

# ENVIRONMENTAL CONCEPT PLAN EAST SIDE

## SECTION 1, LOTS 17 & 18 (A RESUBDIVISION OF LOT 1 EAST SIDE SECTION 1)

### ZONING: R-20 (RESIDENTIAL: SINGLE DISTRICT) TAX MAP No. 30 GRID No. 01 PARCEL No. 159 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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

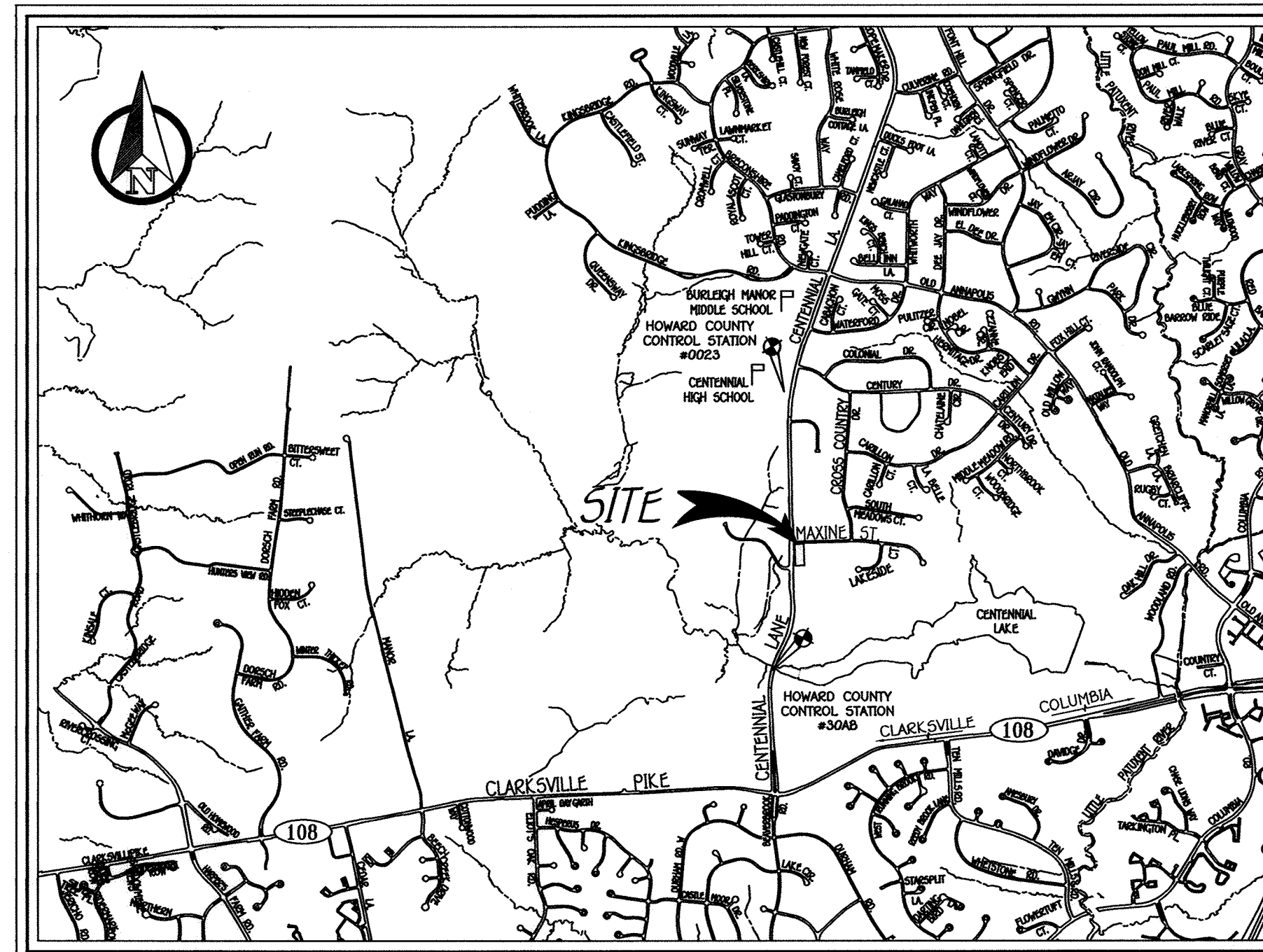
SOILS LEGEND			
SOIL	NAME	CLASS	K-VALUE
GhB	Glennel-Urban land complex, 0 to 8 percent slopes	B	0.43

HOWARD COUNTY WEB SOILS SURVEY

STORMWATER MANAGEMENT PRACTICES BY LOT			
LOCATION	MICRO-BIO (M-6) QUANTITY	DRYWELL (M-5) QUANTITY	REMARKS
LOT 17	1	2	PORTION OF HOUSE AND DRIVEWAY DRAINS TO MICRO-BIO 1
			PORTION OF HOUSE DRAINS TO DRYWELLS
LOT 18	1		PORTION OF HOUSE AND DRIVEWAY DRAINS TO MICRO-BIO 2
			PORTION OF HOUSE DRAINS TO DRYWELLS

STORMWATER MANAGEMENT PRACTICES							
LOCATION	AREA ID	DRAINAGE AREA SF.	% IMPERVIOUS	ESDV REQUIRED CUFT.	ESDV PROVIDED CUFT.	MICRO BIO-RETENTION M-6 (Y/N)	DRY WELL M-5 (Y/N)
LOT 17	M-6(1)	3,465	99.0%	202	206		
	1A(M-5)	825	100.0%	105	120	Y	Y
	1B(M-5)	1,100	100.0%	140	168		Y
LOT 18	M-6(2)	2,673	98.0%	216	368	Y	
	2A(M-5)	825	100.0%	105	120		Y
	2B(M-5)	1,100	100.0%	140	168		Y

GROSS AREA = 1.00 ACRE  
LOD = 0.77 ACRES  
RCN = 55.0  
TARGET Pe = 1.6"



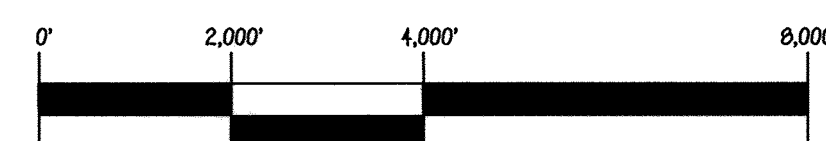
HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 0023  
N 577,373.143 E 1,349,751.273  
ELEVATION: 479.248

HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 30AB  
N 573,239.305 E 1,349,547.846  
ELEVATION: 361.90

