

Erosion Control for the Home Builder

Soil erosion, stormwater runoff, and resulting sedimentation are a leading cause of water quality problems in Thurston County. Although erosion has long been associated with farming activities, it is also a major concern at construction sites. Every phase of a construction project has the potential to contribute significant quantities of sediment-laden runoff, if the disturbed land is left unprotected. Therefore, all who are associated with a building project must do their part to control erosion.

This pamphlet discusses erosion and stormwater control on individual building lots. It presents:

- ◆ Consequences of construction site erosion
- ◆ Principles important for control
- ◆ Steps in the construction sequence
- ◆ Installation instructions for five practices

PRIMARY CONCERNS RELATED TO SOIL EROSION

- ◆ **Water quality.** Sediment degrades fish and shellfish habitat and promotes the growth of nuisance weeds and algae. It decreases recreational opportunities and can pose human health risks.
- ◆ **Local taxes.** Sediment that finds its way into streets, storm drains, and ditches results in additional maintenance cost for local governments.
- ◆ **Flooding.** Sediment accumulation in streams, lakes, and rivers reduces their capacity to carry water, which increases flooding.
- ◆ **Property values.** Eroded lots are unpleasant sights to potential home buyers and if erosion is not controlled, may affect structural stability.

PRINCIPLES FOR CONTROLLING BUILDING SITE EROSION

Erosion and stormwater control is important on any building site regardless of its size. Preventing erosion is less expensive and easier than trapping sediment on site. Here are four basic rules to follow when developing a building site.

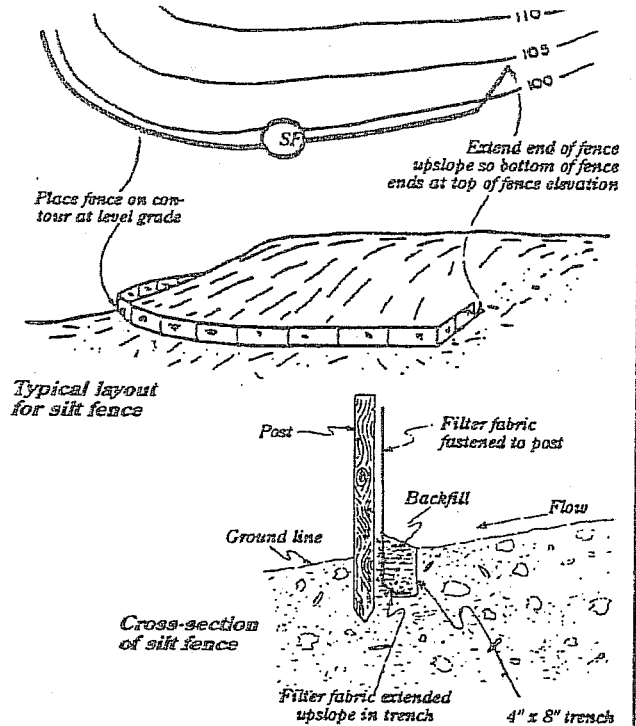
- ✓ **Evaluate the site.** Fit the development to the terrain. Time the grading and construction to minimize soil exposure to storm events. Limit the area open to construction traffic. Retain vegetation because it will reduce erosion and minimize cost of containing sediment on site.
- ✓ **Select and install erosion and stormwater control practices.** Determine the specific practices needed and install them prior to grading. Common techniques include mulching disturbed areas, reducing length & steepness of bare slopes, keeping runoff velocities low, and diverting runoff from graded areas.
- ✓ **Develop a maintenance program.** Maintenance of erosion and sediment control is as important as proper installation. All control devices should be inspected after each rainfall event. Remove sediment from behind silt fences and catch basin traps to a stable area, where it will remain on site. In addition, sediment tracked onto the street should be removed at the end of the work day. *Do not flush sediment from the street with water.*
- ✓ **Revegetate the site.** Do so as soon as possible. A well-vegetated site is more attractive and has a greater sale potential.



