Virgin Islands
Resource
Conservation &
Development
Council, Inc.

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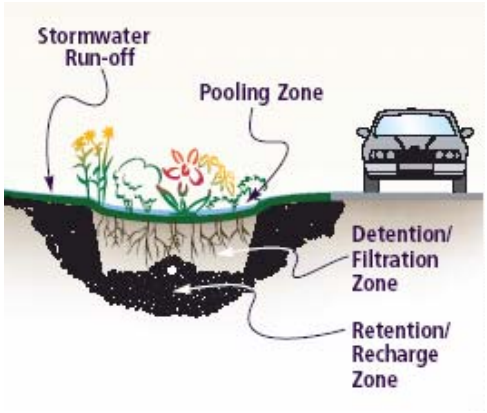
What is a Rain Garden?

Rain gardens are shallow, constructed depressions that are planted with deep-rooted native plants and grasses. They are strategically located to capture runoff from hard surfaces such as a driveway, parking area, sidewalk or streets. Rain gardens fill with a few inches of water after a storm and then water filters into the surrounding soil, rather than running off to the street or storm culvert.

Rain gardens also conserve water, reducing the need for irrigation. Rain gardens are a beautiful and colorful way for homeowners, businesses and municipalities to help ease storm water problems. There is a growing national trend by municipalities and homeowners to incorporate natural processes such as rain gardens to help relieve flooding and pollution.

Benefits of Rain Gardens

Rain gardens are an inexpensive, simple to implement and environmentally sound solution to residential and urban storm water runoff.



Increased imperviousness – the increased build up of towns and cities with buildings, roads, parking lots and other hard surfaces – alters the local water cycle and inundates guts and bays with large quantities of storm water and associated contaminants.

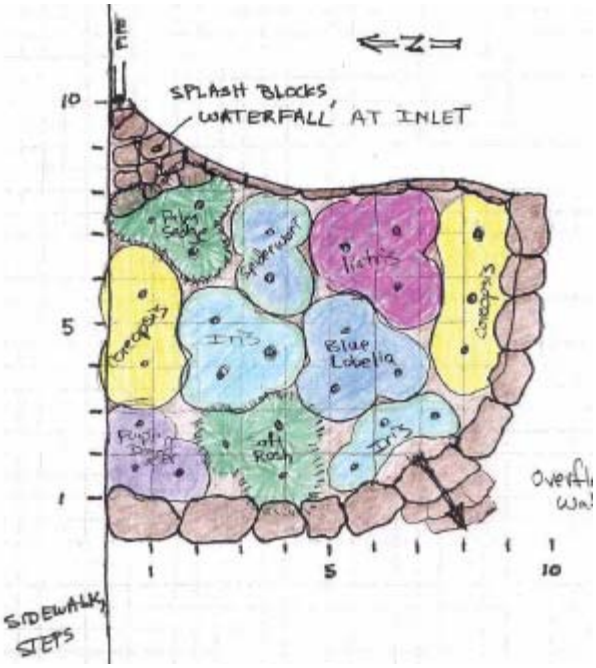
By mimicking the natural absorption and pollutant removal abilities of a forest or meadow, rain gardens can absorb runoff more efficiently – as much as 30% - 40% more than a standard lawn. By capturing rainwater in a rain garden, holding it, and then slowly releasing it into the soil, the rush of runoff from a large storm can be slowed and cleaned – quickly, neatly and naturally.

Rain gardens are a very good option to help lower the impact of impervious surfaces and polluted runoff because they are low-tech, inexpensive, sustainable and aesthetically pleasing. A Rain Garden will:

- Filter pollutants from runoff,
- Recharge groundwater,
- Conserve water,
- Protect guts, ponds and coastal waters,
- Remove standing water in your yard,
- Reduce mosquito breeding,
- Increase beneficial insects that eliminate pests,
- Reduce potential of home flooding,
- Create habitat for birds & butterflies,
- Survive drought seasons,
- Reduce garden maintenance, and
- Enhance property value.

Rain Garden Design

For a low-maintenance garden, choose a natural style rather than a formal style. Integrate the rain garden into your existing landscape.



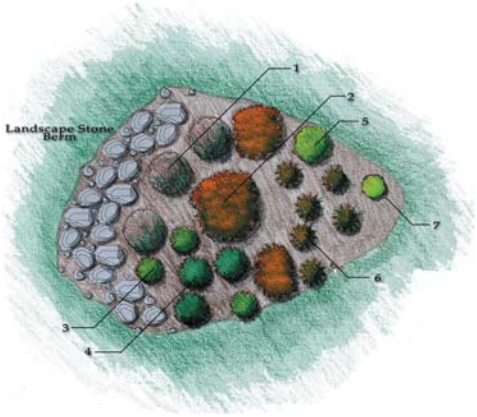
Put your rain garden in the right place. Your property has an existing drainage pattern (even though it may not be very noticeable), and it will usually be easiest to take advantage of that. Note the direction of runoff and low spots where water collects. If these spots are away and downhill from your building foundations, they will be good places for your rain garden. Call utility companies to make sure underground wires, cables or pipes aren't located in the proposed garden area.

- The garden should not be within 10 feet of the house foundation.
- Gardens should be located at least 25 feet from a septic system drainfield.
- Gardens should not be placed within 25 feet of a well head.
- Make sure to avoid underground utility lines.
- The best location for the garden will be in partial to full sun.
- Rain gardens should be constructed where the water table is at least 2' below the surface of the soil. If you hit the water table when constructing your rain garden, consider turning it into a wetland garden.

Size the rain garden correctly. Figure out what kind of soil you have (sandy, clayey or mixed).

- Estimate the area that your garden will get storm water from. Multiply the width by the length of each area (driveway, sidewalk, parking area, and any other paved surface) to get square feet of each. Add each area to get square feet of the total drainage area. Remember, though, that different paved areas on your property may drain to different spots — you want to estimate only the square footage that will drain into your rain garden.
- For sandy soil, your rain garden should be 20-30% of the drainage area. For example, if the parking area and driveway measure 1200 square feet and all the rain from them will be used, your rain garden should be 20 to 30% of that, or 240-360 square feet. (ex: 10' X 24')
- For clay soil, your rain garden should be about 60% of the drainage area (Clay absorbs water very slowly; the varieties of rain garden plants that do well in clay take at least three years to get established. Soil replacement may be the best choice in clay soils).
- If you replace your soil with rain garden mix (50-60% sand, 20-30% topsoil, 20-30% compost) to improve your soil drainage, your rain garden should be about 20-30% of the square footage of the drainage area.
- Dig a coffee-can sized hole where the deepest part of the rain garden will be. Fill the hole with water. Mark the water level with a popsicle stick. After four hours, measure between the stick and the new waterline. For example: if the water fell one inch, then it will percolate 6 inches in 24 hours. Your rain garden should be a maximum of 6 inches deep. ***The results of your percolation test determine the depth of your rain garden.***

Rain gardens for single-family homes will typically range from 150 to 400 square feet. But remember; any size rain garden, even a small one, will contribute to solving local water pollution problems. It will also be a lovely addition to your landscape.



