STATE OF MARYLAND
CRITICAL AREA COMMISSION
CHESAPEAKE AND ATLANTIC COASTAL BAYS
1804 West Street, Suite 100, Annapolis, Maryland 21401
(410) 260-3460 Fax: (410) 974-5338
www.dnr.state.md.us/criticalarea/

February 4, 2008

Ms. Pam Cotter
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6401
Annapolis, Maryland 21401

Re: Local Case 2008-0021-V
Sandra Sarget

Dear Ms. Cotter:

Thank you for submitting the above referenced variance. The applicant is requesting a variance to allow a new single family dwelling with less Buffer than required. The property is classified as a Limited Development Area (LDA) and located entirely within the 100-foot Buffer. An existing garage lies partially within the lot, which will be removed prior to construction.

Provided the lot is properly grandfathered, we do not oppose this variance request. Based on the information provided, I have the following comments:

1. Mitigation of 3:1 for the new impervious surface within the 100-foot Buffer should be required. Rather than fee-in-lieu the entire mitigation should be accommodated on both Lot 6 and Lot 7, as both are owned by the applicant, within the 100-foot Buffer. Plantings should consist of a mix of native trees and shrubs and blend with the existing forested area on the Lots.
2. In addition to the mitigation described above, the applicant should provide appropriate best management practices for stormwater management to treat the new impervious surface, including all rooftop areas.

Thank you for the opportunity to provide comments. Please include this letter in your file and submit is as part of the record for this variance. Also, please notify the Commission in writing of the decision made in this case.

Sincerely,

Kate Schmidt

Kate Schmidt
Natural Resources Planner
AA61-08

61-08

IN THE OFFICE OF ADMINISTRATIVE HEARINGS

CASE NUMBER 2008-0021-V

RICK AND SANDRA SARGENT, TRUSTEES

FIRST ASSESSMENT DISTRICT

DATE HEARD: MARCH 11, 2008

ORDERED BY: **STEPHEN M. LeGENDRE**, ADMINISTRATIVE HEARING OFFICER

PLANNER: **LORI RHODES**

DATE FILED: **MARCH** 17th, **2008**

PLEADINGS

Rick and Sandra Sargent, Trustees, the applicants, seek a variance (2008-0021-V) to allow a dwelling with less buffer than required on property located along the southwest side of Loch Haven Drive, southwest of South River Terrace, Edgewater.

PUBLIC NOTIFICATION

The hearing notice was posted on the County's web site in accordance with the County Code. The file contains the certification of mailing to community associations and interested persons. Each person designated in the application as owning land that is located within 175 feet of the property was notified by mail, sent to the address furnished with the application. James Robinson testified that the property was posted for more than 14 days prior to the hearing. I find and conclude that there has been compliance with the notice requirements.

FINDINGS AND CONCLUSIONS

This case concerns property with a street address of 3579 Loch Haven Drive, also known as Lot 6 in the Loch Haven Beach subdivision, Edgewater. The property comprises 11,250 square feet and is zoned R5 residential with a Chesapeake Bay Critical Area designation as Limited Development Area (LDA). The only improvements are a garage and graveled driveway associated with a

dwelling on Lot 7 to the north.[1] The request is to develop Lot 6 with a dwelling, well, septic, driveway and rain gardens with disturbance to the buffer to tidal wetlands.[2]

Anne Arundel County Code, Article 18, Section 18-13-104 establishes a 100-foot buffer from tidal wetlands. Accordingly, the proposal requires a variance to disturb the buffer.

Lori Rhodes, a planner with the Office of Planning and Zoning, testified that the property is wholly located in the tidal wetlands buffer. The request is within the allowance for impervious coverage (2,025 square feet versus 3,515 square feet). The project includes stormwater management and mitigation plantings. The request is considered consistent with the character of the neighborhood, including other properties that receive variances for development with disturbances to non-tidal wetlands. The witness summarized the agency comments. The Health Department requires plan approval. The Chesapeake Bay Critical Area Commission did not oppose the request, subject to mitigation with plantings in the buffer. The County's Development Division suggested relocating the dwelling closer to the front building restriction line. However Ms. Rhodes countered that the change would adversely impact the root system of a large tree. By way of ultimate conclusion, Ms. Rhodes supported the request.

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[1] The applicants also own Lot 7.

[2] At the hearing, the applicants revised the site plan to include a pervious rear deck addition (12 X 16 feet).

Ed Brown, a surveyor and land-planning consultant to the applicants, testified that the dwelling has been sited to minimize the impacts to slopes and the tidal wetlands. The requested mitigation would be accommodated on Lot 6 with any excess on Lot 7. Finally, the existing shed would be removed and the applicants are not planning any accessory structures at the premises.

There was no other testimony in the matter.

Upon review of the facts and circumstances, I find and conclude that the applicants are entitled to conditional relief to the code. For this critical area property, due to the extent of the tidal wetlands buffer, which extends across the entire site, a strict implementation of the program would result in an unwarranted hardship. To literally interpret the program would deny the applicants the right to develop the property with a single-family dwelling, a right commonly enjoyed by other properties in similar areas in the critical area. Conversely, the granting of the variance is not a special privilege that the program typically denies. There is no indication that the request results from the actions of the applicants or from land use of neighboring property. Finally, with mitigation and other conditions, the variance will not adversely impact critical area assets and harmonizes with the general spirit and intent of the program.

I further find that the variance represents the minimum relief. The dwelling is not overly large. It has been located 5 feet beyond the front building restriction line in order to avoid additional woodlands disturbance. There was nothing to suggest that the granting of the variance would alter the essential character of the

neighborhood, substantially impair the appropriate use or development of adjacent property, or cause a detriment to the public welfare. The approval is subject to the conditions in the Order.

ORDER

PURSUANT to the application of Rick and Sandra Sargent, Trustees, petitioning for a variance to allow a dwelling with less buffer than required, and

PURSUANT to the notice, posting of the property, and public hearing and in accordance with the provisions of law, it is this 17th day of March, 2008,

ORDERED, by the Administrative Hearing Officer of Anne Arundel County, that the applicants are **granted** a variance to disturb tidal wetlands to permit a dwelling and rear deck addition in accordance with the revised site plan. *The approval is subject to the following conditions:*

1. *The building permit is subject to the approval of the Health Department.*
2. *The applicants shall provide stormwater management as determined by the Permit Application Center.*
3. *The applicants shall provide mitigation at a 3:1 ratio with plantings in the buffer prioritized to Lot 6 with any excess on Lot 7.*
4. *No further expansion of the dwelling is allowed and accessory structures are not allowed.*
5. *The conditions of the approval run with the land and shall be included*

in any contract of sale.

Stephen M. LeGendre
Administrative Hearing Officer

NOTICE TO APPLICANT

Within thirty days from the date of this Decision, any person, firm, corporation, or governmental agency having an interest thercin and aggrieved thereby may file a Notice of Appeal with the County Board of Appeals.

Further Scction 18-16-405(a) provides that a variance expires by operation of law unless the applicant obtains a building permit within eighteen months. Thereafter, the variance shall not expire so long as construction proceeds in accordance with the permit.

If this case is not appealed, exhibits must be claimed within 60 days of the date of this Order, otherwise they will be discarded.

DETAILS AND SPECIFICATIONS FOR VEGETATIVE ESTABLISHMENT

Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within seven calendar days for the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than 3 horizontal to 1 vertical (3:1) and fourteen days for all other disturbed or graded areas on the project site. The above requirements do not apply to those areas which are shown on the plan and are currently being used for material storage or for those areas on which actual construction activities are currently being performed or to interior areas of a surface mine site where the stabilization material would contaminate the recoverable resource. Maintenance shall be performed as necessary to ensure that the stabilized areas continuously meet the appropriate requirements of the "1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control".

1. Permanent Seeding:
   - A. Soil tests: Lime and fertilizer will be applied per soil tests results for site greater than 5 acres. Soil tests will be done at completion of initial rough grading or as recommended by the sediment control Inspector. Rates and analyses will be provided to the grading inspector as well as the contractor.
     1. Occurrence of acid sulfate soils (greyish black color) will require covering with a minimum of 12 inches of clean soil with 6 inches minimum capping of top soil. No stockpiling of material is allowed. If needed, soil tests should be done before and after a 6-week incubation period to allow oxidation of sulfates.

     The minimum soil conditions required for permanent vegetative establishment are:
     - a. Soils pH shall be between 6.0 and 7.0.
     - b. Soluble salts shall be less than 500 parts per million (ppm).
     - c. The soil shall contain less than 40% clay but enough fine grained material (.30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. A exception is if lovegrass or sereclá lespedeza is to be planted, then a sandy soil (.30% silt plus clay) would be acceptable.
     - d. Soils shall contain 1.5% minimum organic matter by weight.
     - e. Soil must contain sufficient pore space to permit adequate root penetration.

     f. If these conditions cannot be met by soils on site, adding topsoil is required in accordance with Section 21 Standard and Specification for Topsoil or amendments made as recommended by a certified agronomist.
   - B. Seedbed Preparation: Area to be seeded shall be loose and friable to a depth of at least 3 inches. The top layer shall be loosened by raking, disking or other acceptable means before seeding occurs. For sites less than 5 acres, apply 100 pounds of dolomitic limestone and 21 pounds of 10-10-10 fertilizer per 1,000 square feet. Harrow or disk lime and fertilizer into the soil to a depth of at least 3 inches on slopes flatter than 3:1.
   - C. Seeding: Apply 5-8 pounds per 1,000 square feet of tall fescue between February 1 and April 30 or between August 15 and October 31. Apply seed uniformly on a moist firm seedbed with a cyclone seeder, cultipacker seeder or hydroseeder (slurry includes seeds and fertilizer, recommended on steep slopes only).Maximum seed depth should be 1/4 inch in clayey soils and 1/2 inch in sandy soils when using other than the hydroseeder method. Irrigate if soil moisture is deficient to support adequate growth until vegetation is firmly established. If other seed mixes are to be used, select from Table 25, entitled "Permanent Seeding For Low Maintenance Areas" from the current Standards and Specifications for Soil Erosion and Sediment Control. Mixes suitable for this are 1, 3, and 5–7. Mixes 2–7 are suitable in non-mowable situations.
   - D. Mulching: Mulch shall be applied to all seeded areas immediately after seeding. During the time periods when seeding is not permitted, mulch shall be applied immediately after grading.

