ENVIRONMENTAL CONCEPT PLAN

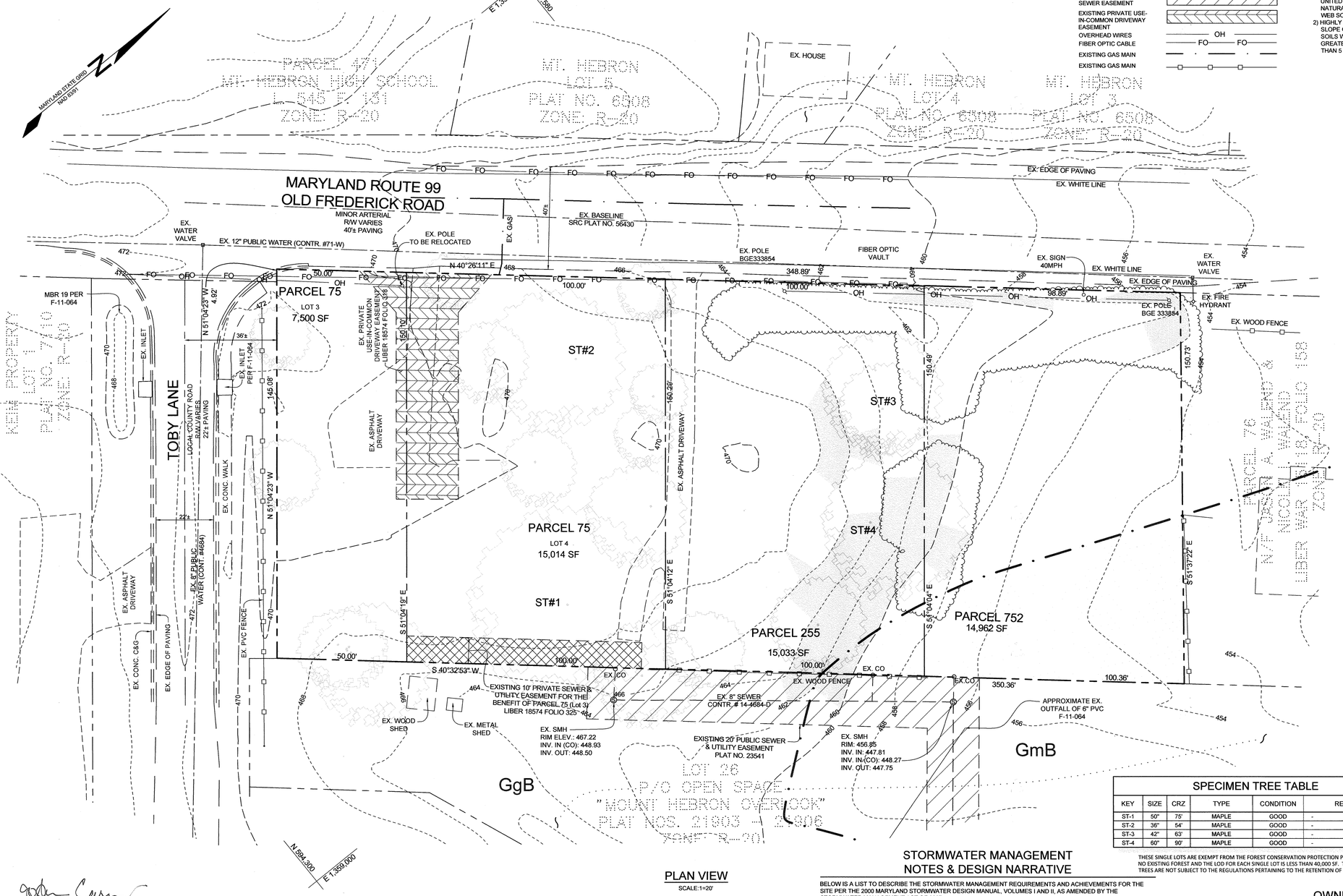
KEIM PROPERTY

HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT PRACTICES					
PARCEL	ADDRESS	MICRO-BIORETENTION M-6 (NUMBER)	DRYWELL M-5 (NUMBER)	ROOFTOP DISCONNECT N-1 (Y/N)	NON-ROOFTOP DISCONNECT N-2 (Y/N)
75, LOT 3	9345 OLD FREDERICK ROAD	0	3	N	Y
75, LOT 4	9343 OLD FREDERICK ROAD	0	3	N	Y
255	9339 OLD FREDERICK ROAD	1	3	N	Y
752	9329 OLD FREDERICK ROAD	0	3	Y	Y

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	'K' FACTOR
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37
GmB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	0.55

NOTES:
1) SOIL INFORMATION HAS BEEN TAKEN FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE; NATURAL RESOURCES CONSERVATION SERVICE; WEB SOIL SURVEY
2) HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR 'K' GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.



