

**GENERAL NOTES**

1. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY VOGEL ENGINEERING-TIMMONS GROUP DATED FEBRUARY 2021. OFFSITE TOPOGRAPHY IS BASED ON HOWARD COUNTY GIS.
3. THE PROJECT BOUNDARY SHOWN HEREON IS BASED ON A BOUNDARY SURVEY PREPARED BY VOGEL ENGINEERING-TIMMONS GROUP DATED FEBRUARY 2021.
4. THE SUBJECT PROPERTY IS ZONED "TOD" IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
5. THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
6. PUBLIC WATER IS PROVIDED BY CONTRACT 24-WAS.
7. PUBLIC SEWER IS PROVIDED BY CONTRACT 24-WAS.
8. THERE IS NO 100-YEAR FLOODPLAIN ON-SITE.
9. THERE ARE NO STEEP SLOPES WITH A CONTIGUOUS AREA OF 20,000SF LOCATED ON-SITE.
10. THERE ARE WETLANDS, STREAMS AND BUFFERS ON-SITE.
11. THERE ARE NO SPECIMEN TREES ON-SITE.
12. ENVIRONMENTAL AND FOREST STAND DELINEATION REPORTS FOR LOTS 1, 2, 6-11, AND 13 PREPARED BY ECO-SCIENCE PROFESSIONALS, INC.; BOTH DATED MARCH 2021.
13. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
14. BINDER LANE IS CLASSIFIED AS A LOCAL ROAD.
15. 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.
16. STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THREE MICRO-BIORETENTION FACILITIES (M-6). THIS FACILITIES SHALL BE PRIVATELY OWNED AND MAINTAINED.
17. 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.
18. APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING AND ADDRESS THE PROJECT TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.

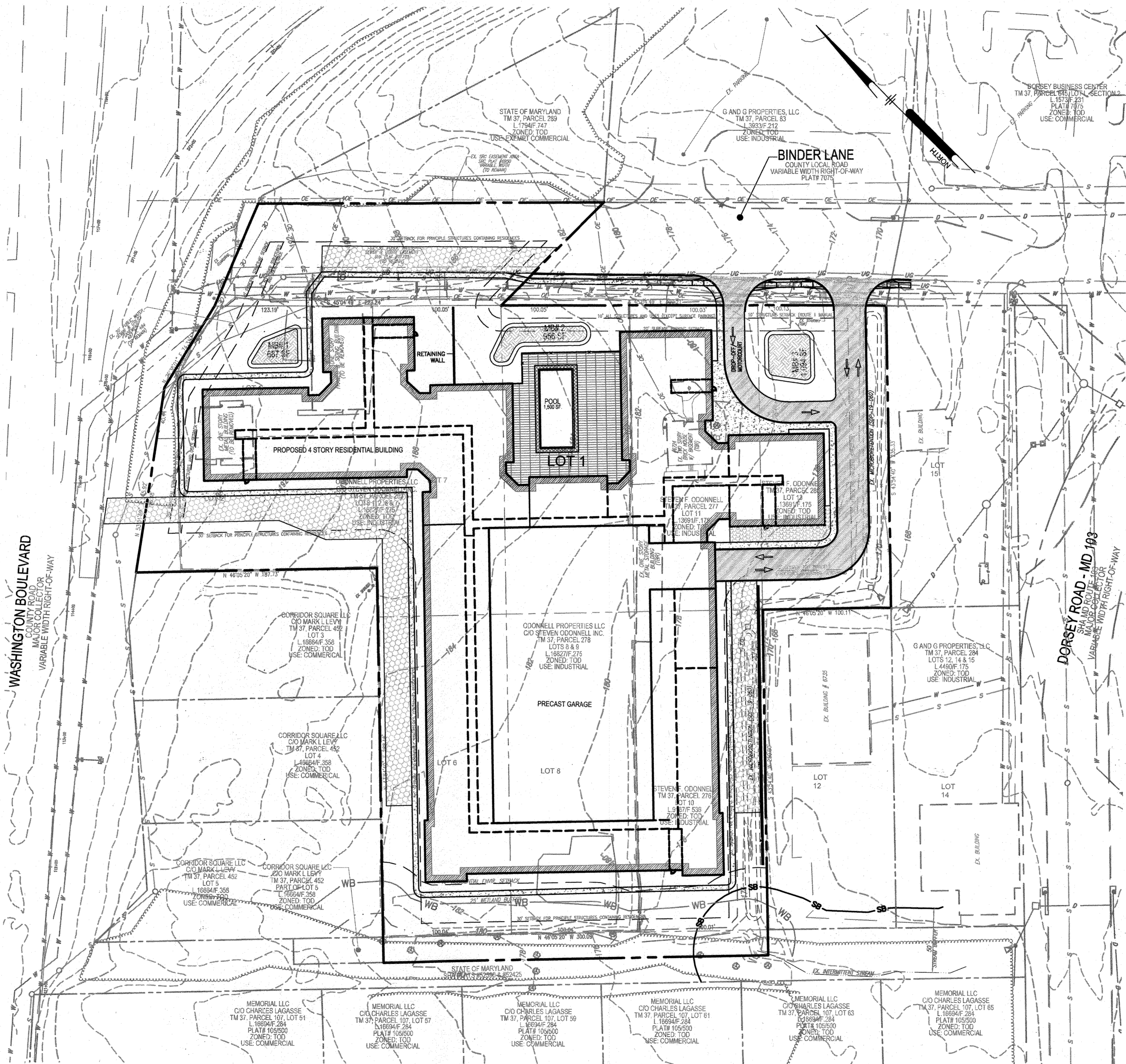
**ENVIRONMENTAL SITE DESIGN NARRATIVE:**

