measures preventing its neglect, adverse alteration, and removal.
- During the first year of operation, inspection frequency should be after every major storm and poorly established areas revegetated.
- Sediment accumulation on the surface of the facility should be removed and the top two to three inches of surface layer replaced as needed.
- The top few inches of the planting soil should be removed and replaced when water ponds for more than 48 hours or there is algal growth on the surface of the facility.
- If standing water persists after filter media has been maintained, the gravel, soil, and sand may need to be cleaned and/or replaced.
- Occasional pruning and replacement of dead vegetation is necessary. If specific plants are not surviving, more appropriate species should be used. Watering may be required during prolonged dry periods.

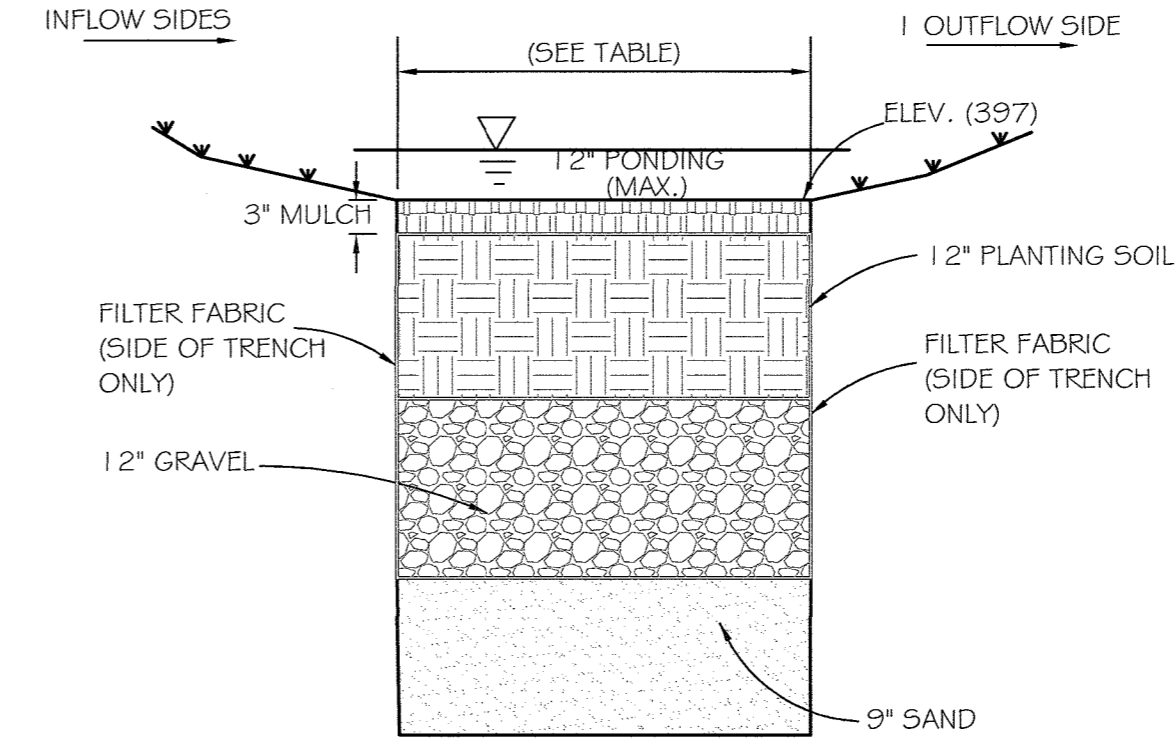
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%) & coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1.8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 738, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained, reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved state or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	

a. 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.
b. The Owner shall perform a plant in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.
c. 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.
d. The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