SILT FENCE

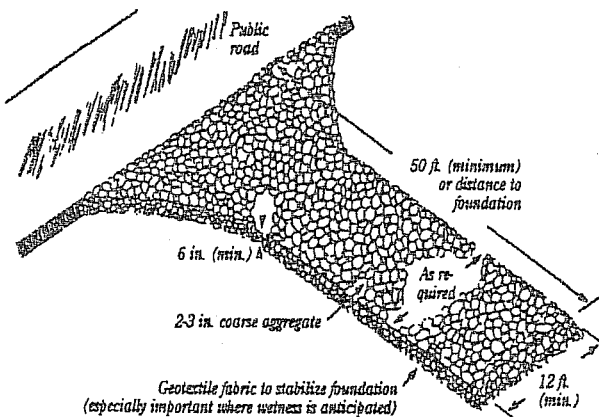
1. Install parallel to the contour of the land.
2. Extend ends upslope enough to allow water to pond behind the fence.
3. Excavate a trench 8 inches wide and 12 inches deep.
4. Install fence with stakes on the downslope side.
5. Bury 12 inches of fabric in the trench, extending the bottom 4 inches toward the upslope side.
6. Backfill the trench with soil material, and compact.
7. Join silt fence sections by overlapping sections and nailing with lath to the nearest post.
8. Inspect after each storm event; repairing as needed and removing sediment deposits when they reach one-half the fence height.

(NOTE: Silt fence has a life expectancy of 6 months to 1 year; straw bale barriers have a life of 3 months or less.)



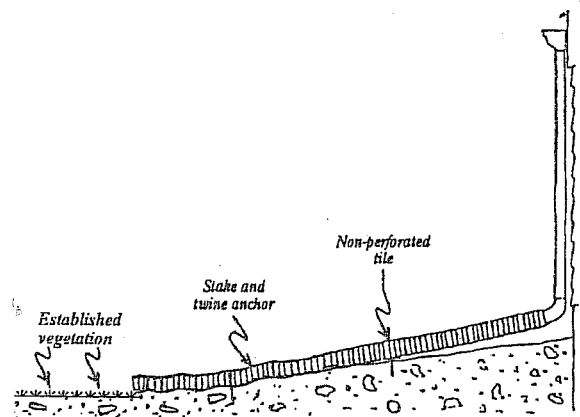
GRAVEL ENTRANCE

1. Place a gravel entrance, equal in width of the ingress/egress area, extending from the road to the foundation (see *Drainage Manual* for gravel size).
2. Add stone as needed to maintain 6 inches of clean depth.
3. To improve stability in wet conditions, place geotextile fabric on the graded foundation.
4. Construction entrance serves as a great sub-grade for pouring the driveway.



TEMPORARY DOWNSPOUT EXTENDERS

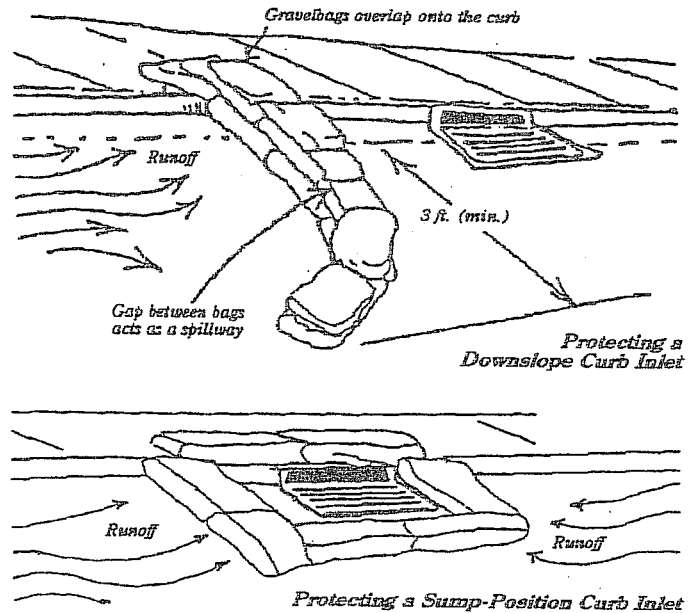
1. Install extenders as soon as gutters and downspouts are installed.
2. Use non-perforated (*unslotted*) drainline.
3. Route water to a stable grassed or paved area, or to a storm drain.
4. Remove after vegetation is established.



