

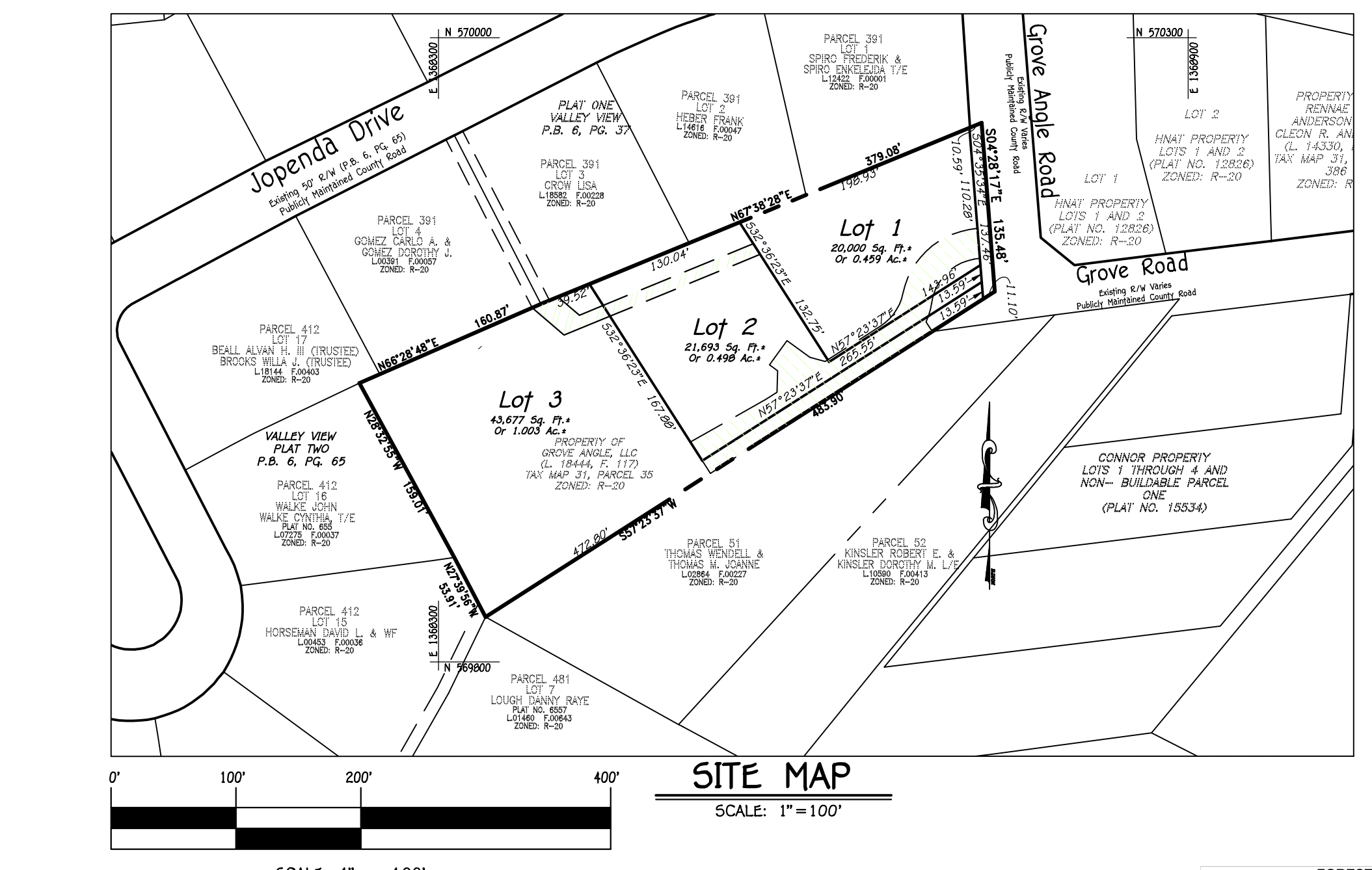
SHEET INDEX table with columns SHEET NO. and DESCRIPTION. Rows include TITLE SHEET, SITE LAYOUT / LANDSCAPE PLAN, STORMWATER MANAGEMENT PLAN, and GRADING AND EROSION/SEDIMENT CONTROL PLAN.

SOILS LEGEND table with columns SOIL, NAME, CLASS, and K-VALUE. Includes entry for Urban land-Chillum-Beltville complex.

STORMWATER MANAGEMENT PRACTICES BY LOT table with columns AREA ID, MICRO-BIO NUMBER, and REMARKS. Includes notes on stormwater management for Lot 3.

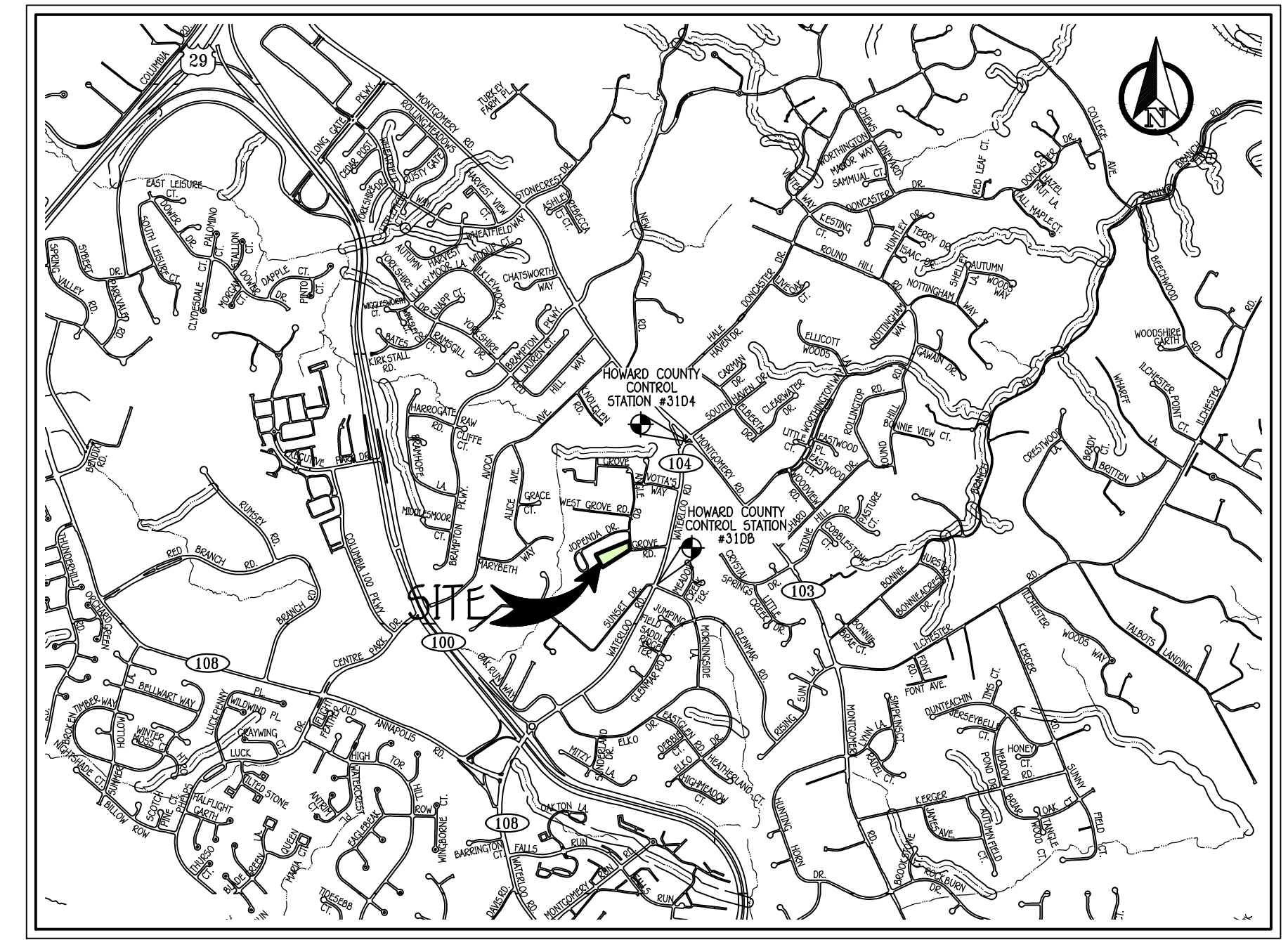
STORMWATER MANAGEMENT PRACTICES table with columns AREA ID, LOCATION, DRAINAGE AREA, % IMPERVIOUS, etc. Includes notes on stormwater management for Lot 3.