REFER TO HOWARD CO. ADC MAP 26-E3, E4, F3 & F4

#### VICINITY MAP

SCALE: 1" = 2,000'



SCALE: 1" = 2,000'

#### 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 MARCH, 2019.
- CONTOURS ARE BASED ON A TOPOGRAPHIC FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS AND CARTER, ON OR ABOUT MARCH, 2019.
- COORDINATES BASED ON NAD83 MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 306A AND NO. 306B:  
HOWARD COUNTY MONUMENT NO. 0023 N 577,373.143 E 1,349,751.273 ELEV. 479.248  
HOWARD COUNTY MONUMENT NO. 30AB N 573,239.305 E 1,349,547.846 ELEV. 361.90
- STORM WATER MANAGEMENT IS IN ACCORDANCE WITH THE M.D.E. STORM WATER DESIGN MANUAL, VOLUMES I & II, REVISED 2009. THIS PLAN PROPOSES THE USE OF TWO (2) M-6 MICRO BIO RETENTION FACILITIES AND FOUR (4) M-5 DRY WELLS.
- 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.
- LANDSCAPING WILL BE PROVIDED AT THE FINAL PLAN STAGE OF THIS PROJECT.
- FOREST CONSERVATION OBLIGATIONS WILL BE ADDRESSED AT THE FINAL PLAN STAGE OF THIS PROJECT BY EITHER PAYMENT OF A FEE-IN-LIEU OR ACQUISITION OF A FOREST BANK EASEMENT.
- 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.

#### SITE ANALYSIS DATA CHART

- TOTAL AREA OF THIS SUBMISSION = 1.00 AC.±
- LIMIT OF DISTURBED AREA = 0.77 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: P86, F98
- TOTAL AREA OF FLOODPLAIN LOCATED ON-SITE = 0 AC
- TOTAL AREA OF SLOPES IN EXCESS OF 2% = 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 = 1.00 AC.±
- TOTAL IMPERVIOUS AREA EXCLUDING EXISTING IMPERVIOUS = 0.19 AC.± (WITHIN LOD)
- TOTAL GREEN SPACE AREA (PREVIOUS) = 0.81 AC.±
- TOTAL AREA OF ERODIBLE SOILS = 0 AC.±

#### SWM 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 ON THIS PROJECT. THE GOAL OF CREATING HYDROLOGY SIMILAR TO THAT OF "WOODS IN GOOD CONDITION" WILL BE ACCOMPLISHED THROUGH THE USE OF THE PRACTICES CONTAINED WITHIN CHAPTER 5 OF SAID MANUAL.

##### GENERAL SITE CONDITIONS:

THE SUBJECT PROPERTY IS ZONED R-20 AND LOCATED ON TAX MAP 30, PARCEL NO. 159 OF THE HOWARD COUNTY, MARYLAND TAX MAP DATABASE SYSTEM. THE PROPERTY CONSISTING OF 1.00 ACRE, IS RECTANGULAR IN SHAPE AND IS IMPROVED WITH A RANCH STYLE SINGLE FAMILY RESIDENCE AND A SHED. THE PROPERTY IS BORDERED BY RESIDENTIAL LOTS TO THE EAST AND SOUTH AND HAS ROAD FRONTAGE ON MAXINE STREET AND CENTENNIAL LANE TO THE NORTH AND WEST RESPECTIVELY. CURRENTLY ACCESS TO THE PROPERTY IS FROM A DRIVEWAY LOOP ON CENTENNIAL LANE, A MINOR ARTERIAL PUBLIC ROAD. THE EXISTING HOUSE, SHED AND DRIVEWAY WILL BE REMOVED AS PART OF THE SUBDIVISION PROCESS. THIS PROJECT PROPOSES A SUBDIVISION CONSISTING OF TWO (2) LOTS INCLUDING ONE (1) LOT WITH ACCESS FROM MAXINE STREET AND ONE (1) LOT USING THE EXISTING DRIVEWAY ACCESS FROM CENTENNIAL LANE. THE EXISTING BUILDINGS AND A PORTION OF THE EXISTING DRIVEWAY ON THIS PROPERTY WILL BE REMOVED. THE PROPERTY IS LOCATED WITHIN THE LITTLE PATUXENT RIVER WATERSHED (02131105) AND THE SITE CURRENTLY DRAINS TO THE NORTH WEST TO AN EXISTING YARD INLET LOCATED ON THE PROPERTY. THE RUNOFF FROM THE ROOFS AND DRIVEWAYS OF THE PROPOSED HOUSES WILL BE TREATED BY FOUR (4) DRYWELLS AND TWO (2) MICRO BIORETENTION (M-6) FACILITIES. THE WEB SOIL SURVEY SHOWS SOILS ON THE SITE CONSIST OF GLENNEL-URBAN LAND COMPLEX (GHB), TYPE "B" SOILS.

##### I. NATURAL RESOURCE PROTECTION:

THERE ARE NO ENVIRONMENTALLY SENSITIVE AREAS ON-SITE.

##### II. 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.

##### III. REDUCTION OF IMPERVIOUS AREAS THROUGH BETTER SITE DESIGN, ALTERNATIVE SURFACES AND NONSTRUCTURAL PRACTICES

THE DESIGN OF THIS PROJECT UTILIZES ONE PROPOSED DRIVEWAY FOR LOT 17 AND THE EXISTING DRIVEWAY ENTRANCE FOR LOT 18 FOR A TOTAL OF TWO (2) SINGLE FAMILY DETACHED HOUSES & LOTS. NON-STRUCTURAL PRACTICES AS PERMITTED IN CHAPTER 5, MICRO BIO-RETENTION FACILITIES (M-6) AND DRY WELLS (M-5) WILL BE USED.

##### IV. INTEGRATION OF EROSION AND SEDIMENT CONTROLS INTO STORMWATER STRATEGY:

IT IS ANTICIPATED THAT SEDIMENT TRAPS WILL NOT BE NEEDED. SILT FENCE, SUPER SILT FENCE, AND EROSION CONTROL MATTING WILL BE UTILIZED. NO OFF-SITE DRAINAGE EASEMENTS WILL BE REQUIRED. IT IS ANTICIPATED THAT ALL CUT WILL BE UTILIZED ON-SITE FOR CONSTRUCTION AT TIME OF FINAL ROAD CONSTRUCTION PLANS AND SITE DEVELOPMENT PLANS.

##### V. IMPLEMENTATION OF ESD PLANNING TECHNIQUES AND PRACTICES TO THE MAXIMUM EXTENT PRACTICABLE (MPEP)

THE FULL REQUIRED ESD VOLUME IS BEING PROVIDED.

