

Town of Essex

Small Site Erosion Control Guide

Why do we need to protect against erosion?

Water Quality: Erosion and the transport of sediment and pollutants impacts the water quality of nearby streams which all flow into Lake Champlain. Erosion degrades the habitat of aquatic organisms and fish, decreases the recreational value of the waterways and promotes the growth of nuisance weeds and algae.

Local Taxes: Sediment that finds its way into streets, catch basins, storm sewers and ditches results in added maintenance and removal costs for local government. Tax dollars used for sediment clean up are not available for other purposes such as road repair or education.

Flooding: Sediment accumulates in streams and rivers reducing their capacity to carry runoff. The gradual build-up clogs natural channels resulting in increased flooding and property damage.

Property Values: Erosion and sediment loss can cause soil instability, which can create unsafe conditions around structures. Soil erosion can lead to expensive repairs to fix damaged property.

What can you do to minimize erosion during construction?

- Disturb the minimum construction area at any given time.
- Reduce runoff over disturbed areas. Divert run off away from slopes into grassed swales or temporary silt basins. Keep runoff velocities as low as possible. If permanent measures for drainage control are in the plans,, build these first.
- Use sediment fence and other measures to keep soil onsite
- Sediment basins or traps should be considered to allow settling of particles before any storm water is discharged from the site. Mulch and erosion control blankets reduce erosion.

Areas to pay special attention to:

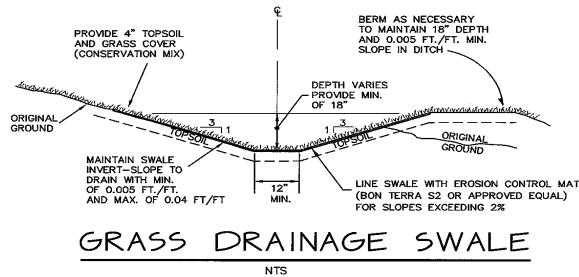
- Culvert inlets and outlets
- Steep Slopes
- Any areas of concentrated flow
- Ditches
- Accesses to the property
- Inlets and outlets of catch basin systems
- Area abutting waterways or wetlands

Erosion Control Basics

- 1) Evaluate the site for the effect of runoff from sudden rainstorms.
- 2) Identify areas where you want to limit construction traffic. Wherever possible, preserve existing vegetation. To protect root damage to trees and other sensitive areas, mark areas off for preservation and do not allow grading, burning, storage, parking or driving within these areas. Place mesh snow fence around the drip lines of trees, designated leach field areas and across any protected buffer zones.
- 3) Install erosion/sediment control before the site is cleared.
- 4) At least once a week and after each rainfall event inspect measures put in place and repair them as necessary.
- 5) Ensure that all drainage is away from the home and not directed to an adjacent property owners lot. Provide an outlet for foundation drains and for general lot drainage by using storm sewers or by obtaining drainage easements if you must cross or if the runoff affects adjoining properties.
- 6) Do not fill existing drainage channels or roadside ditches. This could result in flow capacity reduction, flooding on another property and/or damage to adjacent road.
- 7) Do not flush sediment to the street with water.
- 8) Re-vegetate the site as soon as possible. A well-maintained lot has a higher sale potential.
- 9) Pay special attention to runoff adjacent to driveways and affected road ditches; use stone/erosion control in the ditch to prevent erosion.

Erosion Control Options

Ditch and Swale Protection: These are often a basic element of any storm water and erosion control plan. All ditches and swales should be protected by plantings or coarse stone. The decision should be made based upon slope and potential velocities in the channel. Preferred grasses include Bermuda grass, reed canary grass, tall fescue, Kentucky bluegrass, grass legume mixtures, and red fescue.



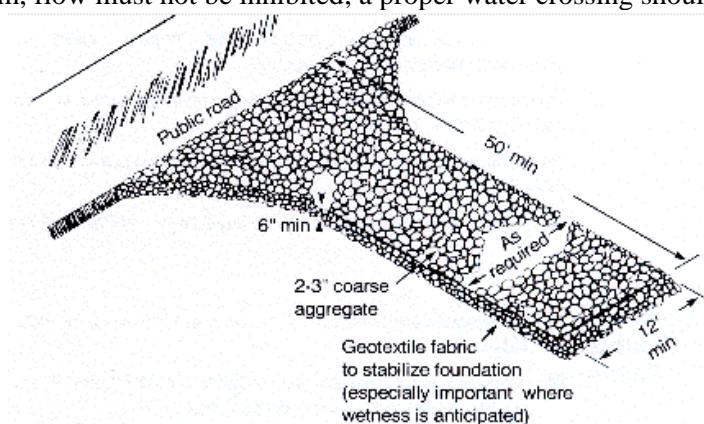
Erosion Control Blankets: Blankets are made of biodegradable materials such as jute matting, excelsior wood fiber; coconut fiber, straw or interwoven paper strips and netting made of biodegradable polypropylene or extruded plastics. These are formed into sheets and used as temporary or permanent mulching primarily to stabilize disturbed slopes and can be used in areas of moderate concentrated flows such as ditches and swales. Use anchoring staples. Place at least four inches of the material edge into a dug slot or soil then tamp down firmly to prevent floating blankets. The surface below the blanket should be smooth and stabilized to prevent the flow of water underneath.

