

ECP NOTE:  
 APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN, SITE DEVELOPMENT PLAN, OR GRADING OR BUILDING PERMIT 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, SITE DEVELOPMENT PLAN, OR GRADING AND BUILDING PERMIT STAGES.

Key	Species	Size (in. DBH)	CRZ (feet Radius)	Comments
1	Norway Maple	31	30	poor, broken main stem
2	Silver Maple	30	30	good

LOT NO.	GROSS AREA	PIPESTEM AREA	MIN. LOT SIZE
1	29,415 S.F.	3,919 S.F.	25,496 S.F.
2	24,673 S.F.	2,303 S.F.	22,370 S.F.

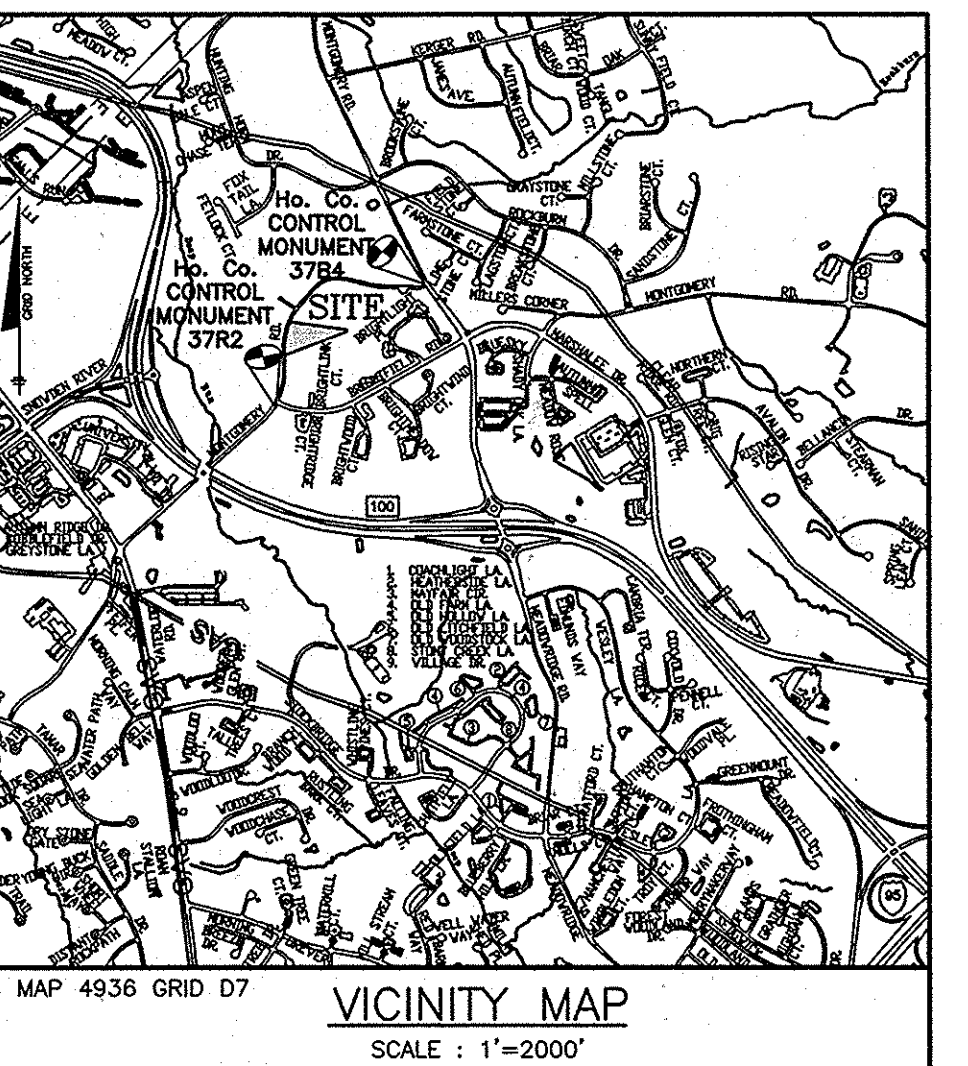
MAP SYMBOL	SOIL TYPE	MAPPING UNIT	Kc VALUE
AwB	C	ALLOWAY SILT LOAM - 2 TO 5 PERCENT SLOPES	0.43
Fs	D	FALLSINGHAM SANDY LOAM - 0 TO 2 PERCENT SLOPES	0.20
SsB	B	SASSAFRAS LOAM - 2 TO 5 PERCENT SLOPES	0.37
Sd	B	SASSAFRAS AND CROOM LOAMS - 10 TO 15 PERCENT SLOPES	0.37

USDA-NRCS WEBSITE, MAP #19 SAVAGE NE

**BENCH MARKS**

HO. CO. #37R2 (NAD '83) ELEV. 399.65'  
 STAMPED DISC ON CONCRETE MONUMENT BEING 45.9' SOUTHWEST OF A TRAFFIC LIGHT POLE AT OLD MONTGOMERY ROAD AND BRIGHTFIELD ROAD, 3.1' NORTHWEST OF A CONCRETE SIDEWALK AND 59.6' WEST OF A COMMUNICATION PEDESTAL.  
 N 562,611.4397 E 1,371,554.4726

HO. CO. #37B4 (NAD '83) ELEV. 401.32'  
 STAMPED DISC ON CONCRETE MONUMENT BEING 41.1' WEST OF A SANITARY MANHOLE, 98.5' EAST OF BG&E POLE #125676 AND 29.7' SOUTH OF THE EDGE OF PAVING OF MD ROUTE 103  
 N 563,928.5811 E 1,373,109.0962



TEST BORING NO.	INFLTRATION RATE (INCHES PER HOUR)	DEPTH OF PIPE (FT)
B-1	24.0	4.0
B-2	20.6	4.0
B-3	0	2.0

**NARRATIVE:**

The site currently is developed with one existing single-family detached dwelling to remain; it consists of mostly meadow areas with a small wooded area surrounding the house. The majority of the site drains west to east sheet flows at an average slope of 5-10 percent towards an existing stream at the northeast corner boundary. The site also receives insignificant drainage from Old Montgomery Road which runs parallel with the western boundary and adjoining Parcel 24 at the southwest corner, both of which have no impact on this design described herein. The proposed development shall consist of: 3 new single-family dwellings and the existing home to remain on 4 residential lots. The subdivision will include a private use-in-common access driveway utilizing 16' open section roadway design for the existing dwelling (lot 2) and Lots 1 & 3; Lot 2 fronts and receive access directly from Old Montgomery Road.

The area of this submission is a portion of Tax Map 37, Parcel 25 and is approximately 2.25 acres total. The property is located on the east side of Old Montgomery Road, approximately 600' northeast of the intersection with Brightfield Road. The entire site topography slopes generally east to west, with minimal drainage from Old Montgomery Road and adjoining Parcel 24. This flows towards the aforementioned stream, which is an unnamed tributary of Deep Run, and ultimately flows into the Lower North Branch of the Patuxent River (d/c 130996), which is a major tributary to the Patuxent River Area Watershed (2-13-09) a Class I stream.

The proposed development will temporarily encroach into environmental elements towards the rear of the site for utility installation. These include the existing 75' Streambank Buffer (SMB) and approximately 700' of existing forest. A portion of this disturbance is within an existing 20' Public Right-of-Way for a Sewer under Contract #547-S. The overall limit of disturbance is basically limited to within the site boundary & immediate adjoining public right-of-way for Old Montgomery Road.

There is approximately 0.11 acres of existing impervious area on-site including: 0.06 acres from the existing dwelling to remain (on new Lot 2); and 0.05 acres from the existing driveway to be removed. There will be approximately 0.37 acres of proposed impervious area added including: 0.15 ac. for the proposed dwellings; 0.22 ac. for the driveways. The limit of disturbance being proposed for development is approximately 1.66 acres.

Sediment and Erosion control shall comply with the latest edition of the MDE Standards and Specifications for Sediment Control as shown on the accompanying plan. Soil for the proposed construction activities will be available on-site.

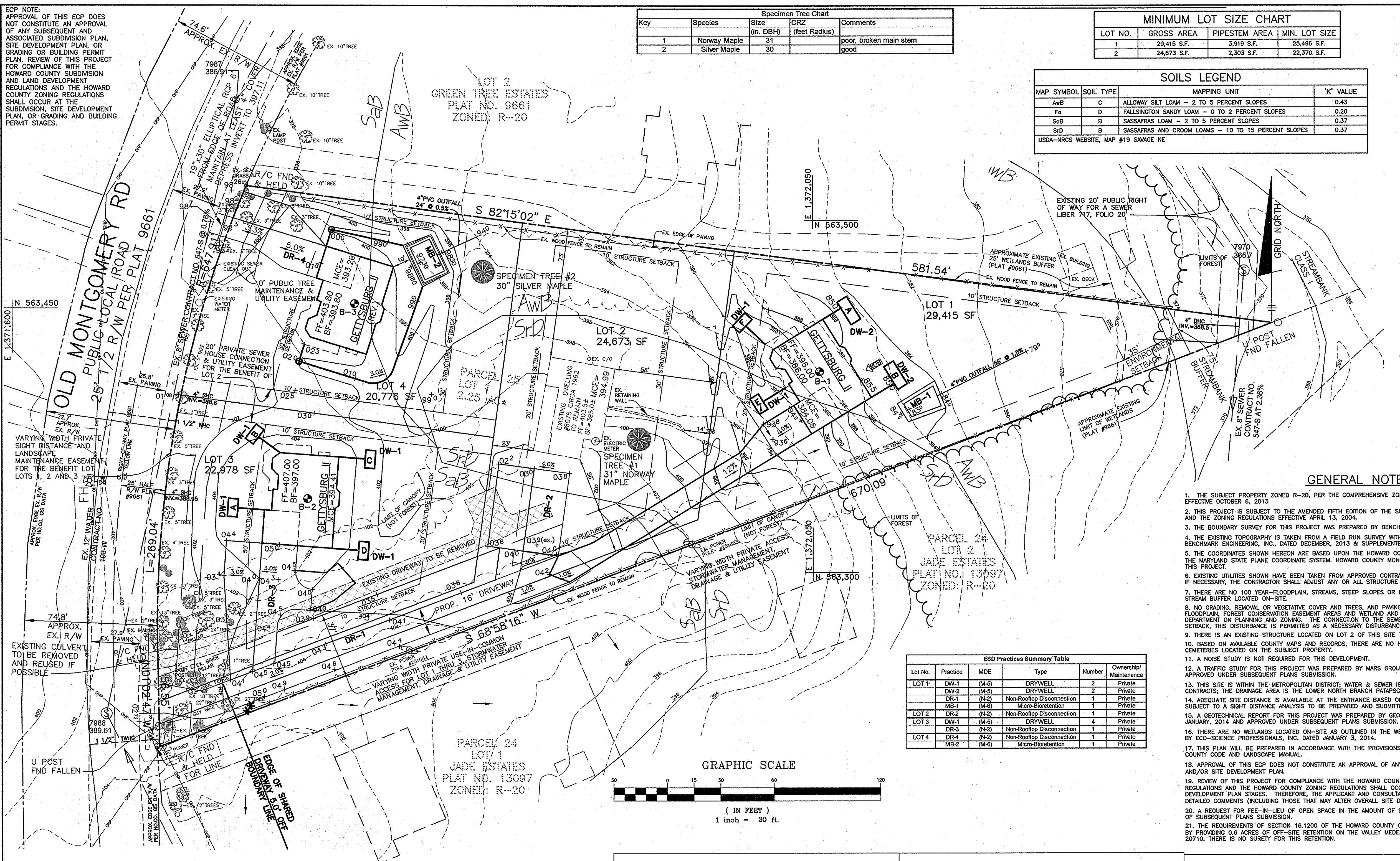
Based upon the existing topography the project was identified and analyzed for the developed area. Based upon the final grades it was determined that for the ESD/OW treatment the drainage area (DAF) would break down into approximately 3 sub-areas for driveway runoff treatment; 1 sub-area for rooftop disconnection; 2 sub-areas for micro-bioretenion; and 8 sub-areas for rooftop on-site practices. These sub-areas distribute the captured and subsequently treated flow of the 1-yr storm (P=1.50") to separate points of discharge where applicable to avoid any concentrated flow or allowed to sheet flow off-site.