PLAN VIEW

SCALE:1=20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 INCH = 20 FEET

LEGEND

- EXISTING CONTOUR — 382
- EXISTING SPOT ELEVATION — 382.5
- EXISTING TREELINE
- PROPOSED TREELINE
- SOIL BOUNDARY
- SWM BORING LOCATION — SWM #1
- EXISTING SPECIMEN TREE — ST# 36" CRZ 63' (W)
- EXISTING WELL
- MODERATE SLOPES 15% - 24.9%
- EXISTING 20' PUBLIC SEWER EASEMENT
- EXISTING PRIVATE USE-IN-COMMON DRIVEWAY EASEMENT
- OVERHEAD WIRES — OH
- FIBER OPTIC CABLE — FO FO
- EXISTING GAS MAIN
- EXISTING GAS MAIN

SITE ANALYSIS DATA SHEET	
ENVIRONMENTAL AREA	SIZE OR USE
TOTAL PROJECT AREA	1.2062 AC ±
ROW TO BE DEDICATED	N/A
PROPOSED PROJECT AREA	1.2062 AC ±
LIMIT OF DISTURBANCE	1.0972 AC ±
GREEN OPEN AREA (LAWN)	0.8052 AC ±
PROPOSED IMPERVIOUS AREA	0.2920 AC ±
PROPOSED SITE USES	RESIDENTIAL
WETLANDS	0 AC ±
WETLAND BUFFERS	0 AC ±
FLOODPLAINS	0 AC ±
FLOODPLAIN BUFFERS	0 AC ±
EXISTING FOREST	0.1596 AC ±
SLOPES 15%-24.9%*	0.0989 AC ±
SLOPES GREATER THAN 25%	0.0000 AC ±
HIGHLY ERODIBLE SOILS	0.1240 AC ± (1)

* NOTES:
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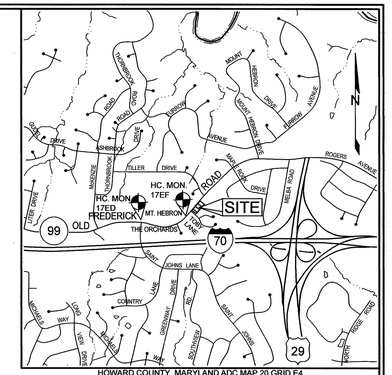

HOWARD COUNTY, MARYLAND ADC MAP 20 GRID E4

VICINITY MAP

SCALE: 1"=2000'

