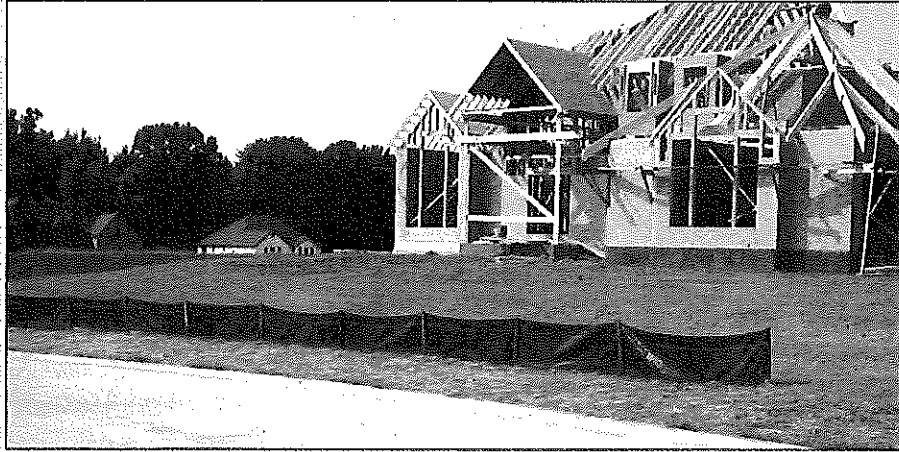


Erosion Control for the Home Builder



Prepared by the Urban Conservation Program Staff, IDNR Division of Soil Conservation

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

This pamphlet deals with erosion/sediment control on an individual building lot. First it looks at some consequences of construction site erosion and presents four principles important for control. Next it addresses the issue of proper lot drainage. Then it presents the seven steps within a construction sequence that should result in effective erosion control. Also included are installation instructions for five commonly used building site erosion control practices as well as suggested references materials and sources of further assistance.

PRIMARY CONCERNS RELATED TO EROSION AND SEDIMENTATION

- **Water quality.** Sediment is the number one pollutant, by volume, of surface waters in the state of Indiana. It impacts water quality by degrading the habitat of aquatic organisms and fish, by decreasing recreational value, and by promoting the growth of nuisance weeds and algae.
- **Local taxes.** Sediment that finds its way into streets, storm sewers, and ditches results in additional maintenance costs for local government.
- **Flooding.** Sediment accumulation in streams, lakes, and rivers reduces their capacity, which can result in increased flooding.

- **Property values.** Sediment deposits not only impair water quality but also damage property, thus reducing its use and value.

PRINCIPLES FOR CONTROLLING BUILDING SITE EROSION AND SEDIMENTATION

Erosion control is important on any building site regardless of its size. Usually, the principles and methods for controlling erosion and reducing off-site sedimentation are relatively simple and inexpensive. Here are four basics to be followed when developing a building site.

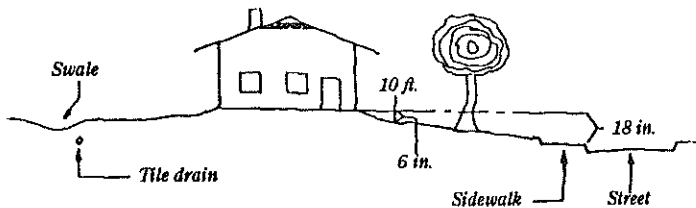
- **Evaluate the site.** Inventory and evaluate the resources on the lot before building. Location of structures should be based, in large part, on the lot's natural features. Identify trees that you want to save and vegetation that will remain during construction. Also identify areas where you want to limit construction traffic. Wherever possible, preserve existing vegetation to help control erosion and off-site sedimentation.
- **Select and install erosion/sediment control practices.** Determine the specific ones needed, and install them before clearing the site. Among the more commonly used practices are vegetative filter strips, silt fence, gravel drives, and runoff inlet protection.
- **Develop a practice maintenance program.** Maintenance of all practices is essential for them to function properly. They should be inspected twice a week and after each rainfall event. When a problem is identified, repair the practice immediately. Also, any sediment that is tracked onto the street should be scraped and deposited in a stable area. *Do not flush sediment from the street with water.*
- **Revegetate the site.** Do so as soon as possible. A well-maintained lot has a higher sale potential.

