

SHEET INDEX	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	EXISTING CONDITIONS & SOILS PLAN
3	ENVIRONMENTAL CONCEPT PLAN
4	STORMWATER MANAGEMENT NOTES AND DETAILS

SOILS LEGEND			
SOIL	NAME	CLASS	K VALUE
GqB	Glástone-Urban land complex, 0 to 8 percent slopes	B	0.32
Gub	Glenville-Urban land-Udorthents complex, 0 to 8 percent slopes	C	0.49

HOWARD COUNTY SOILS MAP 17; CLARKSVILLE NE

STORMWATER MANAGEMENT PRACTICES BY LOT			
AREA ID.	DRYWELL (M-5) QUANTITY	MICRO-BIO (M-6) NUMBER	REMARKS
LOT 1	4	1	HOUSE DRAINS TO DRYWELLS ON LOT PROPOSED DRIVEWAY DRAINS TO MICRO BIO ON LOT
LOT 2	-	-	EXISTING HOUSE AND SHARED DRIVEWAY TO REMAIN
LOT 3	4	1	HOUSE DRAINS TO DRYWELLS ON LOT PROPOSED DRIVEWAY DRAINS TO MICRO BIO ON LOT

GROSS AREA = 1.82 ACRES
 LOD = 1.06 ACRES
 RCN = 55.0
 TARGET Pe = 1.2'

STORMWATER MANAGEMENT PRACTICES						
LOCATION	AREA ID	DRAINAGE AREA SF.	% IMPERVIOUS	ESDV REQUIRED Cuft.	ESDV PROVIDED Cuft.	DRY WELL M-5 (Y/N)
LOT 1	(M-5)1A	4,532	68.0%	224	395	Y
	(M-5)1B	334	100.0%	39	144	Y
	(M-5)1C	796	100.0%	72	115	Y
	(M-5)1D	802	100.0%	77	115	Y
	(M-5)1E	796	100.0%	76	144	Y
LOT 2	EXISTING HOUSE AND SHARED DRIVEWAY TO REMAIN					
	(M-5)2A	3,352	78.0%	254	340	Y
LOT 3	(M-5)3A	395	100.0%	39	144	Y
	(M-5)3B	796	100.0%	72	144	Y
	(M-5)3C	800	100.0%	76	144	Y

STORMWATER MANAGEMENT DESIGN NARRATIVE

INTRODUCTION:
 THIS REPORT WILL DEMONSTRATE HOW THE CRITERIA SET FORTH IN THE MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I AND II (EFFECTIVE OCTOBER 2000, REVISED MAY 2009) WILL BE SATISFIED FOR THIS PROJECT. THE GOAL OF CREATING HYDROLOGY SIMILAR TO THAT OF "WOODS IN GOOD CONDITION" WILL BE ACCOMPLISHED THROUGH THE USE OF DRY WELLS AS SUGGESTED WITHIN CHAPTER 5 OF PREVIOUSLY MENTIONED MANUAL. THE ACHIEVEMENT OF THIS GOAL WILL REMOVE THE REQUIREMENT OF PROVIDING CHANNEL PROTECTION VOLUME.

GENERAL SITE CONDITIONS:

THE SUBJECT PROPERTY IS ZONED R-20 AND LOCATED ON TAX MAP 31, PARCEL NO. 35 OF THE HOWARD COUNTY, MARYLAND TAX MAP DATABASE SYSTEM. THE PROPERTY CONSISTS OF 1.81 ACRES, IS RECTANGULAR IN SHAPE AND IS IMPROVED WITH A RANCH STYLE SINGLE FAMILY RESIDENCE AND SEVERAL SHEDS. THE PROPERTY IS BORDERED BY RESIDENTIAL LOTS AND HAS ROAD FRONTAGE ON OWEN BROWN ROAD, A MAJOR COLLECTOR PUBLIC ROAD, TO THE SOUTH. CURRENTLY ACCESS TO THE PROPERTY IS FROM AN EXISTING SHARED DRIVEWAY WITH LOTS 1B, 19 AND 20; EDWIN BASSLER SUBDIVISION NO. 2 PLAT NO. 6594. THE EXISTING HOUSE IS TO REMAIN. THIS PROJECT PROPOSES A SUBDIVISION CONSISTING OF THREE (3) LOTS INCLUDING TWO (2) PIPE STEM LOTS USING THE EXISTING SHARED DRIVEWAY FOR A TOTAL OF SIX (6) LOTS. THE PROPERTY IS LOCATED WITHIN THE LITTLE PATUXENT RIVER WATERSHED (02131105) AND THE SITE CURRENTLY DRAINS AROUND THE EXISTING HOUSE WITH THE FRONT PORTION OF THE PROPERTY DRAINING TO A ROADSIDE SWALE ON THE NORTH SIDE OF OWEN BROWN ROAD. THE PORTION OF THE PROPERTY TO REAR OF THE EXISTING HOUSE DRAINS TO THE NORTH WEST CORNER PROPERTY. THE RUNOFF FROM THE ROOFS AND DRIVEWAYS OF THE PROPOSED HOUSES WILL BE TREATED BY A COMBINATION OF SIX (M-5) DRYWELLS AND TWO (M-6) MICRO BIORETENTION FACILITIES WHICH WILL BE OWNED AND PRIVATELY MAINTAINED BY THE INDIVIDUAL HOMEOWNERS. THE WEB SOIL SURVEY SHOWS SOILS ON THE SITE CONSIST OF GLENELG-URBAN LAND COMPLEX (GHB), TYPE "B" SOILS.

- NATURAL RESOURCE PROTECTION:**
 TO ENSURE THE PROTECTION OF NATURAL RESOURCES LOCATED ON THIS SITE, ALL BUFFERS WILL BE HONORED BY LOCATING IMPROVEMENTS AWAY FROM ENVIRONMENTALLY SENSITIVE AREAS.
- MAINTENANCE OF NATURAL FLOW PATTERNS:**
 IT IS THE INTENT OF THE PROPOSED DESIGN TO DISCHARGE RUNOFF SIMILAR TO THE CHARACTERISTICS AND DIRECTION OF THIS SITE PRIOR TO ANY OF THE PROPOSED IMPROVEMENTS.
- REDUCTION OF IMPERVIOUS AREAS THROUGH BETTER SITE DESIGN, ALTERNATIVE SURFACES AND NONSTRUCTURAL PRACTICES**
 ONLY THE MINIMUM AMOUNT OF PAVING IS BEING PROPOSED AT THIS TIME.
- INTEGRATION OF EROSION AND SEDIMENT CONTROLS INTO STORMWATER STRATEGY:**
 IF REQUIRED SEDIMENT TRAPPING WILL BE PLACED IN THE AREA OF BIO-RETENTION FACILITIES.
- IMPLEMENTATION OF ESD PLANNING TECHNIQUES AND PRACTICES TO THE MAXIMUM EXTENT PRACTICABLE (MPE):**
 THE FULL REQUIRED ESD VOLUME IS BEING PROVIDED FOR PROPOSED IMPROVEMENTS AND THE ALTERNATIVE ACCESS SHOULD THE NEED EVER ARISE.
- REQUEST FOR DESIGN MANUAL WAIVER:**
 NO WAIVERS ARE BEING REQUESTED AT THIS TIME.

STORMWATER MANAGEMENT NOTES

- STORMWATER MANAGEMENT IS PROVIDED IN ACCORDANCE WITH WITH CHAPTER 5, "ENVIRONMENTAL SITE DESIGN OF THE 2007 MARYLAND STORMWATER MANAGEMENT DESIGN MANUAL, EFFECTIVE MAY 4, 2010.
- MAXIMUM CONTRIBUTING ROOF TOP AREA TO EACH DOWNSPOUT SHALL BE 500 SQ. FT. OR LESS.
- FINAL GRADING SHALL BE PROVIDED WITH THE SITE DEVELOPMENT PLAN.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DATE: 7/19/21
 DATE: 7/19/21

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTENAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
 ELLETT CITY, MARYLAND 21042
 (410) 461-2995