GENERAL NOTES

1. SUBJECT PROPERTY ZONED R-20 PER 10-06-2013 COMPREHENSIVE ZONING PLAN.
2. PROJECT ACREAGE::
   - PARCEL 75, LOT 3: 7,500 SF
   - PARCEL 75, LOT 4: 15,014 SF
   - PARCEL 255: 15,033 SF
   - PARCEL 752: 14,962 SF
   - TOTAL ACREAGE: 52.509 SF
3. PUBLIC WATER AND PUBLIC SEWER WILL BE USED WITHIN THIS SITE.
4. THE BOUNDARY SHOWN HEREON IS BASED ON A FIELD RUN BOUNDARY SURVEY PREPARED BY HANOVER LAND SERVICES, INC. ON 8/17/2017.
5. THE TOPOGRAPHY SHOWN ON SITE WAS FIELD RUN BY HANOVER LAND SERVICES, INC. ON 8/17/2017. THE CONTOURS ARE SHOWN AT TWO-FOOT CONTOUR INTERVALS.
6. ENVIRONMENTAL FEATURES DO NOT EXIST ON-SITE.
7. THERE WERE TWO EXISTING HOUSES, ONE HOUSE RESIDED ON PARCEL 255 WHICH WAS DEMOED IN SEPTEMBER OF 2018, WHILE THE OTHER STRADDLED THE PROPERTY LINE OF LOTS 3 AND 4 ON PARCEL 75 AND WAS DEMOED IN SEPTEMBER OF 2017.
8. THERE ARE NO CEMETERIES WITHIN THE PROJECT BOUNDARY.
9. EXISTING UTILITIES ARE LOCATED BY THE USE OF ANY OR ALL OF THE FOLLOWING: ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND SEWER PLANS AND OTHER AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF THE EXISTING UTILITIES ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY.
10. DRIVEWAY(S) SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING REQUIREMENTS:
    1) WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE);
    2) SURFACE - SIX (6") INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MINIMUM);
    3) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND 45-FOOT TURNING RADIUS;
    4) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25-LOADING);
    5) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE;
    6) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE
11. TBA= TO BE ABANDONED
12. TBR= TO BE REMOVED
13. APPROVAL OF THE ECP DOES NOT CONSTITUTE APPROVALS OF SUBSEQUENT OR ASSOCIATED SITE DEVELOPMENT PLANS, SUBDIVISION PLANS, GRADING OR BUILDING PERMITS. PLAN REVISIONS OR FOREST CONSERVATION PLANS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL COMMENTS AS THE DEVELOPMENT PLAN PROGRESSES THROUGH THE PLAN REVIEW OR PERMIT APPLICATION PROCESS.
14. THE STORMWATER MANAGEMENT SYSTEM SHOWN ON THESE PLANS IS AN APPROXIMATION OF THE SIZE, SHAPE, AND LOCATION. IT IS UNDERSTOOD THAT THIS SYSTEM HAS NOT BEEN DESIGNED AND THE ACTUAL DESIGN MAY CHANGE, ALTERING THE NUMBER OF UNITS ALLOCATED FOR THIS DEVELOPMENT.
15. A SIMPLIFIED FOREST STAND DELINEATION HAS BEEN COMPLETED AND NO FOREST EXIST FOR THIS SITE. IT IS NOT LOCATED IN A 100 YEAR FLOODPLAIN, AND THERE ARE NO STREAMS ON SITE. THERE ARE NO STEEP SLOPES AND NO CRITICAL HABITAT AREAS. THERE ARE NO NON-TIDAL OR TIDAL WETLANDS ON SITE.
16. ON FEBRUARY 23, 2018 THE HOWARD COUNTY BOARD OF APPEALS HEARING EXAMINER GRANTED CASE BA-17-029V PERTAINING TO PARCEL 75, LOT 3, A PETITION FOR VARIANCES TO REDUCE THE 50-FOOT SETBACK FROM A PUBLIC STREET RIGHT-OF-WAY TO 7.5 FEET AND THE REQUIRED 10-FOOT SIDE LOT LINE SETBACK TO 7.5 FEET FOR A NEW SINGLE-FAMILY DETACHED DWELLING IN AN R-20 ZONING DISTRICT.
17. ON AUGUST 3, 2017 A REQUEST TO FOR ALTERNATIVE COMPLIANCE TO SECTION 16.147 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, TO FINAL SUBDIVISION PLAN AND FINAL PLAT, WAS APPROVED BY THE DIRECTOR OF PLANNING AND ZONING SUBJECT TO THE FOLLOWING CONDITIONS, REFER TO ALTERNATIVE COMPLIANCE NUMBER WP-17-134:
    - THE ALTERNATIVE COMPLIANCE REQUEST APPROVAL FROM THE FINAL SUBDIVISION PLAT REQUIREMENTS IN THIS CASE IS ONLY A MECHANISM FOR DEPARTMENT OF PLANNING AND ZONING TO RECOGNIZE THE RESENT PROPERTY CONFIGURATION FOR PARCEL NO. 752, LOT 4 0.341 ACRES AS A SEPARATE BUILDING LOT.
    - A SITE DEVELOPMENT PLAN WILL BE REQUIRED FOR BUILDING A SINGLE-FAMILYDWELLING.
18. PREVIOUS HOWARD COUNTY FILE NUMBERS: BA-17-029V, WP-17-134; CONTR. 14-4684-D; CONTR. 71-W.

ADDRESS CHART	
PARCEL	STREET ADDRESS
75, LOT 3	9345 OLD FREDERICK ROAD
75, LOT 4	9343 OLD FREDERICK ROAD
255	9339 OLD FREDERICK ROAD
752	9329 OLD FREDERICK ROAD

SHEET INDEX	
SHEET NO.	DESCRIPTION
1	EXISTING CONDITION PLAN & SIMPLIFIED FOREST STAND DELINEATION
2	CONCEPTUAL GRADING, LAYOUT, SEDIMENT AND EROSION CONTROL AND SWM PLAN
3	CONCEPTUAL GRADING, LAYOUT, SEDIMENT AND EROSION CONTROL AND SWM PLAN
4	CONCEPTUAL STORMWATER MANAGEMENT DRAINAGE AREA MAP
5	CONCEPTUAL STORMWATER MANAGEMENT NOTES AND DETAILS

SPECIMEN TREE TABLE					
KEY	SIZE	CRZ	TYPE	CONDITION	REMARKS
ST-1	50"	75'	MAPLE	GOOD	-
ST-2	36"	54'	MAPLE	GOOD	-
ST-3	42"	63'	MAPLE	GOOD	-
ST-4	60"	90'	MAPLE	GOOD	-

THESE SINGLE LOTS ARE EXEMPT FROM THE FOREST CONSERVATION PROTECTION PLAN AS THERE IS NO EXISTING FOREST AND THE LOD FOR EACH SINGLE LOT IS LESS THAN 40,000 SF. THE SPECIMEN TREES ARE NOT SUBJECT TO THE REGULATIONS PERTAINING TO THE RETENTION OF SPECIMEN TREES.

STORMWATER MANAGEMENT NOTES & DESIGN NARRATIVE

BELOW IS A LIST TO DESCRIBE THE STORMWATER MANAGEMENT REQUIREMENTS AND ACHIEVEMENTS FOR THE SITE PER THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I AND II, AS AMENDED BY THE STORMWATER MANAGEMENT ACT OF 2007.

