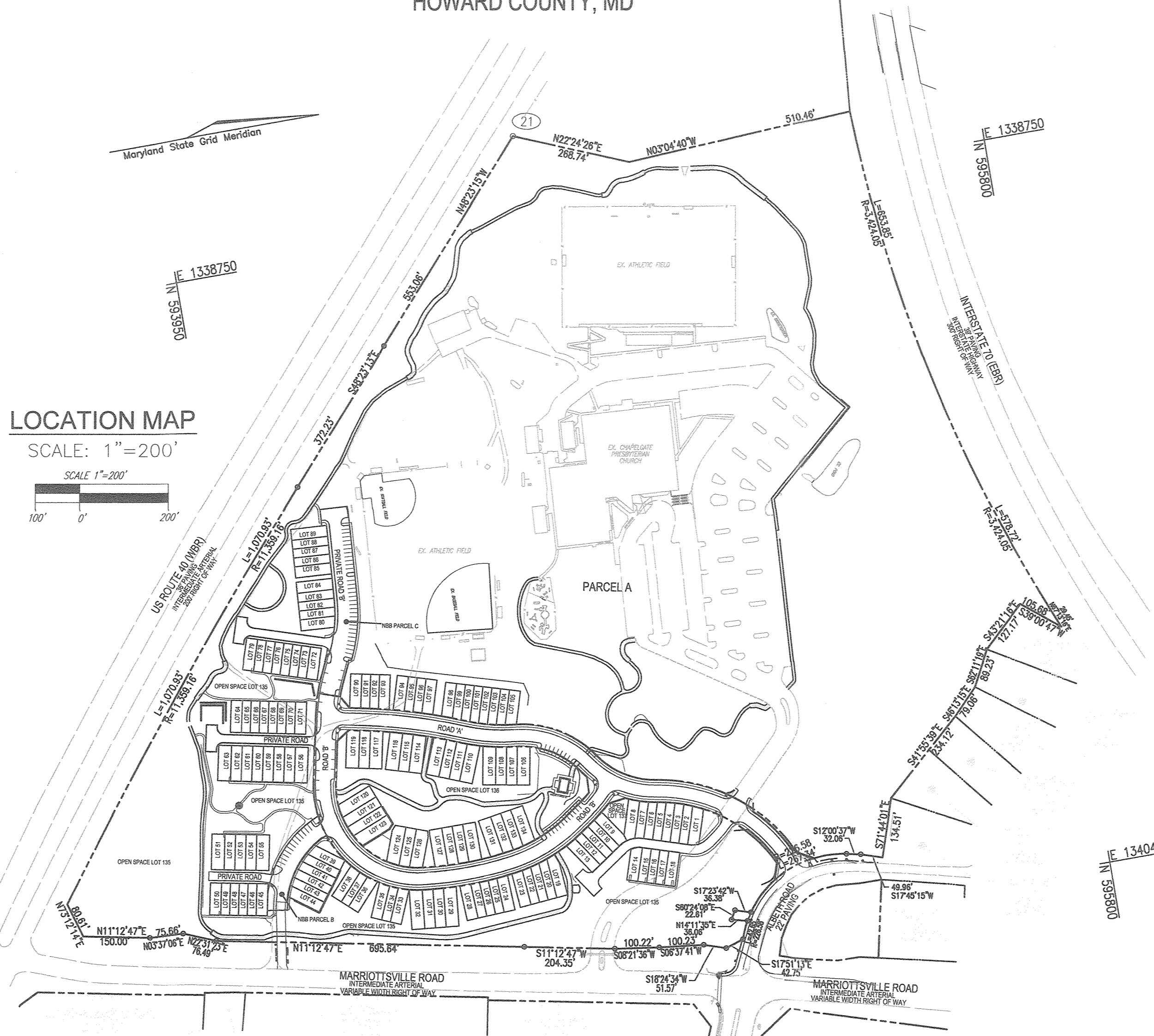
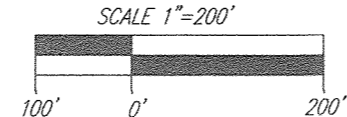


**GENERAL NOTES**

- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
- THE EXISTING TOPOGRAPHY SHOWN HEREON WAS OBTAINED FROM AERIAL PHOTOGRAMMETRY COMPILED BY POTOMAC AERIAL SURVEYS INC. DECEMBER 21, 2017. THE EXISTING ELEVATIONS WERE OBTAINED FROM FIELD SURVEYS PREPARED BY VOGEL ENGINEERING-TIMMONS GROUP DATED MARCH 2013, FEB/MARCH 2014 AND FEB/MARCH/JUNE 2018.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY VOGEL ENGINEERING-TIMMONS GROUP, DATED MAY 2018.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE. THE HOWARD COUNTY MONUMENT NOS. 18E1 AND 18H13 WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "CEF-M" PER ZONING BOARD DECISION AND ORDER FOR CASE ZB-1105-M, ISSUED ON NOVEMBER 6, 2017 AND IN ACCORDANCE WITH THE 10/6/13 ZONING REGULATIONS, AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- WATER FOR THIS PROJECT IS TO BE PUBLIC EXTENSION OF CONTRACT NO. 44-3480.
- SEWER FOR THIS PROJECT IS TO BE PUBLIC EXTENSION OF CONTRACT NO. 44-3641-D.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
- AN ALTERNATIVE COMPLIANCE REQUEST FOR THE ENVIRONMENTAL DISTURBANCE SHOWN FOR ROAD/STREAM CROSSING AND UTILITY EXTENSIONS SHALL BE SUBMITTED.
- EXISTING UTILITIES LOCATED FROM TOPOGRAPHIC SURVEY AND AS-BUILT DRAWINGS, CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
- A FLOODPLAIN IS LOCATED ONSITE.
- THE FLOODPLAIN SHOWN HEREON IS BASED ON CHAPELGATE PRESBYTERIAN CHURCH SITE DEVELOPMENT PLAN SDP 93-128.
- STEEP SLOPES OVER 20,000 SF CONTIGUOUS ARE LOCATED ONSITE AND SHOWN HEREON.
- FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH A FUTURE SUBDIVISION PLAN.
- ANY LOSS OF EXISTING FOREST CONSERVATION EASEMENTS WILL BE ACCOMMODATED ONSITE OR OFF-SITE IN A FOREST CONSERVATION BANK IN ACCORDANCE WITH CONDITIONS PROVIDED WITH SDP 02-133(PC) AND PLAT NO 15923.
- WETLANDS AND STREAMS SHOWN ONSITE ARE BASED ON THE DELINEATION PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, IN A REPORT TITLED WETLAND, FOREST STAND DELINEATION & PRELIMINARY FOREST CONSERVATION PLAN REPORT; DATED JULY 24, 2018.
- IN ACCORDANCE WITH ZONING BOARD DECISION AND ORDER FOR CASE ZB1105-M, THE RECREATION OPEN SPACE REQUIREMENTS FOR THIS CEF-M PROJECT IS 25% OF GROSS AREA (20.12 AC. GROSS AREA X 25% = 5.03 AC.). REFER TO PROPOSED OPEN SPACE SHOWN HEREON.
- GEOTECHNICAL INVESTIGATIONS SHALL COMPLETED AND SUBMITTED WITH THE FUTURE SUBDIVISION PLANS.
- A NOISE STUDY SHALL BE PREPARED AND SUBMITTED WITH A FUTURE SUBDIVISION PLAN.
- A FOREST STAND DELINEATION PLAN & REPORT TITLED WETLAND, FOREST STAND DELINEATION & PRELIMINARY FOREST CONSERVATION PLAN REPORT; DATED JULY 24, 2018 WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES.
- 53 SPECIMEN TREES WERE IDENTIFIED.
- ALBETH ROAD IS CLASSIFIED AS A LOCAL ROAD.
  - MARRIOTTSVILLE ROAD IS CLASSIFIED AS AN INTERMEDIATE ARTERIAL.
  - US ROUTE 40 IS CLASSIFIED AS AN INTERMEDIATE ARTERIAL.
  - THE PROPOSED INTERIOR STREETS ARE CLASSIFIED AS ACCESS STREET & PRIVATE ALLEY.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERY LOCATED ON THE SUBJECT PROPERTY OR THE COUNTY'S CEMETERY SITE MAP.
- THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF ALTERNATIVE SURFACES AND MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIORETENTION, RAIN BARREL, DRYWELLS AND A GRAVEL WETLAND. ALTERNATIVE SURFACES - PERMEABLE SURFACES. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- IN ACCORDANCE WITH ZONING BOARD DECISION AND ORDER FOR CASE ZB1105-M, THE RECREATION OPEN SPACE REQUIREMENTS FOR THIS CEF-M PROJECT IS 1,000 SF/UNIT. SOME RECREATIONAL AREA OF THE RESIDENTIAL DEVELOPMENT WILL BE SHARED WITH AND WILL REMAIN PART OF CHAPELGATE PRESBYTERIAN CHURCH PROPERTY.
  - 134 UNITS X 1,000 SF = 134,000 SF OR 3.07 ACRES
- THE SITE IS NOT LOCATED IN THE HISTORIC DISTRICT OR LISTED ON THE HISTORIC SITES INVENTORY.
- THE PRE-SUBMISSION COMMUNITY MEETING WAS HELD FOR THIS PROJECT ON JULY 25TH, 2018 AT 6 PM AT THE CHAPELGATE PRESBYTERIAN CHURCH.
- IN ACCORDANCE WITH ZONING BOARD DECISION AND ORDER FOR CASE ZB1105-M, THIS SUBDIVISION IS SUBJECT TO MODERATE INCOME HOUSING UNITS. A MIHU AGREEMENT AND MIHU COVENANTS WILL BE REQUIRED IN ACCORDANCE WITH SECTION 13.402 OF THE HOWARD COUNTY CODE.
- THE MIHU REQUIREMENTS FOR THIS SUBDIVISION WILL BE 14 UNITS (10% OF 134 UNITS).
  - PER ZB1105-M, 21 MODERATE INCOME HOUSING UNITS ARE PROPOSED.
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING AND ADDRESS THE PROJECT TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
- TEMPORARY STORMWATER MANAGEMENT WILL BE PROVIDED FOR DISTURBED AREAS OF 2 ACRES OR MORE.
- THIS PROJECT IS SUBJECT TO WP-19-056. ON MARCH 26, 2018, THE PLANNING DIRECTOR APPROVED THE REQUEST FOR ALTERNATIVE COMPLIANCE TO THE FOLLOWING SECTIONS: SECTION 16.120(A)(7) REMOVAL OF SPECIMEN TREES 30" IN DIAMETER OR GREATER. THIS REQUEST IS FOR THE REMOVAL OF 27 SPECIMEN TREES (26 TULIP PUPULAR AND 1 MAPLE). SECTION 16.120(C)(4) SINGLE FAMILY ATTACHED LOTS MAY BE APPROVED WITHOUT PUBLIC ROAD FRONTAGE PROVIDED THEY FRONT ON A COMMONLY OWNED AREA CONTAINING A PARKING AREA OR PRIVATE ROAD NOT EXCEEDING A LENGTH OF 200 FEET MEASURED FROM THE EDGE OF THE PUBLIC RIGHT-OF-WAY ALONG THE CENTERLINE OF THE CENTERLINE OF THE ROAD. THE REQUEST IS TO EXCEED THE 200' LENGTH FROM A PUBLIC ROAD FOR LOTS 14, 15, 46-54, 74-79 AND 82-89. SECTION 16.116 PROTECTION OF WETLANDS, STREAMS, AND STEEP SLOPES - THE REQUEST IS FOR THE DISTURBANCE TO THE 100' STREAM BUFFER AND 25% STEEP SLOPES TO ACCOMMODATE INSTALLATION OF THE PROPOSED PATHWAY SYSTEM APPROVED AS PART OF THE COMMUNITY ENHANCEMENT REQUIREMENTS PER ZB CASE NO. 1105M.

**LOCATION MAP**

SCALE: 1"=200'



**LEGEND**

- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING MAILBOX
- EXISTING SIGN
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- EXISTING STREAM
- EXISTING STREAM BUFFER
- LOOP TRAIL
- EX. 100 YEAR FLOODPLAIN

**SWM PRACTICE CHART**

REFER TO SHEET 18 FOR STORMWATER MANAGEMENT PRACTICE CHART.

**SITE ANALYSIS DATA CHART**

- A. TOTAL AREA: 61.80 AC ±
- B. AREA OF PLAN SUBMISSION(CEF REGULATIONS): 20.12 AC ±
- C. AREA OF WETLANDS AND BUFFERS: 0.67 SF
- D. AREA OF FLOODPLAIN: 0.7 AC ± (WITHIN PROJECT AREA)
- E. AREA OF FOREST: 16.8 AC (WITHIN PROJECT AREA)
- F. AREA OF STEEP SLOPES (15% & GREATER): 5.42 AC (WITHIN PROJECT AREA)
- G. AREA OF ERODIBLE SOILS: 18.6 AC ±
- H. LIMIT OF DISTURBED AREA: 21.2 AC (INCLUDES PATHWAY)
- I. PROPOSED USES FOR SITE AND STRUCTURES: RESIDENTIAL SINGLE FAMILY ATTACHED (SFA) HOMES 12.26 AC (WITHIN PROJECT AREA)
- J. GREEN OPEN AREA: 7.86 AC (WITHIN PROJECT AREA)
- K. PROPOSED IMPERVIOUS AREA: 1.6 PRESENT ZONING DESIGNATION: CEF-M
- L. OPEN SPACE REQUIRED: 5.03 ACRES (25%)
- N. TOTAL NUMBER OF UNITS ALLOWED: 134 SFA
- O. TOTAL NUMBER OF UNITS PROPOSED: 134 SFA
- P. DPZ FILE REFERENCES: BA CASE 86-09E, SDP-88-037, BA CASE 93-07E, SDP-83-128, PLAT 13157, PLAT 15336, TU-01-01 BA CASE 01-23E, WP-03-94, SDP-02-133FC, PLAT 15923-25, SDP-03-122, TU-06-004, SDP-07-133, WP-08-034, PLAT 20074-76, ZB-1105-M, WP-19-056

**OWNER/DEVELOPER**

CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

**CHAPELGATE CEF-M REGULATIONS:**

- PERMITTED USES:
  - RELIGIOUS FACILITIES, STRUCTURES AND LAND USE PRIMARILY FOR RELIGIOUS ACTIVITIES
  - SCHOOLS, PRIVATE ACADEMIC, INCLUDING COLLEGES AND UNIVERSITIES.
  - CHILD DAY CARE CENTERS AND NURSERY SCHOOLS
  - SINGLE FAMILY ATTACHED DWELLING UNITS
  - COMMUNITY COMMERCIAL, DEFINED AS: PUBLIC SPACES WHICH ARE INTENDED FOR COMMUNITY INTERACTION AND MAY INCLUDE SPACES FOR ART, KIOSKS, FARMERS MARKETS, FARM PRODUCE STANDS, SEASONAL DISPLAYS AND SALES OR OTHER SIMILAR FEATURES. COMMUNITY COMMERCIAL AREAS MUST BE GENERALLY ACCESSIBLE BY THE PUBLIC WITHOUT ADMISSION CHARGE, BUT GOODS OR SERVICES MAY BE PROVIDED FOR CHARGE.
- ACCESSORY USES:
 

THE FOLLOWING ARE PERMITTED ACCESSORY USES IN THIS CEF-M DISTRICT. MORE THAN ONE ACCESSORY USE SHALL BE PERMITTED ON A LOT, PROVIDED THAT THE COMBINATION OF ACCESSORY USES REMAINS SECONDARY, INCIDENTAL, AND SUBORDINATE TO THE PRINCIPAL USE.

  - ANY USE NORMALLY AND CUSTOMARILY INCIDENTAL TO THE PERMITTED USES OF THIS DISTRICT. ACCESSORY STRUCTURES ARE SUBJECT TO THE REQUIREMENT OF HOWARD COUNTY ZONING REGULATIONS SECTION 128.0.A.
  - THE HOUSING BY A RESIDENT FAMILY OF:
    - NOT MORE THAN FOUR NON-TRANSIENT ROOMERS OR BOARDERS; OR
    - NOT MORE THAN EIGHT MENTALLY AND/OR PHYSICALLY DISABLED PERSON OR PERSON 62 YEARS OF AGE OR OLDER, PROVIDED THE USE IS REGISTERED, LICENSED OR CERTIFIED BY THE STATE OF MARYLAND, OR
    - A COMBINATION OF A AND B ABOVE, PROVIDED THAT THE TOTAL NUMBER OF PERSONS HOUSED IN ADDITION TO THE RESIDENT FAMILY DOES NOT EXCEED EIGHT.
  - HOME OCCUPATIONS, SUBJECT TO THE REQUIREMENTS OF HOWARD COUNTY ZONING REGULATIONS SECTION 128.0.C.
  - HOME CARE, PROVIDED THAT IF HOME CARE IS COMBINED WITH HOUSING OF MENTALLY OR PHYSICALLY DISABLED PERSONS OR PERSONS 62 YEARS OF AGE OR OLDER, AS ALLOWED BY PARAGRAPH 2.B ABOVE, THE TOTAL NUMBER OF PERSONS BEING HOME CARE AT ANY ONE TIME PLUS THE NUMBER OF PERSONS BEING HOUSED SHALL NOT EXCEED EIGHT.
  - PARKING ACCESSORY TO RESIDENTIAL:
    - OFF-STREET PARKING OF NO MORE THAN ONE COMMERCIAL VEHICLE
    - OFF-STREET PARKING OR STORAGE OF REGISTERED, INOPERABLE, WRECKED, DISMANTLED OR DESTROYED MOTOR VEHICLES SHALL NOT BE PERMITTED, EXCEPT AS PROVIDED BY HOWARD COUNTY ZONING REGULATIONS SECTION 128.0.D.
  - STORAGE OF RECREATIONAL VEHICLES OR BOATS, PROVIDED THAT SUCH STORAGE SHALL BE LIMITED TO THE FOLLOWING:
    - ONE RECREATIONAL VEHICLE WITH A LENGTH OF 30 FEET OR LESS; AND
    - ONE BOAT WITH A LENGTH OF 20 FEET OR LESS
  - SMALL WIND ENERGY SYSTEMS, BUILDINGS MOUNTED, ON NON-RESIDENTIAL STRUCTURES, SUBJECT TO THE REQUIREMENTS OF HOWARD COUNTY ZONING REGULATIONS SECTION 128.0.L.
  - ACCESSORY SOLAR COLLECTORS.
- GENERAL BULK REGULATIONS:
 

1. MAXIMUM DENSITY: _____	134 TOTAL RESIDENTIAL UNITS
2. BUILDING/USE SETBACKS: _____	
A. FROM EXTERNAL PROPERTY LINES: _____	30'
B. FROM EXTERNAL RIGHT-OF-WAYS: _____	30'
3. MINIMUM DISTANCE BETWEEN SINGLE FAMILY ATTACHED BUILDINGS: _____	
A. FACE TO FACE: _____	30'
B. FACE TO SIDE/REAR TO SIDE: _____	30'
C. SIDE TO SIDE: _____	15'
D. REAR TO REAR: _____	60'
E. REAR TO FACE: _____	100'
4. SINGLE FAMILY ATTACHED BULK REGULATIONS: _____	
1. MAXIMUM UNITS PER STRUCTURE: _____	8 UNITS
2. BUILDING SETBACKS: _____	
A. FRONT, FROM RIGHT-OF-WAY: _____	5'
B. FRONT LOADED GARAGE FROM RIGHT-OF-WAY: _____	18'
C. SIDE FROM RIGHT-OF-WAY: _____	10'
D. SIDE TO INTERNAL ALLEY: _____	5'
E. REAR PRINCIPLE STRUCTURES FROM INTERNAL ALLEY: _____	18'
5. MAXIMUM HEIGHT: _____	
A. PRINCIPAL STRUCTURE: _____	45'
B. ACCESSORY STRUCTURE: _____	15'
4. MAXIMUM BUILDING LENGTH: _____	200'
- COMMERCIAL/INSTITUTIONAL:
  - BUILDING SETBACKS:
    - FROM THE RESIDENTIAL LOTS: \_\_\_\_\_
 75' |    - FROM THE PUBLIC STREET RIGHT-OF-WAY: \_\_\_\_\_
 15' |
  - MAXIMUM HEIGHT:
    - GENERAL CEF DISTRICT HEIGHT: \_\_\_\_\_
 45' |    - RELIGIOUS FACILITY INCREASE SETBACKS BY 1' FOR EACH 1' INCREASE IN BUILDING HEIGHT BEYOND GENERAL HEIGHT LIMIT
- OPEN SPACE (OF TOWNHOUSE DEVELOPMENT PROPERTY) 25%
- ONSITE AMENITY AREA/RECREATIONAL AREA: 1,000 SF/UNIT SOME RECREATIONAL AREA OF THE RESIDENTIAL DEVELOPMENT WILL BE SHARED WITH AND WILL REMAIN PART OF CHAPELGATE PRESBYTERIAN CHURCH PROPERTY. (134 UNITS X 1,000 SF = 134,000 SF OR 3.07 ACRES)
- MIHU (MODERATE INCOME HOUSING UNITS)
 

1. NUMBER OF UNITS TO BE MIHU:	21
NO FEE IN UNITS	

\*\* CEF-M REGULATIONS TAKEN FROM PETITIONERS EXHIBIT 3

**ENVIRONMENTAL SITE DESIGN NARRATIVE:**

IN ACCORDANCE WITH CHECKLIST ITEM III.K.

- THE NATURAL AREAS ON THE PROJECT SITE ARE LOCATED NEAR THE PROJECT BOUNDARY CORNER AT THE EXISTING CHURCH ENTRANCE AND MARRIOTTSVILLE ROAD. SEE #6 BELOW, AS PRESENTED WITH ZB1105-M, MINOR DISTURBANCES ARE PROPOSED FOR ROAD/STREAM CROSSING, AND UTILITY INSTALLATION.
- NO DRAMATIC DISTURBANCE TO THE NATURAL DRAINAGE PATTERNS ARE PROPOSED, PLEASE REFER TO THE PROPOSED CONCEPTUAL GRADING.
- THE CONCEPTUAL REDUCTION IN IMPERVIOUS AREA THROUGH BETTER SITE DESIGN IS ACHIEVED THROUGH THE ENVIRONMENTAL SITE DESIGN (ESD) FOR THE PROJECT. THE ESD CONCEPT INCLUDES THE USE OF MICRO-SCALE PRACTICES INCLUDING MICRO-BIORETENTION FACILITIES (M-6), DRYWELLS (M-5), BIO-SWALES (M-8), GRAVEL WETLAND (M-2) AND RAIN BARRELS (M-1). ALSO, ALTERNATIVE SURFACE DRIVEWAYS, TRAIL AND PARKING (A-2) ARE PROPOSED. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF BASIN / TRAPS AND PERIMETER CONTROLS. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT.
- STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-SCALE PRACTICES INCLUDING MICRO-BIORETENTION FACILITIES (M-6), DRYWELLS (M-5), BIO-SWALES (M-8), GRAVEL WETLAND (M-2) AND RAIN BARRELS (M-1). ALSO, ALTERNATIVE SURFACE DRIVEWAYS (A-2) ARE PROPOSED. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED. THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION".

