

GENERAL NOTES:

- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., PERFORMED ON AUGUST 14, 2017. OFF-SITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED AUGUST 14, 2017.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 0016 AND 42EA WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "CCT" IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- PUBLIC WATER IS PROVIDED BY CONTRACT 3-W. PUBLIC SEWER IS PROVIDED BY CONTRACT 350-S.
- THERE IS NO 100-YEAR FLOODPLAIN.
- THERE ARE NO STEEP SLOPES WITH A CONTIGUOUS AREA OF 20,000SF LOCATED ON-SITE.
- WETLANDS DELINEATION AND FOREST STAND DELINEATION REPORT PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. IN OCTOBER 3, 2016.
- THERE ARE NO WETLANDS, STREAMS OR BUFFERS WITHIN THE LOD.
- THREE SPECIMEN TREES TO BE REMOVED.
- THE FOREST CONSERVATION OBLIGATION FOR THIS PROJECT IS 0.20 ACRES OF REFORESTATION, WHICH SHALL BE SATISFIED BY THE PURCHASE OF FOREST PLANTING IN AND OFF-SITE FOREST MITIGATION BANK. THE FOREST CONSERVATION OBLIGATION FOR THIS PROJECT SHALL BE ADDRESSED UNDER THE SITE DEVELOPMENT PLAN STAGE.
- A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
- GUILFORD ROAD IS CLASSIFIED AS A MAJOR COLLECTOR.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS OR CEMETERIES ON THIS PROPERTY. THERE ARE NO HISTORIC HOUSES LOCATED ON THIS PROPERTY.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THREE MICRO-BIORETENTION FACILITIES (M-6). THIS FACILITIES SHALL BE PRIVATELY OWNED AND MAINTAINED.
- THE LIMITS OF DISTURBANCE (LOD) SHOWN ON THE PLAN EXTENDS OFF-SITE. LETTERS OF PERMISSION FOR ANY REQUIRED OFF-SITE GRADING WILL BE PROVIDED AS PART OF THE SITE DEVELOPMENT PLAN PHASE OF THE PROJECT.
- 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 REDLINE 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 REDLINE 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 COUNTY 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.
- ADMINISTRATIVE ADJUSTMENT AA-17-016 APPROVED ON 3/6/2018
 - SECTION 117.4.D.2.a. REDUCE THE STRUCTURE OR USE SETBACK FOR AN ASSISTED LIVING FACILITY FROM AN R-12 ZONE (PARCEL 632) FROM 50' TO 40.43' (18.14% REDUCTION) FOR A PARKING LOT; TO REDUCE THE 50' STRUCTURE AND USE SETBACK FROM AN R-12 ZONE (PARCEL 669) FROM 50' TO 40.80' (18.4% REDUCTION) FOR A TRASH ENCLOSURE; TO REDUCE THE 50' STRUCTURE AND USE SETBACK FROM AN R-12 ZONE (PARCEL 1039) FROM 50' TO 40' (20% REDUCTION) FOR A SIDEWALK, AND TO REDUCE THE 50' STRUCTURE AND USE SETBACK FROM AN R-12 ZONE (PARCEL 1039) FROM 50' TO 48.35' (3.36% REDUCTION) FOR A BUILDING.
 - SECTION 117.4.D.2.c. REDUCE THE STRUCTURE OR USE SETBACK FOR AN ASSISTED LIVING FACILITY FROM A PUBLIC ROAD (GUILFORD ROAD) FROM 30' TO 24' (20% REDUCTION) FOR A BUILDING, AND TO REDUCE THE STRUCTURE AND USE SETBACK FROM A PUBLIC ROAD FROM 30' TO 28.42' (6.27% REDUCTION) FOR A PARKING LOT.
 - SECTION 117.4.D.1.b. INCREASE THE MAXIMUM BUILDING HEIGHT FOR AN ASSISTED LIVING FACILITY FROM 40' TO 48' (20% INCREASE).