1. ENVIRONMENTALLY SENSITIVE AREAS HAVE BEEN AVOIDED WHERE POSSIBLE. THE SITE WAS DESIGNED TO DISTURB AREAS OF STEEP SLOPES ONLY WHEN NECESSARY. THE LIMIT OF DISTURBANCE AND ALL DEVELOPMENT ACTIVITY IS OVER 140' AWAY FROM THE 100 YEAR FLOODPLAIN ON-SITE. NO STREAMS OR WETLANDS EXIST ON-SITE.
2. TO THE GREATEST EXTENT PRACTICABLE THE NATURAL FLOW PATTERNS OF THE SITE HAVE BEEN MAINTAINED.
3. IMPERVIOUS AREAS HAVE BEEN REDUCED BY POSITIONING THE BUILDING AS CLOSE TO THE STREET AS THE SETBACKS AND GRADES ALLOW.
4. A STABILIZED CONSTRUCTION ENTRANCE, SILT FENCES AND SUPER SILT FENCES ARE USED AS SEDIMENT AND EROSION CONTROL.
5. THE STORMWATER MANAGEMENT OBLIGATIONS FOR THESE PARCELS WILL BE MET BY THE USE OF DRYWELLS (M-5) AND MICRO-BIORETENTION FACILITIES (M-6).
6. ACCORDING TO THE DEFINITION IN THE HOWARD COUNTY CONSERVATION MANUAL, JUNE 1999, NO FOREST EXISTS ON THIS SITE.

OWNER

STACY CAROL WALLACE
& DENNIS KEIM, JR.
7600 RIDGE ROAD
MARRIOTTSVILLE, MARYLAND 21104

DEVELOPER

KWL PROPERTIES
C/O KENNY LIVESAY
15928 FREDERICK ROAD
WOODBINE, MD 21797

BENCHMARKS				
NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
17ED	594,314.858	1,357,380.943	478.273	56.3' EAST OF LIGHT POLE IN PARKING WEST OF MT HEBRON HS ENTRANCE, 9.6' SOUTH OF LIGHT POLE IN MEDIAN OPPOSITE OF HS ENTRANCE
17EF	594,243.880	1,358,578.648	473.651	NE SIDE OF ROUTE 99 2..6' FROM ED OF PAVEMENT. 86' NE OF BGE POLE 213287

JOANNE CAREY, RLA
MD DNR QUALIFIED PROFESSIONAL

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 4.17.20

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 4/15/2020

EXISTING CONDITION PLAN & SIMPLIFIED FOREST STAND DELINEATION
KEIM PROPERTY
OLD FREDERICK ROAD
ZONED: R-20

TAX MAP 17 GRID 16 — PARCELS 75 (LOTS 3 & 4), 255 & 752
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — JOANNE M. SILL — No. 32025 — PROFESSIONAL ENGINEER

SILL ENGINEERING GROUP, LLC
16005 Frederick Rd, 2nd Floor
Woodbine, Maryland 21797
Phone: 443.325.5076
Fax: 410.696.2022
Email: info@sillengineering.com
Civil Engineering for Land Development

DESIGN BY:	PS
DRAWN BY:	AEA / RA
CHECKED BY:	PS
SCALE:	AS SHOWN
DATE:	MARCH 31, 2020
PROJECT #:	16-017
SHEET #:	1 of 5

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. 32025, EXPIRATION DATE: JUNE 20, 2021

ECP-19-033

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	'K' FACTOR
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37
GmB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	0.55

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LEGEND

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- PROPOSED CONTOUR — 382
- EXISTING SPOT ELEVATION — 382.5
- PROPOSED SPOT ELEVATION — + 82.53
- DIRECTION OF FLOW
- EXISTING TREELINE
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- SILT FENCE — SF — SF
- SUPER SILT FENCE — SSF — SSF
- LIMIT OF DISTURBANCE — LOD
- OVERHEAD WIRES — OH
- FIBER OPTIC CABLE — FO — FO
- EXISTING GAS MAIN

MATCHLINE SEE SHEET THREE

PLAN VIEW
SCALE:1=20'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

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CONCEPTUAL GRADING, LAYOUT, SEDIMENT AND EROSION CONTROL, AND SWM PLAN
KEIM PROPERTY
OLD FREDERICK ROAD
ZONED: R-20

TAX MAP 17 GRID 16
2ND ELECTION DISTRICT

PARCELS 75 (LOTS 3 & 4), 255 & 752
HOWARD COUNTY, MARYLAND

SILL ENGINEERING GROUP, LLC
16005 Frederick Rd, 2nd Floor
Woodbine, Maryland 21797
Phone: 443.325.5076
Fax: 410.696.2022
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Civil Engineering for Land Development

STATE OF MARYLAND — PAUL M. SILL — No. 32025 — PROFESSIONAL ENGINEER

DESIGN BY:	PS
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MARYLAND STATE GRID
NAD 83/91