BUILDING LOT DRAINAGE

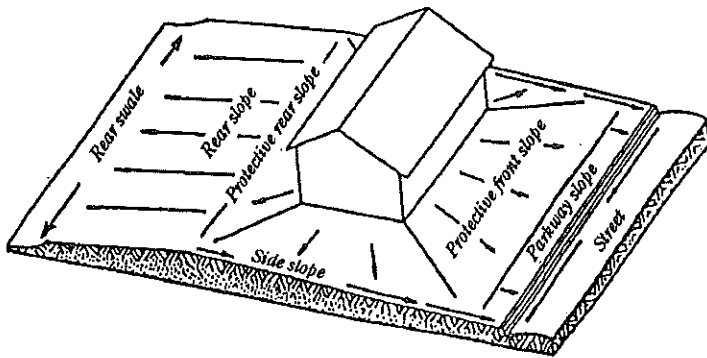
The best time to provide for adequate lot drainage is before construction begins. With proper planning, most drainage problems can be avoided. And that's important because correcting a problem after it occurs is usually much more difficult and costly. Here's what it takes to ensure good lot surface and subsurface drainage.

Surface Drainage

- Position the structure a minimum of 18 inches above street level.
- Divert stormwater runoff away from the structure by grading the lawn to provide at least 6 inches of vertical fall in the first 10 feet of horizontal distance.



- Construct side and rear yard swales to take surface water away from the structure.



- Avoid filling in existing drainage channels and roadside ditches, since that could result in wetness problems on someone else's property and/or damage to adjacent road surfaces.

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 an existing field tile, assume that it carries water even if currently dry; therefore, re-route it (using the same size tile) around the structure or septic field, then reconnect it.

STEP 1. EVALUATE THE SITE.

Before construction, evaluate the entire site, marking for protection any important trees and associated rooting zones, unique areas to be preserved, on-site septic system absorption fields, and vegetation suitable for filter strips especially in perimeter areas.

Identify Vegetation To Be Saved.

- Select and identify the trees, shrubs, and other vegetation that you want to save (see "Vegetative Filter Strips" under Step 2 below).

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 trees' dripline to protect the area below their branches.
- Place a physical barrier, such as plastic fencing, around the area designated for a septic system absorption field (if applicable).

STEP 2. INSTALL PERIMETER EROSION AND SEDIMENT CONTROLS.

Identify the areas where sediment-laden runoff could leave the construction site, and install perimeter controls to minimize the potential for off-site sedimentation. It's important that perimeter controls are in place before any other earth-moving activities begin.

Protect Down-Slope Areas.

With Vegetative Filter Strips

- On slopes of less than 6 percent, preserve a 20- to 30-foot wide vegetative buffer strip around the perimeter of the property, and use it as a filter strip for trapping sediment.
- Do not mow filter strip vegetation shorter than 4 inches.

With Silt Fence

- Use silt fencing along the perimeter of the lot's downslope side(s) to trap sediment (see Exhibit #3).

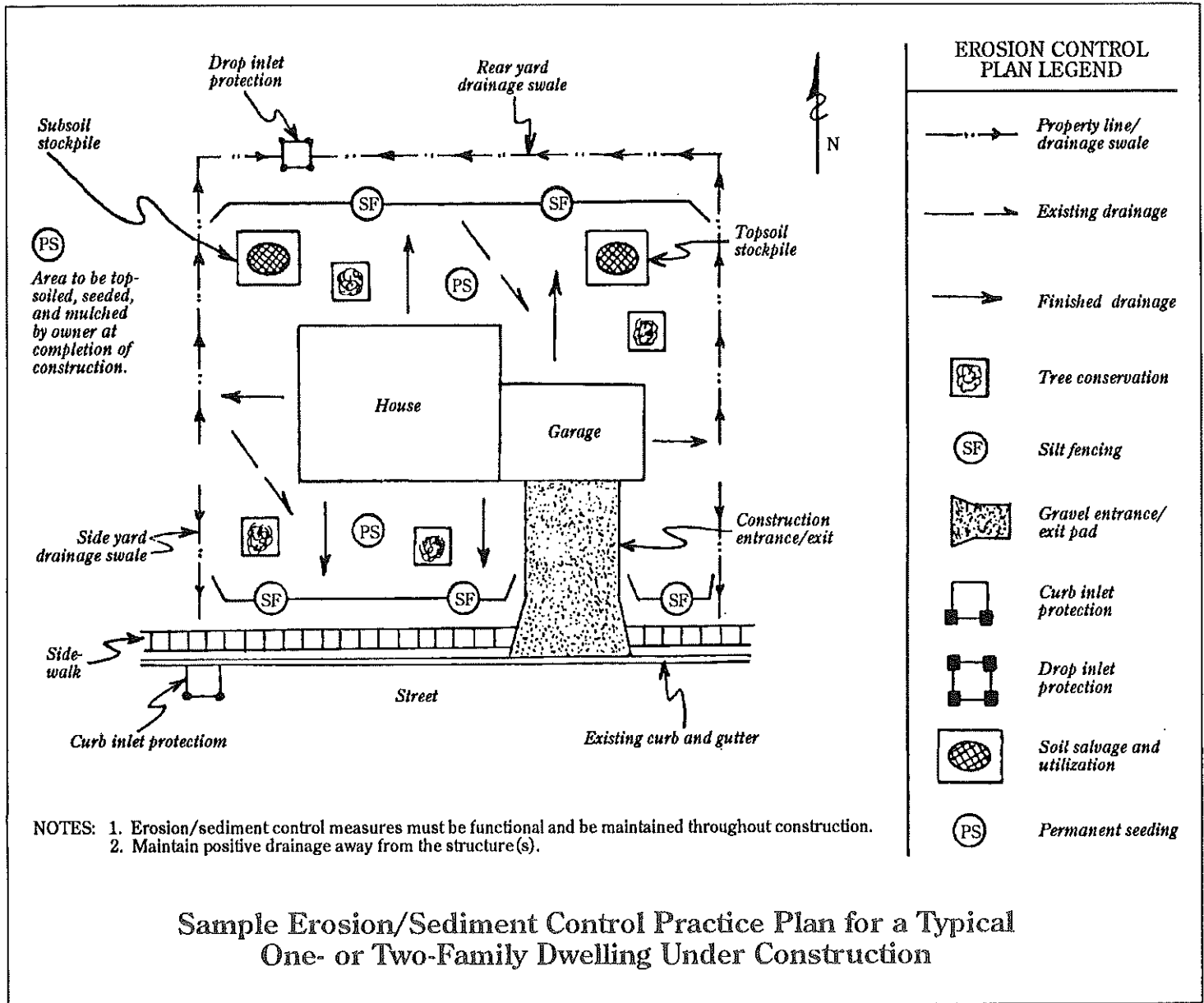
Install Gravel Drive.

