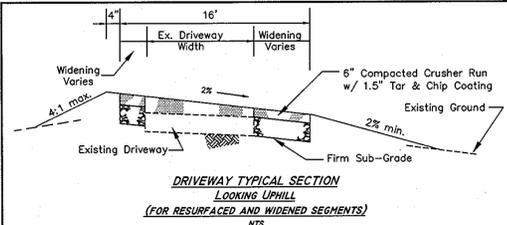


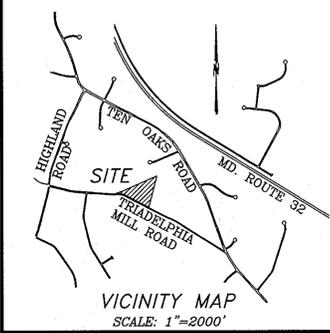
OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION FACILITY

1. THE PROPERTY OWNER IS RESPONSIBLE FOR PERIODIC MAINTENANCE OF THE MICRO-BIORETENTION FACILITY. THE FACILITY SHALL BE INSPECTED EVERY SPRING AND FALL AS WELL AS AFTER HEAVY STORMS. THE APPROPRIATE NECESSARY MAINTENANCE SHALL BE PROVIDED AS DETERMINED BY THE INSPECTIONS.
2. **PLANT MATERIAL:** TREES, SHRUBS, AND GRASS SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION. REMOVE AND REPLACE DEAD OR DYING VEGETATION CONSIDERED BEYOND TREATMENT. IF SPECIFIC PLANTS ARE NOT SURVIVING, THE PLANT TYPE SHOULD BE CHANGED TO A BETTER-SUITED SPECIES. REPLACEMENT VEGETATION IS LIMITED TO THOSE LISTED IN THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2. MAINTENANCE ALSO INCLUDES PRUNING, AND REPLACEMENT OF DEFICIENT STAKES AND WIRE.
3. **MULCH LAYER:** SHALL BE REPLACED EVERY 2 TO 3 YEARS IN THE SPRING DUE TO THE CONCENTRATION OF HEAVY METALS. THE PROPERTY OWNER SHALL REMOVE AND PROPERLY DISPOSE OF THE OLD MULCH SO AS NOT TO CAUSE WATER CONTAMINATION ELSEWHERE. WASHED OUT AND ERODED AREAS SHALL BE REPAIRED.
4. **SOIL LAYER:** SHOULD STORMWATER POND FOR MORE THAN 48 HOURS. THE TOP 6 INCHES (MINIMUM) OF THE SOIL LAYER SHALL BE REPLACED IN KIND PER MDE SPECIFICATIONS. THE OLD SOIL SHALL BE PROPERLY DISPOSED.
5. **SPILLWAY OUTFALL & INTERIOR SLOPES:** ERODED AREAS SHALL BE REPAIRED (FILLED-IN AND SEEDED) WHEN DISCOVERED. BARE AREAS SHALL BE REPAIRED (SCARIFIED, TOP SOIL ADDED AS NEEDED AND RE-SEEDED).
6. REMOVE AND PROPERLY DISPOSE ACCUMULATED SEDIMENT GREATER THAN ONE (1) INCH.
7. PLANT WATERING MAY BE NEEDED DURING PROLONGED DRY PERIODS.