This Drainage area is based on the flow that will impact the proposed ESD-SWM design. There is minimal off-site area that under the existing condition will flow through the analyzed area, but does not adversely impact the site. Therefore, the analyzed area encompasses the anticipated limit of disturbance for this project.

The drainage areas were analyzed as woods in good condition and a target RCN was determined. A target rainfall depth (P=1.5") was determined based on the measured impervious areas and HSG types. This P=1.5" was then used to determine if any Alternative Surface practices could be implemented, which subsequently was deemed impractical. Then the target P=1.5" was converted to a target ESD using the volumetric runoff coefficient. Environmental Site Design practices were designed to treat the proposed impervious cover and the 1" storm to provide water quality. The amount of treatment provided by these practices was calculated based on the surface areas and depth of ponding/treatment.

As a result of addressing the stormwater management by use of ESD to the MEP the land conditions have theoretically been returned to woods in good condition and reduced the overall run-off for the 1-year storm. Therefore, no additional analysis is required. WQv is provided in accordance with the MDE Stormwater Management Act of 2007 criteria as the resulting imperviousness is treated by use of ESD to the MEP implementation. Qv is addressed by essentially returning the developed area to woods in good condition through use of ESD to the MEP implementation.

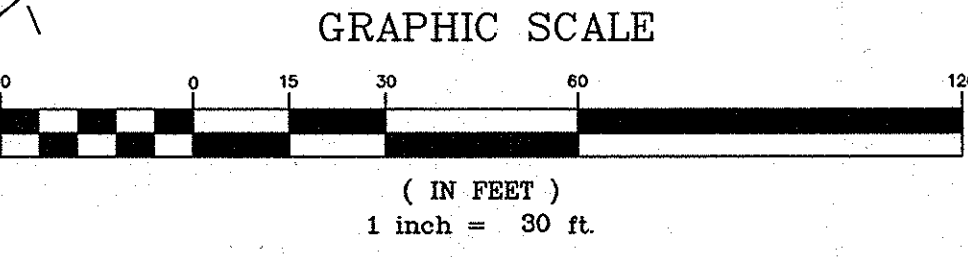
It is concluded that all ESD to the MEP requirements as defined in the Stormwater Management Act of 2007 have been met for the proposed development. The Water Quality has been provided by the implementation of Micro-Bioretenion (M-6), Dry Wells (M-5), and practical utilization of Disconnection of Impervious Runoff (N-1 & N-2). The infiltration practices utilized adhere to the USDA Map Hydrologic soils information and geotechnical analysis.



**GENERAL NOTES**

1. THE SUBJECT PROPERTY ZONED R-20, PER THE COMPREHENSIVE ZONING PLAN, MAPS AND AMENDED REGULATIONS, EFFECTIVE OCTOBER 5, 2013.
2. THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE APRIL 13, 2004.
3. THE BOUNDARY SURVEY FOR THIS PROJECT WAS PREPARED BY BENCHMARK ENGINEERING, INC., DATED NOVEMBER, 2013.
4. THE EXISTING TOPOGRAPHY IS TAKEN FROM A FIELD RUN SURVEY WITH TWO FOOT CONTOUR INTERVALS, PREPARED BY BENCHMARK ENGINEERING, INC., DATED DECEMBER, 2013 & SUPPLEMENTED WITH HO.CO. GIS TOPOGRAPHICAL INFORMATION.
5. THE COORDINATES SHOWN HEREIN ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM, HOWARD COUNTY MONUMENT NOS. #37R2 AND #37B4 WERE USED FOR THIS PROJECT.
6. EXISTING UTILITIES SHOWN HAVE BEEN TAKEN FROM APPROVED CONTRACT DRAWINGS AND FIELD SURVEYED LOCATIONS. IF NECESSARY, THE CONTRACTOR SHALL ADJUST ANY OF ALL STRUCTURE TOP ELEVATIONS TO MATCH PROPOSED GRADES.
7. THERE ARE NO 100 YEAR-FLOODPLAIN, STREAMS, STEEP SLOPES OR FORESTED AREAS LOCATED ON-SITE; THERE IS A 75' STREAM BUFFER LOCATED ON-SITE.
8. NO GRADING, REMOVAL OR VEGETATIVE COVER AND TREES, AND PAVING ARE NOT PERMITTED IN WETLANDS, STREAMS, FLOODPLAIN, FOREST CONSERVATION EASEMENT AREAS AND WETLAND AND STREAM BUFFERS EXCEPT AS APPROVED BY THE DEPARTMENT ON PLANNING AND ZONING. THE CONNECTION TO THE SEWER MAIN FOR LOT 1 IS WITHIN THE STREAMBANK SETBACK, THIS DISTURBANCE IS PERMITTED AS A NECESSARY DISTURBANCE.
9. THERE IS AN EXISTING STRUCTURE LOCATED ON LOT 2 OF THIS SITE TO REMAIN.
10. BASED ON AVAILABLE COUNTY MAPS AND RECORDS, THERE ARE NO HISTORIC STRUCTURES OR KNOWN CEMETERIES LOCATED ON THE SUBJECT PROPERTY.
11. A NOISE STUDY IS NOT REQUIRED FOR THIS DEVELOPMENT.
12. A TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY MARS GROUP, INC., DATED DECEMBER, 2013 TO BE APPROVED UNDER SUBSEQUENT PLANS SUBMISSION.
13. THIS SITE IS WITHIN THE METROPOLITAN DISTRICTS, WATER & SEWER IS PUBLIC, CONNECTING TO EXISTING CONTRACTS; THE DRAINAGE AREA IS THE LOWER NORTH BRANCH PATAPUSCO RIVER WATERSHED.
14. ADEQUATE SITE DISTANCE IS AVAILABLE AT THE ENTRANCE BASED ON FIELD VERIFICATION, THIS PROJECT IS SUBJECT TO A SIGHT DISTANCE ANALYSIS TO BE PREPARED AND SUBMITTED WITH FURTHER PLAN SUBMISSION.
15. A GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY GEOTECHNICAL LABORATORIES, INC., DATED JANUARY, 2014 AND APPROVED UNDER SUBSEQUENT PLANS SUBMISSION.
16. THERE ARE NO WETLANDS LOCATED ON-SITE AS OUTLINED IN THE WETLANDS CERTIFICATION LETTER PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. DATED JANUARY 3, 2014.
17. THIS PLAN WILL BE PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
18. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION AND/OR SITE DEVELOPMENT PLAN.
19. 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 AND/OR SITE DEVELOPMENT PLAN STAGES. THEREFORE, THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED COMMENTS (INCLUDING THOSE THAT MAY ALTER OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES.
20. A REQUEST FOR FEE-IN-LIEU OF OPEN SPACE IN THE AMOUNT OF \$1,500 PER NEW LOT WILL BE PROVIDED AT TIME OF SUBSEQUENT PLANS SUBMISSION.
21. THE REQUIREMENTS OF SECTION 16.120 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION ARE FULFILLED BY PROVIDING 0.6 ACRES OF OFF-SITE RETENTION ON THE WILLEY MEDE, SECTION 2, LOT 72 (F-09-051), PLAN NUMBER 20710. THERE IS NO SURETY FOR THIS RETENTION.

Lot No.	Practice	MDE	Type	Number	Ownership/Maintenance
LOT 1	DW-1	(M-5)	DRYWELL	2	Private
	DW-2	(M-5)	DRYWELL	2	Private
	DR-1	(N-2)	Non-Rooftop Disconnection	1	Private
LOT 2	MB-1	(M-6)	Micro-Bioretenion	1	Private
	DR-2	(N-2)	Non-Rooftop Disconnection	1	Private
LOT 3	DR-2	(N-2)	DRYWELL	4	Private
	DR-3	(N-2)	Non-Rooftop Disconnection	1	Private
LOT 4	DR-4	(N-2)	Non-Rooftop Disconnection	1	Private
	MB-2	(M-6)	Micro-Bioretenion	1	Private



**PROJECT BACKGROUND INFORMATION**  
 PRESENT ZONING: R-20  
 LOCATION: TAX MAP 37 - GRID 02 - PARCEL 25  
 APPLICABLE DPZ FILE REFERENCES: F-90-112  
 DEED REFERENCES: L15373/F.00356  
 PROPOSED USE OF SITE: RESIDENTIAL (SFD)  
 PROPOSED WATER AND SEWER SYSTEMS: PUBLIC WATER & SEWER

SITE DATA TABULATION	
1) TOTAL PROJECT AREA.....	2.25±AC.
2) AREA OF 100-YR. FLOODPLAIN.....	0.00±AC.
3) AREA OF STEEP SLOPES (15% OR GREATER).....	0.00±AC.
4) AREA OF EXISTING FOREST.....	0.00±AC.
5) AREA OF ERODIBLE SOILS.....	0.00±AC.
6) AREA OF WETLANDS.....	0.00±AC.
7) NET AREA OF SITE(S).....	2.25±AC.
8) NUMBER OF UNITS ALLOWED.....	N/A
9) NUMBER OF RESIDENTIAL UNITS PROPOSED.....	N/A
10) AREA OF PLAN SUBMISSION.....	2.25±AC.
11) APPROXIMATE LIMIT OF DISTURBANCE.....	1.66±AC.
12) PRESENT ZONING DESIGNATION.....	R-20
13) PROPOSED USES FOR THE SITE & STRUCTURES.....	RESIDENTIAL - SFD
14) MINIMUM LOT SIZE.....	20,000 SF
15) OPEN SPACE REQUIRED (6%).....	0.14±AC.
16) OPEN SPACE PROVIDED.....	0.00±AC.
17) RECREATIONAL OPEN SPACE REQUIRED.....	N/A
18) RECREATIONAL OPEN SPACE PROVIDED.....	N/A
19) NUMBER OF PARKING SPACES REQUIRED.....	N/A
20) TOTAL NUMBER OF PARKING SPACES PROVIDED.....	N/A
21) BUILDING COVERAGE AREA (IMPERVIOUS).....	0.19±AC(±8%)
22) TOTAL IMPERVIOUS AREA.....	0.37±AC(±16%)