1. THE SITE NATURALLY SLOPES FROM NORTH TO SOUTH. THE SITE HAS BEEN DESIGNED TO MAINTAIN THE NATURAL DRAINAGE PATTERNS, WITH NO DRAMATIC CHANGES TO THE NATURAL DRAINAGE.
2. 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). THIS PROJECT QUALIFIES FOR REDEVELOPMENT. EXISTING IMPERVIOUS AREA ON SITE IS 100% WHICH IS ABOVE THE 40% THRESHOLD FOR REDEVELOPMENT. THE ESD CONCEPT INCLUDES THE USE OF THREE MICRO-BIORETENTION FACILITIES (M-6). THE TARGET P<sub>100</sub> AND THE TARGET SITE ESD<sub>100</sub> REQUIRED IS 4,242 CF. THIS PLAN PROVIDES 5,588 CF ESD<sub>100</sub>. THE 100-YR STORM HAS DECREASED BY REDUCING THE IMPERVIOUS AREA ON SITE, AND BY REDUCING THE 100 YEAR PEAK DISCHARGE FROM THIS SITE FROM 94.24 cfs TO 92.76 cfs. PROPOSED IMPERVIOUS AREA IS 62% OF THE PROJECT AREA.
3. SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF SUPER SILT FENCE AND DIVERSION FENCE. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT DURING THE FUTURE SITE DEVELOPMENT PLAN PHASE OF THE PROJECT.
4. STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF THREE MICRO-BIORETENTION FACILITIES (M-6). THE PROPOSED PRACTICES HAVE BEEN MAXIMIZED TO THE EXTENT PRACTICAL.

