



The Virgin Islands' rainy season runs from August through November, with almost half of the average annual rainfall occurring during this time. Another mini-rainy period usually occurs in May, producing about 11% of the average annual rainfall, according to National Weather Service records (USGS, 1973).

FACTORS AFFECTING WATER ABSORPTION:

- K Soil Type
- K Ground Cover
- K Compaction
- K Rainfall Intensity
- K Slope Length
- K Slope Steepness

Contact the USDA Service Center at 692-9632 for a Soil Survey or maps to help determine your soil types and characteristics. Soils information is also available at the UVI Cooperative Extension Service's St. Thomas office (693-1080). Digital soil maps are available from the UVI Conservation Data Center (693-1030). The revised Soil Survey can also be downloaded in Adobe Acrobat format from <http://www.statlab.iastate.edu/soils/soildiv/surveys/virgnis.pdf>.

PRACTICES TO REDUCE WATER VELOCITY

- K Seeding
- K Mulching or Matting
- K Diversion Channels
- K Water Retention Basins
- K Water Conveyance Systems

MAINTAIN / IMPROVE THE SOIL'S CAPACITY TO ABSORB WATER

Controlling the amount of storm water runoff from a construction site is a cumulative, site-specific problem based on the area contributing storm water, soil type(s), plant cover, slope length and steepness, amount of imperious (paved) area, and compaction of the soil surface.

- C Preserve as much of the soil's top layer (topsoil) as possible. This layer, including plant roots, is the most absorbent and fertile layer in the soil profile.
- C Lessen soil compaction by limiting vehicle traffic and equipment movement to designated areas. Rubber-tired vehicles, especially those with cleated tires, compact the soil more than heavy equipment with tracks.
- C When the soil is wet, restrict traffic to stabilized access roads and designated parking areas. Moist, bare soils compact easier than vegetated soil surfaces.
- C When possible, minimize exposure of bare soil by preserving existing vegetation. Plant leaves, decaying ground litter, plant roots and organic material near the ground surface act as a "sponge," absorbing rainwater as it falls.

SLOW THE VELOCITY OF RUNOFF

Flowing water is a very destructive force. Slowing the speed of storm water runoff over the bare ground is critical in controlling erosion.

- C Divert runoff water flowing from off-site or uncleared areas away from the construction area. Minimize the amount of water that flows over the site by installing diversion channels, surface inlets, storm water basins, or other practices to catch, hold and divert runoff.
- C Maintain vegetation and decrease soil compaction to reduce surface water flow. This will also significantly decrease storm water speed.
- C Schedule construction activities during the dry season.
- C Make sure the practices used for water retention (like silt traps or fences), slope breaks (terraces, berms or diversions) and water drainage channels or swales are properly designed for the drainage area. Most practice failures are due to poor design and installation.

PLAN FOR STORM WATER RUNOFF

- C Pinpoint areas where water collects. Design and install practices, like drainage swales, to reduce storm water volume and speed in these areas.
- C Filter sediment from storm water before it leaves the site or enters storm drains. Sediment-laden water entering storm drains empties directly into guts, ponds, beaches and coastal waters.
- C Design erosion and sediment control practices for specific problems and sites. Most practice failures are due to inadequate design or poor installation.
- C Identify critical points where runoff leaves the property. Design practices that minimize the amount of sediment leaving the site, like sediment traps, silt fences, or vegetated infiltration areas.



WARNING! YOU MAY NEED EXTRA MEASURES

IF YOUR SITE:

- K Is within 100 feet of a gut, wetland or shoreline.
- K Is on a steep slope (20% or greater).
- K Has a large drainage area contributing storm water runoff to the site.



Sediment retention basins can be modified to serve as water retention or detention basins once construction is completed. As sites are planned, use of dual purpose structures may be suitable.

THREE WAYS TO ATTAIN EROSION & SEDIMENT CONTROL

- K Reduce erosion in the watershed with soil stabilization and runoff control practices.
- K Allow erosion to take place but remove sediment from storm water *before it leaves the site*.
- K A combination of the two above.

The *Virgin Islands Environmental Protection Handbook* is a guide to assist in designing erosion and sediment control practices. It is available at DPNR's Divisions of Permits and Coastal Zone Management, the USDA Service Center, or the UVI Cooperative Extension Service.