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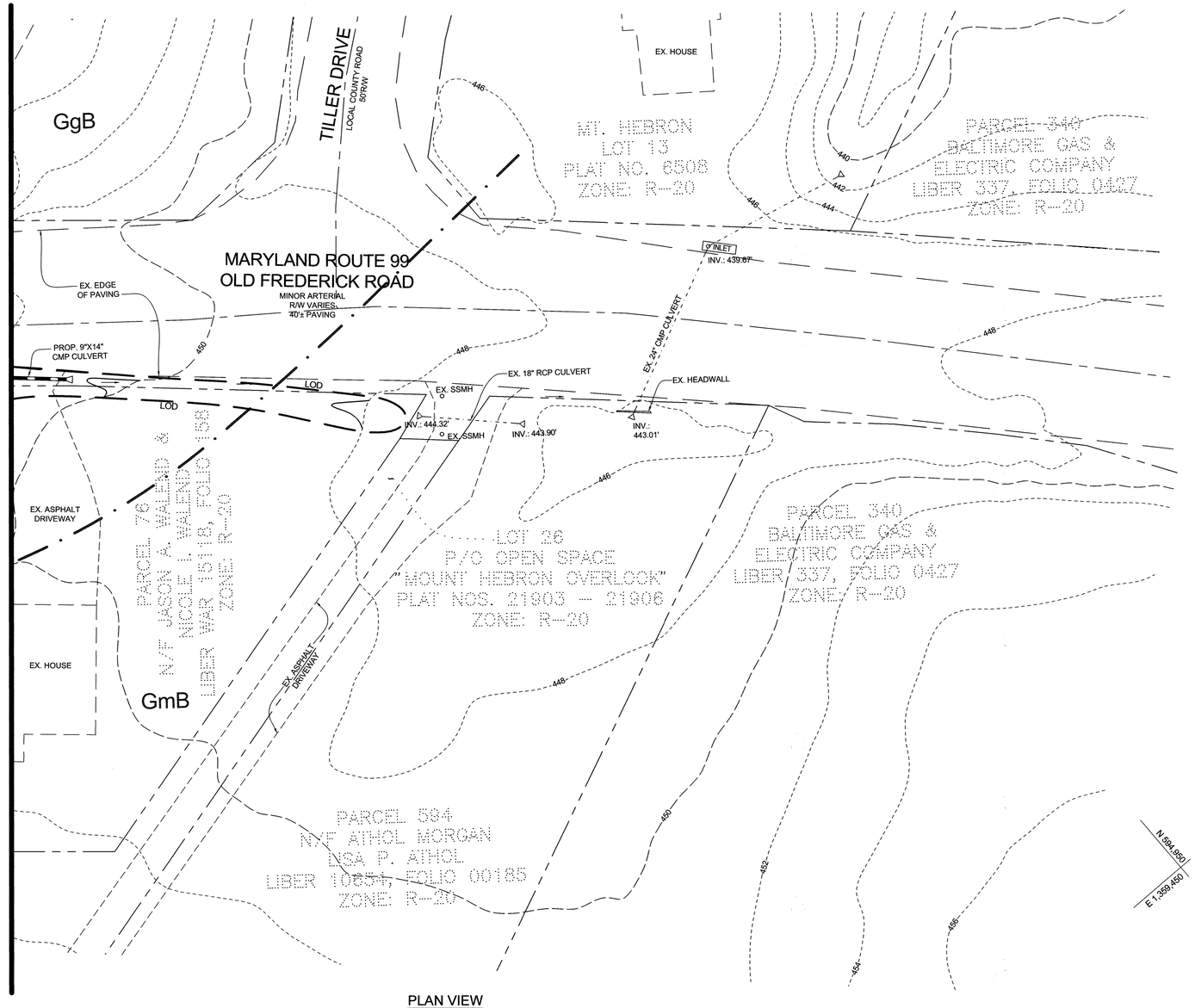
N 595,000



