

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)					
		3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
P-2	PARKING DRIVE ASLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SACS: RESIDENTIAL	PAVEMENT MATERIAL (INCHES)					
		HMA SUPERPAVE FINAL SURFACE					
		HMA SUPERPAVE INTERMEDIATE SURFACE					
		HMA SUPERPAVE BASE					
		MIN HMA WITH GAB		HMA WITH CONSTANT GAB			
		1.5	1.5	1.5	1.5	1.5	1.5
		2.0	2.0	2.0	3.5	2.0	2.0
		8.0	4.0	3.0	4.0	4.0	4.0

P-2 PAVING DETAIL

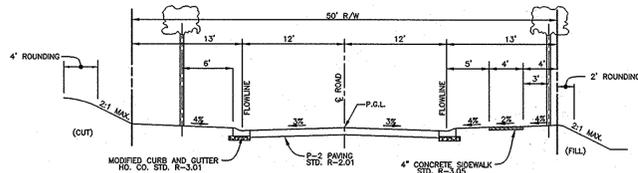
CENTER LINE CURVE DATA						
STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
KINDLER OVERLOOK DRIVE	9+53.71 TO 11+33.73	381.97	180.02'	27°00'12"	91.72'	N23°13'36"E 178.36'

CENTERLINE CONTROL DATA				
STREET NAME	STATION	NORTH	EAST	
KINDLER OVERLOOK DRIVE	9+53.71	545426.4422	1345446.3393	
	11+33.73	545590.3477	1345516.6794	
	12+14.19	545669.6696	1345530.1208	
	12+36.35	545691.5206	1345533.8235	

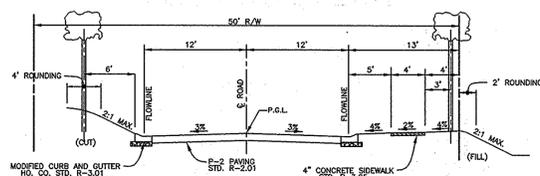
STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
☼	CL STATION 11+43, OFFSET 23' RIGHT	150 WATT HPS VAPOR PREMIER POST-TOP MOUNTED ON A 14' BLACK FIBERGLASS POLE

SIGN POSTS:

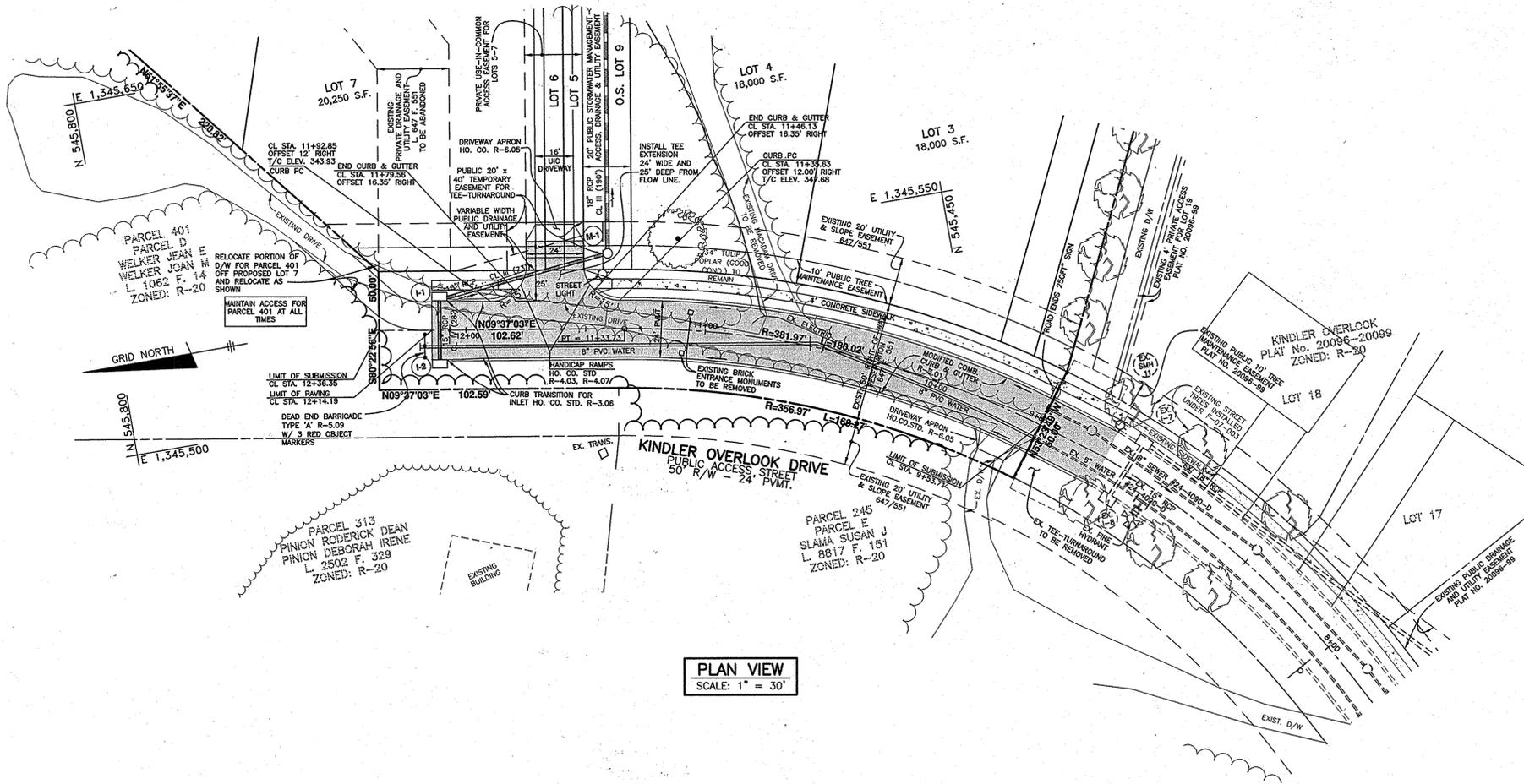
ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.



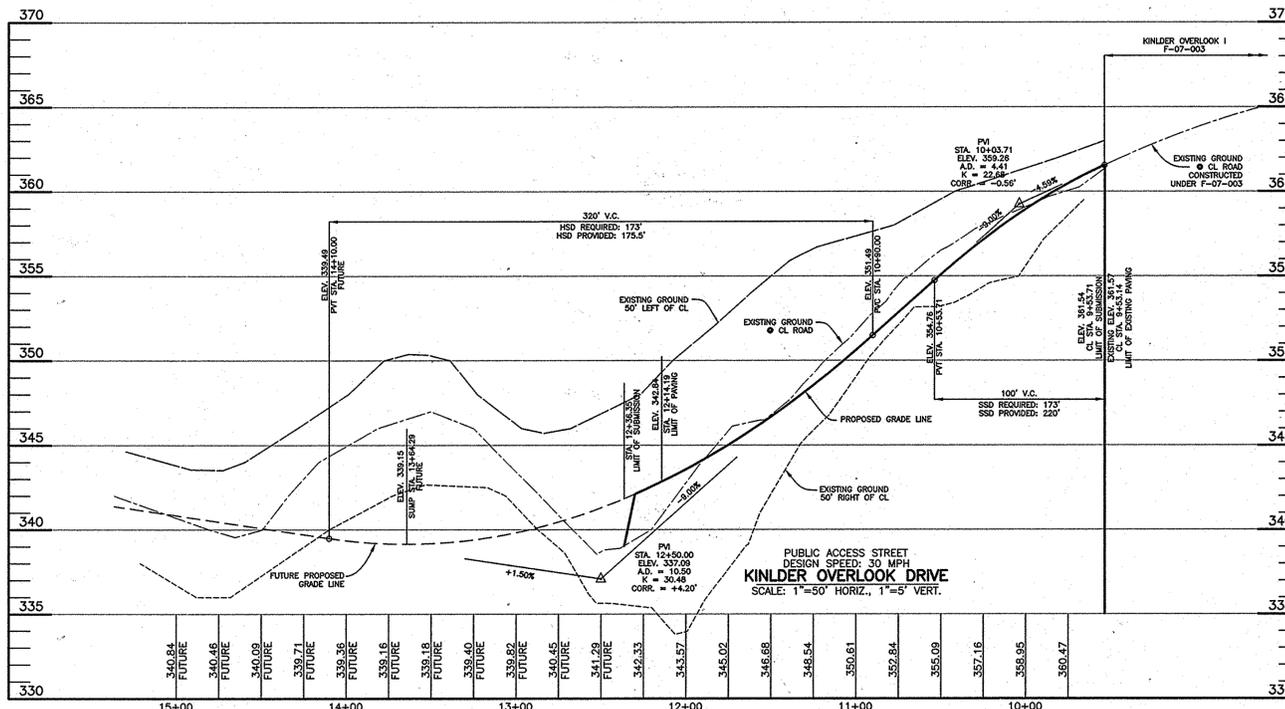
KINDLER OVERLOOK DRIVE
TYPICAL ROADWAY SECTION
STA. 9+53.71 TO 10+50
(PUBLIC ACCESS STREET - LESS THEN 1000 ADT)
DESIGN SPEED: 30 MPH
SCALE: 1"=10'



KINDLER OVERLOOK DRIVE
TYPICAL ROADWAY SECTION
STA. 10+50 TO 12+14.19
(PUBLIC ACCESS STREET - LESS THEN 1000 ADT)
DESIGN SPEED: 30 MPH
SCALE: 1"=10'



PLAN VIEW
SCALE: 1" = 30'



*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

NOV. 2014	REVISION BY SHEET REPLACEMENT TO REVISE TEE-TURNAROUND	
JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET	
NO.	DATE	REVISION
BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM		
OWNER/DEVELOPER: ROBERT MOWREY 826 FROG MORTAR ROAD MIDDLE RIVER, MARYLAND 21220 443-955-3043		
REVISED FINAL ROAD CONSTRUCTION PLANS KINDLER OVERLOOK II LOTS 1 thru 7 AND OPEN SPACE LOTS 8 thru 10 and 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)		
TAX MAP: 41 GRID: 18 PARCEL: 386 ZONED: R-20 ELECTION DISTRICT NO. 6 HOWARD COUNTY, MARYLAND		
ROAD PLAN & PROFILE		
DATE:	NOVEMBER, 2014	BEI PROJECT NO. 1962
SCALE:	AS SHOWN	SHEET 2 OF 15

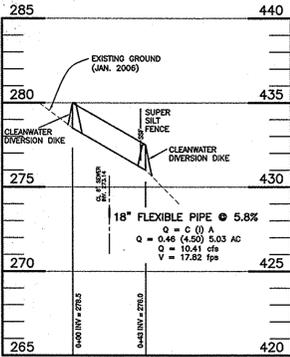
APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 12/10/2014
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 12-15-14
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12-15-14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

- A. Soil Preparation**
1. Temporary Stabilization
 - a. Seeded preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrow or chisel plow or ripper mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 1:1 or flatter to be treated with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
 2. Permanent Stabilization
 - a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - i. Soil pH between 6.0 and 7.0.
 - ii. Soluble salts less than 500 parts per million (ppm).
 - iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent all plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if geogloss will be planted, then a sandy soil (less than 30 percent all plus clay) would be acceptable.
 - iv. Soil contains 1.5 percent minimum organic matter by weight.
 - v. Soil contains sufficient pore space to permit adequate root penetration.
 - b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - c. 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.
 - d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
 - e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake down areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Coarse surface soil by dragging with a heavy chain or other equipment to roughen the surface where all conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seeded loosening may be unnecessary on newly disturbed areas.
- B. Topsoiling**
1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
 2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile location in the soil survey published by USDA-NRCS.
 3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
 - a. The texture of the exposed subsoil material is not adequate to support vegetative growth.
 - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
 - c. The original soil to be vegetated contains material toxic to plant growth.
 - d. The soil is so acidic that treatment with limestone is not feasible.
 4. Areas having slopes steeper than 2:1 require special consideration and design.
 5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 - a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority.
 - b. Topsoil must be a mixture of contrasting textural subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
 - c. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
 - d. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
 6. Topsoil Application
 - a. Erosion and sediment control practices must be maintained when applying topsoil.
 - b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches.
 - c. Spreading is to be performed in such a manner that seeding or setting can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
 - d. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
- C. Soil Amendments (Fertilizer and Lime Specifications)**
1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
 2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the product, and the net weight.
 3. Lime materials must be ground limestone (hydrated or burnt lime) may be substituted except when hydroseeding which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 90 percent will pass through a #100 mesh sieve and 99 to 100 percent will pass through a #20 mesh sieve.
 4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
 5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 1 to 3 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.



PROFILE ALONG TEMPORARY PIPE
SCALE: 1" = 5' HORIZ., 1" = 5' VERT.

NOTE:
 * ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
 * TEMPORARY OR PERMANENT STABILIZATION IS TO BE PERFORMED AS DIRECTED BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR OR AT THE TIME FRAMES REQUIRED BY THE 2001 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL WHICHEVER IS MORE RESTRICTIVE.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

- A. Seeding**
1. Specifications
 - a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B-4 regarding the quality of seed. Seed tags must be available upon request to verify type of seed and seeding rate.
 - b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
 - c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
 - d. Seed and fertilizer must be mixed with soil fertilizers or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
 2. Application
 - a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1. Permanent Seeding Table B.3, or site-specific seeding alternatives.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
 - iii. Drill Cultipacker Seeding: Mechanical seeders that apply and cover seed with soil.
 - iv. Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seeded must be firm after planting.
 - v. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
 - vi. Hydroseeding: Apply seed uniformly with hydroseeder (heavy includes seed and fertilizer).
 - vii. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorus), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
 - viii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
 - ix. Mix seed and fertilizer on site and seed immediately with without interruption.
 - x. When hydroseeding do not incorporate seed into the soil.
- B. Mulching**
1. Mulch Materials (in order of preference)
 - a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
 - b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniform spread slurry.
 - ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
 - iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
 - v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.5 percent maximum and water holding capacity of 90 percent maximum.
 2. Application
 - a. Apply mulch to all seeded areas immediately after seeding.
 - b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
 - c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to obtain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
 3. Anchoring
 - a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed in preference, depending upon the size of the area and erosion hazard):
 - i. A mulch anchoring tool: a tractor-drawn device designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the manufacturer's instructions.
 - ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water. Synthetic binders such as Acrylic DLR (Ago-Tack), DCA-70, Perosol, Terra Tax, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
 - b. Lightweight plastic netting may be stretched over the mulch according to manufacturer recommendations. Netting is usually available in rolls 14 to 15 feet wide and 300 to 3,000 feet long.
- H-5 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA**
- DEFINITION:** A mound or pile of soil produced 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 other site drainage patterns.
- CONDITIONS WHERE PRACTICE APPLIES:** Stockpile areas are utilized when it is necessary to salvage stockpiles for later use.
- CRITERIA:**
1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
 2. The height of the stockpile must be limited to the maximum height of material and based on a side slope ratio no steeper than 2:1. Benchmark must be provided in accordance with Section B-3 Land Grading.
 3. Runoff from the stockpile area must drain to a suitable sediment control structure.
 4. Access the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flows in a non-erodible manner.
 5. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion control practice must be used to dissipate the discharge.
 6. Stockpiles must be stabilized in accordance with the 37 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
 7. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.
- MAINTENANCE:**
- The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benchmark must be provided in accordance with Section B-3 Land Grading.