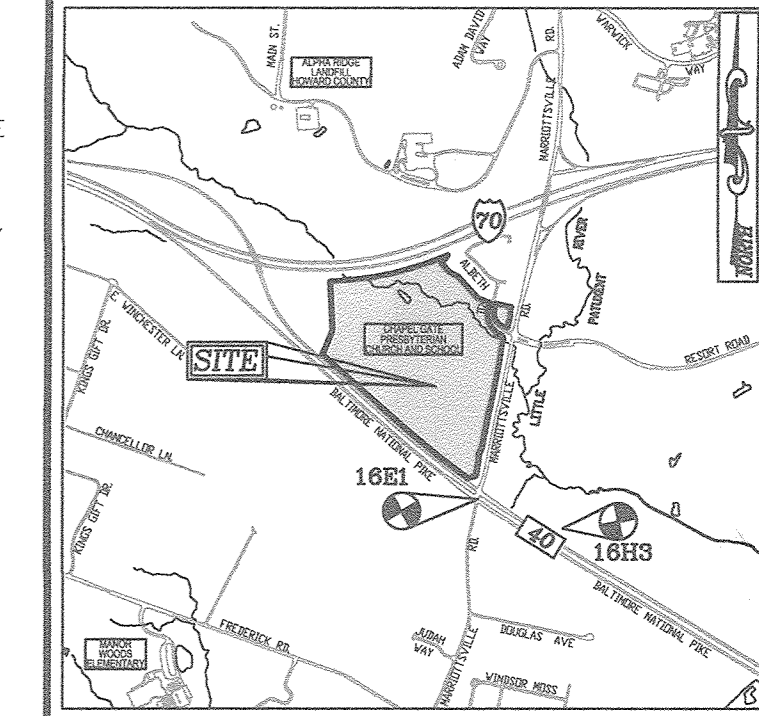
TARGET PE = 1.5'                      PROVIDED PE = 1.92'  
TARGET ESDM = 51.114 CF(1)              PROVIDED = 59,909 CF(2)  
(1) ESTIMATED  
(2) MEASURED

AT THIS CONCEPT STAGE OF DEVELOPMENT, AN ALTERNATIVE COMPLIANCE PETITION WILL BE REQUIRED FOR SPECIMEN TREE REMOVAL, WETLAND/WETLAND BUFFER STREAM/STREAM BUFFER AND FLOODPLAIN DISTURBANCE FOR ROAD/STREAM CROSSING.  
REFER TO GENERAL NOTE 30 AND 31.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4.10.19  
CHIEF, DEVELOPMENT ENGINEERING DIVISION                      DATE

*[Signature]* 4.01.19  
CHIEF, DIVISION OF LAND DEVELOPMENT                      DATE



**VICINITY MAP**

SCALE: 1"=2000'  
ADC MAP: PAGE: 19 BLOCK: B3, B4, C3 & C4

**SHEET INDEX**

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**ENVIRONMENTAL CONCEPT PLAN**

**COVER SHEET**

**CHAPELGATE**

LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
2600 MARRIOTTSVILLE ROAD  
HOWARD COUNTY, MD

PARCELS: 110 & 421  
1-134, 135-136, 136  
3RD ELECTION DISTRICT

ZONED: CEF-M  
L 1389/F 339 (P. 110)  
L 4153/F 424 (P. 421)  
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**

ENGINEERS • SURVEYORS • PLANNERS  
3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
TEL: 410.461.7666 FAX: 410.461.8961

DESIGN BY: RHV  
DRAWN BY: VE, TG, KG  
CHECKED BY: RHV  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.D. NO.: 13-36 / 49220

1 SHEET OF 18



Specimen Tree Chart

Key (X#)	Species	Size (DBH)	CRZ (feet radius)	Comments
1	Tulip poplar	32.5	48.75	TO BE REMOVED
2	Tulip poplar	31.5	46.5	TO BE REMOVED
3	Tulip poplar	60+	90	poor major trunk rot TO BE REMOVED
4	Tulip poplar	37.5	56.25	TO BE REMOVED
5	Tulip poplar	30	45	TO BE REMOVED
6	Tulip poplar	38	57	TO BE REMOVED
7	Tulip poplar	35	52.5	TO BE REMOVED
8	Tulip poplar	34	51	TO BE REMOVED
9	Tulip poplar	38	57	TO BE REMOVED
10	Tulip poplar	33.6	50.25	TO BE REMOVED
11	Tulip poplar	38.6	58.25	TO BE REMOVED
12	Tulip poplar	33	49.5	fair condition, some dieback TO BE REMOVED
13	Tulip poplar	40	60	TO BE REMOVED
14	Tulip poplar	30	45	TO REMAIN
15	Tulip poplar	37.5	56.25	TO BE REMOVED
16	Tulip poplar	38	54	TO BE REMOVED
17	Tulip poplar	33	49.5	TO BE REMOVED
18	Tulip poplar	39	58.5	TO BE REMOVED
19	Tulip poplar	34	51	TO BE REMOVED
20	Tulip poplar	31.5	47.25	TO BE REMOVED
21	Tulip poplar	32	48	TO BE REMOVED
22	Tulip poplar	32	48	TO BE REMOVED
23	Tulip poplar	30	45	TO REMAIN
24	Tulip poplar	31	46.5	TO REMAIN
25	Tulip poplar	30	45	TO REMAIN
26	Tulip poplar	34	51	TO REMAIN
27	Tulip poplar	32	48	TO REMAIN
28	Tulip poplar	36.5	54.75	TO BE REMOVED
29	Tulip poplar	39	58.5	TO BE REMOVED
30	Tulip poplar	32.6	48.75	TO BE REMOVED
31	Tulip poplar	30.6	45.75	TO BE REMOVED
32	Tulip poplar	30	45	TO REMAIN
33	Red oak	36.5	57.75	TO REMAIN
34	Red oak	43	64.5	TO REMAIN
35	Tulip poplar	31	46.5	TO REMAIN
36	White oak	38	57	TO REMAIN
37	Black oak	32.6	48.75	TO REMAIN
38	Red maple	30	45	TO REMAIN
39	Tulip poplar	33	49.5	TO REMAIN
40	Tulip poplar	32	48	fair condition, some dieback TO REMAIN
41	Tulip poplar	31	46.5	TO REMAIN
42	Tulip poplar	33	49.5	TO REMAIN
43	Tulip poplar	33.6	50.25	TO REMAIN
44	Red oak	48.6	72.75	TO REMAIN
45	Tulip poplar	44	66	TO REMAIN
46	Red oak	32.6	48.75	TO REMAIN
47	Overcup sp	40.6	60.75	fair condition, dieback noted TO REMAIN
48	Tulip poplar	32	48	TO REMAIN
49	Tulip poplar	34.6	51.75	TO REMAIN
50	Tulip poplar	33	49.5	TO BE REMOVED
51	Red maple	31	46.5	poor, severe rot TO BE REMOVED
52	Sour cherry	38	54	fair; heavy vine and trunk rot TO REMAIN
53	Tulip poplar	31	46.5	TO REMAIN

NOTE:  
 ALTERNATE COMPLIANCE REQUEST TO ALLOW THE REMOVAL OF 27 SPECIMEN TREES SHALL BE SUBMITTED WITH FUTURE SUBDIVISION PLAN

LEGEND

- EXISTING CURB AND GUTTER
- EXISTING CONTOUR
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING UTILITY POLE
- EXISTING MAILBOX
- EXISTING SIGN
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- EX. 100 YEAR FLOODPLAIN
- EXISTING STREAM
- EXISTING STREAM BUFFER
- EXISTING VEGETATION
- SOILS BOUNDARY
- EXISTING SIDEWALK
- MODERATE SLOPES (15% - 24.99%)
- STEEP SLOPE (>25%)
- EXISTING FENCE
- NRCS/AIDE/HSCD HIGHLY ERODIBLE SOILS
- EX. FOREST CONSERVATION EASEMENT
- EX. SPECIMEN TREE
- EX. SPECIMEN TREE TO BE REMOVED
- CEF LINE DEVELOPMENT

CHAPELGATE PRESBYTERIAN CHURCH INC. FOREST CONSERVATION EASEMENTS

CE#	SDP-02-133 PLATS 15923-25	SDP-07-133 PLATS 20074-76	SCP-18-062 S-19-001
#1A	6.2811 AC	1.40 AC	1.40 AC
#1B		1.38 AC	1.38 AC
#2	2.5797 AC	2.58 AC	2.58 AC
#3	0.3735 AC	0.86 AC	0.65 AC
#3A			0.11 AC
#3B			
#4	0.4309 AC	0.43 AC	0.09 AC
#4A			
#5	1.0790 AC	1.08 AC	0 AC
#6	2.0558 AC	3.44 AC	
#6A			0.92 AC
#6B			2.58 AC
#6C			
#7		1.63 AC	0 AC
#8*			2.42 AC
TOTALS	12.80 AC	12.80 AC	11.73 AC

FOREST CONSERVATION NOTES:  
 1. EXISTING FOREST CONSERVATION EASEMENTS WERE ESTABLISHED TO FULFILL THE FOREST CONSERVATION OBLIGATIONS OF SDP-02-133 AND SDP-07-133. SURETY WAS PREVIOUSLY POSTED WITH THE DEVELOPER'S AGREEMENT FOR SDP-02-133 FOR 12.8 ACRES OF RETENTION. NO SURETY WAS REQUIRED FOR THE RECONFIGURATION UNDER SDP-07-133.  
 2. UNDER A FUTURE SUBDIVISION PLAN, THE DEVELOPER AGREES TO ADJUST THE LIMITS OF THE FOREST RETENTION AREAS ON SITE AND TO PROVIDE OFF-SITE RETENTION AND/OR PAY FEE-IN-LIEU, IF RETENTION REQUIREMENTS CANNOT BE MET ON-SITE. THE OWNER SHALL RECORD AN AMENDED PLAT REDEFINING THE AMENDED FOREST CONSERVATION AREAS WITH NO FINANCIAL PENALTY FOR CHANGES OR REDUCTION IN THE LIMITS OF RETENTION. STANDARD FEES WILL BE CHARGED AS SURETY FOR RETENTION OR FOR FEE-IN-LIEU.

NOTE:  
 THE REMOVAL OF ANY FOREST CONSERVATION EASEMENT AREA MUST BE COMPENSATED BY NEW ON-SITE OR OFF-SITE FOREST CONSERVATION EASEMENT.

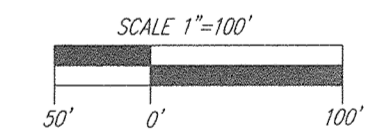
SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaC	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	49	NO
GcC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	43	YES
GcH	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	37	YES
GcB	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	49	YES
Ho	HATBORO-CODORIUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	43	NO
MoD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	32	YES
Luf	LUDORHENS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
LUD	LUDORHENS, HIGHWAY, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE:  
 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 \* LIMITS OF PROJECT

EX. CONDITIONS PLAN

SCALE: 1"=100'



OWNER/DEVELOPER  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

EXISTING CONDITIONS PLAN

CHAPELGATE

LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
 A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
 2600 MARRIOTTVILLE ROAD  
 HOWARD COUNTY, MD

PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

**ROBERT H. VOGEL ENGINEERING, INC.**  
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 3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE  
 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. 16193, EXPIRATION DATE: 09-27-2020

DESIGN BY: RHV  
 DRAWN BY: VE, TG, KG  
 CHECKED BY: RHV  
 DATE: MARCH 2019  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

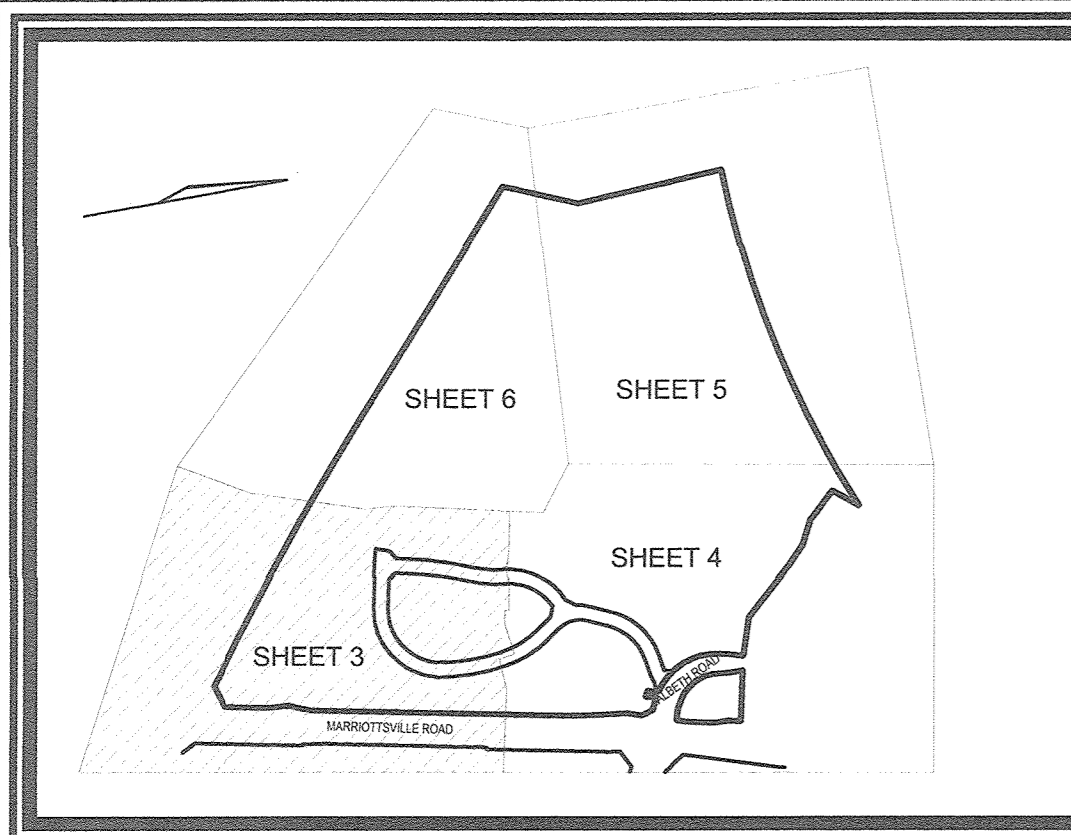
2 SHEET OF 18

APPROVED:  
 HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 4-10-19  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4-21-19  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE







**KEY MAP**  
NOT TO SCALE

- NOTES:**
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  - REVIEW OF THIS PLAN FOR COMPLIANCE WITH ZONING AND SUBDIVISION AND SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE FINAL PLAN AND SITE DEVELOPMENT PLAN STAGES, AND THEREFORE, THIS PLAN IS SUBJECT TO ADDITIONAL AND MORE DETAILED COMMENTS AS THE PLAN PROGRESSES THROUGH THE PERMIT PROCESS.



**LEGEND:**

[Symbol]	EXISTING CURB AND GUTTER
[Symbol]	PROPOSED CURB AND GUTTER
[Symbol]	EXISTING UTILITY POLE
[Symbol]	EXISTING LIGHT POLE
[Symbol]	EXISTING MAILBOX
[Symbol]	EXISTING SIGN
[Symbol]	EXISTING SANITARY MANHOLE
[Symbol]	EXISTING SANITARY LINE
[Symbol]	EXISTING CLEANOUT
[Symbol]	EXISTING FIRE HYDRANT
[Symbol]	EXISTING WATER LINE
[Symbol]	PROPOSED STORM DRAIN
[Symbol]	PROPOSED STORM DRAIN INLET
[Symbol]	EXISTING TREELINE (FIELD LOCATED)
[Symbol]	EXISTING VEGETATION
[Symbol]	EXISTING FENCE
[Symbol]	PROPERTY LINE
[Symbol]	RIGHT-OF-WAY LINE
[Symbol]	PROPOSED SIDEWALK
[Symbol]	PROPOSED PATHWAY
[Symbol]	VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT

**FOREST CONSERVATION LEGEND:**

[Symbol]	EXISTING FOREST CONSERVATION EASEMENT PLAT#20075-20076
[Symbol]	EXISTING FOREST CONSERVATION EASEMENT TO REMAIN/BE REDEFINED
[Symbol]	PROPOSED FOREST CONSERVATION EASEMENT (RETENTION)

**CURVE TABLE - PUBLIC ROAD A**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+19.20 - 3+98.84	379.64	350.00	62°08'50"	S33°59'48"W 361.30	210.91
3+98.84 - 5+69.75	170.90	210.00	46°37'40"	S32°14'11"W 166.22	90.50
5+69.75 - 7+59.31	189.56	210.00	49°48'37"	S32°38'31"W 176.87	97.50
7+59.31 - 8+70.35	111.04	400.00	16°54'27"	S1°11'28"W 117.61	59.45
8+70.35 - 10+88.68	218.33	1175.00	11°02'46"	S1°20'19"W 226.18	113.62

**CURVE TABLE - PUBLIC ROAD B**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+00.00 - 0+85.58	85.58	275.00	17°49'53"	S43°20'31"E 85.24	43.14
1+33.84 - 2+99.13	165.29	350.00	26°24'12"	S21°13'29"E 159.87	80.10
2+99.13 - 4+78.44	179.31	284.55	33°46'05"	S20°08'20"E 180.98	91.10
4+86.66 - 8+47.99	361.33	210.00	95°51'14"	S53°40'19"W 311.76	232.63
10+491.11 - 10+46.54	45.57	350.00	07°26'15"	N74°40'57"W 45.40	22.75

**CURVE TABLE - PRIVATE ROAD B**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
10+46.54 - 10+82.03	35.50	350.00	05°48'43"	N68°03'28"W 35.49	17.77
11+39.58 - 12+68.73	129.15	350.00	21°08'57"	N75°43'34"W 128.46	65.34

**OWNER/DEVELOPER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**SITE LAYOUT PLAN**  
**CHAPEL GATE**  
LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
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DESIGN BY: RHV  
DRAWN BY: VE, TG, KG  
CHECKED BY: RHV  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

3 SHEET OF 18

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4.10.19  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 4.01.19  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**SECONDARY / EMERGENCY ENTRANCE NOTES:**

- ACCESS SHALL BE GATED ENTRANCE.
- A KNOX BOX SHALL BE PROVIDED FOR FIRE RESCUE SERVICES.

**SITE LAYOUT PLAN**  
SCALE: 1"=50'

SCALE 1"=50'

25' 0' 50'

NICHOLAS B. & MARY MANGIONE MANGIONE ENTERPRISES OF TURF VALLE PLAT# 18698 USE: COMMERCIAL

INDA M. LICATA OANNE M. HOCK TM 16 P. 48 L. 2918 F. 716 USE: RESIDENTIAL

TM 16 P. 50 OPEN SPACE LOT 1 NICHOLAS B. & MARY MANGIONE OWNERS ASSOC. INC. PLAT# 18697 USE: COMMERCIAL

TM 16 P. 50 LOT K-1 TURF VALLEY PROPERTY MANGIONE ENTERPRISES OF TURF VALLE PLAT# 18697 USE: COMMERCIAL



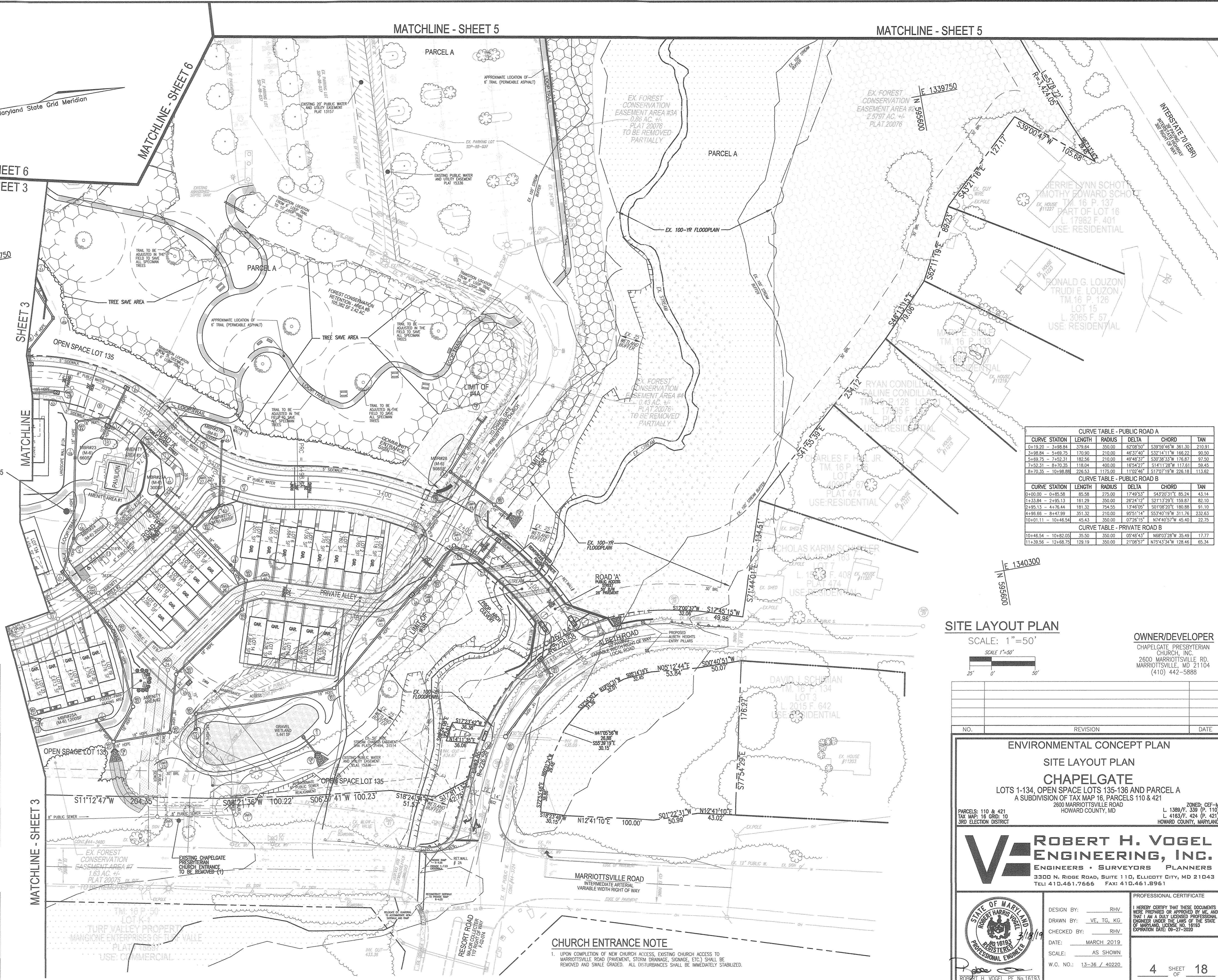
**LEGEND:**

	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREELINE (FIELD LOCATED)
	EXISTING VEGETATION
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	PROPOSED SIDEWALK
	PUBLIC 100 YR FLOODPLAIN
	EX. WETLAND
	EX. WETLAND BUFFER
	EX. STREAM
	EX. STREAM BUFFER
	PROPOSED PATHWAY
	VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT

MATCHLINE - SHEET 5

MATCHLINE - SHEET 5

MATCHLINE - SHEET 6  
MATCHLINE - SHEET 3



**FOREST CONSERVATION LEGEND:**

	EXISTING FOREST CONSERVATION EASEMENT PLAT 20075-20076
	EXISTING FOREST CONSERVATION EASEMENT TO REMAIN/BE REDEFINED
	PROPOSED FOREST CONSERVATION EASEMENT (RETENTION)

REFER TO SHEET 3 FOR CONCEPTUAL FOREST CONSERVATION TABULATION DATA.

**CURVE TABLE - PUBLIC ROAD A**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+19.20 - 3+98.84	379.64	350.00	62°08'50"	S39°59'46"W 361.30	210.91
3+98.84 - 5+169.75	170.90	210.00	46°37'40"	S32°14'11"W 160.22	90.20
5+169.75 - 7+52.31	232.56	210.00	49°48'37"	S33°38'53"W 178.87	97.50
7+52.31 - 8+70.35	118.04	400.00	16°54'27"	S14°11'28"W 117.61	59.45
8+70.35 - 10+98.88	228.53	1175.00	11°02'46"	S17°07'19"W 228.18	113.62

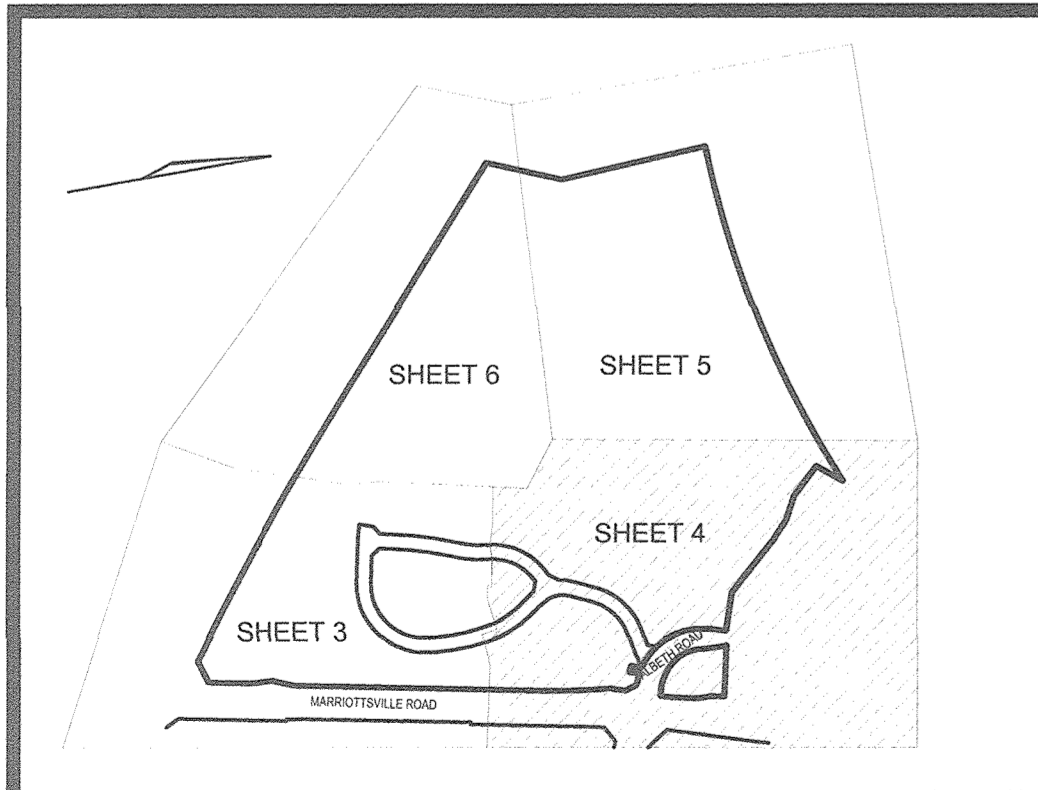
**CURVE TABLE - PUBLIC ROAD B**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+00.00 - 0+85.58	85.58	275.00	17°49'23"	S43°20'31"E 85.24	43.14
0+85.58 - 2+95.13	209.55	350.00	26°24'12"	S21°13'29"E 199.87	92.10
2+95.13 - 4+76.44	181.32	754.55	13°48'06"	S01°08'20"E 180.88	91.10
4+76.44 - 8+47.99	371.55	210.00	95°51'14"	S53°40'19"W 311.76	232.63
8+47.99 - 10+46.54	45.55	350.00	07°28'15"	N7°40'57"W 45.40	22.75

**CURVE TABLE - PRIVATE ROAD B**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
10+46.54 - 10+82.00	35.46	350.00	05°48'43"	N68°03'28"W 35.49	17.77
10+82.00 - 12+68.75	186.75	275.00	21°08'57"	N19°43'34"W 128.66	65.34

- NOTES:**
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  - REVIEW OF THIS PLAN FOR COMPLIANCE WITH ZONING AND SUBDIVISION AND SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE FINAL PLAN AND SITE DEVELOPMENT PLAN STAGES; AND THEREFORE, THIS PLAN IS SUBJECT TO ADDITIONAL AND MORE DETAILED COMMENTS AS THE PLAN PROGRESSES THROUGH THE PERMIT PROCESS.



**SITE LAYOUT PLAN**  
SCALE: 1"=50'  
SCALE 1"=50'  
OWNER/DEVELOPER  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE ROAD  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**SITE LAYOUT PLAN**  
**CHAPEL GATE**  
LOTS 1-134, OPEN SPACE LOTS 135-138 AND PARCELA  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
2600 MARRIOTTVILLE ROAD  
HOWARD COUNTY, MD  
ZONED: CE-M  
L 1389/F. 339 (P. 110)  
L 4163/F. 424 (P. 421)  
3RD ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21143  
TEL: 410.461.7666 FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**  
DESIGN BY: RHV  
DRAWN BY: VE, TG, KG  
CHECKED BY: RHV  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220  
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. 16193, EXPIRATION DATE 09-27-2020.  
4 SHEET OF 18

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*[Signature]* 4.10.19  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
*[Signature]* 4.01.19  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**CHURCH ENTRANCE NOTE**  
1. UPON COMPLETION OF NEW CHURCH ACCESS, EXISTING CHURCH ACCESS TO MARRIOTTVILLE ROAD (PAVEMENT, STORM DRAINAGE, SIGNAGE, ETC.) SHALL BE REMOVED AND SWALE GRADED. ALL DISTURBANCES SHALL BE IMMEDIATELY STABILIZED.