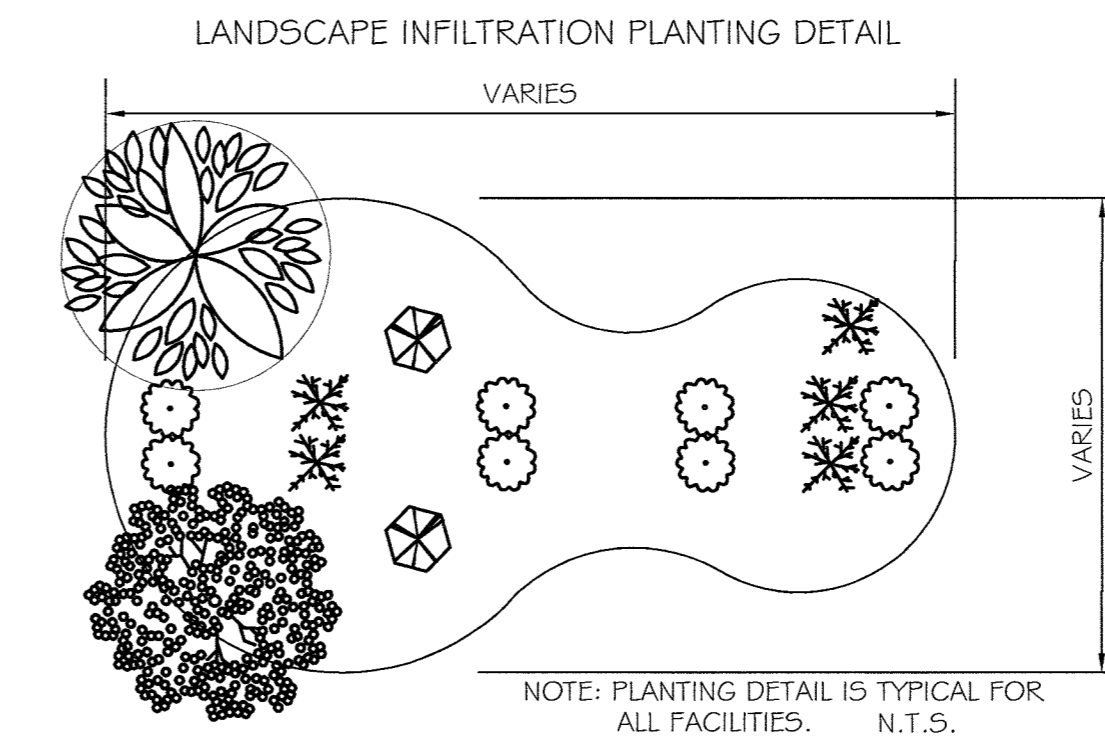
SWM	M-3 LANDSCAPED INFILTRATION	70' x 4.0' -12" PONDING

Practice	Area Treated	Methodology	ESDv Volume (cft)	
			Required	Provided
Mullineaux Heights Lot-4	4734 sf	ESDv = Pe*Rv*DA/12 where Pe=2.6" & Rv=0.95	429	
M-3 Landscape Infiltration	4734 sf			616
TOTAL			429	616

FACILITY NO.	LOCATION	LENGTH	WIDTH	SQUARE FT.	PLANTING SOIL DEPTH	GRAVEL DEPTH	SAND DEPTH	TOP MULCH ELEV.	GROUND ELEV. OUTFLOW SIDE
1	MULLINEAUX HEIGHTS LOT 4	70'	4.0'	280	12"	12"	9"	396.7	398