**SITE DATA:**

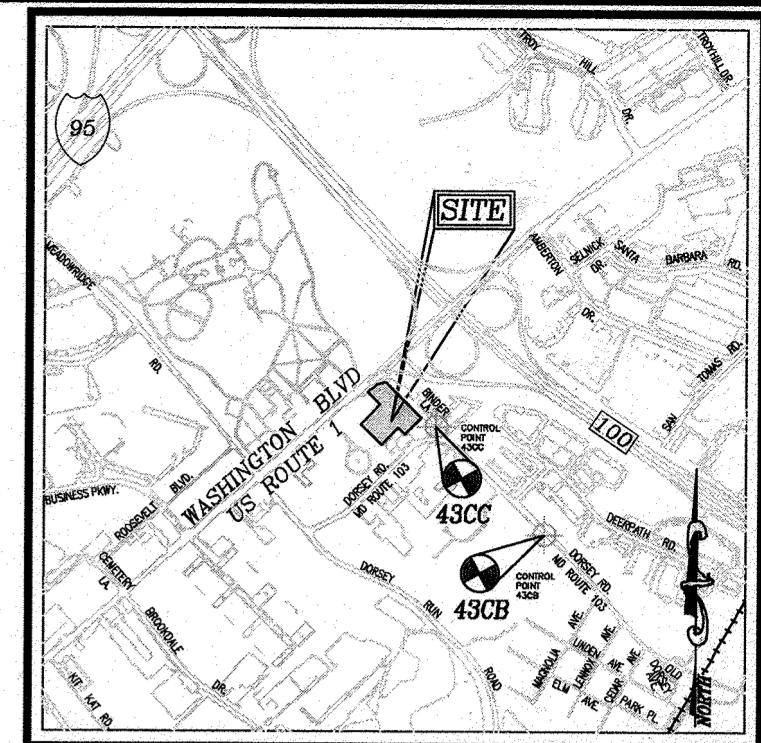
LOCATION: COLUMBIA, MD.; TAX MAP 37, BLOCK 23, PARCELS 276-278, 280, 283  
 1ST ELECTION DISTRICT  
 PRESENT ZONING: TOD  
 PROJECT AREA: 5.29 AC.  
 - 0.36 AC. LOT 1  
 - 0.43 AC. LOT 2  
 - 0.57 AC. LOT 6  
 - 0.55 AC. LOT 7  
 - 0.57 AC. LOT 8  
 - 0.55 AC. LOT 9  
 - 0.57 AC. LOT 10  
 - 0.55 AC. LOT 11  
 - 0.54 AC. LOT 13  
 - 0.45 AC. COUNTY ROW (TO BE ACQUIRED)  
 - 0.14 AC. SHA ROW (TO BE ACQUIRED)  
 DPZ REFERENCES: L.9167/F.536, L.13691/F.175  
 USE OF PROPOSED STRUCTURE: RESIDENTIAL  
 TOTAL BUILDING COVERAGE: 105,022 SF (2.41 AC. OR 45.56% OF GROSS AREA)  
 PAVED PARKING LOT/AREA ON SITE: 9,454 SF (0.22 AC. OR 4.16% OF GROSS AREA)  
 AREA OF LANDSCAPE ISLAND: 0 SF (0.00 AC. OR 0% OF GROSS AREA)  
 LIMIT OF DISTURBED AREA: 5.23 AC.  
 WETLANDS WITHIN LOD: 0.00 AC.  
 WETLAND BUFFERS WITHIN LOD: 0.00 AC.  
 STREAMS AND THEIR BUFFERS WITHIN LOD: 0.00 AC.  
 AREA OF ON-SITE 100 YEAR FLOODPLAIN WITHIN LOD: 0.00 AC.  
 AREA OF EXISTING FOREST WITHIN LOD: 0.00 AC.  
 AREA OF ON-SITE NRCS/MDE/HSCD STEEP SLOPES (20% OR GREATER): 0.00 AC.  
 AREA OF ON-SITE STEEP SLOPES (25% OR GREATER): 0.00 AC.  
 AREA OF ERODIBLE SOILS: 0.00 AC.  
 AREA MANAGED BY ESDV (THIS PLAN): 1.22 AC.  
 IMPERVIOUS AREA (MANAGED BY ESDV): 1.08 AC.  
 GREEN AREA (MANAGED BY ESDV): 0.14 AC.

# ENVIRONMENTAL CONCEPT PLAN O'DONNELL PROPERTIES BINDER LANE



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

**BENCHMARKS**  
 BENCHMARK NO. 1: HOWARD COUNTY CONTROL #43CB  
 N. 552084.214, E. 1382282.508 ELEV. = 144.435  
 BENCHMARK NO. 2: HOWARD COUNTY CONTROL #43CC  
 N. 553201.436, E. 1381152.910 ELEV. = 163.697



**VICINITY MAP**  
SCALE: 1"=2000'  
ADC MAP COORDINATE: 35-AS

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division *JR* DATE  
 Chief, Division of Land Development *JS* 3/16/22 DATE

DEVELOPER: OLD TOWN CONSTRUCTION  
 5304 DORSEY HALL DRIVE  
 ELLICOTT CITY, MD 21042  
 ATTN: JARED SPAHN  
 PHONE: 410-730-3725

OWNER: O'DONNELL PROPERTIES LLC  
 5 LONGWOOD ROAD  
 BALTIMORE, MD 21210  
 ATTN: STEVE O'DONNELL  
 PHONE: 410-786-7988