STORMWATER MANAGEMENT NOTES. 1. STORMWATER MANAGEMENT IS PROVIDED IN ACCORDANCE WITH CHAPTER 5 "ENVIRONMENTAL SITE DESIGN" OF THE 2007 MARYLAND STORMWATER MANAGEMENT DESIGN MANUAL...

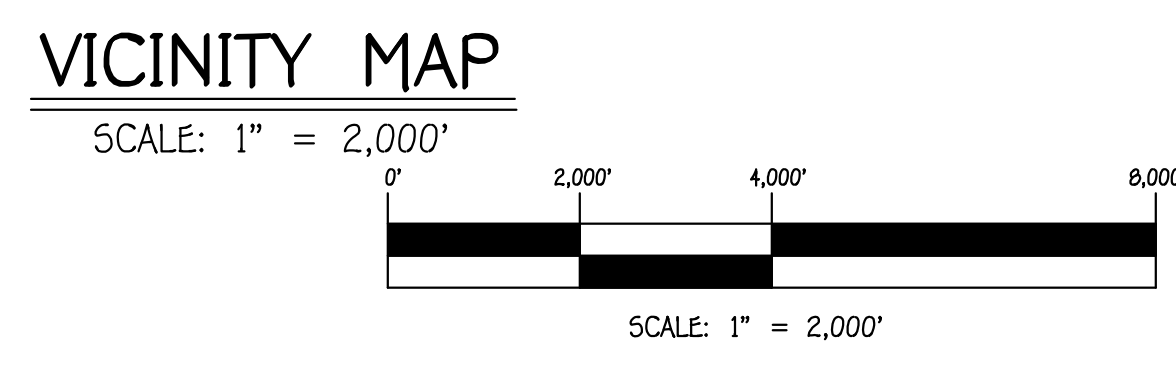


FOREST CONSERVATION WORKSHEET FOR GROVE ANGLE PROPERTY. Includes sections for Net Tract Area, Land Use Category, Existing Forest Cover, Break Even Point, Proposed Forest Clearing, and Planting Requirements Inside and Outside Watershed.

SUPPLEMENTAL PLAN GROVE ANGLE PROPERTY LOTS 1 THRU 3 R-20 (RESIDENTIAL: SINGLE DISTRICT) TAX MAP No.: 31 GRID No.: 13 PARCEL NO.: 35



HOWARD COUNTY GEODETIC SURVEY CONTROL NO. 3104 N 571,700.664 E 1,369,606.417 ELEVATION: 494.445'



LEGEND table with columns SYMBOL and DESCRIPTION. Includes symbols for existing contours, proposed contours, spot elevations, water lines, sewer lines, and various easements.

Minimum Lot Size Tabulation table with columns Lot No., Gross Area, Pipestem Area, and Minimum Lot Size.

MODERATE INCOME HOUSING UNITS (MIHU) ALLOCATION EXEMPTIONS TRACKING table with columns Total Number of Lots/Units Proposed, Number of MIHU Required, etc.

GENERAL NOTES. 1. THE SUBJECT PROPERTY IS ZONED R-20 (PER 10/06/13 COMPREHENSIVE ZONING PLAN.) 2. BOUNDARY IS BASED ON A FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS & CARTER ON OR ABOUT MARCH, 2019. 3. CONTOURS ARE BASED ON A TOPOGRAPHIC FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS AND CARTER, ON OR ABOUT JANUARY, 2019. 4. COORDINATES BASED ON NAD'83 MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL.

SITE ANALYSIS DATA CHART. A. TOTAL AREA OF THIS SUBMISSION: 06,720 Sq.Ft. (1.991 Ac.) LOT 1 = 20,000 sq-ft. (0.459 Ac.) LOT 2 = 21,693 sq-ft. (0.498 Ac.) LOT 3 = 43,677 sq-ft. (1.003 Ac.)



APPROVED: DEPARTMENT OF PLANNING AND ZONING. Includes signature of Chad Edmondson, Chief, Development Engineering Division, dated 8/22/2024.

REVISION table with columns NO., REVISION, and DATE. Includes a revision for 8/23/2024.



PROFESSIONAL CERTIFICATION. 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: 7/14/25.

OWNER/DEVELOPER. GROVE ANGLE LLC, 8611 HAYFIELD LANE, COLUMBIA, MARYLAND 21045, 410-641-1506.