Five Common Construction Site Erosion Control Practices

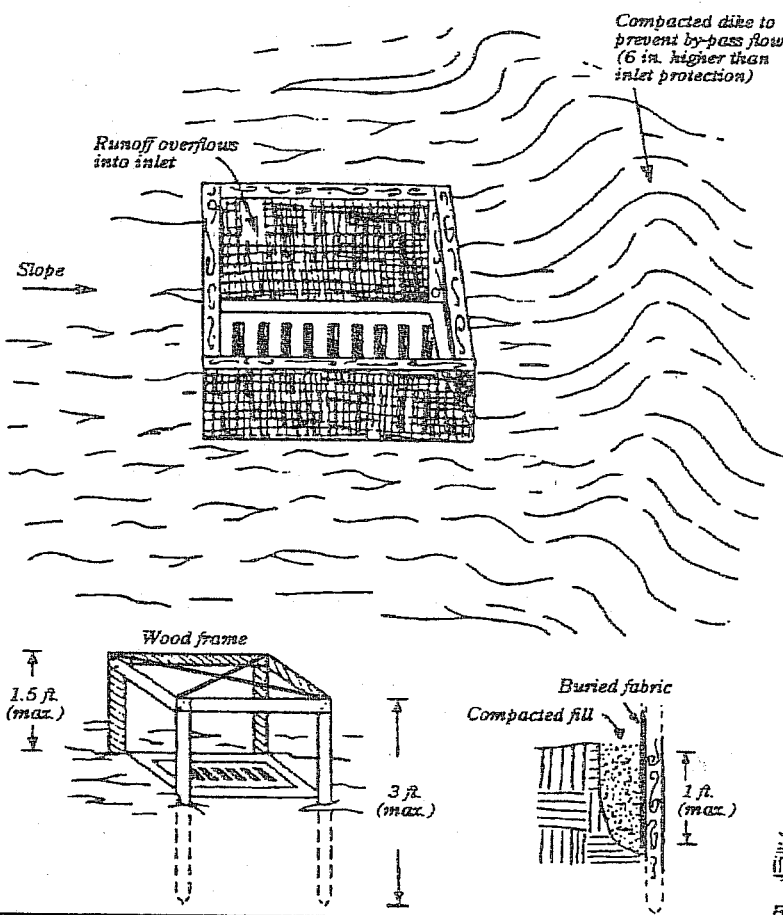
CURB INLET PROTECTION

1. Fill geotextile bags approximately half full with 2-3 inch stone or gravel.
2. At a position downslope of the lot and upslope of the inlet, lay bags tightly in a row curving upslope from curb and away from inlet.
3. Overlap bags onto the curb and extend a minimum of 3 feet into the street.
4. For additional layers, overlap bags with the row beneath, and leave a one bag gap in the middle of the top row to serve as a spillway.
5. Place bags in an arc around curb inlets that are in a sump position.
6. Set up safety/traffic barriers to keep vehicles from hitting bags.
7. Inspect and repair as needed, and remove any accumulated sediments after every storm.



DROP INLET PROTECTION

1. Construct a 6 inch dike on the downslope side to prevent bypass flow.
2. Dig a trench 12 inches deep and 4 inches wide.
3. Space support posts evenly against the inlet perimeter a maximum of 3 feet apart, and drive them about 1.5 feet into the ground.
4. Cut enough filter fabric from a single roll to eliminate joints.
5. Using lath and nails, fasten the fabric to the posts.
6. Bury the bottom of the fabric at least 1 foot deep; then backfill and compact the backfill.
7. Cross brace the corners to prevent collapse.
8. Inspect and repair as needed, and remove accumulated sediments after every storm.