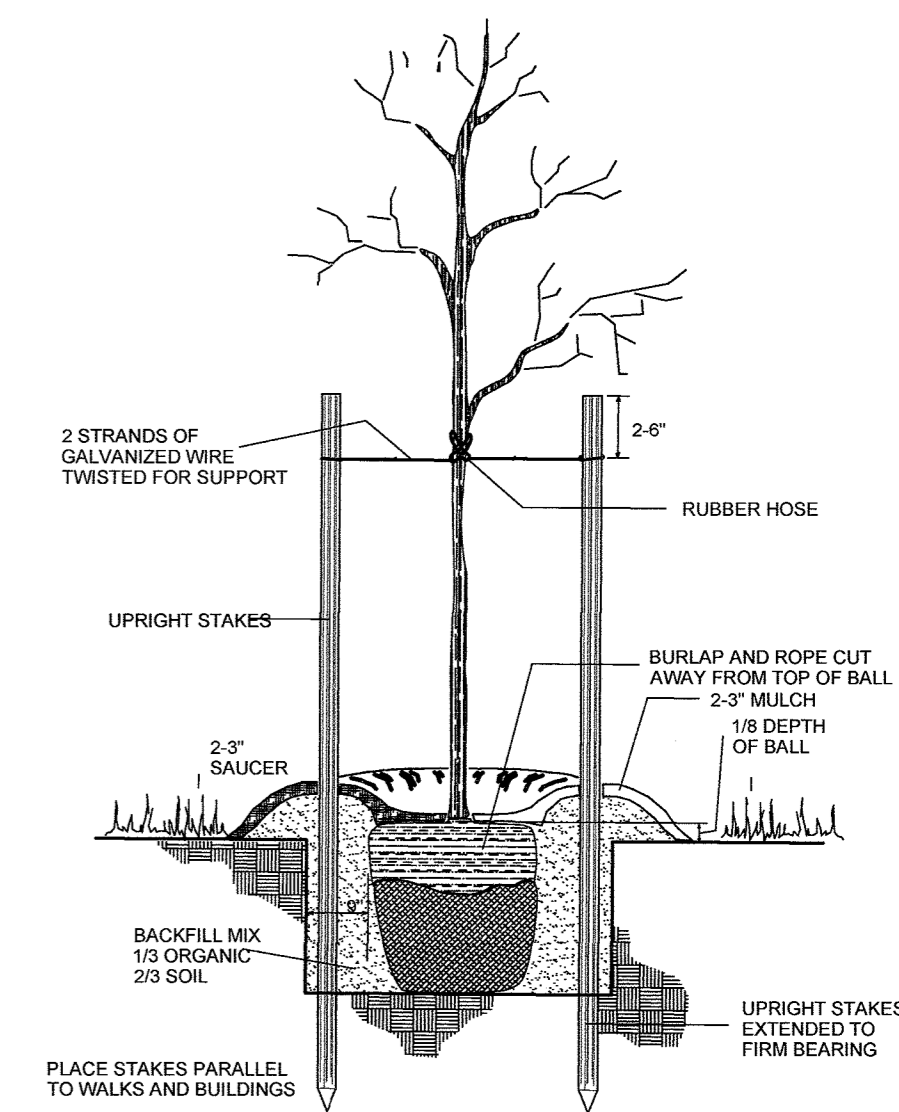


TYPICAL SECTION FOR PROPOSED LANDSCAPE INFILTRATION FACILITIES N.T.S.

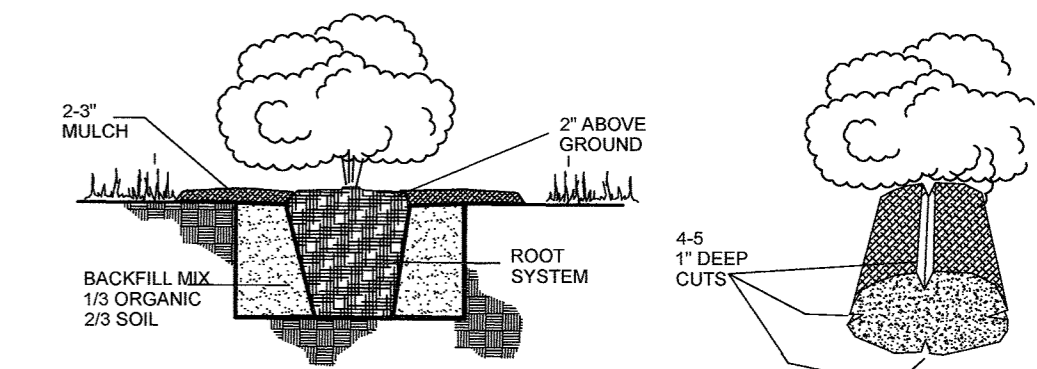


LANDSCAPE INFILTRATION PLANTING DETAIL N.T.S.