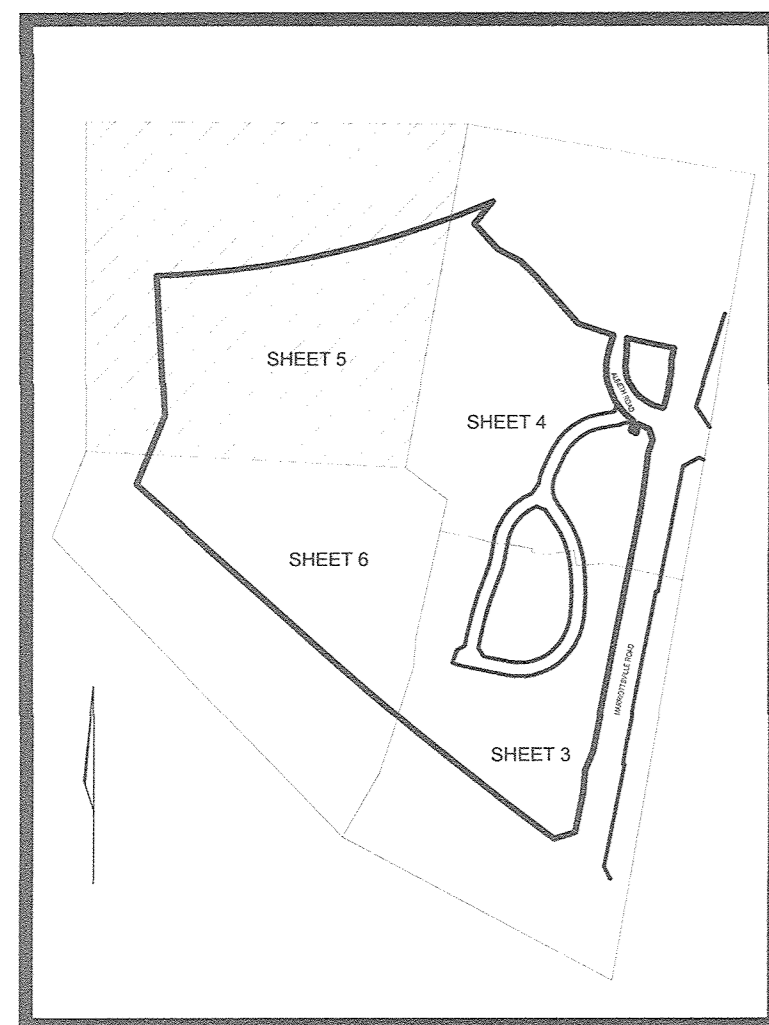
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**NOTE:**  
ONLY THE PROJECT LOOP TRAIL & ASSOCIATED AMENITIES ARE PROPOSED ON THIS PORTION OF THE SITE

**SWM NOTE:**

1. THE LOOP TRAIL AS SHOWN HEREON IS TO BE A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT



**KEY MAP**  
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad Edwards*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

4.10.19  
DATE

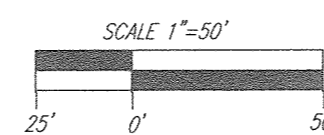
*Veronica L. ...*  
CHIEF, DIVISION OF LAND DEVELOPMENT

4-01-19  
DATE

E 1338550  
N 594800

**SITE LAYOUT PLAN**

SCALE: 1"=50'



**LEGEND:**

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING TREE LINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED PATHWAY
- PUBLIC 100 YR FLOODPLAIN
- EX. STREAM
- EX. STREAM BUFFER

**FOREST CONSERVATION LEGEND:**

- EXISTING FOREST CONSERVATION EASEMENT (PLAT 20075-20076)
  - EXISTING FOREST CONSERVATION EASEMENT TO REMAIN/BE REDEFINED
  - PROPOSED FOREST CONSERVATION EASEMENT (RETENTION)
- REFER TO SHEET 3 FOR CONCEPTUAL FOREST CONSERVATION TABULATION DATA.

**OWNER/DEVELOPER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSTOWN RD.  
MARRIOTTSTOWN, MD 21104  
(410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**

**SITE LAYOUT PLAN**

**CHAPELGATE**

LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421

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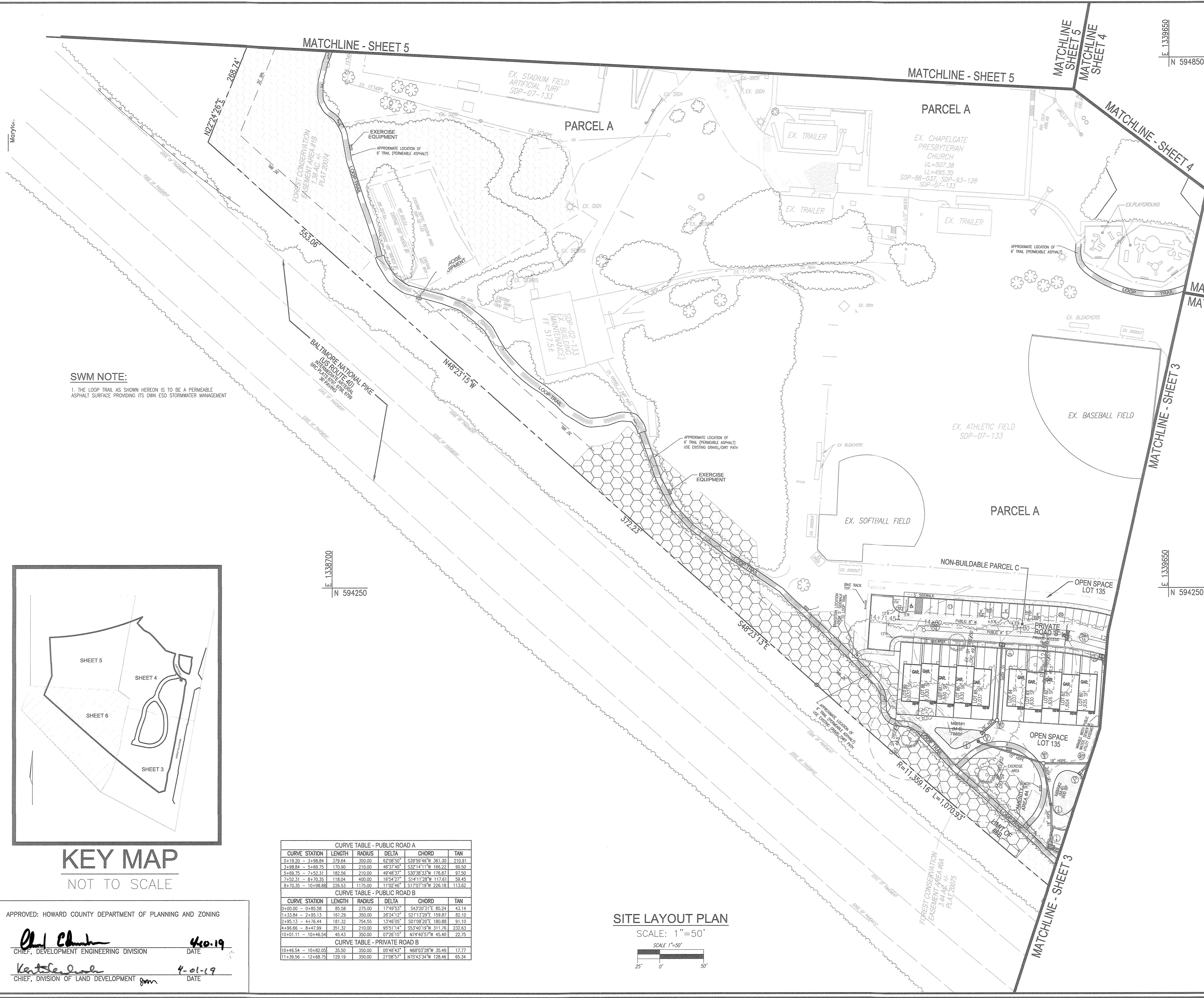
**PROFESSIONAL CERTIFICATE**

DESIGN BY: \_\_\_\_\_ RHV  
DRAWN BY: \_\_\_\_\_ VE, TG, KG  
CHECKED BY: \_\_\_\_\_ RHV  
DATE: \_\_\_\_\_ MARCH 2019  
SCALE: \_\_\_\_\_ AS SHOWN  
W.O. NO.: 13-36 / 40220

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5 SHEET OF 18





- LEGEND:**
- EXISTING CURB AND GUTTER
  - PROPOSED CURB AND GUTTER
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
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  - RIGHT-OF-WAY LINE
  - PROPOSED SIDEWALK
  - PROPOSED PATHWAY
  - VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT

- FOREST CONSERVATION LEGEND:**
- EXISTING FOREST CONSERVATION EASEMENT PLAN 20075-20076
  - EXISTING FOREST CONSERVATION EASEMENT TO REMAIN/BE REDEFINED
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**SITE LAYOUT PLAN**  
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PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

ZONED: C5F-H  
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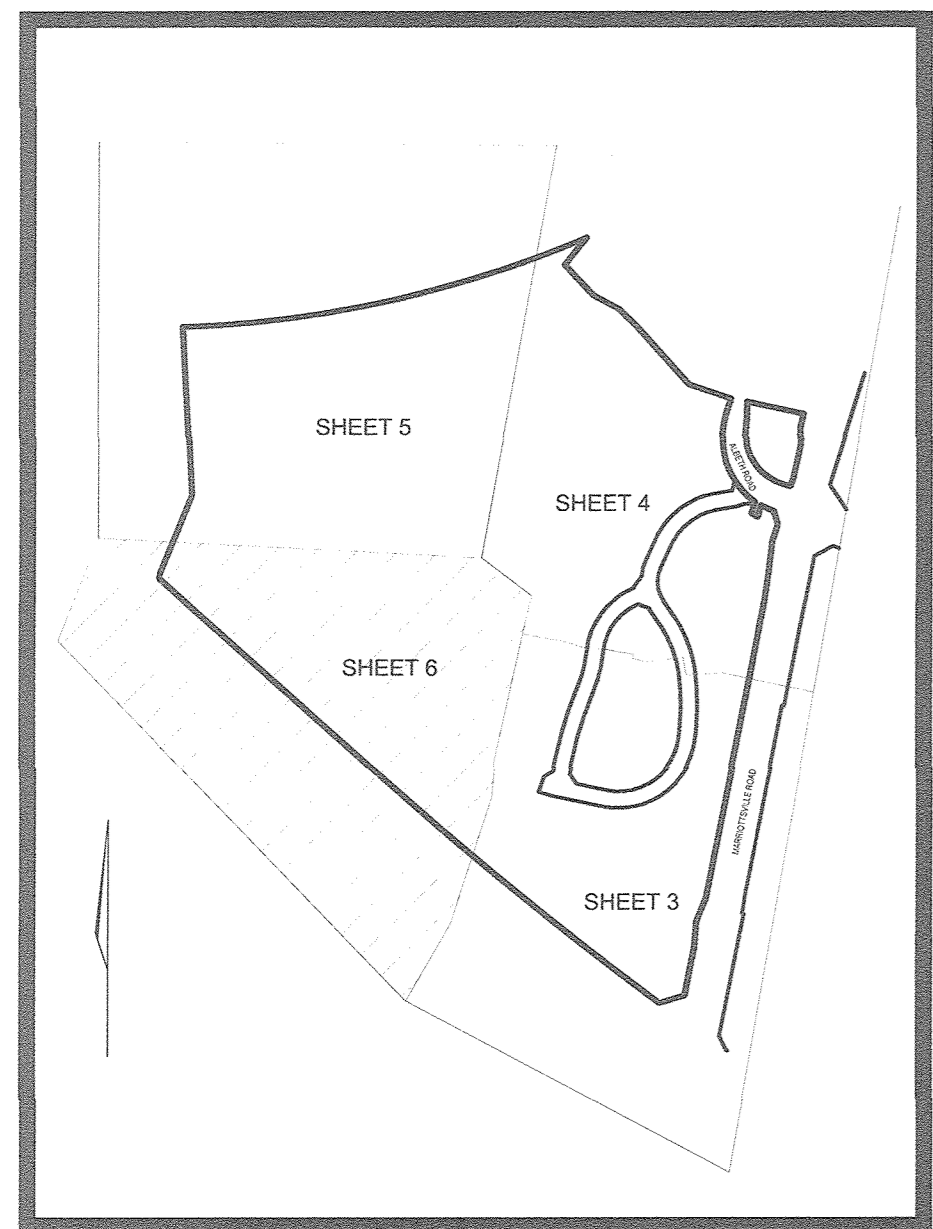
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 DRAWN BY: \_\_\_\_\_ VE, TG, KC  
 CHECKED BY: \_\_\_\_\_ RHV  
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 SCALE: \_\_\_\_\_ AS SHOWN  
 W.O. NO.: 13-36 / 40220

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. 18183, EXPIRATION DATE: 09-27-2020

6 SHEET OF 18

**SWM NOTE:**  
 1. THE LOOP TRAIL AS SHOWN HEREON IS TO BE A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT



CURVE TABLE - PUBLIC ROAD A					
CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+19.10 - 3+98.84	379.74	350.00	42°08'50"	S32°29'46"W 361.30	210.81
3+98.84 - 5+69.75	170.90	210.00	48°37'40"	S32°14'11"W 166.22	80.50
5+69.75 - 7+52.31	182.56	210.00	49°48'37"	S30°38'33"W 176.87	97.50
7+52.31 - 8+70.35	118.04	400.00	16°54'27"	S14°11'28"W 117.81	58.45
8+70.35 - 10+98.98	228.63	1175.00	11°02'48"	S17°07'19"W 226.18	113.67

CURVE TABLE - PUBLIC ROAD B					
CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+00.00 - 0+85.58	85.58	275.00	17°49'53"	S43°20'31"E 85.24	43.14
1+33.84 - 2+95.13	161.29	350.00	26°24'12"	S21°13'29"E 159.87	82.10
2+95.13 - 4+76.44	181.32	754.55	13°46'05"	S01°08'20"E 180.88	91.10
4+86.66 - 8+47.99	361.32	210.00	85°51'14"	S53°40'19"W 311.76	232.83
10+01.11 - 10+46.54	45.43	350.00	07°26'15"	N74°40'57"W 45.40	22.75

CURVE TABLE - PRIVATE ROAD B					
CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
10+46.54 - 10+82.05	35.50	350.00	05°48'43"	N68°03'28"W 35.49	17.77
11+39.56 - 12+68.75	129.19	350.00	21°08'57"	N75°43'34"W 128.46	65.34

**SITE LAYOUT PLAN**  
 SCALE: 1"=50'  
 SCALE 1"=50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad E. Chisholm* 4-10-19  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Kathleen O'Neil* 4-01-19  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

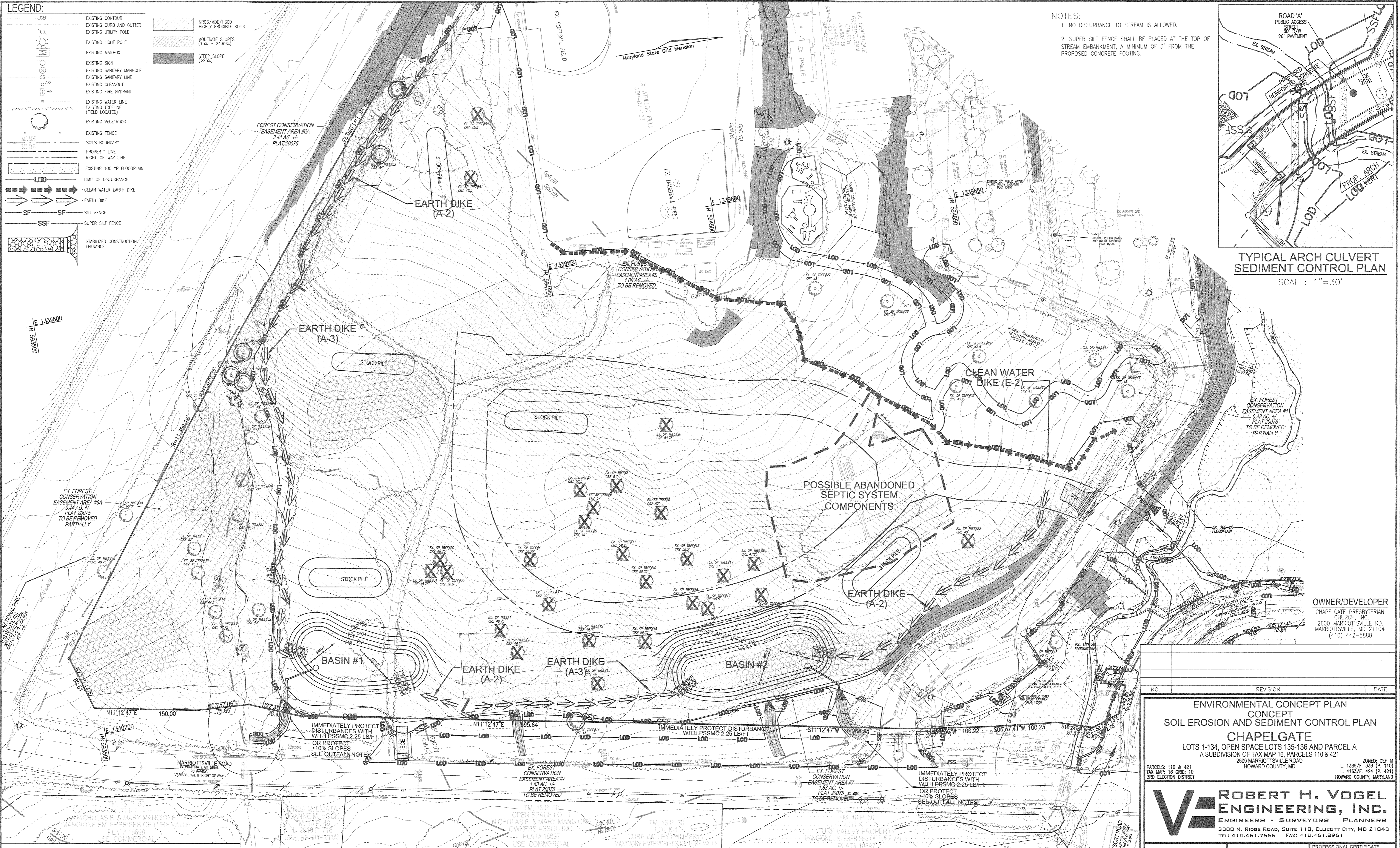
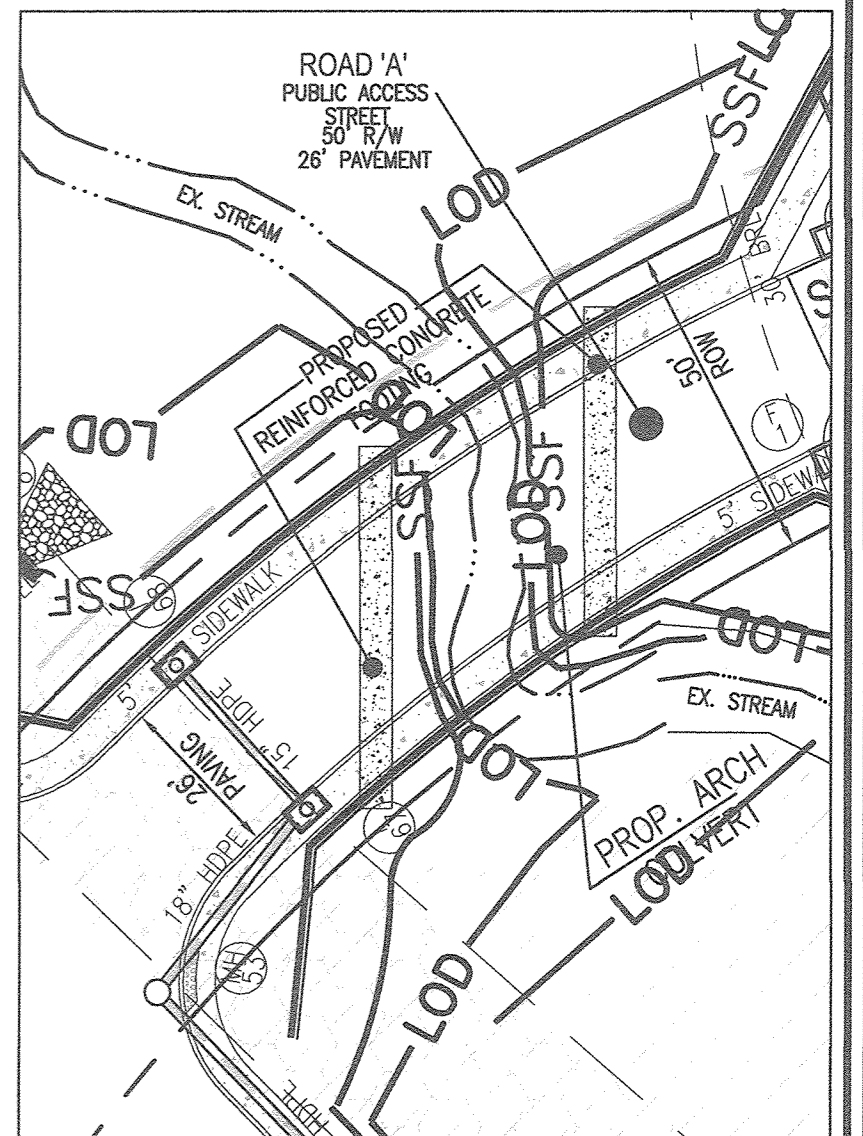


**LEGEND:**

- EXISTING CONTOUR
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREE LINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- SOILS BOUNDARY
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING 100 YR FLOODPLAIN
- LOD LIMIT OF DISTURBANCE
- CLEAN WATER EARTH DIKE
- EARTH DIKE
- SF SILT FENCE
- SSF SUPER SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE

- NRCS/ARCS/HSDC HIGHLY ERODIBLE SOILS
- MODERATE SLOPES (15% - 24.99%)
- STEEP SLOPE (>25%)

- NOTES:**
- NO DISTURBANCE TO STREAM IS ALLOWED.
  - SUPER SILT FENCE SHALL BE PLACED AT THE TOP OF STREAM EMBANKMENT, A MINIMUM OF 3' FROM THE PROPOSED CONCRETE FOOTING.



**OWNER/DEVELOPER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTSVILLE RD.  
 MARRIOTTSVILLE, MD 21104  
 (410) 442-5888

NO. \_\_\_\_\_ REVISION \_\_\_\_\_ DATE \_\_\_\_\_

**ENVIRONMENTAL CONCEPT PLAN**  
**CONCEPT**  
**SOIL EROSION AND SEDIMENT CONTROL PLAN**  
**CHAPEL GATE**  
 LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
 A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
 2600 MARRIOTTSVILLE ROAD  
 HOWARD COUNTY, MD

**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666 FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**

STATE OF MARYLAND  
 ROBERT H. VOGEL  
 LICENSE NO. 16183  
 PROFESSIONAL ENGINEER

DESIGN BY: RHV  
 DRAWN BY: VE, TG, KG  
 CHECKED BY: RHV  
 DATE: MARCH 2019  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

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7 SHEET OF 18

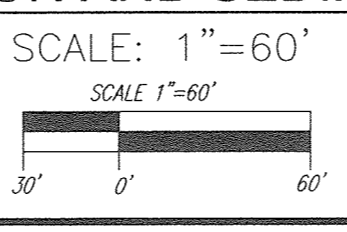
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4.10.19  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 4.01.19  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**SEDIMENT BASIN NOTE:**  
 BASINS INTENDED TO REMAIN IN PLACE FOR 3 YEARS OR MORE SHALL BE DESIGNED IN ACCORDANCE WITH MD-278 CRITERIA.

**CONCEPT SOIL EROSION AND SEDIMENT CONTROL PLAN**

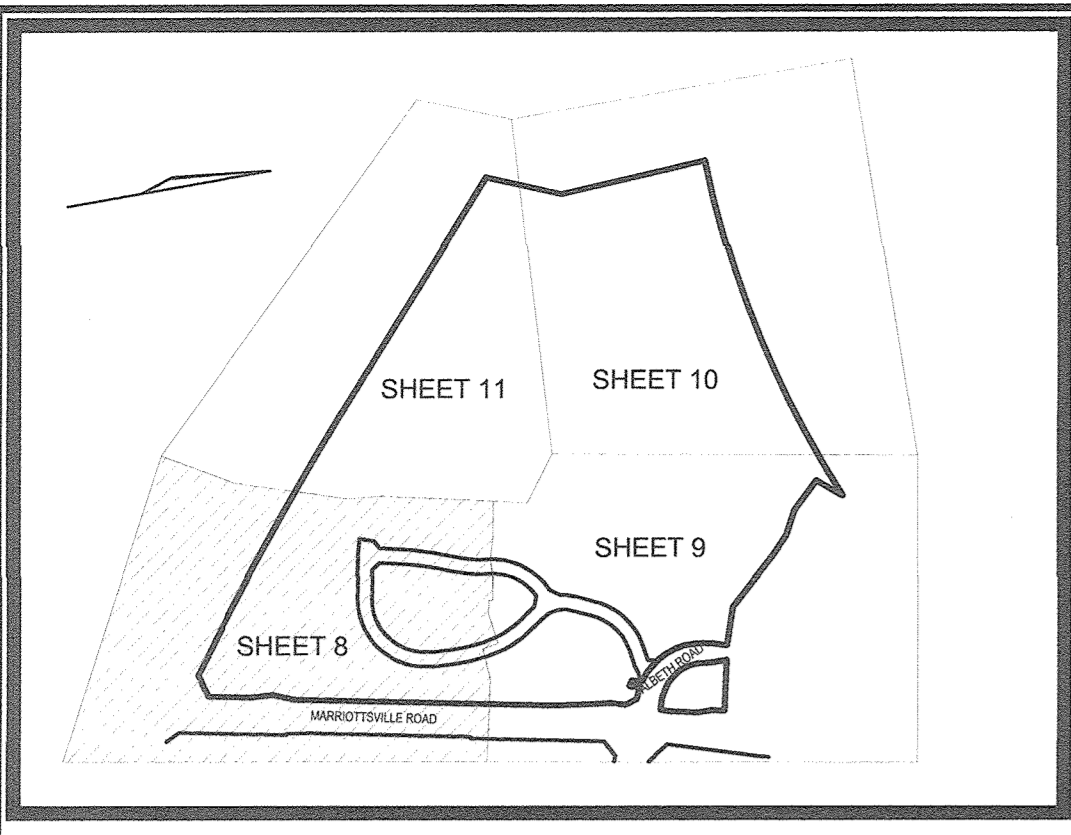


**OUTFALL NOTES:**

- STORM DRAIN & SEDIMENT BASIN OUTFALLS SHALL NOT OUTLET TO DISTURBED GROUND. ALL OUTFALLS SHALL BE ON SLOPES LESS THAN 10% SLOPE OR THE SLOPES SHALL BE PROTECTED TO THE RECEIVING WATER COURSE.
- STORM DRAIN & SEDIMENT BASIN OUTFALLS SHALL FUNCTION WITH THE CAPITAL PROJECT J-4205 PROPOSAL.

REFER TO SHEET 9





**KEY MAP**  
NOT TO SCALE

E 1339600  
N 533500

NOTE:  
EITHER PERMANENT OR TEMPORARY STABILIZATION IS TO BE APPLIED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF DAYS/DATES IN THE STANDARD SEDIMENT CONTROL NOTES AND/OR SEEDING SPECIFICATIONS.