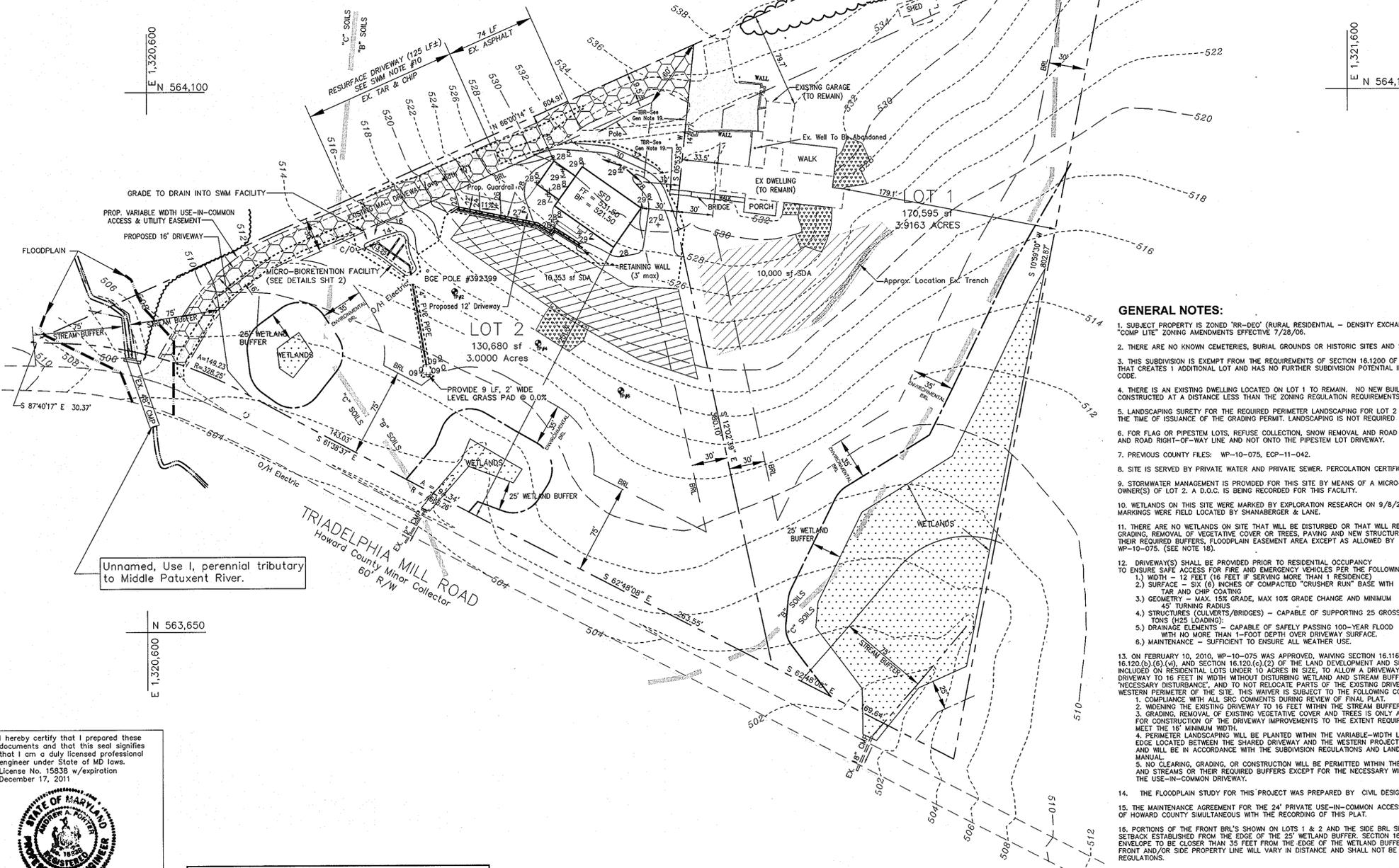
SHEET INDEX	
SHEET No.	TITLE
1	SUPPLEMENTAL STORMWATER MANAGEMENT (SWM) PLAN
2	STORMWATER MANAGEMENT DETAILS
3	LANDSCAPE PLAN



- DRIVEWAY TYPICAL SECTION**
LOOKING UPHILL
(FOR RESURFACED AND WIDENED SEGMENTS)
- NOTES:
1. Slope all widened pavement surfaces (including resurfaced segments) to the southeast (i.e., to right looking uphill).
 2. Resurface (with 2% slope) as shown on the plan. Provide smooth 10 ft transition into paving into areas where only widening is needed.
 3. Provide firm subbase, remove top soil and unstable soils as needed. Compact sub-base to 95% as needed.
 4. The Lot 2 driveway to the new house is 12' wide and shall be constructed to County standards.

