

EROSION CONTROL FOR THE HOME BUILDER

For Projects Vested Prior to September 30, 2010

Soil erosion, stormwater runoff, and resulting sedimentation are a leading cause of water quality problems in Snohomish 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 bulletin 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 spawning 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.

PRIMARY STEPS TO CONTROL EROSION ON EACH BUILDING SITE

Erosion and stormwater control is important on every building site regardless of lot size. The goal that is envisioned is to prevent erosion before it occurs. This is more cost effective

than building sediment traps or sediment ponds on site.

The following are the five steps to follow when building on a site in Snohomish County:

1. **Work** with the County Site Reviewer or your consultant to try and fit the proposed building structure or development activity to the terrain. Grading activities should be timed to minimize uncovered or unvegetated soil. Limit the access and staging areas open to construction traffic; use the appropriate Best Management Practices (BMPs) for the site.

2. **Develop** an erosion control plan or jointly select BMPs and install these erosion and stormwater controls as soon as practicable for the site.

Determine which of the specific erosion control practices are best suited for the lot. These techniques include dispersion, infiltration, perimeter control, and cover revegetation. Reduce the length and steepness of bare earthen slopes.

3. **Install** the erosion control measures prior to storm events and the wet season; do not wait until it starts to rain. Think ahead and make sure proper installation methods are used.

4. **Maintain** the erosion control measures on site during construction. Keep the catch basins, yard drains, and pipes from becoming plugged by sediment. Periodically check silt fences, sweep streets, and make sure the construction rock entrance does not allow mud to be tracked into sidewalks or roadways. Make sure stockpiles that are covered with plastic stay secured during wind or rainstorms.

5. **Revegetate and landscape** As soon as possible, restore or revegetate disturbed areas. A well-vegetated site is more attractive and has greater sales potential. It protects the water quality for all our citizens and our endangered species.

(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 AND 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 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.