Create an attractive planting design. Rain gardens should feature easy-to-maintain plants that are native to the Caribbean. Give your rain garden a neat appearance (neatly defined borders, not weedy looking). Home owners new to rain gardens or native plants may need guidance in plant selection. Do not plant aggressive or invasive species that will need frequent pruning or weeding. ***For help in selecting plants, contact the UVI Cooperative Extension Service or the V.I. RC&D office.***

Building a Rain Garden

Use stakes and string, non-toxic soccer-field paint, or just a hose to show the shape of the garden bed. Think about where rain goes in and overflows out. If possible, direct your storm water into the rain garden with a grassed or rock-lined swale. Use "splash rocks" to disperse rain and keep soil from washing away near the place where storm water enters the rain garden. Plan where rain will overflow during storms with very heavy rainfall.

Stage construction carefully to avoid erosion. Protect the rain garden from erosion and sediment run-off during and after construction. Make sure to install a silt fence before you begin excavating the rain garden area. Sediment can seal the surface. Install effective erosion controls, and leave them in place until all site construction, including other landscaping, is completed.

Dig a flat depression 6-12 inches deep, located at least 10 feet away from building foundations, septic systems and utility lines. Once your garden is dug, give it a trial run. Put a hose or sprinkler on in the garden for 30 to 60 minutes to see how well water soaks in (infiltrates). Once plants are mature, infiltration will be much quicker. Be sure to let the garden dry out before planting. If the bed does not drain, remove 3-4 inches of soil. Add compost or sand. Till deeply, about a foot, to loosen compacted soil. On slopes, use some of the excavated soil to create a berm on the down-stream edge of the rain garden to help hold storm water from small storms. In the first year, you may also cut a notch at the top of the garden to let rain flow out; the bed will not fill to the top, allowing plants to establish root systems for infiltration.

Place plants in pots on the bed, according to your design. Gently remove plants from pots, break up the roots, and plant. A rain garden planted with plugs or container plants benefits from a layer of shredded hardwood mulch. Mulch reduces weeds and conserves water, helping to establish the plants. It also prevents surface sealing of the rain garden and removes some pollutants from pavement runoff. Water the bed once a week with one inch of water until plants are established.

The most common cause of rain garden failure is **soil compaction. Avoid soil compaction during all phases of construction. P**lace and grade soil in the rain garden from the side. Prevent vehicles from driving on the rain garden. Place barriers to protect the rain garden from foot and construction traffic.

Maintaining a Rain Garden

Rain gardens are not completely maintenance-free. It is important to weed, clean-up and re-mulch the garden periodically, and especially after heavy rains. Regular maintenance is required to keep your rain garden looking good and functioning well. Be sure to include this in your plan and your budget!

Caring for your garden the first several weeks after planting is critical to its success. The most important work during the first year of the garden is watering and weeding. A young garden will need about an inch of water per week until it is established.

All gardens need constant weeding and replenishing of mulch. Educate people working in the rain garden. They may identify native plants as weeds. As the garden matures, weeds will be pushed out by the growing plants. Periodically prune dead vegetation and plants that are too big. Rake mulch periodically and replenished yearly.

Fertilizer should not be necessary. Native plants should thrive in the prepared soil mix. Avoid use of herbicides, pesticides, and fungicides in and around the rain garden.

Mosquitoes won't find rain gardens to be good breeding area because if a rain garden is built properly the water will drain within 24 hours (but usually within an hour or two). Mosquitoes prefer to breed in small, stagnant containers of water. These are usually old tires, pots, birdbaths and pans under planters.

The development of a mosquito, from egg to adult takes 10 to 14 days depending on the air temperature. The warmer the air the shorter time the eggs take to mature. It takes 24 - 48 hours for eggs to hatch. After the eggs hatch the mosquito larva must live in water for 7 -12 days.

V.I. RC&D works directly with homeowners and other property owners to help them do what they can on their property and in their lives to protect the water quality of our guts, ponds and coastal waters from pollution and the damage done by storm water runoff. To see a rain garden in action, visit V.I. RC&D's Rain Garden Demonstration site at the V.I. Waste Management Authority's Green House Program located on Centerline Road in Estate Lower Love, St. Croix, west of the St. Croix Educational Complex, or visit www.usvircd.org.

More Information about Rain Gardens

www.raingardennetwork.com
www.raingardens.org
www.lowimpactdevelopment.org/raingarden_design
www.rainKC.com
http://clean-water.uwex.edu/pubs/home.htm#rain
www.npsnj.org/rain_garden_home.htm
www.bae.ncsu.edu/topic/raingarden
www.dof.virginia.gov/rfb/rain-gardens/shtml

Build a Rain Garden in 10 Steps

Materials

- Shovel & pick
- Ruler, stick or wood scrap
- Pencil or marker
- Compost, sand or gravel
- Moisture-loving native plants
- Shredded hard wood mulch
- Decorative rock

Step 1: Call before you dig. Contact local utilities (WAPA, Vitelco, Cable, VIWMA) to have them mark locations of underground wires, cables or pipes.

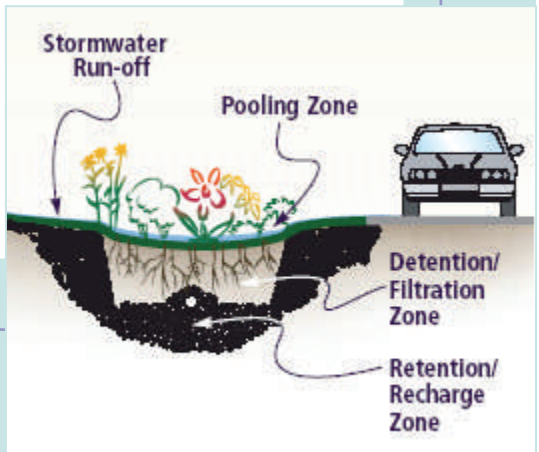
Step 2: Pick a location. A rain garden should be at least 10 feet from foundations and fence posts, and 25 feet from septic system drain fields and well heads.