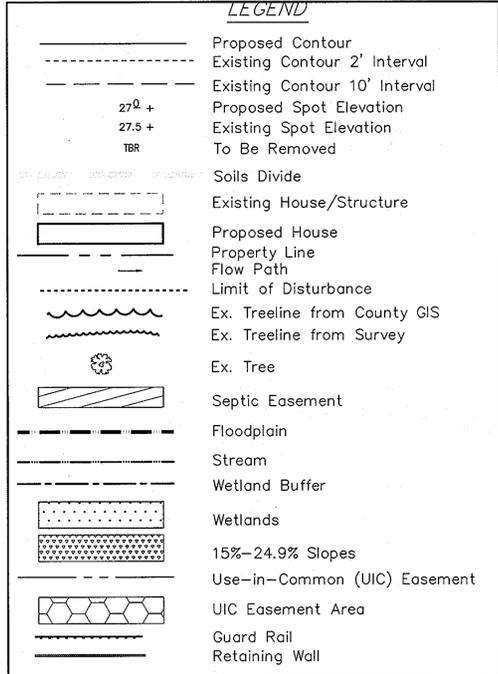


- STORMWATER MANAGEMENT (SWM) NOTES**
1. Stormwater management has been provided with ESD to the MEP. Specifically, a Micro-Bioretenation Facility and non-rooftop credits address the stormwater management for this site. Please refer to the SWM Report prepared by CIVIL DESIGN SERVICES, LC dated October 5 for more information.
 2. The Boundary and Topography shown on this plan were supplied by Shanaberger & Lane, Surveyors, Ellicott City. The topography was field-run in April, 2009.
 3. All construction shall meet the latest edition of the Howard County Standards and Specifications or as shown on these plans. The contractor shall consult the engineer should there be any discrepancies.
 4. The Micro-Bioretenation Facility shall not be constructed until all upstream areas have been stabilized (i.e., thick grass cover, or paved).
 5. The utility locations are approximate. Contractor shall test pit all known existing utilities to verify, size, shape, location, and type prior to performing construction. Utility relocations, whether shown or not, are the responsibility of the owner. Any utility damaged due to construction must be repaired immediately.
 6. Should the contractor discover discrepancies between the plans and field conditions, the engineer is to be notified immediately to resolve the situation. If the contractor makes field corrections or adjustments without notifying the engineer, then the contractor assumes all responsibility for those changes.
 7. Contractor shall notify Miss Utility 1-800-257-7777 and the Howard County Department of Inspection Licenses & Permits three (3) working days before beginning construction.
 8. CIVIL DESIGN SERVICES, LC is not responsible for the contractor's utilization of men, materials, equipment, or safety measures in the performance of any work for this project. The contractor assumes all responsibility for performing the work correctly and in conformance with code/specification requirements.
 9. The Stormwater Management Facility (i.e., bio-retention area) shown on this plan shall be privately owned and maintained.
 10. During the driveway widening paving, the contractor shall resurface/repair 120 LF± of the driveway to the limits shown on the plan. This segment of the driveway shall be resurfaced to have a 2% cross slope draining to the southwest (i.e., to the right facing driveway uphill). A driveway detail is shown on this sheet. The intent is to ensure that the driveway next to and up hill of the stormwater facility drains into the stormwater management facility.
 11. Roof leaders shall drain to the west side of house to drain into the stormwater management facility.
 12. Site soil types: HSG B-Soils: Glenelg (GgB), (GgC); HSG C-Soils: Glenview, (GnB).
 13. Coordinates are based on NAD '83 Maryland coordinate system as projected by Howard County geodetic control stations 0066 & 24b5.



GENERAL NOTES:

1. SUBJECT PROPERTY IS ZONED "RR-DEO" (RURAL RESIDENTIAL - DENSITY EXCHANGE OPTION) PER THE 2/2/04 COMPREHENSIVE ZONING PLAN AND PER THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE 7/28/06.
2. THERE ARE NO KNOWN CEMETERIES, BURIAL GROUNDS OR HISTORIC SITES AND STRUCTURES ON THIS SITE.
3. THIS SUBDIVISION IS EXEMPT FROM THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION IT IS A SUBDIVISION THAT CREATES 1 ADDITIONAL LOT AND HAS NO FURTHER SUBDIVISION POTENTIAL IN ACCORDANCE WITH SECTION 16.1202(b)(1)(vii) OF THE HOWARD COUNTY CODE.
4. THERE IS AN EXISTING DWELLING LOCATED ON LOT 1 TO REMAIN. NO NEW BUILDINGS, EXTENSIONS OR ADDITIONS TO THE EXISTING DWELLING ARE TO BE CONSTRUCTED AT A DISTANCE LESS THAN THE ZONING REGULATION REQUIREMENTS.
5. LANDSCAPING SURETY FOR THE REQUIRED PERIMETER LANDSCAPING FOR LOT 2 IN THE AMOUNT OF \$1800.00 (FOR 6 SHADE TREES) SHALL BE PROVIDED AT THE TIME OF ISSUANCE OF THE GRADING PERMIT. LANDSCAPING IS NOT REQUIRED FOR LOT 1 SINCE IT HAS AN EXISTING HOUSE WHICH WILL REMAIN.
6. FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT-OF-WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.
7. PREVIOUS COUNTY FILES: WP-10-075, ECP-11-042.
8. SITE IS SERVED BY PRIVATE WATER AND PRIVATE SEWER. PERCOLATION CERTIFICATION PLAN WAS SIGNED BY THE HEALTH DEPARTMENT ON June 22, 2009.
9. STORMWATER MANAGEMENT IS PROVIDED FOR THIS SITE BY MEANS OF A MICRO-BIORETENTION FACILITY WHICH WILL BE OWNED AND MAINTAINED BY THE OWNER(S) OF LOT 2. A D.O.C. IS BEING RECORDED FOR THIS FACILITY.
10. WETLANDS ON THIS SITE WERE MARKED BY EXPLORATION RESEARCH ON 9/8/2009. SEE WETLANDS REPORT DATED 9/11/2009. STREAMS AND WETLAND MARKINGS WERE FIELD LOCATED BY SHANABERGER & LANE.
11. THERE ARE NO WETLANDS ON THIS SITE THAT WILL BE DISTURBED OR THAT WILL REQUIRE 401 AND 404 WETLANDS PERMITS FROM THE STATE OF MARYLAND. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, OR THEIR REQUIRED BUFFERS, FLOODPLAIN EASEMENT AREA EXCEPT AS ALLOWED BY WP-10-075. (SEE NOTE 18).
12. DRIVEWAY(S) SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING:
 - 1.) WIDTH - 12 FEET (16 FEET IF SERVING MORE THAN 1 RESIDENCES)
 - 2.) SURFACE - SIX (6) INCHES OF COMPACTED "CRUSHER RUN" BASE WITH TAR AND CHIP COATING
 - 3.) GEOMETRY - MAX. 15% GRADE, MAX 10% GRADE CHANGE AND MINIMUM 45' TURNING RADIUS
 - 4.) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (HQS LOADS)
 - 5.) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1-FOOT DEPTH OVER DRIVEWAY SURFACE.
 - 6.) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
13. ON FEBRUARY 10, 2010, WP-10-075 WAS APPROVED, HAVING SECTION 16.116.(c).(3), SECTION 16.120.(b).(4).(ii).(b), SECTION 16.120.(b).(6).(v), AND SECTION 16.120.(c).(2) OF THE LAND DEVELOPMENT AND SUBDIVISION REGULATIONS TO ALLOW ENVIRONMENTAL FEATURES TO BE INCLUDED ON RESIDENTIAL LOTS UNDER 10 ACRES IN SIZE, TO ALLOW A DRIVEWAY THROUGH LOT 1 FOR THE USE OF LOT 2, TO IMPROVE THE EXISTING DRIVEWAY TO 16 FEET IN WIDTH WITHOUT DISTURBING WETLAND AND STREAM BUFFERS EXCEPT AS ALLOWED BY THE DEVELOPMENT ENGINEERING DIVISION AS "NECESSARY DISTURBANCE", AND TO NOT RELOCATE PARTS OF THE EXISTING DRIVEWAY IN ORDER TO ALLOW A FULL 10-FOOT LANDSCAPE EDGE ALONG THE WESTERN PERIMETER OF THE SITE. THIS WAIVER IS SUBJECT TO THE FOLLOWING CONDITIONS:
 1. COMPLIANCE WITH ALL SDC COMMENTS DURING REVIEW OF FINAL PLAN.
 2. WIDENING THE EXISTING DRIVEWAY TO 16 FEET WITHIN THE STREAM BUFFER.
 3. GRADING, REMOVAL OF EXISTING VEGETATIVE COVER AND TREES IS ONLY ALLOWED FOR CONSTRUCTION OF THE DRIVEWAY IMPROVEMENTS TO THE EXTENT REQUIRED TO MEET THE 16' MINIMUM WIDTH.
 4. PERIMETER LANDSCAPING WILL BE PLANTED WITHIN THE VARIABLE-WIDTH LANDSCAPE EDGE LOCATED BETWEEN THE SHARED DRIVEWAY AND THE WESTERN PROJECT BOUNDARY, AND WILL BE IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS AND LANDSCAPE MANUAL.
 5. NO CLEARING, GRADING, OR CONSTRUCTION WILL BE PERMITTED WITHIN THE WETLANDS AND STREAMS OR THEIR REQUIRED BUFFERS EXCEPT FOR THE NECESSARY WIDENING OF THE USE-IN-COMMON DRIVEWAY.
14. THE FLOODPLAIN STUDY FOR THIS PROJECT WAS PREPARED BY CIVIL DESIGN SERVICES, LC, DATED 6/4/2010 AND WAS APPROVED ON 5/3/2011.
15. THE MAINTENANCE AGREEMENT FOR THE 24' PRIVATE USE-IN-COMMON ACCESS EASEMENT FOR LOTS 1 AND 2 HAS BEEN RECORDED IN THE LAND RECORDS OF HOWARD COUNTY SIMULTANEOUS WITH THE RECORDING OF THIS PLAN.
16. PORTIONS OF THE FRONT BRL'S SHOWN ON LOTS 1 & 2 AND THE SIDE BRL SHOWN ON LOT 2 COINCIDE WITH THE BOUNDARY OF THE 35' ENVIRONMENTAL SETBACK ESTABLISHED FROM THE EDGE OF THE 25' WETLAND BUFFER. SECTION 16.120.(d).(viii) OF THE SUBDIVISION REGULATIONS PROHIBITS THE BUILDING ENVELOPE TO BE CLOSER THAN 35 FEET FROM THE EDGE OF THE WETLAND BUFFER. THEREFORE, THE DISTANCE FROM THE FRONT AND/OR SIDE BRL'S TO THE FRONT AND/OR SIDE PROPERTY LINE WILL VARY IN DISTANCE AND SHALL NOT BE LESS THAN 75' FRONT AND/OR 30' SIDE SETBACKS REQUIRED BY THE ZONING REGULATIONS.
17. THE REQUIREMENTS OF SECTION 16.121.(c)(2) FOR OPEN SPACE FOR NON-CLUSTER LOT 1 HAVE BEEN SATISFIED THROUGH THE PAYMENT OF A FEE-IN-LIEU IN THE AMOUNT OF \$1500.00 WHICH HAS BEEN DEPOSITED IN INTO ACCOUNT #403099010-1300-42200.
18. NO CLEARING, FILLING, ALTERING DRAINAGE, OR IMPERVIOUS PAVING MAY OCCUR ON LAND LOCATED IN A FLOODPLAIN UNLESS REQUIRED OR AUTHORIZED BY THE DEPARTMENT OF PLANNING & ZONING UPON THE ADVICE OF THE DEPARTMENT OF INSPECTIONS, LICENSES, & PERMITS, THE DEPARTMENT OF PUBLIC WORKS, THE DEPARTMENT OF RECREATION & PARKS, THE HOWARD SOIL CONSERVATION DISTRICT, OR THE MARYLAND DEPARTMENT OF THE ENVIRONMENT. ANY PROPOSED CONSTRUCTION OF A STRUCTURE LOCATED WITHIN A FLOODPLAIN SHALL BE SUBJECT TO THE REQUIREMENTS OF THE HOWARD COUNTY BUILDING CODE. BUILDING MATERIALS AND OTHER DEBRIS SHALL NOT BE STORED OR DISCARDED IN FLOODPLAINS.
19. THE PORTION OF THE EXISTING DRIVEWAY THROUGH LOT 2 THAT LIES OUTSIDE THE VARIABLE-WIDTH USE-IN-COMMON ACCESS EASEMENT IS TO BE REMOVED WITH THE BUILDING PERMIT APPLICATION FOR LOT 2. THE PART OF THE WALK FROM THE EXISTING HOUSE WHICH CROSSES THE LOT LINE INTO LOT 2 IS TO BE REMOVED WITH THE BUILDING PERMIT APPLICATION FOR LOT 2.
20. SEE LANDSCAPE PLAN (SHEET 3 OF 3) FOR PROPOSED RETAINING WALL INFORMATION.