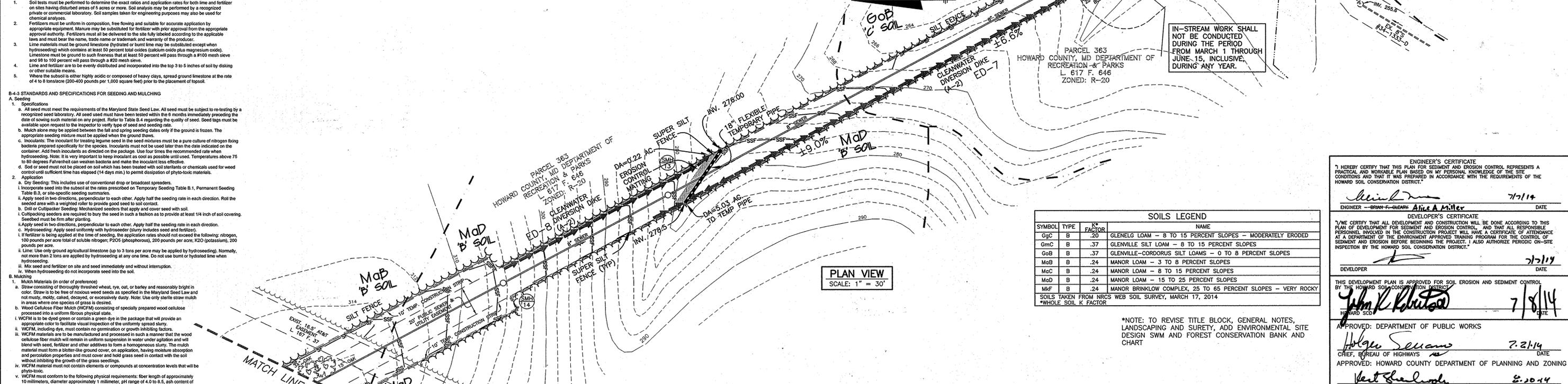
SCALE: 1" = 5' HORIZ., 1" = 5' VERT.

B-4-4 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

- DEFINITION:** Controlling the suspension and movement of dust particles from construction activities.
- PURPOSE:** To prevent blowing and movement of dust from exposed soil surfaces to roads and on-site damage including health and traffic hazards.
- CONDITIONS WHERE PRACTICE APPLIES:** Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.
- REQUIREMENTS:**
1. **Mulches:** See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding, and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
 2. **Vegetative Cover:** See Section B-4-4 Temporary Stabilization.
 3. **Straw:** Till to roughen surface and bring clover to the surface. Begin mowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are an option of equipment that may provide the desired effect.
 4. **Straw:** Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
 5. **Barriers:** Solid board fences, tall fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
 6. **Chemical Treatment:** Use of chemical treatment approved by the appropriate plan review authority.

LEGEND

	EXISTING CONTOURS
	PROPOSED CONTOURS
	EXISTING STEEP SLOPES 25% OR GREATER
	EXISTING STEEP SLOPES 15% TO 24.9%
	EXISTING TREE LINE
	PROPOSED TREE LINE
	PROJECT BOUNDARY
	PROPOSED STORM DRAIN
	FOREST CONSERVATION EASEMENT
	SOILS DELINEATION LINE
	SOILS TYPE
	SUPER SILT FENCE
	SILT FENCE
	LIMIT OF DISTURBANCE
	STABILIZED CONSTRUCTION ENTRANCE
	TEMPORARY EROSION CONTROL MATTING
	GASON MAT
	EARTH DIKES



SOILS LEGEND

SYMBOL	TYPE	K* FACTOR	NAME
GcC	B	.20	GLENELG LOAM - 8 TO 15 PERCENT SLOPES - MODERATELY ERODED
GmC	B	.37	GLENVILLE SILT LOAM - 8 TO 15 PERCENT SLOPES
GoB	B	.37	GLENVILLE-CORDORUS SILT LOAMS - 0 TO 8 PERCENT SLOPES
MoB	B	.24	MANOR LOAM - 3 TO 8 PERCENT SLOPES
McC	B	.24	MANOR LOAM - 8 TO 15 PERCENT SLOPES
MoD	B	.24	MANOR LOAM - 15 TO 25 PERCENT SLOPES
MkF	B	.24	MANOR BRINKLOW COMPLEX, 25 TO 65 PERCENT SLOPES - VERY ROCKY

SOILS TAKEN FROM NRCS WEB SOIL SURVEY, MARCH 17, 2014
*WHOLE SOIL K FACTOR

ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY CONSERVATION DISTRICT.

ENGINEER - *Brian B. Seary* **Alice A. Miller** DATE 7/7/14

DEVELOPER'S CERTIFICATE

I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

DEVELOPER - *John K. Roberts* DATE 7/2/14

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John K. Roberts DATE 7/8/14

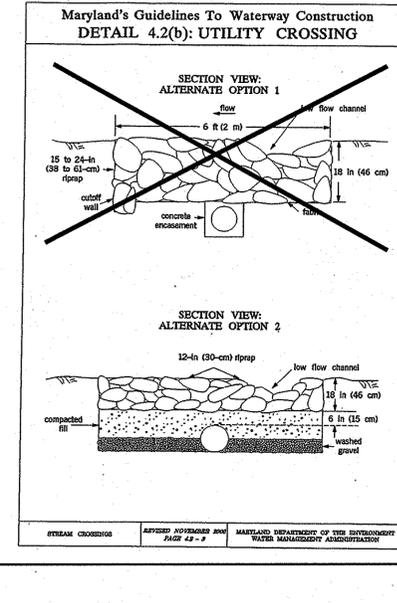
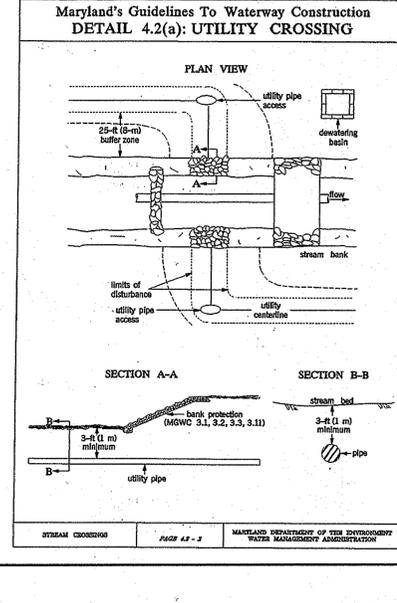
APPROVED: DEPARTMENT OF PUBLIC WORKS

Holger Seemann DATE 7-21-14
CHIEF, BUREAU OF HIGHWAYS

Walt E. ... DATE 8-20-14
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT

John E. ... DATE 8/19/14
CHIEF, DEVELOPMENT ENGINEERING DIVISION

- BEST MANAGEMENT PRACTICES FOR WORKING IN CONTIGUOUS WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS**
1. No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
 2. Do not use the excavated material as backfill if it contains waste metal products, insignificantly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, insignificantly debris, toxic material, or any other deleterious substance.
 3. Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
 4. Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
 5. Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
 6. All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (*Lolium multiflorum*), Millet (*Setaria italica*), Barley (*Hordeum sp.*), Oats (*Avena sp.*), and/or Rye (*Sesale cereale*). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-permanent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division, Kentucky 31 fence shall not be utilized in wetland or buffer areas. The area should be seeded and mulched to reduce erosion after construction activities have been completed.
 7. After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
 8. To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:
 - a. Use IV waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
 - b. Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year.
 - c. Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.
 9. Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
 10. Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.



1 JULY, 2014 REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21104
 (P) 410-466-1102 (F) 410-466-0644
 WWW.BE-ENGINEERING.COM

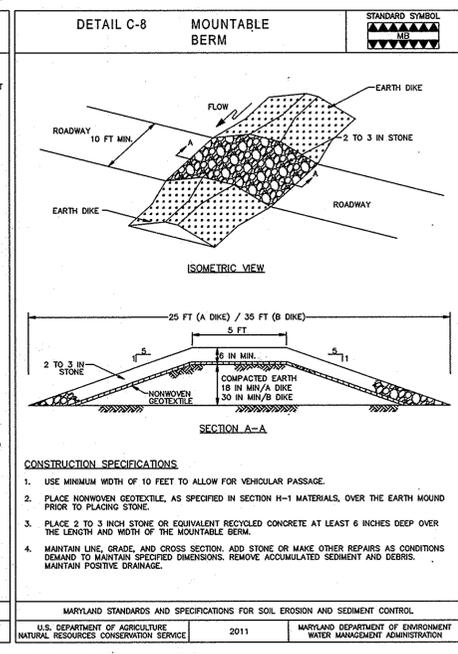
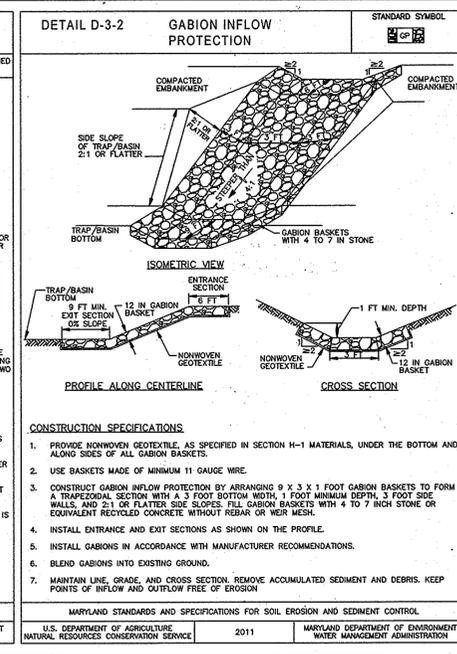
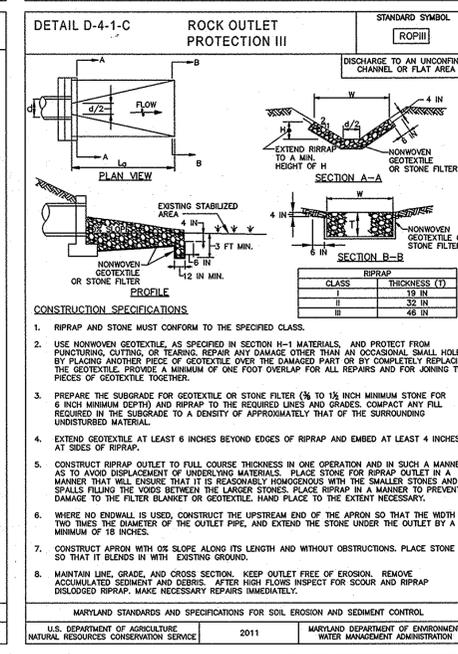
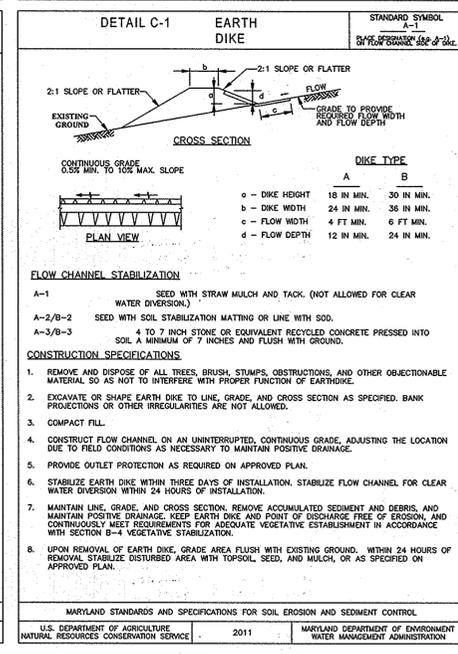
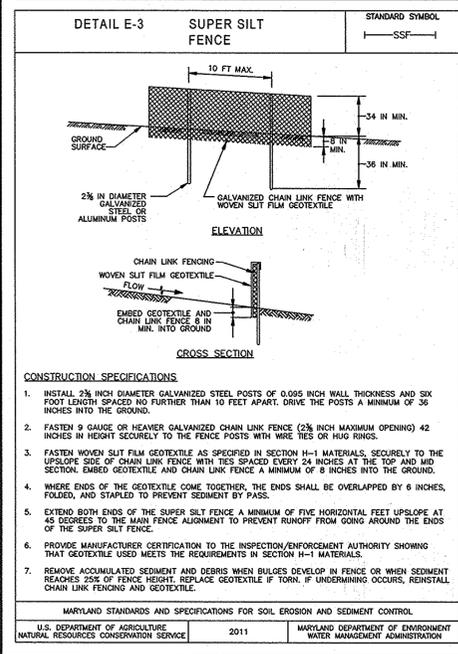
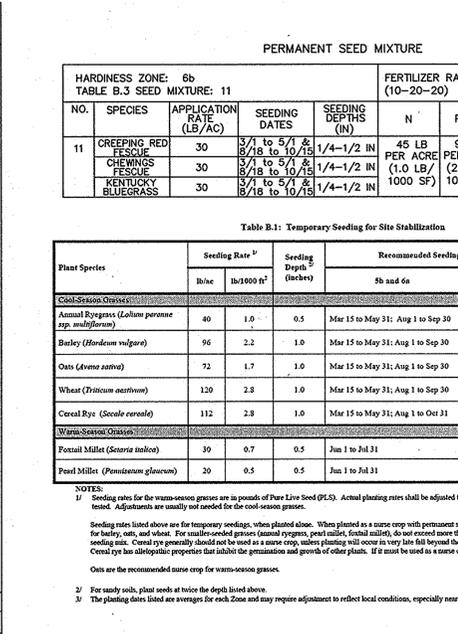
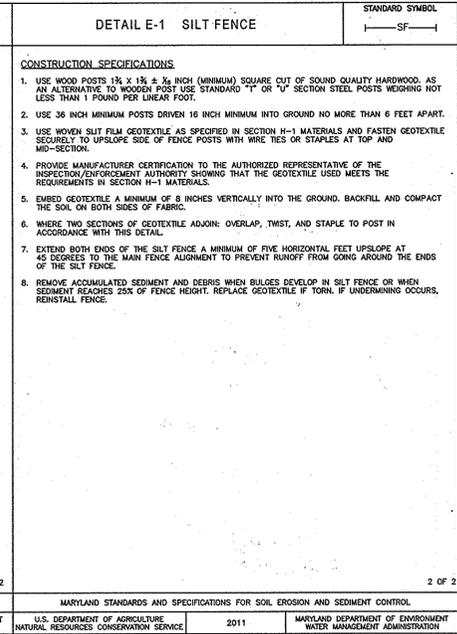
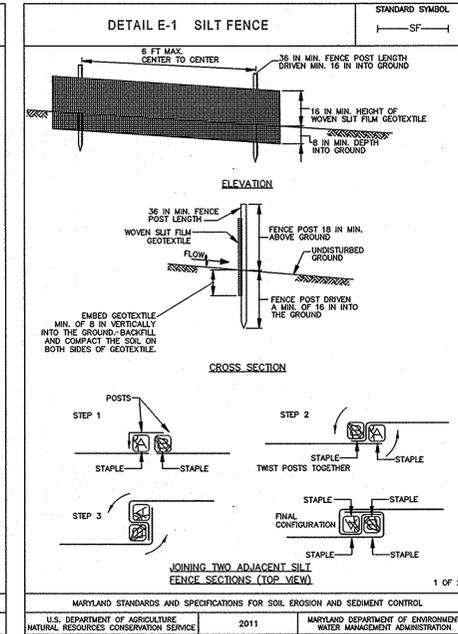
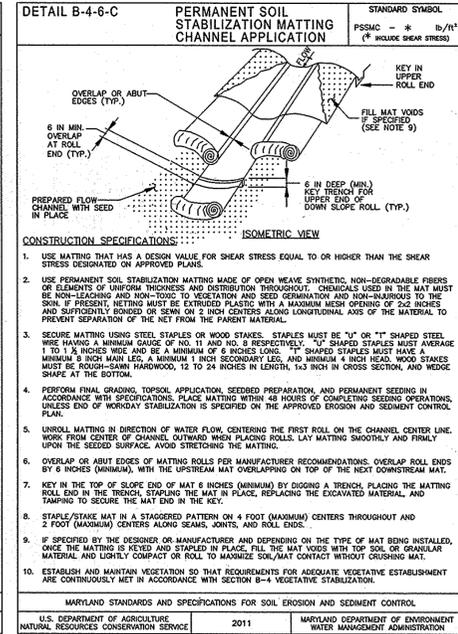
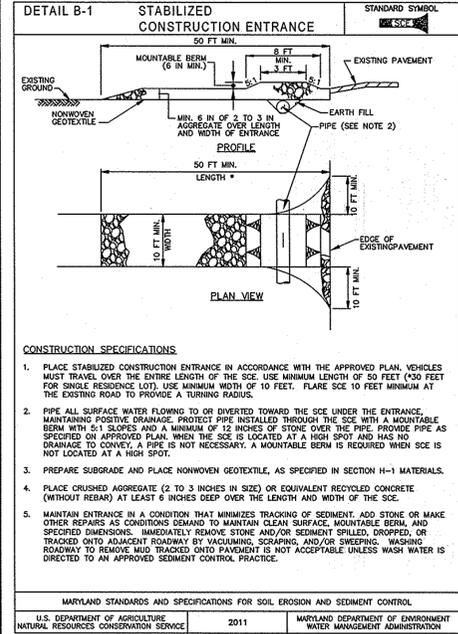
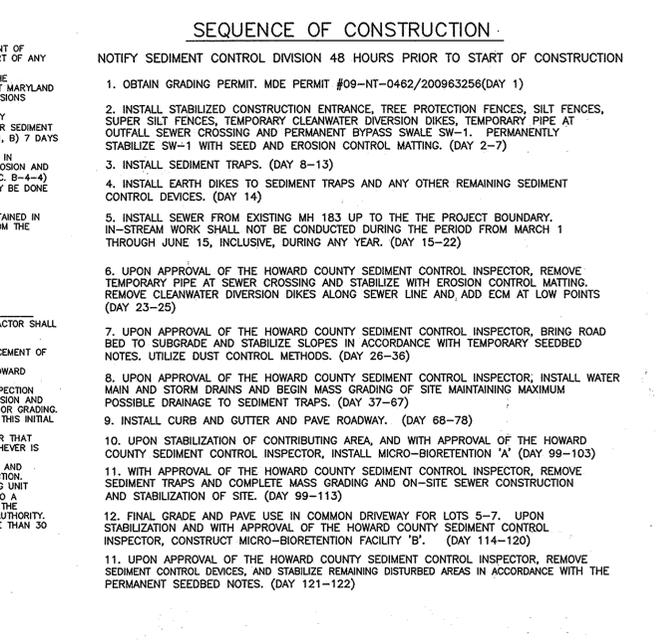
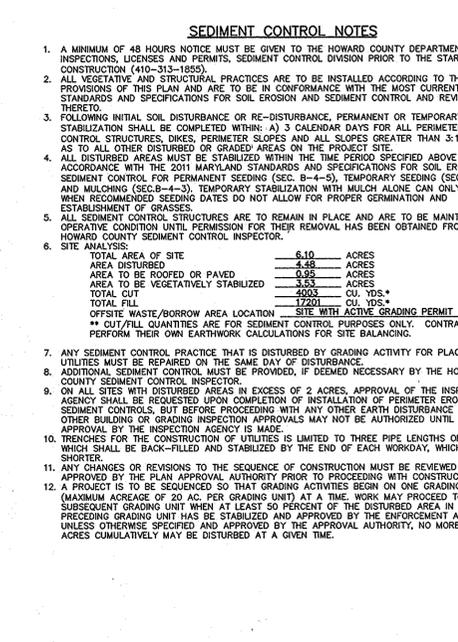
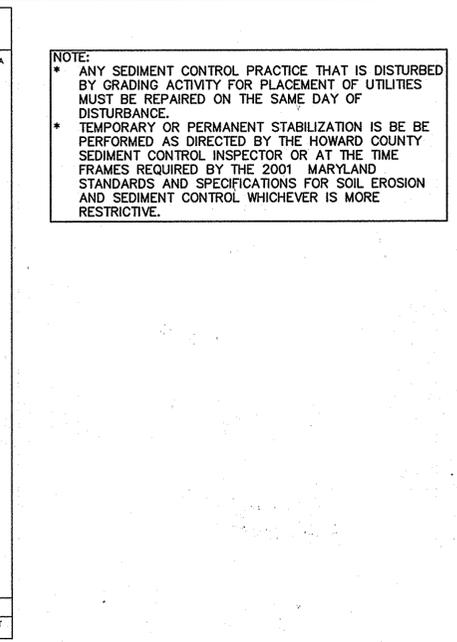
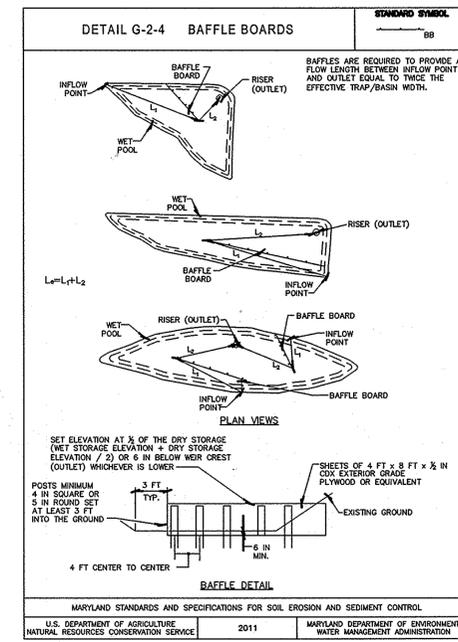
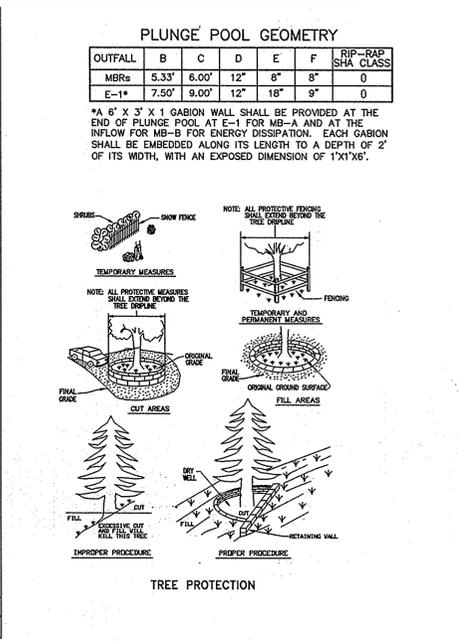
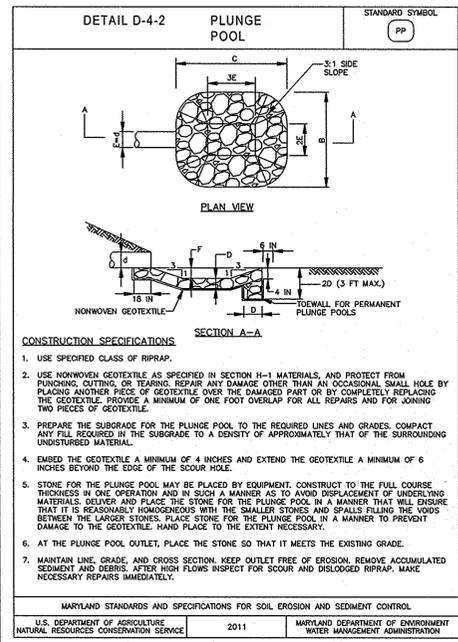
OWNER/DEVELOPER: ROBERT MOWREY, 826 FROG MORTAR ROAD, MIDDLE RIVER, MARYLAND 21220, 443-955-3043