ENVIRONMENTAL CONCEPT PLAN

POPE PROPERTY

LOTS 1 THRU 3

A RESUBDIVISION OF

EDWIN BASSLER PROPERTY - LOT 2

R-20 (RESIDENTIAL: SINGLE) DISTRICT

TAX MAP No. 35 GRID No. 12 PARCEL NO. 179

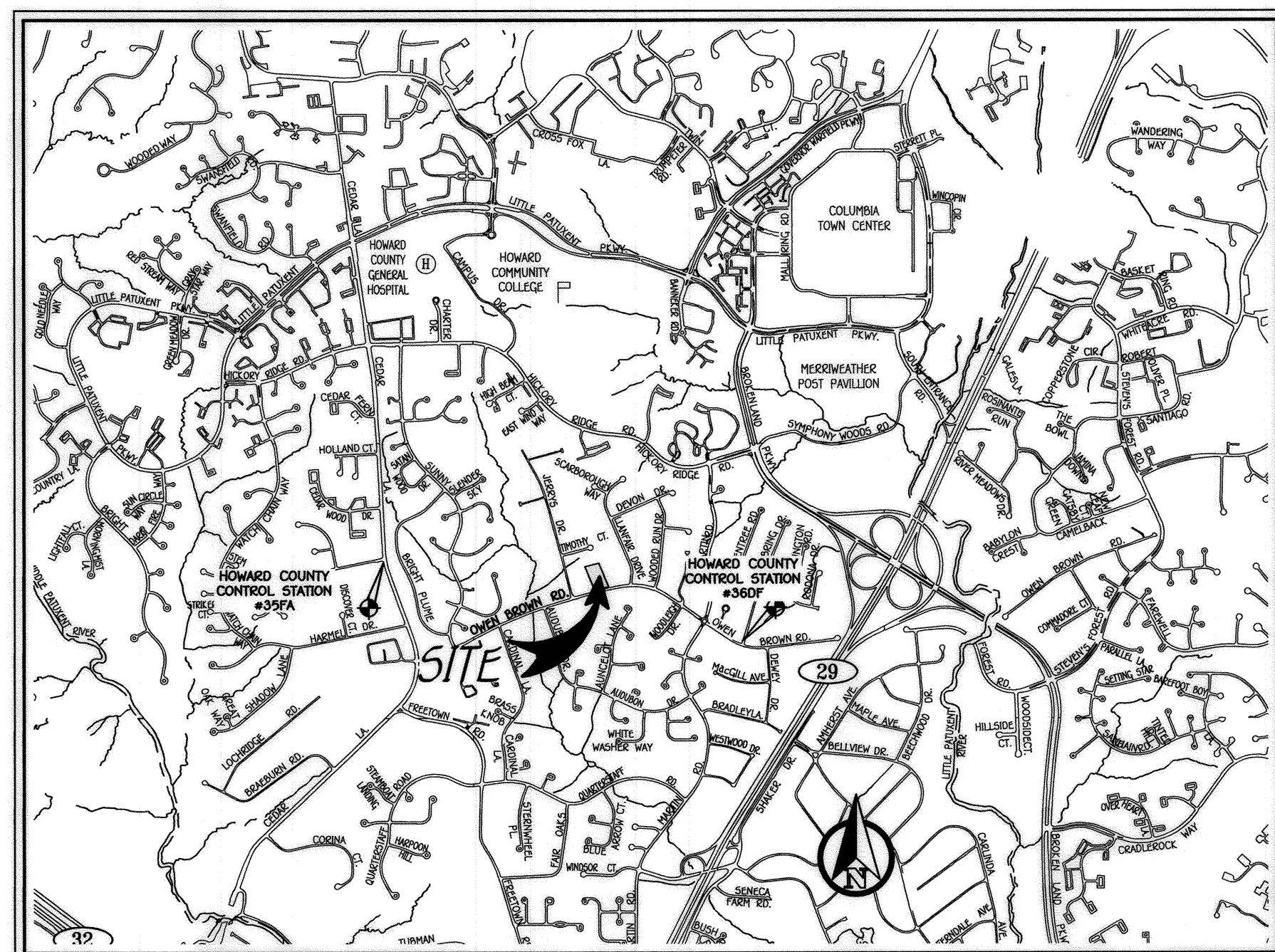
SEVENTH ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	EXISTING CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
---	EXISTING FENCE
X 440.5	SPOT ELEVATION
---	EXISTING STORM DRAIN
---	EXISTING WATER LINE
---	EXISTING SEWER LINE
---	EXISTING OVERHEAD WIRE
---	EXISTING PAVING
---	PROPOSED PAVING
---	PRIVATE UIC EASEMENT
---	PRIVATE DRAINAGE & UTILITY EASEMENT
---	LIMIT OF DISTURBANCE
---	SUPER SILT FENCE/TREE PROTECTION FENCE
---	DIVERSION FENCE/TREE PROTECTION FENCE
---	EARTH DIKE
---	EXISTING TREE LINE
---	PROPOSED TREE LINE
---	DRAINAGE DIVIDE
---	SOIL LINES AND TYPES
---	BIO RETENTION FACILITY (F-6) OR (M-6) AS NOTED
---	PROPOSED ROOF LEADER
---	DENOTES EXISTING TREES TO REMAIN
ST 3	SPECIMEN TREE
---	CRITICAL ROOT ZONE
B-1	DENOTES SWM TEST BORING LOCATION

SITE ANALYSIS DATA CHART

- TOTAL AREA OF THIS SUBMISSION = 1.82 AC.+
- LIMIT OF DISTURBED AREA = 1.08 AC.+ (SWM BASED ON LOD)
- PRESENT ZONING DESIGNATION = R-20 (PER 10/06/2013 COMPREHENSIVE ZONING PLAN)
- PROPOSED USE: RESIDENTIAL SINGLE FAMILY DETACHED
- PREVIOUS HOWARD COUNTY FILES: N/A
- TOTAL AREA OF FLOODPLAIN LOCATED ON-SITE = 0 AC.
- TOTAL AREA OF SLOPES IN EXCESS OF 25% = 0 AC.
- TOTAL AREA OF WETLANDS (INCLUDING BUFFER) = 0 AC.
- TOTAL AREA OF STREAM (INCLUDING BUFFER) = 0 AC.
- TOTAL AREA OF EXISTING FOREST = 0 AC.
- TOTAL AREA OF FOREST TO BE RETAINED = 0 AC.
- TOTAL AREA OF LOTS / BUILDABLE PARCELS = 1.82 AC.
- TOTAL GREEN OPEN AREA (PERVIOUS) = 1.61 AC.
- TOTAL IMPERVIOUS AREA = 0.21 AC. (WITHIN LOD)
- EXCLUDES EXISTING IMPERVIOUS = 0 AC.
- TOTAL AREA OF ERODIBLE SOILS = 0 AC.

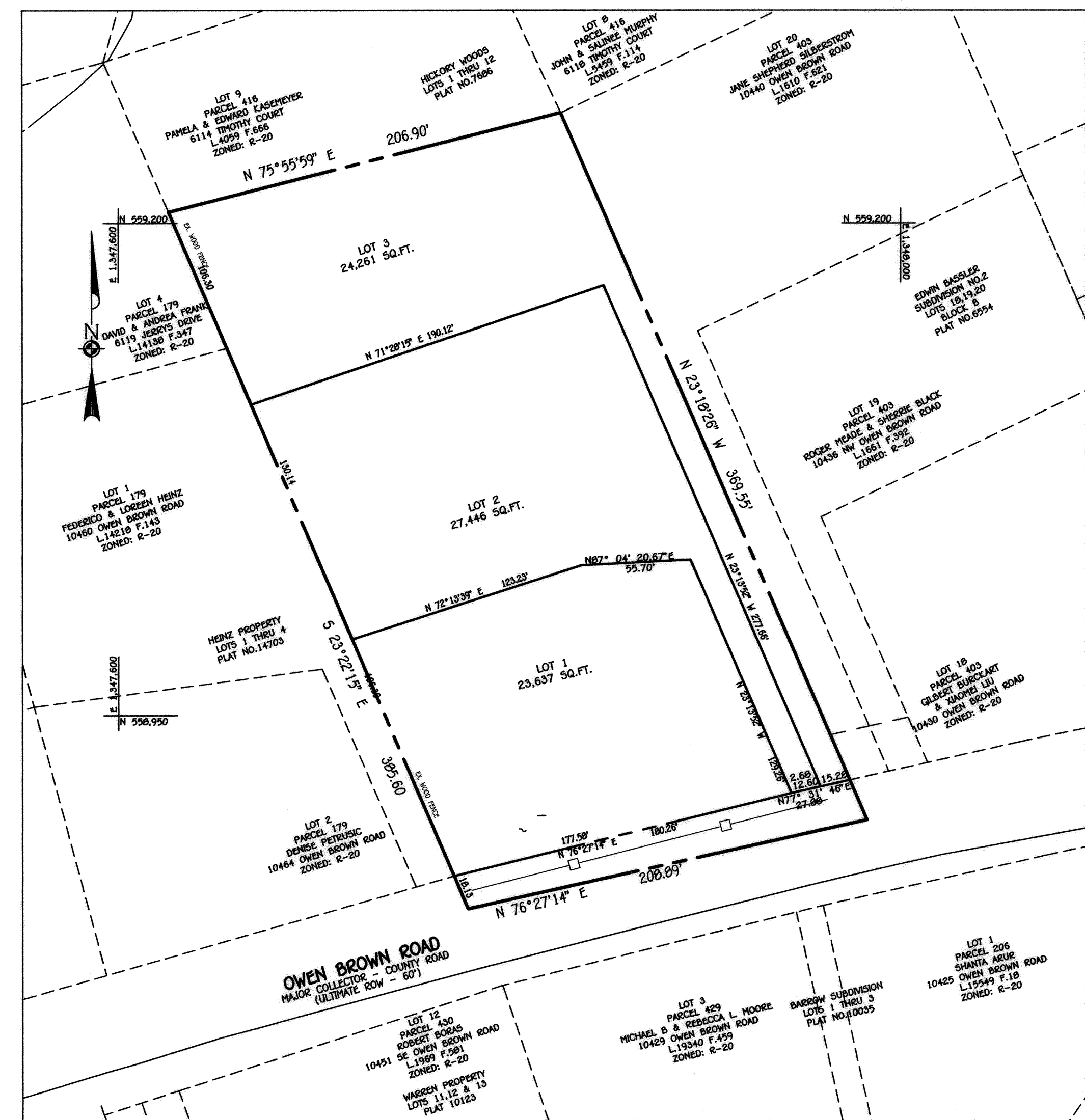
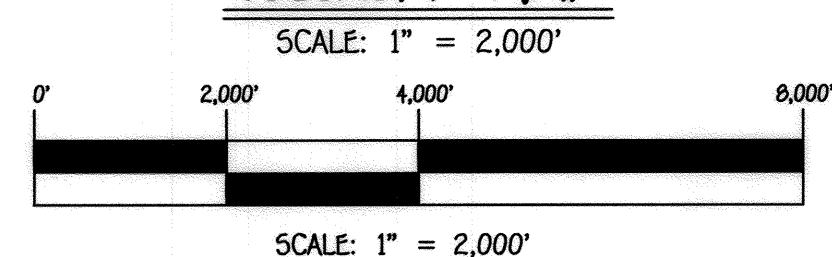


HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 35FA
 N 559,266.116 E 1,344,682.707 ELEVATION: 410.34

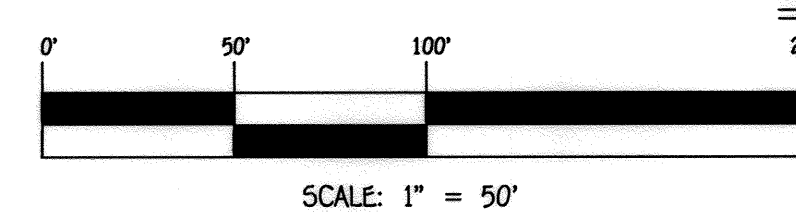
HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 360F
 N 559,122.36 E 1,349,924.206 ELEVATION: 392.34

REFER TO HOWARD CO. ADC MAP 32-62

VICINITY MAP



BOUNDARY EXHIBIT



TITLE SHEET

10446 OWEN BROWN ROAD
 LOTS 1 THRU 3



PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/23.