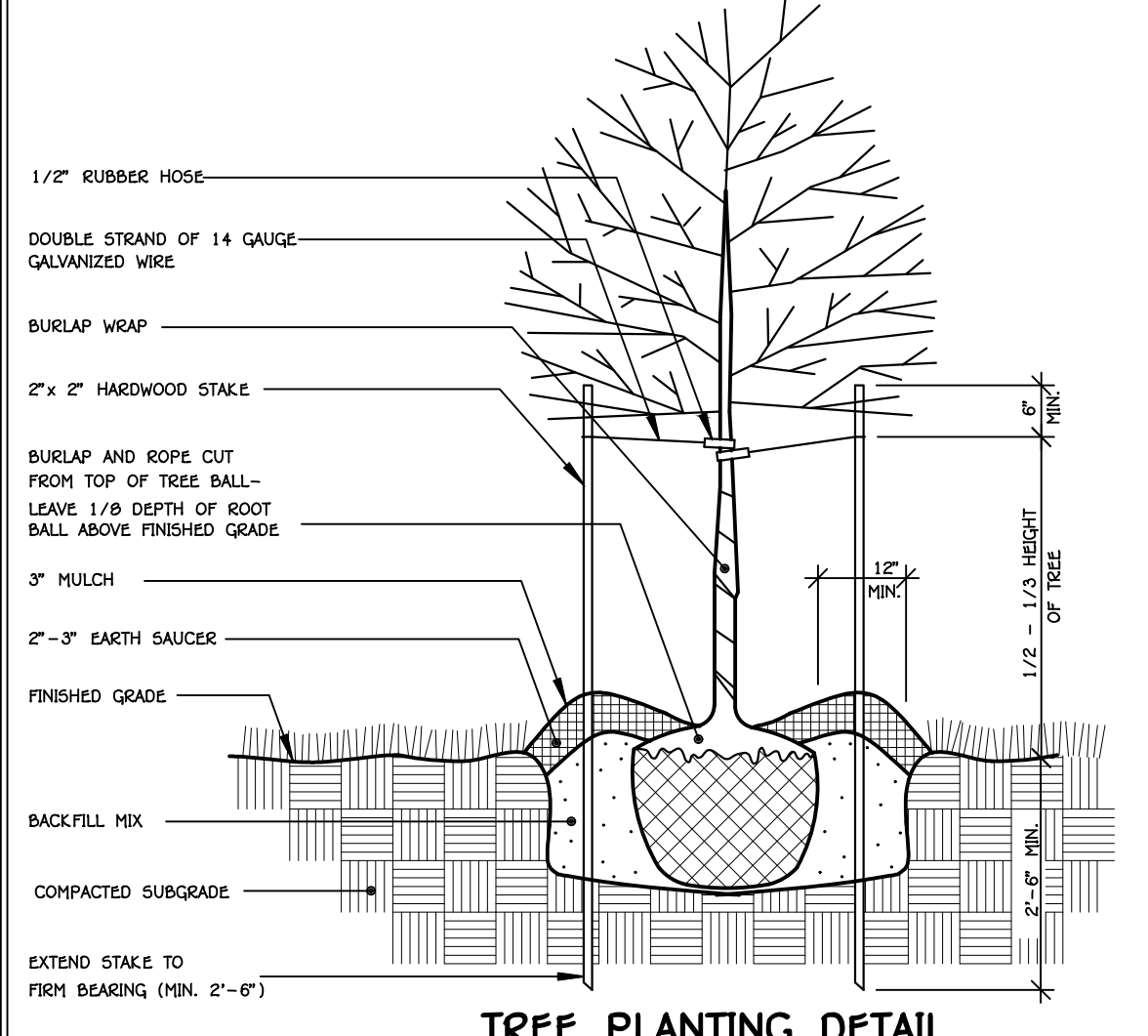
TITLE SHEET GROVE ANGLE PROPERTY LOTS 1 THRU 3 TAX MAP NO.: 31 GRID NO.: 13 PARCEL NO.: 35 ZONED R-20 PREVIOUS HOWARD COUNTY FILES: ECP-19-059, SDP-20-011, WP-20-042 (VOID).

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

LANDSCAPING PLANT LIST			
QTY.	KEY	NAME	SIZE
5	○	ACER RUBRUM OCTOBER GLORY (OCTOBER RED MAPLE)	2 1/2" - 3" CALIPER FULL CROWN, 8-8
4	○	THUJA STANDISHI X PLICATA (GREEN GIANT ARBORVITAE)	5'-6" HT. 8-8

SOILS LEGEND			
SOIL	NAME	CLASS	Kc VALUE
UcB	Urban land-Chillum-Belleville complex, 0 to 5 percent slopes	D	0.37

HOWARD COUNTY WEBSOILS SURVEY 05/06/19



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

APPROVED: DEPARTMENT OF PLANNING AND ZONING	8/22/2024
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE

PLANTING SPECIFICATIONS

PLANTS, RELATED MATERIAL, AND OPERATIONS SHALL MEET THE DETAILED DESCRIPTION AS GIVEN ON THE PLANS AND AS DESCRIBED HEREIN.

ALL PLANT MATERIAL, UNLESS OTHERWISE SPECIFIED, SHALL BE NURSERY GROWN, UNIFORMLY BRANCHED, HAVE A VIGOROUS ROOT SYSTEM, AND SHALL CONFORM TO THE SPECIES, SIZE, ROOT AND SHAPE SHOWN ON THE PLANT LIST AND THE AMERICAN ASSOCIATION OF NURSERYMEN (AA) STANDARDS. PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, FREE FROM DEFECTS, DECAY, DISFIGURING ROOTS, SUN SCALD INJURIES, ABRASIONS OF THE BARK, PLANT DISEASE, INSECT PEST INFECTIONS, BARKS AND ALL FORMS OF INSECT INFESTATIONS OR OBJECTIONABLE DISFIGUREMENTS. PLANT MATERIAL THAT IS WEAK OR WHICH HAS BEEN CUT BACK FROM LARGER GRADES TO MEET SPECIFIED REQUIREMENTS WILL BE REJECTED. TREES WITH FORKED LEADERS WILL NOT BE ACCEPTED. ALL PLANTS SHALL BE FRESHLY DUG; NO HEALED-IN PLANTS FROM COLD STORAGE WILL BE ACCEPTED.

UNLESS OTHERWISE SPECIFIED, ALL GENERAL CONDITIONS, PLANTING OPERATIONS, DETAILS AND PLANTING SPECIFICATION SHALL CONFORM TO "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS", (HEREINAFTER "LANDSCAPE GUIDELINES") APPROVED BY THE LANDSCAPE CONTRACTORS ASSOCIATION OF METROPOLITAN WASHINGTON AND THE POTOMAC CHAPTER OF THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECT, LATEST EDITION, INCLUDING ALL AGENDA.

CONTRACTOR SHALL BE REQUIRED TO GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR AFTER DATE OF ACCEPTANCE IN ACCORDANCE WITH THE APPROPRIATE SECTION OF THE LANDSCAPE GUIDELINES. CONTRACTOR'S ATTENTION IS DIRECTED TO THE MAINTENANCE REQUIREMENTS FOUND WITHIN THE ONE YEAR SPECIFICATIONS INCLUDING WATERING AND REPLACEMENT OF SPECIFIED PLANT MATERIAL.