ENVIRONMENTAL SITE DESIGN NARRATIVE

- THE SITE IS LOCATED AT 10210 GUILFORD ROAD IN JESSUP, MARYLAND. THE SITE CONSIST OF 1.426 ACRES ZONED CCT. THIS DEVELOPMENT PROPOSES TO REMOVE THE EXISTING VACANT DWELLING AND CONSTRUCT AN ASSISTED LIVING HOUSING AND ASSOCIATED INFRASTRUCTURE. ANY IMPACTS TO THE ENVIRONMENTAL RESOURCES SHALL BE THE LEAST NECESSARY FOR THE DEVELOPMENT OF THIS PROJECT.
- THE SITE NATURALLY SLOPES FROM NORTH TO SOUTH TOWARDS THE EXISTING LITTLE PATUXENT RIVER LOCATED SOUTH OF OLD GUILFORD ROAD. THE SITE HAS BEEN DESIGNED TO MAINTAIN THE NATURAL DRAINAGE PATTERNS, WITH NO DRAMATIC CHANGES TO THE NATURAL DRAINAGE. AN ALTERNATIVE COMPLIANCE WILL BE REQUESTED TO ALLOW THE REMOVAL OF THREE SPECIMEN TREES.
- THE CONCEPTUAL REDUCTION IN IMPERVIOUS AREA THROUGH BETTER SITE DESIGN IS ACHIEVED THROUGH THE ENVIRONMENTAL SITE DESIGN (ESD) FOR THE PROJECT TO THE MAXIMUM EXTENT PRACTICABLE (MEP). THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION". THE ESD CONCEPT INCLUDES THE USE OF THREE MICRO-BIORETENTION FACILITIES (M-6). THE TARGET REQUIRED PROVIDED PER 18", THE ESDv REQUIRED IS 4,080 CF, AND THE ESDv PROVIDED IS 4,159 CF.
- SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH STANDARD INLET PROTECTION FOR INLETS AND SILT FENCE FOR THE PERIMETER SEDIMENT CONTROL. SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD COUNTY CONSERVATION DISTRICT DURING THE FUTURE SITE DEVELOPMENT PLAN PHASE OF THE PROJECT.
- STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF THREE (3) MICRO-BIORETENTION FACILITIES (M-6). THE PROPOSED PRACTICES HAVE BEEN MAXIMIZED TO THE MAXIMUM EXTENT PRACTICAL.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

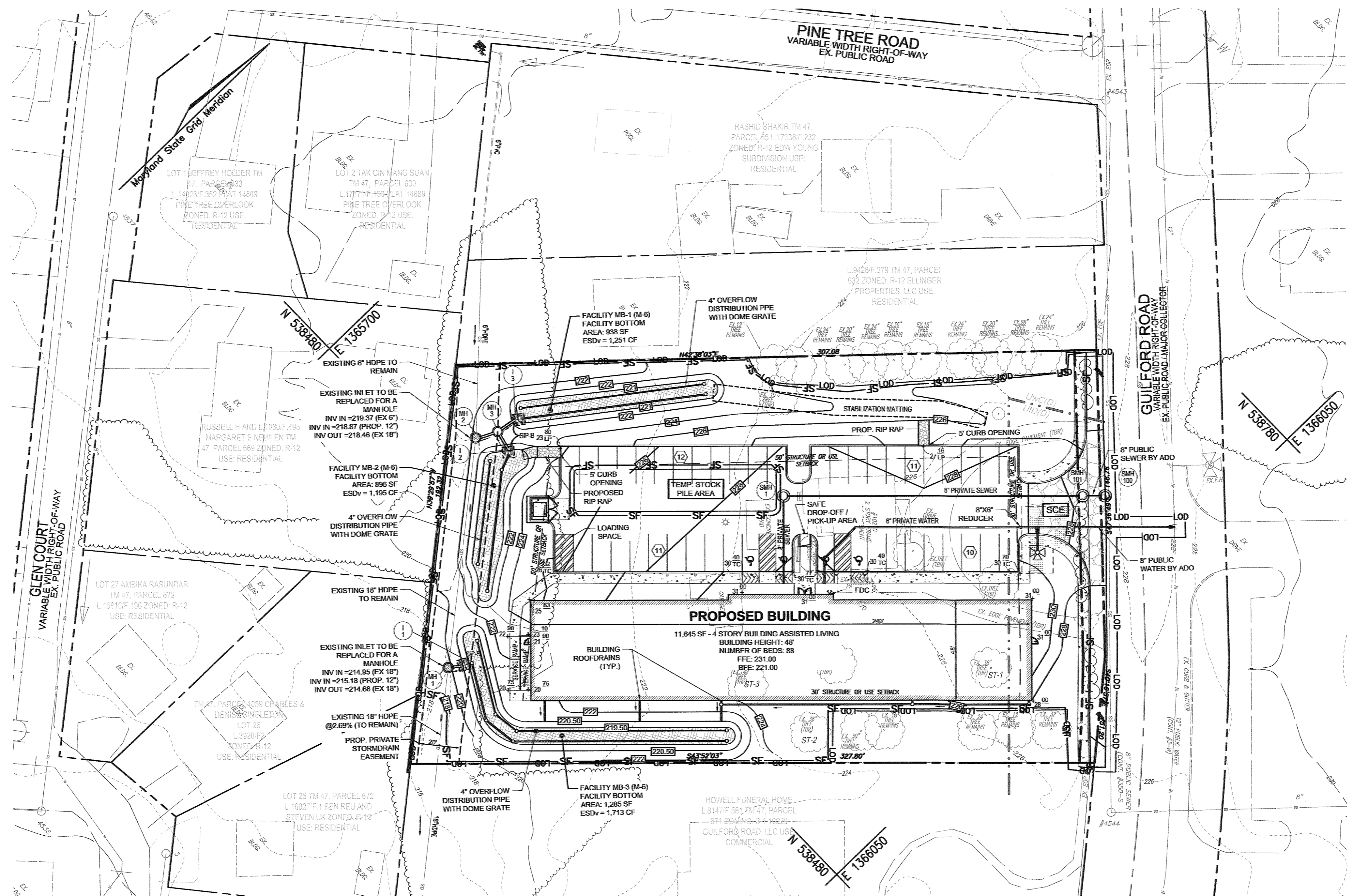
[Signature] 11-16-18
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 11-14-18
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