REVISED FINAL ROAD CONSTRUCTION PLANS
KINDLER OVERLOOK II
 LOTS 1 thru 7 AND
 OPEN SPACE LOTS 8 thru 10 and
 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)

TAX MAP: 41 GRID: 18 PARCEL: 386
 ZONED: R-20
 ELECTION DISTRICT NO. 6
 HOWARD COUNTY, MARYLAND

GRADING, SEDIMENT & EROSION CONTROL PLAN

DATE: JULY, 2014 BEI PROJECT NO. 1962
 SCALE: AS SHOWN SHEET 4 OF 15



NOTE:

- ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- TEMPORARY OR PERMANENT STABILIZATION TO BE PERFORMED AS DIRECTED BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR OR AT THE TIME FRAMES REQUIRED BY THE 2001 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, WHICHEVER IS MORE RESTRICTIVE.

SEDIMENT CONTROL NOTES

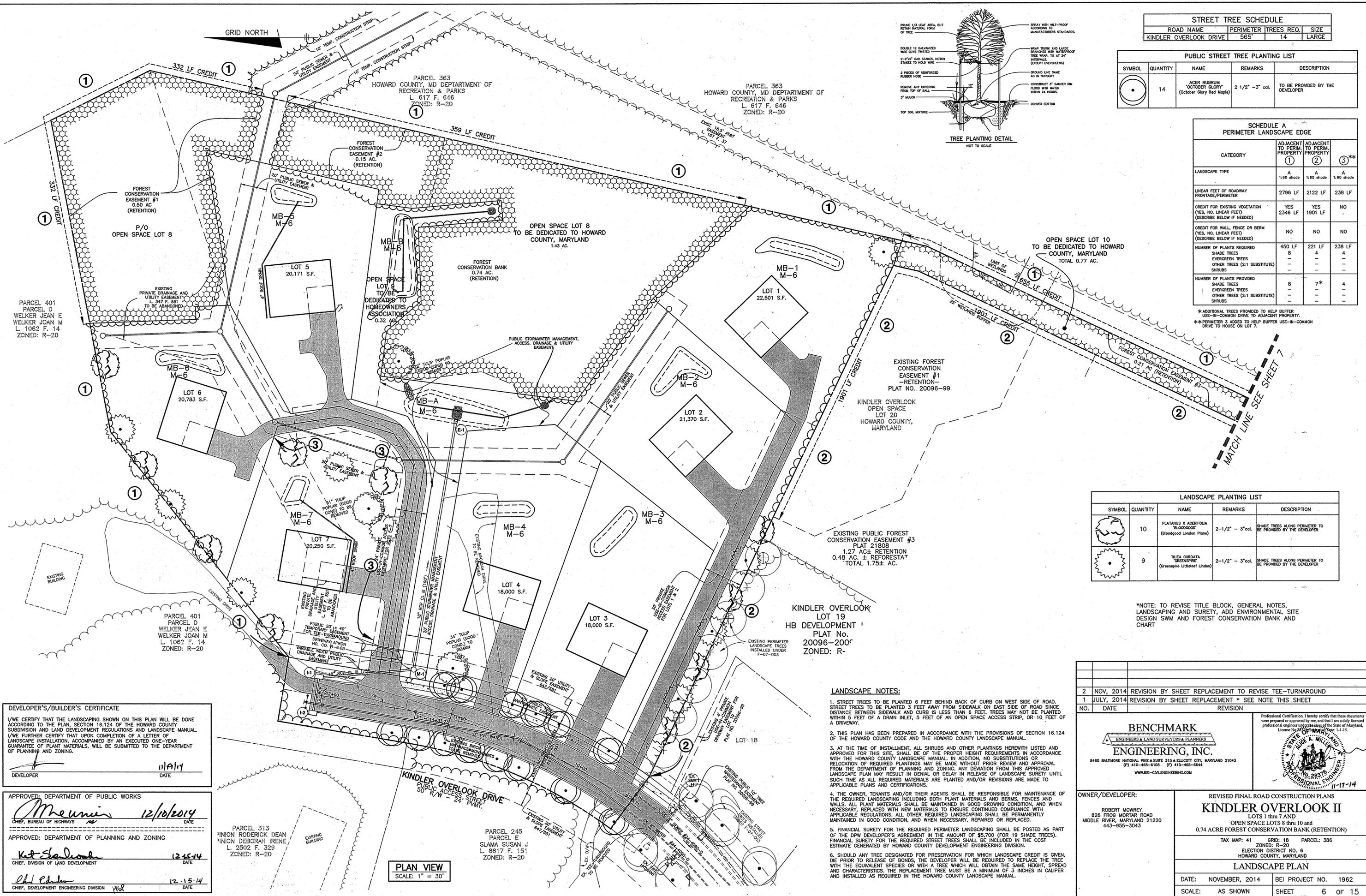
- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (410-313-1855).
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THEREOF.
- FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERMETER STONES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2001 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE AND WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMITS FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE ANALYSIS:

TOTAL AREA OF SITE	6.10	ACRES
AREA DISTURBED	4.48	ACRES
AREA TO BE ROOFED OR PAVED	0.85	ACRES
AREA TO BE VEGETATIVELY STABILIZED	3.53	ACRES
TOTAL CUT	4903	CU. YDS.
TOTAL FILL	17201	CU. YDS.

 OFFSITE WASTE/BORROW AREA LOCATION - SITE WITH ACTIVE GRADING PERMIT
 ** CUT/FILL QUANTITIES ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR SHALL PERFORM THEIR OWN EARTHWORK CALCULATIONS FOR SITE BALANCING.
- ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROL PRACTICES MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUIRED UPON COMPLETION OF INSTALLATION OF PERMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.
- A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM AREA OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY, UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

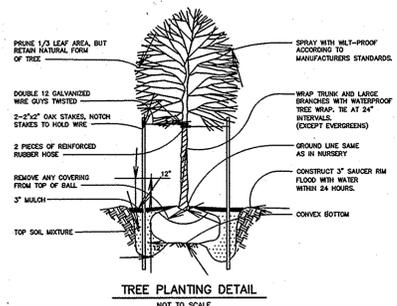
SEQUENCE OF CONSTRUCTION

- NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION
- OBTAIN GRADING PERMIT. MDE PERMIT #09-NI-0462/200963256(DAY 1)
 - INSTALL STABILIZED CONSTRUCTION ENTRANCE, TREE PROTECTION FENCES, SILT FENCES, SUPER SILT FENCES, TEMPORARY CLEANNATER DIVERSION DIKES, TEMPORARY PIPE AT OUTFALL, PERMETER CROSSING AND PERMANENT BYPASS SW-1, PERMANENTLY STABILIZE SW-1 WITH SEED AND EROSION CONTROL MATTING. (DAY 2-7)
 - INSTALL SEDIMENT TRAPS. (DAY 8-13)
 - INSTALL EARTH DIKES TO SEDIMENT TRAPS AND ANY OTHER REMAINING SEDIMENT CONTROL DEVICES. (DAY 1-4)
 - INSTALL SEWER FROM EXISTING MH 183 UP TO THE PROJECT BOUNDARY. IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD FROM MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR. (DAY 15-22)
 - UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE TEMPORARY PIPE AT SEWER CROSSING AND STABILIZE WITH EROSION CONTROL MATTING. REMOVE CLEANNATER DIVERSION DIKES ALONG SEWER LINE AND, ADD ECM AT LOW POINTS (DAY 23-25)
 - UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, BRING ROAD BED TO SUBGRADE AND STABILIZE SLOPES IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES. UTILIZE DUST CONTROL METHODS. (DAY 26-36)
 - ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
 - ADDITIONAL SEDIMENT CONTROL PRACTICES MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
 - ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUIRED UPON COMPLETION OF INSTALLATION OF PERMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
 - ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.
 - A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM AREA OF 20 AC. PER GR



STREET TREE SCHEDULE			
ROAD NAME	PERIMETER	TREES REQ.	SIZE
KINDLER OVERLOOK DRIVE	565'	14	LARGE

PUBLIC STREET TREE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
(Symbol)	14	ACER RUBRUM OCTOBER GLORY (October Glory Red Maple)	2 1/2" - 3" col.	TO BE PROVIDED BY THE DEVELOPER



SCHEDULE A PERIMETER LANDSCAPE EDGE				
CATEGORY	ADJACENT TO PERIM. PROPERTY		ADJACENT TO PERIM. PROPERTY	
	1	2	3	4
LANDSCAPE TYPE	A	A	A	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	2796 LF	2122 LF	238 LF	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES 2346 LF	YES 1901 LF	NO	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	
NUMBER OF PLANTS REQUIRED	450 LF	221 LF	238 LF	
EVERGREEN TREES	8	4	4	
OTHER TREES (≥1 SUBSTITUTE)	-	-	-	
SHRUBS	-	-	-	
NUMBER OF PLANTS PROVIDED	8	7*	4	
SHADE TREES	-	-	-	
EVERGREEN TREES	-	-	-	
OTHER TREES (≥1 SUBSTITUTE)	-	-	-	
SHRUBS	-	-	-	

*ADDITIONAL TREES PROVIDED TO HELP BUFFER USE-IN-COMMON DRIVE TO ADJACENT PROPERTY.
 **PERIMETER 3 ADDED TO HELP BUFFER USE-IN-COMMON DRIVE TO HOUSE ON LOT 7.