DATE: 7/19/21
 FRANK MANALANSAN, II

OWNER/DEVELOPER
 ANDREW POPE
 10446 OWEN BROWN ROAD
 COLUMBIA, MARYLAND 21044
 301-641-0897

TAX MAP NO.: 35 GRID NO.: 12 PARCEL NO.: 179
 ZONED R-20
 SEVENTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: MAY, 2021
 SHEET 1 OF 4

GENERAL NOTES

- THE SUBJECT PROPERTY IS ZONED R-20 (PER 10/06/13 COMPREHENSIVE ZONING PLAN).
- BOUNDARY IS BASED ON A FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS & CARTER ON OR ABOUT MAY, 2019.
- CONTOURS ARE BASED ON A TOPOGRAPHIC FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS AND CARTER, ON OR ABOUT MAY, 2019.
- COORDINATES BASED ON NAD83 MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 360A AND NO. 360B:
 HOWARD COUNTY MONUMENT NO. 35FA N 559,266.116 E 1,344,682.707 ELEV. 410.340
 HOWARD COUNTY MONUMENT NO. 360F N 559,122.36 E 1,349,924.206 ELEV. 392.340
- STORM WATER MANAGEMENT IS IN ACCORDANCE WITH THE M.D.E. STORM WATER DESIGN MANUAL, VOLUMES 1 & II, REVISED 2009. THIS PLAN PROPOSES THE USE OF FIVE (M-5) DRYWELLS AND TWO (M-6) MICRO-BIORETENTION FACILITIES.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. PUBLIC WATER AND SEWER WILL BE UTILIZED FOR THIS PROJECT.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAM(S) OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100 YEAR FLOODPLAIN.
- THERE ARE NO WETLANDS, STREAMS OR THEIR BUFFERS LOCATED WITHIN THE BOUNDARY OF THIS SITE.
- LANDSCAPING WILL BE PROVIDED AT THE FINAL PLAN STAGE OF THIS PROJECT.
- FOREST CONSERVATION REQUIREMENTS FOR THIS PROPOSED SUBDIVISION WILL BE PROVIDED AT THE FINAL PLAN STAGE OF THIS PROJECT IN ACCORDANCE WITH SECTION 16.1200 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION ACT. IT IS ANTICIPATED THAT A FEE-IN-LIEU OF AFFORESTATION WILL BE REQUESTED.
- THE EXISTING HOUSE ON LOT 2 IS TO REMAIN.
- SOIL BORING INFORMATION WILL BE PROVIDED AT THE NEXT PLAN STAGE OF THIS PROJECT. APPROVAL OF THIS ECP DOES NOT CONSTITUTE APPROVAL OF SUBSEQUENT OR ASSOCIATED SUBDIVISION OR SITE DEVELOPMENT PLANS OR RED-LINE REVISIONS. 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, SITE DEVELOPMENT PLAN, OR RED-LINE REVISION PROCESSES. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THE PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
- THIS PROJECT IS CLASSIFIED AS RESIDENTIAL INFILL DEVELOPMENT AND IS SUBJECT TO SECTION 16.127 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE REGULATIONS STATE THAT THE REQUIRED FRONT YARD SETBACK SHALL BE ESTABLISHED AS THE AVERAGE OF THE EXISTING FRONT YARD SETBACKS OF THE BLOCK FACE AREA OR THE AREA WITHIN 500 FEET IN EITHER DIRECTION OF THE SUBJECT PROPERTY, WHICHEVER IS LESS. THE BLOCK FACE AREA CONSISTS OF THE AREA BETWEEN THE SUBJECT PROPERTY AND THE INTERSECTION OF ANY TWO STREETS MEASURED ALONG THE SIDE OF THE STREET THAT THE SUBJECT PROPERTY IS LOCATED. IN THIS CASE THE AVERAGE SETBACK OF EXISTING HOUSES BETWEEN JERRY'S DRIVE AND LANFAIR DRIVE IS 54.9 FEET TO THE EXISTING RIGHT OF WAY.
- THIS ENVIRONMENTAL CONCEPT PLAN IS SUBJECT TO APPROVAL A DESIGN MANUAL WAIVER TO SECTION SECTION 16.132(A)(2) OR PUBLIC ROAD FRONTAGE IMPROVEMENTS WILL BE PROVIDED ON THE SUBDIVISION PLAN STAGE. AT THE SUBDIVISION PLAN STAGE DESIGN MANUAL WAIVER WILL BE SUBMITTED UNDER SEPARATE COVER TO ADDRESS FRONTAGE IMPROVEMENT REQUIREMENTS

SPECIMEN TREE DATA					
NO.	SPECIES	SIZE	CRZ	COMMENTS	TO BE REMOVED
ST-1	SOUTHERN RED OAK	42"	63'	GOOD-IMPACTED BY EXISTING PAVING	NO
ST-2	SOUTHERN RED OAK	43.5"	65.25'	GOOD-IMPACTED BY EXISTING PAVING	NO
ST-3	SOUTHERN RED OAK	30"	45'	GOOD-IMPACTED BY EXISTING PAVING	NO
ST-4	SILVER MAPLE	33"	49.5'	GOOD-IN HORSE PASTURE, MULTI-STEMMED	NO

LEGEND	
SYMBOL	DESCRIPTION
--- (dashed line)	EXISTING CONTOUR 2' INTERVAL
--- (dashed line)	EXISTING CONTOUR 10' INTERVAL
---	EXISTING FENCE
---	EXISTING STORM DRAIN
⊙	EXISTING WELL
---	EXISTING WATER LINE
---	EXISTING SEWER LINE
---	EXISTING OVERHEAD WIRE
---	BUILDING AND DRIVES TO BE REMOVED
---	EXISTING PAVING
---	EXISTING TREE LINE
GfB, GfC	SOIL LINES AND TYPES
☼, ☼	DENOTES EXISTING TREES TO REMAIN
⊙	SPECIMEN TREE
⊙	CRITICAL ROOT ZONE
⊙ B-1	DENOTES 5MM TEST BORING LOCATION



APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature]
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 7-19-21

[Signature]
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 7/14/21

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PLACE
 ELKROTT CITY, MARYLAND 21042
 (410) 461-2895

SOILS LEGEND			
SOIL	NAME	CLASS	'K' VALUE
GfB	Gibbstone-Urban land complex, 0 to 8 percent slopes	B	0.32
GuB	Glenville-Urban land-Udorthents complex, 0 to 8 percent slopes	C	0.49

HOWARD COUNTY SOILS MAP 17; CLARKSVILLE, NE

PLAN
 SCALE: 1" = 30'

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/23.