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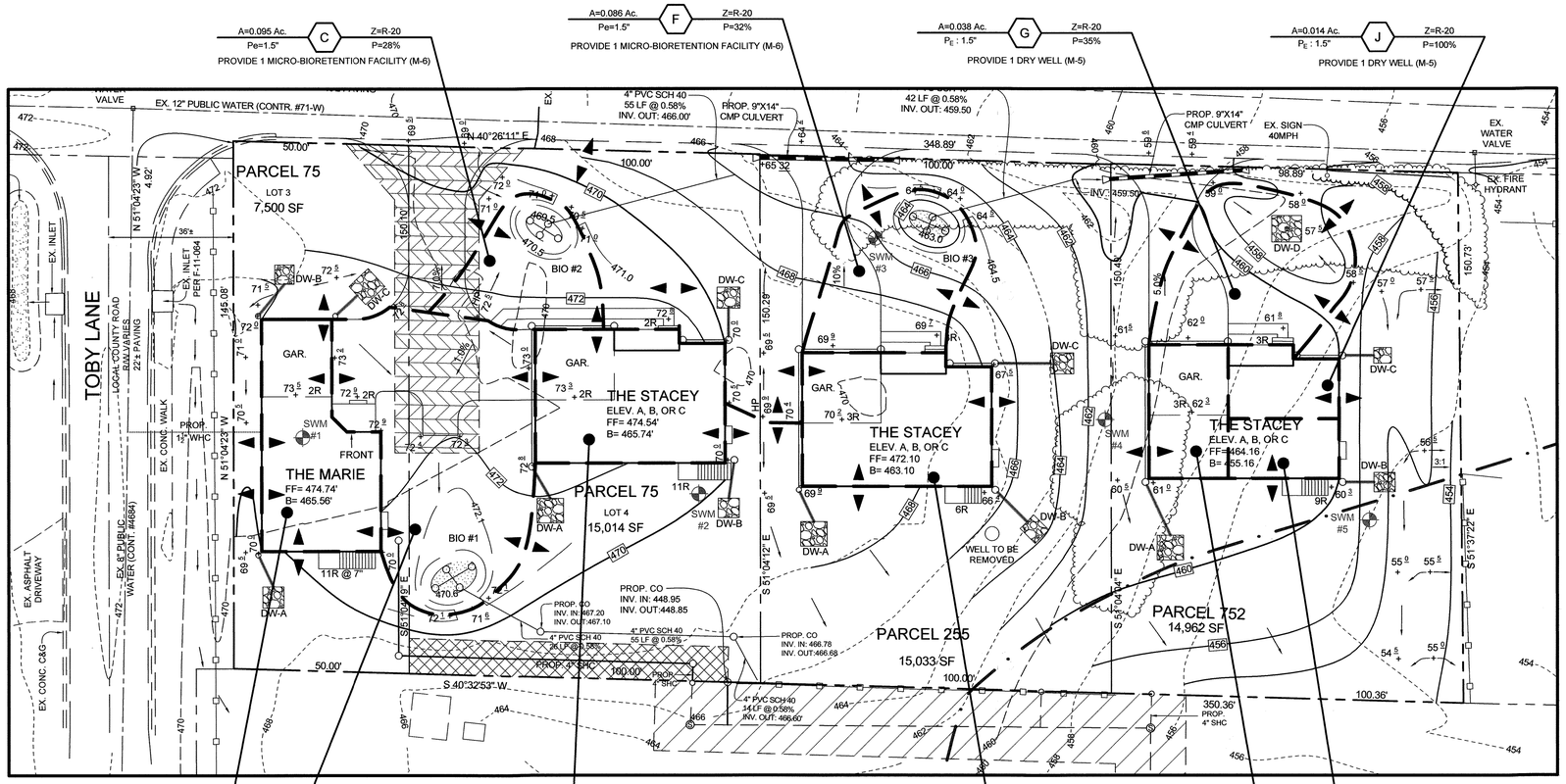

DRAINAGE AREA DETAIL

SCALE: 1=20'

A=0.044 Ac. | P_E : 1.5" | A | Z=R-20 | P=100%
PROVIDE 3 DRY WELLS (M-5)

A=0.104 Ac. | P_E : 1.5" | B | Z=R-20 | P=34%
PROVIDE 1 MICRO-BIORETENTION FACILITY (M-6)

A=0.046 Ac. | P_E : 1.5" | D | Z=R-20 | P=100%
PROVIDE 3 DRY WELLS (M-5)

A=0.046 Ac. | P_E : 1.5" | E | Z=R-20 | P=100%
PROVIDE 3 DRY WELLS (M-5)

A=0.012 Ac. | P_E : 1.5" | I | Z=R-20 | P=100%
PROVIDE 1 DRY WELL (M-5)

A=0.020 Ac. | P_E : 1.5" | H | Z=R-20 | P=100%
PROVIDE 1 DRY WELL (M-5)

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 INCH = 20 FEET

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

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DEVELOPER

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CONCEPTUAL STORMWATER MANAGEMENT DRAINAGE AREA PLAN
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OLD FREDERICK ROAD
ZONED: R-20