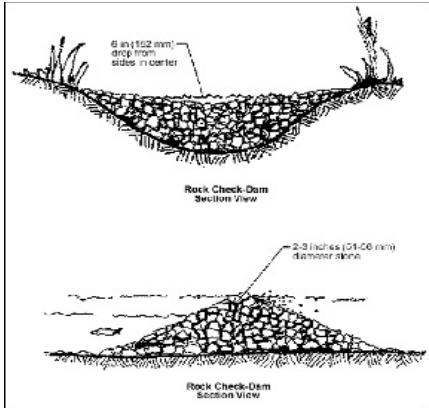
Vegetative Filter Strips: On hillside slopes, preserve a 20 foot wide vegetative buffer strip back from the top of slope.

Mulch: Apply hay, straw, bark mulch, crushed stone or cellulose fiber to disturbed surfaces. This method can be used on any area subject to erosion, as well as any area that may be otherwise unfavorable for plant establishment. Permanent mulch is particularly valuable in stabilizing chronic erosion areas such as those subject to high vehicle or foot traffic.

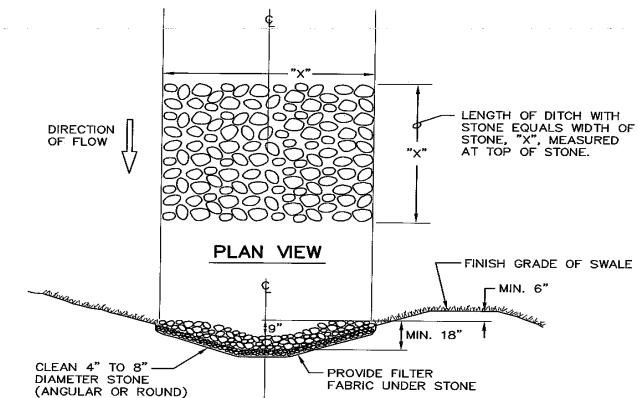
Mulch Material	Application per Acre	Depth of application of Area covered per unit	Notes
Hay or Straw	90 - 100 bales	95-100% coverage	Hay and Straw are not effective in areas of concentrated flows.
Green Wood Chips or Shavings	10 - 20 tons	2 – 4 inches	Decomposes rapidly, resistant to wind blowing, can be used in critical areas if protected from washing.
Bark Mulch	14,000 cubic feet	4 inches	Decomposes slowly, can be left for long periods of time, resistant to wind, vegetation may eventually grow over
Gravel and Stone	11,500 cubic feet	100% surface coverage	Should be $\frac{1}{4}$ inch to 5 inches in size. Should be washed before placement in sensitive areas

Stabilized Construction Entrances: Entrances shall be installed at every point where construction vehicles leave a paved or gravel road and enter onto a site. Large washed stone that is round in shape to prevent damage to tires should be placed over geo-textile. The protected entrance will minimize dusting as well as transportation of sediment into existing drainage ways. If two-way traffic is likely the entrance must be wide enough to allow for this. If the entrance crosses a swale or stream, flow must not be inhibited; a proper water crossing should be constructed.





Check Dams: Small dams constructed of dumped stone are effective in drainage channels both for temporary and permanent use. They are placed in small open channels, which are under construction or are downstream from a disturbed area. They lose efficiency on slopes greater than 15% ; however they can still be utilized in such case to slow flow. Only stone check dams may be left over the winter. Sediment that builds up behind the check dam should be removed when it has accumulated to $\frac{1}{2}$ the original height of the dam. Repairs should be done frequently to ensure the system is effective. They should only be removed when vegetation has been established sufficiently.



NOTES:

1. STONE DAMS SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS.
2. SWALE SHALL BE SEADED & MULCHED (IF GRASS-LINED) PRIOR TO THE INSTALLATION OF THE STONE FILTER.
3. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING CLOGGING / SILTATION OF THE STONE DAM DURING AND IMMEDIATELY AFTER CONSTRUCTION UNTIL THE PROJECT'S PERMANENT EROSION CONTROLS ARE IN PLACE (VEGETATION ESTABLISHED, ETC.) AND THE PROJECT HAS BEEN ACCEPTED BY THE OWNER. IF NECESSARY THE STONE SHALL BE CLEANED AND REPLACED.