PROJECT: O'DONNELL PROPERTIES

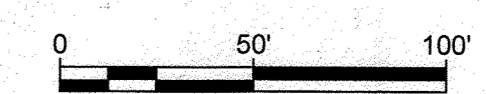
AREA: TAX MAP 37 PARCELS 276, 277, 278, 280 & 283 LOTS 1, 2, 6-11 & 13  
 ZONED TOD GRID NO. 23 1ST ELECTION DISTRICT  
 6724 W. 6728 DORSEY ROAD AND 6718 BINDER LANE  
 ELKRIDGE, MARYLAND 21075  
 HOWARD COUNTY, MARYLAND

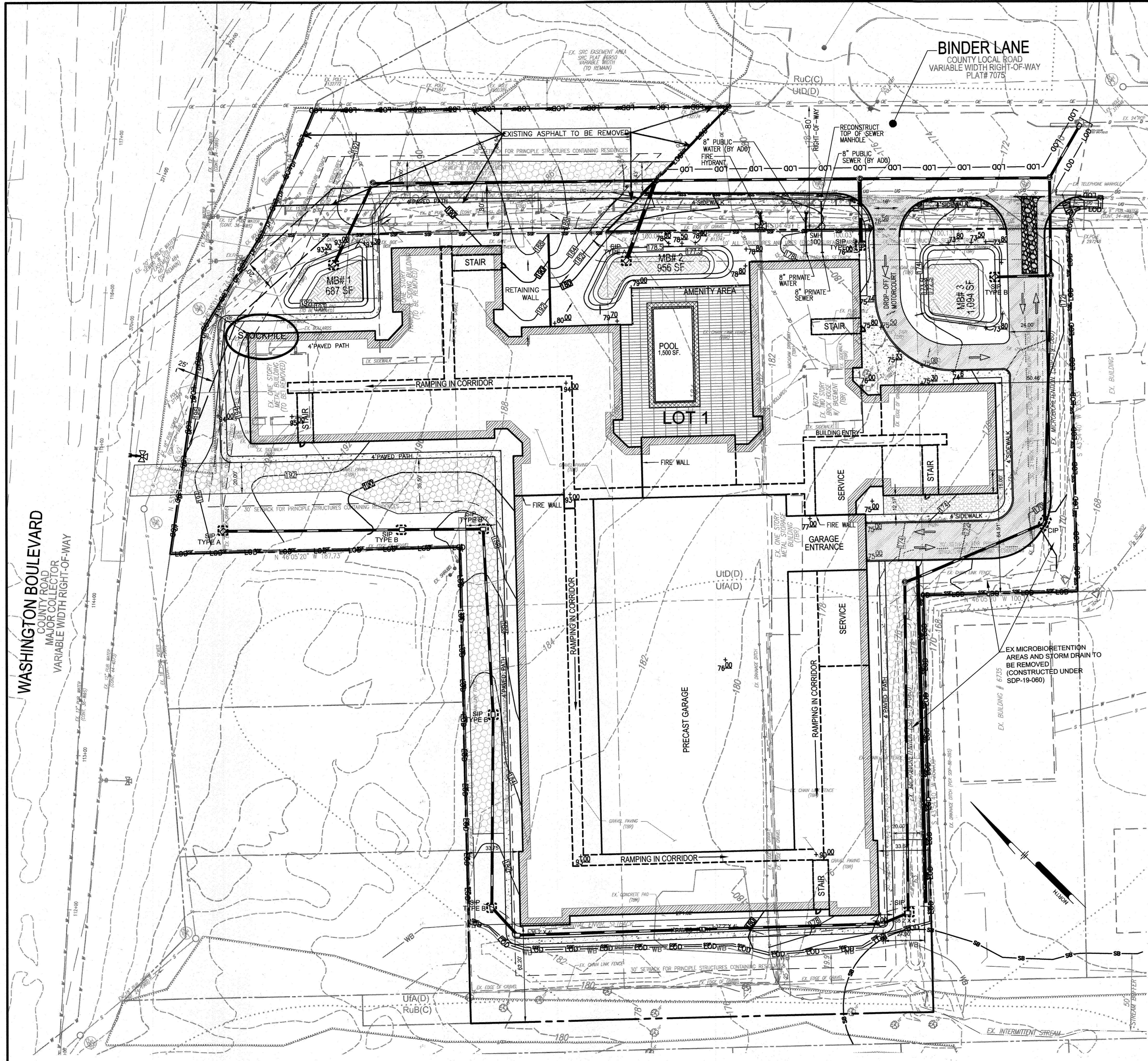
TITLE: COVER SHEET

Pennoni Associates Inc.  
**Pennoni** Engineers • Surveyors • Planners  
 Landscape Architects  
 8890 McGaw Road, Suite 100 Columbia, MD 21045  
 T 410.997.8900 F 410.997.9282