##### VI. REQUEST FOR DESIGN MANUAL WAIVER:

NO WAIVERS RELATED TO STORMWATER MANAGEMENT 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.

LEGEND	
SYMBOL	DESCRIPTION
-----	EXISTING CONTOUR 1' INTERVAL
-----	EXISTING CONTOUR 5' INTERVAL
-----	PROPOSED CONTOUR 10' INTERVAL
-----	PROPOSED CONTOUR 2' INTERVAL
-----	EXISTING FENCE
x 440.5	SPOT ELEVATION
18" 50	EXISTING STORM DRAIN
EX FA	EXISTING WATER LINE
PTW	EXISTING SEWER LINE
-----	EXISTING OVERHEAD WIRE
-----	PROPOSED PAVING
-----	PRIVATE DRAINAGE & UTILITY EASEMENT
LOD	LIMIT OF DISTURBANCE
SSP/TP	SUPER SILT FENCE/TREE PROTECTION FENCE
DF/TP	DIVERSION FENCE/TREE PROTECTION FENCE
-----	EXISTING TREE LINE
-----	PROPOSED TREE LINE
-----	DRAINAGE DIVIDE
GHB	SOIL LINES AND TYPES
LoB	
XXXXXX	PERMANENT SOIL STABILIZATION CONTROL MATTING
→	DENOTES MBR OVERLAND FLOWPATH
○	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
○	DENOTES EXISTING TREES TO BE REMOVED

TITLE SHEET

**EAST SIDE**  
SECTION 1, LOTS 17 AND 18  
A RESUBDIVISION OF LOT 1

EAST SIDE, SECTION 1  
PLAT BOOK 6, FOLIO 98  
TAX MAP NO.: 30 GRID NO.: 01 PARCEL NO.: P/O159  
ZONED R-20  
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
SCALE: AS SHOWN DATE: JUNE 5, 2020  
SHEET 1 OF 4 **ECP-19-054**

Approved: Department Of Planning And Zoning

*[Signature]*  
Chief, Development Engineering Division  
Date: 7-27-20

**FISHER, COLLINS & CARTER, INC.**  
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
CENTENNIAL SQUARE OFFICE PARK - 10222 BALTIMORE NATIONAL PIKE  
ELLICOTT CITY, MARYLAND 21042  
(410) 461-2255



#### 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: 7/14/21.

*[Signature]*  
FRANK MANALANSAN, II  
Date: 7/19/20

#### OWNER/DEVELOPER

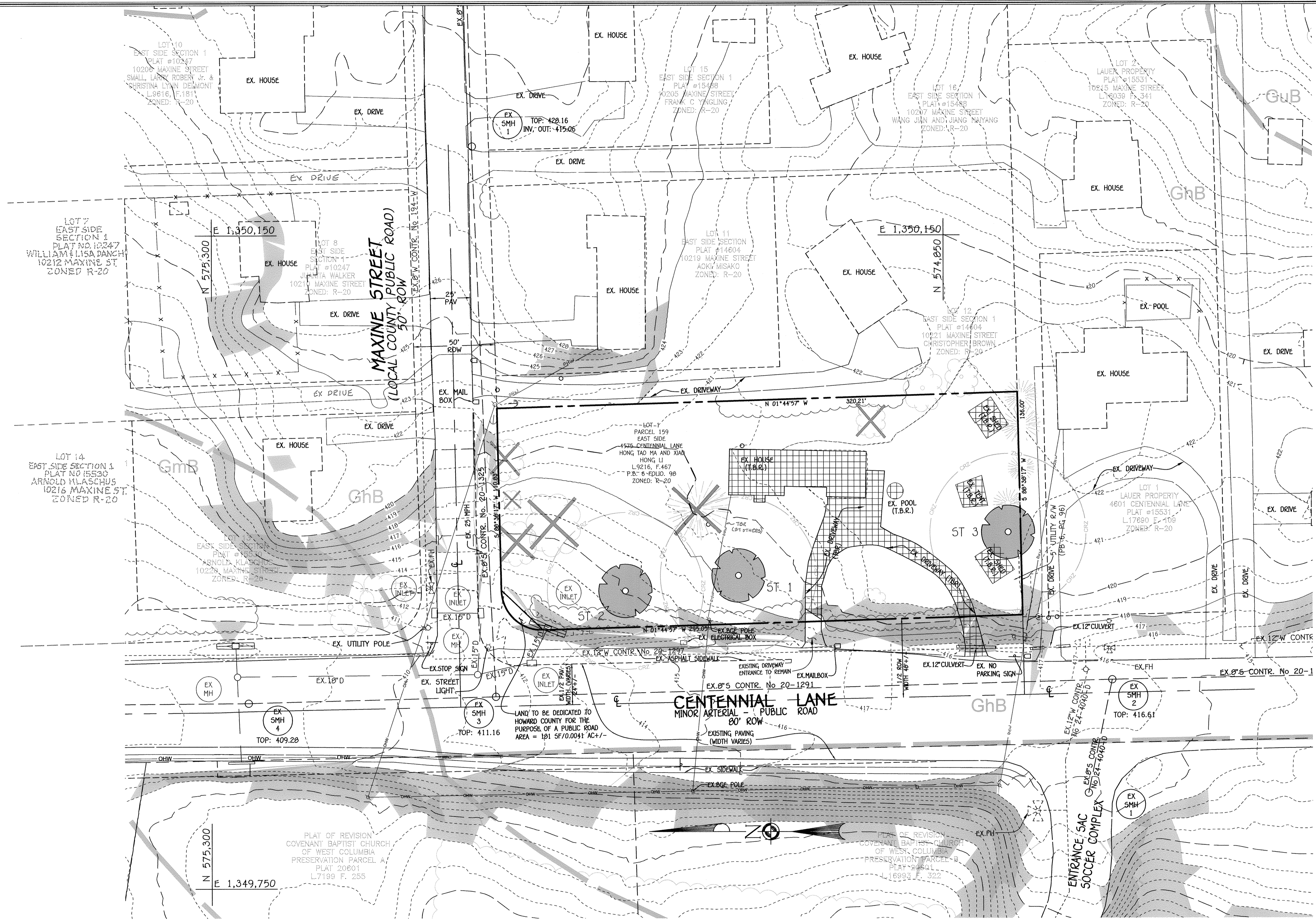
HONG TAO MA &  
XIAO HONG LI  
4260 MAISEL FARM LANE,  
ELLICOTT CITY, MD. 21042  
TEL: 410-493-4930