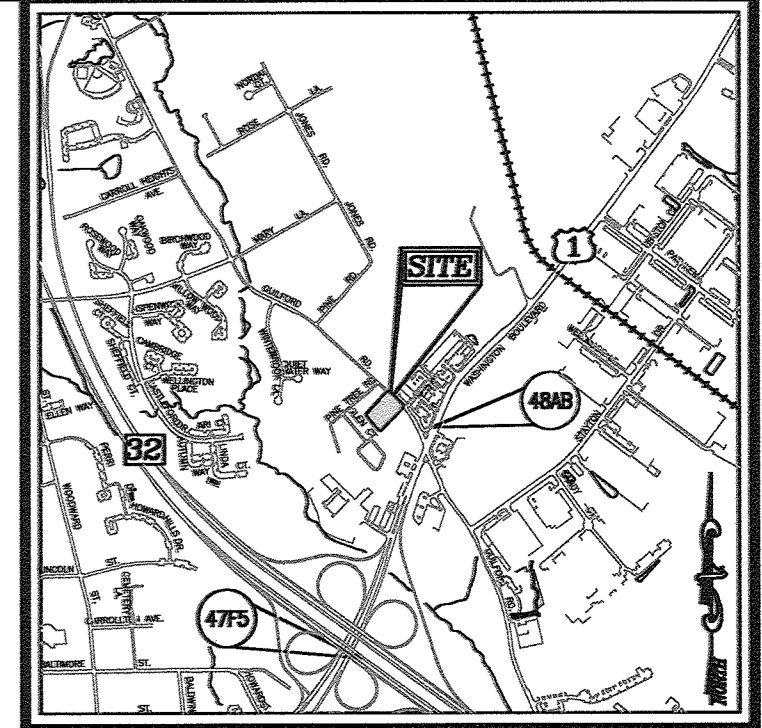
ENVIRONMENTAL CONCEPT PLAN

GUILFORD ASSISTED LIVING

10210 GUILFORD ROAD



BENCHMARKS
 BENCHMARK NO. 1: COUNTY CONTROL #484B
 N. 53894.464, E. 1366415.858 ELEV. = 226.357
 BENCHMARK NO. 2: COUNTY CONTROL #47F5
 N. 53995.011 E. 1366653.538 ELEV. = 225.032



VICINITY MAP
 SCALE: 1"=2000'
 ADC MAP COORDINATE: 41-A3

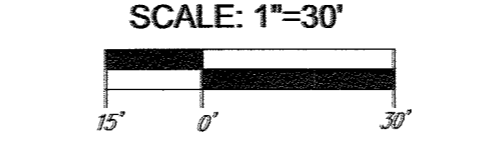
LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING TREETRUELINE
- PROPOSED TREETRUELINE
- EXISTING SPECIMEN TREE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED CURB
- PROPOSED SIDEWALK
- MICRO-BIORETENTION
- PROPOSED PUBLIC WATER & UTILITY EASEMENT
- LIMIT OF DISTURBANCE
- SILT FENCE
- STANDARD INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE

SITE ANALYSIS

LOCATION	JESSUP, MD; TAX MAP 47, BLOCK 6, PARCEL 67
ELECTION DISTRICT	6TH ELECTION DISTRICT
PRESENT ZONING	CCT (COMMUNITY CENTER TRANSITION)
PROJECT AREA	1.426 ACRES
DPZ REFERENCES	L17209 F.66
USE OF STRUCTURE	ASSISTED LIVING
TOTAL BUILDING COVERAGE	11,645 SF (0.27 AC. OR 18.93% OF GROSS AREA)
PAVED PARKING LOT AREA ON-SITE	13,157 SF (0.30 AC. OR 21.03% OF GROSS AREA)
AREA OF LANDSCAPE ISLAND	1,557 SF (0.036 AC OR 2.52% OF GROSS AREA)
LIMIT OF DISTURBANCE AREA	1.15 AC
WETLAND WITHIN LOD	0 AC
WETLAND BUFFERS WITHIN LOD	0 AC
STREAMS AND THEIR BUFFERS WITHIN LOD	0 AC
AREA OF ON-SITE 100YEAR FLOODPLAIN WITHIN LOD	0 AC
AREA OF EXISTING FOREST WITHIN LOD	0 AC
AREA OF ON-SITE NRCS /MDC /HSCD STEEP SLOPES (20% OR GREATER)	0 AC
AREA OF ON-SITE STEEP SLOPES (25% OR GREATER)	0 AC
AREA OF ERODIBLE SOILS	0 AC
AREA MANAGED BY ESDv	1.00 AC
IMPERVIOUS AREA (MANAGED BY ESDv)	0.63 AC
GREEN AREA (MANAGED BY ESDv)	0.37 AC

ESDv CONCEPT PLAN



SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET AND ESDv CONCEPT PLAN	1 OF 2
STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS	2 OF 2

Specimen Tree Chart

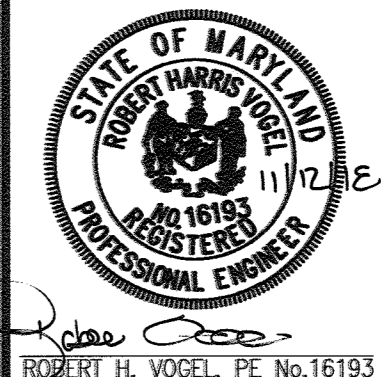
Key (X#)	Species	Size (in dbh)	CRZ (feet radius)	Comments
1	Willow oak	36	54	Good condition, to be removed
2	Loblolly pine	34	51	Good condition, to be removed
3	Willow oak	46.5	69.75	Good condition, to be removed

OWNER/DEVELOPER
 DAVID XU
 163 MOUNTAIN ROAD
 PASEDENA, MD 21122
 C/O KEVIN XU
 (443) 370-5402

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
COVER SHEET AND ESDv CONCEPT PLAN
GUILFORD ASSISTED LIVING
 10210 GUILFORD ROAD
 ZONED: CCT
 PARCEL 67
 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 3300 NORTH RIDGE ROAD TEL: 410-461-7666
 SUITE 110 FAX: 410-461-8961
 ELLICOTT CITY, MD 21043



DESIGN BY: JPR
 DRAWN BY: JPR
 CHECKED BY: RHY
 DATE: NOVEMBER 12, 2018
 SCALE: AS SHOWN
 W.O. NO.: 16-23

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

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), AND ENHANCED FILTERS (M-9)

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

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 A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUINCY GRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
 - * SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
 - * ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
 - * CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
 - * PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.
THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL, IF TOPSOIL IS IMPORTED, THEN A SOLUBLE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.
3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF 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 CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE. WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE. WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL
RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION
COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.
GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL LAYER FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

- * PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
- * PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4M) GALVANIZED HARDWARE CLOTH.
- * GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- * THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
- * A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
- * A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