SEAL: [Professional Seal of Steve O'Donnell, State of Maryland, License No. 3666, Exp. 03/31/2024]  
 DESIGNED BY: PAI  
 DRAWN BY: ALC  
 PROJECT NO.: ODONN21001  
 DATE: MARCH 7, 2022  
 SCALE: 1" = 50'  
 DRAWING NO.: 1 OF 3

SHEET INDEX	
DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 3
ESDV CONCEPT PLAN	2 OF 3
STORMWATER MANAGEMENT DRAINAGE AREA MAP AND DETAILS	3 OF 3





WASHINGTON BOULEVARD  
 COUNTY ROAD  
 MAJOR COLLECTOR  
 VARIABLE WIDTH RIGHT-OF-WAY

BINDER LANE  
 COUNTY LOCAL ROAD  
 VARIABLE WIDTH RIGHT-OF-WAY  
 PLAT# 7075

**LEGEND**

EXISTING 2' CONTOUR	---	PROPOSED CONCRETE	[Pattern]
EXISTING 10' CONTOUR	---	PROPOSED ASPHALT	[Pattern]
EX. PROPERTY LINE AND RIGHT OF WAY	---	PROPOSED FIRE LANE	[Pattern]
ADJACENT PROPERTY LINE	---	STABILIZED CONSTRUCTION ENTRANCE	[Pattern]
EXISTING BUILDING	[Pattern]	MICRO-BIORETENTION	[Pattern]
EXISTING STREAM	---	STANDARD INLET PROTECTION	[Symbol]
EXISTING WETLANDS	---	SUPER SILT FENCE	[Symbol]
EXISTING WETLANDS BUFFER	WB	DIVERSION FENCE	DF-DF
EXISTING TREELINE	---		
EXISTING WATER	---		
EXISTING SEWER	S-S		
EXISTING STORM DRAIN	D-D		
EXISTING CURB & GUTTER	---		
EXISTING FIRE HYDRANT	⊕		
SOILS BOUNDARY	---		
PROPOSED 2' CONTOUR	---		
PROPOSED 10' CONTOUR	---		
LIMIT OF DISTURBANCE	LOD		
PROPOSED WATER	---		
PROPOSED FIRE HYDRANT	⊕		
PROPOSED SEWER	S-S		
PROPOSED STORM DRAIN	D-D		
PROPOSED BUILDING	[Pattern]		

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 3-16-22 DATE  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION JP