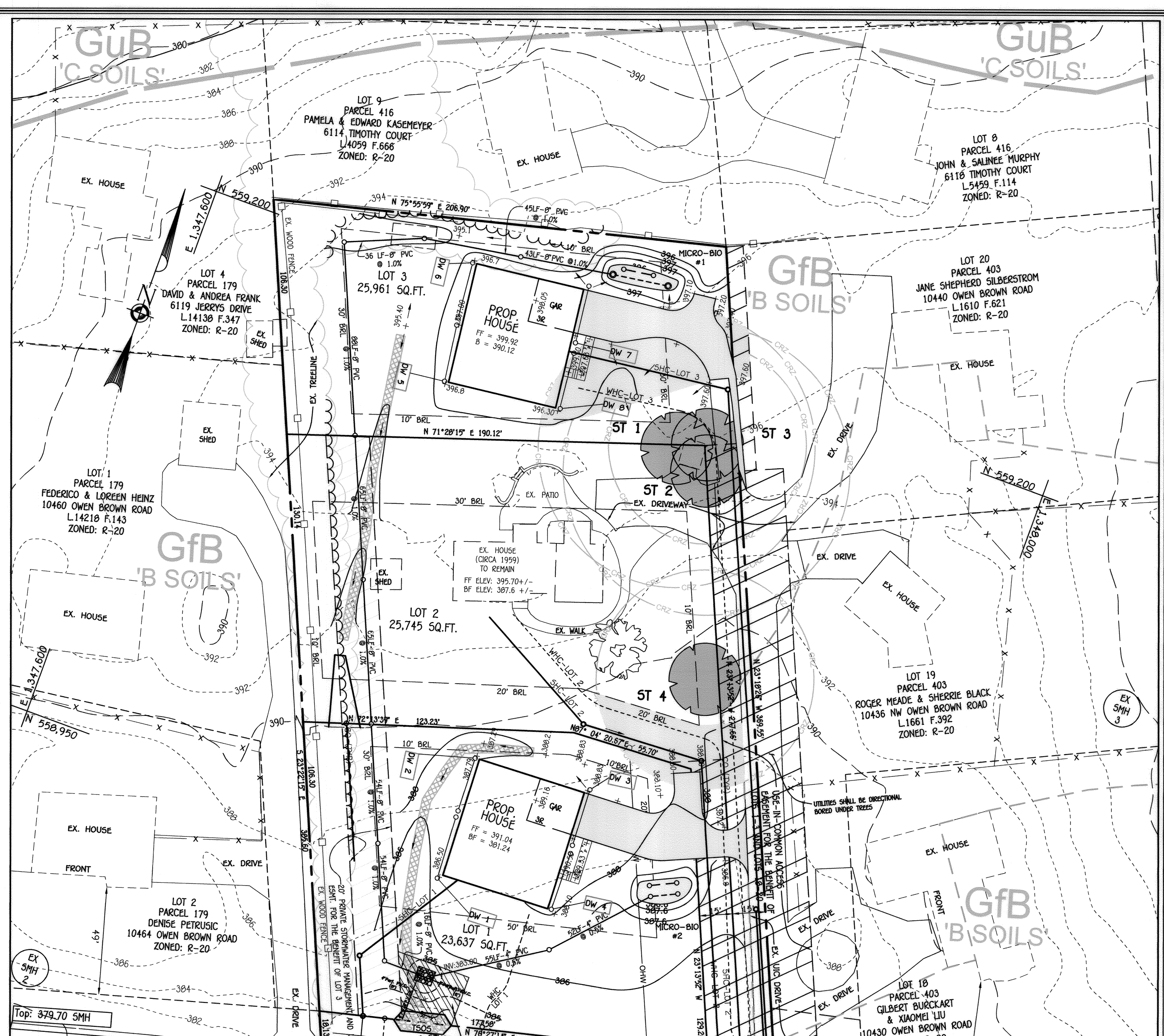
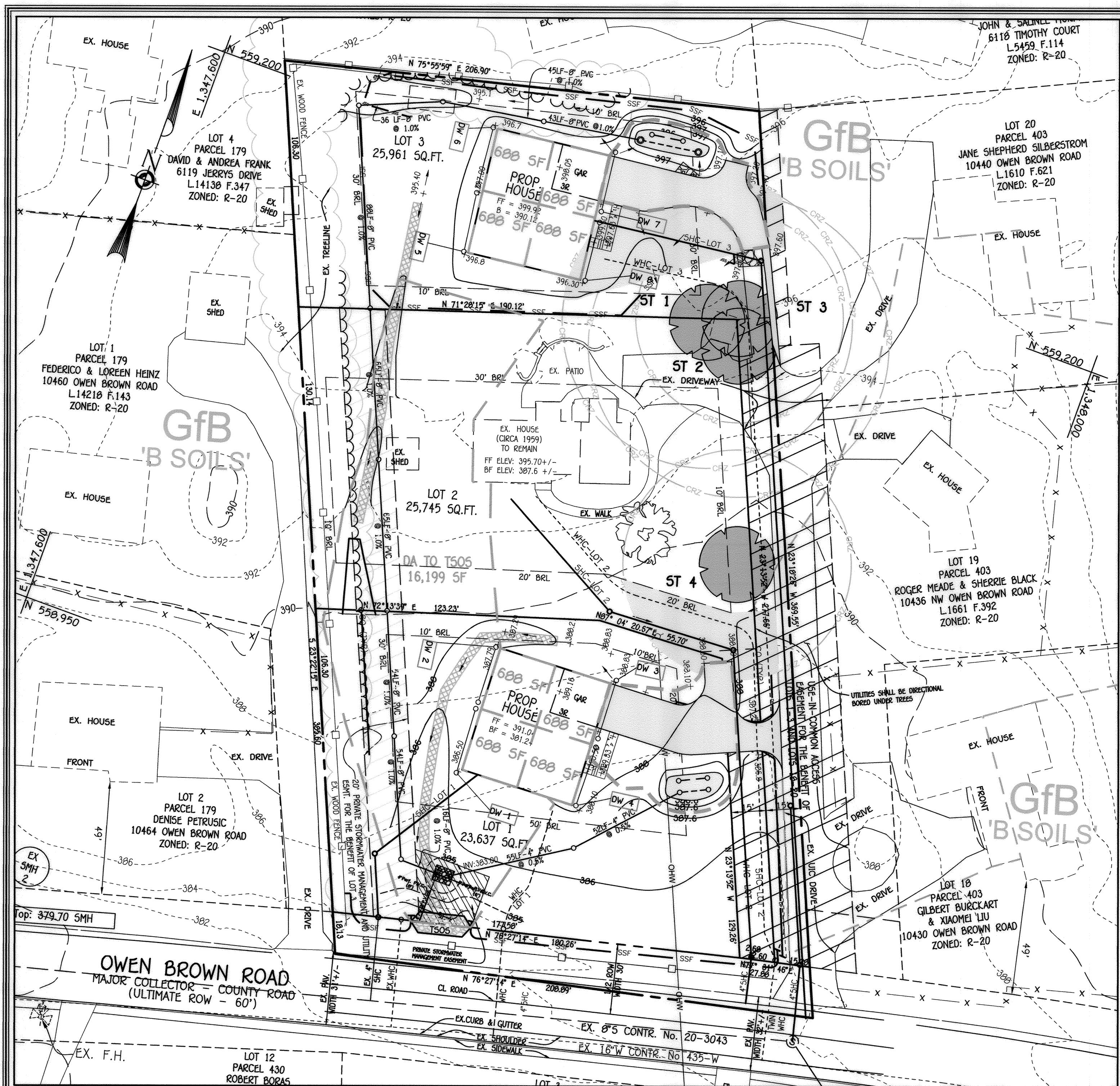
[Signature]
 FRANK MANALANSAN, II
 DATE: 7/14/21

OWNER/DEVELOPER
 ANDREW POPE
 10446 OWEN BROWN ROAD
 COLUMBIA, MARYLAND 21044
 301-641-0857

10446 OWEN BROWN ROAD
 LOTS 1 THRU 3

TAX MAP NO.: 35 GRID NO.: 12 PARCEL NO.: 179
 ZONED R-20
 SEVENTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: MAY, 2021
 SHEET 2 OF 4

ECP-19-055



CONCEPTUAL SEDIMENT /EROSION CONTROL PLAN
SCALE: 1" = 30'

PLAN
SCALE: 1" = 30'

ENVIRONMENTAL CONCEPT PLAN
SCALE: 1" = 30'

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL	---	EXISTING TREE LINE
---	EXISTING CONTOUR 10' INTERVAL	---	PROPOSED TREE LINE
---	PROPOSED CONTOUR 10' INTERVAL	---	DRAINAGE DIVIDE
---	PROPOSED CONTOUR 2' INTERVAL	---	SOIL LINES AND TYPES
---	EXISTING FENCE	---	BIO RETENTION FACILITY (F-6) OR (M-6) AS NOTED
---	SPOT ELEVATION	---	PROPOSED ROOF LEADER
---	EXISTING STORM DRAIN	---	EXISTING TREES TO REMAIN
---	EXISTING WATER LINE	---	SPECIMEN TREE
---	EXISTING SEWER LINE	---	CRITICAL ROOT ZONE
---	EXISTING OVERHEAD WIRE	---	
---	EXISTING PAVING	---	
---	PROPOSED PAVING	---	
---	PRIVATE UIC EASEMENT	---	
---	PRIVATE DRAINAGE & UTILITY EASEMENT	---	
---	LIMIT OF DISTURBANCE	---	
---	SUPER SILT FENCE/TREE PROTECTION FENCE	---	
---	DF/TP DIVERSION FENCE/TREE PROTECTION FENCE	---	
---	EARTH DIKE	---	

SEDIMENT AND EROSION CONTROL NOTE

- 1) THE GRADING, STORMWATER MANAGEMENT AND EROSION/SEDIMENT CONTROL SHOWN ON THESE PLANS IS CONCEPTUAL. FINAL STORMWATER MANAGEMENT DESIGN, SITE GRADING AND EROSION/SEDIMENT CONTROL FOR LOTS 1 - 3 WILL BE PROVIDED AT THE SITE DEVELOPMENT PLAN STAGE.
- 2) BORE AND JACK SHALL BE UTILIZED FOR INSTALLATION OF PROPOSED UTILITIES WITHIN CRZ OF SPECIMEN TREES, WHERE PRACTICAL.

STRUCTURE TABLE

OUTLET STRUCTURE	STORAGE	MAXIMUM STORAGE	WEIR ELEVATION
TS05	667 CFT.	900 CFT.	385.00

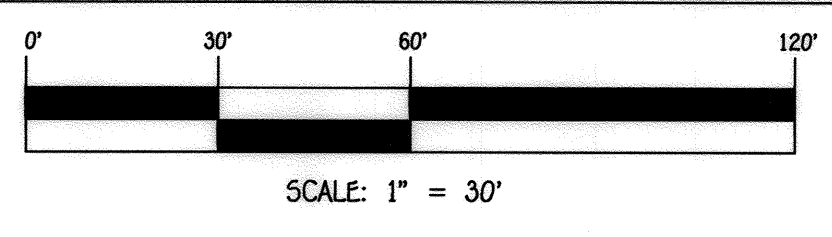
CRITICAL ROOT ZONE IMPACT

TREE	AREA	%
ST1	3,010 SF	24%
ST2	3,351 SF	13%
ST3	6,361 SF	14%
ST4	7,697 SF	22%

SOILS LEGEND

SOIL	NAME	CLASS	Kc VALUE
GfB	Gladstone-Urban land complex, 0 to 8 percent slopes	B	0.32
Gub	Glenville-Urban land-Udorthents complex, 0 to 8 percent slopes	C	0.49

HOWARD COUNTY SOILS MAP 17; CLARKSVILLE, MD



APPROVED: DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 7.19.21
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 7/19/21

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTRAL SQUARE OFFICE PARK - 10722 BALDORNE NATIONAL PIKE
 ELICOTT CITY, MARYLAND 21042
 (410) 461-2295



PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/23.
 FRANK MANALANSAN, II
 DATE: 7/19/21

OWNER/DEVELOPER
 ANDREW POPE
 10446 OWEN BROWN ROAD
 COLUMBIA, MARYLAND 21044
 301-641-0957

TAX MAP NO.: 35 GRID NO.: 12 PARCEL NO.: 179
 ZONED R-20
 SEVENTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: MAY, 2021
 SHEET 3 OF 4
 ECP-19-055

INFILTRATION AND FILTER SYSTEM CONSTRUCTION SPECIFICATIONS

INFILTRATION AND FILTER SYSTEMS EITHER TAKE ADVANTAGE OF EXISTING PERMEABLE SOILS OR CREATE A PERMEABLE MEDIUM SUCH AS SAND FOR WCI, AND RE V. IN SOME INSTANCES WHERE PERMEABILITY IS GREAT, THESE FACILITIES MAY BE USED FOR QP AS WELL. THE MOST COMMON SYSTEMS INCLUDE INFILTRATION TRENCHES, INFILTRATION BASINS, SAND FILTERS, AND ORGANIC FILTERS.