MOBILIZE YOUR SEDIMENT & EROSION CONTROL PLAN

- C Minimize the area of earth change activities or exposed soil.
- C Reduce the amount of time soils are bare.
- C Protect the soil with mulch, erosion control mats or plant cover.
- C Prevent tracking soil off-site by stabilizing driveways or site entrances with gravel.
- C Slow the velocity (speed) of runoff with planned engineering practices.
- C Reduce the volume of runoff on denuded areas with planned diversions.
- C Protect drainage channels with mats, rock or grass to handle the increased runoff.
- C Trap sediment in temporary or permanent basins.
- C Maintain all sediment and erosion control practices.
- C Inspect all practices at the close of each workday and after every storm.

VEGETATION: THE BEST PRESCRIPTION FOR EROSION CONTROL

Preserving existing vegetation on your site is the most effective and least costly method of erosion control. With any seeding project, there is the risk of failure due to poor weather conditions or inadequate seed bed preparation or irrigation. Reduce your risk and save as much vegetation as possible when clearing and grading.

VEGETATION:

- C Protects the soil surface from the impact of raindrops.
- C Maintains the soil's capability to absorb water.
- C Anchors the soil with plant roots.
- C Slows water runoff and reduces sheet and rill erosion.
- C Helps to remove subsurface water through evapo-transpiration.
- C Is universally adaptable to most sites.
- C Is inexpensive and easy to maintain.
- C Is the **most effective** erosion control measure.

WARM SEASON LAWN GRASS RECOMMENDATIONS			
GRASS	SEED	VEGETATIVE PROPAGATION	RATE PER 1000 SQ. FT.
(1) Bermuda (Common)	Yes	Sprigs, Plugs, Sod	1 - 2 lbs.
All others	No	Sprigs, Plugs, Sod	6 - 12 in. apart
(2) Bahia	Yes	Sod	5 - 10 lbs.
(3) St. Augustine	No	Sprigs, Plugs, Sod	6 - 12 in. apart
(4) Hurricane	Yes	Sprigs, Plugs, Sod	1 - 2 lbs.
(5) Zoysia (Z. Japonica)	Yes	Sprigs, Plugs, Sod	½ - 1 lb.
All others	No	Sprigs, Plugs, Sod	6 - 12 in. apart

*For best results, apply plant food according to a soil test**

*Contact the UVI Cooperative Extension Service for information on soil testing.

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Your Guide to Reducing Soil Erosion and Sediment Loss on Small Construction Sites



by Julie Wright
Extension Program Supervisor, Water Quality

University of the Virgin Islands
Cooperative Extension Service

INTRODUCTION

This fact sheet focuses on small-scale construction activities (sites smaller than 5 acres). It is designed to help you develop a plan to reduce erosion and soil loss from your site.

Inside you will find planning, erosion, sediment and storm water control practices (or BMPs, best management practices) that can be used effectively on most small construction and building sites.

The key to successful erosion control on small sites is to identify the factors that contribute to soil erosion and decide how to best deal with those factors. For larger or more complex sites, erosion, sediment and storm water control plans should be more detailed and professionally engineered. Throughout the construction process, **everyone** associated with the project needs to do their part to reduce erosion and soil loss.

CONTROLLING EROSION AND REDUCING SEDIMENT FROM SMALL CONSTRUCTION SITES

Erosion is a natural process. It occurs when water (or wind) runs over the soil surface, picks up soil particles and carries them away. While all lands erode, severe problems can occur when human activities increase erosion that deposits large amounts of soil (or **sediment**) onto our roadways, beaches, and into our coastal waters. This erosion and sediment deposition (**sedimentation**) damages properties, pollutes coastal waters and harms coral reefs and seagrass beds. Construction activities, dirt roads, poorly managed farms or pastures, and soil eroded from guts all send thousands of tons of sediment into our coastal waters each year.

A major source of sediment comes from small-scale construction or earth change activities, such as on individual home sites. For every acre of land under construction, tons of soil can run off the site and into the sea. Every phase of a construction project that leaves soils unprotected can result in large quantities of sediment being deposited onto off-site properties and into guts, ponds and coastal waters. Eroding dirt roads and construction sites are the primary cause of coastal water pollution in the Virgin Islands.