     Mulch shall be unrotted, unchopped, small grain straw applied at a rate of 2 tons per acre or 90 pounds per 1,000 square feet (2 bales). If a mulch anchoring tool is used, apply 2.5 tons per acre. Mulch materials shall be a relatively free of all kinds of weeds and shall be completely free of prohibited noxious weeds. Spread mulch uniformly, mechanically or by hand, to a depth of 1–2 inches.
   - E. Securing Straw Mulch: Straw mulch shall be secured immediately following mulch application to minimize movement by wind or water. The following methods are permitted:
     - (i) Use a mulch anchoring tool which is designed to punch and anchor mulch into the soil surface to a minimum depth of 2 inches. This is the most effective method for securing mulch, however, it is limited to relatively flat areas where equipment can operate safely.
     - (ii) Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. If mixed with water, use 50 pounds of wood cellulose fiber per 100 gallons of water.
     - (iii) Liquid binders may be used. Apply at higher rates at the edges where wind catches mulch, such as in valleys and on crests of slopes. The remainder of the area should appear uniform after binder application. Binders listed in the 1994 Standards and Specifications for Soil Erosion and Sediment Control or approved equal shall be applied at rates recommended by the manufacturers.
     - (iv) Lightweight plastic netting may be used to secure mulch. The netting will be stapled to the ground according to manufacturer's recommendations.
2. Temporary Seeding:
   - Lime: 100 pounds of dolomitic limestone per 1,000 square feet.
   - Fertilizer: 15 pounds of 10-10-10 per 1,000 square feet.
   - Seed: Perennial rye – 0.92 pounds per 1,000 square feet (February 1 through April 30 or August 15 through November 1).
     Millet – 0.92 pounds per 1,000 square feet (May 1 through August 15).
   - Mulch: Same as 1. D and E above.
3. No fills may be placed on frozen ground. All fill to be placed in approximately horizontal layers, each layer having a loose thickness of not more than 8 inches. All fill in roadways and parking area is to be classified Type 2 as per Anne Arundel County Code – Article 21, Section 2–306, and compacted to 90% density; compaction to be determined by ASTM–D1557–66T ASTM–D1557–66T (Modified Proctor). Any fill within the building area is to be compacted to a minimum of 95% density as determined by methods previously mentioned. Fills for pond embankments shall be compacted as per MD–378 Construction Specifications. All other fill shall be compacted sufficiently so as to be stable and prevent erosion and sloughing.
4. Permanent Sod:
   Installation of sod should follow permanent seeding dates. Seedbed preparation for sod shall be as noted in section (B) above. Permanent sod is to be tall fescue, state approved sod; lime and fertilizer per permanent seeding specifications and lightly irrigate soil prior to laying sod. Sod is to be laid on the contour with all ends tightly abutting. Joints are to be staggered between rows. Water and roll or tamp sod to insure positive root contact with the soil. All slopes steeper than 2:1, as shown, are to be permanently sodded or protected with an approved erosion control netting. Additional watering for establishment may be required. Sod is not to be installed on frozen ground. Sod shall not be transplanted when moisture content (dry or wet) and/or extreme temperature may adversely affect its survival. In the absence of adequate rainfall, irrigation should be performed to ensure establishment of sod.
5. Mining Operations:
   Sediment control plans for mining operations must include the following seeding dates and mixtures:
   For seeding dates of:
   February 1 through April 30 and August 15 through October 31, use seed mixture of tall fescue at the rate of 2 pounds per 1,000 square feet and serisea lespedeza at the rate of 0.5 pounds per 1,000 square feet.
6. Topsoil shall be applied as per the Standard and Specifications for Topsoil from the current Maryland Standards and Specifications for Soil Erosionand Sediment Control.

NOTE: Use of this information does not preclude meeting all of the requirements of the "1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control".

NOTE: Projects within 4 miles of the BWI Airport will need to adhere to Maryland Aviation Administration's seeding specification restrictions.

STANDARD RESPONSIBILITY NOTES

I (We) certify that:

1. *a. All development and construction will be done in accordance with this sediment and erosion control plan, and further , authorize the right of entry for periodic on–site evaluation by the Anne Arundel Soil Conservation District Board of Supervisors or their authorized agents.*
   b. Any responsible personnel involved in the construction project will have a certificate of attendance from the Maryland Department of the Environment's approved training program for the control of sediment and erosion before beginning the project.
   Responsible personnel on site: TO BE DETERMINED
   c. If applicable, the appropriate enclosure will be constructed and maintained on sediment basin(s) included in this plan. Such structures(s) will be in compliance with the Anne Arundel County Code.
2. *The developer is responsible for the acquisition of all easements, rights, and/or rights–of–way that may be required for the sediment and erosion control practices, stormwater management practices and the discharge of stormwater onto or across adjacent or downstream properties included in this plan. He is also responsible for the acquisition of all easements, rights, and/or rights–of–way that may be required for grading and/or work on adjacent properties included in this plan.*
3. *Initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within seven calendar days for the surface of all controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than 3 horizontal to 1 vertical (3:1) and fourteen days for all other disturbed or graded areas on the project site. Temporary stabilization of the surface of perimeter controls, dikes, swales, ditches,and perimeter slopes may be allowed at the discretion of the sediment control inspector.*
4. *The sediment control approvals on this plan extend only to areas and practices identified as proposed work.*
5. *The approval of this plan for sediment and erosion control does not relieve the developer/consultant from complying with Federal, State or County requirements appertaining to environmental issues.*
6. *The developer must request that the Sediment Control Inspector approve work completed in accordance with the approved erosion and sediment control plan, the grading or building permit, and the ordinance. On all sites with disturbed areas in excess of 2 acres, approval of the Department of Inspections and Permits*
7. *All material, shall be taken to a site with an approved sediment and erosion control plan.*
8. *On all sites with disturbed areas in excess of two acres, approval of the sediment and erosion control Inspector shall be required on completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. This will require first phase inspections. Other building or grading Inspection approvals may not be authorized until the initial approval by the sediment and erosion control Inspector is given.*
9. *Approval shall be requested on final stabilization of all sites with disturbed areas in excess of two acres before removal of controls.*
10. *Existing topography must be field verified by responsible personnel to satisfaction of the sediment control Inspector prior to commencing work.*

Signature(s) of Developer/Owner _____ *Date* _____

Print: *Name:* SANDRA L. SARGENT

Title: P.O. BOX 1957 *Affiliation:* TRUSTEE OF SARGENT LIVING TRUST

Address: EDGEWATER, MARYLAND 21037

Telephone Number: _____

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

Definition

Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

Purpose

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.

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:
- *a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.*
- *b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies as moisture and plant nutrients.*
- *c. The original soil to be vegetated contains materials toxic to plant growth.*
- *d. The soil is so acidic that treatment with limestone is not feasible.*

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on these plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as seet 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 section in the Soil Survey published by USDA–SCS in cooperation with Maryland Agricultural experimental Station.

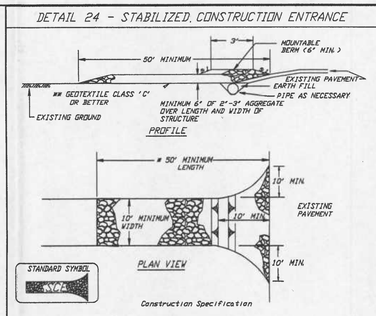
II Topsoil Specifications– Soil to be used as topsoil must meet the following:
- *I. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones,slag,coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1–1/2" in diameter.*
- *II. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, johnsongrass,nutsedge, paisan ivy, thistle, or others as specified.*
- *III. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4–8 tons/acre (200–400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.*

III For sites having disturbed areas under 5 acres:
- *I. Place topsoil (if required") and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Materials.*

IV For sites having disturbed areas over 5 acres:
- *I. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:*
  - *a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be perscribed to raise the pH to 6.5 or higher.*
  - *b. Organic content of topsoil shall be not less than 1.5 percent by weight.*
  - *c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.*
  - *d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto–toxic materials.*

Note: 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.
- *II. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I Vegetative Stabilization Methods and Materials.*

DETAIL 24 – STABILIZED, CONSTRUCTION ENTRANCE

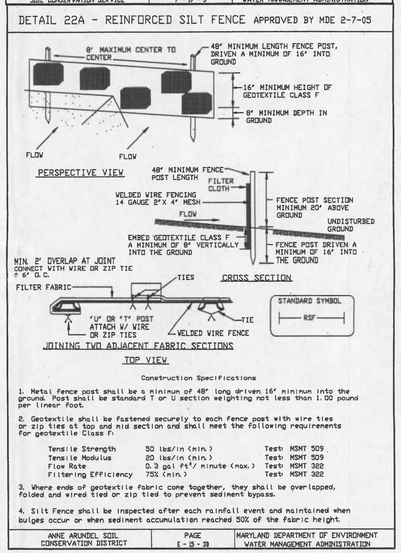


Construction Specification

1. *Length – minimum of 50' (#30' for single residence lot).*
2. *Width – 10' minimum, should be flared at the existing road to provide a turning radius.*
3. *Geotextile Fabric (Filter cloth) shall be placed over the existing ground prior to placing stone. While plan approval authority may not require single family residences to use geotextile.*
4. *Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.*
5. *Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.*
6. *Location – A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.*