WHEN PROPERLY PLANTED, VEGETATION WILL THRIVE AND ENHANCE THE FUNCTIONING OF THESE SYSTEMS. FOR EXAMPLE, PRE-TREATMENT BUFFERS WILL TRAP SEDIMENTS THAT OFTEN ARE BOUND WITH PHOSPHORUS AND METALS. VEGETATION PLANTED IN THE FACILITY WILL AID IN NUTRIENT UPTAKE AND WATER STORAGE. ADDITIONALLY, PLANT ROOTS WILL PROVIDE ACCESS FOR STORMWATER TO PERMEATE SOIL FOR GROUNDWATER RECHARGE. FINALLY, SUCCESSFUL PLANTINGS PROVIDE AESTHETIC VALUE AND WILDLIFE HABITAT MAKING THESE FACILITIES MORE DESIRABLE TO THE PUBLIC.

DESIGN CONSTRAINTS:

- > PLANTING BUFFER STRIPS OF AT LEAST 20 FEET WILL CAUSE SEDIMENTS TO SETTLE OUT BEFORE REACHING THE FACILITY, THEREBY REDUCING THE POSSIBILITY OF CLOGGING.
- > DETERMINE AREAS THAT WILL BE SATURATED WITH WATER AND WATER TABLE DEPTH SO THAT APPROPRIATE PLANTS MAY BE SELECTED (HYDROLOGY WILL BE SIMILAR TO BIORETENTION FACILITIES, SEE FIGURE A.5 AND TABLE A.4 FOR PLANTING MATERIAL GUIDANCE).
- > PLANTS KNOWN TO SEND DOWN DEEP TAPROOTS SHOULD BE AVOIDED IN SYSTEMS WHERE FILTER FABRIC IS USED AS PART OF FACILITY DESIGN.
- > TEST SOIL CONDITIONS TO DETERMINE IF SOIL AMENDMENTS ARE NECESSARY.
- > PLANTS SHALL BE LOCATED SO THAT ACCESS IS POSSIBLE FOR STRUCTURE MAINTENANCE.
- > STABILIZE HEAVY FLOW AREAS WITH EROSION CONTROL MATS OR SOG.
- > TEMPORARILY OVERT FLOWS FROM SEEDER AREAS UNTIL VEGETATION IS ESTABLISHED.
- > SEE TABLE A.5 FOR ADDITIONAL DESIGN CONSIDERATIONS.

BIO-RETENTION

SOIL BED CHARACTERISTICS
THE CHARACTERISTICS OF THE SOIL FOR THE BIORETENTION FACILITY ARE PERHAPS AS IMPORTANT AS THE FACILITY LOCATION, SIZE, AND TREATMENT VOLUME. THE SOIL MUST BE PERMEABLE ENOUGH TO ALLOW RUNOFF TO FILTER THROUGH THE MEDIA, WHILE HAVING CHARACTERISTICS SUITABLE TO PROMOTE AND SUSTAIN A ROBUST VEGETATIVE COVER CROP. IN ADDITION, MUCH OF THE NUTRIENT POLLUTANT UPTAKE (NITROGEN AND PHOSPHORUS) IS ACCOMPLISHED THROUGH ADSORPTION AND MICROBIAL ACTIVITY WITHIN THE SOIL PROFILE. THEREFORE, SOILS MUST BALANCE THEIR CHEMICAL AND PHYSICAL PROPERTIES TO SUPPORT BIOTIC COMMUNITIES ABOVE AND BELOW GROUND.
THE PLANTING SOIL SHOULD BE A SANDY LOAM, LOAMY SAND, LOAM (USDA), OR A LOAM/SAND MIX (SHOULD CONTAIN A MINIMUM 35 TO 60% SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BE LESS THAN 25% BY VOLUME (ENVIRONMENTAL QUALITY RESOURCES (EQR), 1996; ENGINEERING TECHNOLOGY INC. AND BIOHABITATS, INC. (ETAB), 1993). SOILS SHOULD FALL WITHIN THE SM, ML, SC CLASSIFICATIONS OR THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). A PERMEABILITY OF AT LEAST 1.0 FEET PER DAY (0.5"/HR) IS REQUIRED (A CONSERVATIVE VALUE OF 0.5 FEET PER DAY IS USED FOR DESIGN). THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER. BRUSH OR SEEDS FROM NOXIOUS WEEDS (E.G., JOHNSON GRASS, MUGWORT, NUTSEDGE, AND CANADA THISTLE OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.) SHOULD NOT BE PRESENT IN THE SOILS. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN 12 TO 18 LIFTS THAT ARE LOOSELY COMPACTED (TAMPED LIGHTLY WITH A BACKHOE BUCKET OR TRAVELER BY DOZER TRACKS). THE SPECIFIC CHARACTERISTICS ARE PRESENTED IN TABLE A.3.

TABLE A.3 PLANTING SOIL CHARACTERISTICS

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0% (BY WEIGHT)
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (PHOSPHATE - P2O5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (POTASH - K2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25 %
SILT	30 TO 55 %
SAND	35 TO 60%

MULCH LAYER

THE MULCH LAYER PLAYS AN IMPORTANT ROLE IN THE PERFORMANCE OF THE BIORETENTION SYSTEM. THE MULCH LAYER HELPS MAINTAIN SOIL MOISTURE AND AVOIDS SURFACE SEALING, WHICH REDUCES PERMEABILITY. MULCH HELPS PREVENT EROSION AND PROVIDES A MICROENVIRONMENT SUITABLE FOR SOIL BIOTA AT THE MULCH/SOIL INTERFACE. IT ALSO SERVES AS A PRETREATMENT LAYER, TRAPPING THE FINER SEDIMENTS, WHICH REMAIN SUSPENDED AFTER THE PRIMARY PRETREATMENT.
THE MULCH LAYER SHOULD BE STANDARD LANDSCAPE STYLE, SINGLE OR DOUBLE SHREDDED HARDWOOD MULCH OR CHIPS. THE MULCH LAYER SHOULD BE WELL AGED (STOCKPILED OR STORED FOR AT LEAST 12 MONTHS), UNIFORM IN COLOR, AND FREE OF OTHER MATERIALS, SUCH AS WEED SEEDS, SOIL, ROOTS, ETC. THE MULCH SHOULD BE APPLIED TO A MAXIMUM DEPTH OF THREE INCHES. GRASS CLIPPINGS SHOULD NOT BE USED AS A MULCH MATERIAL.

PLANTING GUIDANCE

PLANT MATERIAL SELECTION SHOULD BE BASED ON THE GOAL OF SIMULATING A TERRESTRIAL FORESTED COMMUNITY OF NATIVE SPECIES. BIORETENTION SIMULATES AN UPLAND-SPECIES ECOSYSTEM. THE COMMUNITY SHOULD BE DOMINATED BY TREES, BUT HAVE A DISTINCT COMMUNITY OF UNDERSTORY TREES, SHRUBS AND HERBACEOUS MATERIALS. BY CREATING A DIVERSE, DENSE PLANT COVER, A BIORETENTION FACILITY WILL BE ABLE TO TREAT STORMWATER RUNOFF AND WITHSTAND URBAN STRESSES FROM INSECTS, DISEASE, DROUGHT, TEMPERATURE, WIND, AND EXPOSURE.

THE PROPER SELECTION AND INSTALLATION OF PLANT MATERIALS IS KEY TO A SUCCESSFUL SYSTEM. THERE ARE ESSENTIALLY THREE ZONES WITHIN A BIORETENTION FACILITY (FIGURE A.5). THE LOWEST ELEVATION SUPPORTS PLANT SPECIES ADAPTED TO STANDING AND FLUCTUATING WATER LEVELS. THE MIDDLE ELEVATION SUPPORTS PLANTS THAT LIKE DRIER SOIL CONDITIONS, BUT CAN STILL TOLERATE OCCASIONAL INUNDATION BY WATER. THE OUTER EDGE IS THE HIGHEST ELEVATION AND GENERALLY SUPPORTS PLANTS ADAPTED TO DRIER CONDITIONS. A SAMPLE OF APPROPRIATE PLANT MATERIALS FOR BIORETENTION FACILITIES ARE INCLUDED IN TABLE A.4. THE LAYOUT OF PLANT MATERIAL SHOULD BE FLEXIBLE, BUT SHOULD FOLLOW THE GENERAL PRINCIPLES DESCRIBED IN TABLE A.5. THE OBJECTIVE IS TO HAVE A SYSTEM, WHICH RESEMBLES A RANDOM, AND NATURAL PLANT LAYOUT, WHILE MAINTAINING OPTIMAL CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH. FOR A MORE EXTENSIVE BIORETENTION PLAN, CONSULT ETAB, 1993 OR CLAYTOR AND SCHUELLER, 1997.