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

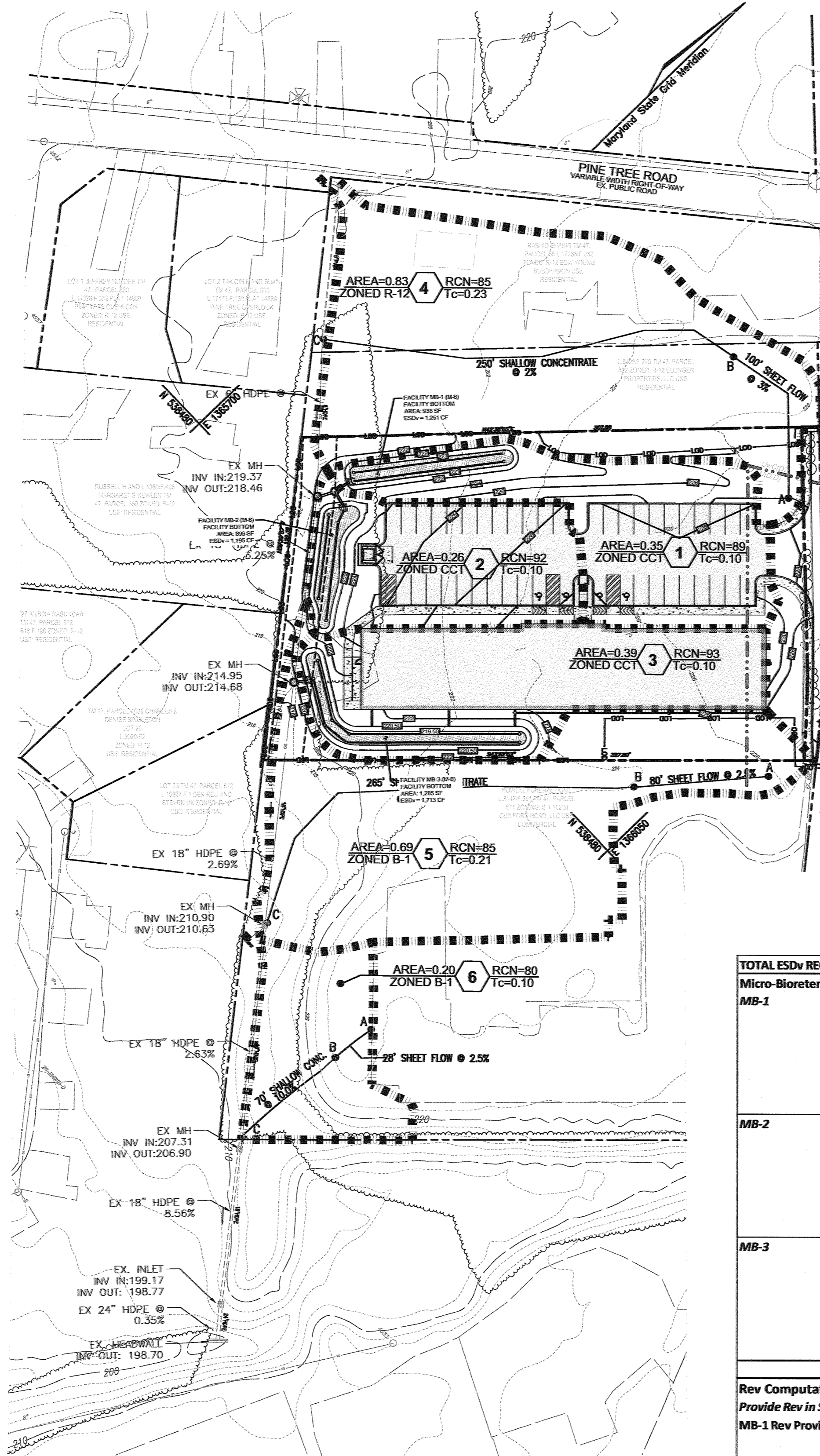
SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K FACTOR	ERODIBLE	ACREAGE
U1D	URBAN LAND - UDRTHMENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	0.28	NO	0.22
U1C	URBAN LAND - WOODTOWN-SASSAFRAS COMPLEX, 5 TO 16% SLOPES	D	0.17	NO	1.205

SOILS 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.

LEGEND

- PROPOSED IMPERVIOUS AREA
- DRAINAGE AREA LIMITS



ESD DRAINAGE AREA MAP

SCALE: 1"=50'