BID SHALL BE BASED ON ACTUAL SITE CONDITIONS. NO EXTRA PAYMENT SHALL BE MADE FOR WORK ARISING FROM SITE CONDITIONS DIFFERING FROM THOSE INDICATED ON DRAWINGS AND SPECIFICATIONS.

ALL SHRUBS SHALL BE PLANTED IN CONTINUOUS TRENCHES OR PREPARED PLANTING BEDS AND MULCHED WITH COMPOSTED HARDWOOD MULCH AS DETAILS AND SPECIFIED EXCEPT WHERE NOTED ON PLANS.

POSITIVE DRAINAGE SHALL BE MAINTAINED IN PLANTING BEDS 2 PERCENT SLOPE.

PLANTING MIX SHALL BE AS FOLLOWS: DECIDUOUS PLANTS - TWO PARTS TOPSOIL, ONE PART WELL-ROTTED COW OR HORSE MANURE. ADD 3 LBS. OF STANDARD FERTILIZER PER CUBIC YARD OF PLANTING MIX. EVERGREEN PLANTS - TWO PARTS TOPSOIL, ONE PART HUMUS OR OTHER APPROVED ORGANIC MATERIAL. ADD 3 LBS. OF EVERGREEN (ACIDIC) FERTILIZER PER CUBIC YARD OF PLANTING MIX. TOPSOIL SHALL CONFORM TO THE LANDSCAPE GUIDELINES.

WEED CONTROL: INCORPORATE A PRE-EMERGENT HERBICIDE INTO THE PLANTING BED FOLLOWING RECOMMENDED RATES ON THE LABEL. CAUTION: BE SURE TO CAREFULLY CHECK THE CHEMICAL USED TO ASSURE ITS ADAPTABILITY TO THE SPECIFIC GROUND COVER TO BE TREATED.

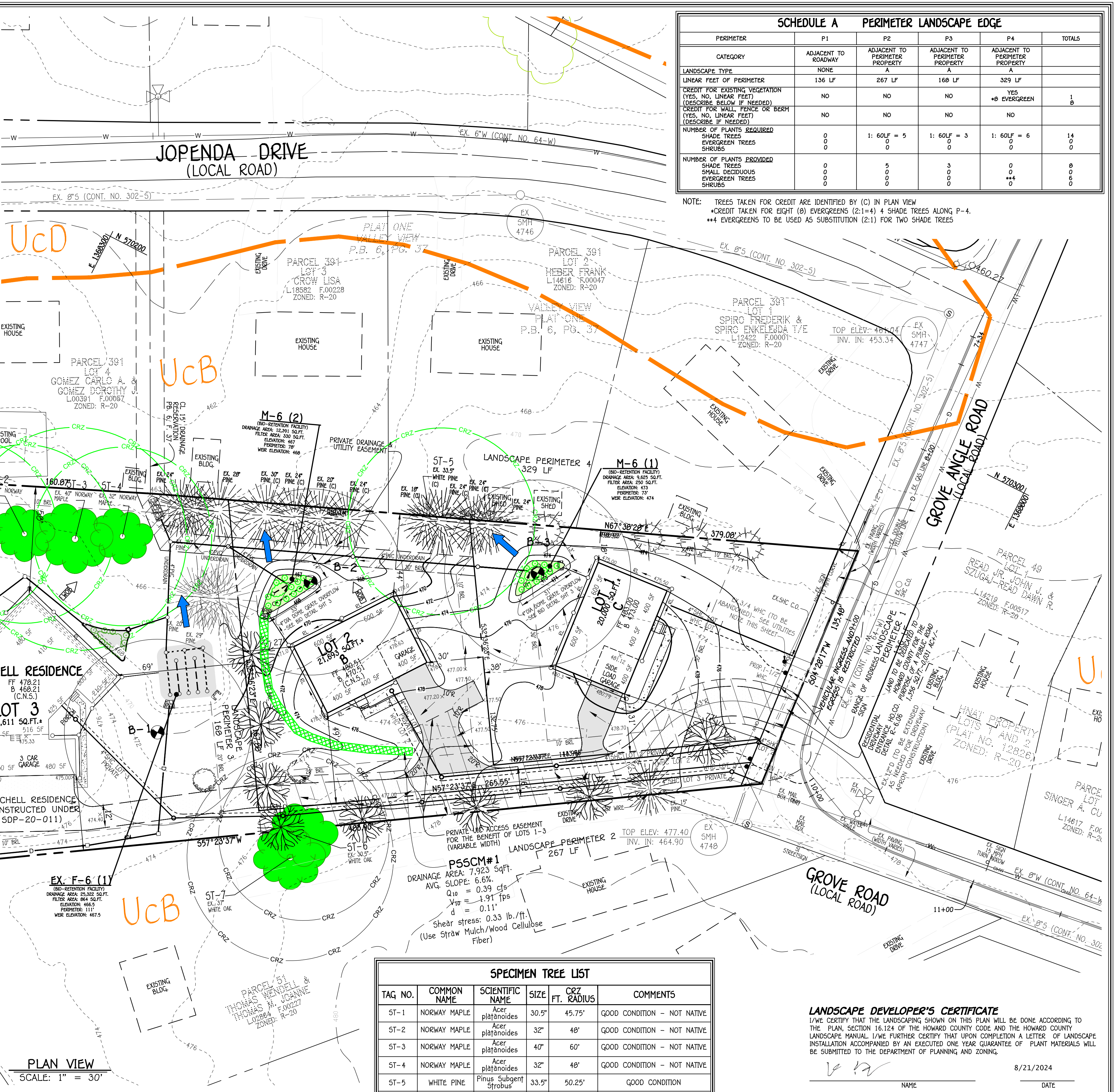
ALL AREAS WITHIN CONTRACT LIMITS DISTURBED DURING OR PRIOR TO CONSTRUCTION NOT DESIGNATED TO RECEIVE PLANTS AND MULCH SHALL BE FINE GRADED AND SEEDED.

CONSTRUCTION NOTES

THE GRADING AND STORMWATER MANAGEMENT SHOWN ON THESE PLANS IS FOR INFORMATIONAL PURPOSES ONLY. FINAL STORMWATER MANAGEMENT DESIGN AND SITE GRADING FOR LOTS 1 AND 2 WILL BE PROVIDED AT THE SITE DEVELOPMENT PLAN STAGE.

UTILITIES NOTES

CONTRACTOR SHALL ABANDON EXISTING 3/4-INCH WATER HOUSE CONNECTION AT THE EXISTING WATER MAIN AND INSTALL A NEW 1 1/2 INCH WATER HOUSE CONNECTION FOR LOT 1. EXISTING 5/8-INCH METER WILL BE REPLACED WITH 1-INCH WATER METER.