Step 3: Measure drainage rate. Dig a hole about the size of a large coffee can. Insert a ruler or stick into the hole. Fill the hole with water from a hose or bucket and mark the water level on the ruler. Wait four hours, then measure & mark the water level again. To determine the daily percolation, multiply the amount of water (in inches) that has drained in four hours by six. (____ inches every 4 hours x 6 = _____ inches every 24 hours)

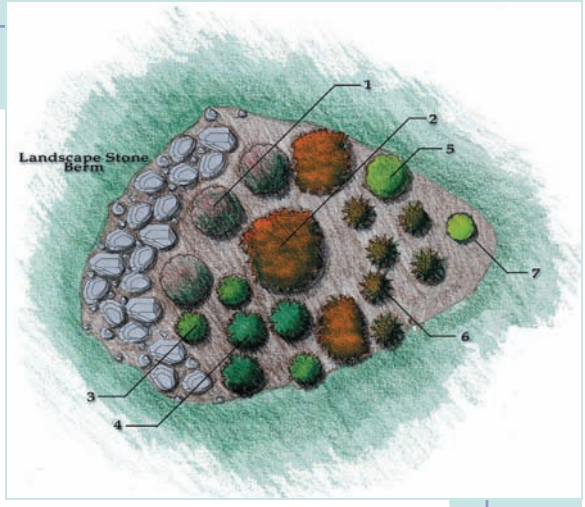
Your rain garden should empty within 24 hours, so if you can drain 6 inches in that much time, dig 6 inches down. If the water in your test hole doesn't drain well, consider different placement, or add gravel, compost, or sand (see Step 7).

Step 4: Determine the garden's depth. It should be no more than 6—12 inches deeper than the surrounding soil, but you can place it in the bottom of a larger landscape depression or slope.

Step 5: Outline the garden location. Use string and wooden stakes or a garden hose to mark the general placement. Think about the land's slope and where heavy rain may come in and flow out; don't orient the garden so that overflow runs into your foundation or septic system.



Build a Rain Garden in 10 Steps (cont.)



Step 6: Dig in. The depression should be within your marked outline and to the depth you determined in the previous steps. Note: The most common cause of failure of a rain garden is soil compaction. ***It is essential to avoid compaction of soils during all phases of construction.***

Step 7: Check the drainage rate again. Fill the depression with water, then measure the infiltration rate as in Step 3. If the drainage is poor, remove 3—4 more inches of soil and till in some sand, gravel or compost to a depth of 1 foot, then check drainage again.

Step 8: Add vegetation. Put native or naturalized plants that can tolerate "wet feet" in the lowest places. Lightly cover with additional soil if necessary, but don't fill the depression completely.

Step 9: Mulch to keep the weeds out. You may also want to install decorative rock at the points where rain water enters the rain garden and where overflow from heavy storms exits the garden to prevent erosion.

Step 10: Water. Until the plants are established—especially during the dry season—it is beneficial to water to 1 inch at least once a week. If there's regular overflow from the depression, you may wish to enlarge it or build a series of rain gardens with connecting drainage notches.

Maintenance. Regular maintenance is required to keep your rain garden looking good and functioning well. Periodically weed and prune dead vegetation and plants that are too big. Rake mulch periodically and replenish mulch yearly.

US VIRGIN ISLANDS RC&D COUNCIL INC

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Fax: 340-692-9607
vircd@usvircd.org

S. Lignum Vitae (*Guajacum sanctum*)

Native to the Caribbean, Lignum-vitae (Tree of Life) is a showy large shrub or small tree with shiny evergreen leaves, light gray bark, and the bluest flowers you will ever see on a tree. Lignum-vitae has the hardest wood of any commercially harvested tree; it is very heavy (it will not float), close-grained and split resistant, and is valued for propeller shaft bushings, machine parts, and other applications in which its natural resins make it self lubricating. Lignum-vitae also is the source of *gum guaiacum*, a resin once used to treat syphilis, arthritis, gout & sciatica.

T. Flamboyant (*Delonix regia*)

Flamboyant is native to Madagascar (where it is endangered), but it is cultivated world-wide, including in the Caribbean. It is a legume so it has nitrogen-fixing and soil-improving properties. Its dense shade and root system prevent other plant species from growing under it, and its wide-spreading roots can damage building foundations and pavement. The seed pods are used in the USVI as a percussion instrument known as a 'shack-shack.'

U. Christmas Palm (*Veitchia merrillii*)

Christmas palms are native to the Phillipines, but are cultivated world-wide, including in the Caribbean.

USDA-NRCS Caribbean Area

654 Plaza, Suite 604
654 Muñoz Rivera Ave.
Hato Rey, PR 00918-4123
PO Box 364868
San Juan, PR 00936-4868

Phone: 787-766-5206
Fax: 787-766-5987
www.pr.nrcs.usda.gov

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Date: October 27, 2012

Rain Garden Plants

USDA-NRCS,
St. Croix Environmental Association (SEA) & Horsley Witten Group, Inc.

53 Hope & Carton Hill,
St. Croix, USVI

Tired of rutted roads?

Do your part and disconnect! Call your HOA for details.

Rain gardens are shallow, man-made depressions that are planted with deep-rooted native plants and grasses. They are strategically located to capture runoff from paved areas like driveways, parking areas, sidewalks or streets. Rain gardens fill with a few inches of water after a storm. Then the rain water slowly seeps into the surrounding soil, rather than running off to flood or erode streets or drainage channels.

The Cullen's rain garden is a pilot project in the Hope & Carton Hill neighborhood to show how residents can capture storm water runoff from their driveways and retain it on their properties. Removing driveway runoff from the neighborhood road network helps to reduce road deterioration, improve road drainage and provide homeowners with a beautiful landscape.

20% of the total Hope & Carton Hill road network is driveways. Runoff from driveways that drain to our roads contributes to road erosion and overall road maintenance costs. If each homeowner managed the runoff from their driveway with a rain garden, our road problems would be greatly reduced!

Check it out as you are driving through!

N. Unknown (??)

O. Marron Bacora (*Solanum conocarpum*)

Solanum conocarpum is a thornless, flowering shrub native to the dry, deciduous forests of St. John. It is severely threatened due to limited range and habitat destruction, with only ~200 known individuals in the wild, it is a candidate for federal endangered species listing.

P. Purple Queen (*Tradescantia pallida*)

Purple queen is an evergreen perennial native to Mexico's Gulf Coast. It is a shade-tolerant ground cover thriving in a wide range of soil conditions.

Q. Wedelia (*Sphagneticola trilobata*)

Wedelia is native to the Caribbean and Central America. It is a creeping, perennial herb with yellow-orange daisy-like flowers. Wedelia forms a dense ground cover that crowds out weeds, but can also crowd out other plants so must be regularly pruned. It grows well in shade and in poor soil, and is useful for erosion control.

R. Turpentine Tree (*Bursera simaruba*)

Turpentine is a semi-deciduous tree native to the Caribbean, Mexico, Central and South America. It is fast-growing and can reach 20-50 feet in height. Its reddish bark peels away in thin flakes, inspiring the nickname "tourist tree." A resin from the trunk and bark is used in the West Indies to make glue, varnish, water repellent coatings and incense. It smells a little like turpentine. The fruits are eaten by birds.