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22A – REINFORCED SILT FENCE APPROVED BY MDE 2-7-05



Construction Specifications

1. Metal fence post shall be a minimun of 48" long driven 16" minimun into the ground. Post shall be standard T or U section weighting not less than 1.00 pound per lineal foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or zip ties at top and mid section and shall meet the following requirements for geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft²/ minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric cone together, they shall be overlapped, folded and wired tied or zip tied to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

ANNE ARUNDEL SOIL CONSERVATION DISTRICT	PAGE F - 19 - 39	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL CONTINUED

V. Topsoil Application
- *I. When topsoiling, maintain needed erosion and sediment control practices such as diversions,Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.*
- *II. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" – 8" higher in elevation.*
- *III. Topsoil shall be uniformly distributed in a 4"–8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be preformed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.*
- *IV. Topsoil shall not be placed while 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.*

VI. Alternative to Permanent Seeding – Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:
- *I. Composted Sludge Material for use as a soil conditioner for site having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:*
  - *a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.*
  - *b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a Ph of 7.0 – 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.*
  - *c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.*
- *II. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lbs/1,000 square feet, and 1/3 the normal lime application rate.*

References: Guideline Specifications, Soil Preparation and Sodding, MD–VA, Pub.#1, Cooperative Extension Service, University of Maryland Polytechnic Institutes. Revised 1973.

QUANTITIES

1. CUT 9 C.Y.
2. FILL 9 C.Y.
3. AREA TO BE VEGETATIVELY STABILIZED: 3,594 S.F. OR 0.083 ACRES
4. AREA TO BE MECHANICALLY STABILIZED: 2,191 S.F. OR 0.050 ACRES

NOTE: THE EARTHWORK QUANTITIES SHOWN ARE FOR THE PURPOSE OF PERMIT FEE CALCULATION. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES AND SOIL TYPES TO HIS SATIFACTION.

LEGEND

- EXISTING GRADE ---------110--------
- PROPOSED GRADE ——110——
- EXISTING ELEVATION 110.8
- PROPOSED ELEVATION 110x8
- REINFORCED SILT FENCE —RSF— —RSF—
- LIMIT OF DISTURBANCE LOD
- STABILIZED CONSTRUCTION ENTRANCE S.C.E.
- STOCKPILE
- PERIMETER DIKE SWALE PD-S

CONSULTANT"S CERTIFICATION

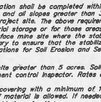
THE DEVELOPER'S PLAN TO CONTROL SILT AND EROSION IS ADEQUATE TO CONTAIN EROSION ON THE PROPERTY COVERED BY THIS PLAN. I CERTIFY THAT THIS PLAN OF EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THIS SITE, AND WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ANNE ARUNDEL COUNTY SOIL CONSERVATION DISTRICT PLAN SUBMITTAL GUIDELINES AND THE CURRENT MARYLAND STATNDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL. I HAVE REVIEWED THIS EROSION AND SEDIMENT CONTROL PLAN WITH THE OWNER/DEVELOPER.

NAME: EDWARD A. BROWN, MD. LAND SURVEYOR LICENSE #10714

FIRM: ED BROWN & ASSOCIATES, INC.

ADDRESS: PLAZA ONE BUILDING
1511 RITCHIE HWY., SUITE 301
ARNOLD, MD. 21012
TEL: (410) 757-2002

SWM-1



SOIL BORING

NO SCALE

I CERTIFY THAT THE SOIL BORING(S) SHOWN HEREON WERE CONDUCTED UNDER MY SUPERVISION AND GUIDANCE. AN ENGINEERING TECHNICIAN MADE THE BORINGS, VISUALLY INSPECTED AND CLASSIFIED THE SOILSENCOUNTERED AND OBTAINED SAMPLES FOR SUBSEQUENT CLASSIFICATION BY ME. THE INFILTRATION RATE IS BASED ON THE USDA TEXTURAL TRIANGLE.

STATE OF MARYLAND — EDWARD A. BROWN — No. 10714 — PROFESSIONAL ENGINEER

1-11-07

STORMWATER MANAGEMENT SUMMARY TABLE

MINIMUM SIZING CRITERIA	SYMBOL	VOLUME DRAINAGE AREA	VOLUME REQUIRED (CUBIC-FEET)	VOLUME PROVIDED (CUBIC-FEET)	SWM PRACTICE	NOTES
WATER QUALITY VOLUME	(WQv)	0.258 ACRES	203 CU. FT.	203 CU. FT.	RAINGARDENS & NATIVE SPECIES PLANTINGS	RAINGARDENS & NATIVE SPECIES PLANTINGS PROVIDE TREATMENT FOR THE WQv REQUIREMENT.
RECHARGE VOLUME	(REv)	0.258 ACRES	25 CU. FT.	25 CU. FT.	RAINGARDENS & NATIVE SPECIES PLANTINGS	RAINGARDENS & NATIVE SPECIES PLANTINGS PROVIDE TREATMENT FOR THE WQv REQUIREMENT.
CHANNEL PROTECTION STORAGE VOLUME	(CPv)	0.258 ACRES	N/A	N/A	N/A	NOT REQUIRED DUE TO QP 1 BEING LESS THAN 2 c.f.s.
OVERBANK FLOOD PROTECTION	(Qp10)	0.258 ACRES	N/A	N/A	N/A	THE Qp10 PEAK DISCHARGE IS ADEQUATELY CONVEYED TO THE SITE OUTFALL AND POINTS-OF-INVESTIGATION
EXTREME FLOOD	(Qf)	0.258 ACRES	N/A	N/A	N/A	THE Qf PEAK DISCHARGE IS ADEQUATELY CONVEYED TO THE SITE OUTFALL AND POINTS-OF-INVESTIGATION

OUTFALL STATEMENT

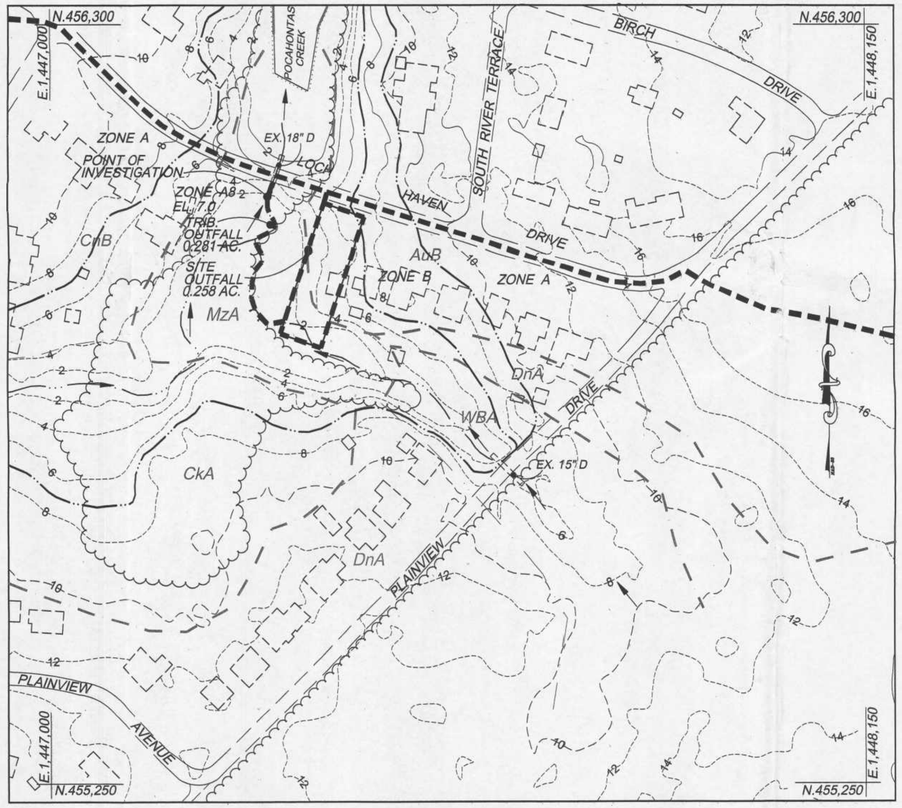
A SITE INSPECTION AND PHOTOGRAPHIC WALKING TOUR WAS CONDUCTED ON AUGUST14, 2007 BY ED BROWN & ASSOCIATES, INC. AND REPORT THE FOLLOWING REGARDING THE OUTFALL AREA.

THE SUBJECT LOT HAS AN EXISTING GARAGE AND A PORTION OF A GRAVEL DRIVEWAY LOCATED IN THE SUBDIVISION OF LOCH HAVEN BEACH.

RUNOFF FROM THE EXISTING LOT SHEET FLOWS FROM THE EASTERN TO WESTERN BOUNDARIES AND ENTERS AN EXISTING WETLAND AREA TO THE WEST OF THE LOT. RUNOFF THEN FLOWS NORTH TO AN EXISTING 18" CMP CULVERT UNDER LOCH HAVEN DRIVE.THIS CULVERT IS LOCATED APPROXIMATELY 80 FT. WEST OF THE SUBJECT LOT. RUNOFF IS CONVEYED NORTH UNDER LOCH HAVEN DRIVE AND DISCHARGES INTO THE TIDAL AREA OF POCAHONTAS CREEK ON THE NORTH SIDE OF THE ROADWAY. THE OUTFALL AREA OF THE 18" CMP CULVERT IS PROTECTED WITH RIPRAP. THERE WERE NO SIGNS OF EROSION, SCOUR OR SEDIMENTATION OF THE OUTFALL CHANNEL ON THIS DATE.