PERIMETER CATEGORY	PERIMETER LANDSCAPE EDGE				TOTALS
	P1	P2	P3	P4	
LANDSCAPE TYPE	ADJACENT TO ROADWAY	ADJACENT TO PERIMETER PROPERTY	ADJACENT TO PERIMETER PROPERTY	ADJACENT TO PERIMETER PROPERTY	
LINEAR FEET OF PERIMETER	136 LF	267 LF	168 LF	329 LF	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	YES	1
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE IF NEEDED)	NO	NO	NO	NO	0
NUMBER OF PLANTS REQUIRED					
SHADE TREES	0	1: 60LF = 5	1: 60LF = 3	1: 60LF = 6	14
EVERGREEN TREES	0	0	0	0	0
SHRUBS	0	0	0	0	0
NUMBER OF PLANTS PROVIDED					
SHADE TREES	0	5	3	0	8
SMALL DECIDUOUS EVERGREEN TREES	0	0	0	0	0
SHRUBS	0	0	0	0	0

NOTE: TREES TAKEN FOR CREDIT ARE IDENTIFIED BY (C) IN PLAN VIEW
 *CREDIT TAKEN FOR EIGHT (8) EVERGREENS (2:1=4) 4 SHADE TREES ALONG P-4
 **4 EVERGREENS TO BE USED AS SUBSTITUTION (2:1) FOR TWO SHADE TREES

- ### NOTES
- THE FERTISER LANDSCAPE OBLIGATION IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. A LANDSCAPE SURETY IN THE AMOUNT OF \$30,000.00 BASED ON EIGHT (8) SHADE TREES @ \$3000/SHADE TREE AND FOUR (4) EVERGREEN TREES @ \$1500/ EVERGREEN TREE SHALL BE BONDED AS PART OF THE GRADING PERMIT FOR LOTS 1 AND 2.
 - AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREIN LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPING MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
 - THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
 - FOR ANY TREE DESIGNATED FOR PRESERVATION, FOR WHICH CREDIT IS GIVEN, BE REMOVED OR DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR IF THE TREE IS LISTED AS A PROHIBITED OR INVASIVE SPECIES ON THE CRZ TREE LIST IT SHOULD BE REPLACED WITH A RECOMMENDED TREE SPECIES WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE LANDSCAPE MANUAL.

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: 7/14/25.
 Frank Manalansan II
 8/21/2024
 DATE

SPECIMEN TREE LIST					
TAG NO.	COMMON NAME	SCIENTIFIC NAME	SIZE	CRZ FT. RADIUS	COMMENTS
ST-1	NORWAY MAPLE	Acer platanoides	30.5'	45.75'	GOOD CONDITION - NOT NATIVE
ST-2	NORWAY MAPLE	Acer platanoides	32'	48'	GOOD CONDITION - NOT NATIVE
ST-3	NORWAY MAPLE	Acer platanoides	40'	60'	GOOD CONDITION - NOT NATIVE
ST-4	NORWAY MAPLE	Acer platanoides	32'	48'	GOOD CONDITION - NOT NATIVE
ST-5	WHITE PINE	Pinus Subgenet Strobus	33.5'	50.25'	GOOD CONDITION
ST-6	WHITE OAK	Quercus alba	30.5'	45.75'	FAIR CONDITION, LIMB DIEBACK
ST-7	WHITE OAK	Quercus alba	37'	55.5'	FAIR CONDITION, LIMB DIEBACK
ST-8	WHITE OAK	Quercus alba	37'	55.5'	REMOVED

NOTE: (1) CRITICAL ROOT ZONE (CRZ) = DBH X 1.5'
 (2) SPECIMEN TREES ST-6 AND ST-7 ARE LOCATED ON ADJACENT PARCEL 51

LANDSCAPE DEVELOPER'S CERTIFICATE
 I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION A LETTER OF LANDSCAPE INSTALLATION ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

NAME: _____ DATE: 8/21/2024

SITE LAYOUT / LANDSCAPE PLAN, NOTES AND DETAILS
GROVE ANGLE PROPERTY
 LOTS 1 THRU 3
 TAX MAP NO.: 31 GRID NO.: 13 PARCEL NO.: 35
 ZONED R-20
 PREVIOUS HOWARD COUNTY FILES: ECP-19-059, SOP-20-011
 WP-20-042 (VOID).
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: AUGUST, 2024
 SHEET 2 OF 4 F-20-034

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 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, FREE-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 DIRECT FLOW FROM SEEDING 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 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 (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 10 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

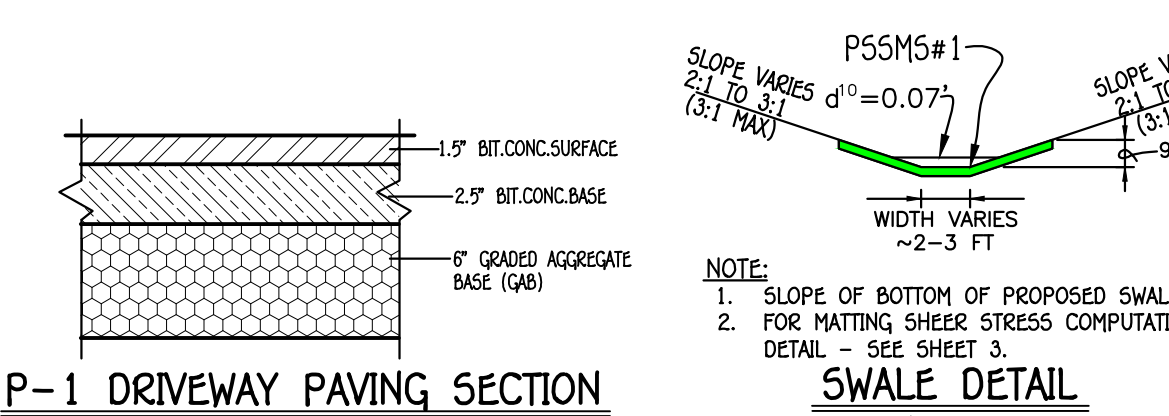
PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0% (BY WEIGHT)
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (PHOSPHATE - P2O5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (POTASH - K2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25 %
SILT	30 TO 55 %
SAND	35 TO 60 %

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 EROSION 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 CATEGORIES WITHIN A BIORETENTION FACILITY (FIGURE A.5). THE LOWEST ELEVATION SUPPORTS PLANTS 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 CLAYTON AND SCHUELER, 1997.