*[Signature]* 3/16/22 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT B

DATE	NO.	REVISION	BY

DEVELOPER: OLD TOWN CONSTRUCTION  
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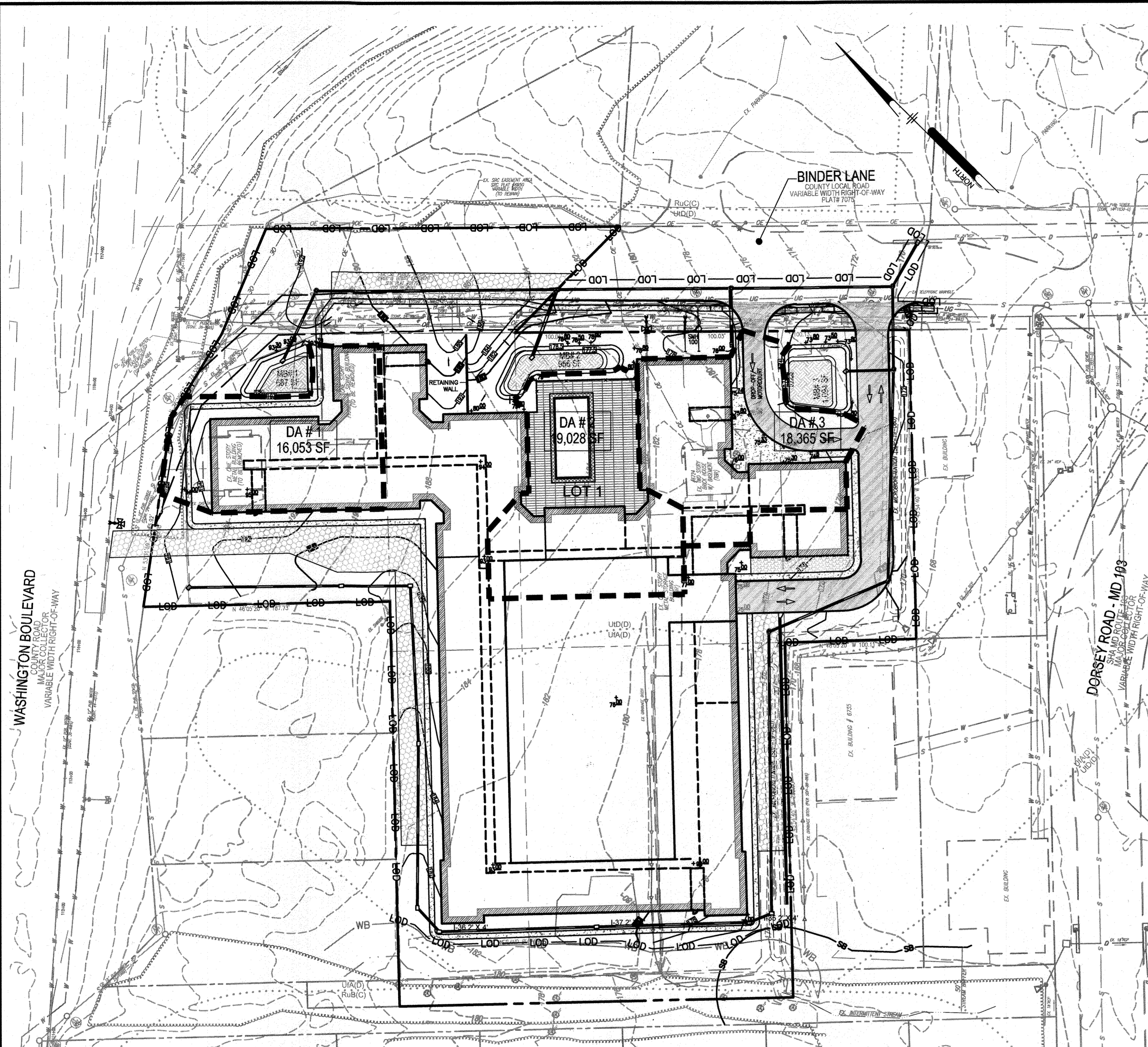
TITLE: ESDv CONCEPT PLAN

Pennoni Associates Inc.  
 Engineers • Surveyors • Planners  
 Landscape Architects

8890 McGaw Road, Suite 100 Columbia, MD 21045  
 T 410.997.8900 F 410.997.9282

SEAL: [Professional Seal]

DESIGNED BY: PAI  
 DRAWN BY: ALC  
 PROJECT NO: ODONN21001  
 DATE: MARCH 7, 2022  
 SCALE: 1" = 30'  
 DRAWING NO. 2 OF 3