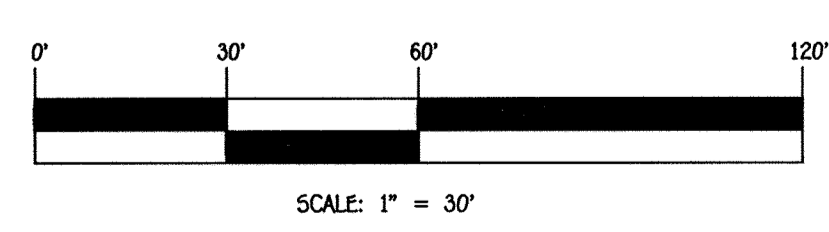
SOILS LEGEND			
SOIL	NAME	CLASS	K-VALUE
GhB	Glenn-Urban land complex, 0 to 8 percent slopes	B	0.43

HOWARD COUNTY WEB SOILS SURVEY

LEGEND	
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 1' INTERVAL
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---	PROPOSED CONTOUR 10' INTERVAL
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18" 50	EXISTING STORM DRAIN
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---	CRITICAL ROOT ZONE
---	DENOTES EXISTING TREES TO BE REMOVED



PLAN VIEW  
SCALE: 1" = 30'



Approved: Department Of Planning And Zoning  
*Chief, Development Engineering Division*  
 Date: 7/27/20

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 ELICOTT CITY, MARYLAND 21042  
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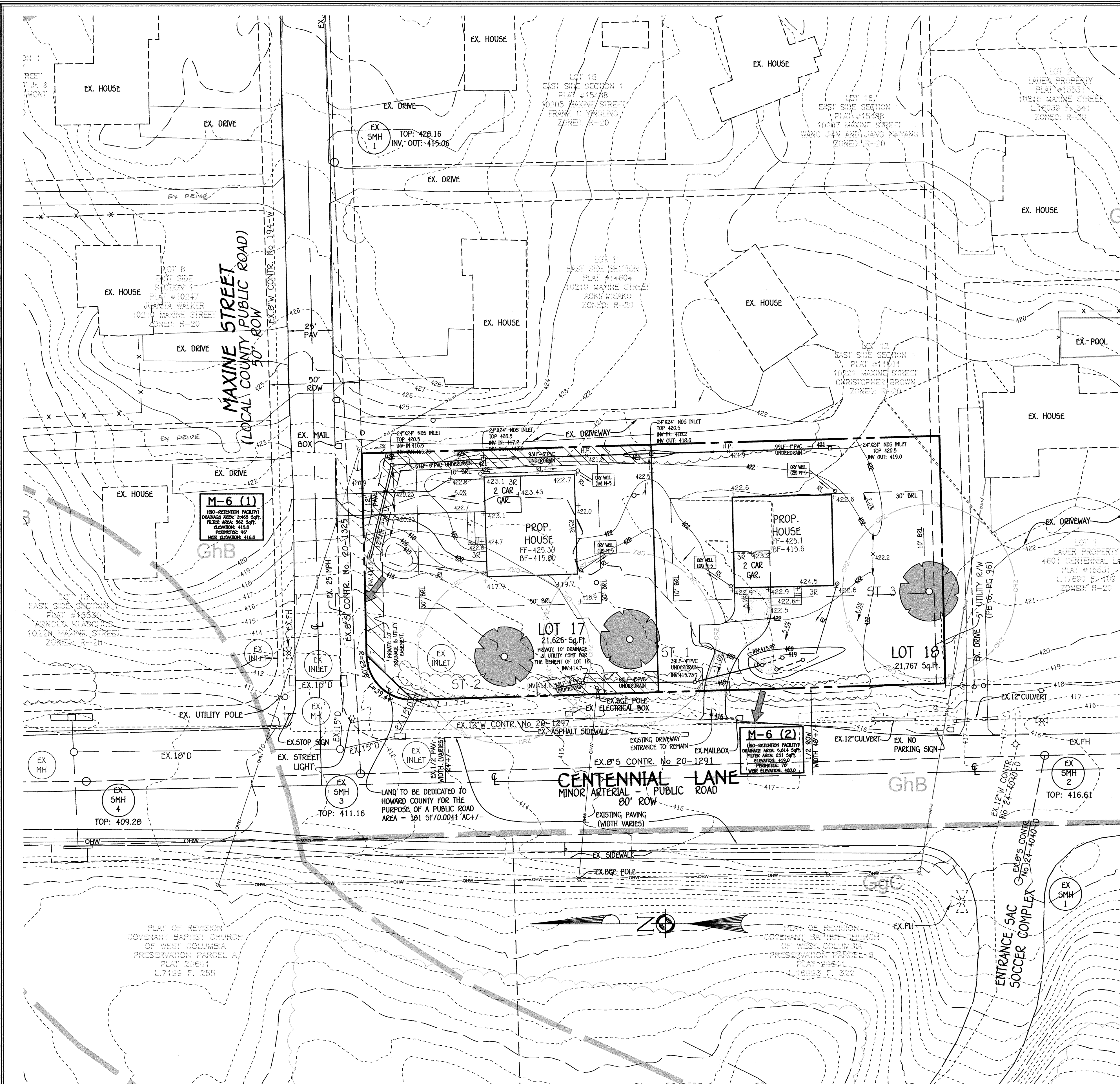
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*Frank Manalansan, II*  
 DATE: 7/8/20

SPECIMEN TREE DATA					
NO.	SIZE	SPECIES	CONDITION	NOTES	TO BE REMOVED
ST-1	56"	SILVER MAPLE	GOOD	CROWN INTERFERES WITH ELECTRIC LINE TO EX. HOUSE	NO
ST-2	38.5"	SILVER MAPLE	FAIR	SOME DIEBACK NOTED	NO
ST-3	40"	SILVER MAPLE	GOOD		NO

**OWNER/DEVELOPER**  
 HONG TAO MA &  
 XIAO HONG LI  
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EXISTING CONDITIONS, SOILS AND DEMOLITION PLAN  
**EAST SIDE**  
 SECTION 1, LOTS 17 AND 18  
 A RESUBDIVISION OF LOT 1  
 EAST SIDE, SECTION 1  
 PLAT BOOK 6, FOLIO 98  
 TAX MAP NO.: 30 GRID NO.: 01 PARCEL NO.: P/0159  
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 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: JUNE 5, 2020  
 SHEET 2 OF 4 **ECP-19-054**