LANDSCAPE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
(Symbol)	10	PLATANUS X ACERIFOLIA BLOODGOOD (Bloodgood London Plane)	2-1/2" - 3" col.	SHADE TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER
(Symbol)	9	TILIA CORDATA GREENSPIRE (Greenspire Littleleaf Linden)	2-1/2" - 3" col.	SHADE TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

- LANDSCAPE NOTES:**
- STREET TREES TO BE PLANTED 6 FEET BEHIND BACK OF CURB ON WEST SIDE OF ROAD. STREET TREES TO BE PLANTED 3 FEET AWAY FROM SIDEWALK ON EAST SIDE OF ROAD SINCE DISTANCE BETWEEN SIDEWALK AND CURB IS LESS THAN 6 FEET. TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A DRAIN INLET, 5 FEET OF AN OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.
 - THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.
 - AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
 - THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
 - FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$5,700 (FOR 19 SHADE TREES). FINANCIAL SURETY FOR THE REQUIRED STREET TREES SHALL BE INCLUDED IN THE COST ESTIMATE GENERATED BY HOWARD COUNTY DEVELOPMENT ENGINEERING DIVISION.
 - SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH LANDSCAPE CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE DEVELOPER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD AND CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE HOWARD COUNTY LANDSCAPE MANUAL.

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

DEVELOPER: 11/19/14 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
12/10/2014 DATE
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
12-15-14 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: DEPARTMENT OF DEVELOPMENT ENGINEERING DIVISION
12-15-14 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

PARCEL 313
 UNION RODERICK DEAN
 UNION DEBORAH IRENE
 L. 2502 F. 328
 ZONED: R-20

PARCEL 245
 SARMA SUSAN J
 L. 8517 F. 151
 ZONED: R-20

PLAN VIEW
 SCALE: 1" = 30'

2	NOV, 2014	REVISION BY SHEET REPLACEMENT TO REVISE TEE-TURNAROUND
1	JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET
NO.	DATE	REVISION

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 28876, Exp. 1-1-15.

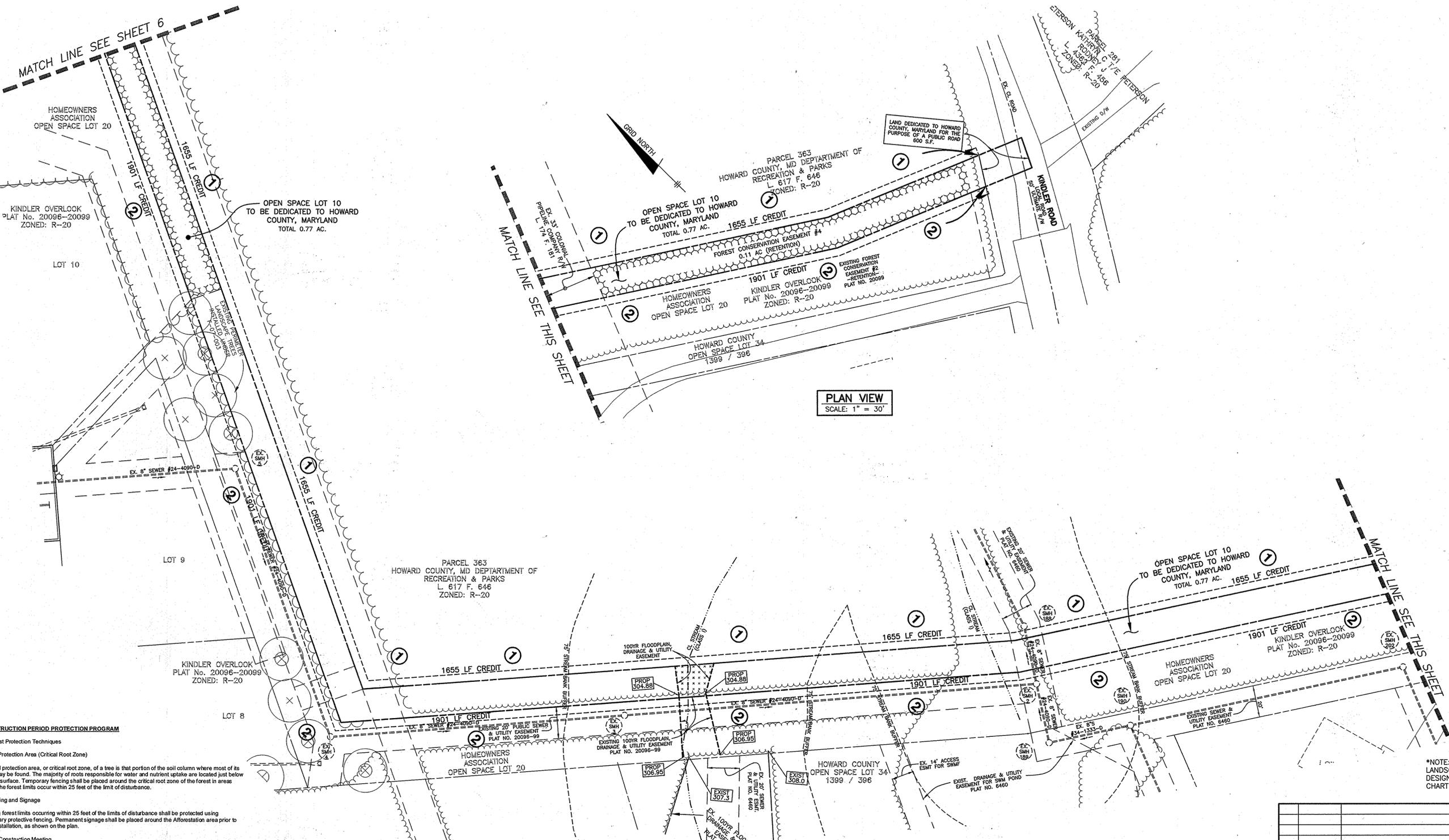
BENCHMARK ENGINEERING, INC.
 8450 BALTIMORE NATIONAL PIKE & SUITE 315 • ELIJAH CITY, MARYLAND 21043
 (P) 410-465-6105 (F) 410-465-6644
 WWW.BE-ENGINEERING.COM

OWNER/DEVELOPER:
 ROBERT MOWREY
 828 FROG MORTAR ROAD
 MIDDLE RIVER, MARYLAND 21220
 443-955-3043

REVISED FINAL ROAD CONSTRUCTION PLANS
KINDLER OVERLOOK II
 LOTS 1 thru 7 AND
 OPEN SPACE LOTS 8 thru 10 and
 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)

TAX MAP: 41 GRID: 18 PARCEL: 386
 ELECTION DISTRICT NO. 6
 HOWARD COUNTY, MARYLAND

LANDSCAPE PLAN
 DATE: NOVEMBER, 2014 BEI PROJECT NO. 1962
 SCALE: AS SHOWN SHEET 6 OF 15



CONSTRUCTION PERIOD PROTECTION PROGRAM

- A. Forest Protection Techniques**
1. Soil Protection Area (Critical Root Zone)
 The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface. Temporary fencing shall be placed around the critical root zone of the forest in areas where the forest limits occur within 25 feet of the limit of disturbance.
2. Fencing and Signage
 Existing forest limits occurring within 25 feet of the limits of disturbance shall be protected using temporary protective fencing. Permanent signage shall be placed around the Afforestation area prior to plant installation, as shown on the plan.
- B. Pre-Construction Meeting**
 Upon staking of limits of disturbance a pre-construction meeting will be held between the Developer, contractor and appropriate county inspector. The purpose of the meeting will be to verify that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.
- C. Storage Facilities/Equipment Cleaning**
 All equipment storage, parking, sanitary facilities, material stockpiling, etc. associated with construction of the project will be restricted to those areas outside of the proposed Forest Conservation Easement. Cleaning of equipment will be limited to area within the LOD of the proposed homesites. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into environmentally sensitive areas.
- D. Sequence of Construction**
 The following timetable represents the proposed timetable for development of the subject property. The items outlined in the Forest Conservation Plan will be enacted within two (2) years of subdivision approval.
- Below find a proposed sequence of construction:
1. Install all signage and sediment control devices.
 2. Hold pre-construction meeting between developer, contractor and county inspector.
 3. Build access roads, install water and sewer, and construct houses. Stabilize all disturbed areas accordingly.
 4. Remove sediment control.
 5. Hold post-construction meeting with county inspections to assure compliance with FCP, Submit Certification of Retention.
- E. Construction Monitoring**
 Eco-Science Professionals, Inc. or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan.
- F. Post-Construction Meeting**
 Upon completion of construction, Eco-Science Professionals, Inc. or another qualified professional designated by the developer will notify the County that construction has been completed and arrange for

PLAN VIEW
SCALE: 1" = 30'

DEVELOPER'S/BUILDER'S CERTIFICATE

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

[Signature] 7/17/14
 DEVELOPER DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 7.21.14
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 8.20.14
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

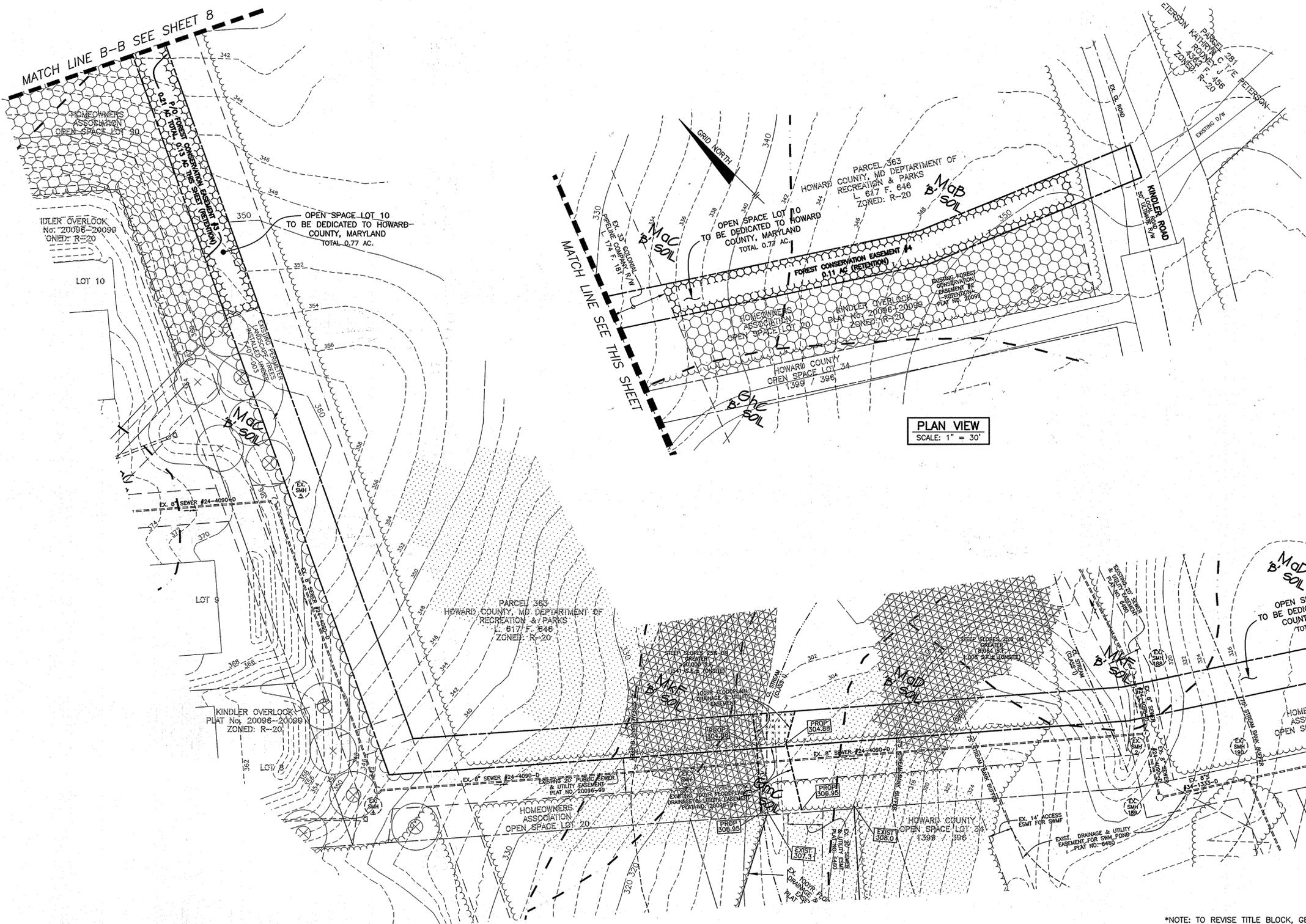
[Signature] 8.19.14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	DATE	REVISION
1	JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

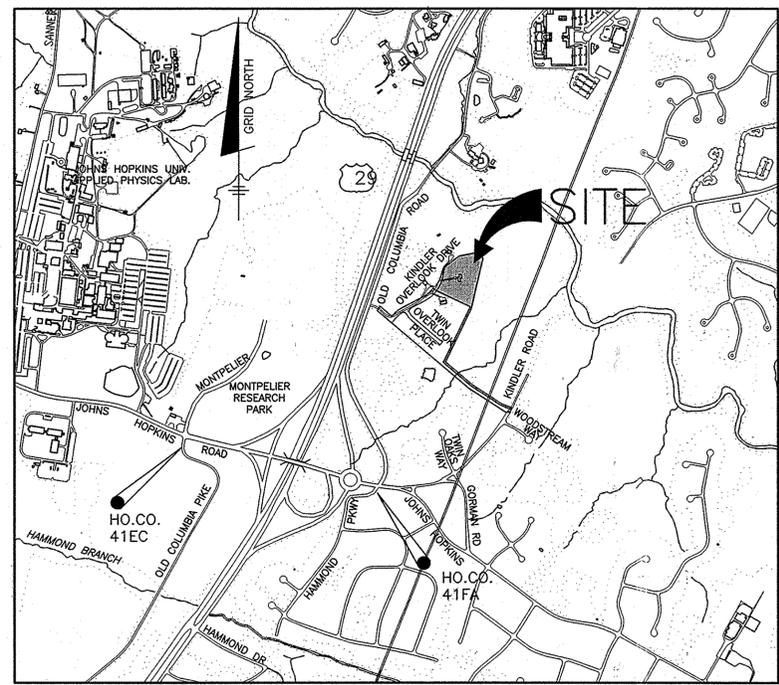
BENCHMARK ENGINEERING, INC.
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 WWW.BE-CIVILENGINEERING.COM