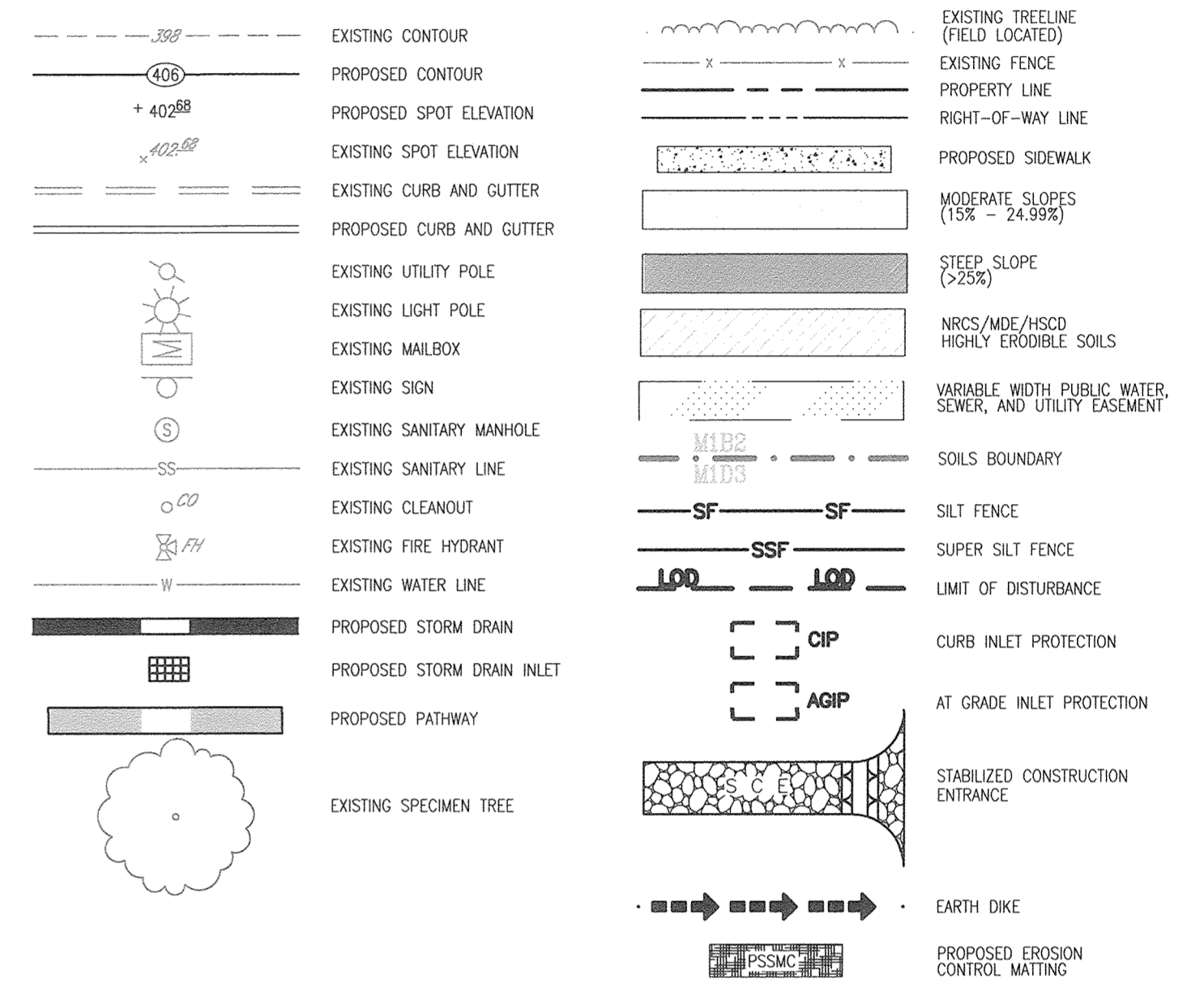
NOTE:  
LOCATE STOCKPILE AS SHOWN HEREON OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. STOCKPILES EXCEEDING 15 FEET IN HEIGHT SHALL BE BENCHED.

NOTE:  
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
- SILT FENCE SHALL BE CURLED UPHILL. NO MORE THAN 35 FEET APART  
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

**HSCD NOTES:**

- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME.
1. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING
  2. THE PROJECT SHALL ADDRESS ANY TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
  3. THE FINAL PLAN SUBMISSION SHALL PROVIDE A DRAINAGE AREA MAP SPECIFIC TO CHOSEN SEDIMENT CONTROLS
  4. THE FINAL PLAN SUBMISSION SHALL PROVIDE COMPUTATIONS TO VERIFY VELOCITIES ALONG DIKES, SWALES AND AT DIKES OUTLET LOCATIONS
  5. PRIOR TO LOOP TRAIL CONSTRUCTION, THE CONCEPTUAL LIMITS OF DISTURBANCE SHOWN HEREON SHALL BE STAKED, REVIEWED AND ADJUSTED AS NECESSARY TO SAVE/PROTECT SPECIMEN TREES. SHOWN FENCING CONTROLS SHALL BE ADJUSTED AS NECESSARY.

**LEGEND:**



**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	EROODIBLE
BaA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GgB	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Ha	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UgF	UDORTHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
LUD	URBAN LAND-UDORTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
-HOWARD COUNTY SOILS MAP NUMBER 12 - STYKESVILLE SE  
-K VALUES PER <https://www.howarddcd.org/documents> - "K" FACTORS (USE "KW")  
NOTE:  
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 + LIMITS OF PROJECT

**OWNER/DEVELOPER**

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MARRIOTTVILLE, MD 21104  
(410) 442-5888

NO.	REVISION	DATE

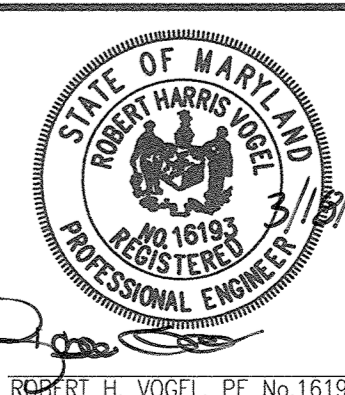
**ENVIRONMENTAL CONCEPT PLAN  
SOILS MAP, GRADING, SOIL EROSION AND  
SEDIMENT CONTROL PLAN  
CHAPELGATE**

LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
2600 MARRIOTTVILLE ROAD  
HOWARD COUNTY, MD

PARCELS: 110 & 421  
TAX MAP: 16 GRD: 10  
3RD ELECTION DISTRICT

ZONED: CE1-M  
L 1389/F. 339 (P. 110)  
L 4163/F. 424 (P. 421)  
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
TEL: 410.461.7666 FAX: 410.461.8961



DESIGN BY: RHV  
DRAWN BY: VE, TG, KG  
CHECKED BY: RHV  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
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. 16193 EXPIRATION DATE: 09-27-2020

8 SHEET OF 18

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

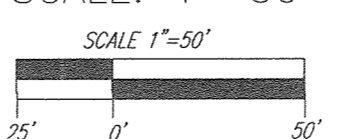
*[Signature]*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 4.10.19

*[Signature]*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 4.01.19

**OUTFALL NOTES:**  
1. STORM DRAIN & SEDIMENT BASIN OUTFALLS SHALL NOT OUTLET TO DISTURBED GROUND. ALL OUTFALLS SHALL BE ON SLOPES LESS THAN 10% SLOPE OR THE SLOPES SHALL BE PROTECTED TO THE RECEIVING WATER COURSE.  
2. STORM DRAIN & SEDIMENT BASIN OUTFALLS SHALL FUNCTION WITH THE CAPITAL PROJECT J-4205 PROPOSAL.

**GRADING PLAN**

SCALE: 1"=50'





**LEGEND:**

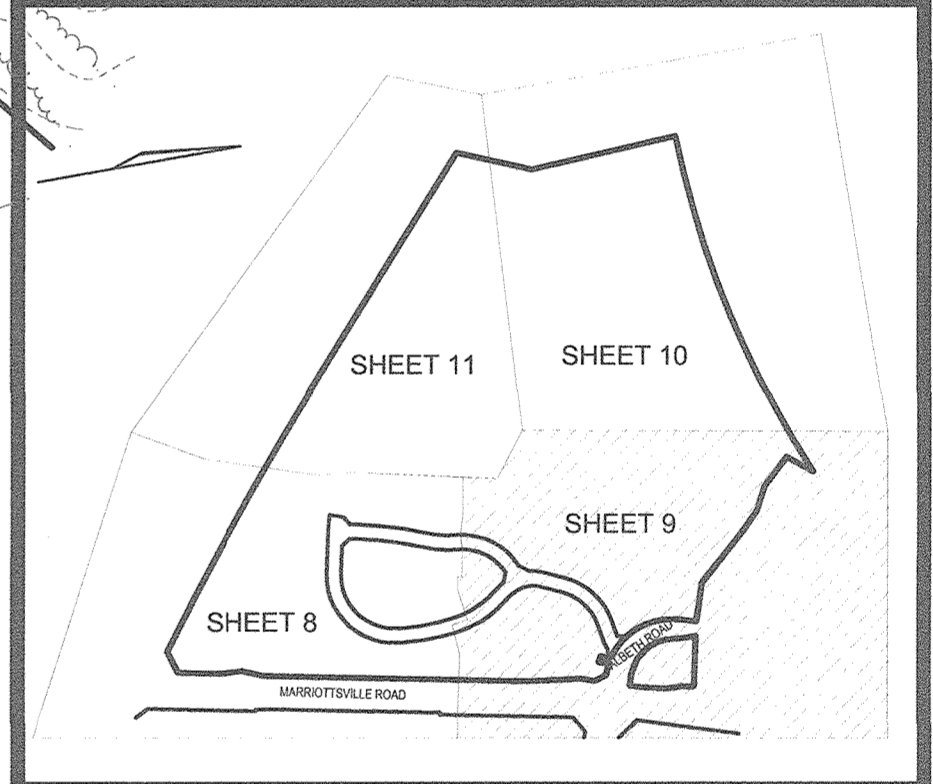
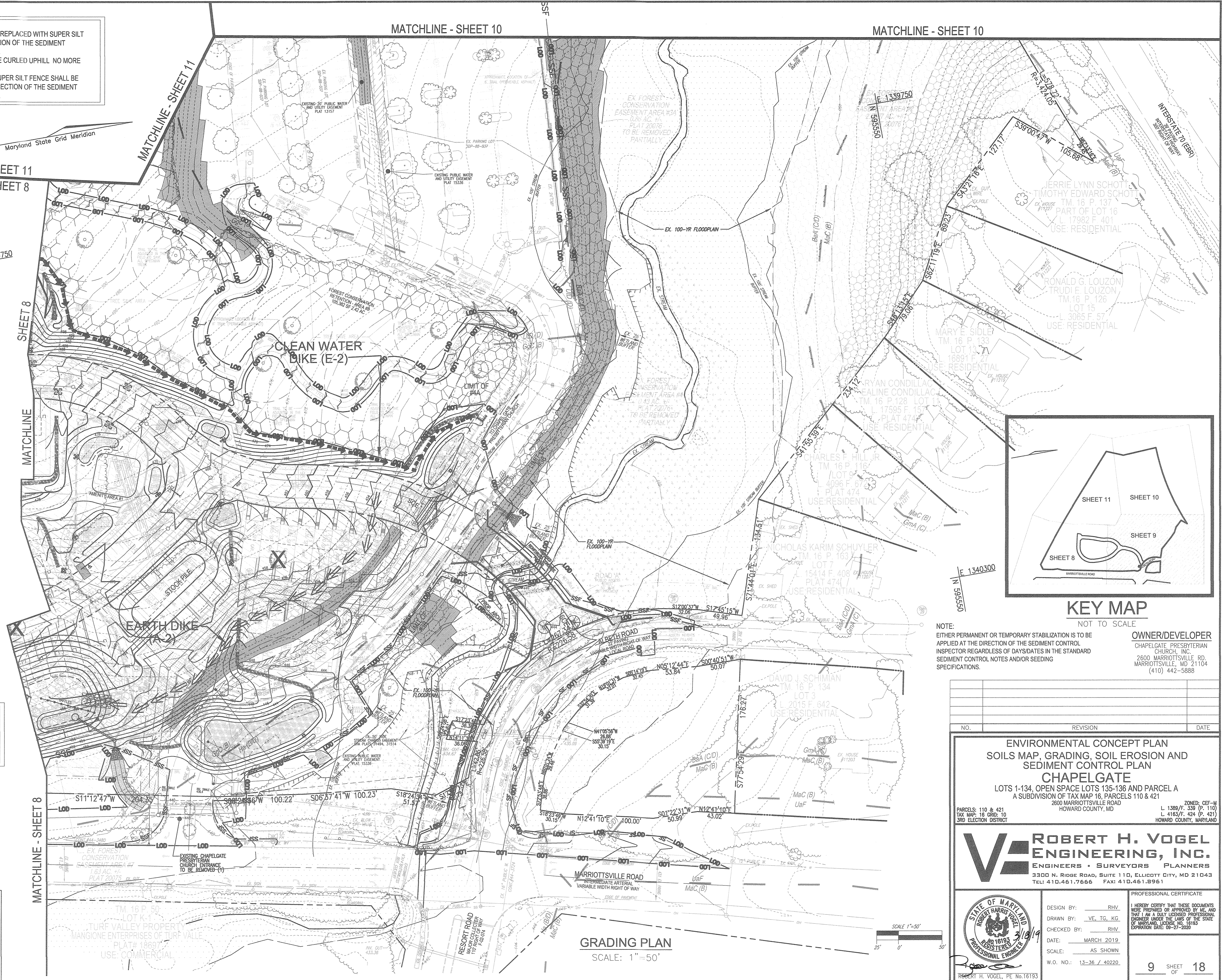
- EXISTING CONTOUR
- - - PROPOSED CONTOUR
- + 402.88 PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
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- EXISTING LIGHT POLE
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- PROPOSED PATHWAY
- EXISTING SPECIMEN TREE
- EXISTING TREELINE (FIELD LOCATED)
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- PROPERTY LINE
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- PROPOSED SIDEWALK
- MODERATE SLOPES (15% - 24.99%)
- STEEP SLOPE (>25%)
- PUBLIC 100 YR FLOODPLAIN
- EX. WETLAND
- EX. WETLAND BUFFER
- EX. STREAM
- EX. STREAM BUFFER
- SF SILT FENCE
- SSF SUPER SILT FENCE
- LIMIT OF DISTURBANCE
- CIP CURB INLET PROTECTION
- AGIP AT GRADE INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE
- SOILS BOUNDARY
- VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
- NRCS/HSCD HIGHLY ERODIBLE SOILS
- PROPOSED EROSION CONTROL MATING

**NOTE:**  
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 - DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

MATCHLINE - SHEET 11  
 MATCHLINE - SHEET 8

MATCHLINE - SHEET 10

MATCHLINE - SHEET 10



**KEY MAP**  
 NOT TO SCALE

**HSCD NOTES:**  
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 2600 MARIOTTVILLE RD.  
 MARIOTTVILLE, MD 21104  
 (410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**SOILS MAP, GRADING, SOIL EROSION AND SEDIMENT CONTROL PLAN**  
**CHAPEL GATE**  
 LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
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9 SHEET OF 18

**SOILS LEGEND**

SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
Ba	BALLE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
CgC	GLENEIG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
CgB	GLENEIG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GhB	GLENEIG BALLE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hg	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/O	.43	NO
Md	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
Luf	LOODHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
Lud	URBAN LAND-LOODHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

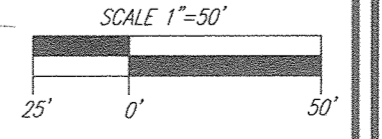
SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 -HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
 -K VALUES PER <https://www.howardocd.org/documents>  
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4/10/19  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 4/01/19  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**GRADING PLAN**  
 SCALE: 1" = 50'





- LEGEND:**
- EXISTING CONTOUR
  - PROPOSED CONTOUR
  - PROPOSED SPOT ELEVATION
  - EXISTING SPOT ELEVATION
  - EXISTING CURB AND GUTTER
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - PROPOSED STORM DRAIN
  - PROPOSED STORM DRAIN INLET
  - PROPOSED PATHWAY
  - EXISTING SPECIMEN TREE
  - EXISTING TREELINE (FIELD LOCATED)
  - EXISTING FENCE
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - MODERATE SLOPES (15% - 24.99%)
  - STEEP SLOPE (>25%)
  - PUBLIC 100 YR FLOODPLAIN
  - EX. STREAM
  - EX. STREAM BUFFER
  - SILT FENCE
  - SUPER SILT FENCE
  - LIMIT OF DISTURBANCE
  - SOILS BOUNDARY

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
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MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UaF	UDORTHERTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD	URBAN LAND-UDORTHERTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

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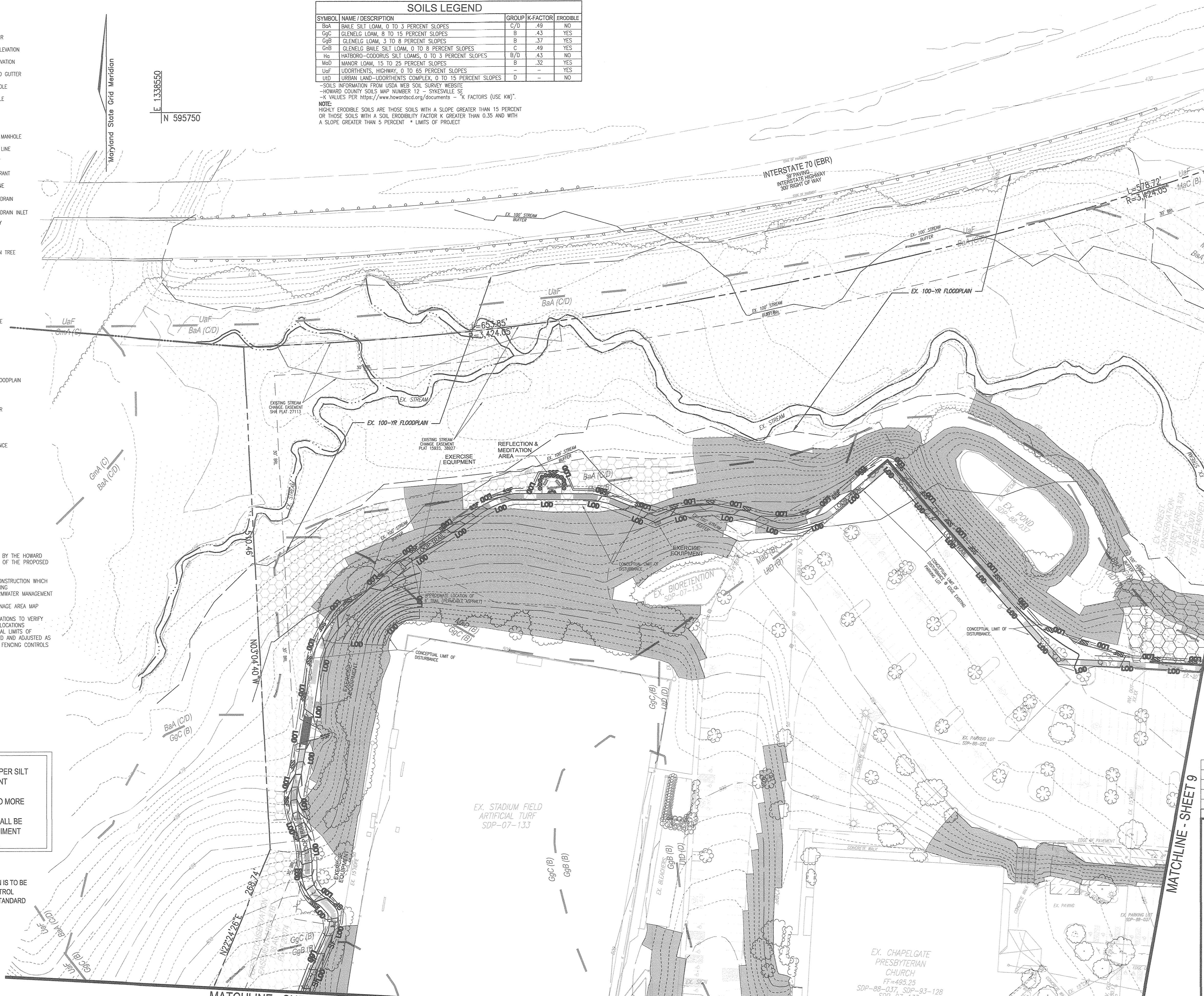
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4.10.19  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 4.01.19  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

E 1338550  
 N 594800

**GRADING PLAN**  
 SCALE: 1"=50'  
 SCALE 1"=50'

**OWNER/DEVELOPER**  
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**ENVIRONMENTAL CONCEPT PLAN**  
**SOILS MAP, GRADING, SOIL EROSION AND SEDIMENT CONTROL PLAN**  
**CHAPELGATE**  
 LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
 A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
 2600 MARRIOTTVILLE ROAD  
 HOWARD COUNTY, MD

PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

ZONED: CEF-M  
 L 1389/F 339 (P. 110)  
 4163/F 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666 FAX: 410.461.8961

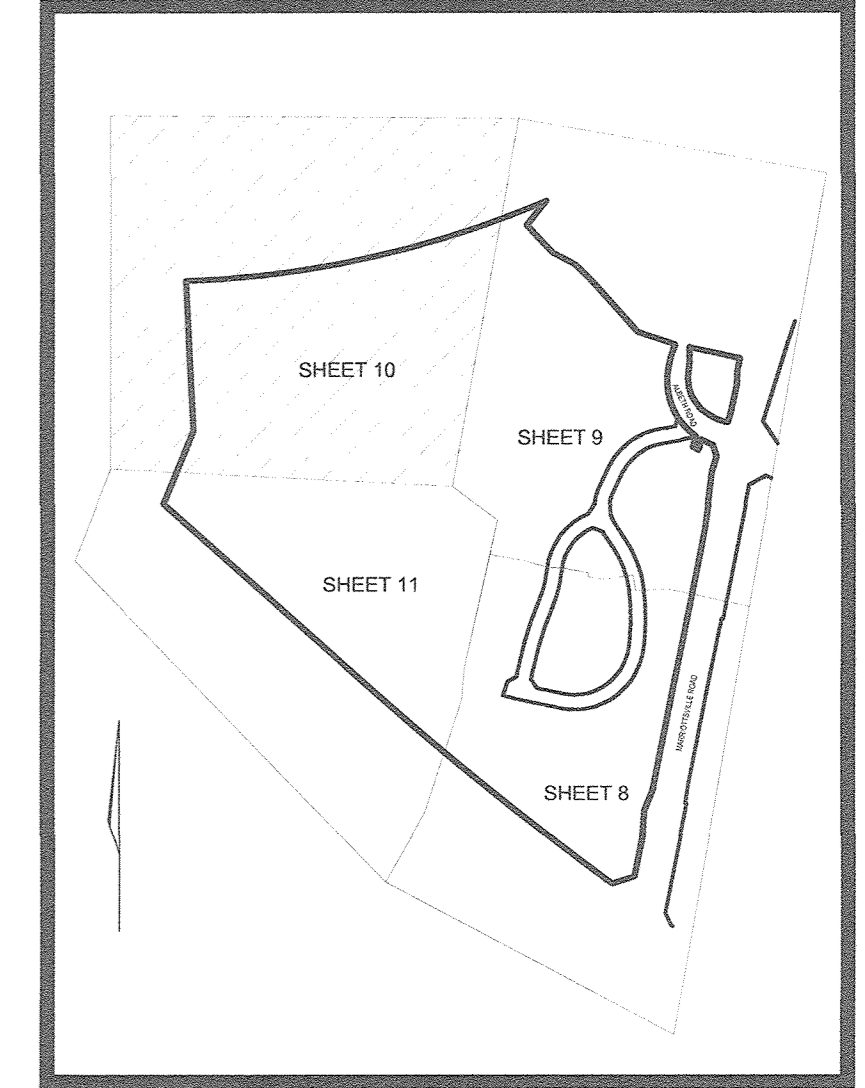
PROFESSIONAL CERTIFICATE

STATE OF MARYLAND  
 ROBERT H. VOGEL  
 16193  
 REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: RHV  
 DRAWN BY: VE, TG, KG  
 CHECKED BY: RHV  
 DATE: MARCH 2019  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

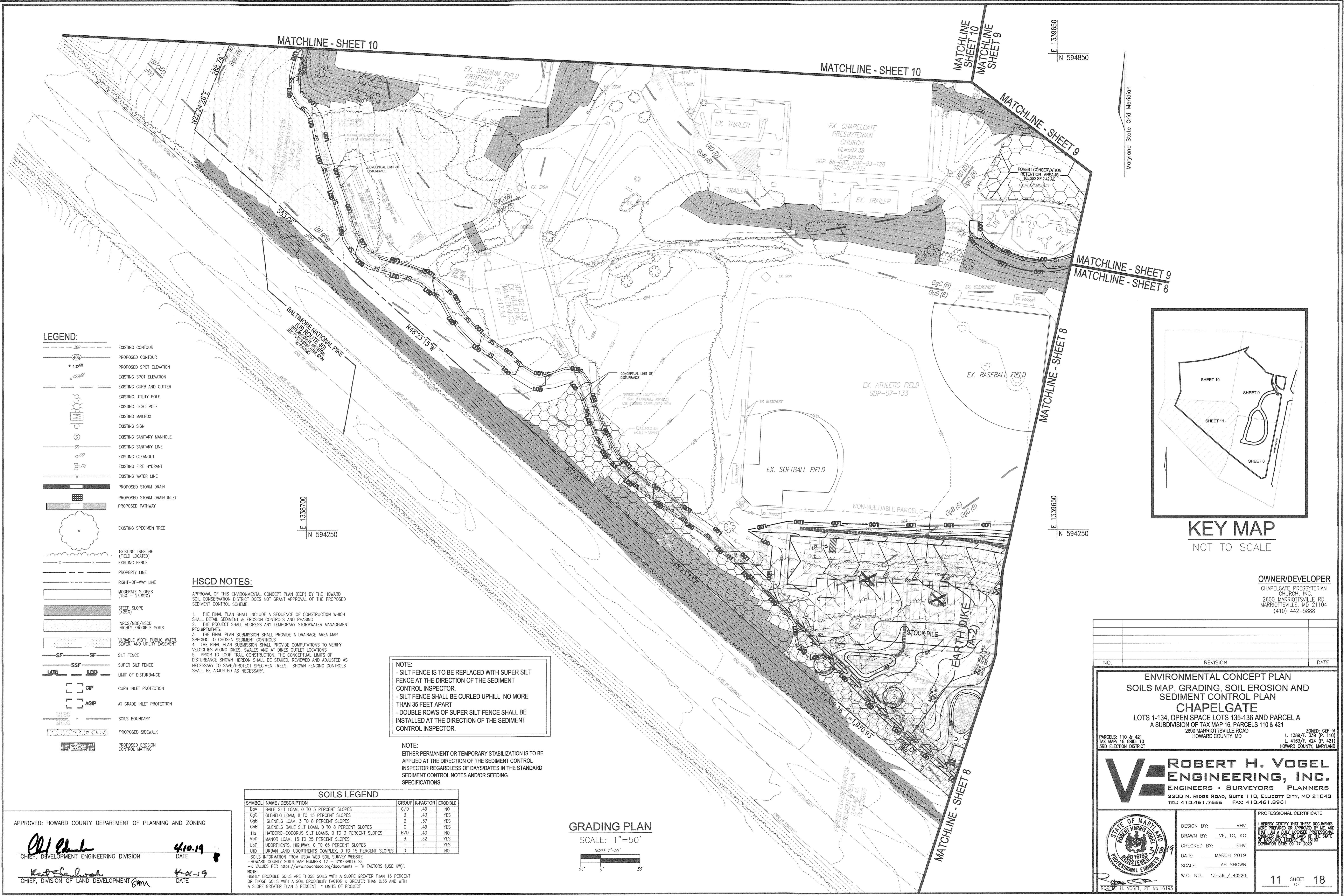
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 08-27-2020

10 SHEET OF 18



**KEY MAP**  
 NOT TO SCALE





- LEGEND:**
- EXISTING CONTOUR
  - PROPOSED CONTOUR
  - PROPOSED SPOT ELEVATION
  - EXISTING SPOT ELEVATION
  - EXISTING CURB AND GUTTER
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - PROPOSED STORM DRAIN
  - PROPOSED STORM DRAIN INLET
  - PROPOSED PATHWAY
  - EXISTING SPECIMEN TREE
  - EXISTING TREE LINE (FIELD LOCATED)
  - EXISTING FENCE
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - MODERATE SLOPES (15% - 24.99%)
  - STEEP SLOPE (>25%)
  - NRCS/NIDE/HSCD HIGHLY ERODIBLE SOILS
  - VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
  - SILT FENCE (SF)
  - SUPER SILT FENCE (SSF)
  - LIMIT OF DISTURBANCE (LOD)
  - CURB INLET PROTECTION (CIP)
  - AT GRADE INLET PROTECTION (AGIP)
  - SOILS BOUNDARY (MBC, MDS)
  - PROPOSED SIDEWALK
  - PROPOSED EROSION CONTROL MATTING

**HSCD NOTES:**

APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME.

- THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING
- THE PROJECT SHALL ADDRESS ANY TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
- THE FINAL PLAN SUBMISSION SHALL PROVIDE A DRAINAGE AREA MAP SPECIFIC TO CHOSEN SEDIMENT CONTROLS
- THE FINAL PLAN SUBMISSION SHALL PROVIDE COMPUTATIONS TO VERIFY VELOCITIES ALONG DIKES, SWALES AND AT DIKES OUTLET LOCATIONS
- PRIOR TO LOOP TRAIL CONSTRUCTION, THE CONCEPTUAL LIMITS OF DISTURBANCE SHOWN HEREON SHALL BE STAKED, REVIEWED AND ADJUSTED AS NECESSARY TO SAVE/PROTECT SPECIMEN TREES. SHOWN FENCING CONTROLS SHALL BE ADJUSTED AS NECESSARY.

**NOTE:**

- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
- SILT FENCE SHALL BE CURLED UPHILL. NO MORE THAN 35 FEET APART
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

**NOTE:**

EITHER PERMANENT OR TEMPORARY STABILIZATION IS TO BE APPLIED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF DAYS/DATES IN THE STANDARD SEDIMENT CONTROL NOTES AND/OR SEEDING SPECIFICATIONS.

SOILS LEGEND			
SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR/ERODIBLE
Ba	BALILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49 NO
Gc	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43 YES
GcB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37 YES
GcB	GLENELG BALILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49 YES
Hs	HATHORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43 NO
Md	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32 YES
UdF	UDORTHERNS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	- YES
Ud	URBAN LAND-UDORTHERNS COMPLEX, 0 TO 15 PERCENT SLOPES	D	- NO

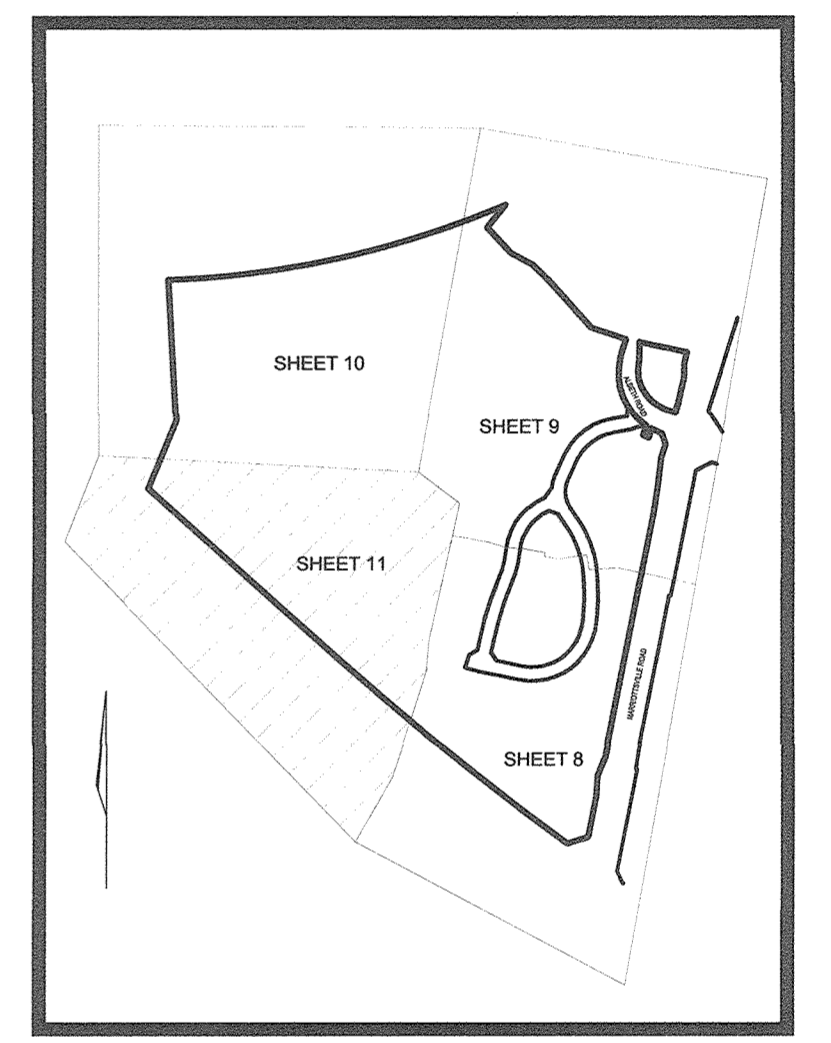
-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
-HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
-K VALUES PER <https://www.howardocd.org/documents> - \* X FACTORS (USE KW)  
NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

**GRADING PLAN**  
SCALE: 1"=50'  
SCALE 1"=50'  
25' 0' 50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Ch Ph...*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 4-10-19

*Robert H. Vogel*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 4-01-19



**KEY MAP**  
NOT TO SCALE

**OWNER/DEVELOPER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
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TEL: 410.461.7666 FAX: 410.461.8961

DESIGN BY: RHW  
DRAWN BY: VE, TG, KG  
CHECKED BY: RHW  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

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11 SHEET OF 18



SOILS LEGEND				
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
G0A	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
G0C	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
G0B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
G0H	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
H0	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
M0D	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
U0F	UDORTHEMITS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
U0D	URBAN LAND-UDORTHEMITS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 -HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
 -K-VALUES PER <https://www.howardcountymd.org/documents> - \*K FACTORS (USE KW)  
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**SWM NOTES:**

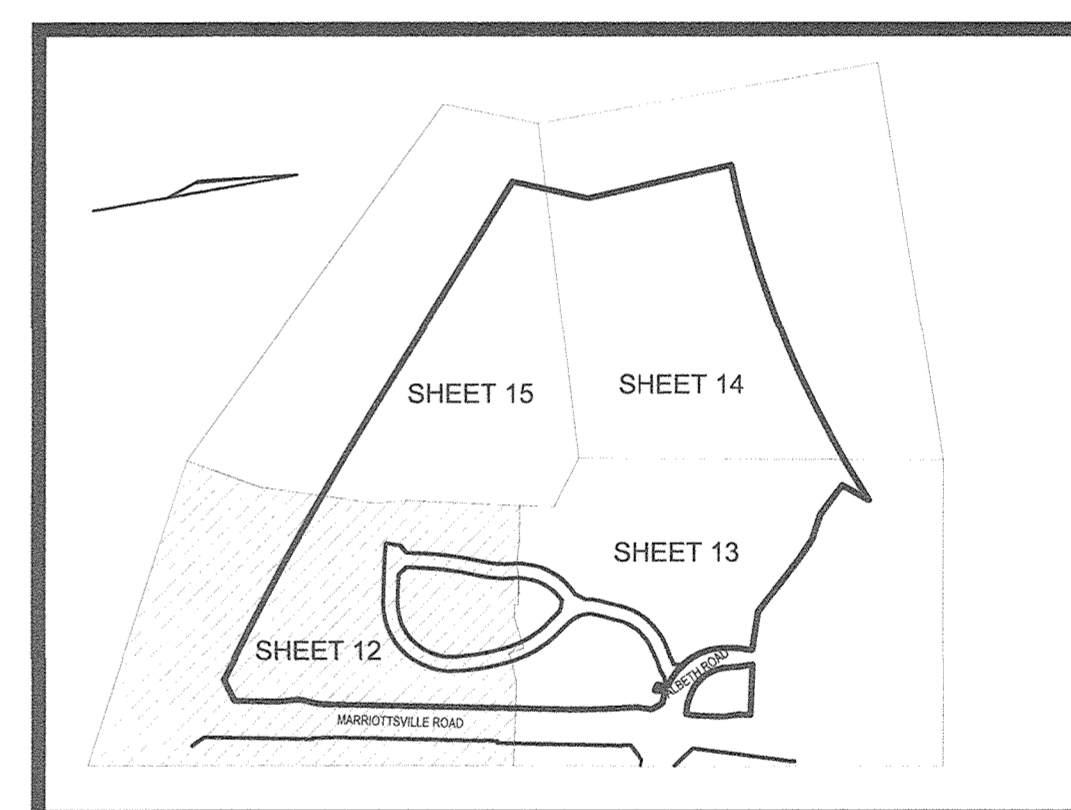
- ENVIRONMENTAL TRAIL IS A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT

**LEGEND:**

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- PROPOSED PATHWAY
- EXISTING SPECIMEN TREE
- EXISTING TREELINE (FIELD LOCATED)
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- SOILS BOUNDARY
- VARIABLE WIDTH PUBLIC WATER SEWER, AND UTILITY EASEMENT

**ESD LEGEND:**

- ESD DRAINAGE AREA DIVIDE
- ESD DRAINAGE AREA DESIGNATION
- AREA #20
- MICRO-SCALE PRACTICE BIO-SWALE (M-8)
- MICRO BIORETENTION (M-6)
- MICRO-SCALE PRACTICE RAIN BARREL (M-1)
- MICRO-SCALE PRACTICE PROPOSED DRYWELL (M-5)
- ALTERNATIVE SURFACE PERMEABLE PAVEMENT (A-2)



**KEY MAP**  
NOT TO SCALE

**OWNER/DEVELOPER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**STORMWATER MANAGEMENT**  
**DRAINAGE AREA MAP**  
**CHAPEL GATE**  
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DESIGN BY: RHV  
 DRAWN BY: VE, TG, KG  
 CHECKED BY: RHV  
 DATE: MARCH 2019  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

12 SHEET OF 18

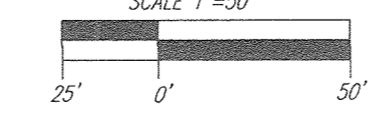
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4-10-19  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 4-01-19  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**SWM DRAINAGE AREA MAP**

SCALE: 1"=50'



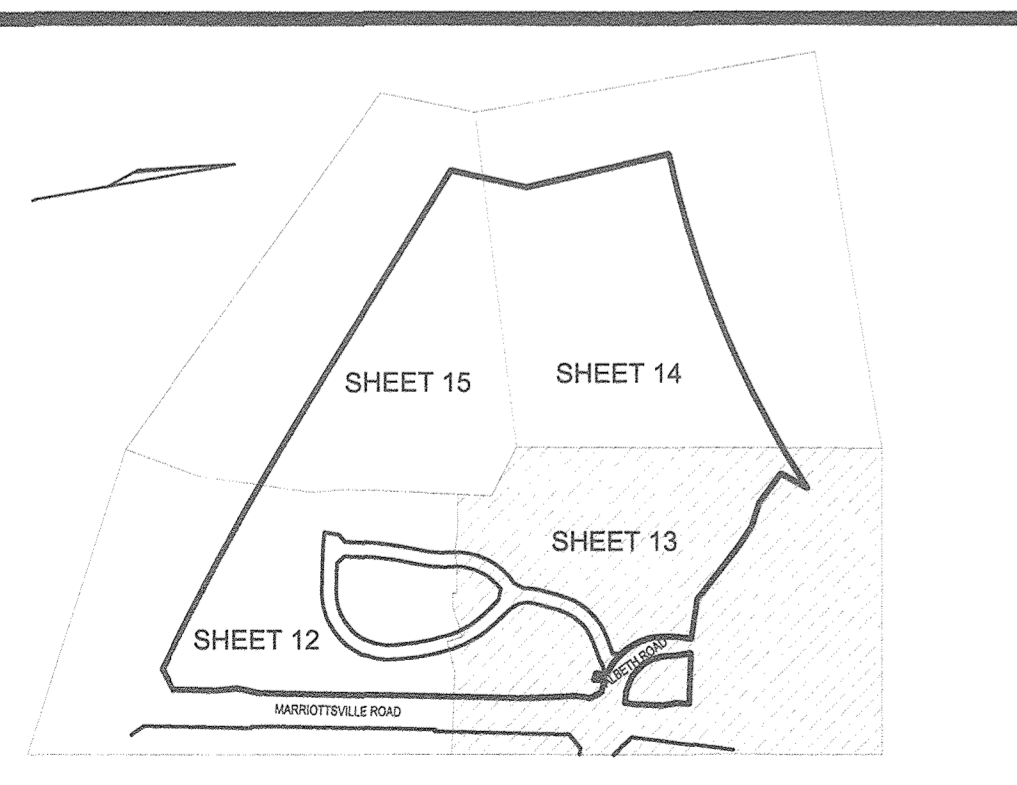


**LEGEND:**

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
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- PROPOSED CURB AND GUTTER
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- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- PUBLIC 100 YR FLOODPLAIN
- EX. WETLAND
- EX. WETLAND BUFFER
- EX. STREAM
- EX. STREAM BUFFER
- SOILS BOUNDARY
- VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT

**ESD LEGEND:**

- ESD DRAINAGE AREA DIVIDE
- ESD DRAINAGE AREA DESIGNATION
- MICRO-SCALE PRACTICE BIO-SWALE (M-8)
- MICRO-SCALE PRACTICE MICRO BIORETENTION (M-6)
- MICRO-SCALE PRACTICE GRAVEL WETLAND (M-2)
- MICRO-SCALE PRACTICE RAIN BARREL (M-1)
- MICRO-SCALE PRACTICE PROPOSED DRYWELL (M-5)
- ALTERNATIVE SURFACE PERMEABLE PAVEMENT (A-2)



**KEY MAP**  
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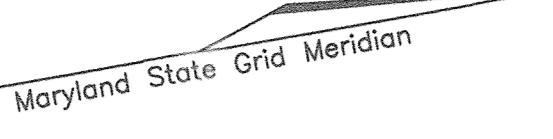
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**4-10-19**  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**SWM DRAINAGE AREA MAP**

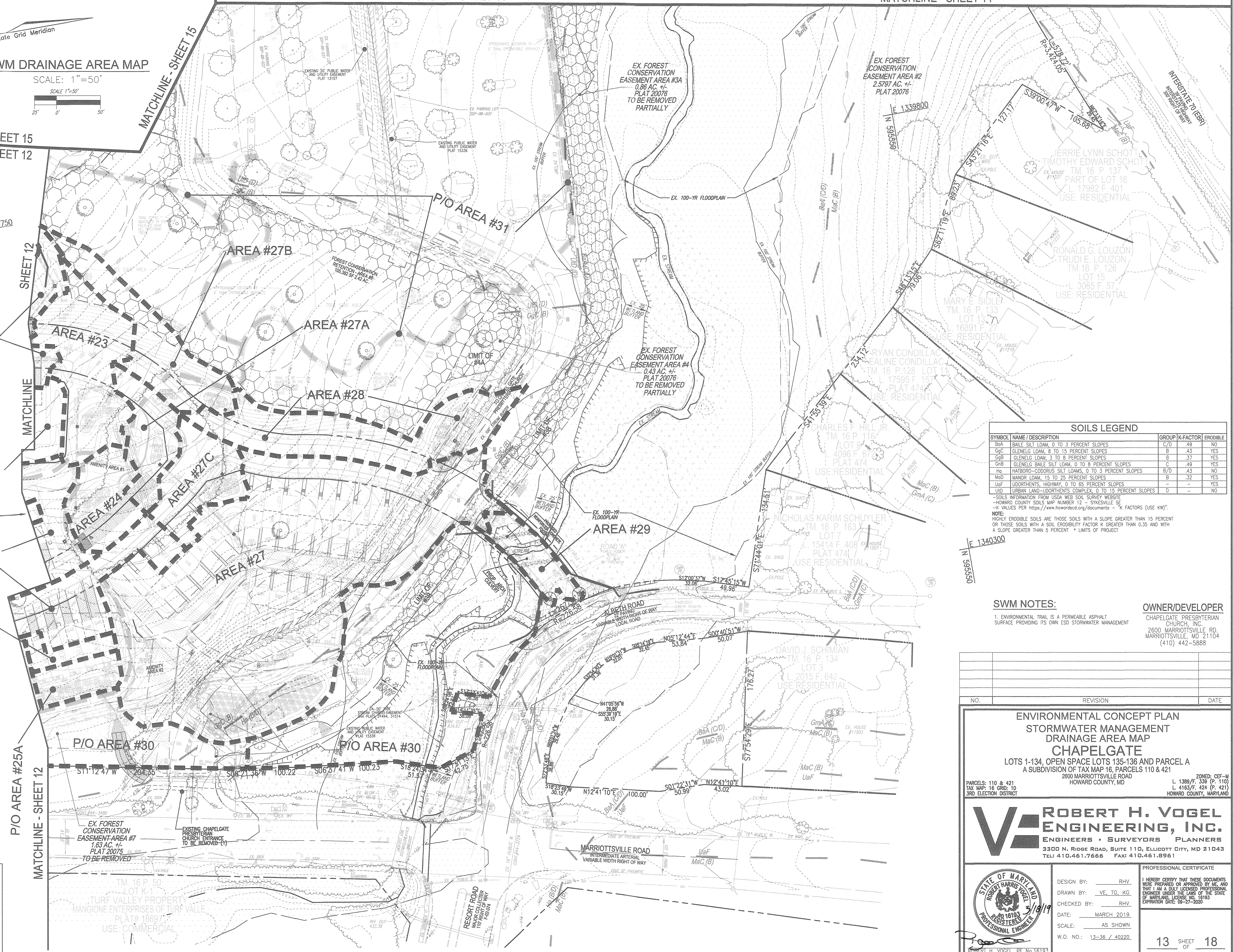
SCALE: 1"=50'  
SCALE: 1"=50'



MATCHLINE - SHEET 15  
MATCHLINE - SHEET 12

MATCHLINE - SHEET 14

MATCHLINE - SHEET 14



**SOILS LEGEND**

SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR	ERODEBLE
BbA	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GgB	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hu	HARBOR-COORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UoF	UDORTMENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
Ud	URBAN LAND-UDORTMENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
HOWARD COUNTY SOILS MAP NUMBER 12 - SYKEVILLE SE  
K-VALUES PER <https://www.howard.org/documents> - \*K FACTORS (USE KW)  
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**SWM NOTES:**

- ENVIRONMENTAL TRAIL IS A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT

**OWNER/DEVELOPER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
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(410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN  
STORMWATER MANAGEMENT  
DRAINAGE AREA MAP  
CHAPEL GATE**  
LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
2800 MARRIOTTVILLE ROAD  
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PARCELS: 110 & 421  
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**ROBERT H. VOGEL, PE No.16193**

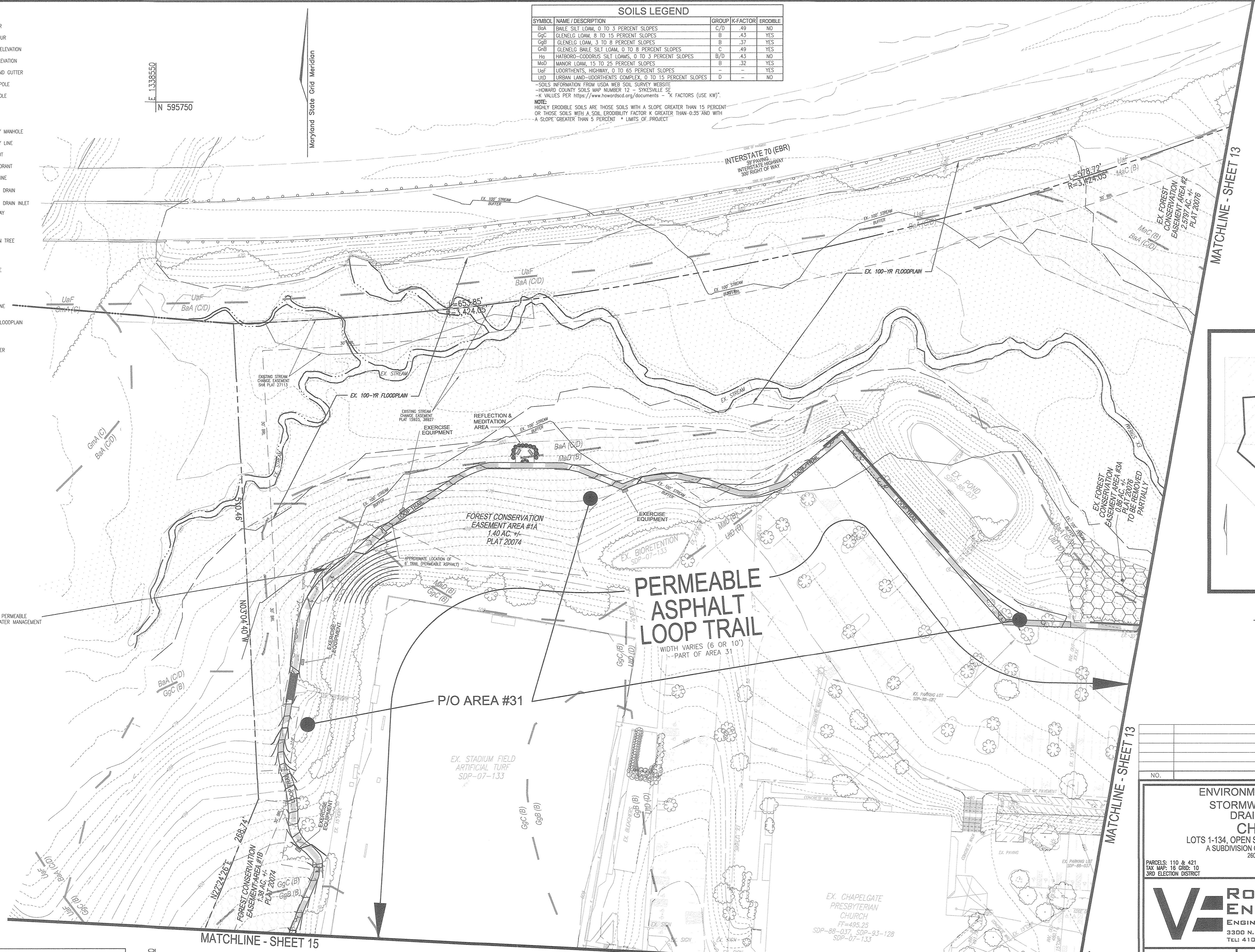


- LEGEND:**
- 350' --- EXISTING CONTOUR
  - 400' --- PROPOSED CONTOUR
  - + 402.88' --- PROPOSED SPOT ELEVATION
  - 402.88' --- EXISTING SPOT ELEVATION
  - --- EXISTING CURB AND GUTTER
  - --- EXISTING UTILITY POLE
  - --- EXISTING LIGHT POLE
  - --- EXISTING MAILBOX
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  - --- EX. STREAM
  - --- EX. STREAM BUFFER
  - M10P --- SOILS BOUNDARY
  - M10S --- SOILS BOUNDARY

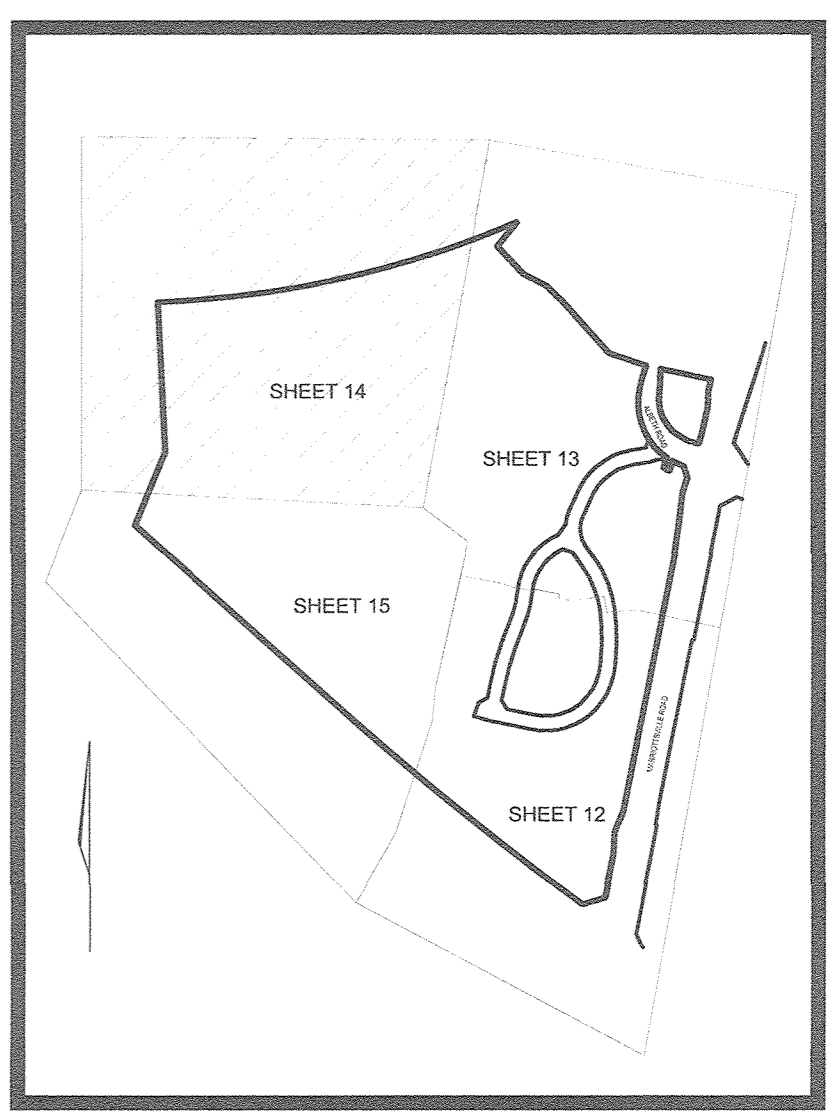
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**SWM NOTE:**  
 1. THE LOOP TRAIL AS SHOWN HEREON IS TO BE A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT



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NO.	REVISION	DATE

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**STORMWATER MANAGEMENT DRAINAGE AREA MAP**  
**CHAPEL GATE**  
 LOTS 1-134, OPEN SPACE LOTS 135-138 AND PARCEL A  
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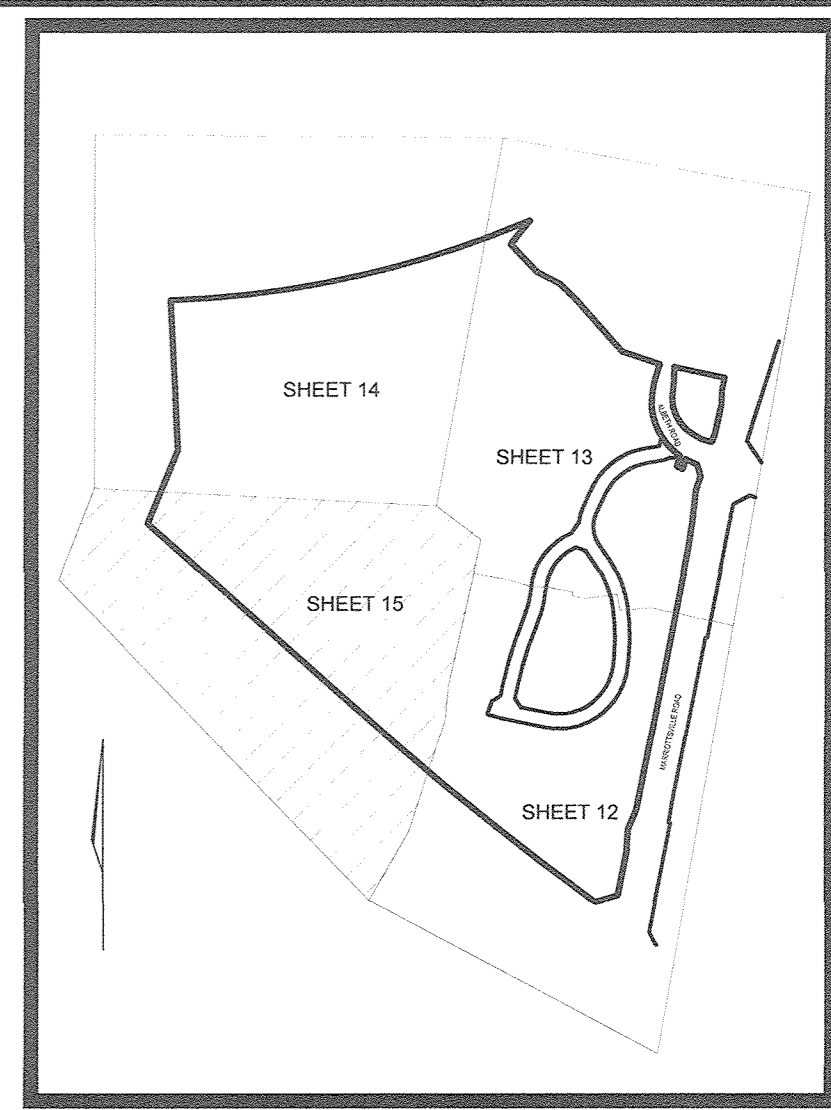
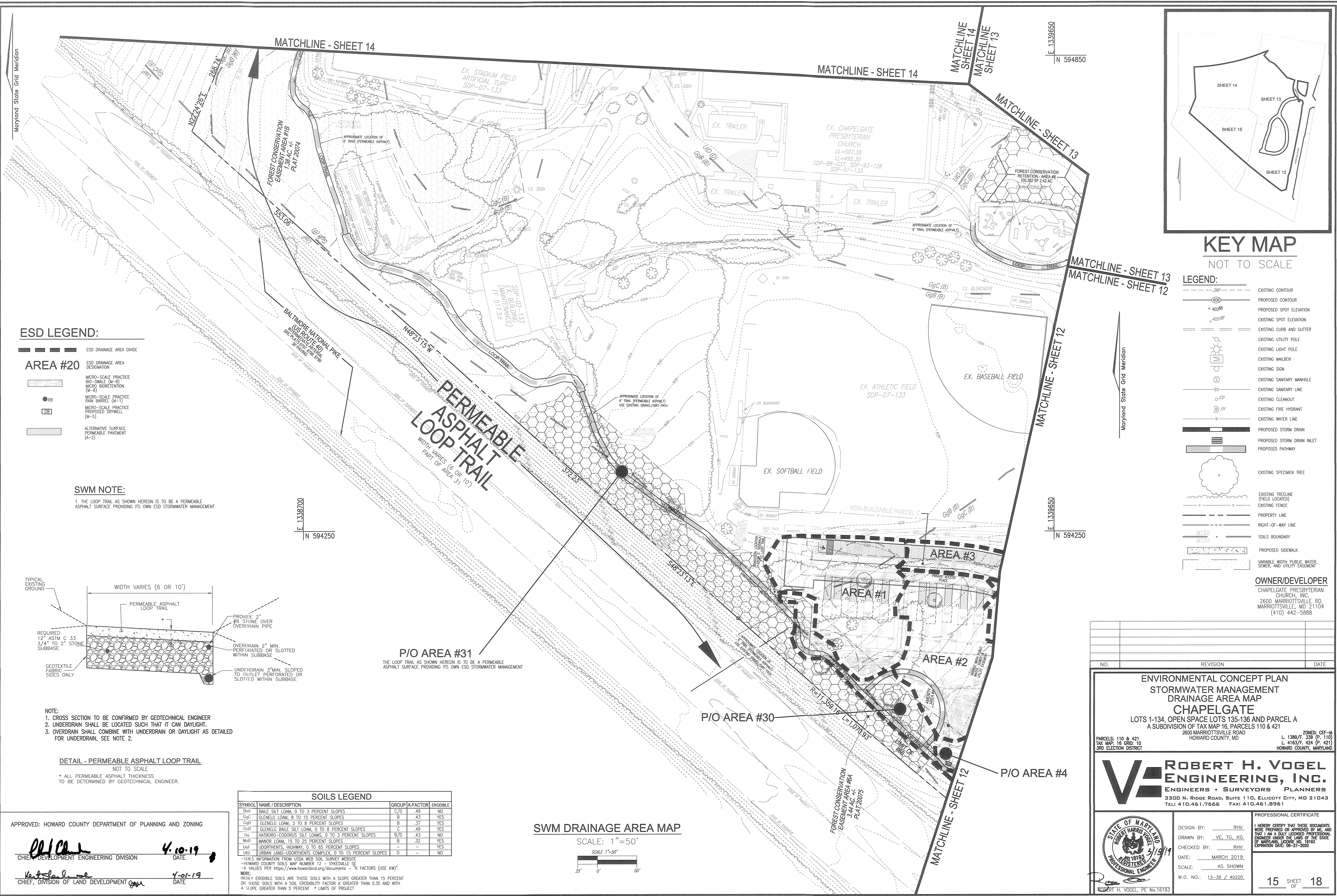
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 4-10-19

*[Signature]*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 4-01-19

**SWM DRAINAGE AREA MAP**  
 SCALE: 1" = 50'  
 SCALE 1"=50'





**KEY MAP**  
NOT TO SCALE

**LEGEND:**

	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED SPOT ELEVATION
	EXISTING SPOT ELEVATION
	EXISTING CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
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	PROPOSED SIDEWALK
	VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT

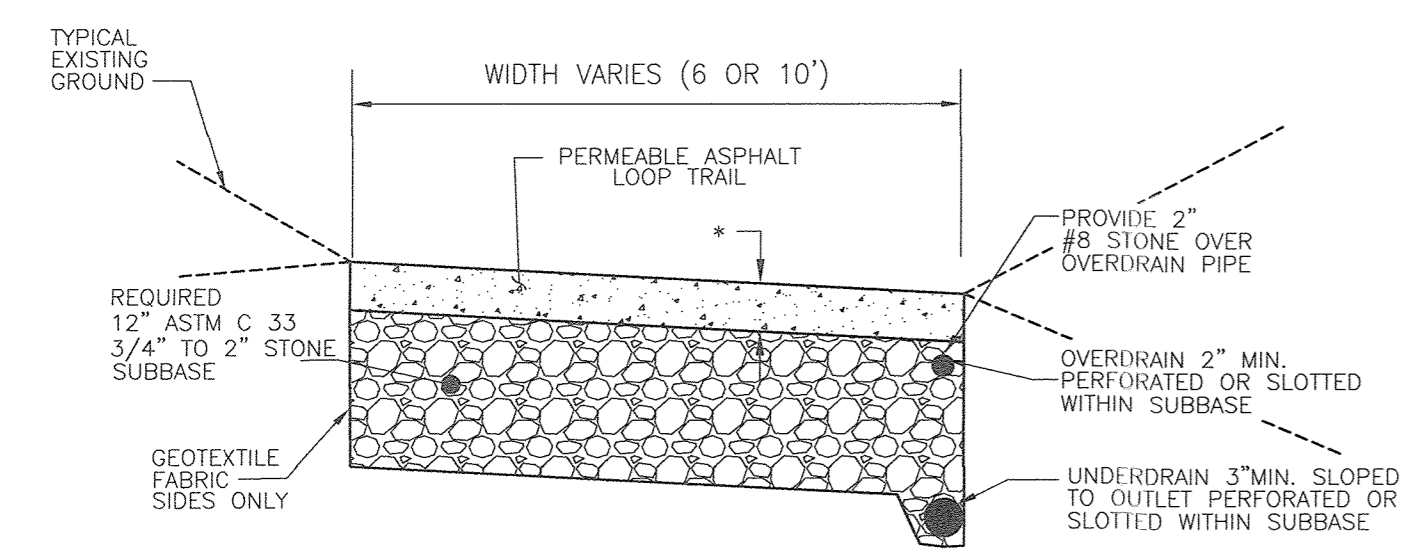
**ESD LEGEND:**

**AREA #20**

	ESD DRAINAGE AREA DIVIDE
	MICRO-SCALE PRACTICE BIO-SWALE (M-8)
	MICRO-SCALE PRACTICE BIO-RETENTION (M-6)
	MICRO-SCALE PRACTICE RAIN BARREL (M-1)
	MICRO-SCALE PRACTICE PROPOSED DRYWELL (M-5)
	ALTERNATIVE SURFACE PERMEABLE PAVEMENT (A-2)

**SWM NOTE:**

1. THE LOOP TRAIL AS SHOWN HEREON IS TO BE A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT



**P/O AREA #31**  
THE LOOP TRAIL AS SHOWN HEREON IS TO BE A PERMEABLE ASPHALT SURFACE PROVIDING ITS OWN ESD STORMWATER MANAGEMENT

**P/O AREA #30**

**P/O AREA #4**

- NOTE:**
- CROSS SECTION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER
  - UNDERDRAIN SHALL BE LOCATED SUCH THAT IT CAN DAYLIGHT.
  - OVERDRAIN SHALL COMBINE WITH UNDERDRAIN OR DAYLIGHT AS DETAILED FOR UNDERDRAIN, SEE NOTE 2.

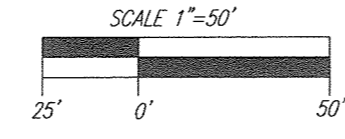
**DETAIL - PERMEABLE ASPHALT LOOP TRAIL**  
NOT TO SCALE  
\* ALL PERMEABLE ASPHALT THICKNESS TO BE DETERMINED BY GEOTECHNICAL ENGINEER.

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BkA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgH	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GcH	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hs	HARBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MuH	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
LwH	LDOROTHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
LmU	URBAN LAND-UDOROTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

**SWM DRAINAGE AREA MAP**

SCALE: 1"=50'



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 4-10-19

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 4-01-19

\*SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE - HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE - K VALUES PER https://www.howardcsd.org/documents - \*K FACTORS (USE KW)\*  
NOTE: 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 \* LIMITS OF PROJECT

**OWNER/DEVELOPER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN**  
**STORMWATER MANAGEMENT**  
**DRAINAGE AREA MAP**  
**CHAPELGATE**  
LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
2800 MARRIOTTSVILLE ROAD  
HOWARD COUNTY, MD  
ZONED: CEF-M  
L 1389/F. 339 (P. 110)  
L 4163/F. 424 (P. 421)  
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
TEL: 410.461.7666 FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**  
DESIGN BY: RHV  
DRAWN BY: VE, TG, KG  
CHECKED BY: RHV  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

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. 16193 EXPIRATION DATE 09-27-2020

15 SHEET OF 18



APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

- 1. MATERIAL SPECIFICATIONS  
THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.
- 2. FILTERING MEDIA OR PLANTING SOIL  
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE AN OBSTACLE 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 COMPOST - 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% - 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
  - CLAY CONTENT - MEDIA SHALL BE A CLAY CONTENT OF LESS THAN 5%.
  - PH RANGE - SHOULD BE BETWEEN 5.5 TO 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

- 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 LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR WASH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TIRE TREADS. 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 SUBSIL FLOW, PEPPER, OR SUBROLLER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGHOUT THE 12 INCH COMPACTION ZONE. CHESTFILL 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.

- 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 PERIPHERY OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.  
ROOTS OF THE PLANT MATERIAL SHALL BE KEPT MOST 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 PLUS SHOULD BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

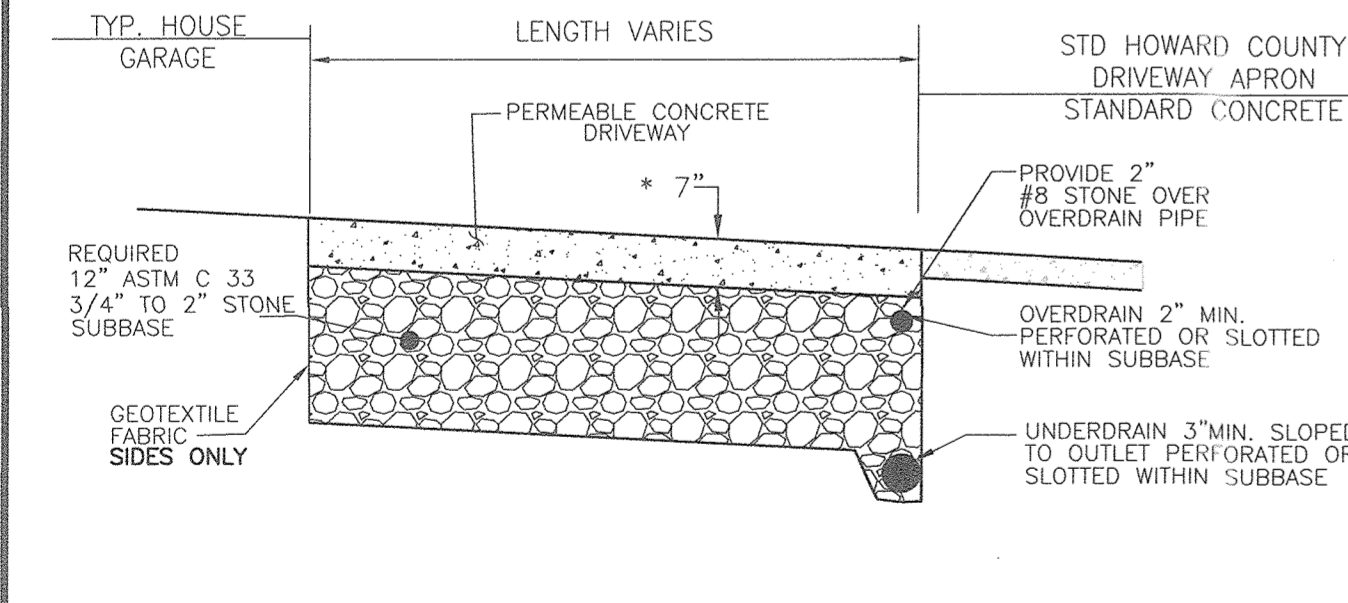
- 6. UNDERDRAINS  
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
  - PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F758, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PERFORATED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OR HDPE).
  - PERFORATIONS - IF PERFORATIONS SHOULD BE 3/8" DIA. PERFORATED WITH 3/8" DIA. PERFORATIONS LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.
  - GRAVEL - THE GRAVEL LAYER (NO. 57 STONE) PREPARED 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 POINT AND MONITOR PERFORMANCE OF THE FILTER.
  - A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

- 7. MISCELLANEOUS  
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TUFF

- 1. PERVIOUS CONCRETE SPECIFICATIONS  
DESIGN THICKNESS - PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, ACI 308.9R, ACI 308R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.  
MIX & INSTALLATION - TRADITIONAL PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TENSILE BONDING) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.  
AGGREGATE - PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4" IN TO 0.425 NO. 8 (3/8" IN. TO NO.10) AND NO. 89 (3/8" IN. TO NO.20) SIZES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.  
WATER CONTENT - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET A.G. 304. AS A GENERAL RULE, POTABLE WATER SHOULD BE USED. ALTHOUGH RECYCLED PRODUCTION WATER MEETING ASTM C 94 OR AASHTO M 157 MAY ALSO BE USED.  
ADMIXTURES - CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERVIOUS CONCRETE. USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 260 (AIR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS.  
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).

- 2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)  
PAVER BLOCKS - BLOCKS SHOULD BE EITHER 37 IN. OR 4 IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (40% PREFERRED) OF THE SURFACE TO BE OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INVERT AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.  
INFILL MATERIALS AND LEVELING COURSE - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.  
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 TUFF  
REINFORCED CONCRETE PAVEMENT (RCP) - WHETHER USED WITH GRASS OR GRAVEL, THE RCP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.



NOTE:  
1. PAVEMENT CROSS SECTION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER  
2. UNDERDRAIN SHALL BE LOCATED SUCH THAT IT CAN DAYLIGHT TO THE CURB INTO A BIO-RETENTION FACILITY OR STORM DRAIN SYSTEM  
3. OVERDRAIN SHALL COMBINE WITH UNDERDRAIN OR DAYLIGHT AS DETAILED FOR UNDERDRAIN. SEE NOTE 2.  
DETAIL - PERMEABLE CONCRETE DRIVEWAY - 5% OR LESS  
NOT TO SCALE  
\* ALL PERMEABLE CONCRETE THICKNESS, MIX AND SUB-BASE TO BE DETERMINED BY GEOTECHNICAL ENGINEER ON-SITE.

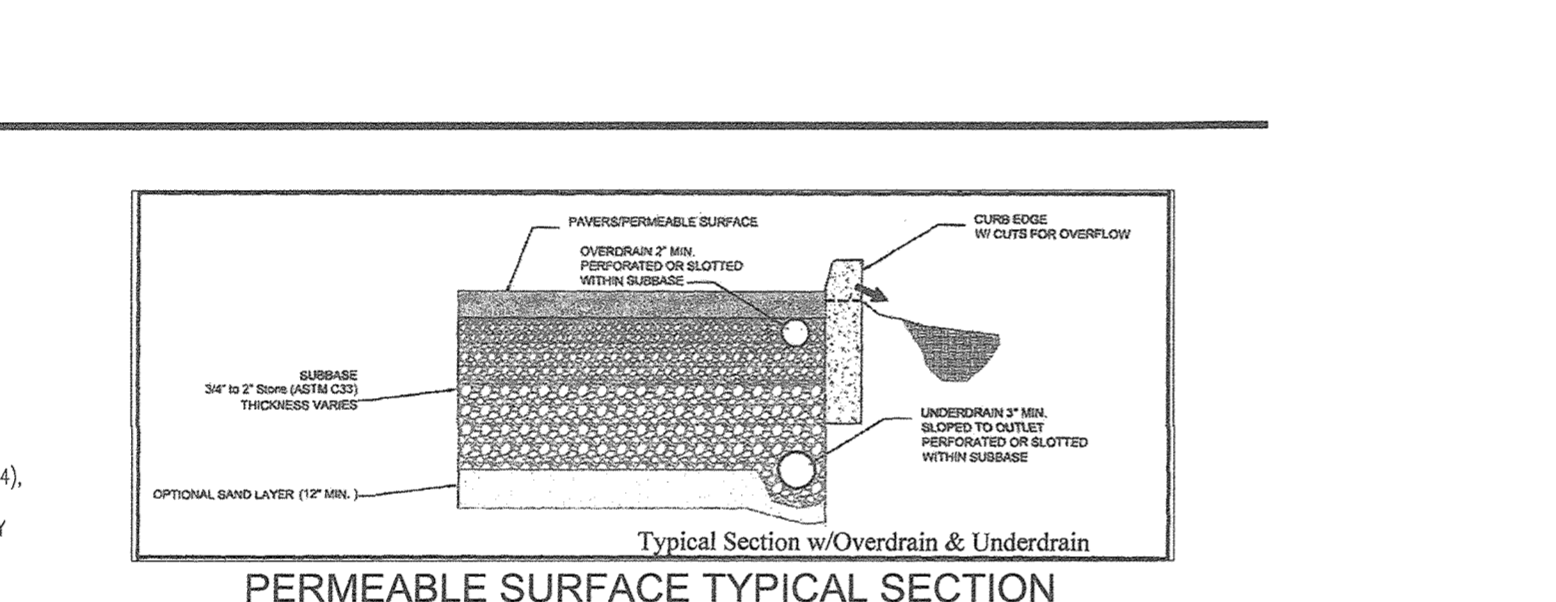
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
[Signature] 4-19-19  
[Signature] 4-19-19  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT

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

Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration-	Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4		n/a	plantings are site-specific
Planting soil	see note 5 (12 to 4\"/>			
Organic content		Min. 10% by dry weight (ASTM D 2974)		
Mulch		shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm		pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain		ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile			n/a	PE Type I nonwoven
Gravel (underdrains and infiltration berms)		AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping		F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 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 concrete not using previously approved Stone or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting A.C.I. Code 318 R-9; vertical loading (H-10 or H-20); allowable horizontal loading (based on soil pressures); and analysis of potential cracking	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 Stone or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting A.C.I. Code 318 R-9; vertical loading (H-10 or H-20); allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand		AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Database and Grystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

OPERATION AND MAINTENANCE SCHEDULE FOR M-6, M-7 AND M-8 AREAS

- 1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL LAYER 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. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIVES.
- 3. MULCH SHALL BE INSPECTED EACH SPRING, REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW MULCH ONLY EVERY 2 TO 3 YEARS.
- 4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.



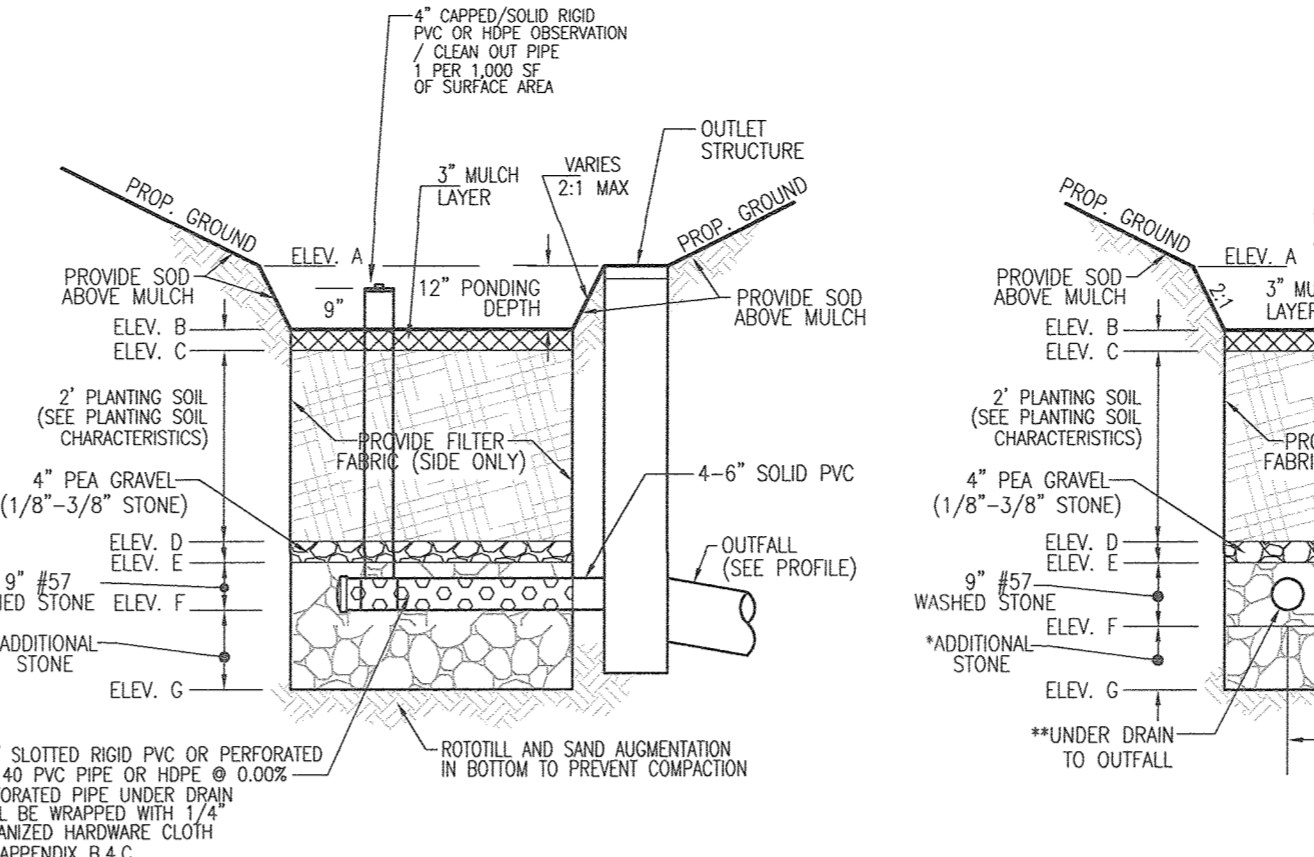
PERMEABLE SURFACE TYPICAL SECTION NOT TO SCALE

- A-2. PERMEABLE PAVEMENTS  
CONSTRUCTION CRITERIA:
  - EROSION AND SEDIMENT CONTROL: FINAL GRADING FOR INSTALLATION SHOULD NOT TAKE PLACE UNTIL THE SURROUNDING SITE IS STABILIZED. IF THIS CANNOT BE ACCOMPLISHED, RUNOFF FROM DISTURBED AREAS SHALL BE DIVERTED AROUND PROPOSED PAVEMENT LOCATIONS.
  - SOIL COMPACTION: SUB SOILS SHALL NOT BE COMPACTED. CONSTRUCTION SHOULD BE PERFORMED WITH LIGHTWEIGHT, WIDE TRACKED EQUIPMENT TO MINIMIZE COMPACTION. EXCAVATED MATERIALS SHOULD BE PLACED IN A COMPACTED AREA.
  - DISTRIBUTION SYSTEMS: OVERDRAIN, UNDERDRAIN AND DISTRIBUTION PIPES SHALL BE CHECKED TO ENSURE THAT BOTH THE MATERIAL AND PERFORATIONS MEET SPECIFICATIONS (SEE APPENDIX B.4). THE UPSTREAM ENDS OF PIPES SHOULD BE CARVED PRIOR TO INSTALLATION. ALL UNDERDRAIN OR DISTRIBUTION PIPES USED SHOULD BE INSTALLED FLAT ALONG THE BED BOTTOM.
  - SUBBASE INSTALLATION: SUBBASE AGGREGATE SHALL BE CLEAN AND FREE OF FINES. THE SUBBASE SHALL BE PLACED IN LIFTS AND LIGHTLY ROLLED ACCORDING TO THE SPECIFICATIONS (SEE APPENDIX B.4).
- INSPECTION:  
REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:
  - DURING EXCAVATION TO SUB GRADE.
  - DURING PLACEMENT AND BACKFILL OF ANY DRAINAGE OR DISTRIBUTION SYSTEMS.
  - DURING PLACEMENT OF THE GRADED STONE SUBBASE MATERIAL.
  - DURING PLACEMENT OF THE SURFACE MATERIAL.
  - UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.
- MAINTENANCE CRITERIA:  
THE FOLLOWING PROCEDURES SHOULD BE CONSIDERED ESSENTIAL FOR MAINTAINING PERMEABLE PAVEMENT SYSTEMS:
  - PAVEMENTS SHOULD BE USED ONLY WHEN REGULAR MAINTENANCE CAN BE PERFORMED. MAINTENANCE AGREEMENTS SHOULD CLEARLY SPECIFY HOW TO CONDUCT ROUTINE TASKS TO ENSURE LONG-TERM PERFORMANCE.
  - PAVEMENT SURFACES SHOULD BE SHEET AND VACUUMED TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SHEETING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING SYSTEMS AND COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
  - DRAINAGE PIPES, INLETS, STONE EDGE DRAINS AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE SHOULD BE CLEANED OUT AT REGULAR INTERVALS.
  - TRUCKS AND OTHER HEAVY VEHICLES CAN GRIND OUT AND GRIT INTO THE POROUS SURFACES, LEADING TO CLOSING AND PREMATURE FAILURE. THESE VEHICLES SHOULD BE PREVENTED FROM TRAVELING AND SPLASHING MATERIAL ONTO THE PAVEMENT.
  - DECIDERS SHOULD BE USED IN MODERATION, WHEN USED, DECIDERS SHOULD BE NON-TOXIC AND ORGANIC AND CAN BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT. SNOW PLOWING SHOULD BE DONE CAREFULLY WITH BLADES SET ONE-INCH HIGHER THAN NORMAL. PLOWED SNOW PILES AND SNOW MELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