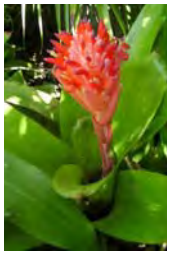
J. West Indian Mahogany Tree (*Swietenia mahagoni*)

Native to the Caribbean, Central & South America, Mahogany is prized for lumber and furniture. It is also grown as an ornamental and shade tree in subtropical and tropical regions.

K. Ti Plant (*Cordyline fruticosa*)

Ti Plant is native to tropical southeastern Asia, the Indian Ocean, and parts of the South Pacific. It is an evergreen flowering plant in the Asparagus family, also known as Cabbage Palm, Good Luck Plant and Palm Lily. It was cultivated in Polynesia for its starchy rhizomes, which are very sweet when the plant is mature, and eaten as food or medicine. Its leaves were used to thatch the roofs, to wrap and store food, and to make clothing.

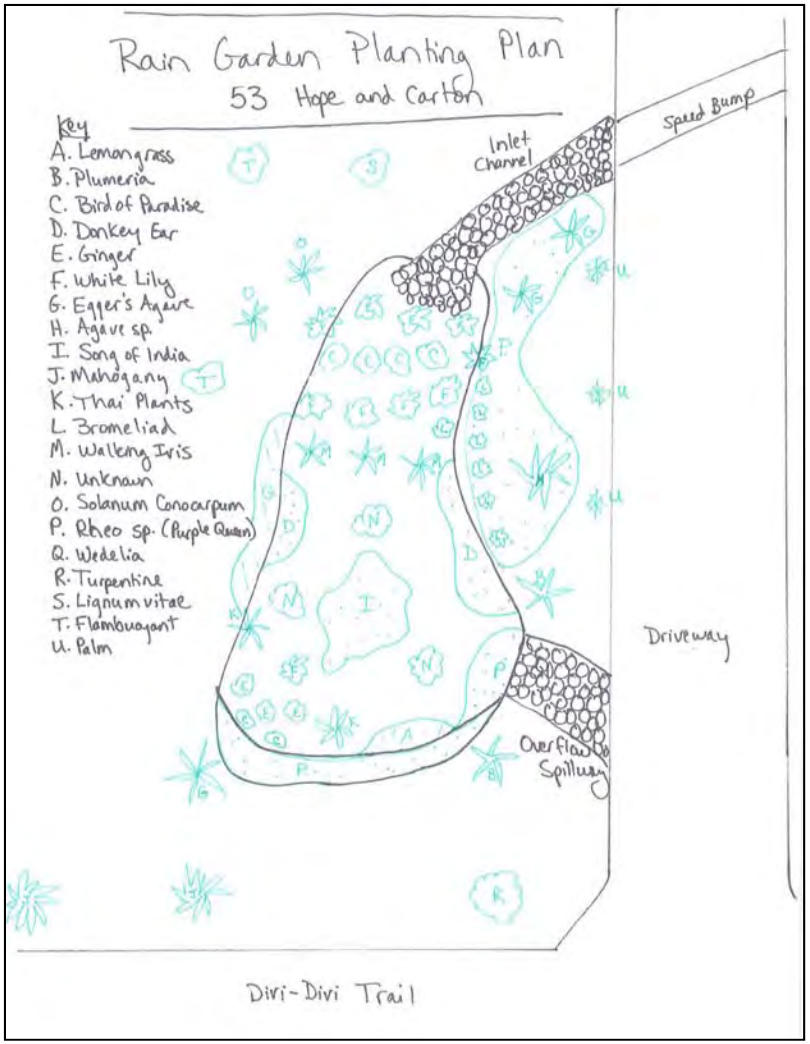
L. Flaming Torch Bromeliad (*Billbergia pyramidalis*)



Native to Brazil, it can grow as a terrestrial or epiphyte. When planted in the ground, it quickly creates large clumps; when planted at the base of a tree, will slowly climb the trunk. It is very hardy and needs little care. In heavy shade leaves are dark green, while in sun the leaves are bright yellow-green. The water-filled well at the base of the leaves acts as a frog refuge.

M. Apostle's Iris (*Neomarica gracilis*)

Apostle's Iris is a type of walking iris native to Central America. The flowers only last one day but the plant produces many blooms. Once the flower is spent, the stem it was on leans to the ground and forms a new plant. Both the white and yellow varieties have been planted in the rain garden.



A. Lemon Grass (*Cymbopogon*)

Native to India and tropical Asia. It is widely used as a herb in Asian cuisine. It has a subtle citrus flavor and can be dried and powdered, or used fresh. Lemongrass is commonly used in teas, soups, and curries. It is also suitable for poultry, fish, beef, and seafood. Lemongrass oil is used as a pesticide and a preservative. Research shows that lemongrass oil has anti-fungal properties. Despite its ability to repel insects, its oil is used as a "lure" to attract honey bees.

B. Frangipani (*Plumeria alba*)

The native, or wild, frangipani has smooth bark and long, slender leaves. It produces a white, aromatic flower that is processed into essential oils used for fragrances.

C. Bird of Paradise (*Heliconia psittacorum*)

This species is indigenous to the Amazonian rain forest and are typically pollinated by hummingbirds.

D. Elephant Ear (*Alocasia sanderiana*(?))

Alocasia species are native to tropical & subtropical Asia and widely cultivated as ornamentals.

E. Red Ginger (*Alpinia purpurata*)

Red Ginger are native Malaysian plants with showy flowers on long brightly colored red “bracts.” The bracts look like the bloom, but the true flower is the small white flower on top.

F. White Flag (*Spathiphyllum sp.*)

Spathiphyllum is a genus of about 40 species of flowering plants native to tropical regions of the Americas and southeastern Asia. Certain species of *Spathiphyllum* are commonly known as Spath or Peace Lilies. They are evergreen herbaceous perennials with large leaves and flowers that are produced on a spike surrounded by a white, yellow, or green curved bract. It doesn’t need excessive light or water to survive.

G. Egger’s Agave (*Agave eggersiana*)

Egger’s Agave is native to St. Croix and a candidate for listing as federally-threatened or endangered. It is a robust, perennial herb with a flower stalk that can grow up to 21 feet tall. Its yellow flowers are large and funnel or tubular shaped**.**

H. Century Plant (*Agave sp.*)

Perennial herbaceous plant native to the southwest United States and the USVI. Each rosette flowers once & then dies. In the USVI, the flowers & stalks have traditionally been harvested & spray-painted for use as a Christmas trees.

I. Song of India (*Dracaena reflexa*)

Dracaena reflexa var. *augustifolia (*or *D. marginata*) is a popular houseplant that needs little attention. It has thin, linear, deep glossy green leaves with red edges; there are also cultivars with variegated leaves with pale yellow or red edges. It tolerates dry soil and irregular watering, but not water-logged soils. It is an effective air cleaner and can remove formaldehyde, xylene and trichloroethylene from indoor air.