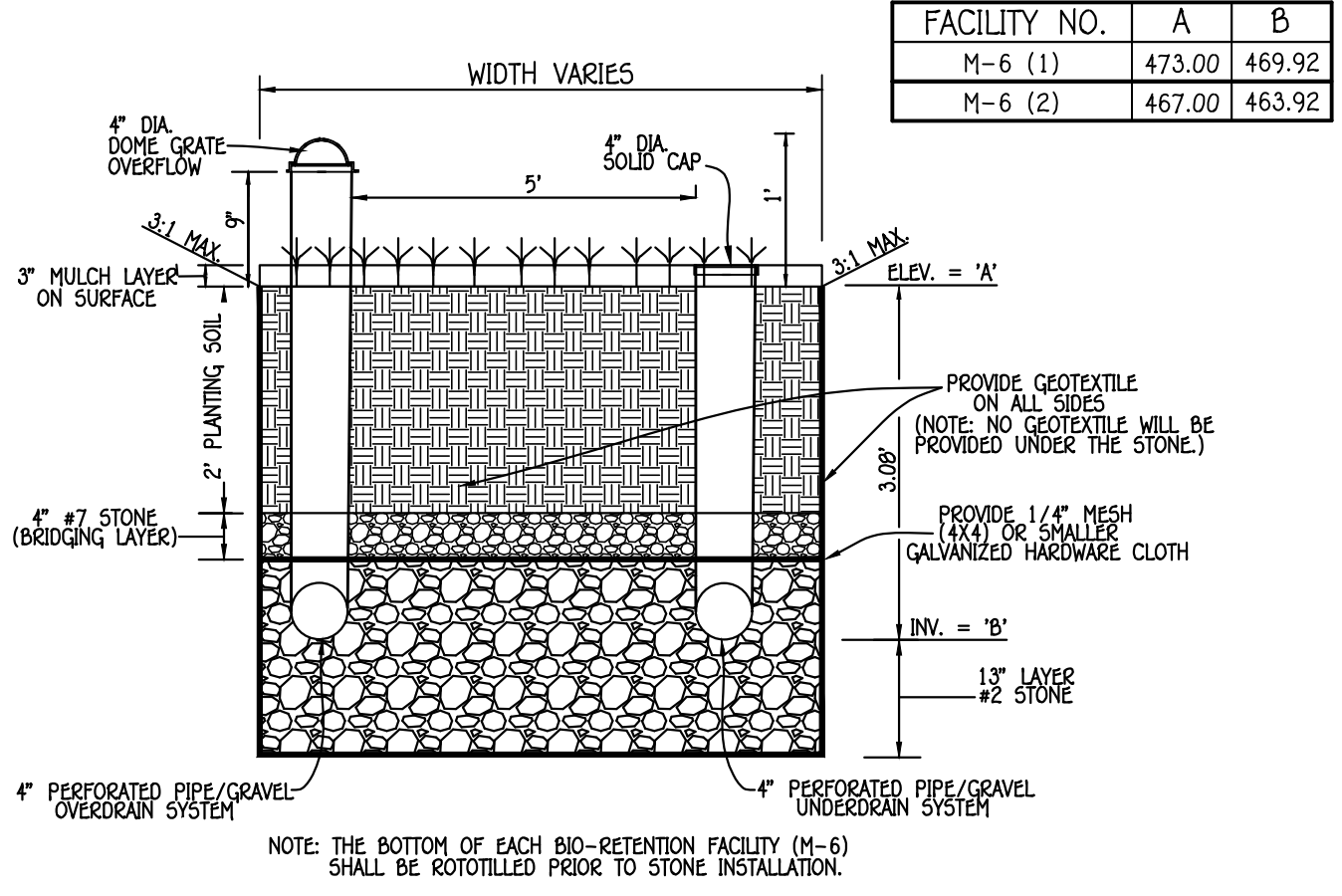
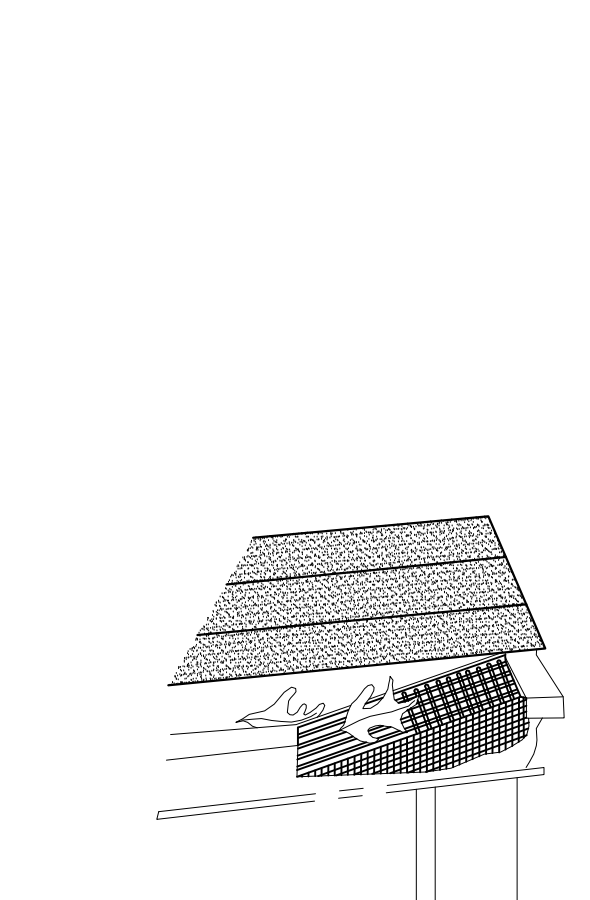
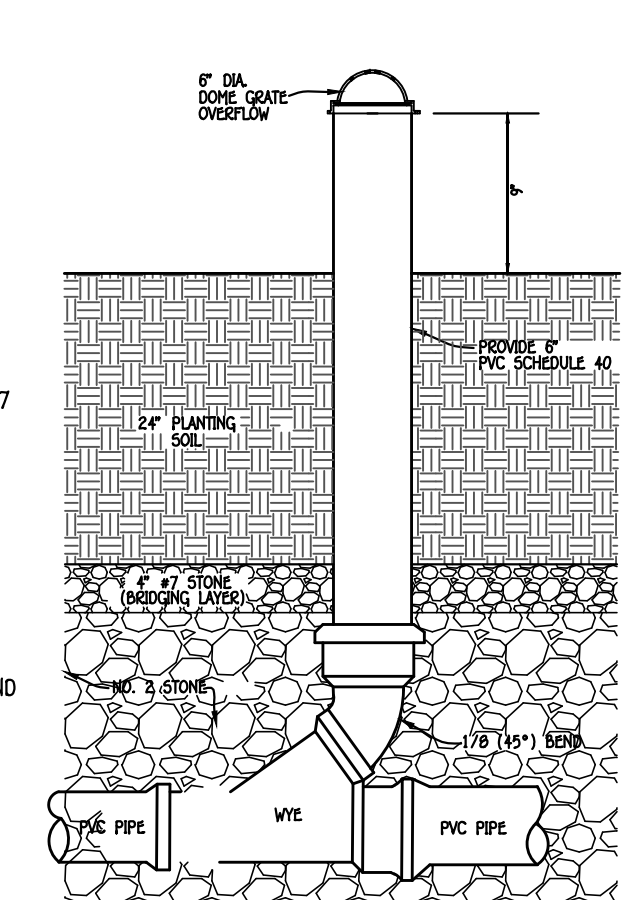
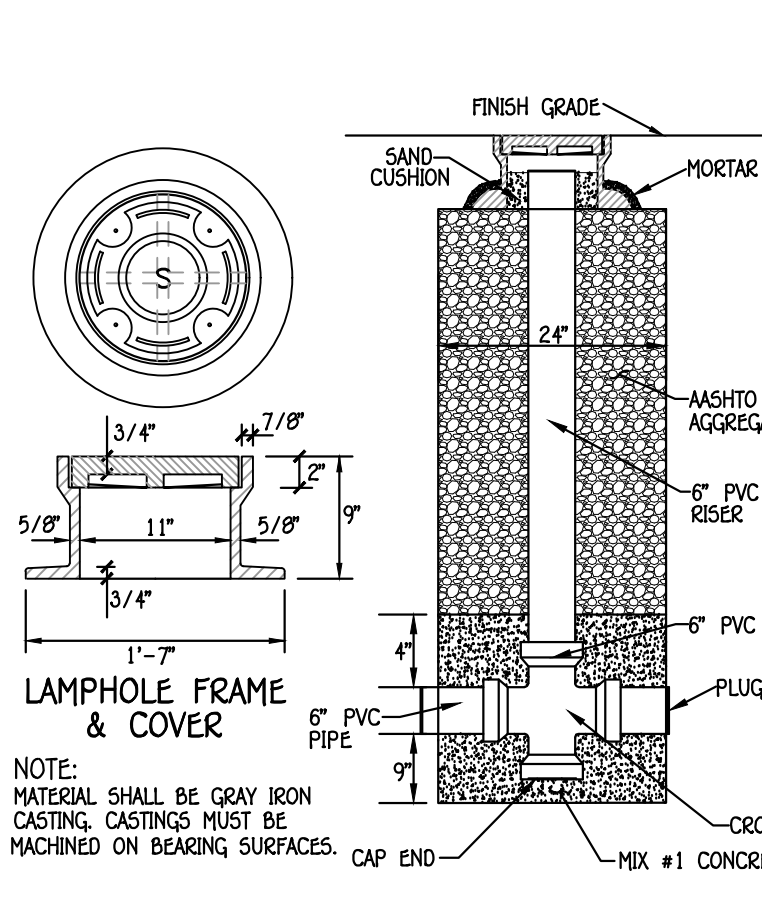
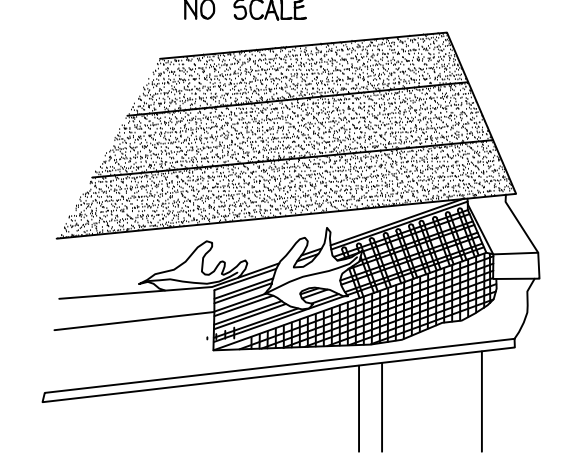
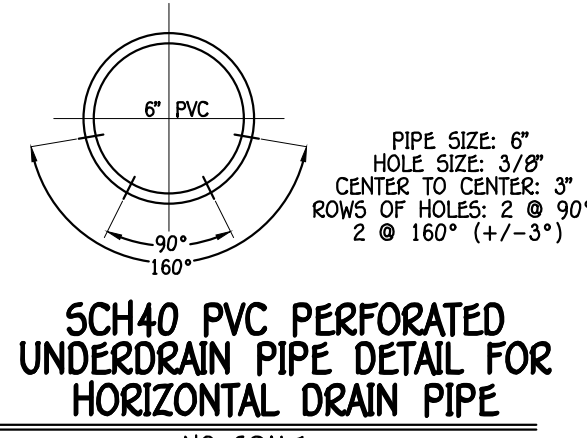