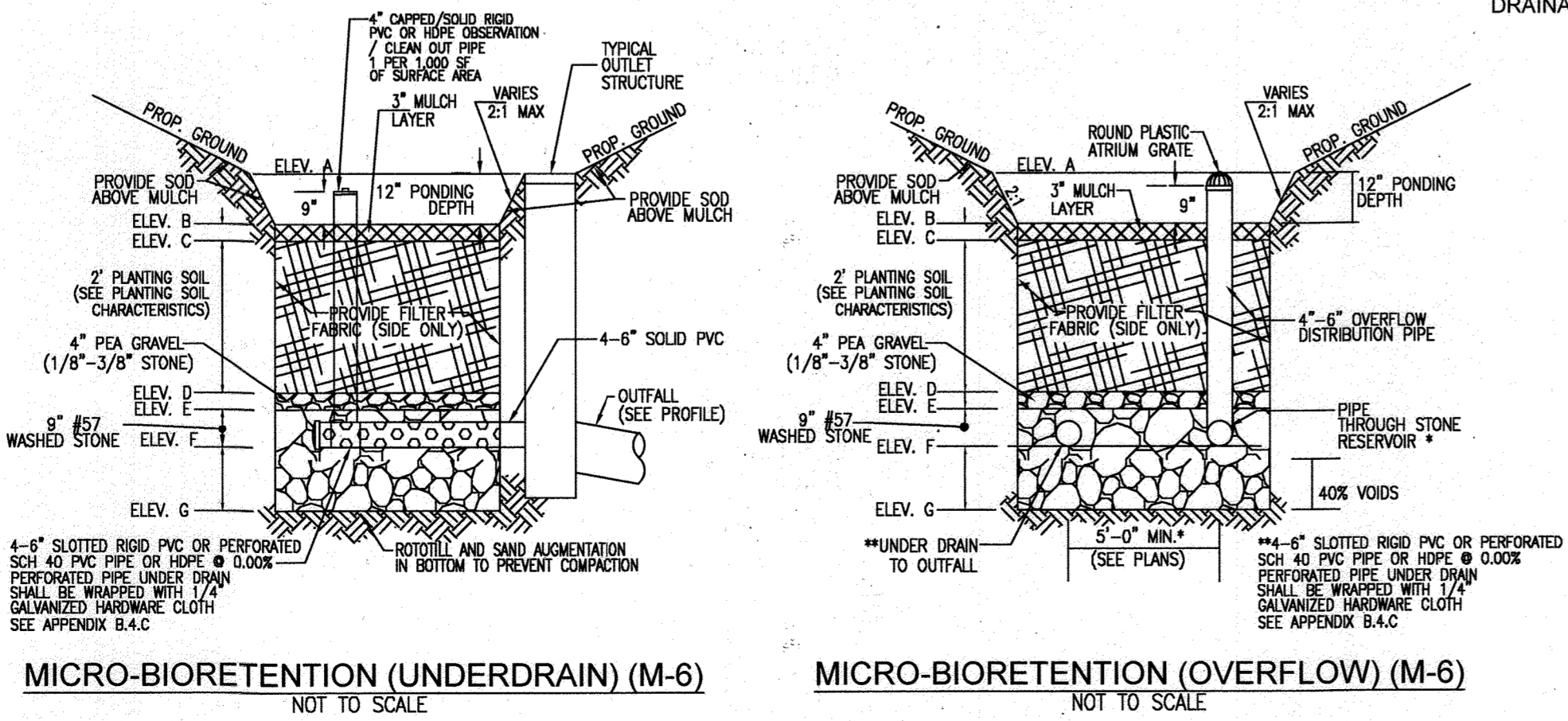


**MICROBIORETENTION NOTES:**  
 1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE WATER TO FAIL AND THEREFORE SHALL NOT BE INSTALLED.  
 2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (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)

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

**LEGEND**  
 MICRO-BIORETENTION

**DRAINAGE AREA**



**MICRO-BIORETENTION (UNDERDRAIN) (M-6)**  
 NOT TO SCALE

**MICRO-BIORETENTION (OVERFLOW) (M-6)**  
 NOT TO SCALE

**APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS**  
 1. MATERIAL SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS  
 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 MATERIAL OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY CAUSE PLANT GROWTH OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMISSA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOxious WEEDS AS SPECIFIED UNDER COMPA 15-B.01.01. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:  
 • SOIL COMPONENTS - 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 PRACTICE. 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 TEXTURE 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 LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TIRE TYPE TIRES. 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 ALLEVATED 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 REFRACATURE 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 LIFT 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 (8 TO 12 MONTHS) FOR ACCEPTANCE. ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/3RD 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 STRAGS. DURING THE ENTIRE PLANTING PROCESS, THOROUGHLY WATER THE PLANT 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. GRASS AND LEGUME SEED SHOULD BE DOLLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLOTS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS. THE TOPSOIL SPECIFICATIONS PRIOR TO PLANTING SHALL BE ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS BEFORE OR AT A MINIMUM, IMPROVES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL, UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

**6. UNDERDRAINS**  
 UNDERDRAINS SHALL 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 4-A) 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 IN TO 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.