**LEGEND**

- EXISTING LANDSCAPING
- EXISTING CANOPY LINES
- EXISTING FOREST LIMITS
- EXISTING WATER MAIN
- EXISTING SEWER MAIN
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SOILS DELINEATION
- SOILS TYPE
- PROPOSED DWELLING
- EXISTING DWELLING

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division: *[Signature]* DATE: 6-13-14

Chief, Division of Land Development: *[Signature]* DATE: 6/12/14

**BORING LOG** GEOLAB, INC. Date: 1/17/2014

Client: Rainmaker Development, Inc. Project: Scarborough Estates. Plot No: 114-006

Elevation	Depth	Description of Materials	Remarks
388.0	0.0	Soil with organic (root) matter and organic soil.	
387.5	0.5	Brown silty SAND with gravel, damp (SM, Loamy Sand)	
387.0	1.0	Brown medium to coarse SAND, little silt and trace gravel, damp (SW-SM, Loamy Sand)	
386.5	1.5	Same as above with gravel.	
386.0	2.0		8.6
385.5	2.5		
385.0	3.0		4.1
384.5	3.5		6.0
384.0	4.0		6.5
383.5	4.5		19.4
383.0	5.0		
382.5	5.5		10.4
382.0	6.0		
381.5	6.5		20.4
381.0	7.0		
380.5	7.5		
380.0	8.0		
379.5	8.5		
379.0	9.0		
378.5	9.5		
378.0	10.0		
377.5	10.5		
377.0	11.0		
376.5	11.5		
376.0	12.0		
375.5	12.5		
375.0	13.0		
374.5	13.5		
374.0	14.0		
373.5	14.5		
373.0	15.0		
372.5	15.5		
372.0	16.0		
371.5	16.5		
371.0	17.0		
370.5	17.5		
370.0	18.0		
369.5	18.5		
369.0	19.0		
368.5	19.5		
368.0	20.0		
367.5	20.5		
367.0	21.0		
366.5	21.5		
366.0	22.0		
365.5	22.5		
365.0	23.0		
364.5	23.5		
364.0	24.0		
363.5	24.5		
363.0	25.0		
362.5	25.5		
362.0	26.0		
361.5	26.5		
361.0	27.0		
360.5	27.5		
360.0	28.0		
359.5	28.5		
359.0	29.0		
358.5	29.5		
358.0	30.0		
357.5	30.5		
357.0	31.0		
356.5	31.5		
356.0	32.0		
355.5	32.5		
355.0	33.0		
354.5	33.5		
354.0	34.0		
353.5	34.5		
353.0	35.0		
352.5	35.5		
352.0	36.0		
351.5	36.5		
351.0	37.0		
350.5	37.5		
350.0	38.0		
349.5	38.5		
349.0	39.0		
348.5	39.5		
348.0	40.0		
347.5	40.5		
347.0	41.0		
346.5	41.5		
346.0	42.0		
345.5	42.5		
345.0	43.0		
344.5	43.5		
344.0	44.0		
343.5	44.5		
343.0	45.0		
342.5	45.5		
342.0	46.0		
341.5	46.5		
341.0	47.0		
340.5	47.5		
340.0	48.0		
339.5	48.5		
339.0	49.0		
338.5	49.5		
338.0	50.0		
337.5	50.5		
337.0	51.0		
336.5	51.5		
336.0	52.0		
335.5	52.5		
335.0	53.0		
334.5	53.5		
334.0	54.0		
333.5	54.5		
333.0	55.0		
332.5	55.5		
332.0	56.0		
331.5	56.5		
331.0	57.0		
330.5	57.5		
330.0	58.0		
329.5	58.5		
329.0	59.0		
328.5	59.5		
328.0	60.0		
327.5	60.5		
327.0	61.0		
326.5	61.5		
326.0	62.0		
325.5	62.5		
325.0	63.0		
324.5	63.5		
324.0	64.0		
323.5	64.5		
323.0	65.0		
322.5	65.5		
322.0	66.0		
321.5	66.5		
321.0	67.0		
320.5	67.5		
320.0	68.0		
319.5	68.5		
319.0	69.0		
318.5	69.5		
318.0	70.0		
317.5	70.5		
317.0	71.0		
316.5	71.5		
316.0	72.0		
315.5	72.5		
315.0	73.0		
314.5	73.5		
314.0	74.0		
313.5	74.5		
313.0	75.0		
312.5	75.5		

**B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATION STABILIZATION**

**Definition:** The process of preparing the soils to sustain permanent vegetation stabilization.

**Purpose:** To provide a suitable soil medium for permanent vegetation stabilization.

**Conditions When Practice Applies:** When vegetative stabilization is to be established.

**Criteria:**

- Temporary Stabilization**
  - Flooded areas consisting of less than 10% of the total site area shall be treated with suitable agricultural or construction equipment, such as disc harrows or chisel plows, to prepare the soil for permanent vegetation stabilization. After the soil is prepared, it must be seeded with vegetation and covered with straw or other suitable mulch to prevent erosion. Apply fertilizer and lime as prescribed in the plan.
  - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disk harrow or other suitable means.
- Permanent Stabilization**
  - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
    - Soil pH between 6.0 and 7.5.
    - Soil salinity less than 500 parts per million (ppm).
    - Soil contains less than 40 percent clay but enough heavy clay to provide a good seedbed.
    - Soil contains 30 percent plus clay to provide the capacity to hold a moderate amount of moisture.
    - An exception: If a soil is to be planted, then a sandy soil (less than 30 percent clay) may be acceptable.
    - Soil contains 1.5 percent minimum organic matter by weight.
    - Soil contains sufficient pore space to permit adequate root penetration.
  - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
  - Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
  - Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
  - Mix soil amendments into the top 3 to 5 inches of soil by disk harrow or other suitable means. Rate from 1/2 to 1 inch of amendments per 100 square feet of area to be seeded, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other device to roughen the surface and improve seed-to-soil contact, leaving the normal seedbed preparation. Track slopes 3:1 or flatter with reduced equipment, leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 2 inches of soil loose and rough. No topsoil or other material is necessary on newly disturbed areas.

**B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION**

**Definition:** Establishment of vegetative cover on an old fill slope.

**Purpose:** To provide timely vegetative cover on an old fill slope as work progresses.

**Conditions When Practice Applies:** Any cut or fill slope greater than 1:1 in height.

**Criteria:**

- Incremental Stabilization - Cut Slopes**
  - Incremental stabilization increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
  - Perform Phase 1 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
  - Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.
- Incremental Stabilization - Fill Slopes**
  - Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all fill slopes as the work progresses.
  - Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases in any area.
  - At the end of each lift, install temporary water conveyance (pipes), as necessary, to intercept surface runoff.
  - Construct and stabilize all temporary weirs or dikes that will be used to divert runoff around the fill. Construct fill plus one foot of fill above the final grade.
  - At the end of each day, install temporary water conveyance (pipes), as necessary, to intercept surface runoff.
  - Place Phase I fill, prepare seedbed, and stabilize.
  - Place Phase II fill, prepare seedbed, and stabilize.
  - Place final Phase III fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

**B-4-2 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION**

**Definition:** To stabilize disturbed soils with permanent vegetation.

**Purpose:** To use long lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

**Conditions When Practice Applies:** Exposed soils where ground cover is needed for 6 months or more.

**Criteria:**

- General Use**
  - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site conditions or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
  - Additional seeding specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Conservation Guide Section 342 - Critical Area Planting.
  - For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
  - For areas receiving low maintenance, apply urea fertilizer (45-0-0) at 3 pounds per 1000 square feet (100 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
- Areas where turfgrass may be desired**
  - Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
  - Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary.
  - The summary is to be placed on the plan.
  - Kentucky Bluegrass - Full Sun Mixture. For use in areas that receive intensive management. Intensive management is the use of annual fertilization and frequent mowing. Recommended Certified Kentucky Bluegrass Seedling Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a mixture of three Kentucky Bluegrass Cultivars with each cultivar from 10 to 30 percent of the total mixture by weight.
  - Kentucky Bluegrass/Perennial Ryegrass - Full Sun Mixture. For use in areas where rapid establishment is necessary and where turf will receive medium to intensive management. Certified Kentucky Bluegrass/Perennial Ryegrass Seedling Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars to be 10 to 25 percent of the total mixture by weight.
  - Tall Fescue/Kentucky Bluegrass - Full Sun Mixture. For use in drought prone areas and/or for areas requiring low maintenance management on full to medium maintenance maintenance sites. Certified Tall Fescue Cultivars 50 to 60 percent. Certified Kentucky Bluegrass Cultivars 10 to 15 percent. Seedling Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
  - Perennial Ryegrass/Perennial Ryegrass - Full Sun Mixture. For use in areas with high maintenance. For establishment in high quality, intensively managed turf areas. More cultivars are Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seedling Rate: 1.5 to 2.0 pounds per 1000 square feet.
  - Soil Amendments: Refer to the tables listed in the most current University of Maryland Publication, Agronomy Manual #77, "Turfgrass Culture Recommendations for Maryland" Choose certified material in the best production conditions of culture plants. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assurance.
  - Planting Dates: Refer to the tables listed in the most current University of Maryland Publication, Agronomy Manual #77, "Turfgrass Culture Recommendations for Maryland" Choose certified material in the best production conditions of culture plants. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assurance.
  - Planting Dates: Refer to the tables listed in the most current University of Maryland Publication, Agronomy Manual #77, "Turfgrass Culture Recommendations for Maryland" Choose certified material in the best production conditions of culture plants. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assurance.

**B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEING AND MULCHING**

**Definition:** To stabilize disturbed soils from erosion during and at the end of construction.

**Purpose:** To protect the soil from erosion during and at the end of construction.

**Conditions When Practice Applies:** To the surface of all perimeter contours, slopes, and all disturbed areas not under active grading.