**SUPPLEMENTAL
STORMWATER MANAGEMENT PLAN**

TUAKLI PROPERTY
LOTS 1 & 2
Clarksville
Tax Map 34 Parcel 8
ZONING: RR-DEO
5th ELECTION DISTRICT, HOWARD COUNTY, MD
SCALE: 1" = 50' DATE: JUNE 24, 2011

I hereby certify that I prepared these documents and that this seal signifies that I am a duly licensed professional engineer under State of MD laws. License No. 15838 w/expiration December 17, 2011

Andrew A. Porter #15,838

THIS PLAN IS FOR STORMWATER MANAGEMENT ONLY.



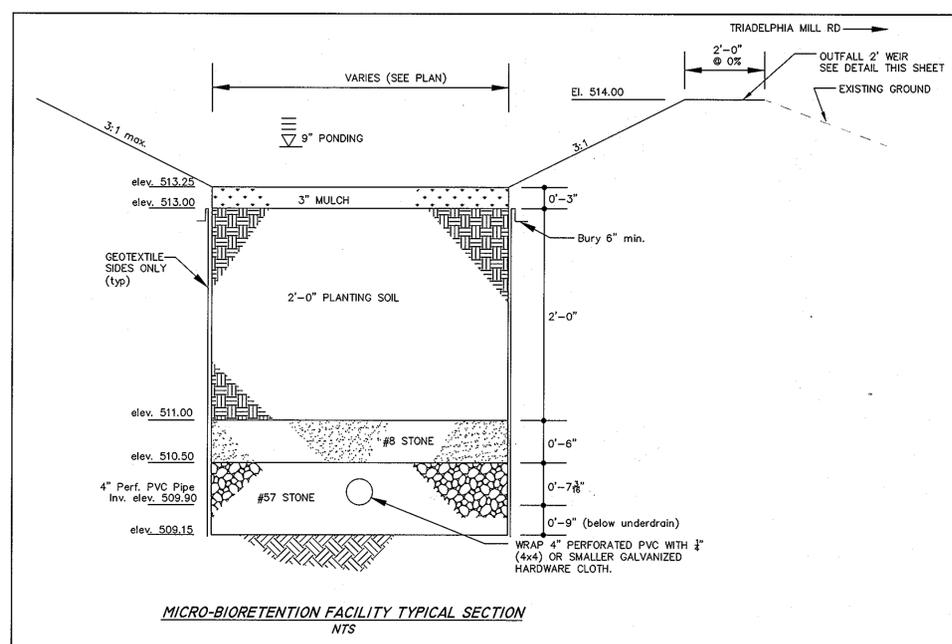
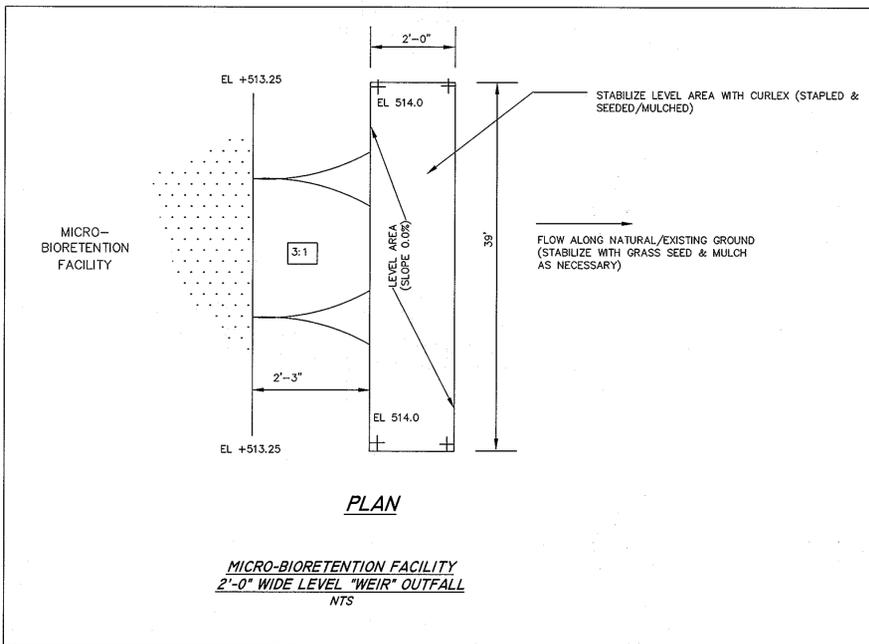
CIVIL DESIGN SERVICES, LC
6123 Holly Ridge Court, Columbia, Maryland 21044
410.531.0572 phone/fax
civildesign@comcast.net