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. 28576
 7/1/14

OWNER/DEVELOPER: ROBERT MOWREY 826 FROG MORTAR ROAD MIDDLE RIVER, MARYLAND 21220 443-955-3043		REVISED FINAL ROAD CONSTRUCTION PLANS KINDLER OVERLOOK II LOTS 1 thru 7 AND OPEN SPACE LOTS 8 thru 10 and 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)	
TAX MAP: 41 GRID: 18 PARCEL: 386 ZONED: R-20 ELECTION DISTRICT NO. 6 HOWARD COUNTY, MARYLAND		LANDSCAPE PLAN	
DATE: JULY, 2014	BEI PROJECT NO. 1962		
SCALE: AS SHOWN	SHEET 7 OF 15		



PLAN VIEW
SCALE: 1" = 30'



VICINITY MAP
SCALE: 1" = 1000'

LEGEND

	EXISTING CONTOURS
	PROPOSED CONTOURS
	EXISTING STEEP SLOPES 25% OR GREATER
	EXISTING STEEP SLOPES 15% TO 24.9%
	EXISTING TREELINE
	PROPOSED TREELINE
	PROJECT BOUNDARY
	PROPOSED STORM DRAIN
	FOREST CONSERVATION EASEMENT
	SOILS DELINEATION LINE
	SOILS TYPE

FOREST CONSERVATION NOTES:

1. THE TOTAL FOREST CONSERVATION OBLIGATION AMOUNT OF 2.83 ACRES SHALL BE MET BY THE ON-SITE RETENTION OF 0.97 AC. OF NET TRACT AREA FOREST WITHIN A FOREST CONSERVATION EASEMENT AND THE OFFSITE PLANTING OF 1.86 ACRES WITHIN THE FOREST MITIGATION BANK LOCATED WITHIN THE MCKENDREE SPRINGS SUBDIVISION (F-09-108). FINANCIAL SURETY FOR THE OFF-SITE PLANTING WAS POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT FOR MCKENDREE SPRINGS (F-09-108). AN ADDITIONAL 0.74 ACRES WILL BE RETAINED ON OPEN SPACE LOT 8 AS A FOREST BANK.
2. ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.
3. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
4. LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.
5. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ.
6. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS DESIGNATED AS FOREST CONSERVATION EASEMENTS.
7. TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE PLACED ALONG ALL FCE RETENTION BOUNDARIES WHICH OCCUR WITHIN 50 FEET OF THE PROPOSED LIMITS OF DISTURBANCE THAT DOES NOT ALREADY HAVE A SUPER SILT FENCE PROPOSED.
8. PERMANENT SIGNAGE SHALL BE PLACED 50'-100' APART ALONG THE BOUNDARIES OF ALL AREAS INCLUDED IN FOREST CONSERVATION EASEMENTS.
9. PORTIONS OF THE SITE OCCURRING WITHIN THE 100-YEAR FLOODPLAIN ARE NOT INCLUDED AS PART OF THE NET TRACT AREA OF THE SITE. AREAS OF FLOODPLAIN FOREST OCCURRING WITHIN THE LIMITS OF A FOREST CONSERVATION EASEMENT WILL BE PROTECTED BY THE EASEMENT RESTRICTIONS BUT HAVE NOT BEEN CREDITED TOWARD THE PROJECTS FCA OBLIGATIONS.
10. THE FOREST CONSERVATION WATERSHED FOR THIS PROJECT IS THE MIDDLE PATUXENT RIVER #2131106.
11. THERE ARE NO RARE, THREATENED OR ENDANGERED SPECIES LOCATED ON THIS SITE. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO HISTORIC STRUCTURES LOCATED ON THIS SITE. THERE ARE 3 SPECIMEN TREES LOCATED ON THIS SITE. TWO ARE TO BE RETAINED, AND ONE IS TO BE REMOVED.
12. THE PROTECTIVE SIGNAGE SHALL STAY ON-SITE IN PERPETUITY.

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

APPROVED: DEPARTMENT OF PUBLIC WORKS	
	7.21.14
CHIEF, BUREAU OF HIGHWAYS	DATE
APPROVED: DEPARTMENT OF PLANNING AND ZONING	
	8.20.14
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
	8.19.14
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
USACE Wetland Delineator
Certification # WDCP31MD61004B2

1 JULY, 2014 REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET	
NO.	REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 6480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6844 WWW.BM-CDLENGINEERING.COM	
OWNER/DEVELOPER:	REVISED FINAL ROAD CONSTRUCTION PLANS
ROBERT MOWREY 828 FROG MORTAR ROAD MIDDLE RIVER, MARYLAND 21220 443-955-3043	KINDLER OVERLOOK II LOTS 1 thru 7 AND OPEN SPACE LOTS 8 thru 10 and 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)
TAX MAP: 41 GRID: 18 PARCEL: 386	ZONED: R-20
ELECTION DISTRICT NO. 8	HOWARD COUNTY, MARYLAND
FOREST CONSERVATION PLAN	
DATE: JULY, 2014	BEI PROJECT NO. 1962
SCALE: AS SHOWN	SHEET: 9 OF 15

CONSTRUCTION PERIOD PROTECTION PROGRAM

A. Forest Protection Techniques

1. Soil Protection Area (Critical Root Zone)

The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface. Temporary fencing shall be placed around the critical root zone of the forest in areas where the forest limits occur within 50 feet of the limit of disturbance.

2. Fencing and Signage

Existing forest limits occurring within 50 feet of the limits of disturbance shall be protected using temporary protective fencing. Permanent signage shall be placed around the afforestation area prior to plant installation, as shown on the plan.

B. Pre-Construction Meeting

Upon staking of limits of disturbance a pre-construction meeting will be held between the developer, contractor and appropriate County inspector. The purpose of the meeting will be to verify that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.

C. Storage Facilities/Equipment Cleaning

All equipment storage, parking, sanitary facilities, material stockpiling, etc. associated with construction of the project will be restricted to those areas outside of the proposed Forest Conservation Easement. Cleaning of equipment will be limited to area within the LOD of the proposed homesites. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into environmentally sensitive areas.

D. Sequence of Construction

The following timetable represents the proposed timetable for development. The items outlined in the Forest Conservation Plan will be enacted within two (2) years of subdivision approval.

Below find a proposed sequence of construction.

1. Install all signage and sediment control devices.
2. Hold pre-construction meeting between developer, contractor and County inspector.
3. Build access roads, install well and septic systems, and construct houses. Stabilize all disturbed areas accordingly.

4. Begin multiflora rose/invasive species removal, as needed. Install permanent protective signage for easements and initiate plantings in accordance with Forest Conservation Plan. Plantings will be completed within two (2) years of subdivision approval.
5. Remove sediment control.
6. Hold post-construction meeting with County inspectors to assure compliance with FCP. Submit Certification of Installation.
7. Monitor and maintain plantings for 2 years.

E. Construction Monitoring

Eco-Science Professionals, or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan.

F. Post-Construction Meeting

Upon completion of construction, Eco-Science Professionals, or another qualified professional designated by the developer, will notify the County that construction has been completed and arrange for a post-construction meeting to review the project site. The meeting will allow the County inspector to verify that afforestation plantings have been installed.

POST-CONSTRUCTION MANAGEMENT PLAN

Howard County requires a two year post-construction management plan be prepared as part of the forest conservation plan. The plan goes into effect upon acceptance of the construction certification of completion by the County. Eco-Science Professionals, or another qualified professional designated by the developer, will be responsible for implementation of the post-construction management plan.

The following items will be incorporated into the plan:

A. Fencing and Signage

Permanent signage indicating the limits of the retention/afforestation area shall be maintained.

B. General Site Inspections/Maintenance of Plantings

Site inspections will be performed a minimum of three times during the growing season. The purpose of the inspections will be to assess the health of the afforestation plantings. Appropriate measures will be taken to rectify any problems which may arise.

In addition, maintenance of the afforestation plantings will involve the following steps:

1. Watering - All plant material shall be watered twice a month during the 1st growing season, more or less frequently depending on weather conditions. During the second growing season, once a month during May-September, if needed.
2. Removal of invasive exotics and noxious weeds. Old field successional species will be retained.
3. Identification of serious plant pests and diseases, treatment with appropriate agent.
4. Pruning of dead branches.
5. After 12 and 24 months, replacement of plants, if required, in accordance with the Guarantee Requirements shown on the FCP.

C. Education

The developer will provide appropriate materials to property owners informing them of the location and purpose of the afforestation area. Materials may include site plans and information explaining the intent of the forest conservation law.

D. Final Inspection

At the end of the two year post-construction management period, Eco-Science Professionals, or another qualified professional, will submit to the administrator of the Howard County Forest Conservation Program certification that all retention/afforestation requirements have been met. Upon acceptance of this certification, the County will release the developer from all future obligations and release the developer's bond.

2-1/2"

FOREST CONSERVATION AREA

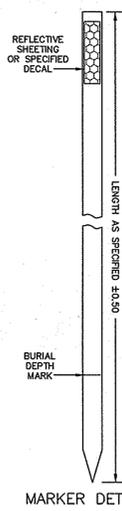
TREES FOR YOUR FUTURE

DUMPING, MACHINERY, OR STORAGE OF MATERIALS, CUTTING OR DISTURBANCE OF VEGETATION OR SOIL IN THIS AREA IS STRICTLY PROHIBITED

Howard County Dept. of Recreation and Parks, Natural Resources Division

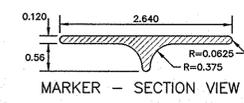
410-313-4725
TTY 410-313-4660

Howard County MARYLAND

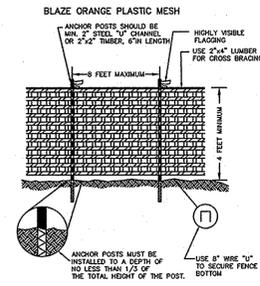
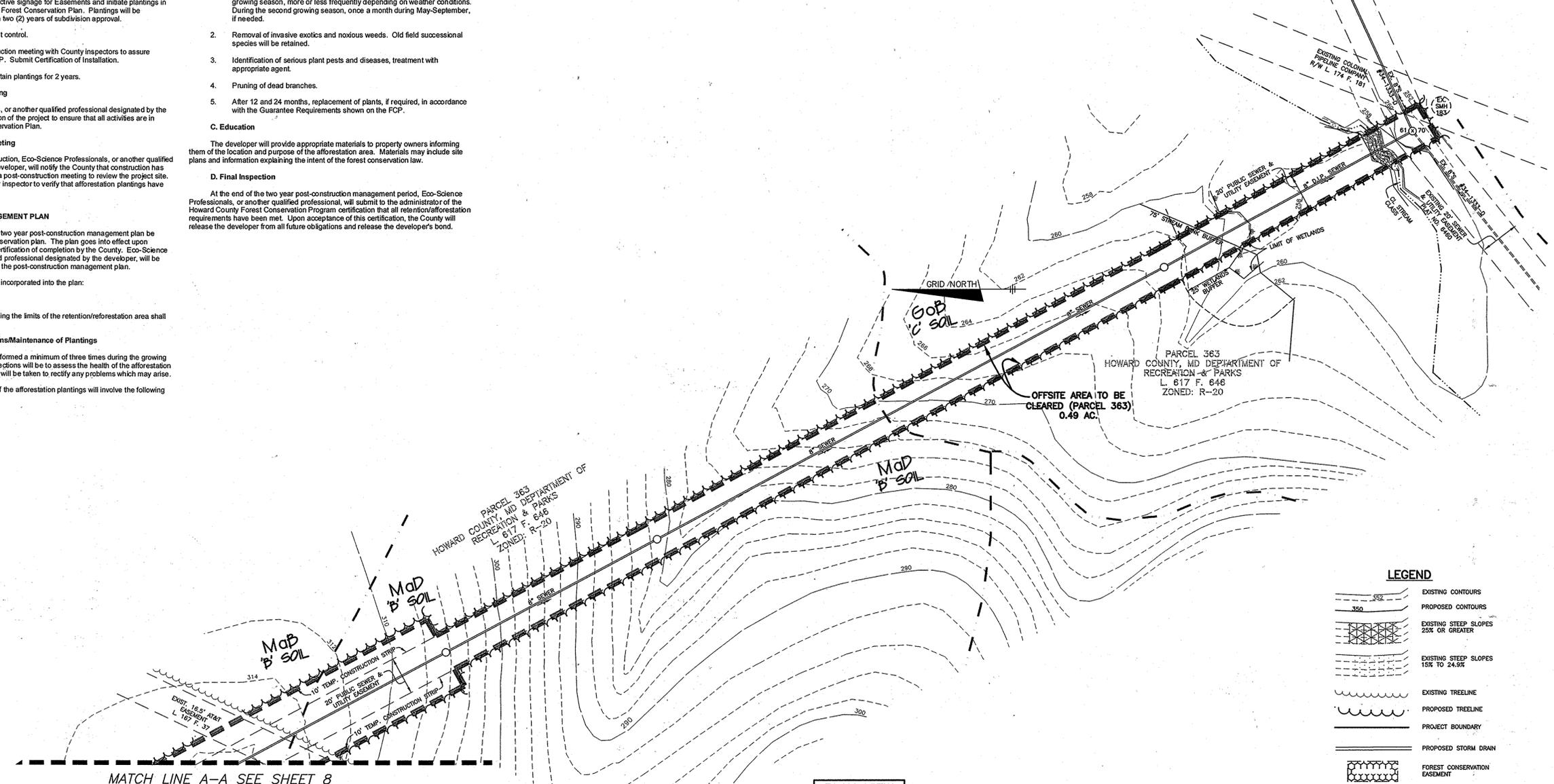


DECAL SPECIFICATIONS

Materials:
Number 3690 Scotchcot non-reflective substrate.
Color: Dark green text and border on beige background.



FCE CARSONITE MARKER
NOT TO SCALE



- NOTES:
1. FOREST PROTECTION DEVICE ONLY.
 2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
 3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
 4. AVOID ROOT DAMAGE WHEN PLACING ANCHOR POSTS.
 5. DEVICES SHOULD BE PROPERLY MAINTAINED DURING CONSTRUCTION.
 6. PROTECTIVE SIGNAGE IS ALSO REQUIRED.

TREE PROTECTION FENCING

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

APPROVED: DEPARTMENT OF PUBLIC WORKS

Hilga Senano 7.21.14
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kathleen 8.20.14
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Paul 8.19.14
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Eco-Science Professionals, Inc.