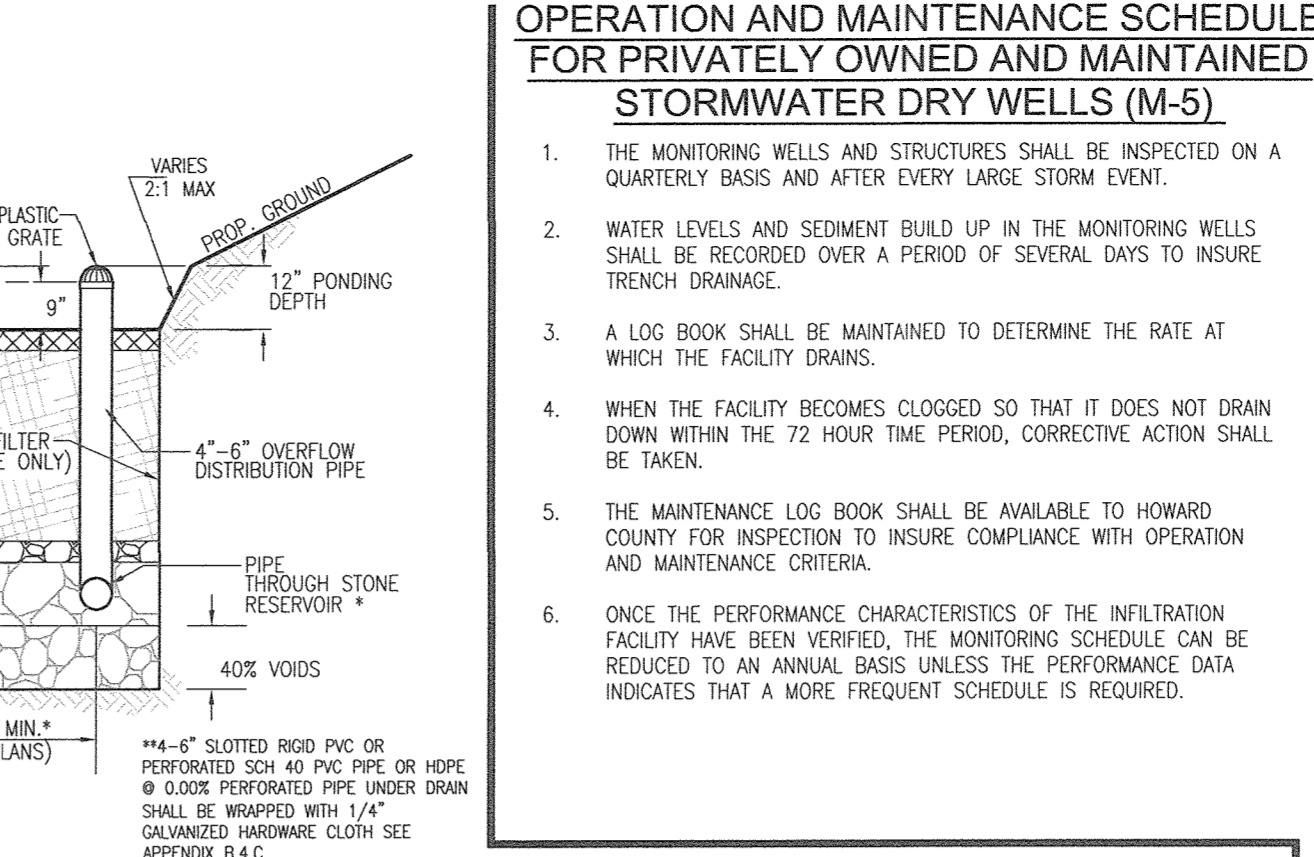
OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)

UNIT DESIGNATION	INSIDE WALL DIMENSIONS	FILTERMERA TREATMENT AREA	MAXIMUM DRAINAGE AREA (TREATED)	STORAGE CAPACITY OF UNIT PRIOR TO FILTRATION (G.P.)	WQV TREATMENT EQUIVALENT (G.P.)
FTFC 6' x 6'	12' x 6'	6' x 6'	5,900	80	209
FTFC 8' x 6'	18' x 6'	8' x 6'	8,500	117	467
FTFC 10' x 6'	24' x 6'	10' x 6'	11,100	153	511
FTFC 12' x 6'	30' x 6'	12' x 6'	13,700	190	702
FTFC 14' x 6'	36' x 6'	14' x 6'	16,300	226	898
FTFC 16' x 6'	42' x 6'	16' x 6'	18,900	263	1,104
FTFC 18' x 6'	48' x 6'	18' x 6'	21,500	299	1,302

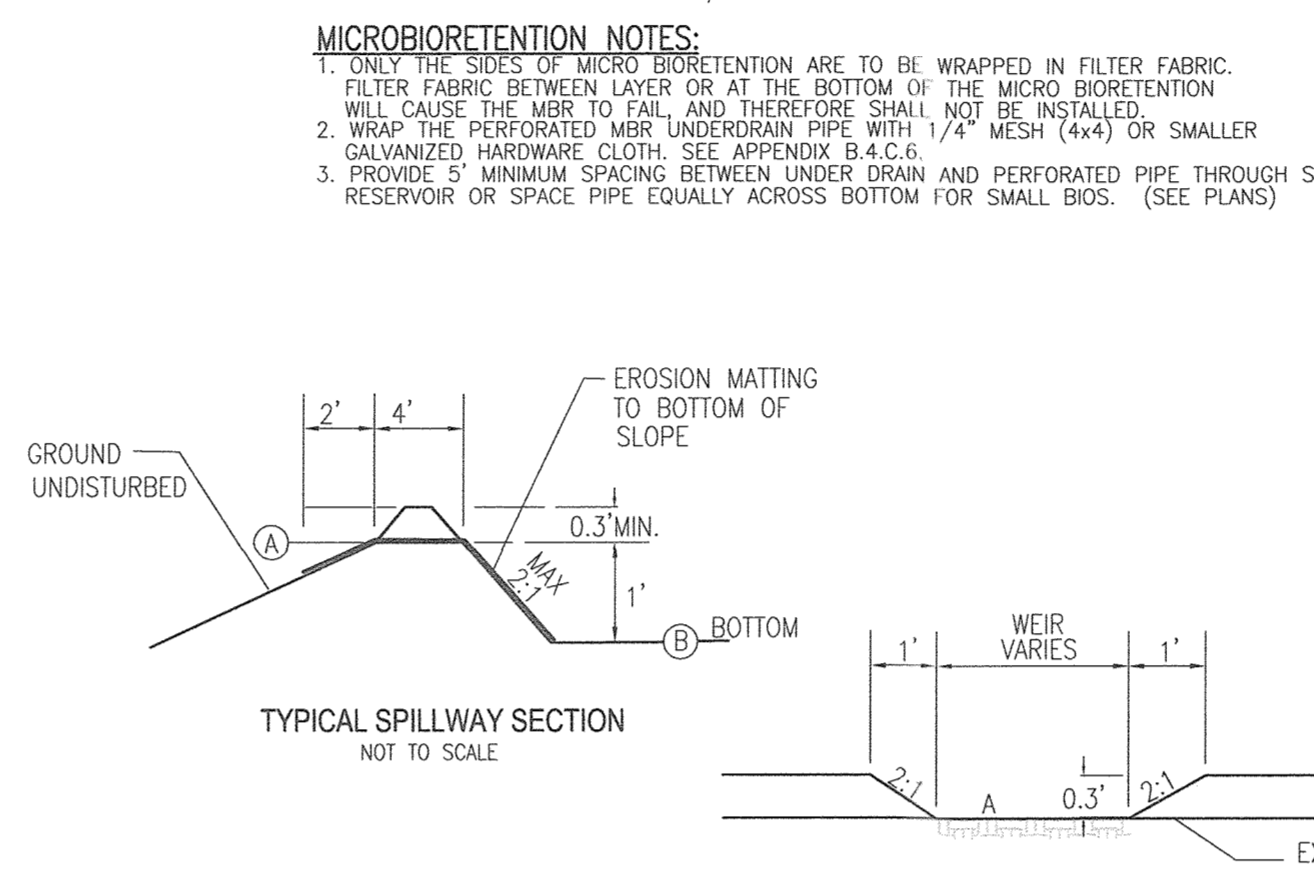
NOTE: 1. WQV TREATMENT AREA BASED UPON MINIMUM OF 0.48% OF THE TOTAL DRAINAGE AREA.  
2. FILTERMERA MEDIA SHALL BE 12" DEPTH. MEDIA SHALL BE REPLACED EVERY 5 YEARS.  
3. STORAGE CAPACITY AVAILABLE 50% VOLUME IN 24 HOURS WITH THE STORAGE AREA AND 50% IN 48 HOURS.  
4. ALL INFORMATION FOR DIMENSIONS, WEIGHTS, AND MATERIALS SHOULD BE OBTAINED FROM THE MANUFACTURER'S LITERATURE.  
5. DEPTH OF 6" IS NOT ACCEPTABLE. DEPTH IS 3.75" WITH 1.5" MINIMUM COVER.  
6. SUBBASE AGGREGATE SHALL BE PERVIOUS AND SHALL BE PLACED IN LIFTS AND LIGHTLY ROLLED.



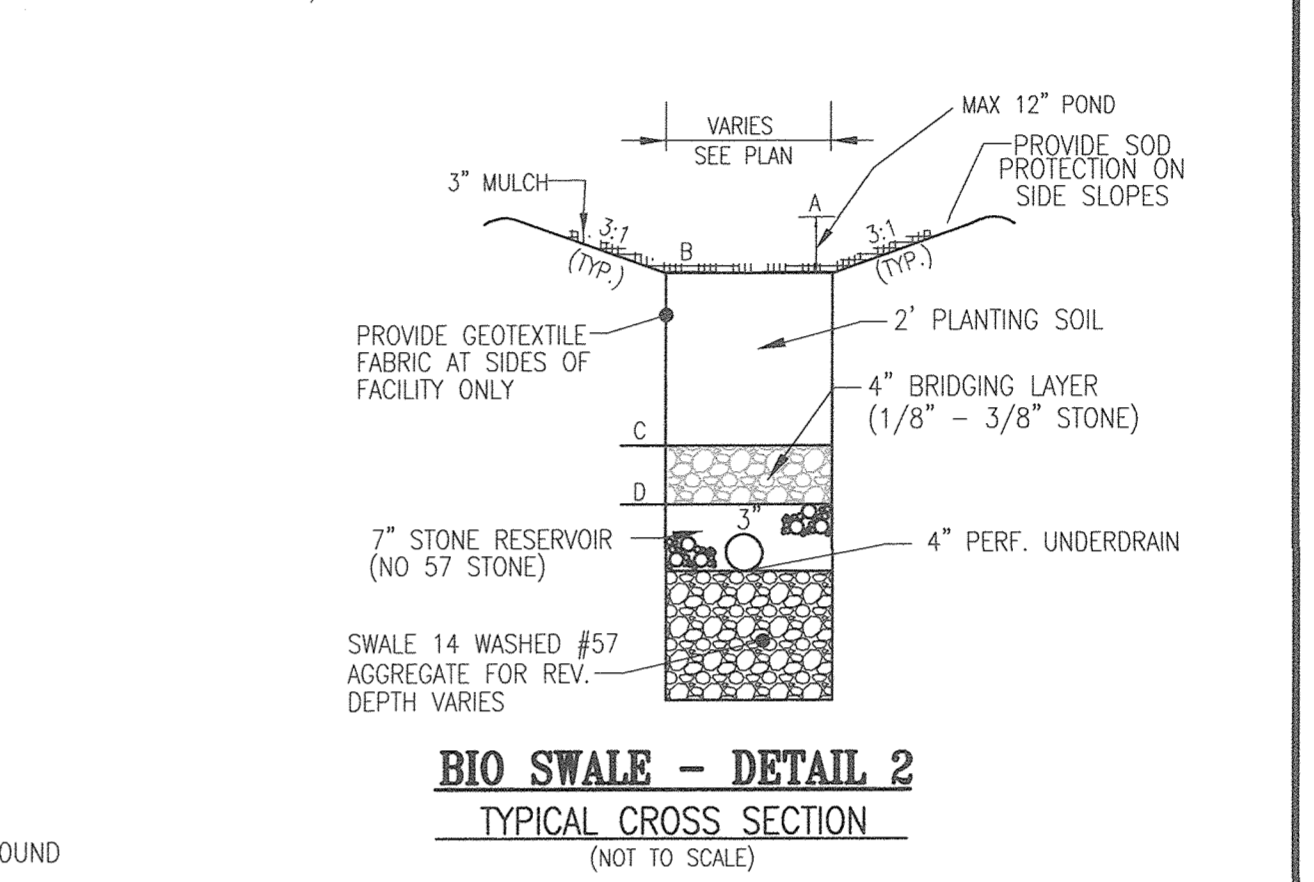
MICRO-BIORETENTION (UNDERDRAIN) NOT TO SCALE



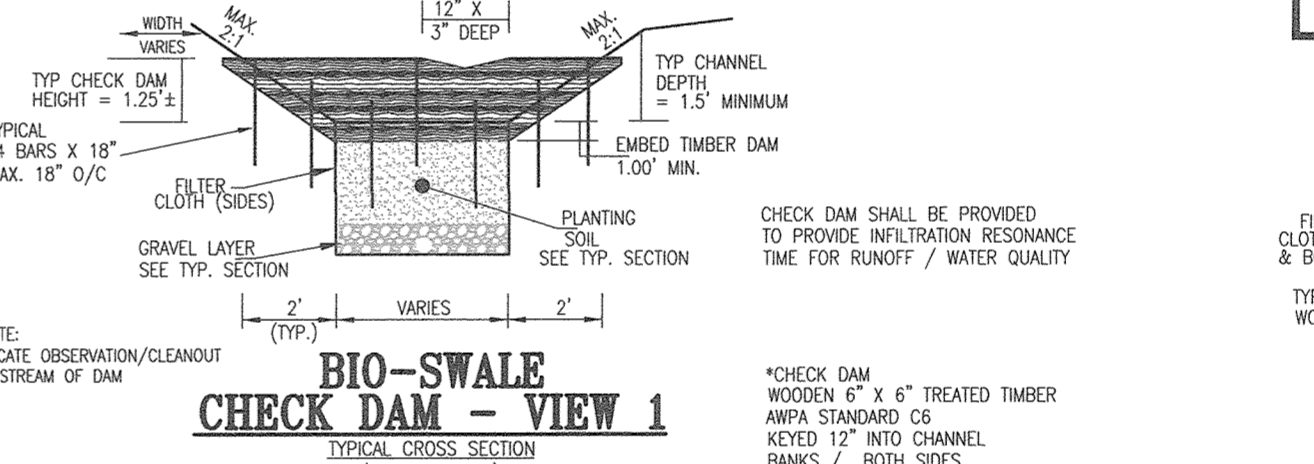
MICRO-BIORETENTION (OVERFLOW) NOT TO SCALE



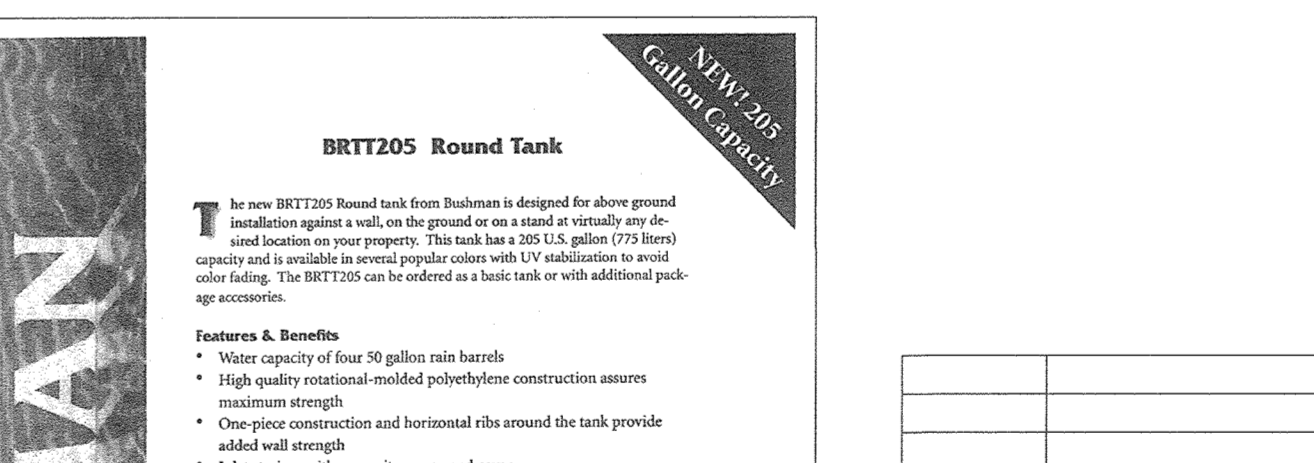
DETAILS OF WEIR OUTLET MICRO-BIORETENTION NOT TO SCALE



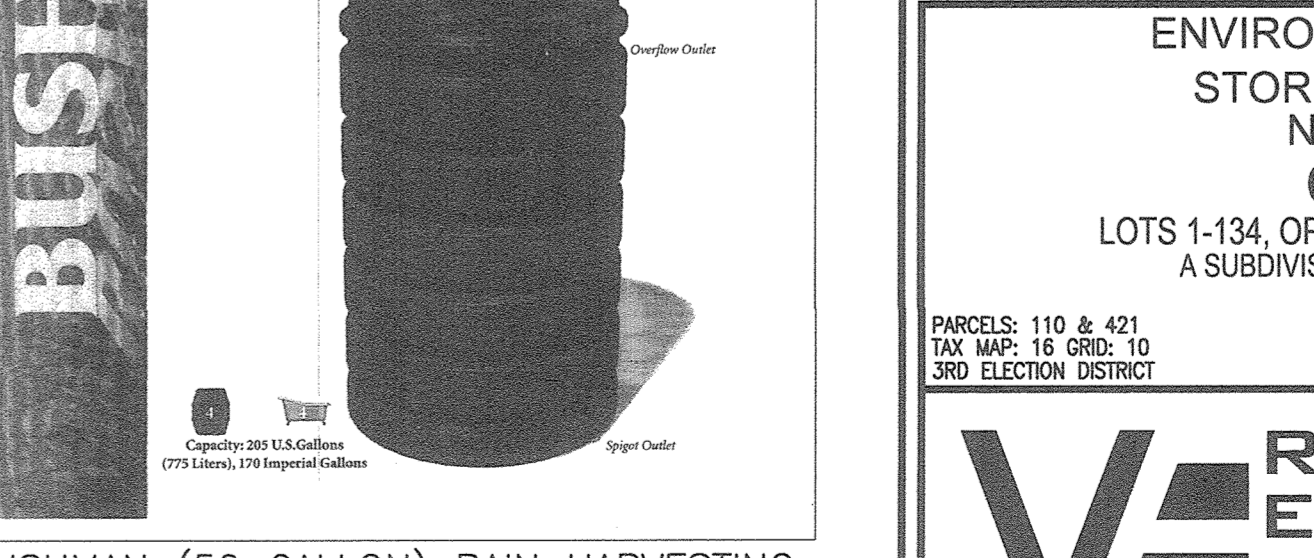
BIO-SWALE - DETAIL 2 TYPICAL CROSS SECTION NOT TO SCALE



BIO-SWALE CHECK DAM - VIEW 1 TYPICAL CROSS SECTION NOT TO SCALE

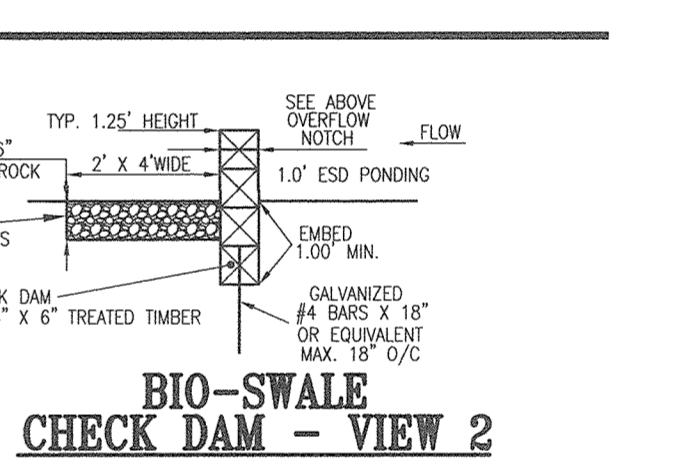
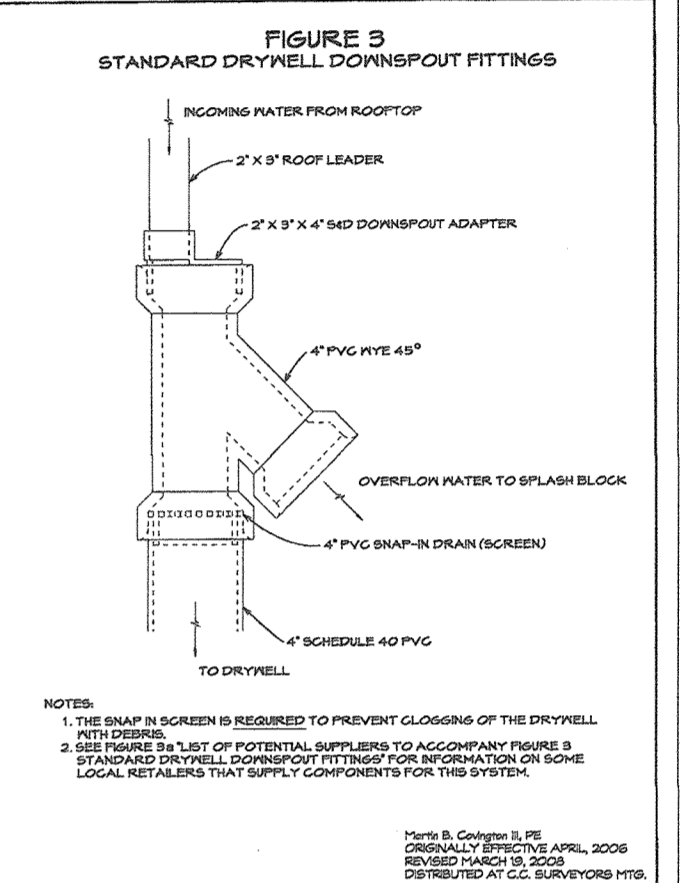
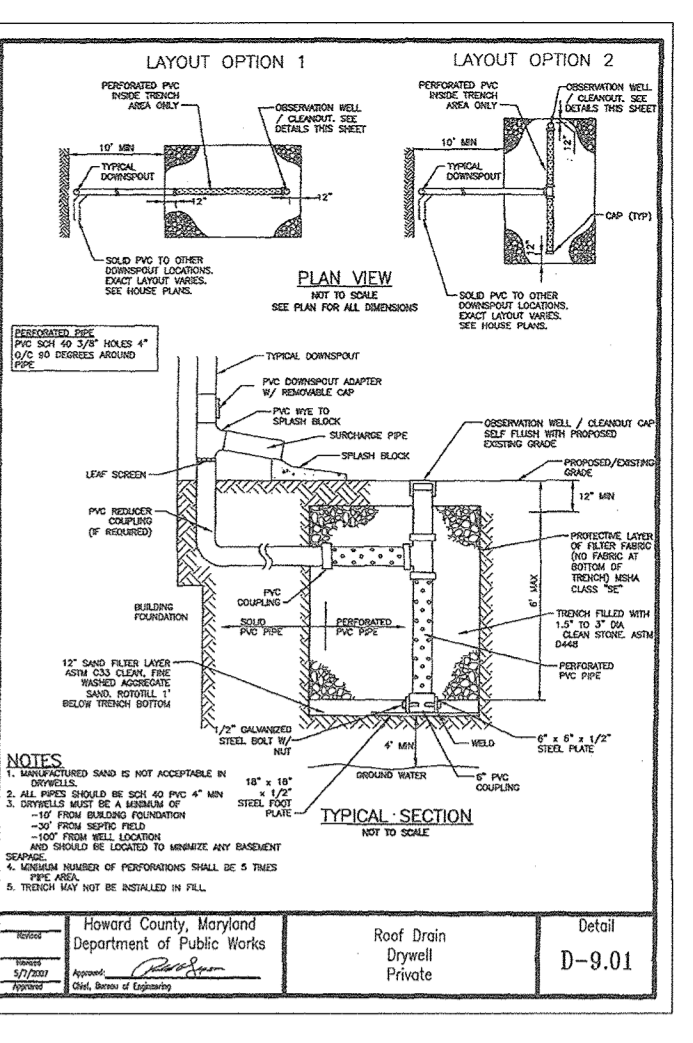


BIO-SWALE CHECK DAM - VIEW 2 TYPICAL CROSS SECTION NOT TO SCALE



OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED RAINWATER HARVESTING (M-1)

- THE OWNER SHALL EMPTY BARRELS ON A MONTHLY BASIS AND CLEAN BARRELS WITH A HOSE.
- THE OWNER SHALL VERIFY INTEGRITY OF LEAF SCREENS, GUTTERS, DOWNSPOUTS, SPOUTS, AND MOSQUITO SCREENS, AND CLEAN AND REMOVE ANY DEBRIS.
- THE OWNER SHALL REPLACE DAMAGED COMPONENTS AS NEEDED.
- THE OWNER SHALL ALLOW THE BARREL TO DRAIN BY BOTTOM SPOUT DURING THE WINTER SEASON.