THE PROPOSED DEVELOPMENT CALLS FOR NEW PLANTED AREAS OF NATIVE SPECIES PLANTINGS AND RAINGARDENS TO BE INSTALLED ON THE SITE PARCEL. THE PLANTINGS WILL ACT AS A FILTER TO THE RUNOFF PRIOR TO IT LEAVING THE SITE. FINAL SITE GRADING WILL NOT CONCENTRATE THE RUNOFF AND WILL ADEQUATELY CONVEY IT TO THE SITE OUTFALL.

NO ADVERSE DOWNSTREAM IMPACT IS ANTICIPATED AS A RESULT OF THE PROPOSED DEVELOPMENT WITH THE IMPLEMENTATION OF SEDIMENT CONTROL MEASURES DURING CONSTRUCTION PHASE AND INSTALLATION OF NATIVE SPECIES PLANTINGS FOR STORMWATER MANAGEMENT REQUIREMENTS.



DRAINAGE AREA MAP

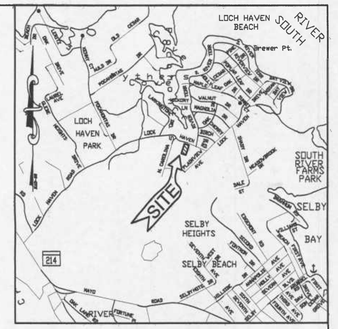
SCALE : 1" = 100'

OWNERS

RICK SARGENT AND
SANDRA LOFGREN SARGENT
TRUSTEES OF SARGENT LIVING TRUST
P.O. BOX 1957
EDGEWATER, MARYLAND 21037

DEED REFERENCE: LIBER 18939, FOLIO 759
TAX ACCOUNT: 1-480-90228918

INDEX TO SHEETS



VICINITY MAP

SCALE : 1" = 2,000'

GENERAL NOTES

1. ZONING: R5- RESIDENTIAL DISTRICT
2. SETBACKS: FRONT: 25'
   REAR: 20'
   SIDE: 7' MINIMMUM
   MINIMUM WIDTH AT FRONT BUILDING RESTRICTION LINE IS 60 FT.
3. PREDOMINANT SOIL TYPE: AuB ANNAPOLIS- URBAN LAND COMPLEX, 0-5% SLOPES HYDROLOGIC SOILS GROUP 'C'
   MZA- MISIPILLION & TRANSQUAKING SOILS, 0-1% SLOPES TIDALLY FLOODED, HYDROLOGIC SOILS GROUP 'D'
4. TOTAL AREA OF SITE: 11,250 SQ. FT. OR 0.258 ACRES.
   MINIMUM LOT AREA IN R5 ZONE IS 7,000 SQ. FT.
5. PROPOSED DISTURBED AREA: 5,785 SQ. FT. OR 0.133 ACRES.
6. A. A. COUNTY TOPO SHEET: 8A
7. F.E.M.A. RATE MAP: #240008-0043C ZONE: A-8 (ELEV. 7.0) AND ZONE C
8. THIS LOT IS WITHIN THE FEMA 100 YEAR FLOOD AREA.
9. FIELD RUN TOPOGRAPHY BY ED BROWN AND ASSOCIATES, INC.
10. PRIVATE WATER.
11. PUBLIC SEWER.
12. EARTH MOVING: ANY STOCKPILE NECESSARY SHALL REMAIN WITHIN THE LIMITS PROTECTED BY SEDIMENT CONTROL MEASURES. ANY EXCESS SPOIL OR BORROW MATERIAL SHALL BE TAKEN TO OR OBTAINED FROM A. A. CO. APPROVED SITE.
13. DOWNSPOUT PROTECTION: ALL DOWNSPOUTS ARE TO BE CARRIED TO THE TOE OF THE FILL SLOPES. SPLASH BLOCKS ARE TO BE PROVIDED AT ALL DOWNSPOUTS NOT DISCHARGING ONTO A PAVED SURFACE.
14. DISTURBANCE WITHIN LOCH HAVEN ROAD
    MUST BE STABILIZED IMMEDIATELY USING COLD PATCH BITUMINOUS MATERIAL. PERMANENT PAVE PATCHING IN THESE AREAS WITH HOT MIX BITUMINOUS MATERIALS MUST BE IMPLEMENTED WITHIN 14-30 DAYS TO MATCH THE EXISTING PAVEMENT SECTION OF ROAD.
15. THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS SATISFACTION PRIOR TO CONSTRUCTION. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS AND ANY DAMAGE TO THEM SHALL BE REPAIRED AT HIS OWN EXPENSE.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE OBSERVANCE OF ALL APPLICABLE O.S.H.A./M.O.S.H.A. REGULATIONS CONCERNING CONSTRUCTION, EXCAVATION AND BACKFILL.
17. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND PROGRAMS.
18. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING AGENCIES AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS-
    - A. MISS UTILITY 1-800-257-7777
    - B. ANNE ARUNDEL COUNTY DEPARTMENT OF INSPECTIONS & PERMITS 410-222-7347

SEQUENCE OF CONSTRUCTION

1. PRE-CONSTRUCTION MEETING: NOTIFY THE DEPARTMENT OF INSPECTIONS AND PERMITS AT LEAST 48 HOURS BEFORE COMMENCING WORK. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PERSONNEL HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS. 48 HOURS
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES SUCH AS REINFORCED SILT FENCE, STABILIZED CONSTRUCTION ENTRANCE CONTACT INSPECTIONS AND PERMITS FOR "PHASE ONE" INSPECTION. 2 DAYS
3. DEMO EXISTING GARAGE AND HAUL TO AN EXISTING LANDFILL OR APPROVED SITE. 1 DAY
4. ROUGH GRADE LIMIT OF DISTURBANCE. 4 DAYS
5. EXCAVATE FOR AND CONSTRUCT FOUNDATION (AT HOUSE BACKFILL, STABILIZE ALL AFFECTED AREAS AS PER THE STABILIZATION SPECIFICATIONS) GRADE AND STABILIZE REMAINDER OF SITE. MAINTAIN SEDIMENT CONTROL MEASURES. 2 WEEKS
6. CONSTRUCT HOUSE, DRIVEWAY AND MAYO SEWER SYSTEM AND MAINTAIN SEDMENT CONTROL MEASURES. 4 MONTHS
7. INSTALL THE REQUIRED STORMWATER MANAGEMENT RAINGARDENS AND PLANTINGS AND OBTAIN INSPECTION BY COUNTY AND ENGINEER OF RECORD. 2 DAYS
8. FINAL CLEANUP, STABILIZATION AND REMOVAL OF REMAINING SEDIMENT CONTROL MEASURES WITH INSPECTOR'S APPROVAL. 5 DAYS

RECEIVED
JAN 24 2008
CRITICAL AREA COMMISSION
Chesapeake & Atlantic Coastal Bays

STATE OF MARYLAND — EDWARD A. BROWN — No. 10714 — PROFESSIONAL LAND SURVEYOR — REGISTERED

1-10-08

ED BROWN & ASSOCIATES, INC.
LAND SURVEYORS - LAND PLANNERS
DEVELOPMENT CONSULTANTS
PLAZA ONE BUILDING
1511 RITCHIE HWY, SUITE 301
ARNOLD, MARYLAND 21012
PHONE 410-757-2002, FAX 410-757-2011
Email: edbrownassoc@comcast.net

RECEIVED
JAN 24 2008
CRITICAL AREA COMMISSION
Chesapeake & Atlantic Coastal Bays

VARIANCE SITE PLAN &

GRADING & SEDIMENT CONTROL PLAN

SCALE: AS NOTED	
DATE: JANUARY 2008	
DRAWN BY: JAY	
CHECKED BY: R.F.M.	
JOB NO: 07-17334	
SHEET NO: 1 OF 3	

LOT 6, BLOCK 'U', SECTION 2
LOCH HAVEN

LOCH HAVEN DRIVE, EDGEWATER, MD. 21037
TAX MAP 60, BLOCK 4, PARCEL 23, ZONING R5
FIRST DISTRICT ANNE ARUNDEL COUNTY, MARYLAND

LEGEND

EXISTING GRADE — 30 —
PROPOSED GRADE — 30
EXISTING ELEVATION 23+0
PROPOSED ELEVATION 23.5 x
EX. SEWER
PROP. SEWER
EX. STORM DRAIN
PROP. HOUSE
EX. WOODS
LIMITS OF DISTURBANCE — LOD —
STEEP SLOPES (25%+)
REINFORCED SILT FENCE —RSF—RSF—
SUPER SILT FENCE —SSF—SSF—
STOCKPILE
PERIMETER DIKE SWALE PD-S
STABILIZED CONSTRUCTION ENTRANCE S.C.E.
EXISTING WETLANDS W
PROP. CR6 PAVE
EX. CR6 PAVE TO BE REMOVED
HYDROLOGIC SOILS AuB MzA
PROP. RAINGARDEN
ZONING BOUNDARY OS R5

IMPERVIOUS TABULATION

PRE-DEVELOPMENT-		POST-DEVELOPMENT-	
EX. GARAGE	678 SF	HOUSE (30'x46')	1,380 SF
EX. CR6 PAVING	764 SF	STOOP & WALK	45 SF
TOTAL IMPERVIOUS=	1,442 SF	PROP. CR6 PAVING	660 SF
		TOTAL IMPERVIOUS=	2,085 SF

WQv COMPUTATIONS

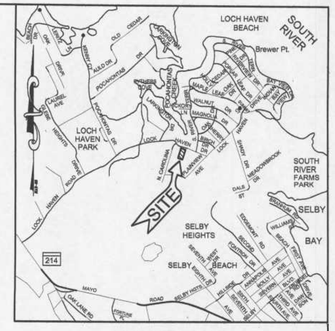
TOTAL LOT AREA= 11,250 S. FT. OR 0.258 AC.
TOTAL IMPERVIOUS AREA= 2,085 SQ. FT. OR 0.048 AC.
IMPERVIOUS COVER % = 2,085 S. FT. / 11,250 SQ. FT.
= .185 OR 18.5%
PRECIPITATION (P)= 1.0 INCH
VOLUMETRIC RUNOFF COEFFICIENT (Rv)-
Rv= 0.05 + (0.009) (I)
Rv= 0.05 + (0.009) (18.5)
Rv= 0.217
WATER QUALITY VOLUME (WQv)-
WQv= [(P) (Rv) (A)] / 12
WQv= [(1.0) (0.217) (0.258)] / 12
WQv= 0.0047 AC. FT.
WQv= 203 CU. FT.