**Criteria:**

- Specifications**
  - All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to testing by a recognized seed laboratory. Seed lot must have been tested within the 6 months immediately preceding the date of seed use. Seed lots must be available upon request to the inspector to verify type of seed and seeding rates.
  - Mulch shall be applied according to the plan and seeding rates shall be as specified on the plan. The appropriate seeding machine must be applied when the ground is prepared.
  - Inoculants: These are inoculants for forming legume seed in the soil. Inoculants must be used on legume seed. Inoculants should be applied to the seed at the time of seeding. Inoculants must be used on legume seed. Inoculants must be used on legume seed. Inoculants must be used on legume seed.
  - Soil seed must be placed on soil that has been treated with soil stabilizers or fertilizers as required on the approved plan. The application rate shall be 14 days (m) to prevent dispersion of phytotoxic materials.
- Application**
  - Dry Seeding: This includes use of conventional strip or broadcast spreaders. Incorporate seed into the soil to a depth of 1/2 to 1 inch. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Soil must be worked with a weighted roller to provide good seed to soil contact.
  - Drill or Coulters: Seeders: Mechanical seeders that apply and cover seed with soil. Cultipicking seeders are required to bury the seed in a fashion to provide good seed to soil contact.
  - Hydroseeding: Apply seed uniformly with hydrosower (slurry includes seed and fertilizer).
  - If fertilizer is being applied at the time of seeding, the application rates should not exceed the following nitrogen, 100 pounds per acre or less of soluble nitrogen; P2O5 (phosphorus), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
  - Lime: Use only ground agricultural limestone (up to 3 tons per acre) and use the areas as prescribed in the plan. Do not use lime on areas that are hydroseeding at any one time. Do not use burnt or hydrated lime.
  - Mix seed and fertilizer on site and seed immediately and without interruption. When hydroseeding do not incorporate seed into the soil.
- Mulching**
  - Mulch (in order of preference):
    - Straw consisting of thoroughly treshed wheat, rye, oat, or barley and reasonably bright in color. Straw to be free of noxious weed seeds as specified in the Maryland Seed Law and not overly moist, compact, or excessively dry.
    - Use only clean straw mulch in areas where the presence of grass is desired.
    - Wood Chippings: Clean chippings (WCPM) consisting of specially prepared wood chips processed into a uniform form physical state.
    - WCPM must be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.
    - WCPM, including dry, must contain no germination or growth inhibiting agents.
    - WCPM materials are to be manufactured and processed in such a manner that the material will be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.
    - WCPM materials must be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.
    - WCPM materials must be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.

**B-4-4 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION**

**Definition:** To stabilize disturbed soils with permanent vegetation.

**Purpose:** To use long lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

**Conditions When Practice Applies:** Exposed soils where ground cover is needed for 6 months or more.

**Criteria:**

- General Use**
  - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site conditions or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
  - Additional seeding specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Conservation Guide Section 342 - Critical Area Planting.
  - For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
  - For areas receiving low maintenance, apply urea fertilizer (45-0-0) at 3 pounds per 1000 square feet (100 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
- Areas where turfgrass may be desired**
  - Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
  - Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary.
  - The summary is to be placed on the plan.
  - Kentucky Bluegrass - Full Sun Mixture. For use in areas that receive intensive management. Intensive management is the use of annual fertilization and frequent mowing. Recommended Certified Kentucky Bluegrass Seedling Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a mixture of three Kentucky Bluegrass Cultivars with each cultivar from 10 to 30 percent of the total mixture by weight.
  - Kentucky Bluegrass/Perennial Ryegrass - Full Sun Mixture. For use in areas where rapid establishment is necessary and where turf will receive medium to intensive management. Certified Kentucky Bluegrass/Perennial Ryegrass Seedling Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars to be 10 to 25 percent of the total mixture by weight.
  - Tall Fescue/Kentucky Bluegrass - Full Sun Mixture. For use in drought prone areas and/or for areas requiring low maintenance management on full to medium maintenance maintenance sites. Certified Tall Fescue Cultivars 50 to 60 percent. Certified Kentucky Bluegrass Cultivars 10 to 15 percent. Seedling Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
  - Perennial Ryegrass/Perennial Ryegrass - Full Sun Mixture. For use in areas with high maintenance. For establishment in high quality, intensively managed turf areas. More cultivars are Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seedling Rate: 1.5 to 2.0 pounds per 1000 square feet.
  - Soil Amendments: Refer to the tables listed in the most current University of Maryland Publication, Agronomy Manual #77, "Turfgrass Culture Recommendations for Maryland" Choose certified material in the best production conditions of culture plants. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assurance.
  - Planting Dates: Refer to the tables listed in the most current University of Maryland Publication, Agronomy Manual #77, "Turfgrass Culture Recommendations for Maryland" Choose certified material in the best production conditions of culture plants. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assurance.
  - Planting Dates: Refer to the tables listed in the most current University of Maryland Publication, Agronomy Manual #77, "Turfgrass Culture Recommendations for Maryland" Choose certified material in the best production conditions of culture plants. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assurance.

**H-5 STANDARDS AND SPECIFICATIONS FOR DUST CONTROL**

**Definition:** Controlling the suspension of dust particles from construction activities.

**Purpose:** To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and safety hazards.

**Conditions When Practice Applies:** Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

**Criteria:**

- Mulch:** See Section B-4-3 Soil Preparation, Topsoiling, and Soil Amendments. Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization.
- Watering:** See Section B-4-3 Soil Preparation, Topsoiling, and Soil Amendments. Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization.
- Watering:** See Section B-4-3 Soil Preparation, Topsoiling, and Soil Amendments. Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization.
- Watering:** See Section B-4-3 Soil Preparation, Topsoiling, and Soil Amendments. Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization.

**ECP NOTE:** APPROVAL OF THIS EOP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN, SITE DEVELOPMENT PLAN, OR GRADING OR BUILDING PERMIT 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, SITE DEVELOPMENT PLAN, OR GRADING AND BUILDING PERMIT STAGES.

**SEEDING AND MULCHING**

**Definition:** To stabilize disturbed soils from erosion during and at the end of construction.

**Purpose:** To protect the soil from erosion during and at the end of construction.

**Conditions When Practice Applies:** To the surface of all perimeter contours, slopes, and all disturbed areas not under active grading.

**Criteria:**

- Specifications**
  - All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to testing by a recognized seed laboratory. Seed lot must have been tested within the 6 months immediately preceding the date of seed use. Seed lots must be available upon request to the inspector to verify type of seed and seeding rates.
  - Mulch shall be applied according to the plan and seeding rates shall be as specified on the plan. The appropriate seeding machine must be applied when the ground is prepared.
  - Inoculants: These are inoculants for forming legume seed in the soil. Inoculants must be used on legume seed. Inoculants should be applied to the seed at the time of seeding. Inoculants must be used on legume seed. Inoculants must be used on legume seed.
  - Soil seed must be placed on soil that has been treated with soil stabilizers or fertilizers as required on the approved plan. The application rate shall be 14 days (m) to prevent dispersion of phytotoxic materials.
- Application**
  - Dry Seeding: This includes use of conventional strip or broadcast spreaders. Incorporate seed into the soil to a depth of 1/2 to 1 inch. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Soil must be worked with a weighted roller to provide good seed to soil contact.
  - Drill or Coulters: Seeders: Mechanical seeders that apply and cover seed with soil. Cultipicking seeders are required to bury the seed in a fashion to provide good seed to soil contact.
  - Hydroseeding: Apply seed uniformly with hydrosower (slurry includes seed and fertilizer).
  - If fertilizer is being applied at the time of seeding, the application rates should not exceed the following nitrogen, 100 pounds per acre or less of soluble nitrogen; P2O5 (phosphorus), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
  - Lime: Use only ground agricultural limestone (up to 3 tons per acre) and use the areas as prescribed in the plan. Do not use lime on areas that are hydroseeding at any one time. Do not use burnt or hydrated lime.
  - Mix seed and fertilizer on site and seed immediately and without interruption. When hydroseeding do not incorporate seed into the soil.
- Mulching**
  - Mulch (in order of preference):
    - Straw consisting of thoroughly treshed wheat, rye, oat, or barley and reasonably bright in color. Straw to be free of noxious weed seeds as specified in the Maryland Seed Law and not overly moist, compact, or excessively dry.
    - Use only clean straw mulch in areas where the presence of grass is desired.
    - Wood Chippings: Clean chippings (WCPM) consisting of specially prepared wood chips processed into a uniform form physical state.
    - WCPM must be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.
    - WCPM, including dry, must contain no germination or growth inhibiting agents.
    - WCPM materials are to be manufactured and processed in such a manner that the material will be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.
    - WCPM materials must be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.
    - WCPM materials must be free of any material that could provide an appropriate cover to facilitate visual inspection of the ground.

**SEDIMENT CONTROL NOTES**

- A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTOR, LICESSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1850).
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE CONFORMED WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL" REVISIONS THEREIN.
- FOLLOWING INITIAL SOIL DISTURBANCE OR RESTORATION/PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN A) THREE (3) CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, Dikes, PERMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN COORDINATE ON THE SAME DAY OF DISTURBANCE, CONSTRUCTION DESIGN MANUAL, CHAPTER 1.10, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED HEREIN ACCORDANCE WITH THE HOWARD COUNTY STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (S.E.S.) SOO (S.E.S.) TEMPORARY SEEDING (S.E.S.) AND MULCHING (S.E.S.) SOO. TEMPORARY STABILIZATION WITH MULCH OR MULCH RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PERMANENT SEEDING AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION FOR THE DURATION OF THE PROJECT. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION FOR THE DURATION OF THE PROJECT.
- SITE ANALYSIS:**
  - TOTAL AREA OF SITE (THIS SUBMISSION) 2.25 ACRES
  - AREA DISTURBED 1.66 ACRES
  - AREA TO BE ROOFED OR PAVED 0.37 ACRES
  - AREA TO BE VEGETATIVELY STABILIZED 1.29 ACRES
  - TOTAL CUT 0.00 CY
  - TOTAL FILL 0.00 CY
  - OFFSITE WASH/BORROW AREA LOCATION \*

**SOILS LEGEND**

MAP SYMBOL	SOIL TYPE	MAPPING UNIT	"K" VALUE
Amb	D	ALLOWAY SILTY LOAM - 2 TO 5 PERCENT SLOPES	0.43
Fs	D	FALLSINGTON SANDY LOAM - 0 TO 2 PERCENT SLOPES	0.20
SaB	B	SASSAFRAS LOAM - 2 TO 5 PERCENT SLOPES	0.37
SbD	B	SASSAFRAS AND CROOM LOAMS - 10 TO 15 PERCENT SLOPES	0.37