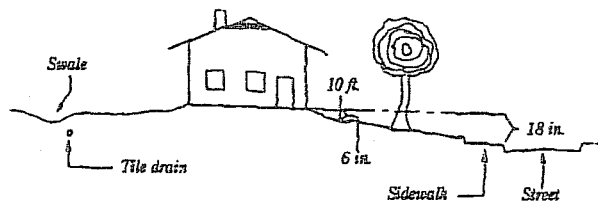


BUILDING LOT DRAINAGE

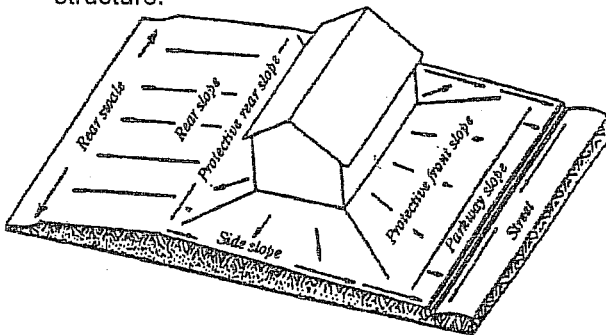
Provide for adequate lot drainage before construction begins. With proper planning, most drainage problems can be avoided. Prevention is easier than correction of a problem and is far cheaper! Here is what it takes to ensure good drainage.

Surface Drainage

- ◆ On graded sites, foundations shall extend above the street gutter at point of discharge.
- ◆ Divert stormwater runoff away from the foundation.



- ◆ When necessary, construct side and rear yard swales to take surface water away from the structure.



- ◆ Don't fill existing drainage channels and roadside ditches, since it could result in drainage problems on a neighbor's property or adjacent roads.

Subsurface Drainage

- ◆ Provide an outlet for foundation or footer drains and for general lot drainage by using storm sewers (*where allowed*), or obtain drainage easements if you must cross adjoining properties.
- ◆ If you accidentally cut through existing drainage tile, assume that it carries water even if currently dry: therefore, reroute it (*using the same size tile*) around the structure or septic field, then reconnect it.

(1) EVALUATE THE SITE

Before construction, evaluate the entire site. Mark for protection any important trees and associated rooting zones, unique areas to be preserved, septic systems, and vegetation suitable for filter strips, especially along the perimeter.

Identify Vegetation To Be Saved

- ◆ Select and identify the trees, shrubs, and other vegetation that you want to save.

Protect Trees and Sensitive Areas

- ◆ To prevent root damage, do not grade, burn, place soil piles, or park vehicles near trees or in areas marked for preservation.
- ◆ Place plastic mesh or snow fence barriers around the drip line of the trees to protect the area below their branches.
- ◆ Place a physical barrier, such as plastic fencing, around the area designated for a septic system drainfield.

(2) INSTALL PERIMETER EROSION & RUNOFF CONTROLS

Identify the areas where sediment-laden stormwater runoff could leave the construction site and install perimeter controls to minimize this potential. Perimeter controls must be in place before any other earth-moving activities begin.