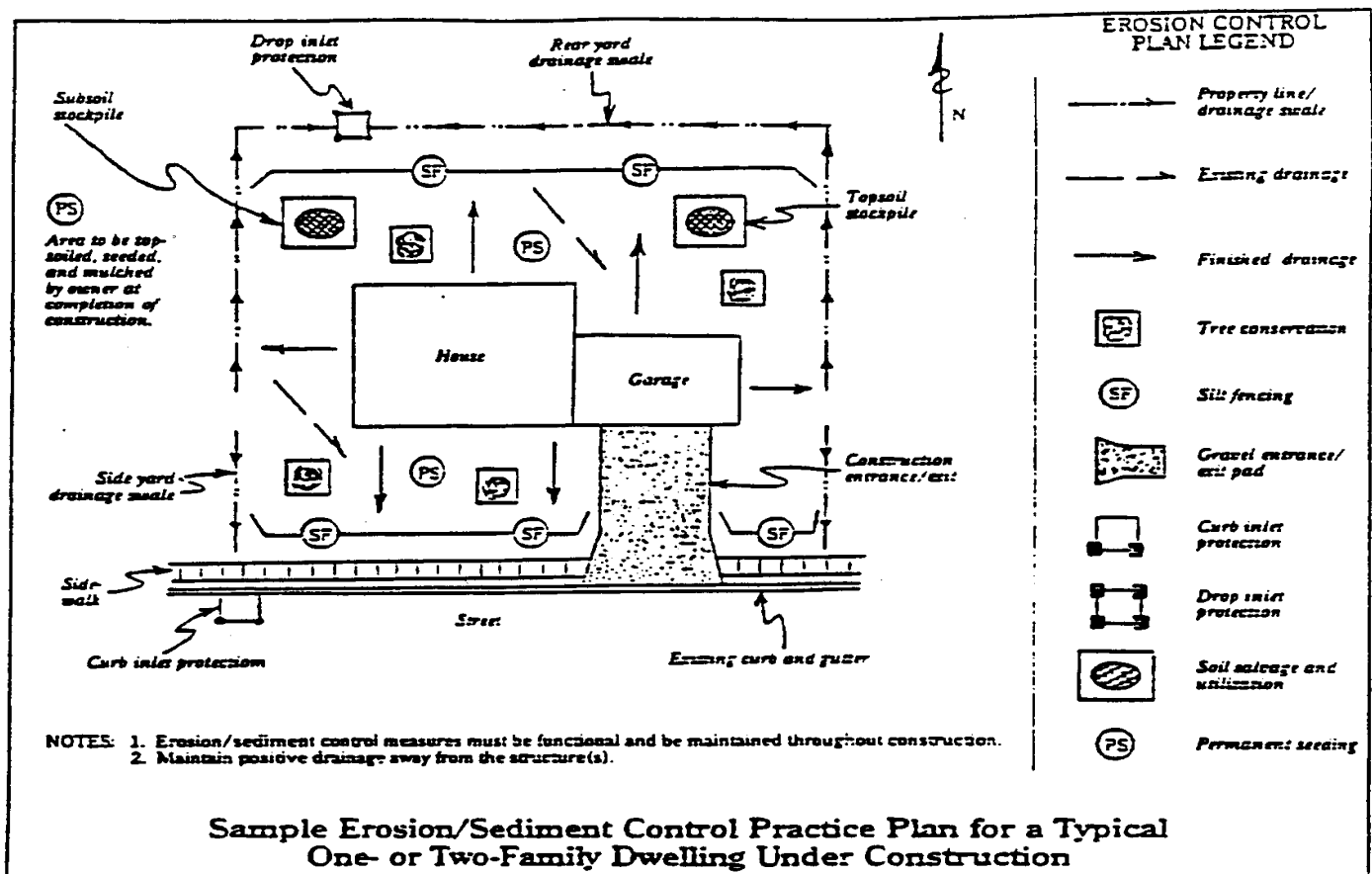
Install Downspout Extenders

- 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 (approximately 1.5 - 2 bales of straw).

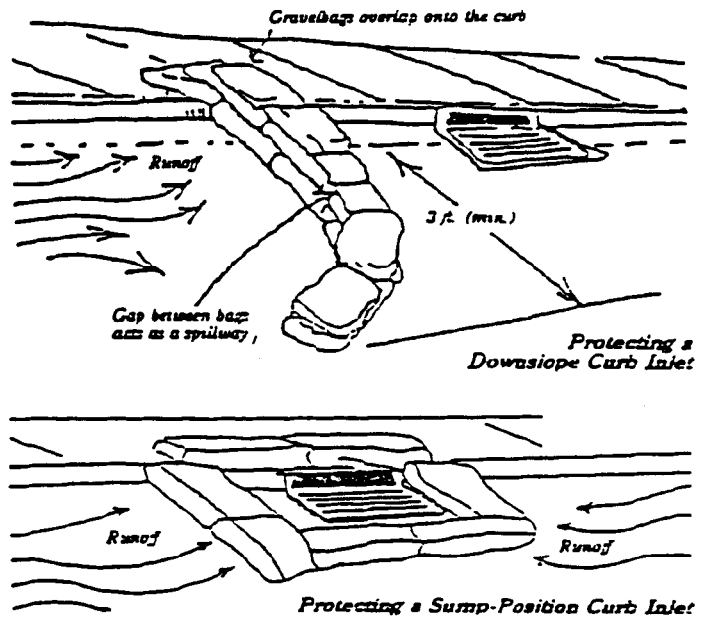
- On flat or gently sloping land, anchor the mulch by crimping it 2 to 4 inches into the soil. On steep slopes, anchor the mulch with netting or tackifiers. An erosion control blanket can substitute for anchored mulch.

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.