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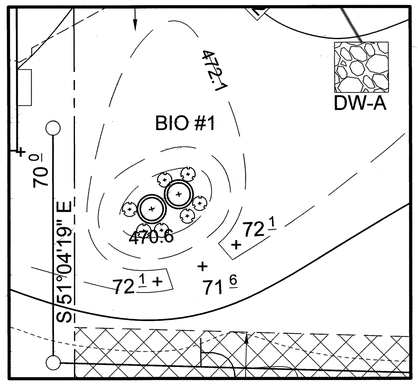
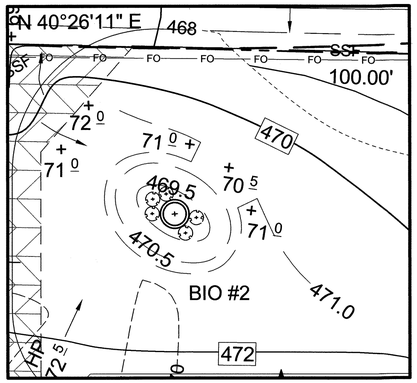
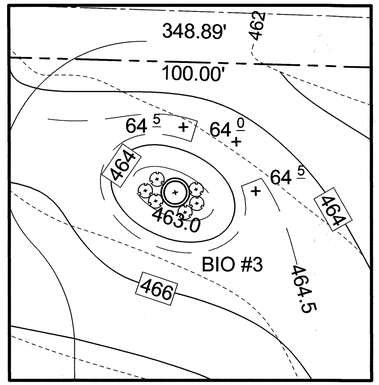


LANDSCAPING PLAN
MICRO-BIORETENTION FACILITY #1
SCALE: 1=10'



LANDSCAPING PLAN
MICRO-BIORETENTION FACILITY #2
SCALE: 1=10'



LANDSCAPING PLAN
MICRO-BIORETENTION FACILITY #3
SCALE: 1=10'

B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION. 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.

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 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 TOPS OIL 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 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 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.

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-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 PS28, 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 ⅜" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A ¼" (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 (⅜" TO ¾" 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

BIORETENTION PLANT LIST								
SHRUBS								
LEGEND	BOTANICAL NAME	COMMON NAME	SPACING	SIZE	REMARKS	QTY. BIO 1	QTY. BIO 2	QTY. BIO 3
	ILEX GLABRA	INK BERRY	AS SHOWN* (MIN. 4' O.C.)	24"- 36" HT.	--	2	1	1
	RUDBECKIA	BLACK-EYED SUSAN	AS SHOWN* (MIN. 2' O.C.)	1 GALLON	--	7	5	6

NOTE: PLANT MATERIAL MUST COVER 50% OF THE MULCH AREA AT MATURE GROWTH.
*INTERSPERSE PLANTINGS THROUGHOUT BIORETENTION FILTER AREA

BIO 1 - BIORETENTION AREA = 93 S.F. OR 0.0021 AC.
PROVIDED: 2 SHRUBS AND 7 HERBACEOUS SPECIES

BIO 2 - BIORETENTION AREA = 54 S.F. OR 0.0012 AC.
PROVIDED: 1 SHRUB AND 5 HERBACEOUS SPECIES

BIO 3 - BIORETENTION AREA = 59.6331 S.F. OR 0.0014 AC.
PROVIDED: 1 SHRUB AND 6 HERBACEOUS SPECIES

MATERIALS SPECIFICATIONS FOR MICRO-BIORETENTION FACILITIES			
MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTINGS	SEE PLANT LIST THIS SHEET	N/A	PLANTINGS ARE SITE-SPECIFIC, SEE PLANT LIST THIS SHEET
PLANTING SOIL (2'-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 AND CURTAIN DRAIN, IF REQUIRED	PEA GRAVEL: ASTM-D-448 ORNAMENTAL STONE: WASHED COBBLES	PEA GRAVEL: NO. 8 OR NO. 9 (1/8" TO 3/8") STONE: 2" TO 5"	
GEOTEXTILE		N/A	PE TYPE 1 NONWOVEN
UNDERDRAIN GRAVEL	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 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES. PERFORATED PIPE SHALL BE WRAPPED WITH 1/4" GALVANIZED HARDWARE CLOTH.

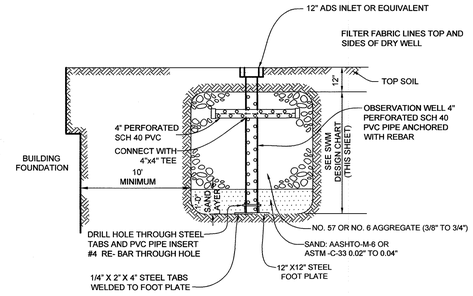
BIORETENTION ELEVATIONS AND DIMENSIONS			
DESCRIPTION	BIO 1	BIO 2	BIO 3
'A' PONDING DEPTH	1.0'	1.0'	1.0'
'B' WSEL	471.6'	470.5'	464.0'
'C' TOP OF MULCH	470.6	469.5	463.0
'D' FACILITY LENGTH	8.5'	6.0'	6.72'
'E' FACILITY WIDTH	14.0'	11.5'	12.14'
'F' PERF. UNDERDRAIN DIMENSION	6.4"	3.9"	4.2"
'G' UNDERDRAIN INVERT	467.52'	466.42'	459.92'
'H' SOLID UNDERDRAIN DIMENSION	95.0'	55.0'	42.2'
'I' OUTFALL INVERT	466.6	466.0	459.5'
'J' OVERFLOW PIPE	12.0'	9.4'	10.0'