CONSULTING ECOLOGISTS

P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # JPCFRMD0610044D2

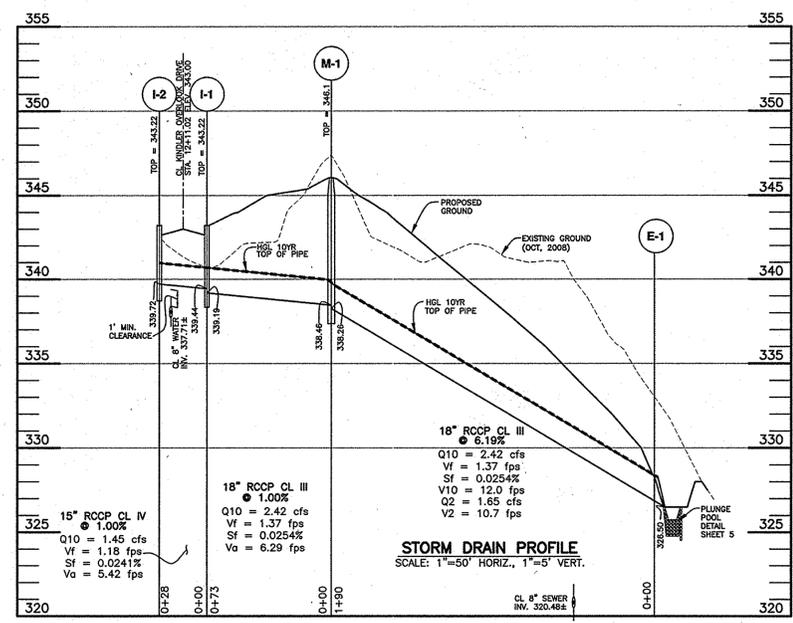
John P. Canoles

1 JULY, 2014 REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET	
NO.	DATE
REVISION	
BENCHMARK ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CVLENGINEERING.COM	
STATE OF MARYLAND JAMES A. WILKIE PROFESSIONAL ENGINEER NO. 28376 7/7/14	
OWNER/DEVELOPER:	REVISED FINAL ROAD CONSTRUCTION PLANS
ROBERT MOWREY 826 FROG MORTAR ROAD MIDDLE RIVER, MARYLAND 21220 443-955-3043	KINDLER OVERLOOK II LOTS 1 thru 7 AND OPEN SPACE LOTS 8 thru 10 and 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)
TAX MAP: 41	GRID: 18 PARCEL: 386
ZONED: R-20	ELECTION DISTRICT NO. 6
FOREST CONSERVATION PLAN	
DATE: JULY, 2014	BEI PROJECT NO. 1962
SCALE: AS SHOWN	SHEET 10 OF 15



LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING STEEP SLOPES 25% OR GREATER
- EXISTING STEEP SLOPES 15% TO 24.9%
- EXISTING TREELINE
- PROPOSED TREELINE
- PROJECT BOUNDARY
- PROPOSED STORM DRAIN
- FOREST CONSERVATION EASEMENT
- SOILS DELINEATION LINE
- SOILS TYPE
- DRAINAGE AREA



STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	PIPE INV. IN	PIPE INV. OUT	TOP ELEV.	OWNERSHIP	HO. CO. STD.
E-1	18" CONC. END SECT.	N 545,559.13 E 1,345,742.19	NA	326.50	NA	PUBLIC	D-5.51
I-1	A-5 width=2.5'	CL STA. 12+11.02 KINDLER OVERLOOK DRIVE, OFFSET 12.43' RIGHT	339.44	339.19	343.22	PUBLIC	D-4.01
I-2	A-5 width=2.5'	CL STA. 12+11.02 KINDLER OVERLOOK DRIVE, OFFSET 12.43' LEFT	NA	339.72	343.22	PUBLIC	D-4.01
M-1	4'-0" MANHOLE	N 545,591.84 E 1,345,549.14	338.46	338.26	346.10	PUBLIC	G-5.12

- STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE.
- STRUCTURE LOCATION FOR INLETS IS AT THE CENTER FACE OF CURB.
- STRUCTURE ELEVATION AND LOCATION FOR ENDSECTIONS IS AT THE MIDPOINT OF THE END OF STRUCTURE.
- PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
- WIDTH LISTED FOR 'A' TYPE INLETS IS THE INTERIOR WALL WIDTH.

PIPE SCHEDULE

PIPE SIZE	LENGTH	TYPE	OWNERSHIP
15"	28'	RCP CLASS IV	PUBLIC
18"	263'	RCP CLASS III	PUBLIC

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

SOILS LEGEND

SYMBOL	TYPE	K _f FACTOR	NAME
GgC	B	.20	GLENELG LOAM - 8 TO 15 PERCENT SLOPES - MODERATELY ERODED
GmC	B	.37	GLENVILLE SILT LOAM - 8 TO 15 PERCENT SLOPES
GoB	B	.37	GLENVILLE-CORDORUS SILT LOAMS - 0 TO 8 PERCENT SLOPES
MaB	B	.24	MANOR LOAM - 3 TO 8 PERCENT SLOPES
MaC	B	.24	MANOR LOAM - 8 TO 15 PERCENT SLOPES
MaD	B	.24	MANOR LOAM - 15 TO 25 PERCENT SLOPES
MkF	B	.24	MANOR BRINKLOW COMPLEX, 25 TO 65 PERCENT SLOPES - VERY ROCKY

SOILS TAKEN FROM NRCS WEB SOIL SURVEY, MARCH 17, 2014
*WHOLE SOIL K FACTOR

PLAN VIEW
SCALE: 1" = 40'

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 12/10/2014
SUB. BUREAU OF HIGHWAYS
DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 12-15-14
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE

[Signature] 12-15-14
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE

2 NOV, 2014 REVISION BY SHEET REPLACEMENT TO REVISE TEE-TURNAROUND
1 JULY, 2014 REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

NO.	DATE	REVISION
2	NOV, 2014	REVISION BY SHEET REPLACEMENT TO REVISE TEE-TURNAROUND
1	JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELIJAH CITY, MARYLAND 21043
(P) 410-485-8105 (F) 410-485-8844
WWW.BEI-CVLENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 9832A. EXPIRES: 11-15-15

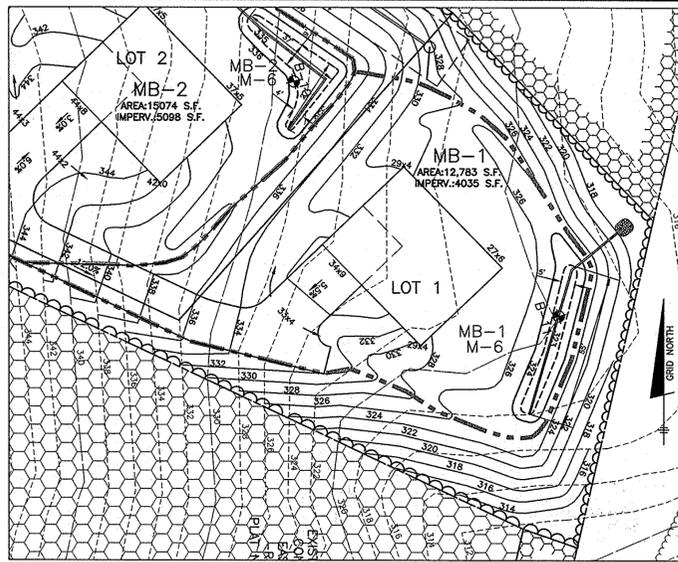
KINDLER OVERLOOK II
LOTS 1 thru 7 AND
OPEN SPACE LOTS 8 thru 10 and
0.74 ACRE FOREST CONSERVATION BANK (RETENTION)

TAX MAP: 41 GRID: 18 PARCEL: 386
ZONED: R-20
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

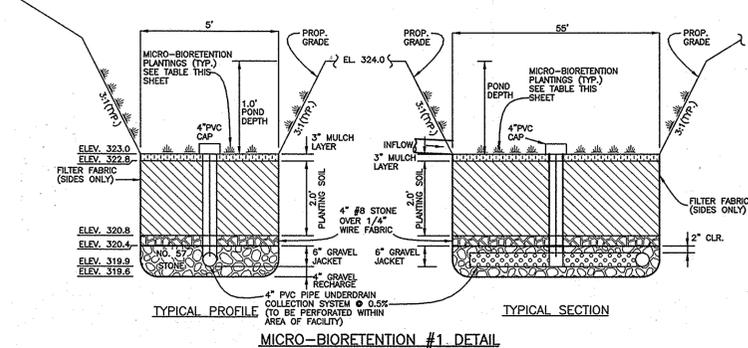
STORM DRAIN DRAINAGE AREA MAP AND STORM DRAIN PROFILES

DATE: NOVEMBER, 2014 BEI PROJECT NO. 1962
SCALE: AS SHOWN SHEET 11 OF 15

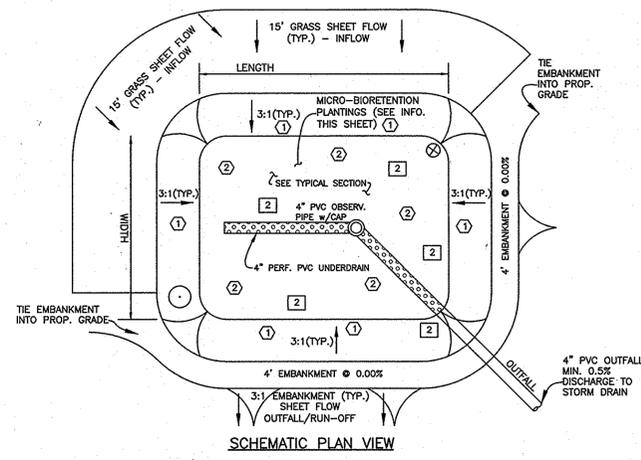




MICRO-BIORETENTMENT #1 - PLAN VIEW
SCALE: 1" = 30'



MICRO-BIORETENTMENT #1 DETAIL



SCHEMATIC PLAN VIEW

PLANTING SCHEDULE			
FACILITY	(1)	(2)	(3)
LOT OWNER OWNED AND MAINTAINED:			
MB-1	12	9	9
MB-2	18	13	13
MB-3	15	11	11

MATERIALS & SPECIFICATIONS FOR MICRO-BIORETENTMENT			
MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60-65% COMPOST 35-40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	AASHTO M-43	NO. 57 OR NO. 6	0.375" TO 0.750"
UNDERDRAIN PIPING	F788, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID	3/8" PERFORATED 6" O/C, 4 HOLES PER ROW, MINIMUM UNDERNEATH PIPES. PIPE SHALL BE WRAPPED WITH 1/4-INCH GALVANIZED HARDWARE CLOTH
GEOTEXTILE (BELOW IMPERV. LINER)	ASTM-D-4633 (PUNCTURE STRENGTH 125LB) ASTM-D-4632 (TENSILE STRENGTH 300 LB)		

MICRO-BIORETENTMENT PLANTING SCHEDULE

1. IRIS VERSICOLOR - IRIS
 2. RUDBECKIA SUBTENTIOSA - SWEET CONEFLOWER
 3. LOBELIA CARDINALIS - CARDINAL FLOWER
 4. CALLUNA VULGARIS (HEATHER)
 5. ACER RUBRUM - RED MAPLE

PLANTING DATA

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

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

3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE FACILITY NEAR OBSERVATION PIPE AND UNDERDRAIN.

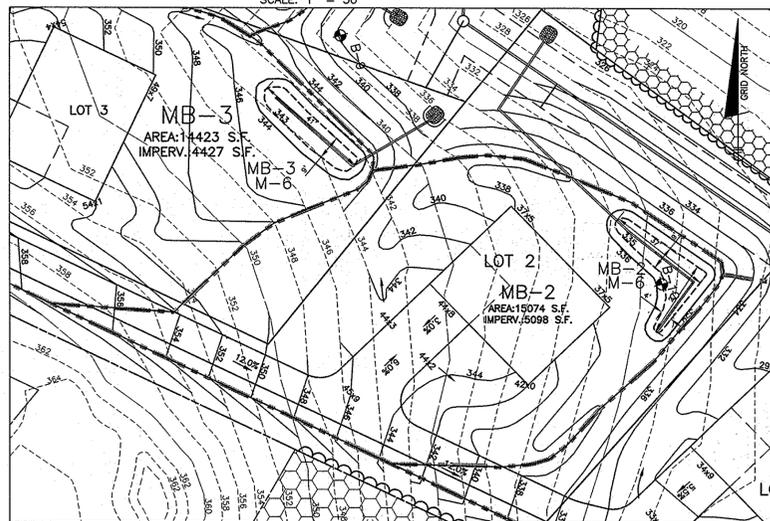
OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTMENT (M-6)

A. 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 II, TABLE A.4.1 AND 2.

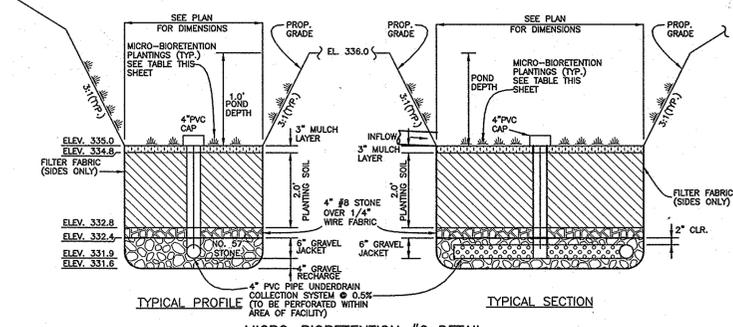
B. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT. REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. 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.

D. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.



MICRO-BIORETENTMENT #2 - PLAN VIEW
SCALE: 1" = 30'

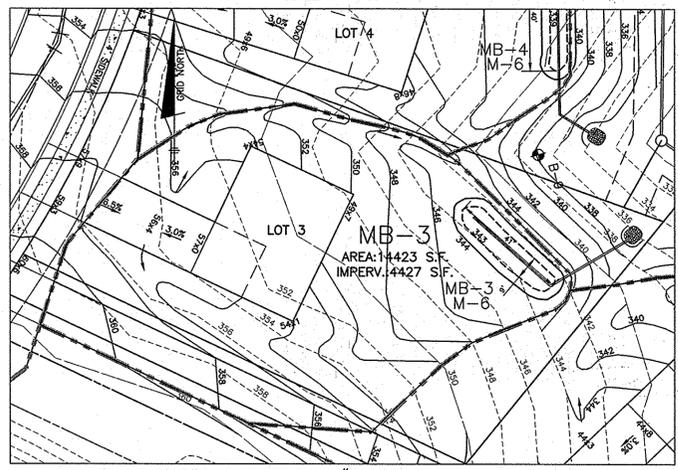


MICRO-BIORETENTMENT #2 DETAIL

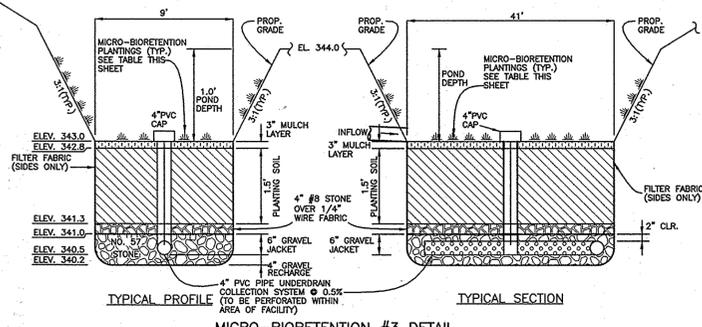
Drainage Area MB-1: Micro-Bioretentment (M-6)		Storage Computation:					
Total Drainage Area:	12783 s.f.	Elevation	Area	Average	Contour	Incremental	Total
Impervious Area:	4035 s.f.	(ft)	(sf)	(sf)	(ft)	(ft³)	(ft³)
Impervious:	32%	323.00	272				0
Rv =	0.334			461.5	1.00	461.5	
ESDV =	589.4 c.f.	324.0	651				462
75% Req'd Storage:	427	Min. Area of Filter (@ 2% DA): 255.68 OK					

Drainage Area MB-2: Micro-Bioretentment (M-6)		Storage Computation:					
Total Drainage Area:	15074 s.f.	Elevation	Area	Average	Contour	Incremental	Total
Impervious Area:	5098 s.f.	(ft)	(sf)	(sf)	(ft)	(ft³)	(ft³)
Impervious:	34%	335.00	396				0
Rv =	0.354			581.5	1.00	581.5	
ESDV =	712.3 c.f.	336.0	767				582
75% Req'd Storage:	534	Min. Area of Filter (@ 2% DA): 301.48 OK					

Drainage Area MB-3: Micro-Bioretentment (M-6)		Storage Computation:					
Total Drainage Area:	14423 s.f.	Elevation	Area	Average	Contour	Incremental	Total
Impervious Area:	4427 s.f.	(ft)	(sf)	(sf)	(ft)	(ft³)	(ft³)
Impervious:	31%	343.00	341				0
Rv =	0.326			494.0	1.00	494.0	
ESDV =	627.4 c.f.	344.0	647				494
75% Req'd Storage:	471	Min. Area of Filter (@ 2% DA): 288.48 OK					



MICRO-BIORETENTMENT #3 - PLAN VIEW
SCALE: 1" = 30'



MICRO-BIORETENTMENT #3 DETAIL

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING TREELINE
- PROPOSED TREELINE
- PROJECT BOUNDARY
- PROPOSED STORM DRAIN
- FOREST CONSERVATION EASEMENT
- DRAINAGE AREA
- MICRO-BIORETENTMENT FACILITY AND OUTFALL

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

NO.	DATE	REVISION
1	JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

BENCHMARK ENGINEERS & PLANNERS, INC.
 8480 BALTIMORE NATIONAL PIKE SUITE 315 FELLOTT CITY, MARYLAND 21043
 (7) 410-465-8100 (F) 410-465-8944
 WWW.BE-CVLENGINEERING.COM

Professional Certification: I hereby certify that these documents were prepared or reviewed by me, and that I am a duly licensed professional engineer in the State of Maryland, License No. 28376.