OPERATION & MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (F-6 & M-6)

- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, TABLE A.4.1 AND 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.
- THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE EXCESSIVE MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
- THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

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

APPROVED: DEPARTMENT OF PLANNING AND ZONING	DATE
Chief, Development Engineering Division	8/22/2024
Chief, Division of Land Development	8/23/2024



GUTTER DRAIN FILTER DETAIL
NO SCALE

CLEANOUT/WATER QUALITY SAMPLING PORT DETAIL
NO SCALE

TYPICAL CLEAN-OUT DETAIL
NO SCALE

GUTTER DRAIN FILTER DETAIL
NO SCALE

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

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.

STORMWATER MANAGEMENT PRACTICES BY LOT

AREA ID	MICRO-BIO NUMBER	REMARKS
LOT 1	1	HOUSE AND PORTION OF UIC DRIVEWAY DRAINS TO BIO ON LOT
LOT 2	2	HOUSE AND PORTION OF UIC DRIVEWAY DRAINS TO BIO ON LOT
*LOT 3	EX. F-6 (1) EX. M-6 (1)	PORTION OF HOUSE AND UIC DRIVEWAY DRAINS TO BIO ON LOT PORTION OF HOUSE AND UIC DRIVEWAY DRAINS TO BIO ON LOT