Protect Downslope Areas

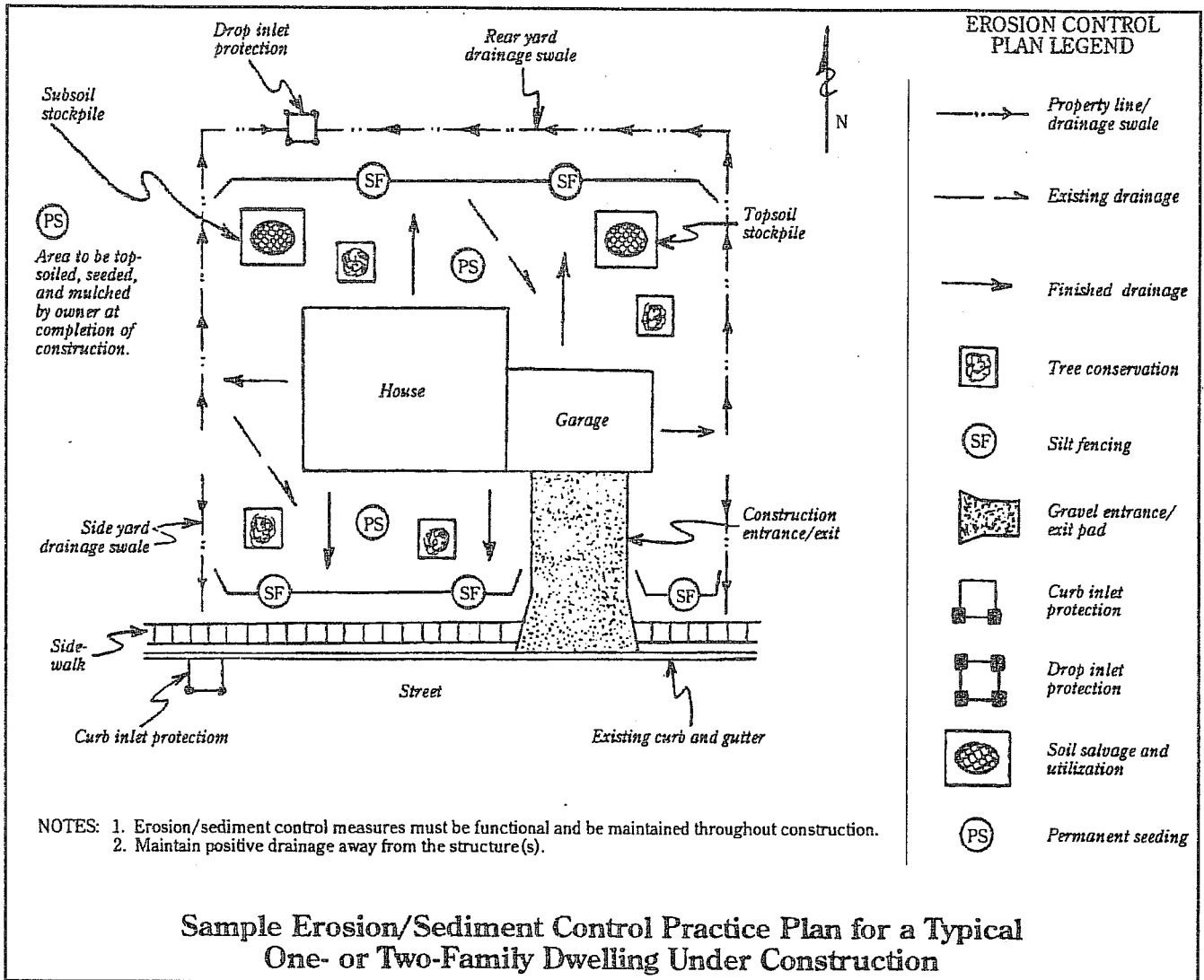
- ◆ **Vegetative Filter Strips.** Where possible, preserve a vegetative strip around the perimeter of the property and use it to trap sediment. Do not mow filter strips shorter than 4 inches.
- ◆ **Silt Fence.** Use silt fence along the perimeter of the lot's downslope sides to trap sediment.

Install Gravel Drive

- ◆ Restrict all lot access to the gravel drive to prevent vehicles from tracking mud onto roadways. Refer to the local *Drainage Manual* for recommended gravel size.

Protect Storm Drain Inlets

- ◆ Protect nearby storm drain inlets with gravel-filled geotextile bags or catch basin sediment traps.