FIVE COMMON CONSTRUCTION EROSION CONTROL PRACTICES

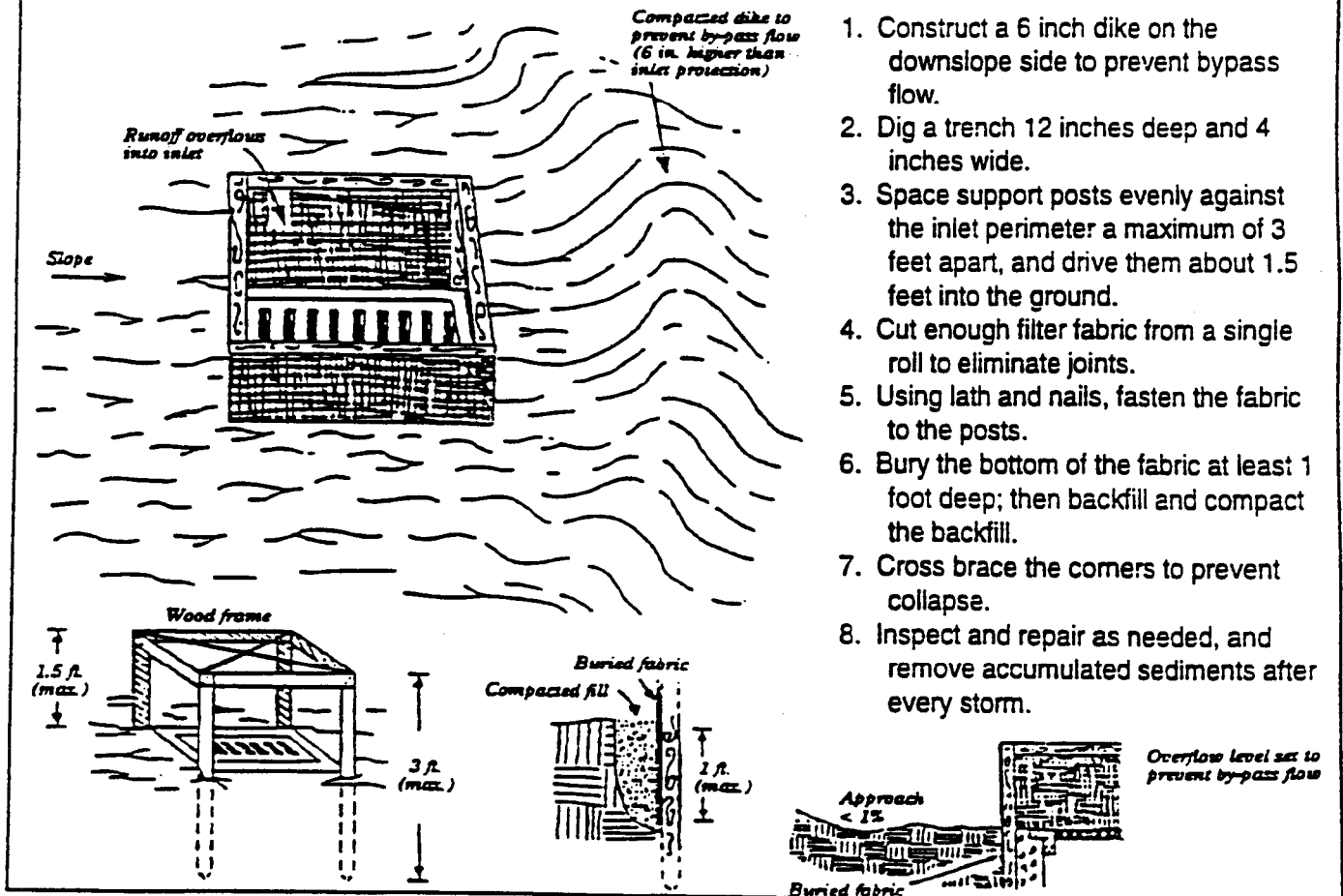
CURB INLET PROTECTION

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

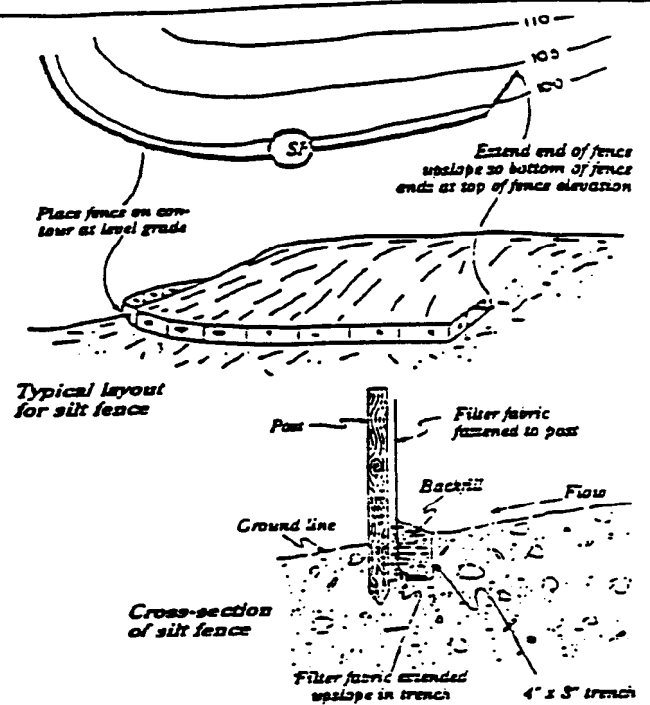
1. Construct a 6 inch dike on the downslope side to prevent bypass flow.
2. Dig a trench 12 inches deep and 4 inches wide.
3. Space support posts evenly against the inlet perimeter a maximum of 3 feet apart, and drive them about 1.5 feet into the ground.
4. Cut enough filter fabric from a single roll 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.