Rev COMPUTATIONS

SOIL SPECIFIC RECHARGE FACTOR (S) FOR 'C' HYDROLOGIC SOILS IS 0.14; FOR 'D' HYDROLOGIC SOILS IS 0.08. THE COMPOSITE (S) IS-
'C' SOILS IS 66.8% OF TOTAL (7,515 SF/ 11,250 SF)
'D' SOILS IS 33.2% OF TOTAL (3,735 SF/ 11,250 SF)
THEREFORE; 0.14 x 0.668= 0.094
0.08 X 0.332= 0.027
COMPOSITE (S)= 0.121
RECHARGE VOLUME (Rev)-
Rev= [(S) (Rv) (A)] / 12
Rev= [(0.121) (0.217) (0.258)] / 12
Rev= 0.0006 AC. FT.
Rev= 25 CU. FT.

CPv COMPUTATIONS

WE OFFER THE FOLLOWING COMPUTATIONS IN ACCORDANCE WITH APPENDIX D-11 OF THE STATE MANUAL-
D.A. TO SITE OUTFALL= 0.258 AC.
COMPOSITE RCN= 82 ('C' & 'D' SOILS, R5 ZONING- 1/4 AC. LOT)
RAINFALL DEPTH FOR 1-YR. STORM= 2.7 INCHES
1. THE TIME OF CONCENTRATION (Tc)=
20 L.F. OVERLAND FLOW- SHORT GRASS @ 5.00%
21 L.F. SHALLOW CONCENT. FLOW- PAVED @ 3.30%
27 L.F. SHALLOW CONCENT. FLOW- UNPAVED @ 6.30%
Tc= 0.100 HR.
2. THE ONE-YEAR POST-DEVELOPMENT RUNOFF DEPTH IN INCHES (Qa) IS 1.14
3. Ia = 200/82 - 2 = 0.439
4. Ia/P = 0.439/2.7 = 0.163
5. qu = 975
6. A= 0.258/640 = 0.0004 Sq. Miles
7. ONE-YEAR POST-DEVELOPMENT PEAK DISCHARGE (qi)-
qi = qu x A x Qa = 975 x 0.0004 x 1.14
qi = 0.45 CFS (CPv OR QP1)
8. SINCE QP1 IS LESS THAN 2.0 CFS, NO CPv IS REQUIRED.



VICINITY MAP
SCALE : 1" = 2,000'

CRITICAL AREA TABULATION (LDA)

1. CRITICAL AREA DESIGNATION: LDA (LIMITED DEVELOPMENT AREA)
PARCEL IS ENTIRELY WITHIN LDA OF THE CRITICAL AREA (CRITICAL AREA MAP #24).
2. THIS ENTIRE DEVELOPMENT IS WITHIN THE 100 FT. TIDAL WETLAND BUFFER.
3. TOTAL LOT 6 AREA= 11,250 SQ.FT. OR 0.258 ACRES.
4. IMPERVIOUS AREAS TABULATION-

EXISTING LOT 6 IMPERVIOUS AREAS=	EX. GARAGE	678 S.F.
	EX. CR6 PAVING	764 S.F.
	TOTAL EX. IMPERVIOUS=	1,442 S.F.

NOTE: ALL EXISTING IMPERVIOUS AREAS ON LOT 6 ARE TO BE REMOVED.

PROPOSED LOT 6 IMPERVIOUS AREAS=	HOUSE	1,380 S.F.
	STOOP & WALK	45 S.F.
	CR6 PAVING	660 S.F.
	TOTAL PROP. IMPERVIOUS=	2,085 S.F.
	OR 18.5% OF TOTAL LOT AREA (2,085 S.F./10,250 S.F.)	

NOTE: MAXIMUM ALLOWED IMPERVIOUS IN CRITICAL AREA FOR LOTS CREATED BEFORE DECEMBER 1, 1985 FOR LOTS SIZE 8,001 S.F. TO 21,780 S.F. IS 31.25% OF PARCEL PER ANNE ARUNDEL COUNTY CODE (ARTICLE 17; SECTION 17-8-402 (b) (1).

INCREASE IN LOT 6 IMPERVIOUS AREAS=	2,085 S.F.	POST-DEVELOPMENT
	-1,442 S.F.	PRE=DEVELOPMENT
	643 S.F.	INCREASE IN IMPERVIOUS AREAS
REDUCTION IN LOT 7 IMPERVIOUS AREAS=	361 S.F.	CR6 PAVING TO BE REMOVED
	-106 S.F.	CR6 PAVING TO BE INSTALLED
	255 S.F.	REDUCTION IN LOT 7 IMPERVIOUS AREAS
NET INCREASE IN IMPERVIOUS AREAS=	643 S.F.	INCREASE IN LOT 6 IMPERVIOUS AREAS
	-215 S.F.	IREDUCTION IN LOT 7 IMPERVIOUS AREAS
	428 S.F.	NET INCREASE IN IMPERVIOUS AREAS

5. WOODLAND AREAS TABULATION-

EXISTING WOODLAND ON LOT 7=	3,926 S.F. OR 34.9% OF TOTAL LOT 7 AREA (3,926 S.F./11,250 S.F.)	
PROPOSED WOODLAND CLEARING=	63 S.F.	AT MAYO SEWER SYSTEM INSTALLATION
	+434 S.F.	EX. 23.4" DIAM. TREE TO BE REMOVED
	497 S.F.	TOTAL

NOTE: THE OWNER WILL PROVIDE REPLACEMENT PLANTING ONSITE TO OFFSET THE WOODLAND CLEARING.

6. THERE ARE NO HABITAT AREAS, OR STEEP SLOPES AFFECTED BY THIS DEVELOPMENT.

PLAN VIEW

SCALE: 1" = 20'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

VARIANCE SITE PLAN &
GRADING & SEDIMENT CONTROL PLAN

ED BROWN & ASSOCIATES, INC.
LAND SURVEYORS - LAND PLANNERS
DEVELOPMENT CONSULTANTS
PLAZA ONE BUILDING
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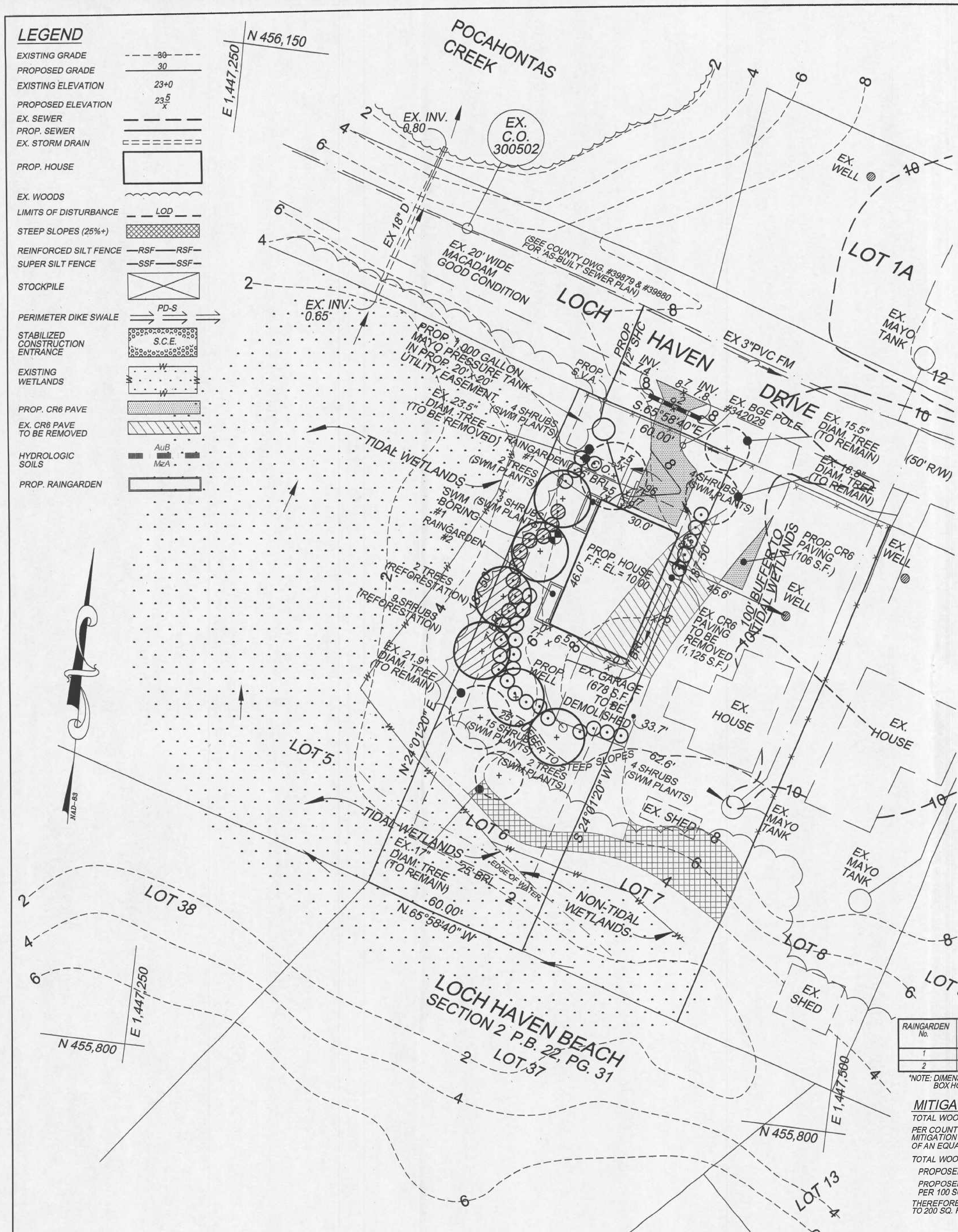
PHONE 410-757-2002, FAX 410-757-2011
Email: edbrownassoc@comcast.net