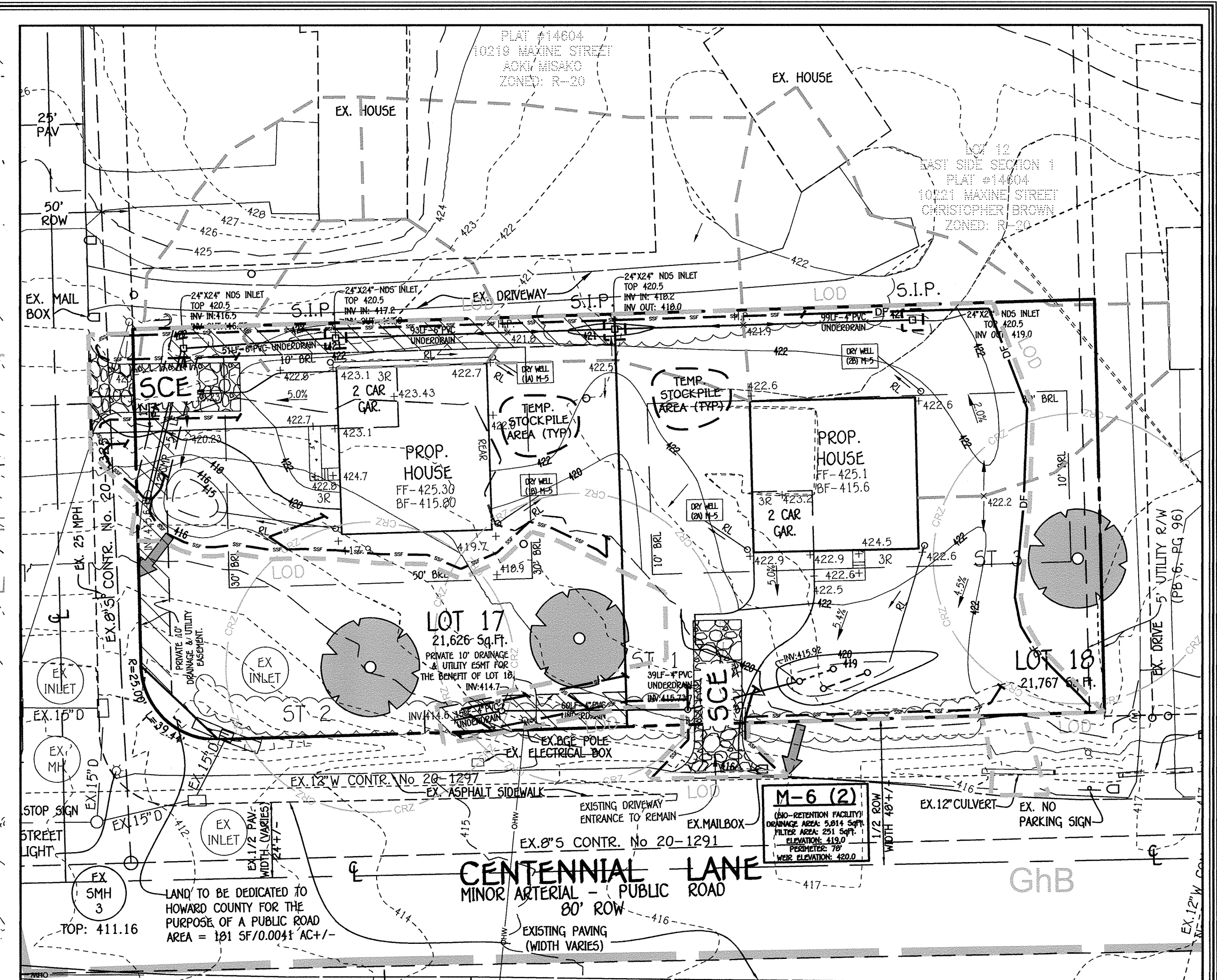


**PLAN VIEW**  
SCALE: 1" = 30'

**SEDIMENT AND EROSION CONTROL NOTE**  
THE GRADING, STORMWATER MANAGEMENT AND EROSION/SEDIMENT CONTROL SHOWN ON THESE PLANS IS FOR INFORMATIONAL PURPOSES ONLY. FINAL STORMWATER MANAGEMENT DESIGN, SITE GRADING AND EROSION/SEDIMENT CONTROL FOR LOTS 17 AND 18 WILL BE PROVIDED AT THE SITE DEVELOPMENT PLAN STAGE.

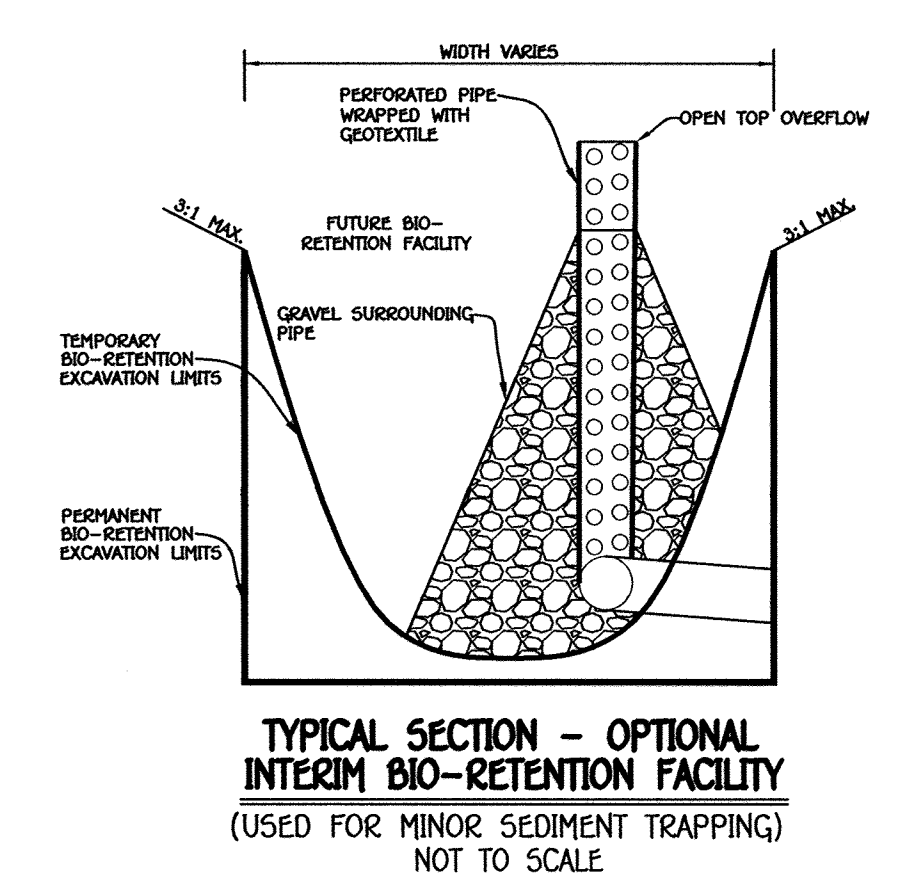
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Frank Manalansan, II  
7/18/20  
DATE