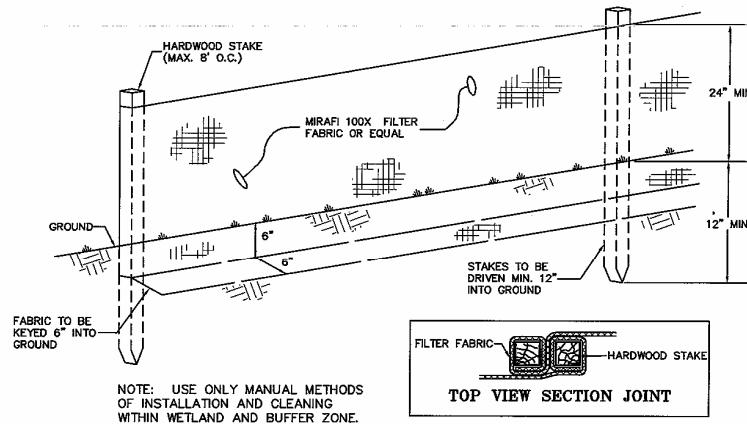
STONE FILTER DAM

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Slope Steepness Maximum Slope Length

2:1—(50%)	50 feet
3:1—(33%)	75 feet
4:1—(25%)	125 feet
5:1—(20%)	175 feet
<5:1—(<20%)	200 feet

Silt Fences: A geo-textile fabric wall is effective as a temporary measure. The fence is held in place with stakes or fence posts and compacted soil. These can be used as an alternative to straw bales to catch sediment on slopes or to prevent sediment from leaving the property. The fence should be aligned perpendicular to the flows and following the above slope limitations. Fence should be inspected after every storm event and sediment build up behind the fence should be removed and any torn sections of fence should be promptly repaired.



TEMPORARY SILT FENCE

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Storm Drain Inlet Protection: If storm drains on site or adjacent to construction will receive flow from the site, these drains must be protected. Protect storm sewer curb inlets with stone filled or gravel filled geo-textile bags before disturbing the soil. Means of sediment detention such as hay bale dams or silt fence can be used to protect the inlet; otherwise, runoff should be diverted to a detention area on site.

Placing of filter fabric under the catch basin cover is an acceptable method of protecting the basin.

Another option is to construct drop inlet protection. This includes the building of a box like structure to surround the inlet, lining the box with filter fabric, then burying the edges of the filter fabric to prevent flow from going around or under the filter.

All new or existing catch basins affected by the construction must be cleaned at the project completion.

Seeding: Rapid restoration of vegetation is one of the most important elements of erosion control. It is used both as a temporary and a permanent solution. Seeding provides long term protection, while reducing runoff velocities and promoting infiltration of runoff into the soil. Disturbed areas that are not fine graded and will otherwise remain exposed for several weeks must be seeded. Examples of areas needing temporary vegetative cover may include soil stockpiles, dams, sediment basin sides, buffer areas, filter strips, vegetative ditches or swales, steep slopes and stream banks. Exposed soils that are not immediately seeded should be mulched. Soil amendments may be necessary to establish permanent growth. Conventional fertilizers should not be applied near areas that flow directly to a waterway. Permanent seeding should be performed in combination with other erosion and sediment control practices until full cover has been firmly established.

Trees, Shrubs, Vines, Groundcover: These materials are used as permanent vegetative stabilization. Install them on steep and rocky slopes where mowing would be difficult, for landscaping purposes, in shady areas where turf maintenance is difficult, and in vegetated buffer areas.

Gutters and Downspouts: should have downspout extenders installed as soon as gutters are installed. They aid in preventing erosion from roof run off.

Quick Access Guide to Erosion Control

Feature	Suggested Erosion Control Measure
Slopes	Erosion control blankets, filter strips, diversion ditches, silt fence and/or straw bale fence.
Construction Access	Stabilized Gravel Construction Entrance.
Ditches and Swales	Plantings, check dams and/or erosion control blankets
Storm Water Inlet	Prevent sediment from entering system though use of filter
Edge of disturbed Area	Silt Fence or Straw Bales
Paths	Gravel Mulch
Flat Disturbed Area	Mulch, and seed if it will be exposed and unmodified for more than week
Finished graded area	Hay or straw mulch and seeding

To minimize erosion the best practice is always to leave area undisturbed and vegetated whenever possible.