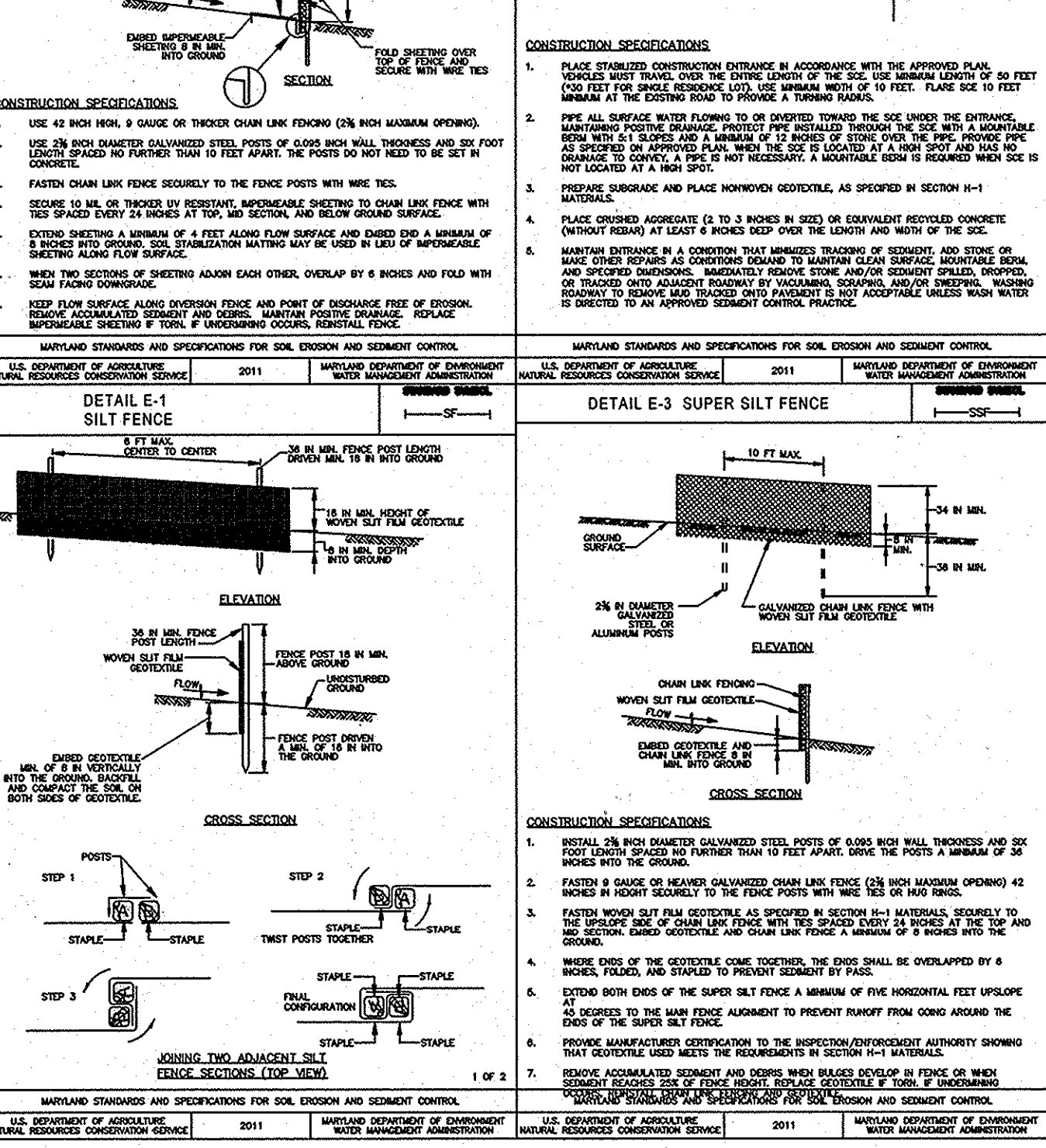
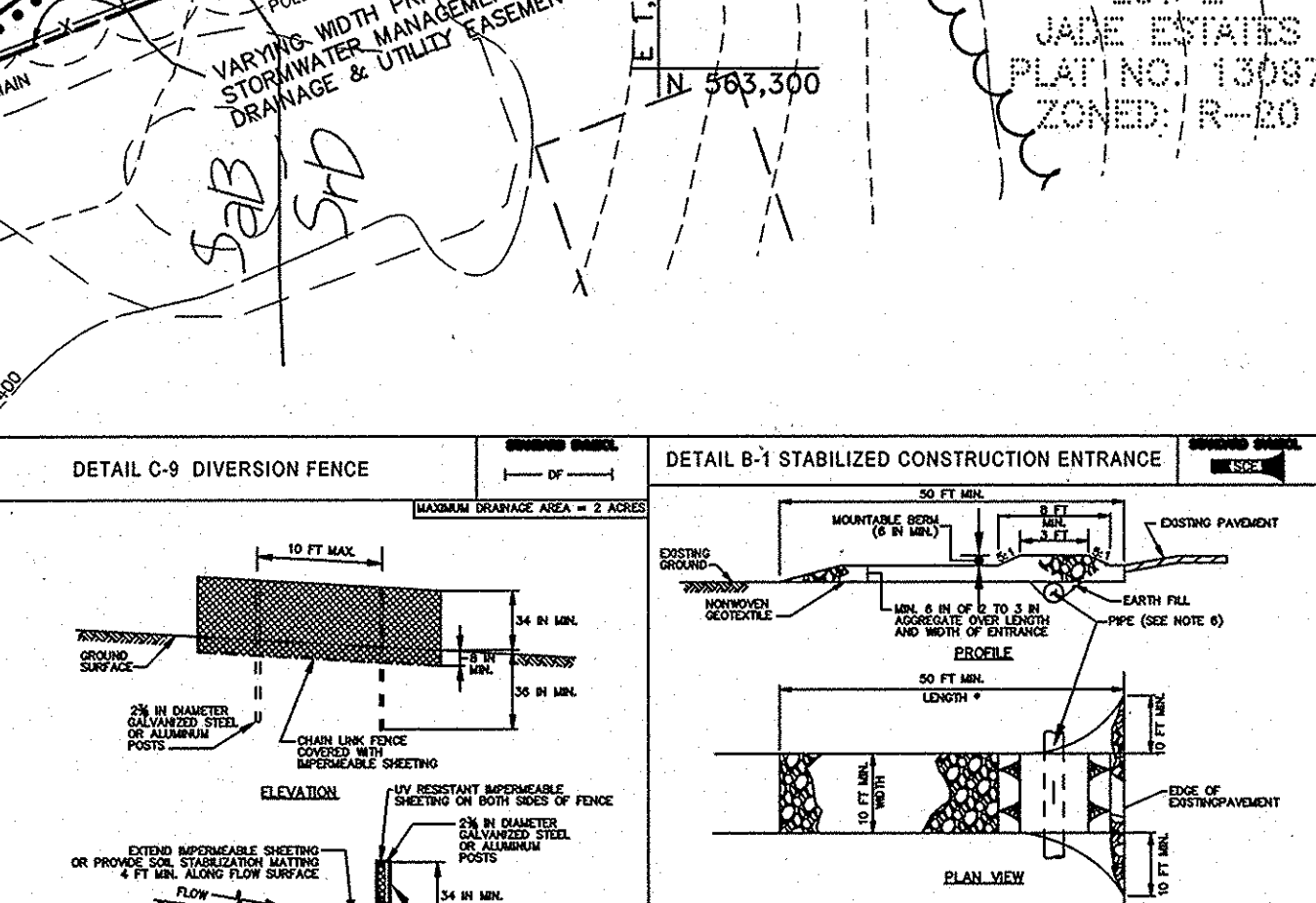
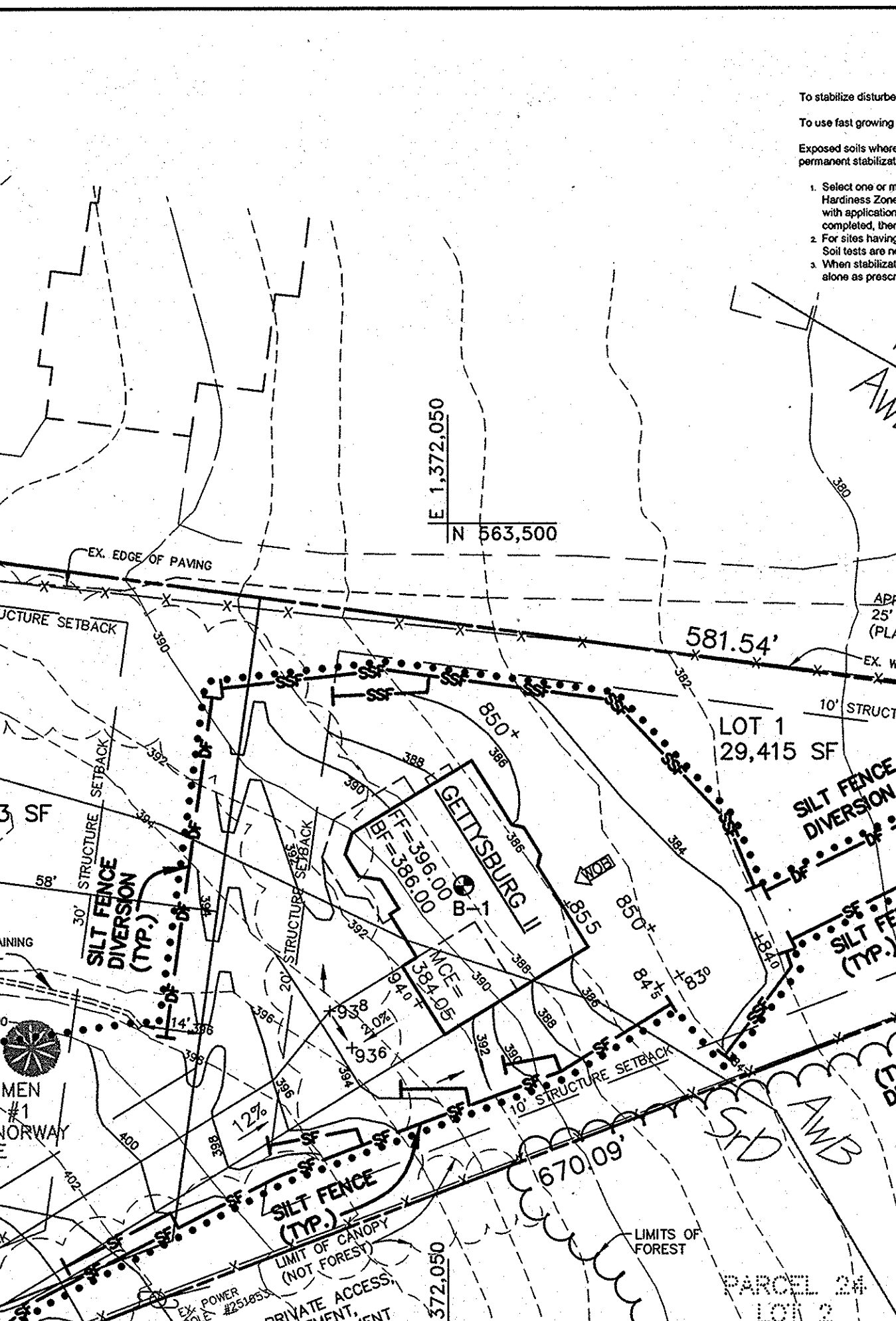
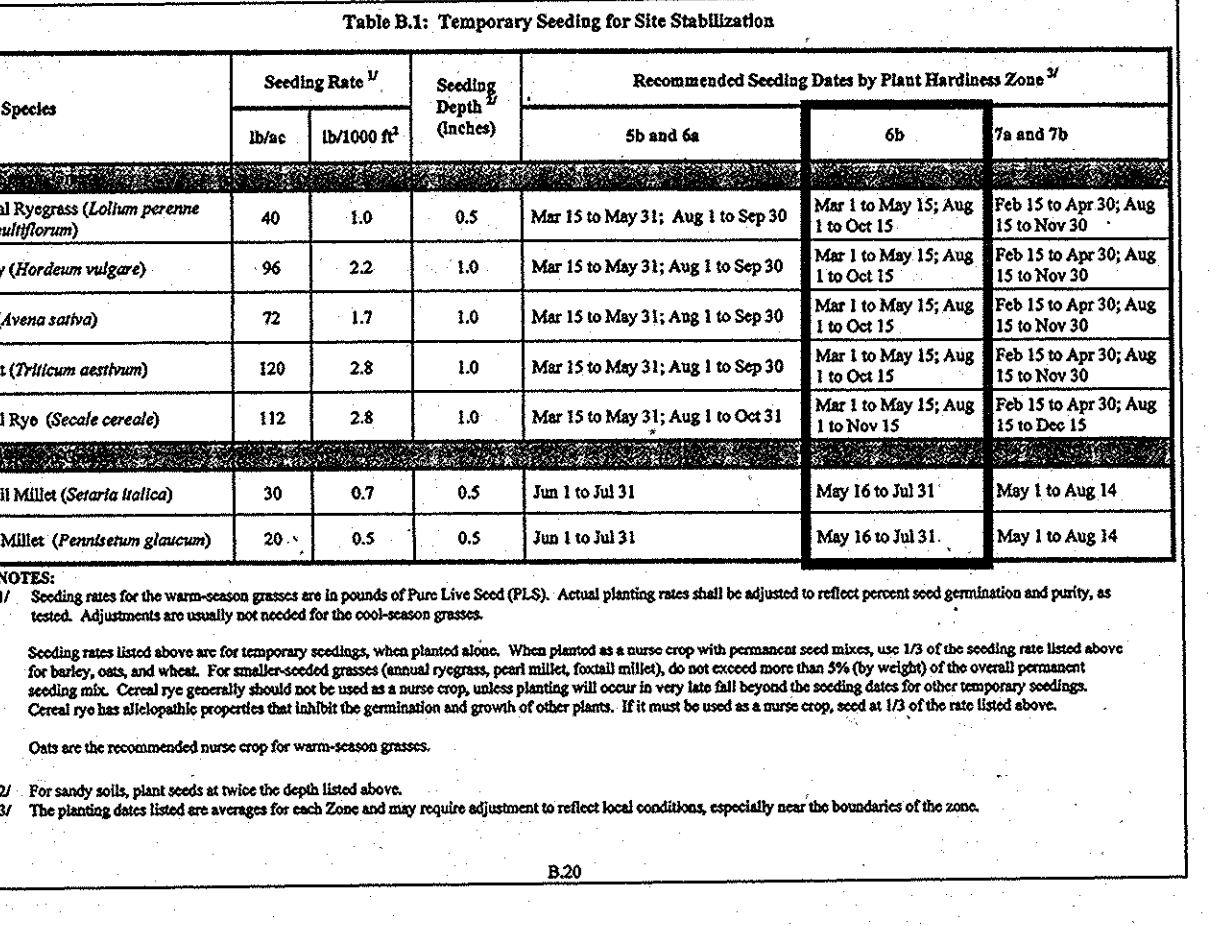