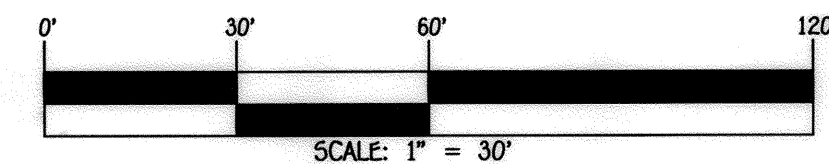
Table B.4. Materials Specifications for Micro-Bioretenion, Rain Gardens & Landscape Infiltration

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% compost 30% compost 40%		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
Pea gravel (diaphragm)	pea gravel: ASTM-D-449	No. 8 or No. 9 (1 1/8" to 3/8")	
Curtain drain	ornamental stone: washed cobble	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	ASHTO H-43	No. 57 or No. Aggregate (3/8" to 3/4")	
Underdrain piping	F 750, Type PS 28 or MGH20 H-276	4" to 6" rigid schedule 40 PVC or SDR35	slotted or perforated pipe; 3/8" perft. @ 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 = 3500 psi at 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 site 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 350.8/89; vertical loading (H-10 or H-20); allowable horizontal loading (based on soil pressure); and analysis of potential cracking
Sand	ASHTO-H-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Gneiss (ASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

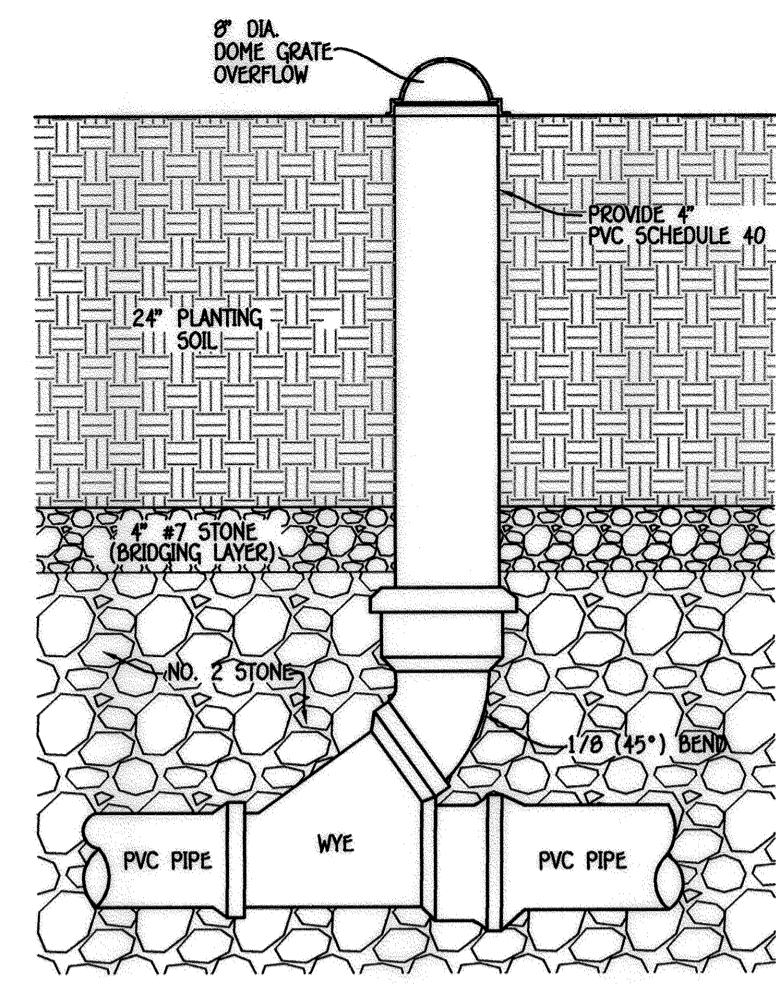
7.19.21
DATE
7/19/21
DATE

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10273 BALTIMORE NATIONAL PIKE
ELLSWORTH CITY, MARYLAND 21042
(410) 461 - 2955

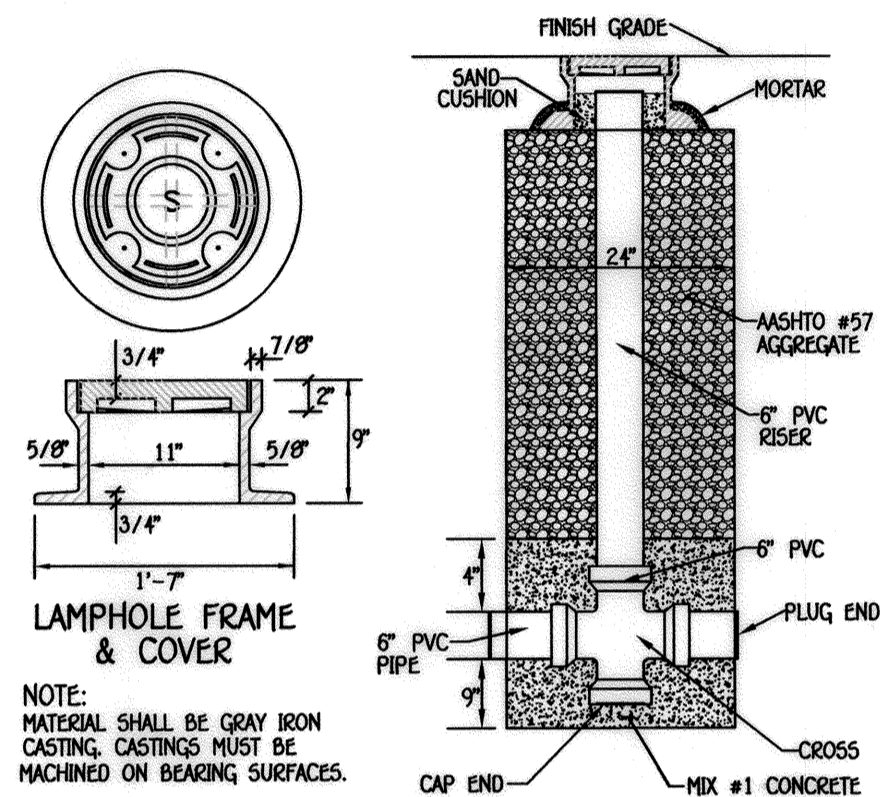


MODIFIED RIP-RAP OUTFALL INFILTRATION CHANNEL

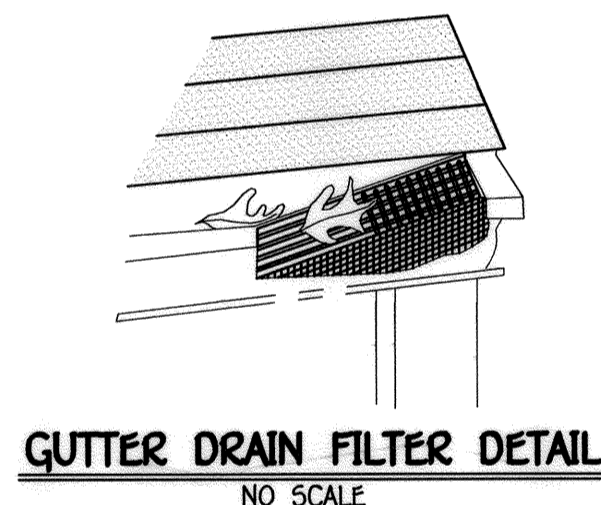
SCALE: 1" = 5'