STATE OF MARYLAND — EDWARD A. BROWN — No. 10714 — REGISTERED — PROFESSIONAL LAND SURVEYOR — 7-10-08

SCALE: AS NOTED	
DATE: JANUARY 2008	
DRAWN BY: JAY	
CHECKED BY: R.F.M.	
JOB NO: 07-17334	
SHEET NO: 2 OF 3	

LOT 6, BLOCK 'U', SECTION 2
LOCH HAVEN BEACH
3579 LOCH HAVEN DRIVE, EDGEWATER, MD. 21037
TAX MAP 60, BLOCK 4, PARCEL 23, ZONING R5
FIRST DISTRICT ANNE ARUNDEL COUNTY, MARYLAND



PLAN VIEW

SCALE: 1" = 20'

GRAPHIC SCALE

0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

SPECIFICATIONS FOR RAINGARDENS

THE ALLOWABLE MATERIALS TO BE USED IN RAINGARDENS ARE DETAILED IN TABLE A.

A. PLANTING SOIL

THE CHARACTERISITCS OF PLANTING SOIL FOR RAINGARDENS AREA AS IMPORTANT TO THE LONGEVITY AND SUCCESS OF THE DESIGN AS LOCATION, SIZE, AND TREATMENT VOLUME. THE SOIL MUST BE PERMEABLE ENOUGH TO ALLOW STORMWATER RUNOFF TO FILTER THROUGH THE RAINGARDEN, WHILE STILL BEING CAPABLE OF PROMOTING AND SUSTAINING VIGOROUS VEGETATIVE COVER. ADDITIONALLY, MUCH OF THE NUTRIENT POLLUTANT UPTAKE IS THROUGH THE ABSORPTION AND MICROBIAL ACYTIVITY WITHIN THE SOIL PROFILE. AS A RESULT, PLANTING SOILS MUST BALANCE CHEMICAL AND PHYSICAL PROPERTIES TO SUPPORT BIOTIC COMMUNITIES BOTH ABOVE AND BELOW THE GROUND SURFACE.

PLANTING SOIL SHOULD BE SANDY LOAM, LOAMY SAND, OR A LOAM/SAND MIX AND SHOULD CONTAIN A MINIMUM 35 TO 60% SAND BY VOLUME. THE CLAY CONTENT SHOULD BE LESS THAN 25%. THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER. BRUSH OR SEEDS FROM NOXIOUS WEEDS (E.G. JOHNSON GRASS, MUGWORT, NUTSEDGE, AND CANADA THISTLE) SHOULD NOT BE PREDSENT IN THE SOILS. ONE SIMPLE METHOD FOR PRODUCING SUITABLE PLANTING SOIL IS TO MIX THREE PARTS OF COMMERCIALLY AVAILABLE WASHED SAND WITH TWO PARTS TOPSOIL TO PRODUCE A HOMOGENEOUS SOIL. PLANTING SOIL SHOULD BE PLACED IN 12" TO 18" LAYERS THAT AREA LOOSELY COMPACTED (E.G. TAMPED LIGHTLY WITH A BACKHOE BUCKET) TO A DEPTH OF 2 1/2 TO 4 FEET.

B. MULCH

ANOTHER IMPORTANT FEATURE OIF THE RAINGARDEN IS THE SURFACE MULCH LAYER. MULCH HELPS MAINTAIN SOIL MOISTURE AND TRAPS FINER SEDIMENTS THAT MAY LEAD TO PREMATURE FAILURE. MULCH ALSO PREVENTS EROSION AND SERVES AS AN IMPORTANT MICROENVIRONMENT FOR SOIL BIOTA.

RAINGARDEN MULCH USED SHOULD BE THE STANDARD LANDSCAPE STYLE, SINGLE OR DOUBLE SHREDDED HARDWOOD MULCH. THE MULCH SHOULD BE WELL AGED (STOCKPILED OR STORED FOR AT LEAST TWELVE MONTHS), UNIFORM IN COLOR, AND FREE OF OTHER MATERIALS SUCH AS WEEDS OR ROOTS. GRASS CLIPPINGS ARE UNACCEPTABLE AS A MULCH MATERIAL. MULCH SHOULD BE APPLIED TO A MAXIMUM DEPTH OF THREE INCHES. RAINGARDENS SHOULD BE RE-MULCHED ON AN ANNUAL BASIS.

C. UNDERDRAINS

RAINGARDENS REQUIRE POSITIVE DRAINAGE CONDITIONS AND PERMEABLE SOILS FOR LONG TERM, TROUBLE-FREE PERFORMANCE. INSTALLING A PERFORATED PIPE UNDERDRAIN SYSTEM PROVIDES CONSISTENT DRAINAGE FOR THE RAINGARDEN. WHILE OPTIONAL IN POROUS WELL-DRAINED SOILS, UNDERDRAINS ARE REQUIRED IN SILT OR CLAY SOILS 9HYDROLOGIC SOILS GROUPS C AND D) OR IN AREAS WHERE GROUNDWATER IS LESS THAN TWO FEET BELOW THE BOTTOM OF THE RAINGARDEN.

UNDERDRAINS SHOULD BE INSTALLED BELKOW THE PLANTING SOIL BED (BETWEEN 2 1/2 TO 4 FEET BELOW SURFACE). THE UNDERDRAIN MAY BE INSTALLED AS SHALLOW AS 18" BELOW THE SURFACE IF NECESSARY TO PROVIDE AN OUTLET. IN THIS EXTREME CASE, THE UNDERDRAIN SHOULD BE INSTALLED WITHIN THE PLANTING SOIL BED.

UNDERDRAINS SHALL CONSIST OF A 1 1/2" TO 4" DIAMETER RIGID SCHEDULE 40 (OR SDR 35) PVC PIPE (SLOTTED HDPE IS ALSO ACCEPTABLE) THAT IS PERFORATED WITHIN THE RAINGARDEN. PERFORATIONS SHALL BE 3/8" DAIMETER MINIMUM AT 6" ON CENTER WITH A MINIMUM OF 4 HOLES PER ROW. UNDERDRAINS SHALL BE PLACED ON A 3' WIDE SECTION OF FILTER CLOTH (CLASS "C" GEOTEXTILE, SEE TABLE R-1). THE PIPE IS PLACED NEXT, FOLLOWED BY THE GRAVEL BEDDING. THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. AT LEATS ONE OBSERVATION WELL/CLEANOUT MUST BE PROVIDED PER RAINGARDEN.

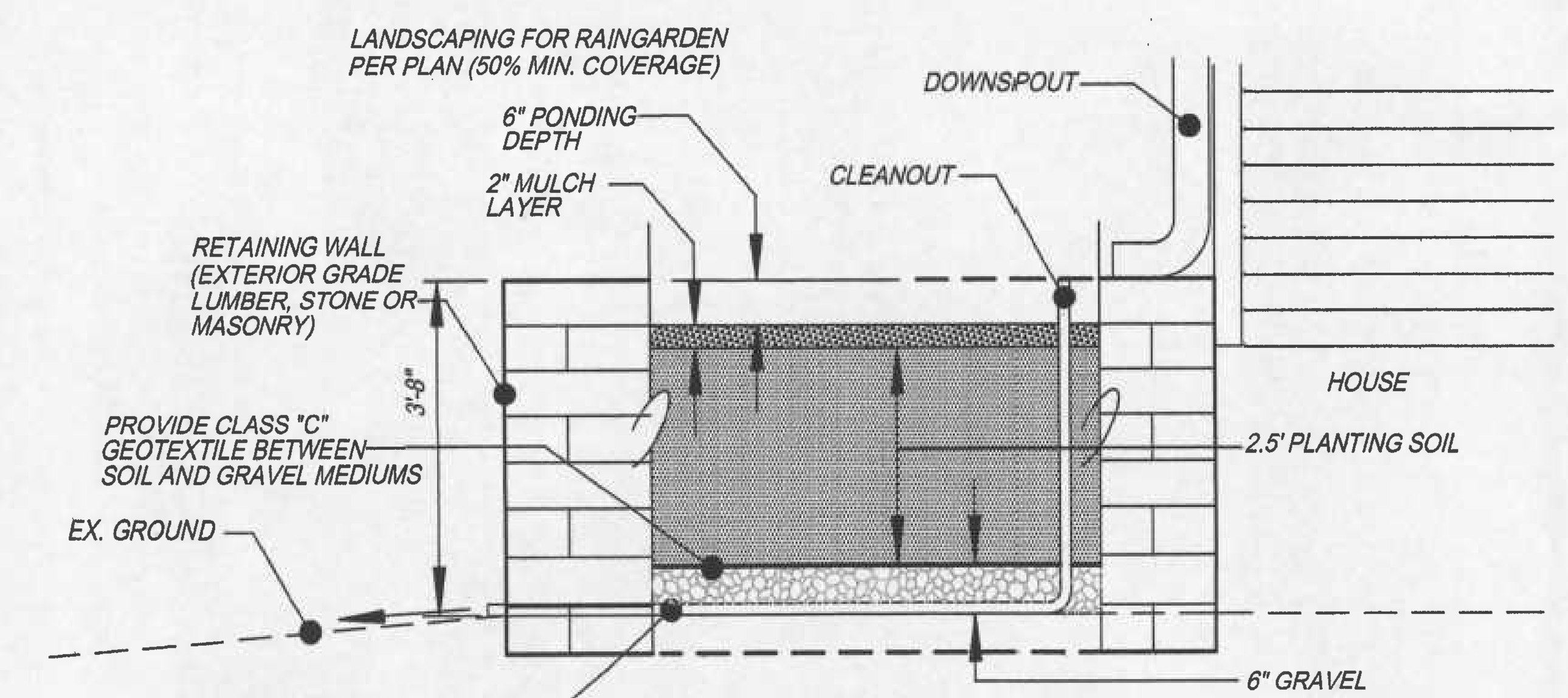
A RODENT GUARD SHOULD BE INSTALLED AT THE DOWNSTREAM END OF UNDERDRAINS TO PREVENT MICE AND LARGE RODENTS FROM ENTRY. A TYPICAL RODENT GUARD CONSISTES OF A 3/8" HEX-HEAD BOLT THROUH THE PIPE HORIZONTALLY. NUTS ARE PLACED ON BOTH THE INSIDE AND OUTSIDE OF THE PIPE. THIS DISCOURAGES RODENTS AND PREVENTS CRUSHING OF THE PIPE.