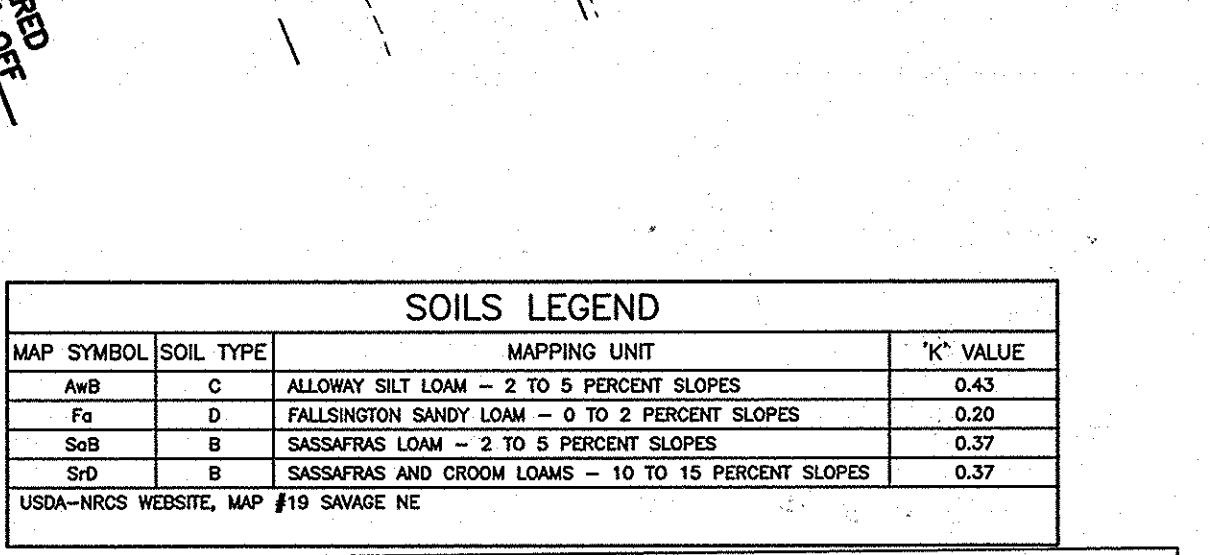
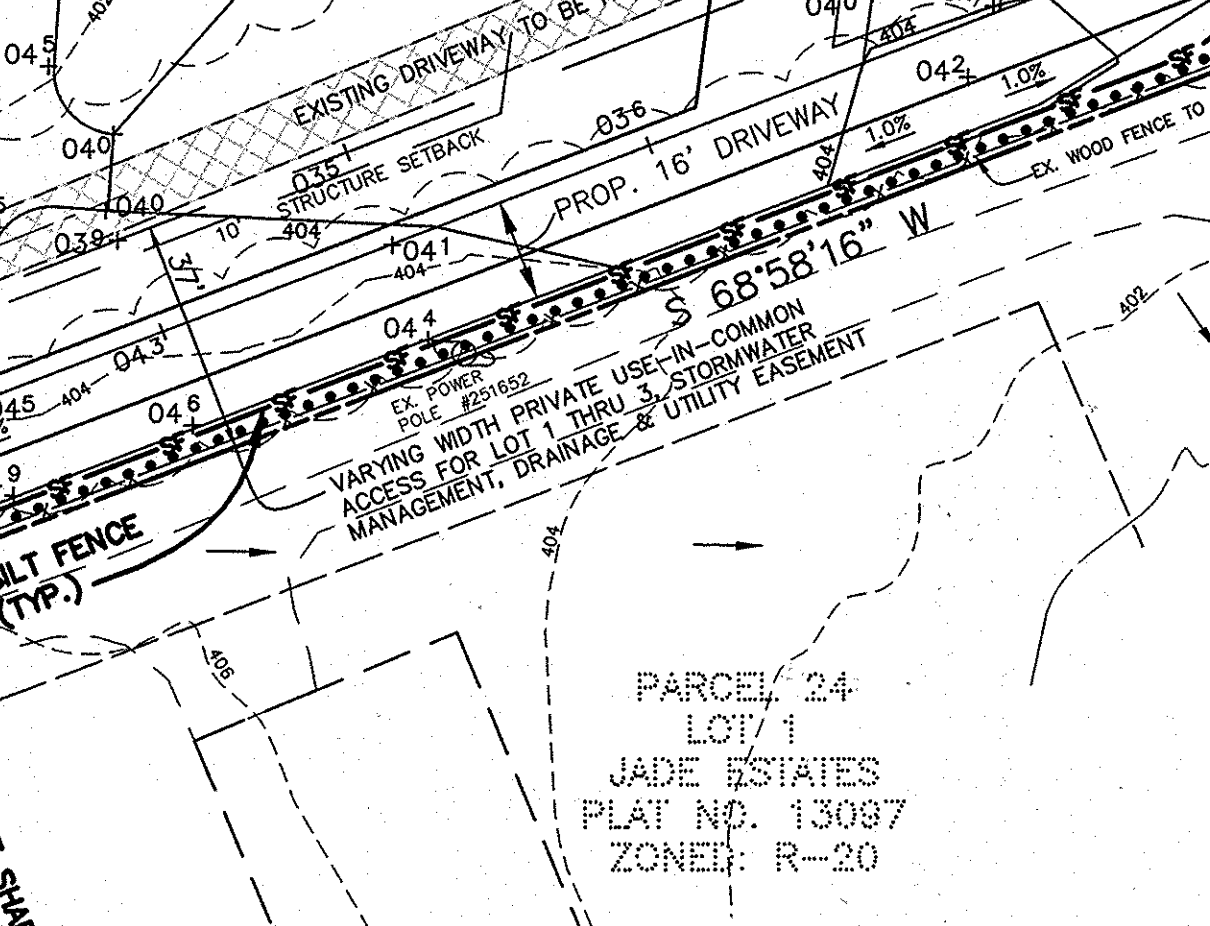
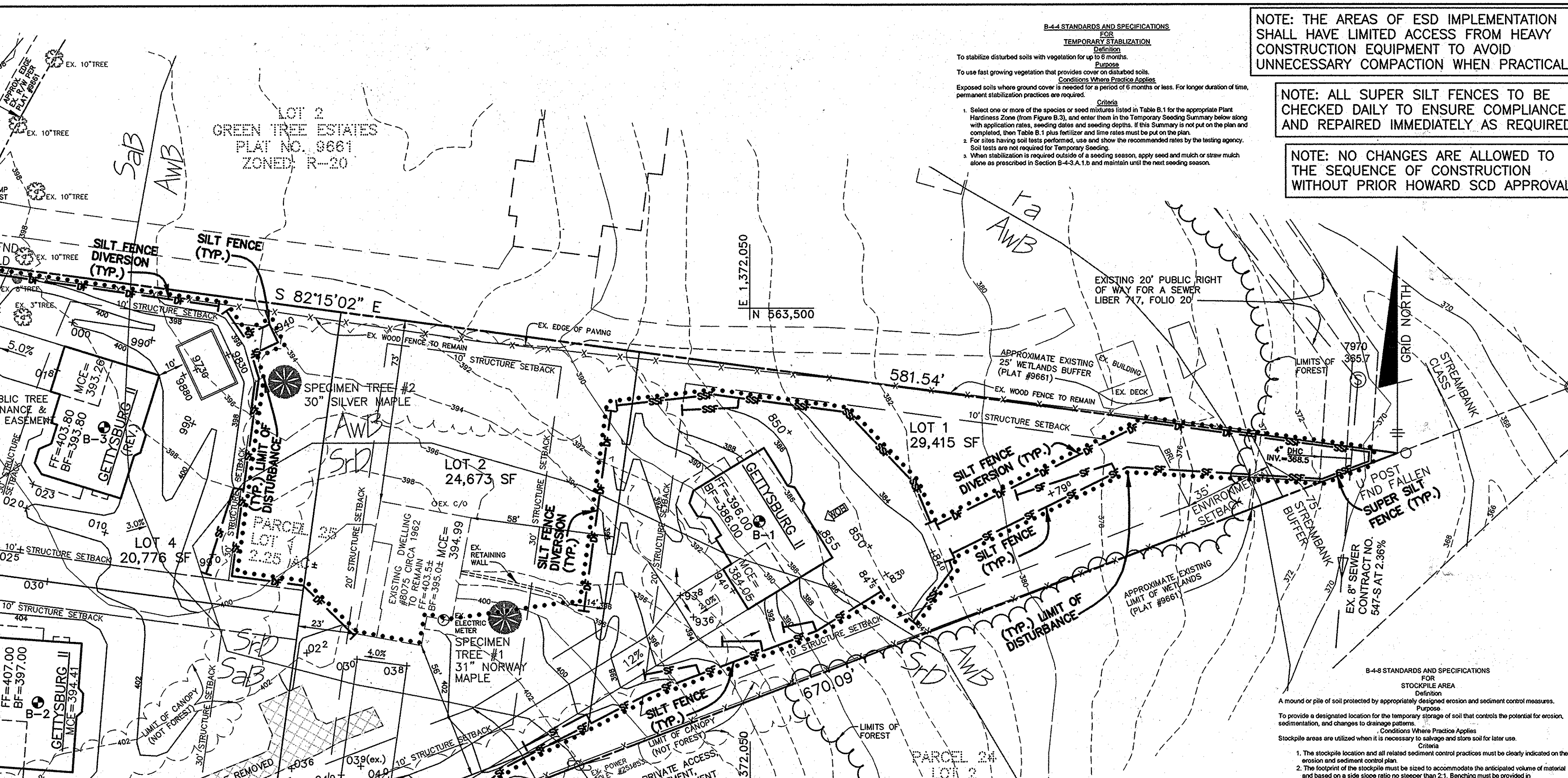
USDA-NRCS WEBSITE, MAP #19 SAVANNA NE