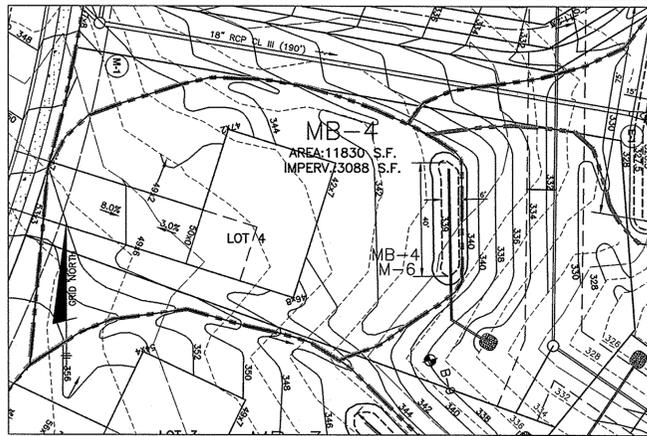
OWNER/DEVELOPER:
 ROBERT MOWREY
 826 FROG MORTAR ROAD
 MIDDLE RIVER, MARYLAND 21220
 443-955-3043

REVISED FINAL ROAD CONSTRUCTION PLANS
KINDLER OVERLOOK II
 LOTS 1 thru 7 AND
 OPEN SPACE LOTS 8 thru 10 and
 0.74 ACRE FOREST CONSERVATION BANK (RETENTION)

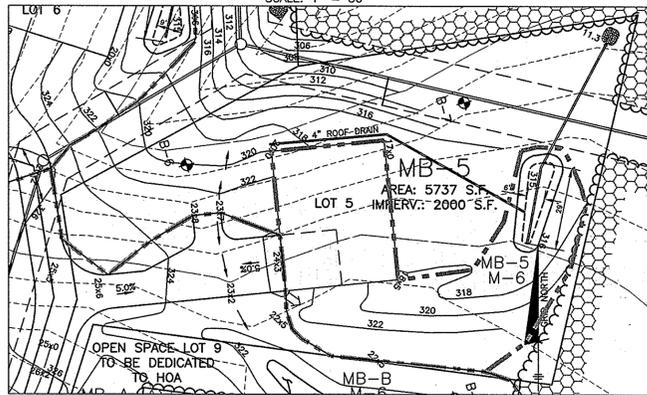
TAX MAP: 41 GRID: 18 PARCEL: 386
 ZONED: R-20
 ELECTION DISTRICT NO. 6
 HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS

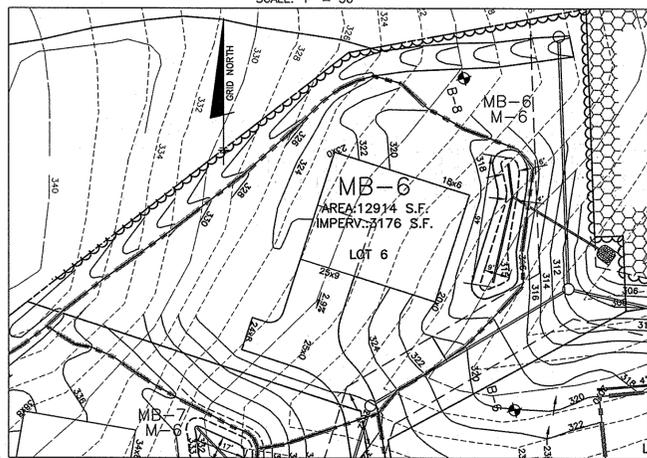
DATE: JULY, 2014 BEI PROJECT NO. 1962
 SCALE: AS SHOWN SHEET 12 OF 15



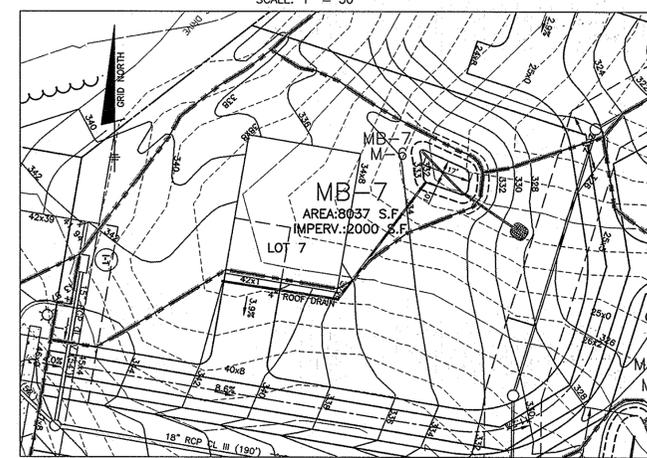
MICRO-BIORETENTION #4 - PLAN VIEW
SCALE: 1" = 30'



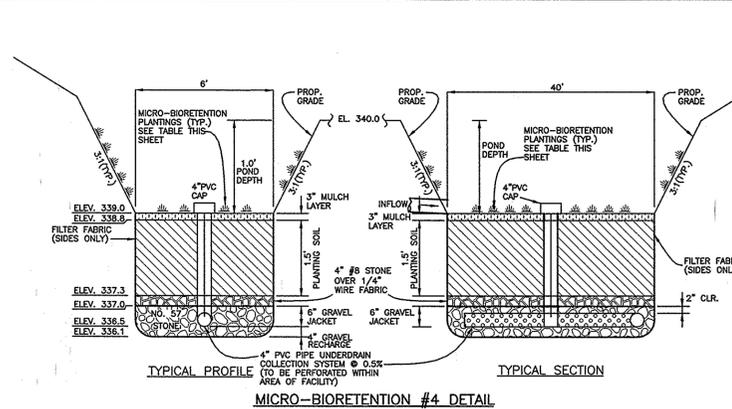
MICRO-BIORETENTION #5 - PLAN VIEW
SCALE: 1" = 30'



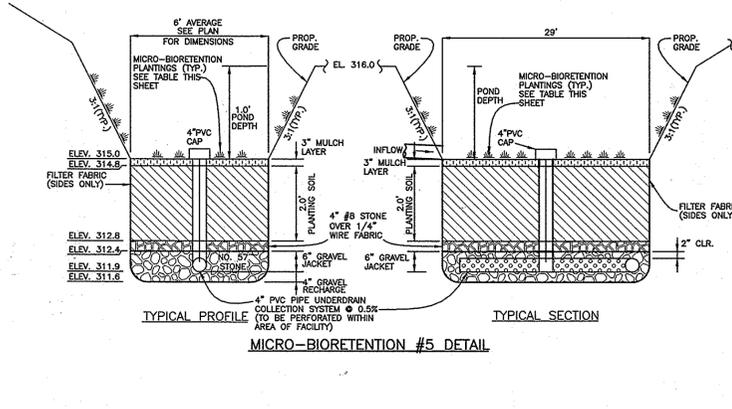
MICRO-BIORETENTION #6 - PLAN VIEW
SCALE: 1" = 30'



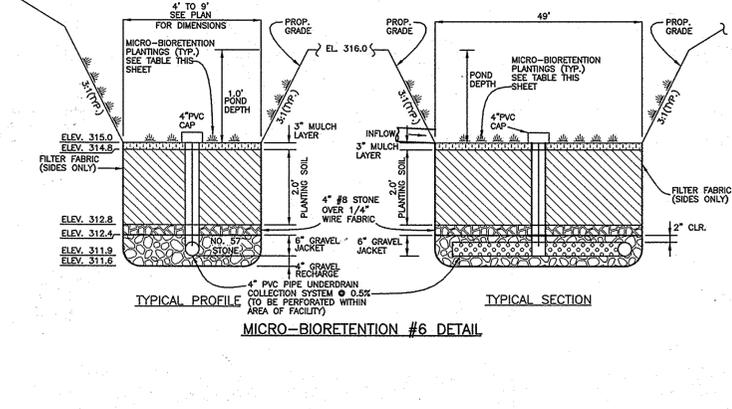
MICRO-BIORETENTION #7 - PLAN VIEW
SCALE: 1" = 30'



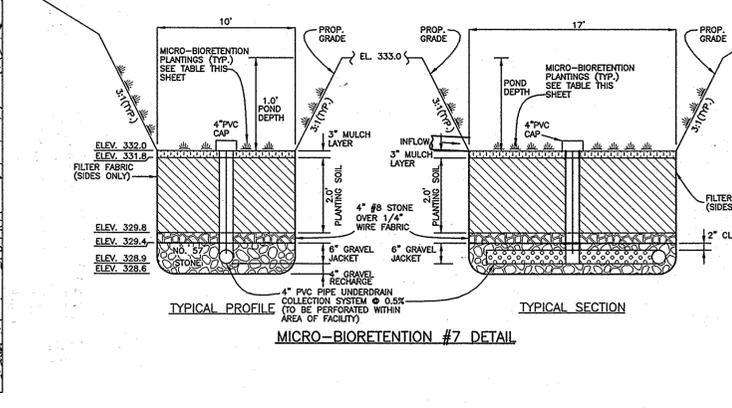
MICRO-BIORETENTION #4 DETAIL



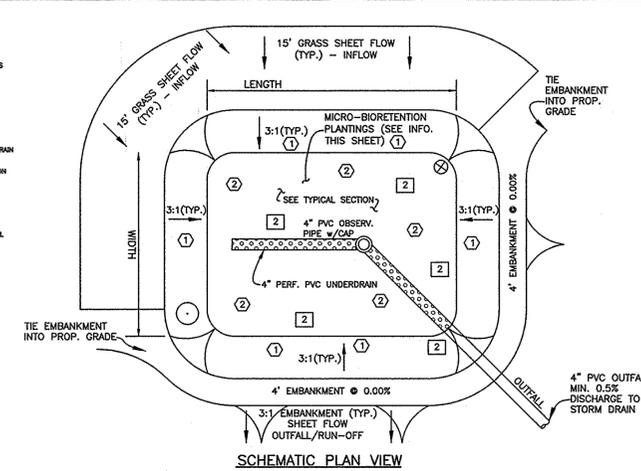
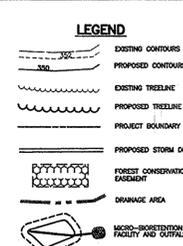
MICRO-BIORETENTION #5 DETAIL



MICRO-BIORETENTION #6 DETAIL



MICRO-BIORETENTION #7 DETAIL



SCHEMATIC PLAN VIEW

FACILITY	PLANTING SCHEDULE		
	(1)	(2)	(3)
MB-4	11	8	8
MB-5	8	6	6
MB-6	12	9	9
MB-7	7	6	6

Drainage Area MB-4: Micro-Bioretentment (M-6)		Storage Computation:					
		Elevation	Area	Average Area	Contour Interval	Incremental Volume	Total Volume
Total Drainage Area:	11830 s.f.	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Impervious Area:	3088 s.f.						
Impervious:	28%		339.00	237			0
Rv =	0.285				394.0	1.00	394.0
ESDV =	449.4 c.f.		340.0	531			384
75% Req'd Storage:	337						236.6 OK
Rev Required:	73 c.f.						

Drainage Area MB-5: Micro-Bioretentment (M-6)		Storage Computation:					
		Elevation	Area	Average Area	Contour Interval	Incremental Volume	Total Volume
Total Drainage Area:	5737 s.f.	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Impervious Area:	2000 s.f.						
Impervious:	35%		315.00	173			0
Rv =	0.354				289.0	1.00	289.0
ESDV =	278.2 c.f.		318.0	405			289
75% Req'd Storage:	209						114.74 OK
Rev Required:	45 c.f.						

Drainage Area MB-6: Micro-Bioretentment (M-6)		Storage Computation:					
		Elevation	Area	Average Area	Contour Interval	Incremental Volume	Total Volume
Total Drainage Area:	12914 s.f.	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Impervious Area:	3176 s.f.						
Impervious:	25%		315.00	260			0
Rv =	0.271				433.5	1.00	433.5
ESDV =	467.2 c.f.		316.0	607			434
75% Req'd Storage:	350						258.28 OK
Rev Required:	76 c.f.						

Drainage Area MB-7: Micro-Bioretentment (M-6)		Storage Computation:					
		Elevation	Area	Average Area	Contour Interval	Incremental Volume	Total Volume
Total Drainage Area:	8037 s.f.	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Impervious Area:	2000 s.f.						
Impervious:	25%		331.00	168			0
Rv =	0.274				262.5	1.00	262.5
ESDV =	293.6 c.f.		332.0	357			263
75% Req'd Storage:	220						160.74 OK
Rev Required:	46 c.f.						

MATERIAL	SPECIFICATION	SIZE	PLANTINGS ARE SITE SPECIFIC
PLANTINGS	SEE APPENDIX A; TABLE A.1	N/A	
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60-65% COMPOST 35-40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974	N/A	
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	ASHTO M-43	NO. 57 OR NO. 6	3/8" TO 1/2"
UNDERDRAIN PIPING	F758, TYPE PS28 OR ASHTO M-278	4" TO 6" RIGID SCH.40 PVC, SDR35 OR HOPE	3/8" PERF. 6" O/C, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES. PIPES SHALL BE WRAPPED WITH 1/4"-THICK GALVANIZED HARDWARE CLOTH
GEOTEXTILE (BELOW IMPERV. LINER)	ASTM-D-4833 (TENSILE STRENGTH 125LB) ASTM-D-4832 (TENSILE STRENGTH 300 LB)		

MICRO-BIORETENTION PLANTING SCHEDULE

- (1) IRIS VERSICOLOR - IRIS
- (2) RUBECKIA SUBTOMETOSA - SWEET CONEFLOWER
- (3) LOBELIA CARDINALIS - CARDINAL FLOWER
- (4) CALLUNA VULGARIS (HEATHER)
- (5) ACER RUBRUM - RED MAPLE

PLANTING DATA

- PLANTINGS WITHIN THE PONDING AREA OF THE FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE.
- PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE.
- AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE FACILITY NEAR OBSERVATION PIPE AND UNDERDRAIN.

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.
- THE OWNER SHALL PERFORM A PLANT INSPECTION 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.