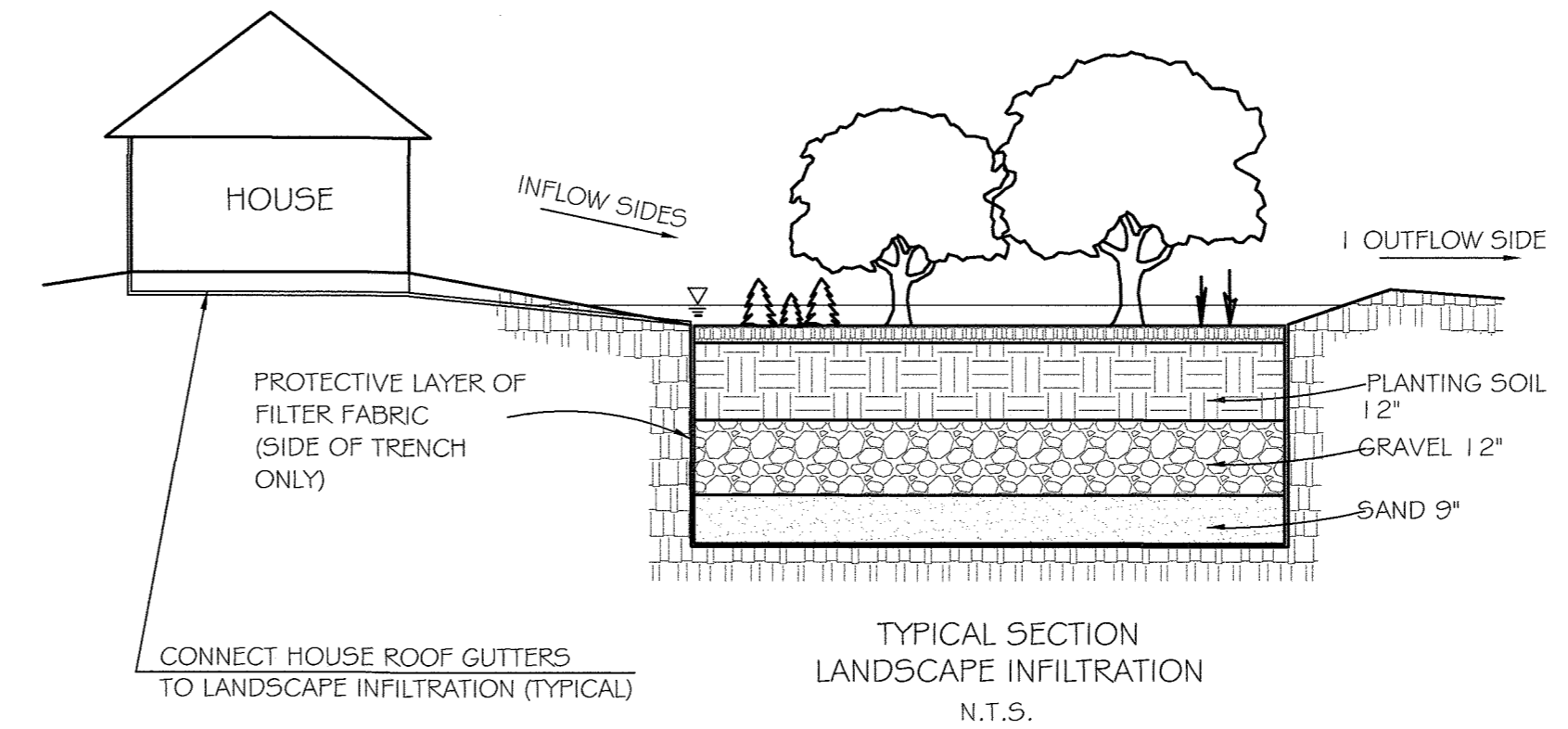
PLANT SPACING
PERENNIALS - 12" ON CENTER FOR QUART SIZE
18" ON CENTER FOR GALLON SIZE
SHRUBS - 3'-4" ON CENTER FOR QUART / GALLON SIZE
PLANT SPECIES
PLANT SPECIES SHALL BE SELECTED FROM 'PLANT SPECIES APPROPRIATE FOR USE IN BIORETENTION AREAS', PRINCE GEORGE COUNTY DEF. MD. (www.lowimpactdevelopment.org)



TREE PLANTING/ STAKING DETAIL (N.T.S)



TYPICAL CONTAINER-GROWN PLANTING DETAIL (N.T.S)



TYPICAL SECTION LANDSCAPE INFILTRATION N.T.S.

CALL "MISS UTILITY" AT
1-800-257-7777
48 HOURS BEFORE START OF CONSTRUCTION

APPROVED
HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 10-7-19
CHIEF, DEVELOPMENT ENGINEERING DIVISION & DATE
[Signature] 10-9-19
CHIEF, DIVISION OF LAND DEVELOPMENT & DATE
[Signature] 10-9-19
DIRECTOR DATE

OWNER / DEVELOPER
GEORGE & SUSAN VARGHESE
3025 MULLINEAUX LANE
ELLICOTT CITY, MD. 21042
610-653-4253

PROFESSIONAL CERTIFICATION
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. 18417, Expiration Date: 9-18-21.

DATE 07/30/19	REVISIONS COUNTY COMMENTS	SITE DEVELOPMENT PLAN PRIVATE LANDSCAPE INFILTRATION 3028 MULLINEAUX LANE, LOT 4 MULLINEAUX HEIGHTS	
TAX MAP: 17 GRID NO: 19 PARCEL NO: 217	ELECTION DISTRICT: No. 2 HOWARD COUNTY, MARYLAND EX. ZONING: R-20	SCALE: AS SHOWN DATE: MAY 2019 SHEET 3 OF 3	
RELATED DPZ FILES: ECP-19-052		VANMAR ASSOCIATES, INC. Engineers Surveyors Planners 310 South Main Street Mount Airy, Maryland 21771 (301) 829-2890 (301) 831-5015 (410) 549-2751 Fax (301) 831-5603 ©Copyright, Latest Date Shown	