**Table B.1: Temporary Seeding for Site Stabilization**

Plant Species	Seeding Rate		Seeding Dates		Planting Dates	
	lb/acre	1000 sq ft	60	60	7a and 7b	7a and 7b
Annual Ryegrass ( <i>Lolium perenne</i> sp. multiflorum)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Berly ( <i>Horridum vulgare</i> )	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Mar 1 to May 15; Aug 1 to Oct 15
Cris ( <i>Arvensis sativa</i> )	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Wheat ( <i>Triticum aestivum</i> )	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Cornel Rye ( <i>Secale cereale</i> )	112	2.6	1.0	Mar 15 to May 31; Aug 1 to Oct 15	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Perennial Millet ( <i>Setaria italica</i> )	30	0.7	0.5	Jan 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Perennial Millet ( <i>Perennis glaucus</i> )	20	0.5	0.5	Jan 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

**NOTES:**

- Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). When planting rates are listed in addition to reflect project seed germination and purity as used. Adjustments must be made for seed quality and purity.
- Seeding rates for the cool-season grasses are in pounds of seed, when planted as a pure crop with no pre-mix seed, use 10% of the seedling rate listed above for barley, rye, and wheat. For pre-mix seed, use the germination and purity rates listed above. For the most current information on seed quality and purity, consult the National Seed Production Council website.
- For ready soils, plant seeds to a depth of 1/2 to 1 inch.
- The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially over the boundaries of the zone.



**B-4-4 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA**

**Definition:** A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

**Purpose:** To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and drainage to adjacent areas.

**Conditions When Practice Applies:** Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

**Criteria:**

- The stockpile location and all related sediment control practices must be clearly indicated on the plan.
- The location of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope no steeper than 2:1.
- Stockpile areas must be protected by a suitable sediment control practice.
- Access the stockpile area from the top of the slope.
- Clear water runoff into the stockpile must be minimized by use of a diversion device such as an earth, temporary silt or diversion fence. Diversion must be provided for discharging construction equipment.
- Where runoff concentrates along the toe of the stockpile, an appropriate erosion control practice must be used to prevent soil erosion.
- Stockpiles must be stabilized in accordance with the 5:7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
- If the stockpile is located on an impervious surface, it should be provided with a stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable materials.

**PROFESSIONAL CERTIFICATION:** I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer in the State of Maryland, License No. 10387, dated 6-30-2010.

**BENCHMARK ENGINEERS, INC.**

8480 BALTIMORE NATIONAL PIKE A SUITE 315  
ELLSWORTH CITY, MARYLAND 21043  
PHONE: 410-465-6100 FAX: 410-465-6644  
WWW.BE-COENGINEERING.COM

**OWNER/DEVELOPER:** RAINMAKER DEVELOPMENT, INC. 6755 BUSINESS PARKWAY, ELKDRIDGE, MARYLAND 21075 410-379-1525 c/o SCOTT ARTERBURN

**SCARBOROUGH ESTATES LOTS 1 THRU 4**

A RESUBDIVISION OF LOT 1 OF GREEN TREE ESTATES, PLAT NO. 9661

8075 OLD MONTGOMERY ROAD

TAX MAP: 37 GRID: 02 PARCEL: 25 ZONED: R-20 ELECTRIC DISTRICT NO. 1 HOWARD COUNTY, MARYLAND ENVIRONMENTAL CONCEPT PLAN, NOTES AND DETAILS

DATE: JUNE 10, 2014 BEI PROJECT NO. 2604 SCALE: AS SHOWN SHEET 2 OF 3

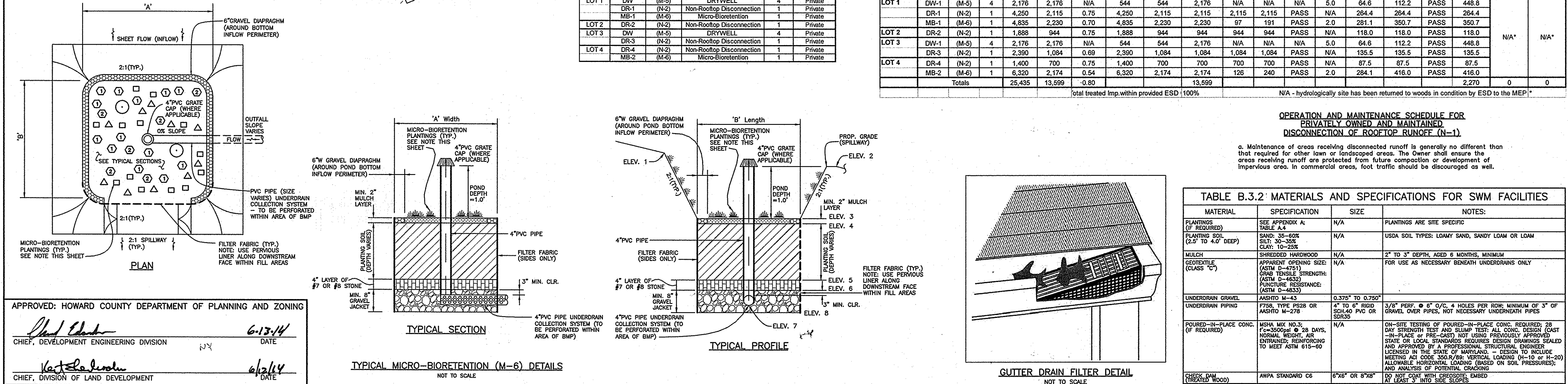
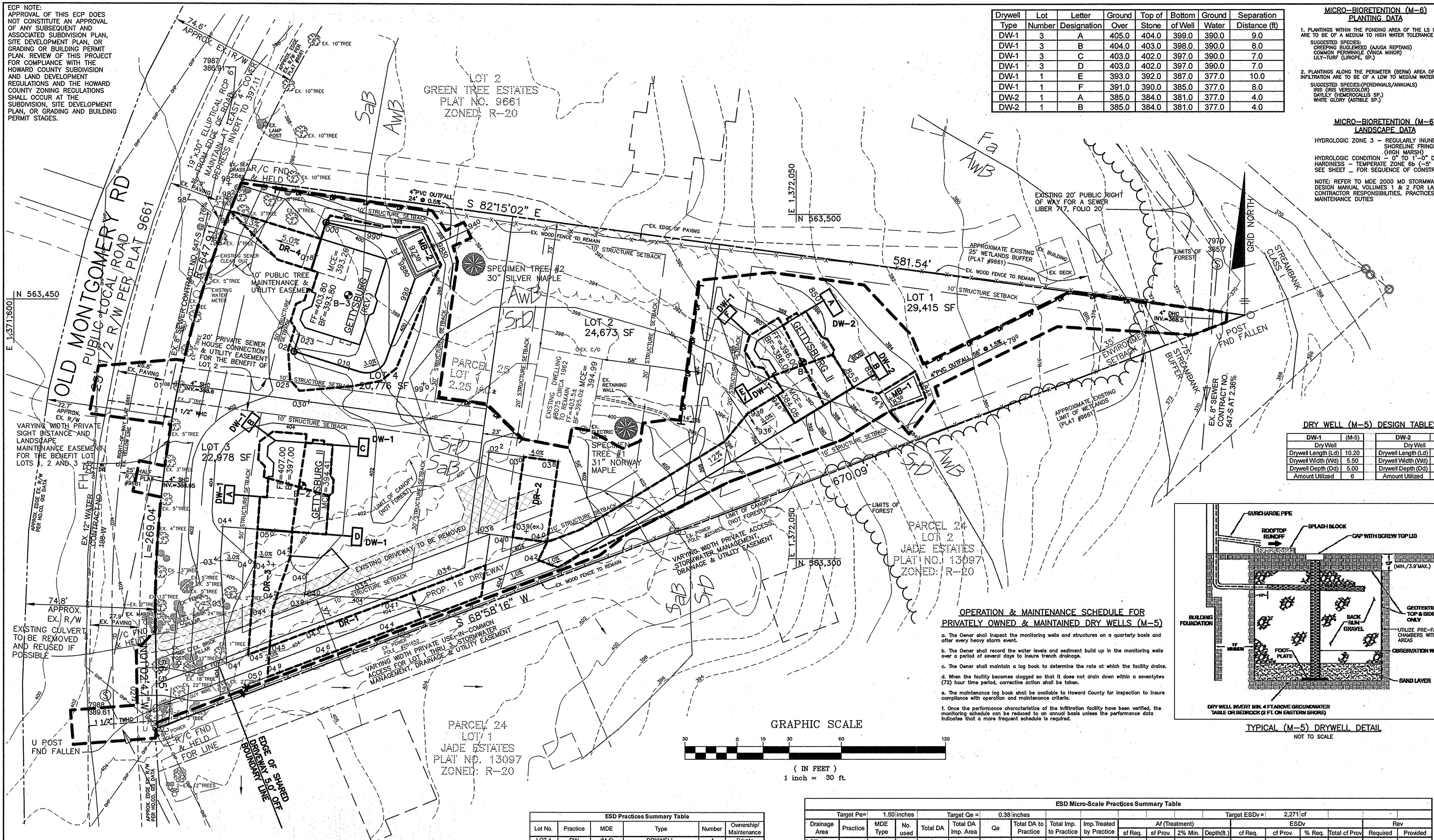
ECP NOTE: APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT PLAN, SITE DEVELOPMENT PLAN, OR GRADING OR BUILDING PERMIT PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION, SITE DEVELOPMENT PLAN, OR GRADING AND BUILDING PERMIT STAGES.

VARYING WIDTH PRIVATE SIGHT DISTANCE AND LANDSCAPE MAINTENANCE EASEMENT FOR THE BENEFIT OF LOTS 1, 2 AND 3.

EXISTING CULVERT TO BE REMOVED AND REUSED IF POSSIBLE.