ENGINEER'S CERTIFICATE
I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
Anna A. Miller 7-7-14
ENGINEER - GRASS-CRENSHAW Anna A. Miller DATE

DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.
John Blanton 7/7/14
DEVELOPER DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
John Blanton 7/8/14
HOWARD SCD DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
Holger Serrano 7-21-14
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Ve O'Sullivan 8-20-14
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
Chad Edman 8-19-14
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART

NO.	DATE	REVISION
1	JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(7) 410-465-6100 (F) 410-465-6844
WWW.BE-CHALLENGERING.COM

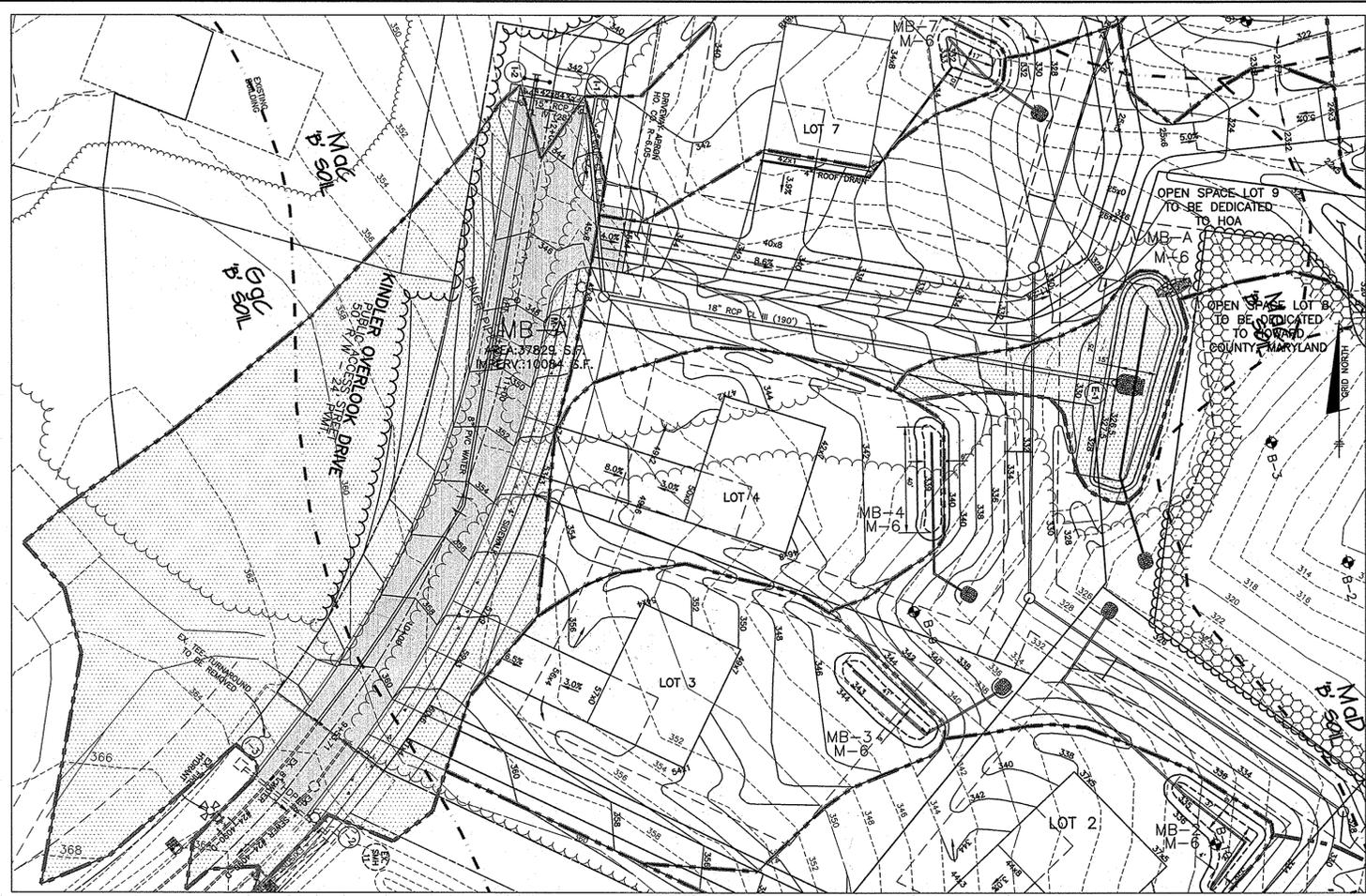
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28976, Registration Page 1-1-15.
Anna A. Miller 7/14
PROFESSIONAL ENGINEER

OWNER/DEVELOPER:
ROBERT MOWREY
826 FROG MORTAR ROAD
MIDDLE RIVER, MARYLAND 21220
443-955-3043

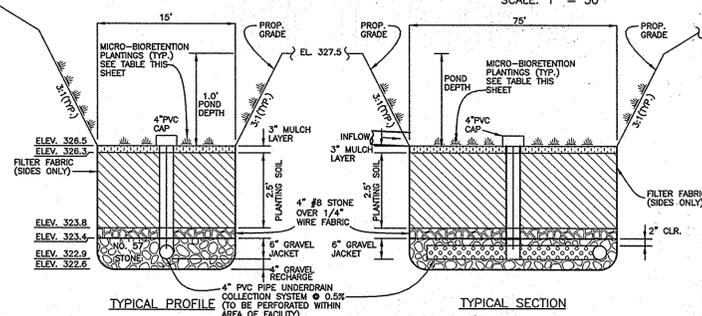
REVISED FINAL ROAD CONSTRUCTION PLANS
KINDLER OVERLOOK II
LOTS 1 thru 7 AND
OPEN SPACE LOTS 8 thru 10 and
0.74 ACRE FOREST CONSERVATION BANK (RETENTION)

TAX MAP: 41 GRID: 18 PARCEL: 386
ZONED: R-20
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS
DATE: JULY, 2014 BEI PROJECT NO. 1962
SCALE: AS SHOWN SHEET 13 OF 15



MICRO-BIORETENTION A - PLAN VIEW
SCALE: 1" = 30'



MICRO-BIORETENTION A DETAIL

NOTE: THE HOA WILL BE RESPONSIBLE FOR MAINTENANCE OF THE MULCHING, PLANTINGS, CLEANING, AND MOWING OF THE FACILITY. HOWARD COUNTY SHALL BE RESPONSIBLE FOR STRUCTURAL COMPONENTS OF THE FACILITY.

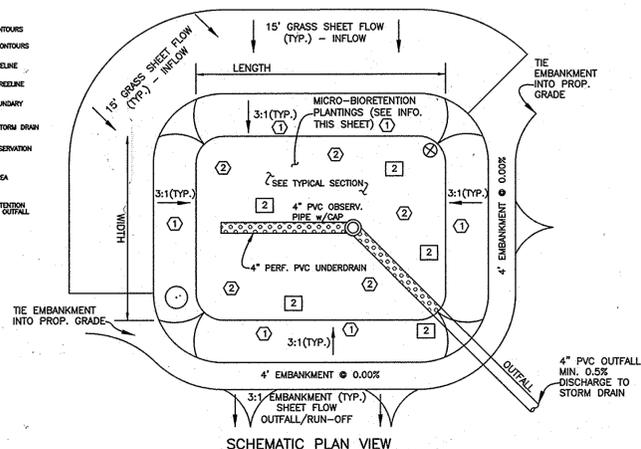
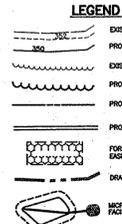
JOINTLY MAINTAINED
MICRO-BIORETENTION FACILITY

HOA MAINTENANCE RESPONSIBILITY:

THE HOA SHALL BE RESPONSIBLE FOR MAINTAINING THE PLANTINGS, MULCH, UNDERDRAINS, EMBANKMENT AND RIPRAP OUT FALL.

COUNTY MAINTENANCE RESPONSIBILITY:

THE COUNTY SHALL BE RESPONSIBLE FOR MAINTAINING STORM DRAIN INFLOW, END SECTION AND RIPRAP.



SCHEMATIC PLAN VIEW

PLANTING SCHEDULE			
FACILITY	(1)	(2)	(3)
HOA OWNED AND MAINTAINED:			
MB-A	42	32	32
MB-B	25	19	19

Drainage Area MB-A: Micro-Bioretentation (M-B)	Storage Computation:					
	Elevation	Area	Average	Contour	Incremental	Total
Total Drainage Area:	39990 s.f.					
Impervious Area:	11114 s.f.	(ft)	(sf)	(sf)	(ft³)	(ft³)
Imperious:	28%	326.50	953	1213.5	1.00	1213.5
Rv =	0.302					
ESDV =	1598.3 c.f.	327.50	1474			1214
75% Req'd Storage:	1199	Min. Area of Filter (@ 2% DA):				793.8 OK

Drainage Area MB-B: Micro-Bioretentation (M-B)	Storage Computation:					
	Elevation	Area	Average	Contour	Incremental	Total
Total Drainage Area:	25791 s.f.					
Impervious Area:	6448 s.f.	(ft)	(sf)	(sf)	(ft³)	(ft³)
Imperious:	25%	318.50	558	785.5	1.00	785.5
Rv =	0.276					
ESDV =	945.7 c.f.	319.50	1013			786
75% Req'd Storage:	709	Min. Area of Filter (@ 2% DA):				515.82 OK

MATERIALS & SPECIFICATIONS FOR MICRO-BIORETENTION			
MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A: TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60-65% COMPOST 35-40% OR SANDY LOAM 50% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS 'C')		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	AASHTO M-43	NO. 57 OR NO. 57.5 TO 0.75"	
UNDERDRAIN PIPING	758, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID SCH 40 PVC, SORBS OR HOPE	3/8" PERFORATED 6" O/C, 4 HOLES PER ROW; MINIMUM OF 1" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES. PIPES SHALL BE WRAPPED WITH 1/4-INCH GALVANIZED HARDWARE SCHEDULE
GEOTEXTILE (BELOW IMPERV. LINER)	AASHTO M-4333 (PUNCTURE STRENGTH 125LB) AASHTO M-4332 (TENSILE STRENGTH 300 LB)		

MICRO-BIORETENTION
PLANTING SCHEDULE

- 1 IRIS VERSICOLOR - IRIS
- 2 RUDBECKIA SUBSTANTIOSA - SWEET CONEFLOWER
- 3 LOBELIA CARDINALIS - CARDINAL FLOWER
- 4 CALLUNA VULGARIS (HEATHER)
- 5 ACER RUBRUM - RED MAPLE

PLANTING DATA

- PLANTINGS WITHIN THE PONDING AREA OF THE FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE.
- PLANTINGS ALONG THE PERIMETER (BANK) AREA OF THE FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE.
- AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE FACILITY NEAR OBSERVATION PIPE AND UNDERDRAIN.

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-B)

- THE HOA 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 8, TABLE A.1 AND 2.
- THE HOA SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION AND CONSIDER BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
- THE HOA 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 HOA SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.
- THE COUNTY SHALL BE RESPONSIBLE FOR MAINTAINING STORM DRAIN INFLOW, END SECTION AND RIPRAP.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

ENGINEER - _____ PE NO. _____ DATE _____

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

ENGINEER'S CERTIFICATE
I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
Alice A. Miller 11-17-14
ENGINEER - BRANN-FLEURY Alice A. Miller #2876 DATE

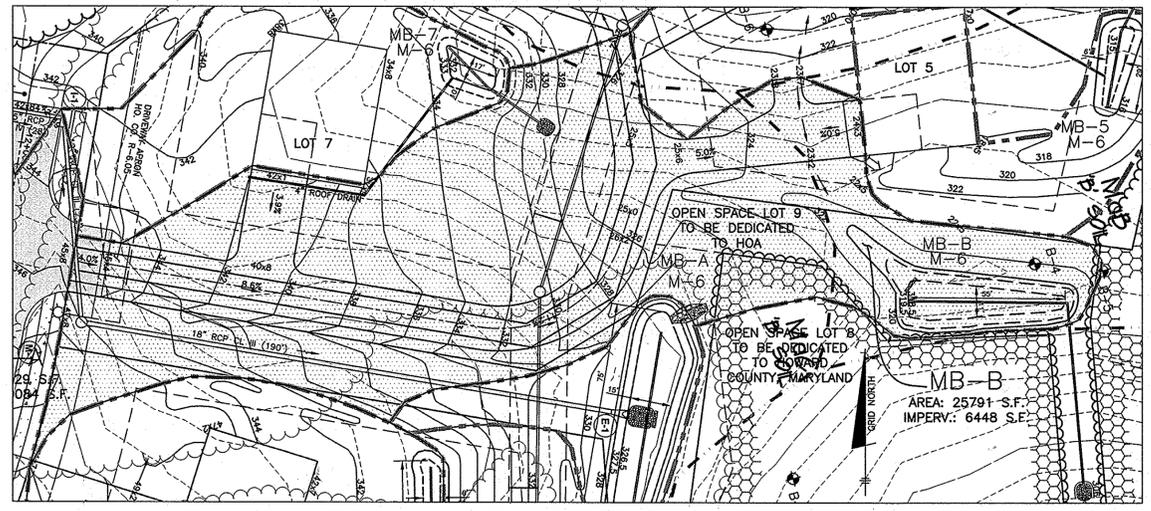
DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.
John P. Khaton 11/25/14
DEVELOPER DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
John P. Khaton 11/25/14
HOWARD SCD DATE

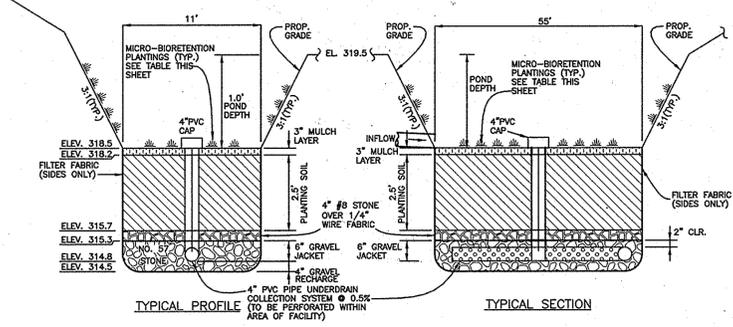
APPROVED: DEPARTMENT OF PUBLIC WORKS
Meunier 12/10/2014
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Kat Shindler 12-15-14
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*NOTE: TO REVISE TITLE BLOCK, GENERAL NOTES, LANDSCAPING AND SURETY, ADD ENVIRONMENTAL SITE DESIGN SWM AND FOREST CONSERVATION BANK AND CHART



MICRO-BIORETENTION B - PLAN VIEW
SCALE: 1" = 30'



MICRO-BIORETENTION B DETAIL

NO.	DATE	REVISION
2	NOV, 2014	REVISION BY SHEET REPLACEMENT TO REVISE TEE-TURNAROUND
1	JULY, 2014	REVISION BY SHEET REPLACEMENT * SEE NOTE THIS SHEET

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLETTT CITY, MARYLAND 21043
(P) 410-465-8100 (F) 410-465-6644
WWW.BE-CIVILENGINEERING.COM

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 2876, Expiration Date 1-15-15.

STATE OF MARYLAND
PROFESSIONAL ENGINEER
11-17-14

OWNER/DEVELOPER: ROBERT MOWREY 826 FROG MORTAR ROAD MIDDLE RIVER, MARYLAND 21220 443-955-3043	REVISED FINAL ROAD CONSTRUCTION PLANS KINDLER OVERLOOK II LOTS 1 thru 7 AND OPEN SPACE LOTS 8 thru 10 and 0.74 ACRE FOREST CONSERVATION BANK (RETENTION) TAX MAP: 41 GRID: 18 PARCEL: 386 ZONED: R-20 ELECTION DISTRICT NO. 6 HOWARD COUNTY, MARYLAND
STORMWATER MANAGEMENT DETAILS	
DATE: NOVEMBER, 2014	BEI PROJECT NO. 1962
SCALE: AS SHOWN	SHEET 14 OF 15