FOR OFFICE USE

Control #:_____
Date received:_____
Date deemed complete:_____
Reviewed by : _____

GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES

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DEPARTMENT OF PLANNING AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

45 MARS HILL, Frederiksted, St. Croix, VI 00840
Cyril E. King Airport, Charlotte Amalie, VI 00801
PHONE: (340) 773-1082, FAX: (340) 773-9310/ (340)774-3320, FAX (340) 714 9549

Earth Change Permit Application Form I-Gut Clearing/Brush Clearing Only

Note *to all applicants: A thirty day period shall apply to the review of an earth change plan by DPNR. The 30-day period shall begin with the date of reception indicated above. However, termination of the 30-day period shall not give inferred or automatic approval to the application (12 VI Rules and Regs. §532-12).*

SECTION A: PROJECT INFORMATION (Please Print)

Owner(s) Name as listed on Deed:_____
Submit Proof of Legal Interest: **(Copy of Deed/Lease with Covenants & Restrictions, if applicable or Purchase Agreement/Land Contract)**

Physical Address:_____

Mailing address of owner:_____

Telephone #:_____(H) _____(W) _____(Cell)

Plot No:_____

Estate: _____

Acreage:_____

Parcel Identification Number:_____
Submit a copy of property tax bill or tax clearance letter (contact Tax Assessor's Office: 773-6459 (C'Sted), 772-3115 (F'Sted), 776-8505 (STT/STJ) for information.)

Zoning:_____

Name and telephone number of project designer, architect, engineer, or draftsman, if applicable.

Name & Phone_____ License Number: _____

Name and telephone number of certified earthwork contractor.

_____

Proposed action(s) – check those that apply:

☐ Land clearing

☐ Gut Clearing

SECTION B: REQUIRED SUBMITTALS

■ Site Plan

1) A brief earth change plan in written form detailing the proposed method, equipment, and purpose of land clearing.

_____

_____

_____

Please check those that apply:

☐ Crops ☐ Livestock ☐ Both

2) **A USDA Soil Conservation Plan is required for land clearing for agricultural purposes.** (Contact USDA office for information at 692-9662)

3) Show all easements on the site and within 50 feet of the property line.

4) PNR/PWD/OLG Drawing; Recorded Parcel Map and/or Registered Survey Map (Registered with the Cadastral Section and **STAMPED CERTIFIED** by the Cadastral Public Surveyor). **(2 Copies)**

5) On PNR/PWD/OLG Drawing, sketch and identify areas to be cleared and proposed Best Management Practices (BMPs) to be installed.

SECTION C: Signature Block

Application is hereby made for a permit to authorize the activities described herein. I agree to provide any additional information/data that may be necessary to provide reasonable assurance or evidence to show that the proposed project will comply with the applicable territorial water quality standards or other environmental protection standards both during construction and after the project is completed. I also agree to provide entry to the project site for the inspectors from the environmental protection agencies in order to make inspections regarding this application. To the best of my knowledge and belief, that such information provided herein is true, complete and accurate; I further certify that I possess the authority to undertake the proposed activities.

Signature of Owner(s) Signatures of **all** individuals listed on deed is required:

_____

_____

Date: _____

Earth Change Permit Application Checklist

Applicant: _____ Date _____

Checked By: _____ Address: _____

_____

Part 1: All applications must be submitted in triplicate

- ☐ Application Signed by person(s) listed on Deed (or other acceptable Proof of Legal Interest)
- ☐ Phone # (Day)
- ☐ Deed (or other acceptable Proof of Legal Interest)
- ☐ Parcel Identification Number (copy of tax bill)
- ☐ Recorded Parcel/Survey Map – certified by Lt. Gov. Office
- ☐ Site Plan

Part 2: For applications using FORM II: Complete Part 1 above and the following:

- ☐ FEMA Flood Insurance Rate
- ☐ Official Zoning Map
- ☐ Sediment Reduction Map
- ☐ Water Resources Map
- ☐ USDA Soil Survey Map
- ☐ Certification of site plan by licensed professional.

Part 3: For applications using FORM III: Complete Parts 1 & 2 above and check items if submitted by applicant

- ☐ Soil Percolation Tests – TMDL watersheds
- ☐ Soil Conservation Plan approved by USDA
- ☐ Cultural Resource Survey Clearance letter by State Historic Preservation Office
- ☐ Hydrology Report
- ☐ Preliminary Subdivision approval by Div. of Comprehensive and Coastal Zone Planning
- ☐ Other

Comments: _____

_____

_____

Rev: 11/20/06

Proposed Rain Garden Installation

#53 Hope and Carton Hill

Project Description
The proposed project involves the construction of a small residential rain garden in an existing grassed area adjacent to a driveway (see graphic below and attached plan). The purpose is to minimize surface runoff from the property onto the adjacent road and to serve as a stormwater demonstration for other residents of the Hope and Carton neighborhood and beyond. A rain garden is a vegetated best management practice designed to capture, treat, and infiltrate stormwater runoff from small storm events to reduce nonpoint source pollution and flooding.