EROSION CONTROL KEYS

The keys to controlling erosion and soil loss on small construction sites are to:

- C **Protect the soil surface from raindrop impact,**
- C **Maintain soil's water holding capacity,**
- C **Slow storm water runoff speed,**
- C **Minimize slope lengths,**
- C **Plan to control storm water runoff,**
- C **Match practices to individual site conditions, and**
- C **Maintain erosion, sediment and control practices.**

PROTECT THE SOIL SURFACE FROM RAINDROP IMPACT

- C Preserve as many existing grasses, ground covers, bushes and trees as possible. These plants reduce the eroding force of raindrops.
- C Seed bare soils with fast-growing grasses as soon as possible after construction or when construction activities will be stopped for 14 days or more.
- C Use proper methods to establish new vegetation: seed mixtures and plant species adapted to VI conditions, proper fertilizers, and mulch or erosion control mats to conserve moisture.
- C Use mulch or erosion control mats on bare soils to break the fall of raindrops. They can also be used for temporary erosion control when and where seeding conditions are not ideal.
- C Schedule earth change activities during the dry season.
- C Always apply a temporary mulch, mat or grass seed to soil stockpiles.

For more detailed descriptions of planning, erosion, sediment and stormwater control practices and their specifications, refer to the *Virgin Islands Environmental Protection Handbook*, available from UVI-CES, USDA-NRCS, or DPNR.

SILT FENCING

- C Entrench fence material 4" to 6" into the soil.
- C Support fence with stakes placed at least every 2' (use steel rebar for most soils).
- C Use only to collect runoff from small (#1 acre) overland flow areas where storm water flow will be less than 1 ft³/sec.
- C Install fencing along the slope contour, with ends curved upwards to allow for ponding.
- C Do **not** install against the base of a slope (see figure at right).
- C Always install downslope from topsoil stockpiles.

Erosion Control Mats Channel Applications

- C Start at the top of the channel, anchoring the mat in a 6" deep by 6" wide trench. Staple every 12", then backfill and compact the trench.
- C Roll the center mat on the bottom of the channel in the direction of water flow.
- C Overlap mats end over end by 6". Use a double row of staggered staples 4" apart to secure mats.
- C The full length of the mat edges at the top of side slopes must be anchored and stapled in a 6" x 6" trench, then back-filled and compacted.
- C Overlap mats on side slopes 4" over center mat and staple.
- C Anchor bottom end of mats in same way as top of channel.

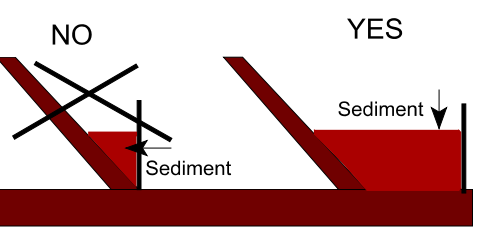
INCORRECT INSTALLATION!

This silt fence should have been trenched into the ground. It is failing because soil and storm water can run under the fence without being filtered. The fence is also less stable and more susceptible to being knocked over because it is not anchored into the ground. Fences in clayey or stony soils like this one should be staked with rebar (3/8" or 1/2"). Fences on steep slopes (> 20%) should be backed with wire mesh to add stability.



SILT FENCE PLACEMENT ON SLOPES

Silt fences should be placed away from the base of the slope to allow storm water runoff to slow down and provide more space for soil to settle out of the water. Silt fences should also be inspected after each storm to make sure they are still in place and to remove accumulated debris.



EROSION CONTROL MATS Slope Stabilization Applications

- C Begin at the top of the slope by anchoring mats in a 6" wide by 6" deep trench. Backfill and compact the trench after stapling.
- C Roll the mats down the slope, stapling every 3'. Overlap the edges of parallel mats 3"-6" and staple.
- C If splicing mats, overlap ends 6"-12" and staple overlapped area every 12".
- C Staple ends of mats at base of slope every 2'.
- C If seeding, prepare soil beforehand.



WHERE TO GO FOR HELP

UVI Cooperative Extension Service
St. Croix:
Research & Extension Center
University of the Virgin Islands
RR2, Box 10,000
Kingshill, VI 00850
(340) 692-4080
St. Thomas:
University of the Virgin Islands

#2 John Brewers Bay
St. Thomas, VI 00802-9990
(340) 693-1080

USDA Service Center
5030 Anchor Way, Suite #2
Gallows Bay
Christiansted, VI 00820-4692
(340) 692-9662

DPNR Coastal Zone Management Program
St. Croix:
#45 Mars Hill
Frederiksted, St. Croix, VI 00840
(340) 773-3450
St. Thomas:
Cyril E. King Airport, 2nd Floor
St. Thomas, VI 00802
(340) 774-3320

DPNR Permits
St. Croix:
#45 Mars Hill
Frederiksted, St. Croix, VI 00840
(340) 778-2994
St. Thomas:
Cyril E. King Airport, 2nd Floor
St. Thomas, VI 00802
(340) 774-3320