SILT FENCE

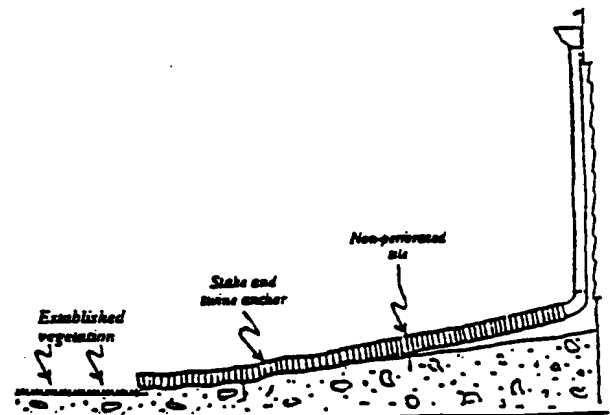
1. Install parallel to the contour of the land.
2. Extend ends upslope enough to allow water to pond behind the fence.
3. Excavate a trench 8 inches wide and 12 inches deep.
4. Install fence with stakes on the downslope side.
5. Bury 12 inches of fabric in the trench, extending the bottom 4 inches toward 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.)



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.



CONSTRUCTION ENTRANCES

(Page II-5-30, DOE Manual)

Function: To prevent transport of mud, dirt, rocks, etc. onto paved surfaces and roads by motor vehicles and by runoff. If all vehicular traffic will be restricted to paved surfaces, a construction entrance is not required.

Use: A stabilized construction entrance is required whenever and wherever traffic will be leaving a construction site and moving onto a paved area.

Design Criteria:

Stabilized Construction Entrance - single family residential projects only

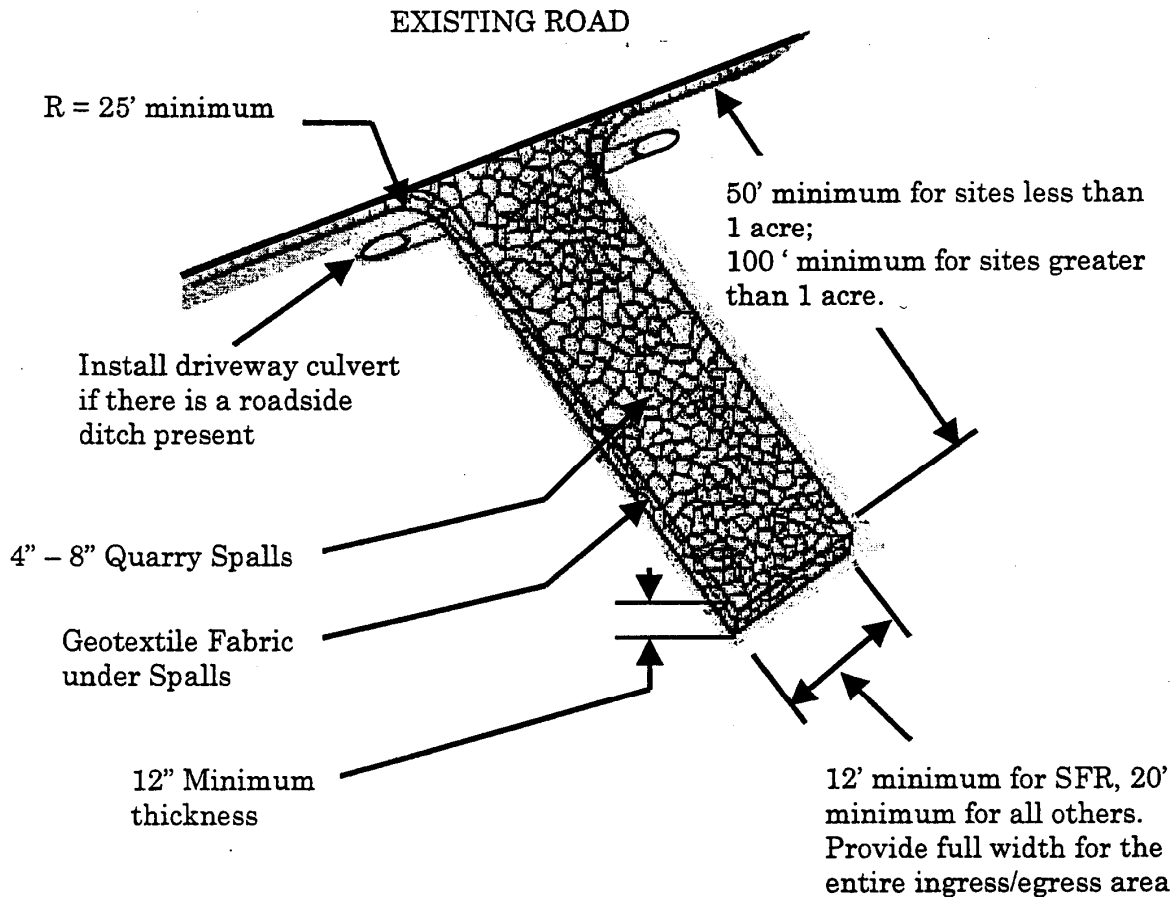
- The entrance shall be stabilized so that no dirt is deposited on paved surfaces by vehicular traffic.
- The entrance may be stabilized by a pad of wood chips, 12" thick minimum.
- The entrance may be stabilized by a pad of 4" - 8" quarry spalls, 12" thick minimum.
- The entrance may be stabilized by a paved driveway.
- Filter fabric shall be laid beneath the rock pad.