BIO-SWALE CHECK DAM - VIEW 2 TYPICAL CROSS SECTION NOT TO SCALE

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN  
STORMWATER MANAGEMENT NOTES AND DETAILS  
CHAPEL GATE  
LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421  
2800 MARIOTTSVILLE ROAD  
HOWARD COUNTY, MD

ROBERT H. VOGEL ENGINEERING, INC.  
ENGINEERS • SURVEYORS • PLANNERS  
3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
TEL: 410.461.7666 FAX: 410.461.8961

DESIGN BY: RHV  
DRAWN BY: VE, TG, KC  
CHECKED BY: RHV  
DATE: MARCH 2019  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 49220  
PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE 08-27-2020.



**CHAPEL GATE - MEASURED SUBAREA - ESDv COMPUTATIONS**

SITE DEVELOPABLE AREA: 20.00 AC  
 TARGET P: 1.80 IN  
 SITE IMPERVIOUS: 38 PERCENT  
 SITE RV: 0.3920

REV Jun-18  
 REV Nov-18  
 REV Feb-19

Rv=0.05+0.009X  
 V min=1.0" rainfall  
 Vmax=3yr rainfall=2.6"

(1.0x0.95xA)/12  
 (2.6x0.95xA)/12

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	1.0" MIN. VOLUME	2.6" MAX. VOLUME	1.8" REQ. VOLUME	VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS
#1	27.88	0.3009	12354	0.28	310	865	558	1050	3444	0.08	0.20	MICROSCALE MICRO-BIO RETENTION 1 1050 788 SF MBR @ 1.0 PONDING MICROSCALE PRAC. (RAINBARREL) 34 CF FOR EACH 50 GAL RAINBARREL ALTERNATIVE SURFACE 1 126 PERM SURFACE DW @ 2.5 126 PE EQUIVALENT = 2.5 126 ALTERNATIVE SURFACE 1 378 PERM SURFACE PARKING @ 0.196 @ 12" 378 PE EQUIVALENT = 2.5 378
SUBAREA TOTAL REQUIRED= 1575 SUBAREA TOTAL PROVIDED= 1588												
#2	21.16	0.2405	15381	0.35	308	801	555	1200	3255	0.07	0.28	MICROSCALE MICRO-BIO RETENTION 2 1200 900 SF MBR @ 1.0 PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL ALTERNATIVE SURFACE 2 123 PERM SURFACE DW @ 0.196 @ 12" 123 PE EQUIVALENT = 2.5 123 ALTERNATIVE SURFACE 2 140 PERM SURFACE TRAIL @ 0.196 @ 12" 140 PE EQUIVALENT = 2.5 140
SUBAREA TOTAL REQUIRED= 1323 SUBAREA TOTAL PROVIDED= 1497												
#3	52.28	0.5205	6915	0.16	300	780	540	653	3615	0.08	0.08	ALTERNATIVE SURFACE 3 653 PERM SURFACE PARKING @ 0.196 @ 12" 653 PE EQUIVALENT = 2.5 653
#4	29.32	0.3139	13156	0.30	344	895	619	1250	3857	0.09	0.21	ALTERNATIVE SURFACE 4 203 PERM SURFACE DW @ 0.196 @ 12" 203 PE EQUIVALENT = 2.5 203 MICROSCALE MICRO-BIO RETENTION 4 1250 938 SF MBR @ 1.0 PONDING ALTERNATIVE SURFACE 4 99 PERM SURFACE TRAIL @ 0.196 @ 12" 99 PE EQUIVALENT = 2.5 99
SUBAREA TOTAL REQUIRED= 1456 SUBAREA TOTAL PROVIDED= 1552												
#5	40.06	0.4105	11802	0.27	404	1050	727	1220	4728	0.11	0.16	ALTERNATIVE SURFACE 5 25 PERM SURFACE DW @ 0.196 @ 12" 25 PE EQUIVALENT = 2.5 25 MICROSCALE MICRO-BIO RETENTION 5 1220 915 SF MBR @ 1.0 PONDING ALTERNATIVE SURFACE 5 87 PERM SURFACE PARKING @ 0.196 @ 12" 87 PE EQUIVALENT = 2.5 87
SUBAREA TOTAL REQUIRED= 1311 SUBAREA TOTAL PROVIDED= 1332												
#6	40.22	0.4120	9585	0.22	371	965	668	750	3855	0.09	0.13	MICROSCALE BIO SWALE 6 (3.5' WIDE BOTTOM) 750 1125 SF BIO SWALE @ 0.5' PONDING ALTERNATIVE SURFACE 6 105 PERM SURFACE TRAIL @ 0.196 @ 12" 105 PE EQUIVALENT = 2.5 105
SUBAREA TOTAL REQUIRED= 743 SUBAREA TOTAL PROVIDED= 855												
#7A	40.87	0.4178	16038	0.37	538	1452	1005	1453	6555	0.15	0.22	ALTERNATIVE SURFACE 7A 228 PERM SURFACE DW @ 0.196 @ 12" 228 PE EQUIVALENT = 2.5 228 MICROSCALE MICRO-BIO RETENTION 7A 1453 1050 SF MBR @ 1.0 PONDING
#7B	45.52	0.4597	15480	0.36	593	1542	1067	2000	7047	0.16	0.19	MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL MICROSCALE MICRO-BIO RETENTION 7B 2000 1500 SF MBR @ 1.0 PONDING
#8	32.12	0.3391	6780	0.16	192	498	345	1120	2178	0.05	0.11	MICROSCALE MICRO-BIO RETENTION 8 1120 840 SF MBR @ 1.0 PONDING
#9	40.87	0.4179	13615	0.31	474	1233	853	875	5565	0.13	0.18	MICROSCALE MICRO-BIO RETENTION 9 875 656 SF MBR @ 1.0 PONDING
#10	33.48	0.3513	10660	0.24	312	811	562	800	3569	0.08	0.16	MICROSCALE MICRO-BIO RETENTION 10 800 600 SF MBR @ 1.0 PONDING
#11	37.29	0.3856	15345	0.35	493	1282	888	1200	5722	0.13	0.22	MICROSCALE MICRO-BIO RETENTION 11 1200 900 SF MBR @ 1.0 PONDING
#12	52.17	0.5195	20810	0.48	901	2343	1622	2020	10857	0.25	0.23	MICROSCALE MICRO-BIO RETENTION 12 2020 1515 SF MBR @ 1.0 PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#13	59.14	0.5823	7550	0.17	366	952	659	700	4465	0.10	0.07	MICROSCALE MICRO-BIO RETENTION 13 700 525 SF MBR @ 1.0 PONDING
#14	67.73	0.6595	21055	0.48	1157	3009	2083	2100	14260	0.33	0.16	MICROSCALE MICRO-BIO RETENTION 14 2100 1575 SF MBR @ 1.0 PONDING
#15A	61.42	0.6028	12700	0.29	638	1659	1148	1250	7800	0.18	0.11	MICROSCALE MICRO-BIO RETENTION 15A 1250 938 SF MBR @ 1.0 PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#15B	28.62	0.3076	16910	0.39	433	1127	780	1451	4840	0.11	0.28	MICROSCALE MICRO-BIO RETENTION 15B 1451 1088 SF MBR @ 1.0 PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL ALTERNATIVE SURFACE 15B 63 PERM SURFACE DW @ 0.196 @ 12" 63 PE EQUIVALENT = 2.5 63

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	1.0" MIN. VOLUME	2.6" MAX. VOLUME	1.8" REQ. VOLUME	VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS
#16	26.65	0.2898	12610	0.29	305	792	548	554	3360	0.08	0.21	MICROSCALE BIO SWALE 16 (5.6' WIDE BOTTOM) 500 750 SF BIO SWALE @ 0.5' PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#17A	46.17	0.4655	21312	0.49	827	2150	1488	1500	9840	0.23	0.26	MICROSCALE MICRO-BIO RETENTION 17A 1500 1125 SF MBR @ 1.0 PONDING
#17B	43.42	0.4408	18736	0.43	688	1789	1239	1500	8135	0.19	0.24	MICROSCALE MICRO-BIO RETENTION 17B 1500 1125 SF MBR @ 1.0 PONDING
#18	100.00	0.9500	1800	0.04	143	371	257	254	1800	0.04	0.00	MICROSCALE PRAC. (DRY WELL) 88 CF FOR EACH (5x11x4) DRYWELL
#19	100.00	0.9500	1800	0.04	143	371	257	254	1800	0.04	0.00	MICROSCALE PRAC. (DRY WELL) 88 CF FOR EACH (5x11x4) DRYWELL
#20	0.00	0.0500	11800	0.27	-	-	-	500	0	0.00	0.27	MICROSCALE BIO SWALE 19A (5' WIDE BOTTOM) 500 375 SF BIO SWALE @ 1.0' PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#21	100.00	0.9500	3600	0.08	285	741	513	41	3600	0.08	0.00	MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#22	100.00	0.9500	1700	0.04	135	350	242	336	1700	0.04	0.00	ALTERNATIVE SURFACE 19A 336 PERM SURFACE TRAIL @ 0.196 @ 12" 336 PE EQUIVALENT = 2.5 336
#23	0.00	0.0500	11675	0.27	-	-	-	800	0	0.00	0.27	MICROSCALE MICRO-BIO RETENTION 19B 800 600 SF MBR @ 1.0 PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#24	100.00	0.9500	2050	0.05	162	422	292	406	2050	0.05	0.00	ALTERNATIVE SURFACE 19B 406 PERM SURFACE TRAIL @ 0.196 @ 12" 406 PE EQUIVALENT = 2.5 406
#25	36.13	0.3752	9300	0.21	291	756	523	554	3360	0.08	0.14	MICROSCALE BIO SWALE 20 (5' WIDE BOTTOM) 1000 750 SF BIO SWALE @ 0.5' PONDING MICROSCALE PRAC. (RAINBARREL) 7 CF FOR EACH 50 GAL RAINBARREL
#26	72.88	0.7059	21070	0.48	1239	3222	2231	2150	15355	0.35	0.13	MICROSCALE MICRO-BIO RETENTION 21A 2150 1613 SF MBR @ 1.0 PONDING
#27	100.00	0.9500	3000	0.07	238	618	428	440	3000	0.07	0.00	MICROSCALE PRAC. (DRY WELL) 88 CF FOR EACH (4x11x5) DRYWELL
#28	32.14	0.3393	11200	0.26	317	823	570	650	3600	0.08	0.17	MICROSCALE MICRO-BIO RETENTION 22 650 488 SF MBR @ 1.0 PONDING
#29	33.44	0.3509	15385	0.35	450	1170	810	880	5144	0.12	0.24	MICROSCALE MICRO-BIO RETENTION 23 880 660 SF MBR @ 1.0 PONDING
#30	13.43	0.1709	4140	0.10	59	153	106	400	556	0.01	0.08	MICROSCALE MICRO-BIO RETENTION 24 400 300 SF MBR @ 1.0 PONDING
#31	100.00	0.9500	580	0.01	46	119	83	115	580	0.01	0.00	ALTERNATIVE SURFACE 24 115 PERM SURFACE TRAIL @ 0.196 @ 12" 115 PE EQUIVALENT = 2.5 115
#32	50.22	0.5019	2780	0.06	116	302	209	274	1396	0.03	0.09	ALTERNATIVE SURFACE 24 PARKING 274 PERM SURFACE PARKING @ 0.196 @ 12" 274 PE EQUIVALENT = 2.5 274
#33	57.72	0.5695	19240	0.44	913	2374	1643	1600	11105	0.25	0.19	MICROSCALE MICRO-BIO RETENTION 25A 1600 1200 SF MBR @ 1.0 PONDING
#34	50.00	0.5000	2560	0.06	107	277	192	253	1280	0.03	0.03	ALTERNATIVE SURFACE 25A 253 PERM SURFACE DW @ 0.196 @ 12" 253 PE EQUIVALENT = 2.5 253
#35	46.77	0.4709	19724	0.45	774	2013	1393	1335	9225	0.21	0.24	MICROSCALE MICRO-BIO RETENTION 25B 1335 1001 SF MBR @ 1.0 PONDING
#36	48.86	0.4888	2906	0.07	119	308	213	294	1420	0.03	0.03	ALTERNATIVE SURFACE 25B 294 PERM SURFACE DW @ 0.196 @ 12" 294 PE EQUIVALENT = 2.5 294
#37	47.89	0.4810	21550	0.49	864	2246	1555	1600	10320	0.24	0.26	MICROSCALE MICRO-BIO RETENTION 25C 1600 1200 SF MBR @ 1.0 PONDING
#38	45.45	0.4591	2200	0.05	84	219	152	238	1000	0.02	0.03	ALTERNATIVE SURFACE 25C 238 PERM SURFACE DW @ 0.196 @ 12" 238 PE EQUIVALENT = 2.5 238
#39	100.00	0.9500	2520	0.06	200	519	359	425	2520	0.06	0.00	MICROSCALE PRAC. (DRY WELL) 62 CF FOR EACH (3.5x11x4) DRYWELL MICROSCALE PRAC. (DRY WELL) 120 CF FOR EACH (4x11x5) DRYWELL
#40	100.00	0.9500	2940	0.07	233	605	419	425	2940	0.07	0.00	MICROSCALE PRAC. (DRY WELL) 62 CF FOR EACH (3.5x11x4) DRYWELL MICROSCALE PRAC. (DRY WELL) 120 CF FOR EACH (4x11x5) DRYWELL
#41	100.00	0.9500	3600	0.08	285	741	513	542	3600	0.08	0.00	MICROSCALE PRAC. (DRY WELL) 90 CF FOR EACH (4x11x5) DRYWELL MICROSCALE PRAC. (DRY WELL) 91 CF FOR EACH (3.5x11x5) DRYWELL
#42	100.00	0.9500	2100	0.05	166	432	299	302	2100	0.05	0.00	MICROSCALE PRAC. (DRY WELL) 62 CF FOR EACH (3.5x11x4) DRYWELL MICROSCALE PRAC. (DRY WELL) 120 CF FOR EACH (4x11x5) DRYWELL
#43	48.06	0.4826	84172	1.93	3385	8801	6093	6600	40457	0.93	1.00	MICROSCALE GRAVEL WETLAND 27 6600 4950 SF MBR @ 1.0 PONDING
#44	41.40	0.4226	5705	0.13	201	522	362	400	2362	0.05	0.08	MICROSCALE MICRO-BIO RETENTION 27A 400 300 SF MBR @ 1.0 PONDING
#45	54.92	0.5443	1320	0.03	60	156	108	118	725	0.02	0.01	ALTERNATIVE SURFACE 27A PARKING 118 PERM SURFACE PARKING @ 0.196 @ 12" 118 PE EQUIVALENT = 2.5 118
#46	17.39	0.2065	10640	0.24	183	476	330	400	1850	0.04	0.20	MICROSCALE MICRO-BIO RETENTION 27B 400 300 SF MBR @ 1.0 PONDING
#47	100.00	0.9500	750	0.02	59	154	107	148	750	0.02	0.00	ALTERNATIVE SURFACE 27B 148 PERM SURFACE TRAIL @ 0.196 @ 12" 148 PE EQUIVALENT = 2.5 148
#48	62.91	0.6161	8640	0.20	444	1153	799	800	5435	0.12	0.07	MICROSCALE MICRO-BIO RETENTION 27C 800 600 SF MBR @ 1.0 PONDING
#49	40.21	0.4119	17780	0.41	610	1587	1099	1210	7150	0.16	0.24	MICROSCALE MICRO-BIO RETENTION 28 1210 908 SF MBR @ 1.0 PONDING
#50	100.00	0.9500	4730	0.11	374	974	674	678	4730	0.11	0.00	FILTERRA FTSC 6X4 339 CF WQV PER FILTERRA INLET HOWARD COUNTY PERMISSION REQUIRED

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	1.0" MIN. VOLUME	2.6" MAX. VOLUME	1.8" REQ. VOLUME	VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS
#51	23.34	0.2601	67218	1.54	1457	3788	2622	2484	15690	0.36	1.18	ALTERNATIVE SURFACE 30 2484 PERM SURFACE TRAIL @ 0.16 @ 12" 2484 PE EQUIVALENT = 2 2484
#52	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CEP AREAS TO REMAIN UNDISTURBED / NO IMPERVIOUS NO ESDV REQUIRED

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	1.0" MIN. VOLUME	2.6" MAX. VOLUME	1.8" REQ. VOLUME	VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS
#53	100.00	0.9500	29192	0.67	2311	6009	4160	4622	29192	0.67	0.00	ALTERNATIVE SURFACE 311 4622 PERM SURFACE TRAIL @ 0.16 @ 12" 4622 PE EQUIVALENT = 2 4622
#54	40.4	0.4136	905004	20.78	30501	79302	54902	59909	365615	8.39	12.38	

OWNER/DEVELOPER  
 CHAPEL GATE PRESBYTERIAN  
 CHURCH, INC.  
 2600 MARRIOTTSVILLE RD.  
 MARRIOTTSVILLE, MD 21104  
 (410) 442-5888

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN  
 STORMWATER MANAGEMENT  
 NOTES, DETAILS  
 CHAPEL GATE**

LOTS 1-134, OPEN SPACE LOTS 135-136 AND PARCEL A  
 A SUBDIVISION OF TAX MAP 16, PARCELS 110 & 421

2600 MARRIOTTSVILLE ROAD  
 HOWARD COUNTY, MD

PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

ZONED: OFF-M  
 L 1389/F. 330 (P. 110)  
 L 4163/F. 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL  
 ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 3300 N. RIDGE ROAD, SUITE 110, E



THE DEVELOPER SHALL OBTAIN THE NECESSARY STATE PERMIT FOR THE PROPOSED ENVIRONMENTAL IMPACTS.

ALL WORK IN THE NONTIDAL WETLAND BUFFER SHALL BE COMPLETED PER THE BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS.

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

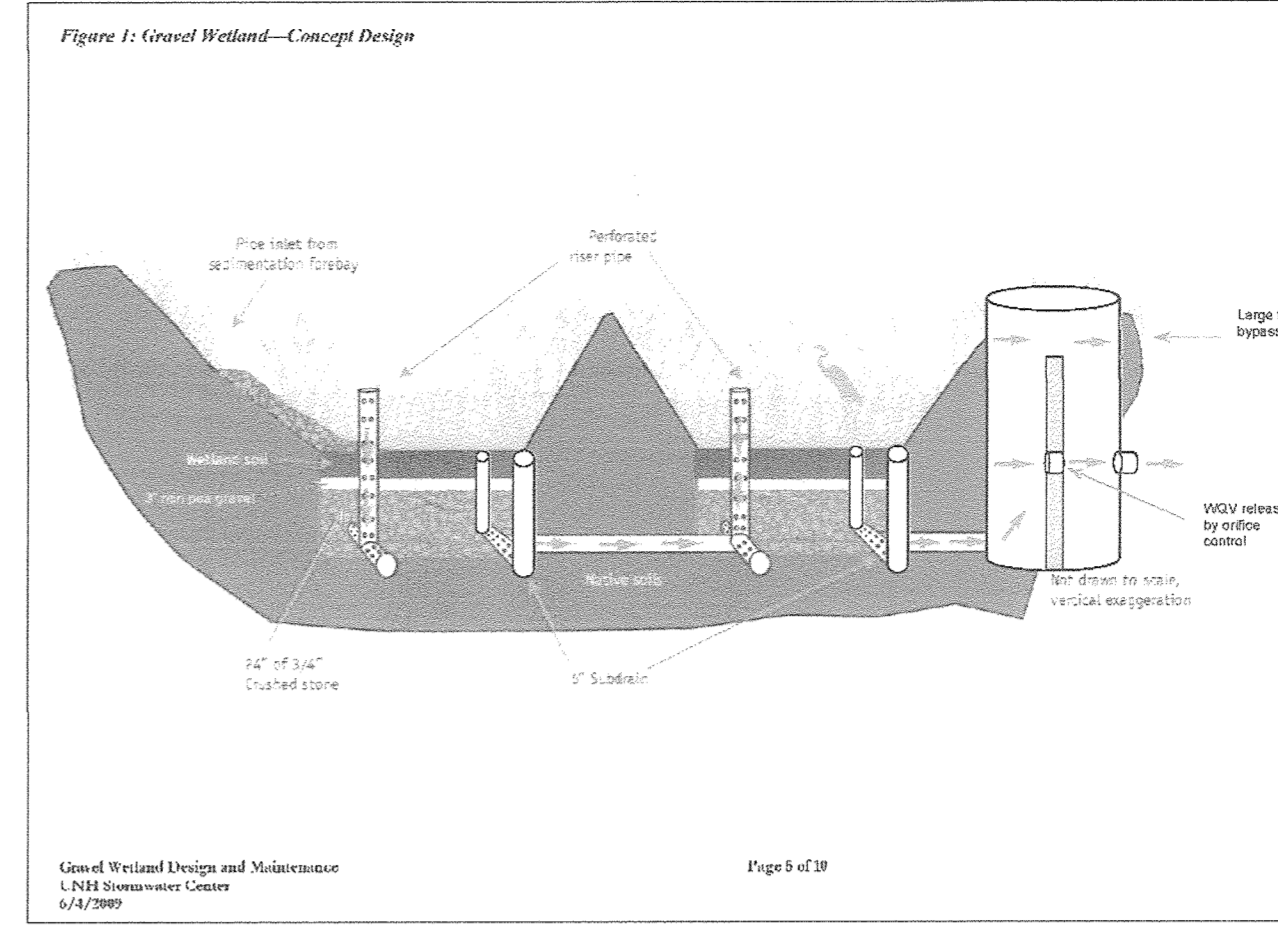
- 1) NO EXCESS FILL, CONSTRUCTION MATERIAL OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
2) PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3) DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DEleterious SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DEleterious SUBSTANCE.
4) PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5) REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN BY EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6) RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7) ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOIDA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8) AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9) TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM.
USE I WATER: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
USE II WATER: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
USE III WATER: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
10) STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11) CULVERTS SHALL BE CONSTRUCTED AND ANY BRP/PP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Handwritten signature and date 4-10-19.
Handwritten signature and date 4-01-19.

Table with columns: LOT NUMBER, ADDRESS, GREEN ROOFS, PERMEABLE PAVEMENTS, REINFORCED TURF, DISCONNECTION OF ROOFTOP RUNOFF (N-1, N-2), SHEETFLOW TO CONSERVATION AREAS (N-3), RAINWATER HARVESTING (M-1), SUBMERGED GRAVEL WETLANDS (M-2), LANDSCAPE INFILTRATION (M-3), INFILTRATION BERMS (M-4), DRY WELLS (M-5), MICRO-BIOTENTATION (M-6), RAIN GARDENS (M-7), SWALES (M-8), ENHANCED FILTERS (M-9).

GRAVEL WETLAND NOT TO SCALE



M-2. SUBMERGED GRAVEL WETLANDS CONSTRUCTION CRITERIA:

THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING THE CONSTRUCTION OF PROJECTS WITH SUBMERGED GRAVEL WETLANDS:

- 1. SITE DISTURBANCE: ALL ON-SITE DISTURBED AREAS SHOULD BE STABILIZED PRIOR TO ALLOWING RUNOFF TO ENTER THE NEWLY CONSTRUCTED WETLAND.
2. EROSION AND SEDIMENT CONTROL: THE PROPOSED LOCATION OF A SUBMERGED GRAVEL WETLAND SHALL BE PROTECTED DURING CONSTRUCTION. SURFACE RUNOFF SHALL BE DIVERTED AWAY FROM THE PRACTICE DURING GRADING OPERATIONS. FLOW SPLITTERS AND OTHER CONVEYANCE INFRASTRUCTURE SHALL BE BLOCKED.
3. GRAVEL MEDIA: THE AGGREGATE SHALL BE COMPOSED OF AN 18 TO 48 INCH LAYER OF CLEAN WASHED, UNIFORMLY GRADED MATERIAL WITH A POROSITY OF 40%. ROUNDED BANK RUN GRAVEL IS RECOMMENDED (E.G., ASTM D448 4.5, OR 6 STONE OR EQUL).

INSPECTION:

- REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:
A. DURING EXCAVATION TO SUBGRADE.
B. DURING PLACEMENT OF BACKFILL OF PERFORATED INLET PIPE AND OBSERVATION WELLS.
C. DURING PLACEMENT OF GEOTEXTILES AND ALL FILTER MEDIA.
D. DURING CONSTRUCTION OF ANY APPURTENANT CONVEYANCE SYSTEMS SUCH AS DIMENSION STRUCTURES, INLETS, OUTLETS, AND FLOW DISTRIBUTION STRUCTURES.
E. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION, AND BEFORE ALLOWING RUNOFF TO ENTER THE WETLAND.

NOTES:

- (1) PROVIDE "GRAVEL JACKET" THROUGH SOIL LAYER TO KEEP SOIL FROM MIGRATING IN TO GRAVEL LAYER.
(2) SLOTTED RIGID PVC OR HDPE OR PERFORATED SCH 40 PVC PIPE TO BE WRAPPED W/ 1/4" GALVANIZED HARDWARE CLOTH OR EQUAL MATERIAL. SEE APPENDIX B.4.C. SHEET 9

WETLAND SOIL SPECIFICATIONS

THE SURFACE INFILTRATION RATES OF THE GRAVEL WETLAND SOIL SHOULD BE SIMILAR TO A LOW HYDRAULIC CONDUCTIVITY WETLAND SOIL (0.1-0.01 FT/DAY = 3.5 X 10^-5 CM/SEC TO 3.5 X 10^-6 CM/SEC). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND, AND SOME FINE SOILS TO BLEND TO A HIGH % ORGANIC MATTER CONTENT SOIL (>15% ORGANIC MATTER). AVOID USING CLAY CONTENTS IN EXCESS OF 15% BECAUSE OF POTENTIAL MIGRATION OF FINES INTO SUBSURFACE GRAVEL LAYER. DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.

IMPERVIOUS LINER:

IF NATIVE A LOW HYDRAULIC CONDUCTIVITY NATIVE SOIL IS NOT PRESENT BELOW THE GRAVEL LAYER, A LOW PERMEABILITY LINER OR SOIL SHOULD BE USED TO:
- MINIMIZE INFILTRATION
- PRESERVE HORIZONTAL FLOW IN THE LAKE.
- MAINTAIN THE WETLAND PLANTS.
IF GEOTECHNICAL TESTS CONFIRM THE NEED FOR A LINER, ACCEPTABLE OPTIONS INCLUDE:
(A) 6 TO 12 INCHES (15 - 30 CM) OF CLAY SOIL (MINIMUM 15% PASSING THE #200 SIEVE AND A MINIMUM PERMEABILITY OF 1 X 10^-5 CM/SEC).
(B) A 30 ML HDPE LINER.
(C) BENTONITE.
(D) USE OF CHEMICAL ADDITIVES (SEE NRCS AGRICULTURAL HANDBOOK NO. 308, DATED 1961, OR ENGINEERING FIELD MANUAL).
(E) A DESIGN PREPARED BY A PROFESSIONAL ENGINEER.

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ENVIRONMENTAL CONCEPT PLAN STORMWATER MANAGEMENT PRACTICE CHART NOTES & DETAILS CHAPEL GATE. Includes project location, scale, date, and Robert H. Vogel Engineering, Inc. logo and contact info.