OWNER & DEVELOPER
Dr. Nadu A. Tuakli
13603 Gilbride Road
Clarksville, Maryland 21029
Contact: Dr. Roberto Sanchez
202.465.2829
rsanche@aol.com

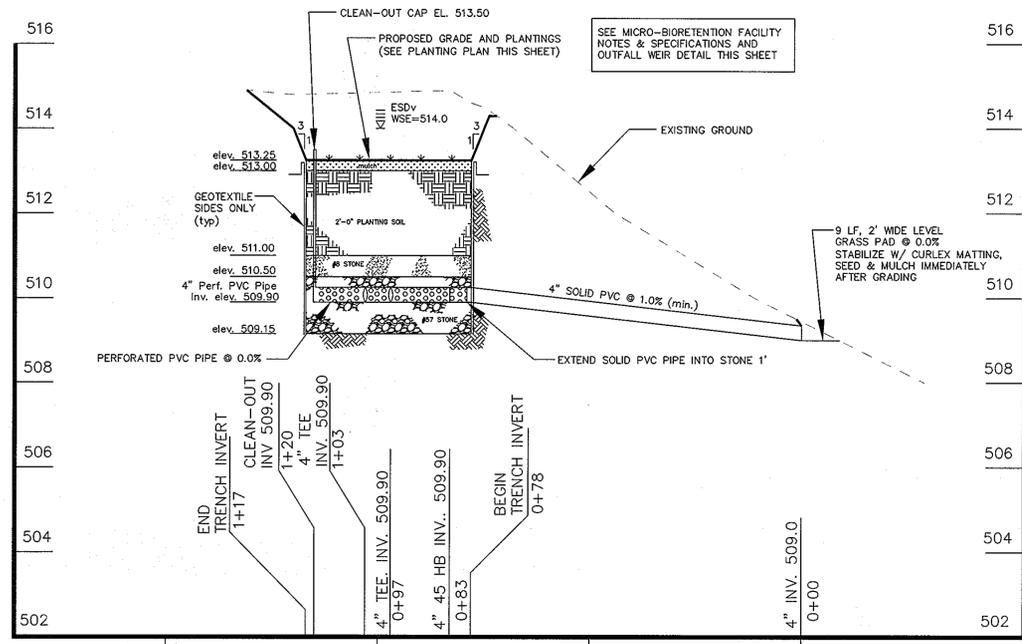
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 7/21/11
Chief, Division of Land Development Date