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

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

Material	Specification	Size	Notes
Planting soil	See Appendix A, Table A.4	n/a	USDA soil type loamy sand or sandy loam; clay content < 5%
Planting soil (2" to 4" deep)	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	
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)	see gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curbs/drain	conventional stone: washed cobble	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 (2" 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 pipe; not necessary underneath pipe. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth.
Poured in place concrete (if required)	MSEA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, shrinkage reducing 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 318.8.9; vertical loading (5-10 or 16-20); allowable horizontal loading (based on soil pressure); and analysis of potential cracking.
Sand	AASHTO-M-4 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Gneiss (AASHTO) #10 are not acceptable. No calcium carbide or deliquescent sand substitutions are acceptable. No "rock dust" can be used for sand.

**ESDv SUMMARY TABLE**

ESDv REQUIRED	ESDv REQUIRED TO MEET C <sub>pv</sub>	ESDv REQUIRED TO MEET W <sub>qv</sub>	ESDv PROVIDED
4,242 cf	N/A	4,242 cf	5,588 cf

THIS SITE IS A REDEVELOPMENT SITE AND IS REQUIRED TO PROVIDE 1.0 INCH OF TREATMENT FOR 2.62 ACRES BY STORMWATER MANAGEMENT OR IMPERVIOUS AREA REDUCTION. TREATMENT FOR THIS SITE IS PROVIDED BY REDUCING IMPERVIOUS AREAS BY 0.76 ACRES AND TREATING 1.22 ACRES IN THREE MICROBIO RETENTION FACILITIES. THESE NUMBERS MAY BE ADJUSTED AS THE PLAN IS REFINED, BUT THE MINIMUM TREATMENT REQUIREMENTS WILL BE MET REGARDLESS.

**ESDv DEVICE SUMMARY TABLE**

TREATMENT	ESDv REQUIRED TO MEET C <sub>pv</sub>	ESDv REQUIRED TO MEET W <sub>qv</sub>	ESDv PROVIDED
MICRO-BIORETENTION 1	N/A	962 cf	1,415 cf
MICRO-BIORETENTION 2	N/A	1,457 cf	2,000 cf
MICRO-BIORETENTION 3	N/A	1,321 cf	2,173 cf
<b>TOTAL</b>			<b>5,588 cf</b>

**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)**

- 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.
- 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 PREVIOUS 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 STORM.

**SOILS LEGEND**  
 HOWARD COUNTY SOILS MAP #25

SYMBOL	NAME / DESCRIPTION	GROUP	K FACTOR	ERODIBLE
UFA	URBAN LAND - FALLSINGTON COMPLEX, 0 TO 2 PERCENT SLOPES	D	-	NO
UHD	URBAN LAND - UODRTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	0.28	NO

**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.

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 3-16-22 DATE  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION JP  
 [Signature] 3/16/22 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT

DEVELOPER: OLD TOWN CONSTRUCTION  
 5304 DORSEY HALL DRIVE  
 ELLICOTT CITY, MD 21042  
 ATTN: JARED SPAHN  
 PHONE: 410-730-3725

OWNER: O'DONNELL PROPERTIES LLC  
 5 LONGWOOD ROAD  
 BALTIMORE, MD 21210  
 ATTN: STEVE O'DONNELL  
 PHONE: 410-796-7968

PROJECT: O'DONNELL PROPERTIES  
 AREA TAX MAP 37 PARCELS 276, 277, 278, 280 & 283 LOTS 1, 2, 6-11 & 13  
 ZONED TOD GRID NO. 23 1ST ELECTION DISTRICT  
 6724 W. 6728 DORSEY ROAD AND 6718 BINDER LANE  
 ELKRIE, MARYLAND 21075  
 HOWARD COUNTY, MARYLAND

**STORMWATER DRAINAGE AREA MAP AND DETAILS**

Pennoni Associates Inc.  
 Engineers • Surveyors • Planners  
 Landscape Architects  
 8890 McGaw Road, Suite 100 Columbia, MD 21045  
 T 410.997.8900 F 410.997.9282

DESIGNED BY: PAI  
 DRAWN BY: ALC  
 PROJECT NO: ODONN21001  
 DATE: MARCH 7, 2022  
 SCALE: 1" = 50'  
 DRAWING NO. 3 OF 3