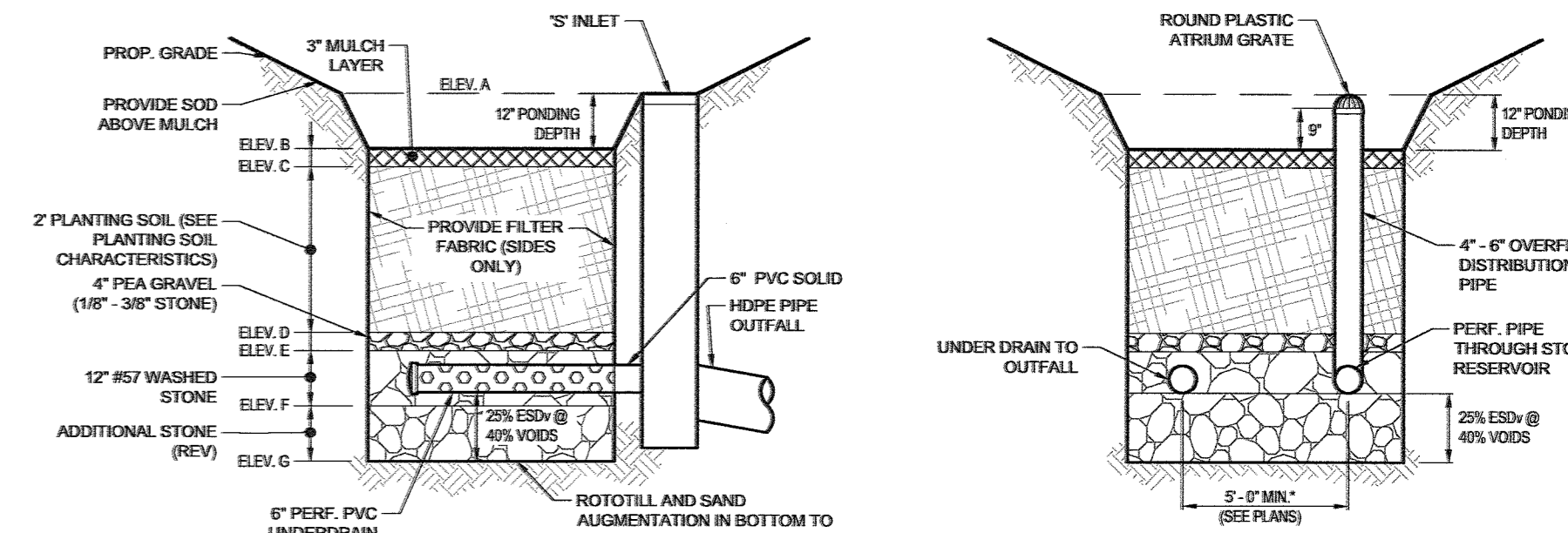


DA	Drainage Area Calculation						% Impv	Rv (a)	Min ESDv (CF) (b)	Req ESDv (CF) (c)	Max ESDv (CF) (d)	ESDv Provided (CF)	Facility Type	Facility Surface Area (SF)	Ponding Depth (in)	Rev Stone Provided (CF)	Rev Stone Depth	
	Total (SF)	Pervious Area (SF)	Impervious Area (SF)	Total (AC)	Pervious Area (AC)	Impervious Area (AC)												
1	15,191	7,965	7,226	0.35	0.18	0.17	48	605	1,089	1,574	1,251	Micro-Bio (M-6)	938	12	586	0.83		
2	11,339	3,371	7,968	0.26	0.08	0.18	70	645	1,161	1,677	1,195	Micro-Bio (M-6)	896	12	560	0.83		
3	16,960	4,904	12,056	0.39	0.11	0.28	71	975	1,755	2,535	1,713	Micro-Bio (M-6)	1,285	12	803	0.83		
Total												4,159						
Required												4,080						

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

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

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile	n/a		PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; F _c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.



MICRO-BIORETENTION (UNDERDRAIN) and **MICRO-BIORETENTION (OVERFLOW)**

- MICROBIORETENTION NOTES:**
1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MBR TO FAIL, AND THEREFORE SHALL NOT BE INSTALLED.
 2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.
 3. PROVIDE 5" MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS. (SEE PLANS)

OWNER/DEVELOPER

DAVID XU
163 MOUNTAIN ROAD
PASKETOWN, MD 21122
C/O KEVIN XU
(443) 370-5402

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS
GUILFORD ASSISTED LIVING
10210 GUILFORD ROAD
ZONED: CCT
PARCEL: 67
HOWARD COUNTY, MARYLAND

TAX MAP 47 BLOCK 6
6TH ELECTION DISTRICT

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
3300 NORTH RIDGE ROAD TEL: 410-461-7666
SUITE 1110 FAX: 410-461-8961
ELLIOTT CITY, MD 21043

PROFESSIONAL CERTIFICATE

DESIGN BY: JPR
DRAWN BY: JPR
CHECKED BY: RHY
DATE: NOVEMBER 12, 2018
SCALE: AS SHOWN
W.D. NO.: 16-23

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 EXPIRES DATE: 09-27-2020

2 SHEET OF 2

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/16/19
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 11/14/19
CHIEF, DIVISION OF LAND DEVELOPMENT