DRYWELL (M-5) DESIGN CHART				
PARCEL NO.	VOLUME REQUIRED	VOLUME PROVIDED	NO. WELLS	SIZE WELLS
75 LOT 3	227 CF	238 CF	DW-A DW-B DW-C	6'X6'X5'DEEP 5.50'X5.50'X5'DEEP 7.50'X7'X5'DEEP
75 LOT 4	240 CF	249 CF	DW-A DW-B DW-C	7.5'X7'X5'DEEP 6'X5.50'X5'DEEP 6.50'X6'X5'DEEP
255	240 CF	249 CF	DW-A DW-B DW-C	7.5'X7'X5'DEEP 6'X5.50'X5'DEEP 6.50'X6'X5'DEEP
752	378 CF	394 CF	DW-A DW-B DW-C DW-D	7.5'X7'X5'DEEP 6'X5.5'X5'DEEP 6.5'X6'X5'DEEP 8.5'X8.5'X5DEEP

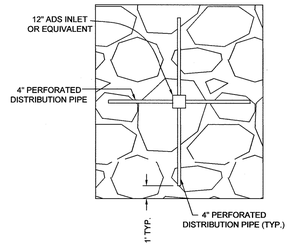
NOTE: THE IMPERVIOUS SURFACE OF THE HOUSE WILL BE TREATED BY EACH DRY WELL. COMPLETION OF DRYWELL WILL HAPPEN AT THE SITE DEVELOPMENT PLAN STAGE.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRY WELLS (M-5)

1. THE MONITORING WELLS AND STRUCTURES SHALL BE INSPECTED ON A QUARTERLY BASIS AND AFTER EVERY LARGE STORM EVENT.
2. WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS SHALL BE RECORDED OVER A PERIOD OF SEVERAL DAYS TO INSURE TRENCH DRAINAGE.
3. A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
4. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN THE 72 HOURS TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
5. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
6. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

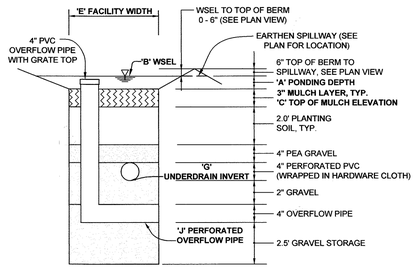


CROSS SECTION
NOT TO SCALE

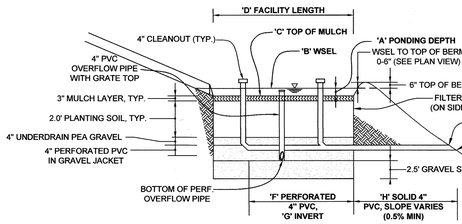


PLAN VIEW

DRY WELL (M-5) DW-D PARCEL 752

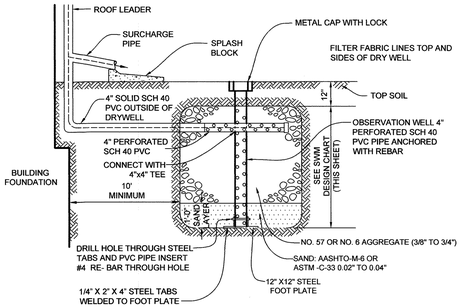


BIORETENTION FACILITY
TYPICAL SECTION
NOT TO SCALE



BIORETENTION FACILITY
TYPICAL PROFILE
NOT TO SCALE

NOTES:
- FOR ADDITIONAL INFORMATION, SEE THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I AND II.
- SEE CHART, THIS SHEET, FOR ELEVATIONS AND DISTANCES



TYPICAL DRY WELL (M-5) CROSS SECTION
NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED MICRO-BIORETENTION FACILITIES (M-6)

1. 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.
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 OR 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.
3. 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.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 4.17.20

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 4/15/2020

OWNER
STACY CAROL WALLACE
& DENNIS KEIM, JR.
7600 RIDGE ROAD
MARRIOTTSVILLE, MARYLAND 21104

DEVELOPER
KWL PROPERTIES
C/O KENNY LIVESAY
15928 FREDERICK ROAD
WOODBINE, MD 21797

CONCEPTUAL STORMWATER MANAGEMENT NOTES & DETAILS
KEIM PROPERTY
OLD FREDERICK ROAD
ZONED: R-20

TAX MAP 17 GRID 16 — PARCELS 75 (LOTS 3 & 4), 255 & 752
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — DAVID M. SILL — No. 32025 — PROFESSIONAL ENGINEER

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Civil Engineering for Land Development

DESIGN BY: PS
DRAWN BY: AEA / RA
CHECKED BY: PS
SCALE: AS SHOWN
DATE: MARCH 31, 2020
PROJECT #: 16-017
SHEET #: 5 of 5

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. 32025, EXPIRATION DATE: JUNE 20, 2021

ECP-19-033