MISCELLANEOUS

RAINGARDENS SHALL NOT BE CONSTRUCTED UNTIL ALL CXONTRIBUTING DRAINAGAE AREA HAS BEEN STABILIZED.

TABLE A. - MATERIALS SPECIFICATIONS FOR RAINGARDENS

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTINGS	SEE TABLE R.5	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2 1/2' TO 4' DEEP	SAND: 30% TO 60% SILT: 30% TO 55% CLAY: 0% TO 25%	N/A	USDA SOIL TYPES LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD	N/A	AGED SIX MONTHS MINIMUM
GEOTEXTILE	CLASS "C" - APPARENT OPENING (ASTM-D-4751), GRAB TENSILE STRENGTH (ASTM-D-4632), PUNCTURE RESISTANCE (ASTM-D-4833)	N/A	USE AS NECESSARY BENEATH UNDERDRAINS ONLY
UNDERDRAIN			
GRAVEL	AASHTO M-43 #57 OR #67	3/8" TO 3/4"	
PIPING	F 758 TYPE PS 28 OR AASHTO M-278	4" TO 6" RIGID SCHEDULE 40 PVC, SDR35 OR HDPE	3/8" PERFORATIONS @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" GRAVEL OVER PIPES; GRAVEL NOT NECESSARY BENEATH PIPES



RAINGARDEN SECTION VIEW

NOT TO SCALE

RAINGARDEN DIMENSIONS

RAINGARDEN No.	CONTRIBUTING IMPERVIOUS AREA (SQ. FT.)	REQUIRED SURFACE AREA (SQ. FT.)	PROVIDED SURFACE AREA (SQ. FT.)	DIMENSIONS LGTH. x WIDTH *
1	345 SQ. FT.	50 SQ. FT.	50 SQ. FT.	12.5 FT. x 4.0 FT.
2	345 SQ. FT.	50 SQ. FT.	50 SQ. FT.	12.5 FT. x 4.0 FT.

*NOTE: DIMENSIONS ARE THE INSIDE DIMENSIONS OF THE RAINGARDEN PLANTING BOX HOLDING THE PLANTING SOIL..

MITIGATION PLANTINGS:

TOTAL WOODLAND CLEARED IS 497 SQ. FT.

PER COUNTY CODE ARTICLE 17, TITLE 8, SUBTITLE 6, SECTION 17-8-602(a), MITIGATION FOR SITE CLEARED 20% OR LESS IS ONSITE REORESTATION OF AN EQUAL AREA TO THE AREA TO BE CLEARED.

TOTAL WOODLAND MITIGATION/REPLACEMENT PLANTINGS-

PROPOSED TWO (2) TREES= 2 x 100 SQ. FT.= 200 SQ. FT.

PROPOSED TWELVE (12) SHRUBS= 12 SHRUBS/3 SHRUBS PER 100 SQ. FT.= 400 SQ. FT.

THEREFORE, TOTAL MITIGATION/REPLACEMENT PLANTINGS EQUAL TO 200 SQ. FT. + 400 SQ. FT.= 600 SQ. FT.

STORMWATER MANAGEMENT PLANTINGS:

SINCE THE SOIL BORING INDICATES SILTY CLAY LOAM SOILS AND A WATER TABLE AT A DEPTH OF 2.0 FEET, NATIVE SPECIES VEGETATION, 1 1/2" CALIPER TREES AND AND 3-4 GALLON SHRUBS, WILL BE INSTALLED TO OFFSET THE ON-SITE IMPERVIOUS AREAS.

MINIMUM REQUIRED PLANTINGS MUST EQUAL OR EXCEED THE PROPOSED IMPERVIOUS AREAS. AT ONE (1) TREE EQUALS 100 SQ. FT. OF IMPERVIOUS AREA AND THREE (3) SHRUBS EQUALS 100 SQ. FT. OF IMPERVIOUS AREA. THE FOLLOWING PLANTINGS ARE PROPOSED-

PROPOSED IMPERVIOUS AREAS= 2,085 SQ. FT.- 690 SQ. FT. (RAINGARDENS FOR HALF OF ROOF)= 1,395 SQ. FT.

PROPOSED FOUR (4) TREES= 4 x 100 SQ. FT.= 400 SQ. FT.

PROPOSED THIRTY (30) SHRUBS= 30 SHRUBS/3 SHRUBS PER 100 SQ. FT.= 10 x 100 SQ. FT. = 1,000 SQ. FT.

EQUIVALENT SQ. FT. WQ TREATMENT= 400 SQ. FT. (TREES) + 1,000 SQ. FT. (SHRUBS) = 1,400 SQ. FT.

EQUIVALENT SQ. FT. WQ TREATMENT OF 1,400 SQ. FT. EXCEEDS PROPOSED IMPERVIOUS AREAS OF 1,395 SQ. FT.

THEREFORE, THE TOTAL SWM PLANTINGS EQUAL TO 1,400 SQ. FT. WILL BE BONDED AT $1.20 PER SQ. FT. AND SHALL BE PLANTED ONSITE.

D. PLANT INSTALLATION

MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2 TO 3 INCHES. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO THAT 1/8TH OF THE BALL IS ABOVE FINAL GRADESURFACE. THE DIAMETER OF THE PLANTING PIT SHOULD BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT (UPRIGHT) DURING THE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.

TREES SHALL BE BRACED USING 2" BY 2" STALKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDED ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE RAINGARDEN IS TI IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH IS USED TO AMEND THE SOIL.

E. PLANTING GUIDANCE

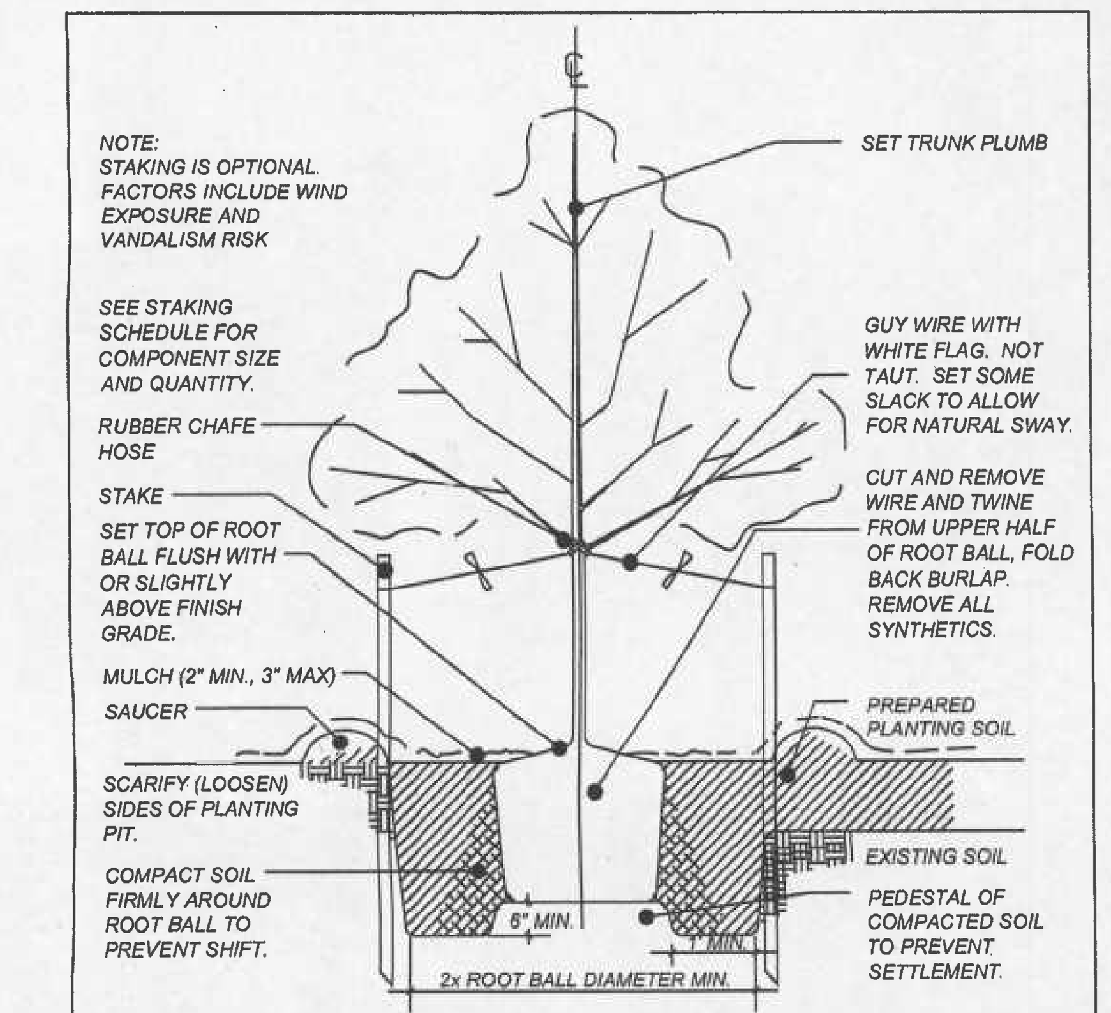
PLANT MATERIAL SELECTION SHOULD BE BASED ON THE GOAL OF SIMULATING A TERRESTRIAL COMMUNITY OF NATIVE SPECIES BUT MAY BE TAILORED TO VARIOUS GARDENING THEMES. RAINGARDENS SIMULATE UPLAND SPECIES ECO-SYSTEMS THAT ARE DOMINATED BY SHRUBS AND HERBACEOUS MATERIALS BUT MAY ALSO CONTAIN TREES. BY CREATING A DIVERSE, DENSE PLANT COVER, THE RAINGARDEN WILL BE ABLE TO TREAT STORMWATER RUNOFF AND WITHSTAND URBAN STRESSES FROM INSECTS, DISEASE, DROUGHT, TEMPERATURE, WIND AND EXPOSURE.