* STORMWATER MANAGEMENT FOR LOT 3 HAS BEEN PROVIDED UNDER S0P-20-011

STORMWATER MANAGEMENT PRACTICES

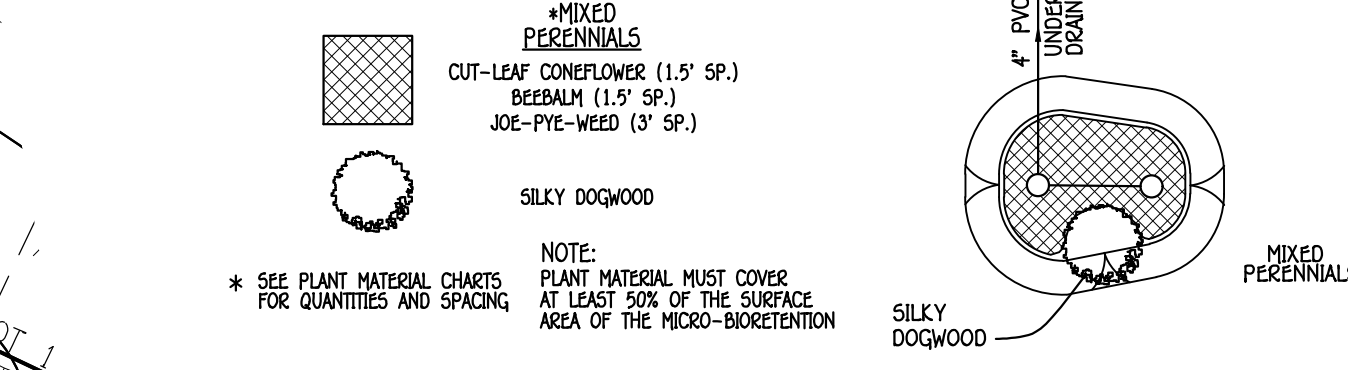
AREA ID	LOCATION	DRAINAGE AREA SF.	% IMPERVIOUS	ESOV REQUIRED CUFT.	ESOV PROVIDED CUFT.	MICRO-BIO-RETENTION (Y/N)
1	LOT 1	9,328	49.0%	342	360	Y
2	LOT 2	11,461	46.0%	398	412	Y
3	LOT 3	29,322	21.0%	450	1,032	Y (F-6)* Y (M-6)*
4	LOT 3	10,061	36.0%	282	416	Y (M-6)*

* STORMWATER MANAGEMENT FOR LOT 3 HAS BEEN PROVIDED UNDER S0P-20-011

SOILS LEGEND

SOIL	NAME	CLASS	K VALUE
UcB	Urban land-Chillum-Bellevue complex, 0 to 5 percent slopes	D	0.37

HOWARD COUNTY WEBSOILS SURVEY 05/06/19



MICRO-BIORETENTION PLANTING DETAIL
NOT TO SCALE

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	loamy sand 60-65% compost 35-40% or sandy loam 30% coarse sand 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-448	No. 8 or No. 9 (1/8" to 3/8")	
Curbin 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. Aggregate (3/8" to 3/4")	
Underdrain piping	F 758 Type P5 2B or AASHTO M-27B	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe: 3/8" per ft. @ 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 @ 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 unless previously approved state or local standards requires design drawings sealed and approved by a professional structural engineer. Referencing to the title of Maryland - design to include meeting MD Code 350.8/89; vertical loading 1H-10 or H-20; allowable horizontal loading (based on soil pressure); and analysis of potential cracking
Sand	AASHTO M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Dibble and Graystone (AASHTO) #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
GROVE ANGLE PROPERTY
LOTS 1 THRU 3
TAX MAP NO.: 31 GRID NO.: 13 PARCEL NO.: 35
ZONED R-20
PREVIOUS HOWARD COUNTY FILES: ECP-19-059, S0P-20-011
WP-20-042 (VOID),
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: AUGUST, 2024
SHEET 3 OF 4 F-20-034



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: 7/14/25.
Frank Manalansan II
FRANK MANALANSAN II DATE 8/21/2024



STORMWATER MANAGEMENT PLAN
SCALE: 1" = 20'

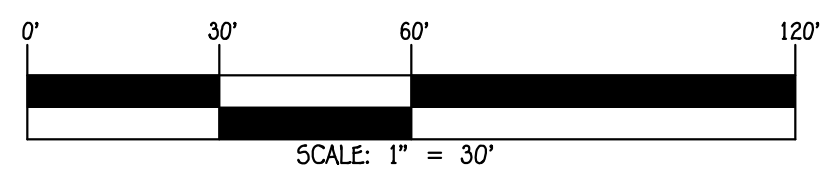
LEGEND	
SYMBOL	DESCRIPTION
	EXISTING CONTOUR 2' INTERVAL
	EXISTING CONTOUR 10' INTERVAL
	PROPOSED CONTOUR 10' INTERVAL
	PROPOSED CONTOUR 2' INTERVAL
	EXISTING FENCE
	SPOT ELEVATION
	EXISTING STORM DRAIN
	EXISTING WATER LINE
	EXISTING SEWER LINE
	EXISTING OVERHEAD WIRE
	EXISTING FENCE LINE
	PROPOSED PAVING
	PRIVATE UIC EASEMENT
	PRIVATE DRAINAGE & UTILITY EASEMENT
	LIMIT OF DISTURBANCE
	SUPER SILT FENCE/TREE PROTECTION FENCE
	DIVERSION FENCE/TREE PROTECTION FENCE
	EXISTING TREE LINE
	PROPOSED TREE LINE
	DRAINAGE DIVIDE
	PERMANENT SOIL STABILIZATION CONTROL MATTING
	SOIL LINES AND TYPES
	BIO RETENTION FACILITY (F-6) OR (M-6) AS NOTED
	PROPOSED ROOF LEADER
	DENOTES MBR OVERLAND FLOWPATH
	DENOTES EXISTING TREES TO BE REMOVED
	DENOTES EXISTING TREES TO REMAIN
	SPECIMEN TREE
	CRITICAL ROOT ZONE
	DENOTES 5WM TEST BORING LOCATION



SOILS LEGEND			
SOIL	NAME	CLASS	K' VALUE
UcB	Urban land-Chillum-Bethsville complex, 0 to 5 percent slopes	D	0.37

HOWARD COUNTY WEBSOILS SURVEY 05/06/19

PLAN VIEW
SCALE: 1" = 30'



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CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
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ELICOTT CITY, MARYLAND 21042
(410) 461-2855

APPROVED:	DEPARTMENT OF PLANNING AND ZONING	DATE	NO.	REVISION	DATE
		8/22/2024			
CHIEF, DEVELOPMENT ENGINEERING DIVISION		8/23/2024			
CHIEF, DIVISION OF LAND DEVELOPMENT					

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 1 AND 2 WILL BE PROVIDED AT THE SITE DEVELOPMENT PLAN STAGE



PROFESSIONAL CERTIFICATION
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Frank Manalansan II
FRANK MANALANSAN II
DATE: 8/21/2024

OWNER/DEVELOPER
GROVE ANGLE LLC
8611 HAYSHED LANE
COLUMBIA MARYLAND 21045
410-641-1506

GRADING AND EROSION/SEDIMENT CONTROL PLAN
GROVE ANGLE PROPERTY
LOTS 1 THRU 3
TAX MAP NO.: 31 GRID NO.: 13 PARCEL NO.: 35
ZONED R-20
PREVIOUS HOWARD COUNTY FILES: ECP-19-059, SDP-20-011
WP-20-042 (VOID)
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: AUGUST, 2024
SHEET 4 OF 4 F-20-034