Stabilized Construction Entrance - all commercial, subdivision, and similar projects (these plans typically are prepared by a Civil Engineer).

- Material should be quarry spalls, 4 - 8 inches in size.
- The rock pad shall be at least 12 inches thick and 100 feet in length for sites > 1 acre.
- The rock pad shall be at least 12 inches thick and 50 feet in length for sites < 1 acre, or to the foundation if 50 feet cannot be achieved.
- Filter fabric shall be laid beneath the rock pad.
- Width shall be the full width of the vehicle ingress and egress area (minimum 20 feet).
- Additional rock should be added periodically to maintain proper function of the pads.
- If the quarry spall pad does not remove all dirt from the tires, a tire wash will be required. Tire washing should be done before the vehicle enters a paved street. Washing should be done on an area covered with crushed rock and the wash water should be drained to a sediment retention facility such as a sediment trap or basin.
- The volume of wash water produced by tire washing should be included when calculating the sediment trap or basin size.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE NOTES:

1. **INSTALLATION:** The area of the entrance should be cleared of all vegetation, roots, and other objectionable material. The gravel shall be placed to the specified dimensions. Any drainage facilities required because of washing should be constructed according to the specifications in the plan. If wash rocks are used, they should be installed according to manufacturer's specifications.
2. **AGGREGATE:** 4" to 8" crushed quarry spalls.
3. **FILTER FABRIC:** Geotextile fabric shall be installed beneath the entire construction entrance.
4. **ENTRANCE DIMENSIONS:** The aggregate layer must be at least 12 inches thick. It must extend the full width of the vehicular ingress and egress area. The length of the entrance must be at least 50 feet, or to the foundation if 50 feet cannot be achieved.
5. **WASHING:** If conditions on the site are such that most of the mud is not removed from vehicle tires by contact with the gravel, then the tires must be washed before vehicles enter a public road. Wash water must be carried away from the entrance to a settling area to remove sediment. A wash rack and/or a drive through sump may also be used to make washing more convenient and effective.
6. **MAINTENANCE:** The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2-inch stone, as conditions demand, and repair and/or clean out of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadway or into storm drains must be removed immediately.

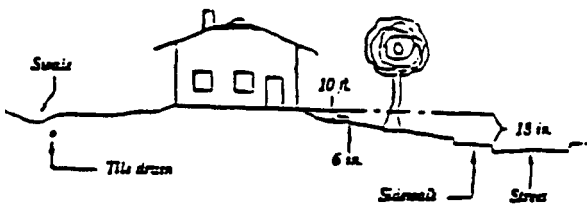


BUILDING LOT DRAINAGE

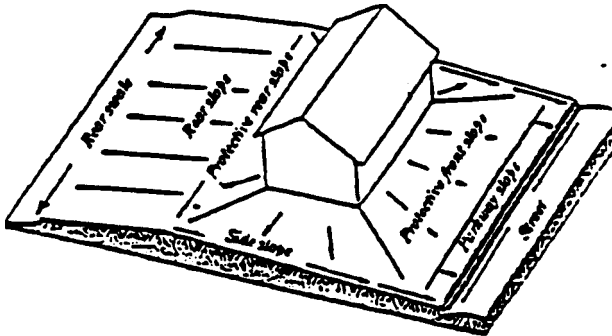
Provide for adequate lot drainage before construction begins. With proper planning, most drainage problems can be avoided. Prevention is easier than correction of a problem and is far cheaper! Here is what it takes to ensure good drainage.

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 footing 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.

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.

LOCAL EROSION CONTROL ORDINANCE

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