TYPICAL CLEAN-OUT DETAIL
NO SCALE



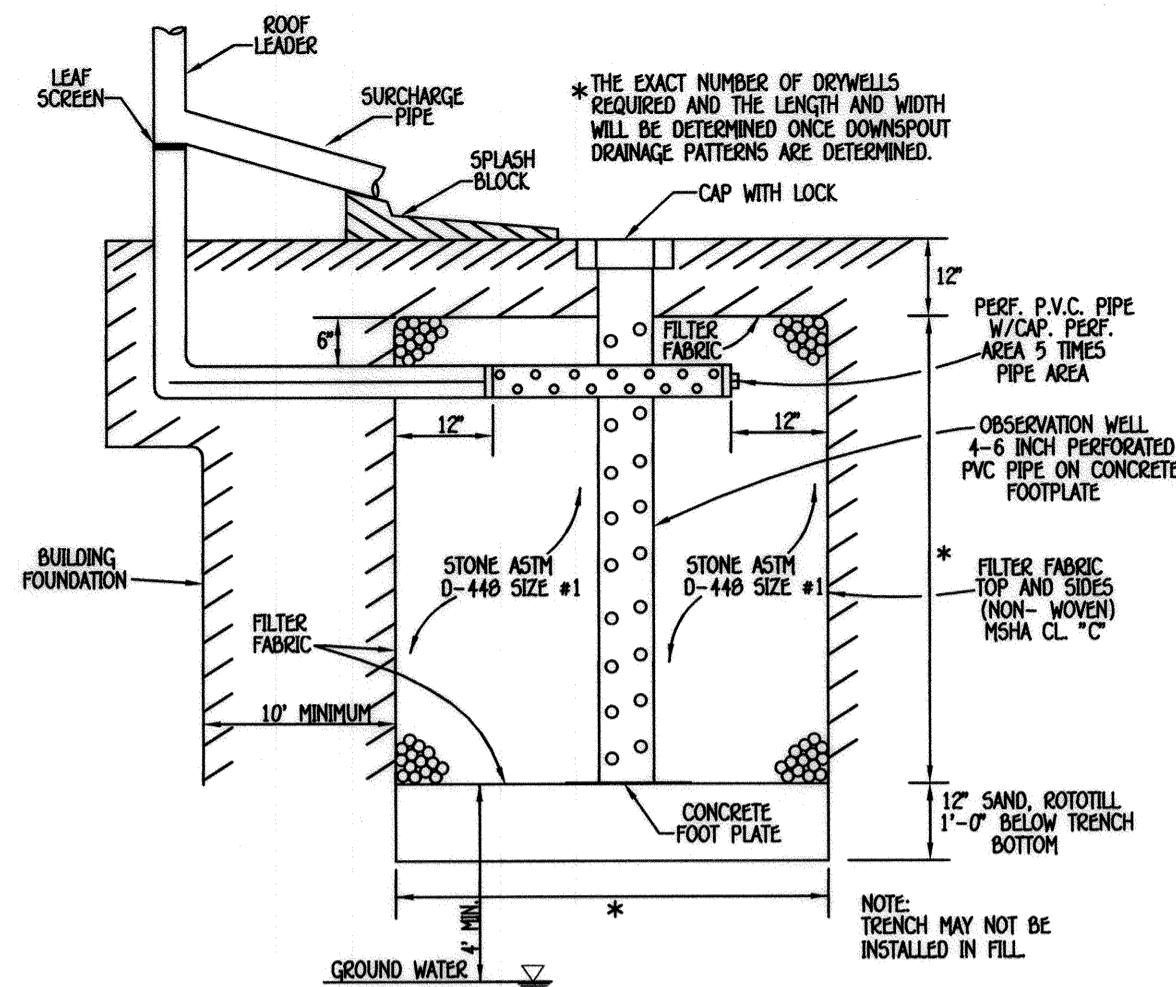
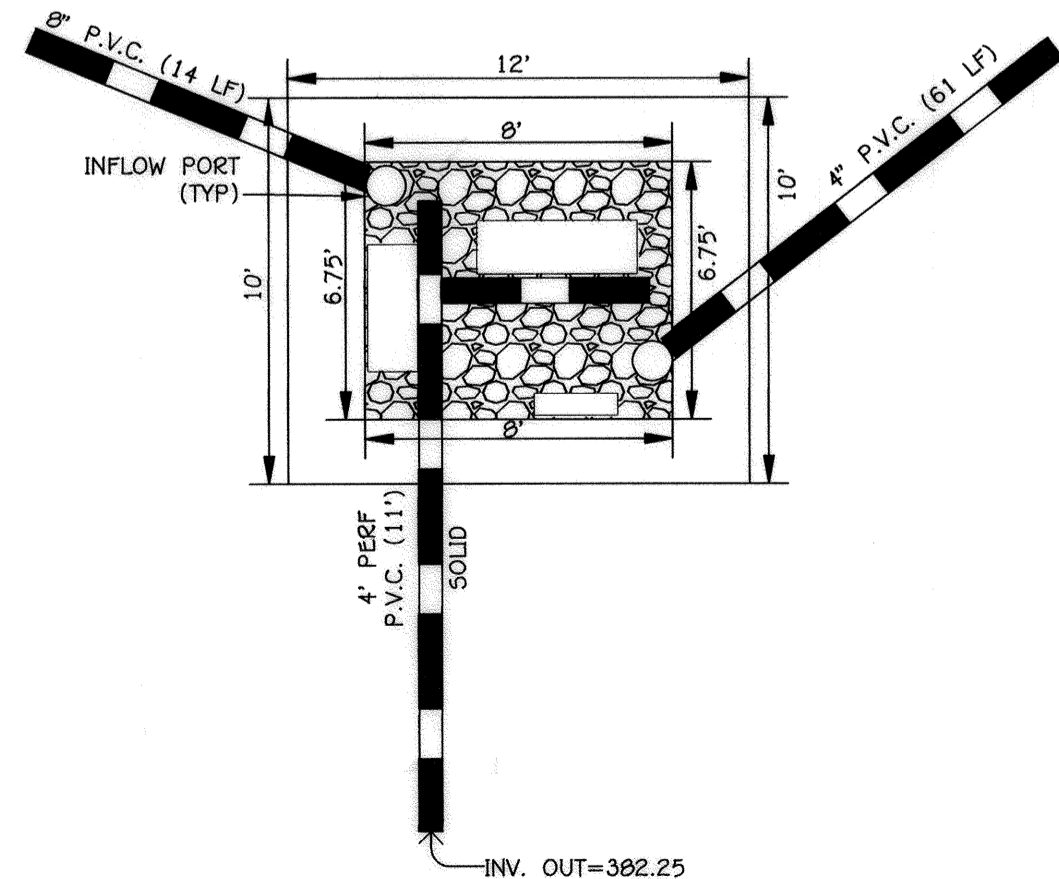
CLEANOUT/ WATER QUALITY SAMPLING PORT DETAIL
NO SCALE



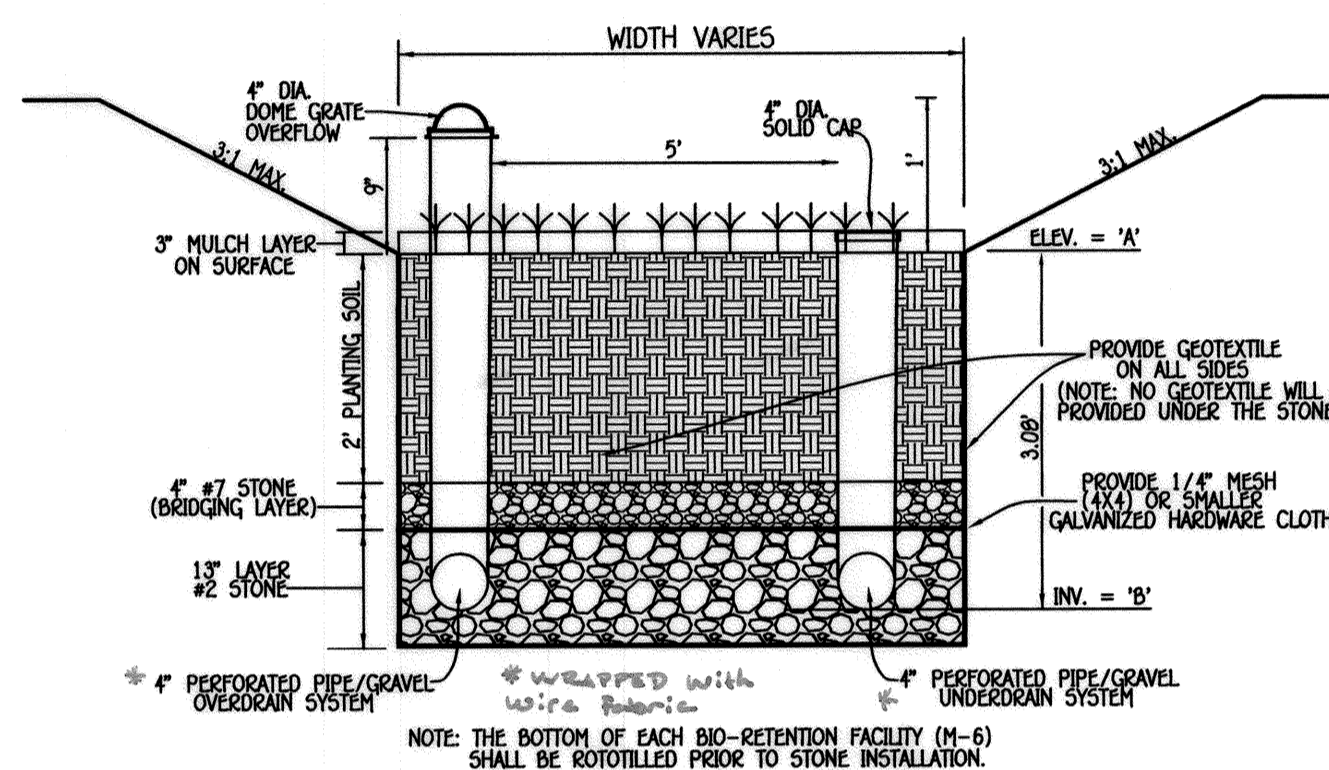
GUTTER DRAIN FILTER DETAIL
NO SCALE

STORMWATER MANAGEMENT NOTES

1. STORMWATER MANAGEMENT IS PROVIDED IN ACCORDANCE WITH CHAPTER 5, "ENVIRONMENTAL SITE DESIGN" OF THE 2007 MARYLAND STORMWATER MANAGEMENT DESIGN MANUAL, EFFECTIVE MAY 4, 2010.
2. MAXIMUM CONTRIBUTING ROOF TOP AREA TO EACH DOWNSPOUT SHALL BE 500 SQ. FT. OR LESS.