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

LEGEND	
SYMBOL	DESCRIPTION
--- (dashed)	EXISTING CONTOUR 1' INTERVAL
--- (dashed)	EXISTING CONTOUR 5' INTERVAL
--- (dashed)	PROPOSED CONTOUR 10' INTERVAL
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---	EXISTING FENCE
•	SPOT ELEVATION
---	EXISTING STORM DRAIN
---	EXISTING WATER LINE
---	EXISTING SEWER LINE
---	EXISTING OVERHEAD WIRE
---	PROPOSED PAVING
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HOWARD COUNTY WEB SOILS SURVEY

**ENVIRONMENTAL CONCEPT PLAN**  
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SHEET 3 OF 4 **ECP-19-054**

**OWNER/DEVELOPER**  
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Approved: Department of Planning And Zoning  
7.27.20  
Chief, Development Engineering Division  
7/18/20  
Chief, Division of Land Development

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**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 WC, AND RE V. IN SOME INSTANCES WHERE PERMEABILITY IS GREAT, THESE FACILITIES MAY BE USED FOR OP 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 PHOSPHOROUS AND METALS. VEGETATION PLANTED IN THE FACILITY WILL AID IN NUTRIENT UPTAKE AND WATER STORAGE. ADDITIONALLY, PLANT ROOTS WILL PROVIDE ARTERIES 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 SOO.
- > TEMPORARILY DIVERT FLOWS FROM SEEDING AREAS UNTIL VEGETATION IS ESTABLISHED.

**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. IN ADDITION, MUCH OF THE NUTRIENT POLLUTANT UPTAKE (NITROGEN AND PHOSPHORUS) IS ACCOMPLISHED THROUGH ABSORPTION 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 (EQ2), 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 TRISTLE 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 TRAVERSED 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 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 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 PRINCIPALS 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 CLAYTON AND SCHUELER, 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 50% compost and 30% compost 40%	n/a	USDA soil types loamy sand or sandy loam; clay content <2%
Organic Content	Min. 10% by dry weight (ASTM D 2974)	n/a	
Mulch	shredded hardwood	n/a	aged 6 months, minimum
Pea gravel diaphragm	pea gravel: ASTM-D-446	No. 8 or No. 9 (1/8" to 3/8")	
Curbside drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile	n/a	n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	ASHTO M-43	No. 57 or No. Aggregate (3/8" to 3/4")	
Underdrain piping	1/2" 750, Type PS 2B or ASHTO H-27B	4" to 6" rigid schedule 40 PVC or 50635	slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary undermesh 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-A113-60	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 308.4R9; vertical loading 1H-10 or H-20; allowable horizontal loading (based on soil pressure); and analysis of potential cracking
Sand	ASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Gabbro (ASHTO #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

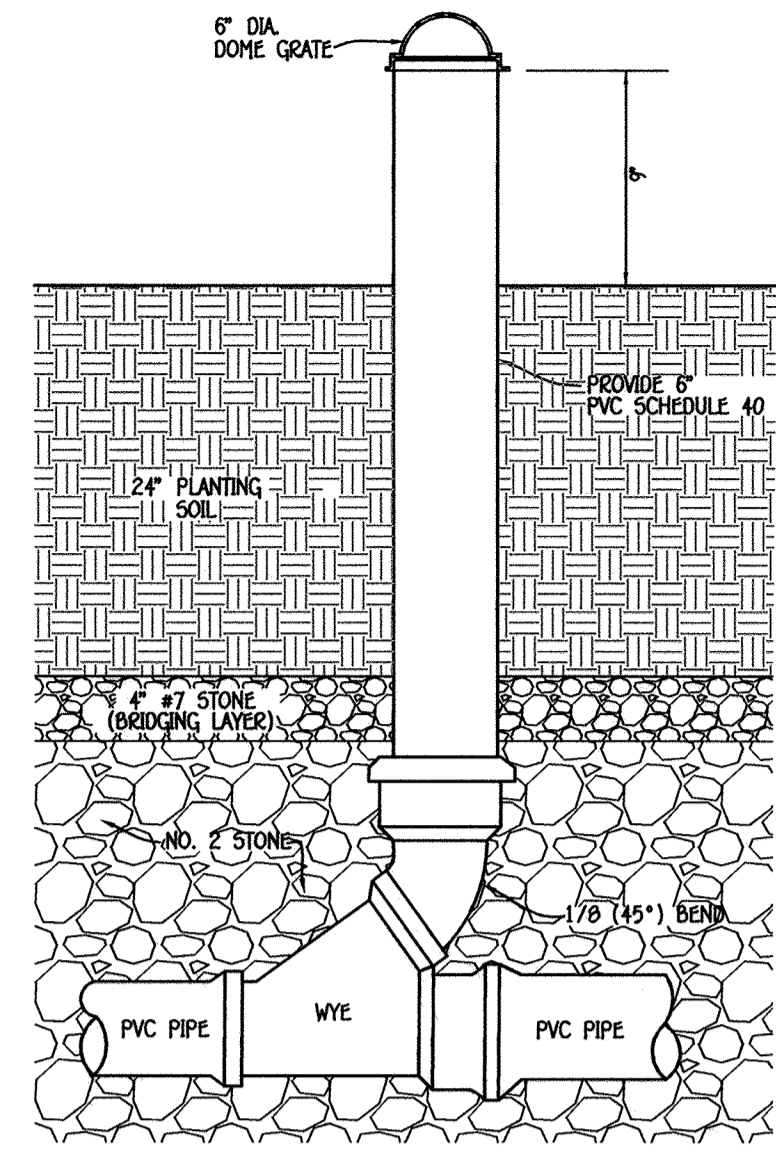
Approved: Department Of Planning And Zoning