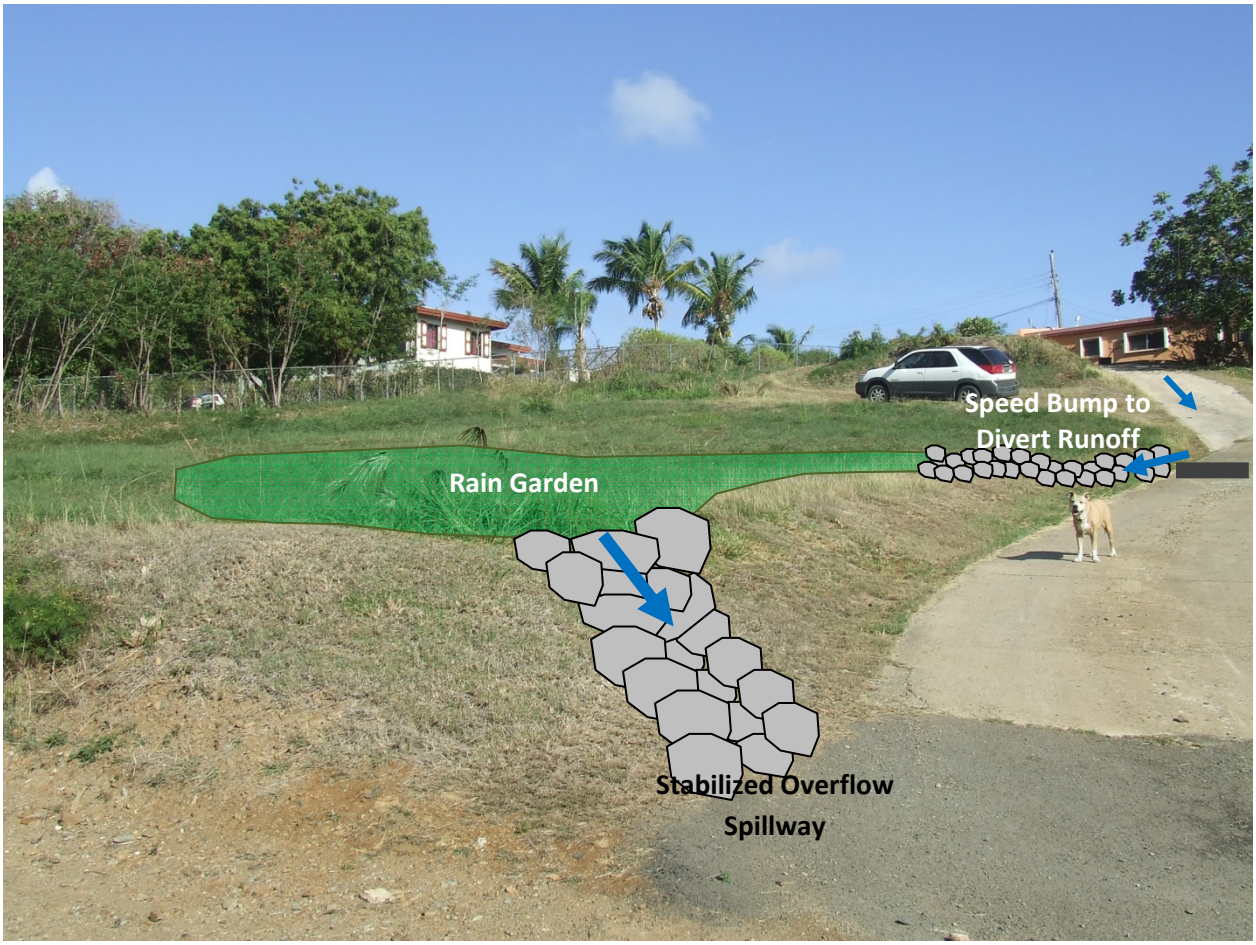
Existing Site
The 0.755-acre residential lot is located in the Solitude Bay Watershed on the East End of St. Croix. The soils in this area are mapped as CvE by the USDA-NRCS Soil Survey of the USVI (see attached Soils Map). These are Cramer-Victory Complex, 20 to 40% slopes, very stony. A percolation test done at the site showed that the infiltration rate was high, less than 5 minutes per inch. There is little to no topsoil currently on the site, and it is very sparsely vegetated, mostly with Guinea grass. Currently, stormwater runoff flows down the steep existing paved driveways and onto Divi Divi Trail, which is an eroding dirt road.

Proposed Project
Stormwater runoff will be diverted from the driveway into a shallow, vegetated rain garden with amended soils (sand and compost). The drainage area to this location is approximately 17,000 square feet (sf), with 12.6% impervious cover (gravel parking area and paved driveways – the rooftop runoff is captured in existing cisterns). The rain garden has a bottom area of 370 sf and was sized to manage the 1-inch storm event. See the attached plan for a cross-section of the proposed rain garden. Any stormwater that does not infiltrate, evaporate, or get taken up by plants will overflow back onto the driveway via a stabilized spillway.

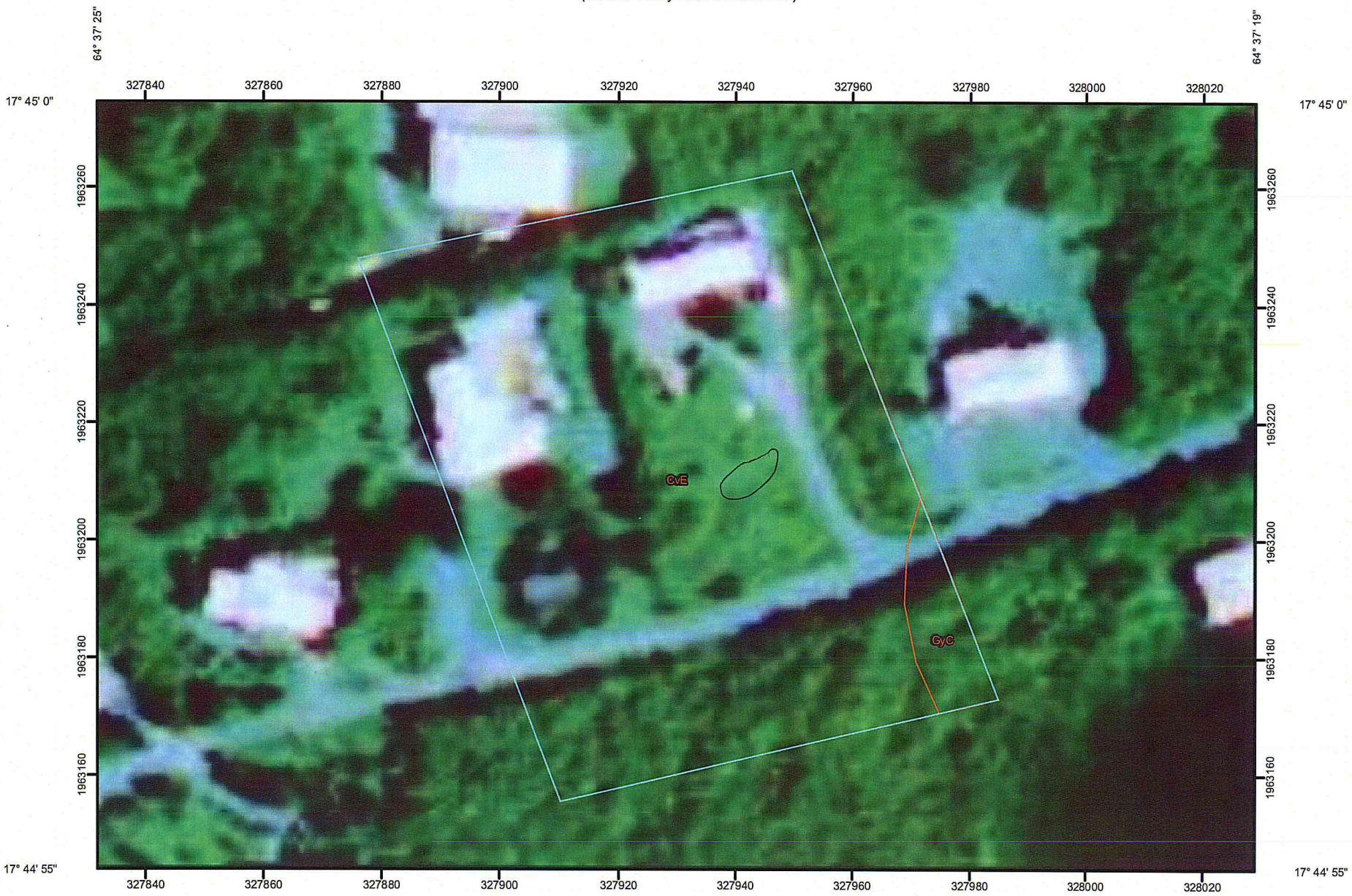
Proposed Method and Equipment
This project will be constructed as a part of a volunteer work day for the neighborhood. Because this is a demonstration and we want to be able to complete installation in one or two days, one small excavator will be used to create the inlet swale, shallow depression, and form the downgradient berm. Any topsoil will be stockpiled on site for use in permanent stabilization. Volunteers will help mix and place the amended soils (6 inches of sand and compost mix); place filter fabric and rock for stabilizing the inlet swale and overflow spillway; install the native plants; spread the top mulch layer (1-2 inches); and seed/stabilize any remaining disturbed areas. Once the site is stable, the speed bump will be installed on the driveway to divert stormwater into the rain garden, and the temporary erosion and sediment control (ESC) measures will be removed.