EXISTING CULVERT TO BE REMOVED AND REUSED IF POSSIBLE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development



Drywell	Lot	Letter	Ground Over	Top of Stone	Bottom of Well	Ground Water	Separation Distance (ft)
DW-1	3	A	405.0	404.0	399.0	390.0	9.0
DW-1	3	B	404.0	403.0	398.0	390.0	8.0
DW-1	3	C	403.0	402.0	397.0	390.0	7.0
DW-1	3	D	403.0	402.0	397.0	390.0	7.0
DW-1	1	E	393.0	392.0	387.0	377.0	10.0
DW-1	1	F	391.0	390.0	385.0	377.0	8.0
DW-2	1	A	385.0	384.0	381.0	377.0	4.0
DW-2	1	B	385.0	384.0	381.0	377.0	4.0

**MICRO-BIORETENTION (M-6) PLANTING DATA**

1. PLANTINGS WITHIN THE PONDING AREA OF THE LS INFILTRATION ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE

2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE LS INFILTRATION ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE

**MICRO-BIORETENTION (M-6) LANDSCAPE DATA**

HYDROLOGIC ZONE 3 - REGULARLY INUNDATED SHORELINE FRINGE (HIGH MARSH)

HYDROLOGIC CONDITION: 0" TO 1"-5" DEEP HARDNESS - TEMPERATURE ZONE 6B (-5" TO 0")

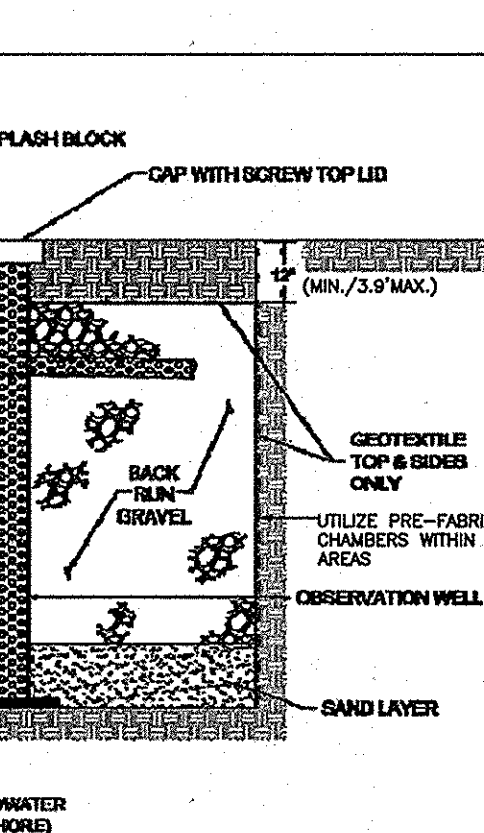
NOTE: REFER TO MDE 2000 MD STORMWATER DESIGN MANUAL VOLUMES 1 & 2 FOR LANDSCAPE CONTRACTOR RESPONSIBILITIES, PRACTICES AND MAINTENANCE DUTIES

**DRY WELL (M-5) DESIGN TABLES**

DW-1	(M-5)	DW-2	(M-5)
Drywell Length (Ld)	10.20	Drywell Length (Ld)	15.00
Drywell Width (Wd)	5.50	Drywell Width (Wd)	6.25
Drywell Depth (Dd)	5.00	Drywell Depth (Dd)	3.00
Amount Utilized	6	Amount Utilized	2

**MICRO-BIORETENTION (M-6) PLANTING DATA**

M-6-1	(M-6)	M-6-2	(M-6)
Quantity	18	Quantity	27
Quantity	16	Quantity	24
Quantity	9	Quantity	13
Quantity	5	Quantity	8
Quantity	1	Quantity	1



**MICRO-BIORETENTION (M-6) DESIGN TABLES**

M-6-1	(M-6)	M-6-2	(M-6)
Elevation 1	384.50	Elevation 1	388.50
Elevation 2	384.00	Elevation 2	388.30
Elevation 3	383.00	Elevation 3	387.30
Elevation 4	382.83	Elevation 4	387.13
Elevation 5	380.83	Elevation 5	385.13
Elevation 6	380.50	Elevation 6	384.80
Elevation 7	379.92	Elevation 7	384.22
Elevation 8	379.84	Elevation 8	384.14
A width	14.30	A width	16.00
B length	23.50	B length	24.00

**ESD Micro-Scale Practices Summary Table**

Target Pipe	1.50 inches	Target Co = 0.38 inches	Target ESD = 2.271 ft
Drainage Area	Practice	MDE Type	No. used
LOT 1	DW-1 (M-5)	DR-1 (N-2)	DR-2 (N-2)
LOT 2	DR-2 (N-2)	DR-3 (N-2)	DR-4 (N-2)
LOT 3	DW-1 (M-5)	DR-3 (N-2)	DR-4 (N-2)
LOT 4	DR-4 (N-2)	MB-2 (M-6)	
Totals	25,435	13,959	0.80

**ESD Practices Summary Table**

Lot No.	Practice	MDE	Type	Number	Ownership/ Maintenance
LOT 1	DW-1 (M-5)	DR-1 (N-2)	DR-2 (N-2)	DR-3 (N-2)	DR-4 (N-2)
LOT 2	DR-2 (N-2)	DR-3 (N-2)	DR-4 (N-2)		
LOT 3	DW-1 (M-5)	DR-3 (N-2)	DR-4 (N-2)		
LOT 4	DR-4 (N-2)	MB-2 (M-6)			

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

- The Owner shall inspect the monitoring wells and structures on a quarterly basis and after every heavy storm event.
- The Owner shall record the water levels and sediment build up in the monitoring wells over a period of several days to insure trench drainage.
- The Owner shall maintain a log book to determine the rate at which the facility drains.
- When the facility becomes clogged so that it does not drain down within a seventy-two (72) hour time period, corrective action shall be taken.
- The maintenance log book shall be available to Howard County for inspection to insure compliance with operation and maintenance criteria.
- 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 & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED & MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1)**

- Maintenance of areas receiving disconnected runoff is generally no different than that required for other lawn or landscaped areas. The Owner shall ensure the areas receiving runoff are protected from future compaction or development of impervious area. In commercial areas, foot traffic should be discouraged as well.

**TABLE B.4.1 MATERIALS AND SPECIFICATIONS FOR (M-6) MICRO-BIORETENTION**

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS (IF REQUIRED)	SEE APPENDIX A: TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	USDA SOIL TYPES: LOAMY SAND (60-65% LOAM SAND (30% COARSE SAND (30% COMPOST (35-40%))	N/A	USDA SOIL TYPES: LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
GEOTEXTILE	NONWOVEN	N/A	PE TYPE 1 - NONWOVEN
GRAVEL (UNDERDRAINS & BERMS)	AASHTO M-43	#57 OR #6 (3/8" TO 3/4")	#6 STONE
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID (3/8" PVC OR SDR35)	SLOTTED OR PERFORATED: 3/8" PERFS @ 6" O/C. 4 HOLES PER LINE. PERFORATED PIPE SHALL BE WRAPPED WITH 30 GAUGE GALVANIZED HARDWARE CLOTH
POURED-IN-PLACE CONC. (IF REQUIRED)	M50 MIX NO. 3 (FC=3000psi @ 28 DAYS, NORMAL MODER. CUR ENTRAINED, REINFORCING TO MEET ASTM 615-99)	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED: 28 DAY STRENGTH TEST AND SLUMP TEST. ALL CONC. DESIGN CAST AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER. DESIGN TO INCLUDE MIN. 10% AIR OR 10-15% ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES);
SAND (1.0' DEEP)	AASHTO M-6 OR ASTM C-33	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DOLARITE AND GRANITON (AASHTO #10) ARE NOT ACCEPTABLE. NO CALCIUM OXIDIZED OR NO "ROCK DUST" CAN BE USED FOR SAND

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

- 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 Volume 1, 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 heavy storm.

**MICRO-BIORETENTION (M-6) CONSTRUCTION SPECIFICATIONS**

- THE SUBGRADE FOR ALL BIORETENTION COMPONENTS SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL. EMBANKMENTS SHALL BE PREPARED BY STRIPPING TOPSOIL AND ANY OTHER UNSUITABLE MATERIALS FROM THE AREAS, AND BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY REFERENCED TO AASHTO T-99 (STANDARD PROCTOR).
- THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
- GEOTEXTILE CLASS C25 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
- STONES FOR THE RIP-RAP OR LEVEL SPREADERS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO ACHIEVE A DISTRIBUTION OF UNDERLYING MATERIALS. THE STONES FOR THE RIP-RAP OR LEVEL SPREADERS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. STONE SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER FABRIC OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
- THE STONE LINER SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

**MICRO-BIORETENTION (M-6) PLANTING TABLES**

M-6-1	(M-6)	M-6-2	(M-6)
Quantity	18	Quantity	27
Quantity	16	Quantity	24
Quantity	9	Quantity	13
Quantity	5	Quantity	8
Quantity	1	Quantity	1

**MICRO-BIORETENTION (M-6) DESIGN TABLES**

M-6-1	(M-6)	M-6-2	(M-6)
Elevation 1	384.50	Elevation 1	388.50
Elevation 2	384.00	Elevation 2	388.30
Elevation 3	383.00	Elevation 3	387.30
Elevation 4	382.83	Elevation 4	387.13
Elevation 5	380.83	Elevation 5	385.13
Elevation 6	380.50	Elevation 6	384.80
Elevation 7	379.92	Elevation 7	384.22
Elevation 8	379.84	Elevation 8	384.14
A width	14.30	A width	16.00
B length	23.50	B length	24.00

**SOILS LEGEND**

MAP SYMBOL	SOIL TYPE	MAPPING UNIT	"K" VALUE
Awb	C	ALLOWAY SILT LOAM - 2 TO 5 PERCENT SLOPES	0.45
Fs	D	FALLENTON SANDY LOAM - 0 TO 2 PERCENT SLOPES	0.30
Ssb	B	SAFFRAS LOAM - 2 TO 5 PERCENT SLOPES	0.37
Srd	B	SAFFRAS AND CROM LOAMS - 10 TO 15 PERCENT SLOPES	0.37

USDA-NRCS WEBSITE, MAP #19 SWAGNE NE

**BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE A SUITE 315  
 ELLOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6844  
 WWW.BEE-CVLENGINEERING.COM

**SCARBOROUGH ESTATES LOTS 1 THRU 4**

A RESUBDIVISION OF LOT 1 OF GREEN TREE ESTATES, PLAT NO. 9661  
 8075 OLD MONTGOMERY ROAD

TAX MAP: 37 GRID; 02 PARCEL: 25  
 ZONED: R-20  
 ELECTION DISTRICT NO. 1  
 HOWARD COUNTY, MARYLAND

ENVIRONMENTAL CONCEPT PLAN  
 ESD-SWM DRAINAGE AREA MAP,  
 NOTES AND DETAILS

DATE: JUNE 10, 2014  
 SCALE: AS SHOWN

PROFESSIONAL CERTIFICATION:  
 I hereby certify that these documents were prepared or approved by me and that I am a duly licensed professional engineer in the State of Maryland, certificate number 11047, expiration date 6-30-2015.

OWNER/DEVELOPER:  
 RAINMARK DEVELOPMENT, INC.  
 6755 BUSINESS PARKWAY  
 ELK RIDGE, MARYLAND 21075  
 410-379-1525  
 c/o SCOTT ARTERBURN

BEI PROJECT NO. 2604  
 SHEET 3 OF 3