*[Signature]*  
Chief, Development Engineering Division  
Date: 7/27/20

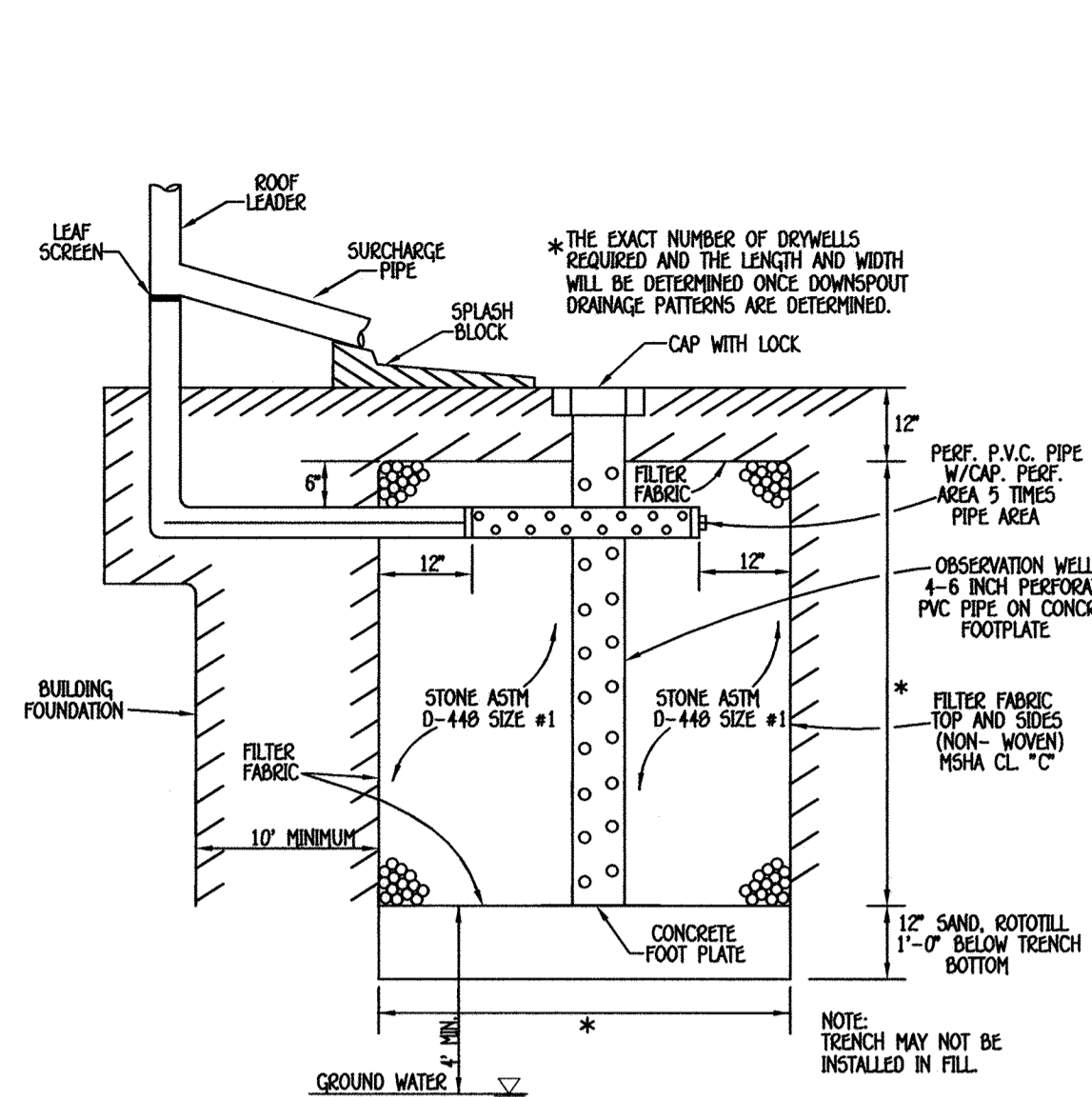
**FISHER, COLLINS & CARTER, INC.**  
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
CONTINENTAL SQUARE OFFICE PARK - 10222 BALTIMORE NATIONAL PARK  
ELLCOTT CITY, MARYLAND 21042  
(410) 461 - 2995



**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: 7/14/21.  
*[Signature]*  
FRANK MANALANSAN, II  
Date: 7/2/20



**TYPICAL CLEAN-OUT DETAIL**  
NO SCALE



**DRY WELL DETAIL (M-5)**  
NO SCALE

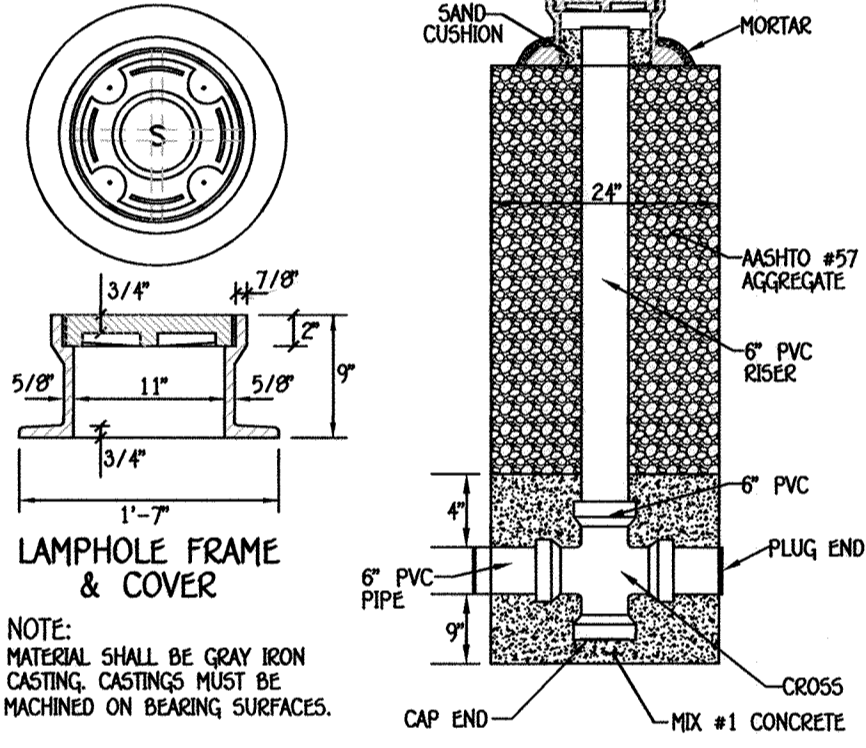
LOT NO.	#DOWNSPOUTS PER DRYWELL	AREA OF ROOF	VOLUME REQUIRED	VOLUME PROVIDED	AREA OF STORAGE	AREA OF TREATMENT	NO. OF DRYWELLS	DIMENSIONS OF DRYWELLS
LOT 17	2	825 SqFt	105 CuFt	108 CuFt	102%	100%	1A	10' X 6' X 5'
	2	1,100 SqFt	140 CuFt	168 CuFt	120%	100%	1B	12' X 7' X 5'
LOT 18	2	825 SqFt	105 CuFt	108 CuFt	102%	100%	2A	10' X 6' X 5'
	2	1,100 SqFt	140 CuFt	168 CuFt	120%	100%	2B	12' X 7' X 5'