The ESC measures proposed for this site include 1) a designated, protected stockpile area; 2) silt sock at the perimeter of the disturbance; and 3) immediate stabilization.

1. Stockpile Area: This is a designated area protected by silt sock where excavated soil will be temporarily stored while the rain garden is constructed. Any usable topsoil will be stored in a separate pile for reuse during final stabilization. This project is proposed to be completed over a very short timeframe (a volunteer workday), so we do not anticipate the stockpiles to be in place for more than a day or two. However, any stockpile left in this area overnight will also be covered with a tarp to prevent erosion.
2. Silt Sock: The entire disturbed area will be protected during construction by a line of silt sock. A silt sock is mesh tube filled with compost. This method is preferred in many cases over silt fence because it acts like a flow-through filter the effectively removes sediment but does not pond water. It is easy to install and maneuver on site, and at the end of the project, the compost can be reused elsewhere.
3. Immediate Stabilization: Once the rain garden itself is installed, volunteers will help to seed and stabilize any remaining disturbed areas. Any topsoil remaining in the stockpile area will be used to help the seeded area germinate quickly. This area will be watered as necessary to ensure stabilization occurs as quickly as possible.



Soil Map—Virgin Islands of the United States
(Cotton Valley Rain Garden Site)

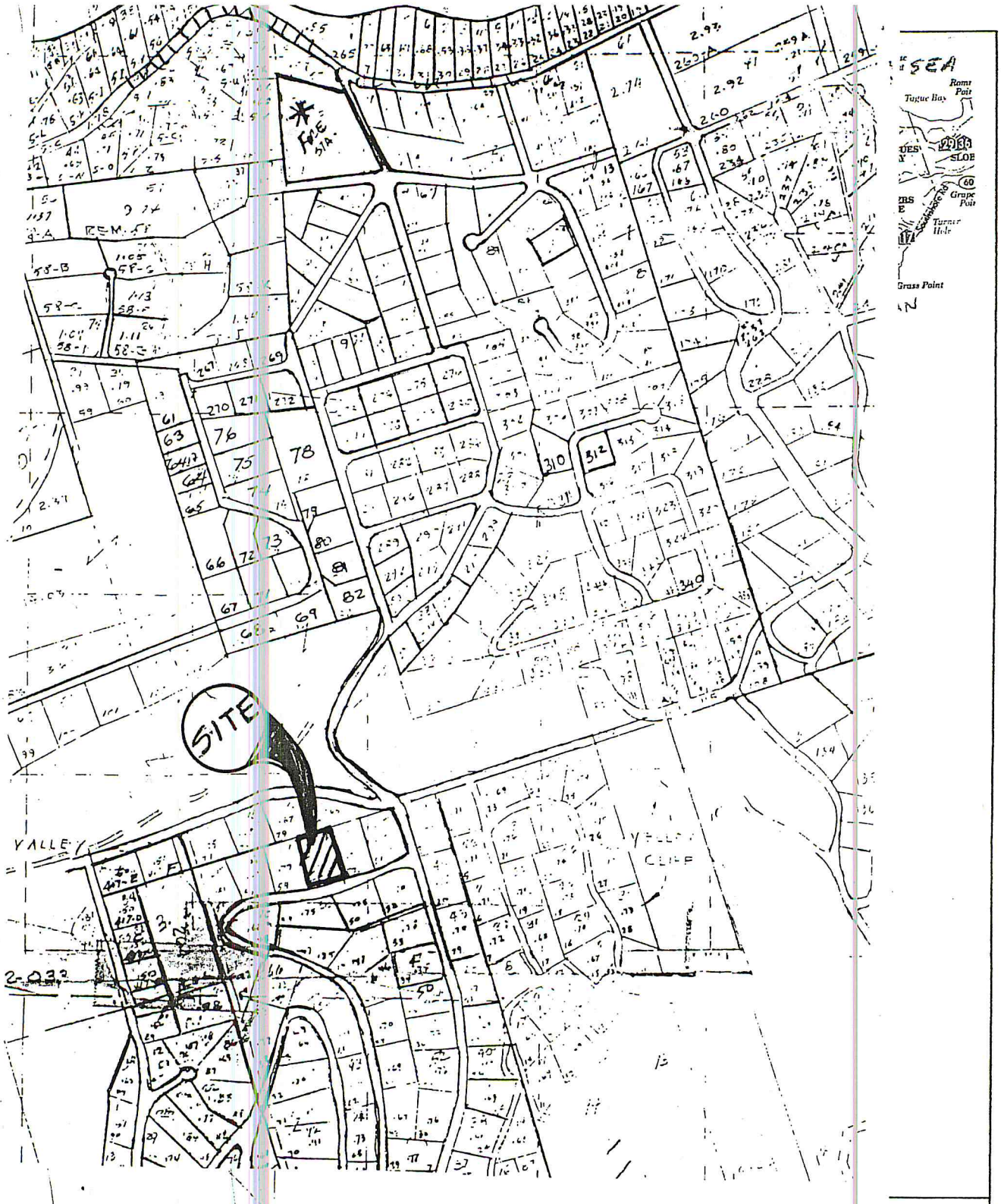


Map Scale: 1:934 if printed on A size (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 50 100 200 300



ASBUILT SURVEY

PLOT NO.53

ESTATE HOPE AND CARTON

ST. CROIX EAST END QUARTER B U.S.V.I.