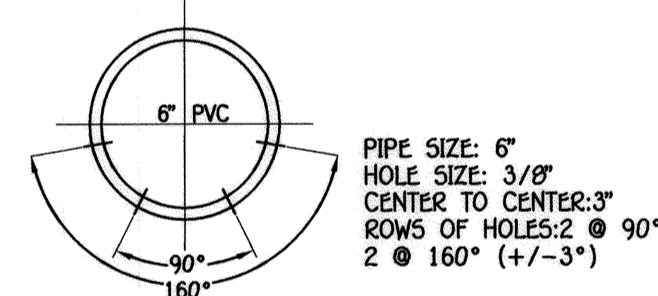


DRY WELL DETAIL (M-5)
NO SCALE



TYPICAL SECTION BIO-RETENTION FACILITY (M-6)
NO SCALE

FACILITY	ELEVATION A	INV. B	NOTES
MICRO-BIO #1	396.00	392.92	
MICRO-BIO #2	396.60	393.52	



SCH40 PVC PERFORATED UNDERDRAIN PIPE DETAIL FOR HORIZONTAL DRAIN PIPE
NO SCALE

DRY WELL CHART

LOT NO.	#DOWNSPOUTS PER DRYWELL	AREA OF ROOF	VOLUME REQUIRED	VOLUME PROVIDED	AREA OF STORAGE	AREA OF TREATMENT	NO. OF DRYWELLS	DIMENSIONS OF DRYWELLS
LOT 1	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 1	7' X 5' X 5'
	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 2	7' X 5' X 5'
	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 3	7' X 5' X 5'
LOT 3	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 4	7' X 5' X 5'
	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 5	7' X 5' X 5'
	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 6	7' X 5' X 5'
	2	680 SqFt	66 CuFt	70 CuFt	106%	100%	DW 7	7' X 5' X 5'

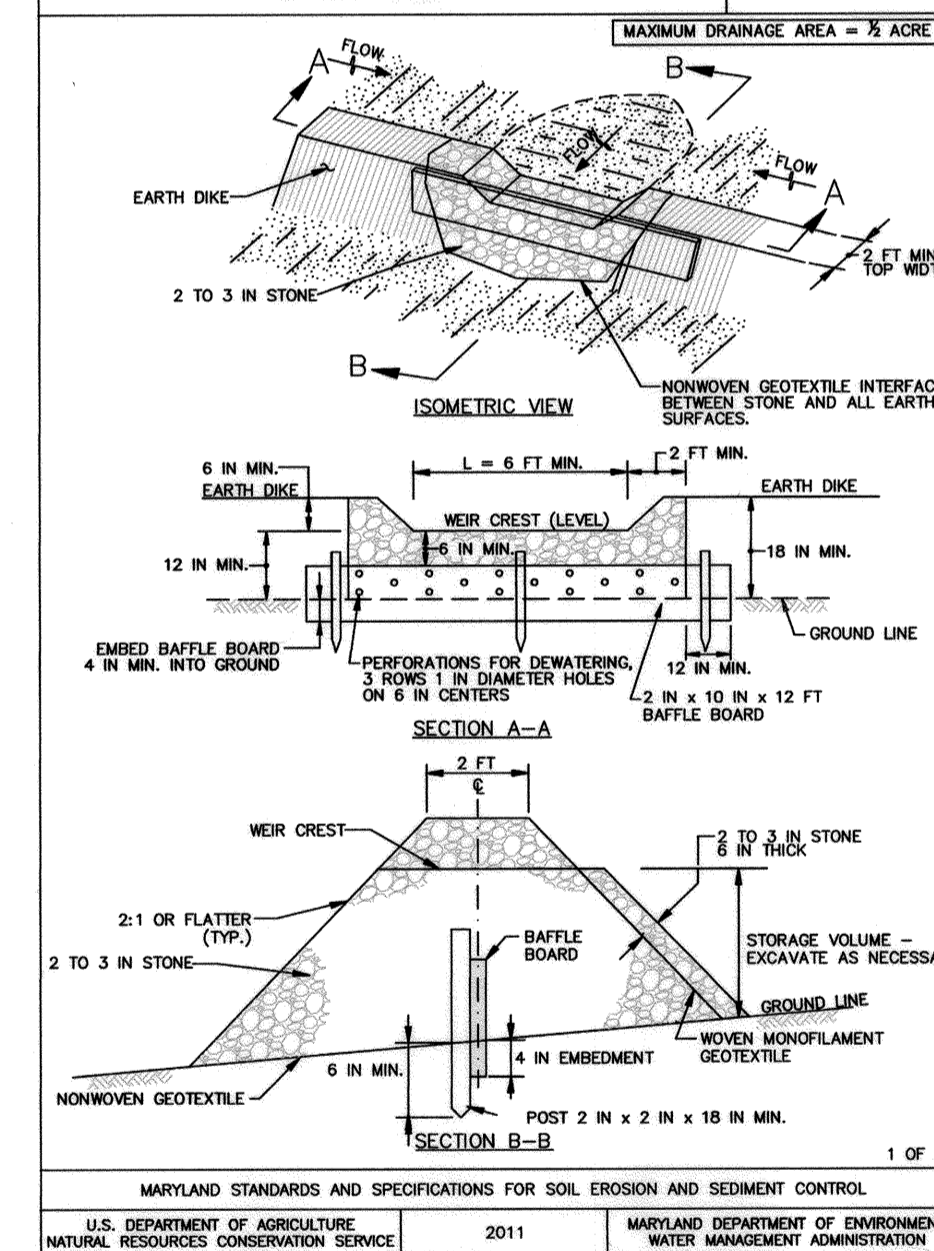
OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRY WELLS (M-5)

- A. THE OWNER SHALL INSPECT THE MONITORING WELLS AND STRUCTURES ON A QUARTERLY BASIS AND AFTER EVERY HEAVY STORM EVENT.
- B. THE OWNER SHALL RECORD THE WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS OVER A PERIOD OF SEVERAL DAYS TO ENSURE TRENCH DRAINAGE.
- C. THE OWNER SHALL MAINTAIN A LOG BOOK TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- D. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN A SEVENTY-TWO (72) HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
- E. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- F. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

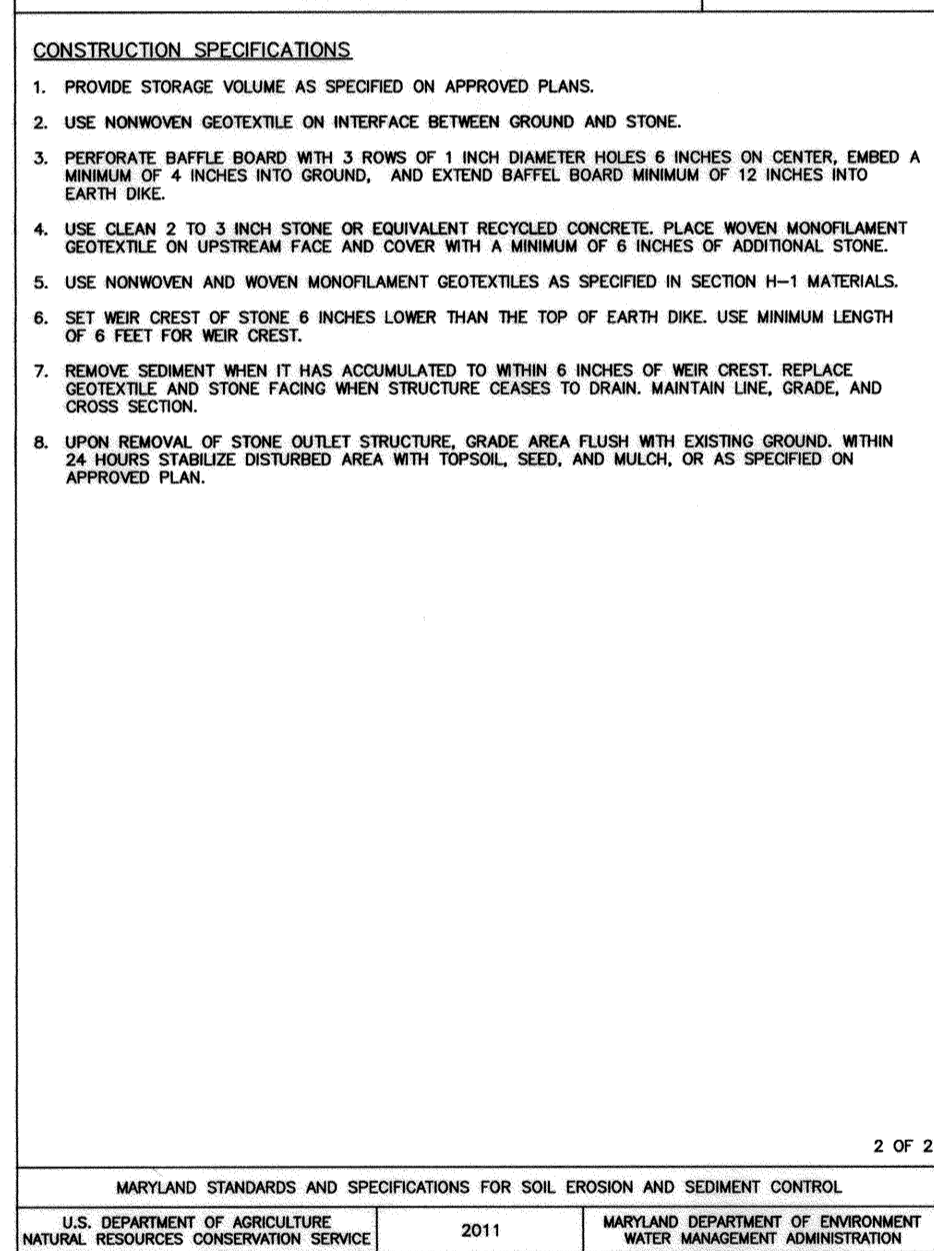
OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS (M-6) AND (F-6)

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDER BEYOND TREATMENT. TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE 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.

DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE



DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE



I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/23.

FRANK MANALANG, II
DATE: 7/19/21

PROFESSIONAL CERTIFICATION

U.S. DEPARTMENT OF AGRICULTURE
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
2011

OWNER/DEVELOPER

ANDREW POPE
10446 OWEN BROWN ROAD
COLUMBIA, MARYLAND 21044
301-641-0857

STORMWATER MANAGEMENT NOTES AND DETAILS
10446 OWEN BROWN ROAD
LOTS 1 THRU 3
DATE: MAY, 2021
SHEET 4 OF 4

TAX MAP NO.: 35 GRID NO.: 12 PARCEL NO.:179

ZONED R-20

SEVENTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: MAY, 2021

ECP-19-055