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

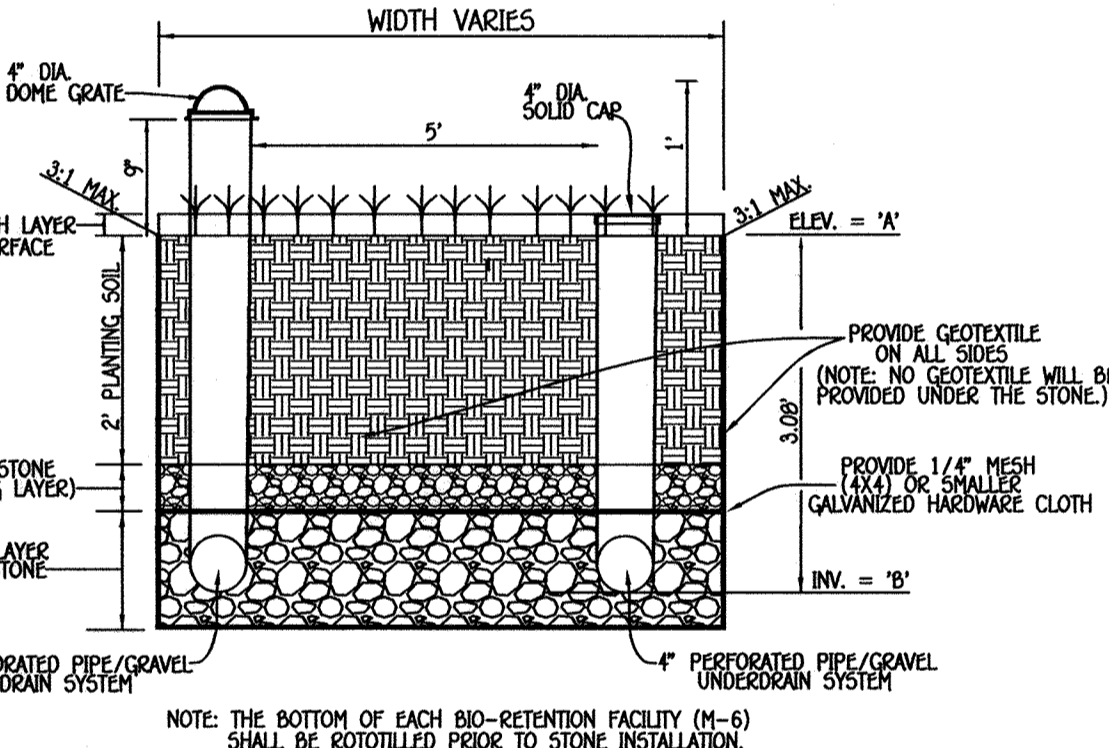
- A. THE OWNER SHALL INSPECT THE MONITORING WELLS AND STRUCTURES ON A QUARTERLY BASIS AND AFTER EVERY HEAVY STORM EVENT.
- B. THE OWNER SHALL RECORD THE WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS OVER A PERIOD OF SEVERAL DAYS TO ENSURE TRENCH DRAINAGE.
- C. THE OWNER SHALL MAINTAIN A LOG BOOK TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- D. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN 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)**

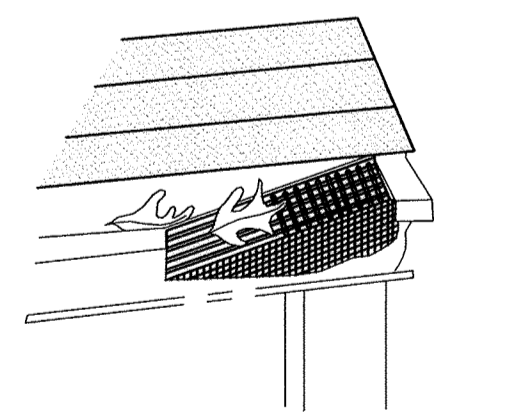
1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL 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 WIRDS.
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.



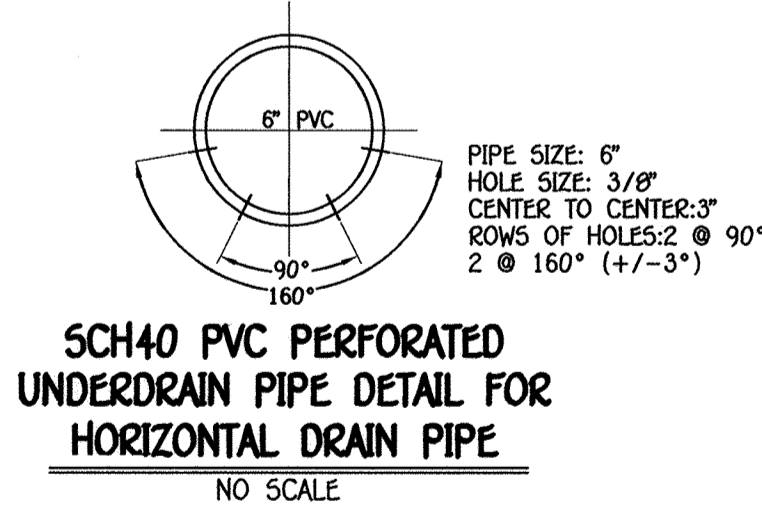
**CLEANOUT/ WATER QUALITY SAMPLING PORT DETAIL**  
NO SCALE



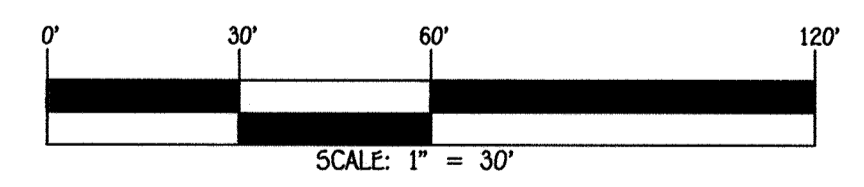
**TYPICAL SECTION BIO-RETENTION FACILITY (F-6)**  
NO SCALE



**GUTTER DRAIN FILTER DETAIL**  
NO SCALE



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



SCALE: 1" = 30'

**STORMWATER MANAGEMENT NOTES AND DETAILS**

**EAST SIDE**  
SECTION 1, LOTS 17 AND 18  
A RESUBDIVISION OF LOT 1  
EAST SIDE, SECTION 1  
PLAT BOOK 6, FOLIO 9B  
TAX MAP NO.: 30 GRID NO.: 01 PARCEL NO.: P/O159  
ZONED R-20  
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
SCALE: AS SHOWN DATE: JUNE 5, 2020  
SHEET 4 OF 4

**OWNER/DEVELOPER**  
HONG TAO MA &  
XIAO HONG LI  
4260 MAISEL FARM LANE,  
ELLCOTT CITY, MD. 21042  
TEL: 410-493-4930