PREPARED BY: J.M.MARSH & ASSOCIATES
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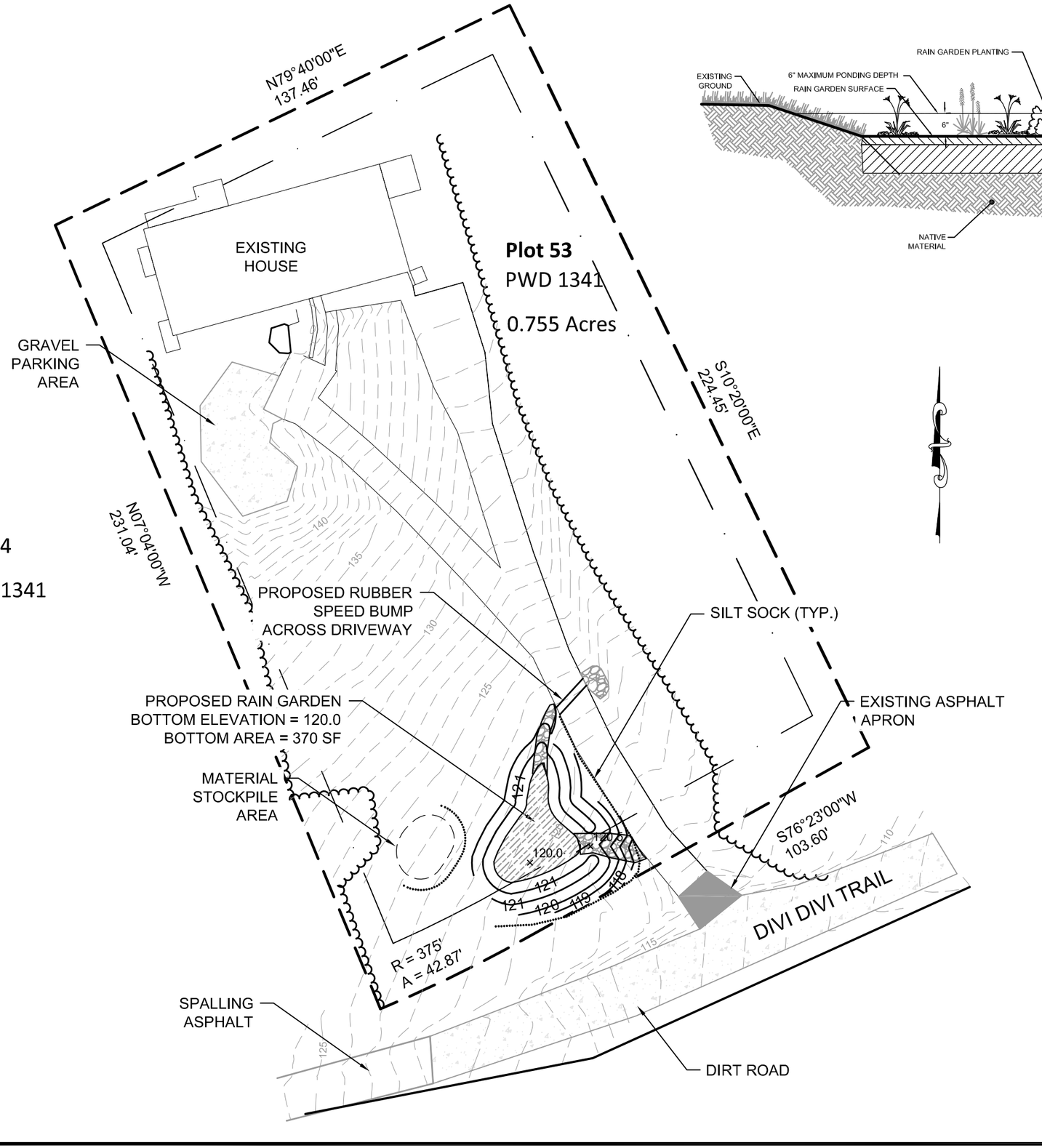
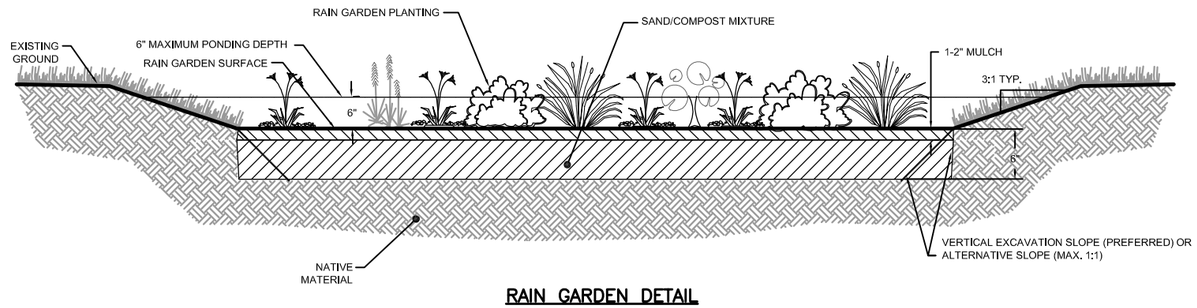
Scale: 1"=50'	Date: 07/11/04	SHEET NO. 1 OF 2
Drawn: JMM	Checked: WT	Job: 04-103

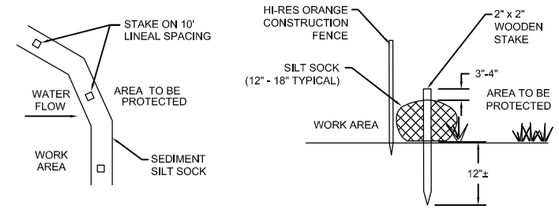
7/11/04

E: SEE SHEET NO 2 OF 2.





RAIN GARDEN DETAIL
NOT TO SCALE



PLAN VIEW **SECTION**

NOTES:
1. SILT SOCK MANUFACTURER SHALL BE SILT SOXX OR ENGINEER APPROVED EQUAL.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. SEDIMENT SILT SOCK TO BE FILLED WITH LEAF COMPOST AND/OR WOODY MULCH PER MANUFACTURER'S REQUIREMENTS.
4. FOLLOWING CONSTRUCTION AND SITE STABILIZATION, COMPOST MATERIAL SHALL BE REMOVED OR DISPERSED ON SITE, AS APPROVED BY THE ENGINEER.

SEDIMENT SILT SOCK DETAIL
NOT TO SCALE

GRAPHIC SCALE
30 0 15 30 60
(in feet)
1 INCH = 30 FEET

Revisions

Rev.	Date	By	Appr.	Description
1	6/01/12	ERK	MLW	
1	8/01/12	ERK	MLW	

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Drawn By: ERK
Design By: MLW
Date: May 2012

Plan Set:
RAIN GARDEN DEMONSTRATION
53 HOPE AND CARTON HILL
HOPE AND CARTON HILL MASTER PLAN

Plan Title:
CONCEPT DESIGN

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1 of 1

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