THE PROPER SELECTION AND INSTALLATION OF PLANT MATERIALS IS KEY TO A SUCESSFUL SYSTEM. THERE ARE ESSENTIALLY THREE ZONES WITHIN A RAINGARDEN. THE LOWEST ELEVATION SUPPORTS PLANT SPECIES THAT ARE ARE ADAPTED TO STANDING AND FLUCTUATINGWATER LEVELS. THE MIDDLE ELEVATION SUPPORTS PLANTS THAT LIKE DRIER SOIL CONDITIONS BUT MAY TOLERATE OCCASSIONALINUNDATION BY WATER. THE OUTER EDGE IS THE HIGHEST ELEVATION AND GENERALLY SUPPORTS PLANTS ADAPTED TO DRIER CONDITIONS. A LISTING OF APPROPRIATE PLANT MATERIALS IS INCLUDED IN APPENDIX A OF THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOL. I & II (SEE WWW.MDE.STATE.MD.US). THE LAYOUT OF PLANT MATERIAL SHOULD BE FLEXIBLE, BUT SHOULD ALSO FOLLOW THE GENERAL PRINCIPLES OUTLINED IN TABLE B. THE OBJECTIVE IS TO HAVE A SYSTEM THAT RESEMBLES A RANDOM AND NATURAL PLANT LAYOUT, WHILE MAINTAINING OPTIMAL CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH.

TABLE B - PLANTING DESIGN CONSIDERATIONS

- > NATIVE PLANT SPECIES SHOULKD BE SPECIFIED OVER EXOTIC OR FOREIGN SPECIES.
- > APPROPRIATE VEGETATION SHOULD BE SELECTED BASED ON THE ZONE OF TOLERANCE.
- > SPECIES LAYOUT SHOULD GENERALLY BE RANDON AND NATURAL.
- > A CANOPY MAY BE ESTABLISHED WITH AN UNDERSTORY OF SHRUBS AND HERBACEOUS MATERIAL.
- > WOODY VEGETATION (SHRUBS AND TREES) SHOULD NOT BE IN THE VICINITY OF INFLOW LOCATIONS.
- > TREES AND SHRUBS SHOULD BE PLANTED PRIMARILY ALONG THE PERIMETER OF THE RAINGARDEN.
- > STRESSORS (E.G. WIND, SUN, EXPOSURE, INSECTS AND DISEASE INFESTATION, AND DROUGHT) SHOULD BE BE CONSIDERED WHEN DEVELOPING THE PLANTING PLAN.
- > NOXIOUS WEEDS SHALL NOT BE SPECIFIED OR USED.
- > AESTHETICS AND VISUAL CHARACTERISTICS SHOULD BE A PRIME CONSIDERATION.
- > SAFETY ISSUES MUST BE CONSIDERED.
- > EXISTING AND PROPOSED UTILITIES (E.G. WATER, SEWER, OR ELECTRIC) MUST BE IDENTIFIED AND CONSIDERED.

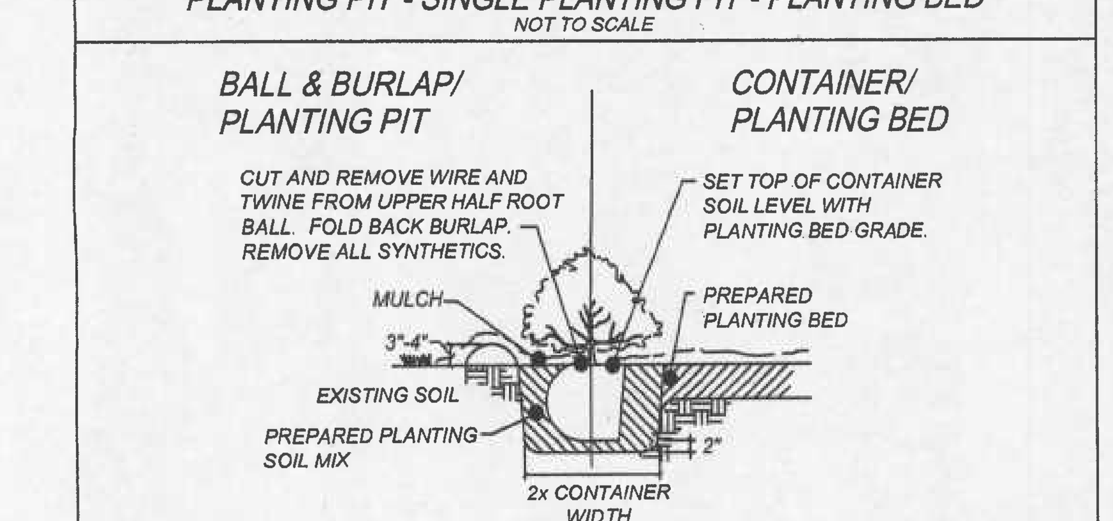
THE PLANT MATERIALS SHOULD CONFORM TO THE AMERICAN ASSOCIATION OF NUSERYMEN'S PUBLICATION, THE AMERICAN STANDARD NURSERY STOCK.



DETAIL - DECIDUOUS TREE PLANTING - TO 2 1/2" CALIPER

PLANTING PIT - SINGLE PLANTING PIT - PLANTING BED

NOT TO SCALE



DETAIL - SHRUB PLANTING

NOT TO SCALE

STORMWATER MANAGEMENT PLANTING CHART

LEGEND	NO.	SCIENTIFIC NAME	COMMON NAME	TYPE
(large circle)	4	SASSAFRAS ALBIDUM QUERCUS FALCATA LIRIODENDRON TULIPFERA CORNUS FLORIDA CERCIS CANADENSIS	SASSAFRAS SOUTHERN RED OAK YELLOW POPLAR DOGWOOD EASTERN REDBUD	1-1/2" CAL TREE B & B
(small circle)	18	MYRICA PENSYLVANICA ILEX GLABRA RHODODENDRON NUDIFLORUM MYRICA CERIFERA ILEX LAEVIGATA	BAYBERRY INKBERRY PINK AZALEA WAX MYRTLE WINTERBERRY	3 GALLON SHRUB

MITIGATION PLANTING CHART

LEGEND	NO.	SCIENTIFIC NAME	COMMON NAME	TYPE
(large hatched circle)	2	SASSAFRAS ALBIDUM QUERCUS FALCATA LIRIODENDRON TULIPFERA CORNUS FLORIDA CERCIS CANADENSIS	SASSAFRAS SOUTHERN RED OAK YELLOW POPLAR DOGWOOD EASTERN REDBUD	1-1/2" CAL TREE B & B
(small hatched circle)	12	MYRICA PENSYLVANICA ILEX GLABRA RHODODENDRON NUDIFLORUM MYRICA CERIFERA ILEX LAEVIGATA	BAYBERRY INKBERRY PINK AZALEA WAX MYRTLE WINTERBERRY	3 GALLON SHRUB

STATE OF MARYLAND
EDWARD A. BROWN
No. 10714
REGISTERED
PROFESSIONAL LAND SURVEYOR
1-30-09

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SCALE: AS NOTED	VARIANCE SITE PLAN & STORMWATER MANAGEMENT PLAN & DETAILS
DATE: JANUARY 2008	LOT 6, BLOCK 'U', SECTION 2 LOCH HAVEN BEACH
DRAWN BY: JAY	3579 LOCH HAVEN DRIVE, EDGEWATER, MD. 21037
CHECKED BY: R.F.M.	TAX MAP 60, BLOCK 4, PARCEL 23, ZONING R5
JOB NO: 07-17334	FIRST DISTRICT ANNE ARUNDEL COUNTY, MARYLAND
SHEET NO: 3 OF 3	