[Signature] 7/26/11
Chief, Development Engineering Division Date

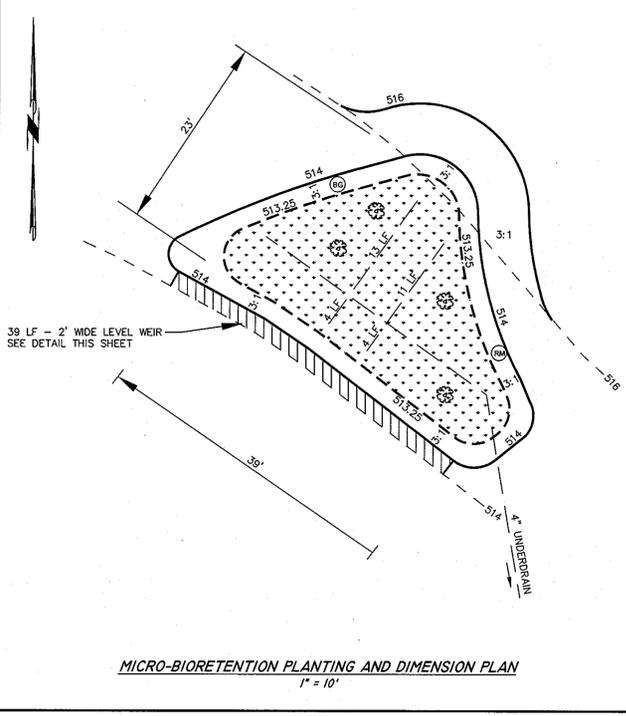


- BIORETENTION FACILITY NOTES AND SPECIFICATIONS**
- REFER TO THE 2000 MARYLAND SWM DESIGN MANUAL FOR BIORETENTION SPECIFICATIONS (PG. B.3.7) NOT LISTED HEREIN AND FOR ADDITIONAL INFORMATION.
 - THE BIORETENTION FACILITY MATERIALS ARE AS FOLLOWS:
 - PLANTING SOIL: SHALL MEET PLANTING SOIL SPECIFICATIONS OUTLINED IN MDE'S 2000 SWM MANUAL. SEE PLANTING SCHEDULE THIS SHEET FOR VEGETATION STABILIZATION.
 - SAND: ASTM C33 "CONCRETE SAND" - VERY CLEAN; FREE OF ALL DIRT AND DEBRIS.
 - PVC PIPE: SCHEDULE 40. PERFORATED PORTION TO BE HAVE NO SLOPE (0.0%).
 - STONE AGGREGATE: MSHA SPECIFICATIONS AS SPECIFIED ON TYPICAL SECTION; AGGREGATE MUST BE FREE OF FINES, DIRT AND DEBRIS.
 - GEOTEXTILE: PER MDE SWM MANUAL OR MIRAFI 140N.
 - MULCH: SHREDDED, WELL-AGED (6-12 MONTHS) HARDWOOD MULCH; NO WOOD CHIPS OR PINE MULCH.
 - THE CONTRACTOR SHALL, UNDER NO CIRCUMSTANCES, ALLOW SURFACE DRAINAGE INTO THE MICRO-BIORETENTION FACILITY UNTIL ALL UPSTREAM AREAS HAVE BEEN STABILIZED (i.e., PAVED OR HAVE WELL-ESTABLISHED VEGETATION).
 - BOARDS SHALL NOT BE LEFT IN PLACE DURING THE CONSTRUCTION OF THE BIORETENTION BMP.
 - GEOTEXTILE (FILTER FABRIC) SHALL BE PLACED AGAINST EXCAVATED SURFACES. SCARIFY EARTH PRIOR TO GEOTEXTILE PLACEMENT. INSTALL GEOTEXTILE PER MANUFACTURER'S SPECIFICATIONS/RECOMMENDATIONS. USE 2 FT MINIMUM OVERLAP AND NOTCH ENDS WITH A 6" MINIMUM BURY, OR EQUIVALENT ANCHORING METHOD.
 - THE CONTRACTOR SHALL OBTAIN INDEPENDENT CERTIFICATION THAT THE SOILS AND OTHER MATERIALS MEET THE SPECIFICATIONS DURING THE AS-BUILT STAGE.
 - THE BIORETENTION FACILITY SHALL BE VEGETATED (TOP LEVEL SURFACE ONLY) IN ACCORDANCE WITH THE PLANTING SCHEDULE.



MICRO-BIORETENTION PLANTING SCHEDULE

PLANT NAME	FORM	QUANTITY	SYMBOL
SWITCH GRASS (<i>panicum virgatum</i>)	Grass	110 Qts ^a	☐
FOX SEDGE (<i>carex vulpinoidea</i>)	Grass	110 Qts ^a	☐
RED MAPLE (<i>acer rubrum</i>)	Tree (4-6', 1" cal.)	1	Ⓜ
BLACKGUM (<i>nyssa sylvatica</i>)	Tree (5-8', 1" cal.)	1	Ⓜ
RED OSIER DOGWOOD (<i>cornus sericea</i>)	Shrub	4	Ⓜ



I hereby certify that I prepared these documents and that this seal signifies that I am a duly licensed professional engineer under State of MD laws. License No. 15838 w/expiration December 17, 2011.

ANDREW A. PORTER MD #15,838

CIVIL DESIGN SERVICES, LC
6123 Holly Ridge Court, Columbia, Maryland 21044
410.531.0572 phone/fax
civildesign@comcast.net

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Kent Schuler Chief, Division of Land Development Date: 7/27/11

Andrew Porter Chief, Development Engineering Division Date: 7/26/11

STORMWATER MANAGEMENT DETAILS

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