(3) PREPARE THE SITE FOR CONSTRUCTION

Prepare the site for construction and for installation of utilities. Make sure all contractors (especially the excavating contractor) are aware of protected areas.

Salvage and Stockpile the Soil

- ◆ Remove topsoil (typically the upper 4 to 6 inches of soil material) and stockpile.
- ◆ Remove subsoil and stockpile separately from the topsoil.
- ◆ Locate the stockpiles away from any downslope street, driveway, stream, lake, wetland, ditch, or other drainage.
- ◆ Immediately after stockpiling, seed them with annual rye or cover with plastic to toe of slope of pile and secure plastic to the ground.

(4) INSTALL UTILITIES AND BUILD

Install the utilities and construct the home. If a septic tank and drainfield or drinking water well is needed, install them as well.

Place all soil from utility trenches up slope so stormwater washes sediment into the trench and not off the construction site.

Immediately after backfilling, reestablish erosion control measures below utility trenches.

Install Downspout Extenders

- ◆ Although not required, downspout extenders are highly recommended. They prevent soil erosion by diverting roof runoff.
- ◆ Be sure the extenders have a stable outlet, such as the street, sidewalk, splash block made of gravel, or a well-vegetated area.

(5) MAINTAIN THE CONTROL PRACTICES

Maintain all erosion and stormwater control practices until construction is completed and soil is stabilized with vegetation or mulch.

- ◆ Inspect the control practices after each storm event, making any needed repairs immediately.
- ◆ Remove sediment from behind silt fences and catch basin sediment traps as needed.
- ◆ After work, sweep/scrape up any soil tracked onto roadways. *Do not flush areas with water.*

(6) REVEGETATE THE BUILDING SITE

Immediately after all outside construction activities are completed, stabilize the soil with sod, seed, or mulch.

Redistribute the Stockpiled Subsoil and Topsoil

- ◆ Spread the stockpiled subsoil to rough grade.
- ◆ Spread the stockpiled topsoil to a depth of 4 to 6 inches over rough-graded areas.
- ◆ Fertilize and lime according to soil test results or recommendations of a lawn care specialist.

Seed or Sod Bare Areas

- ◆ Contact a lawn care specialist for recommended seeding mixtures and rates, or for methods of sod installation.
- ◆ Water newly planted areas every day until grass is well established. Established grass needs far less irrigation.

Mulch Newly Seeded Areas

- ◆ Apply straw mulch to newly seeded areas, using 75 to 100 pounds of straw per 1,000 square feet (*approx. 1.5 -2 bales of straw*).
- ◆ On flat or gently sloping land, anchor the mulch by crimping it 2 to 4 inches into the soil. On steep slopes, anchor the mulch with netting or tackifiers. An erosion control blanket can substitute for anchored mulch.

Once the sod or vegetation is well established, remove any remaining temporary erosion and sediment control practices, such as downspout extenders or storm drain protection.

REFERENCE MATERIALS

Every building site is unique and poses its own potential erosion and stormwater hazards. Additional control methods are necessary, if the lot:

- ◆ Is adjacent to a stream, lake, or wetland.
- ◆ Has slopes in excess of 6 percent.
- ◆ Receives runoff from adjacent areas.
- ◆ Has more than one acre of disturbed ground.

This pamphlet provides installation instructions for five of the more commonly used building site erosion and sediment control practices. For information on other methods, see the *Drainage Design & Erosion Control Manual for Thurston County*, available from the Thurston County Department of Water and Waste Management or contact the Thurston Conservation District's Erosion Control Technician (TEL 360-754-3588).

Another valuable reference is the *Soil Survey of Thurston County, Washington*, which contains information about soil hazards that may need to be addressed at the time of construction. Copies of the soil survey are available at the Thurston Conservation District, 6128 Capitol Blvd, Tumwater, WA 98501.

LOCAL EROSION CONTROL ORDINANCES

Property owners and contractors are responsible for compliance with state laws and local ordinances regarding construction site soil erosion and stormwater control.

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