- Restrict all lot access to this drive to prevent vehicles from tracking mud onto roadways (see Exhibit #4).

Protect Storm Sewer Inlets.

- Protect nearby storm sewer curb inlets with stone-filled or gravel-filled geotextile bags (see Exhibit #1) or equivalent measures before disturbing soil.
- Protect on-site storm sewer drop inlets with silt fence material (see Exhibit #2), straw bales, or equivalent measures before disturbing soil.

Construction Sequence for Building Site Erosion Control Practices



STEP 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 areas to be protected.

Salvage and Stockpile the Topsoil/Subsoil.

- 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 drainageway.
- Immediately after stockpiling, temporary-seed the stockpiles with annual rye or winter wheat and/or place sediment barriers around the perimeter of the piles.

STEP 4. BUILD THE STRUCTURE(S) AND INSTALL THE UTILITIES.

Construct the home and install the utilities; also install the sewage disposal system and drill the water well (if applicable); then consider the following.

Install Downspout Extenders.

- Although not required, downspout extenders are highly recommended as a means of preventing lot erosion from roof runoff.
- Add the extenders as soon as the gutters and downspouts are installed (see Exhibit #5).
- Be sure the extenders have a stable outlet, such as the street, sidewalk, or a well vegetated area.

EP 5. MAINTAIN THE CONTROL PRACTICES.

Maintain all erosion and sediment control practices until construction is completed and the lot is stabilized.

Inspect the control practices a minimum of twice a week and after each storm event, making any needed repairs immediately.

Toward the end of each work day, sweep or scrape up any soil tracked onto roadways. *Do not flush areas with water.*

By the end of the next work day after a storm event, clean up any soil washed off-site.

EP 6. REVEGETATE THE BUILDING SITE.

Immediately after all outside construction activities are completed, stabilize the lot with sod, seed, and/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 seed supplier or a professional landscaping contractor.

Seed or Sod Bare Areas.

Contact local seed suppliers or professional landscaping contractors for recommended seeding mixtures and rates.

Follow recommendations of a professional landscaping contractor for installation of sod.

Water newly seeded/sodded areas every day or two to keep the soil moist. Less watering is needed once grass is 2 inches tall.

Mulch Newly Seeded Areas.

Spread straw mulch on newly seeded areas, using 1½ to 2 bales of straw per 1,000 square feet.

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 alternative to anchored mulch would be the use of erosion control blankets.

EP 7. REMOVE REMAINING TEMPORARY CONTROL MEASURES.

Once the sod and/or vegetation is well established, remove any remaining temporary erosion and sediment control practices, such as:

Downspout extenders. (Or shorten to outlet onto the vegetated areas, allowing for maximum infiltration).

Storm sewer inlet protection measures.

REFERENCE MATERIALS

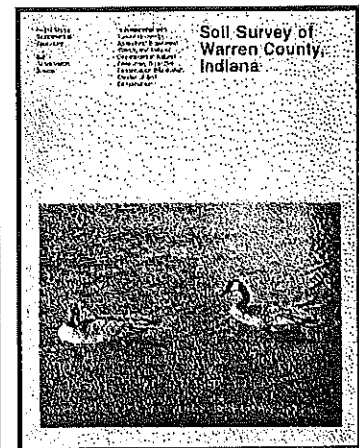
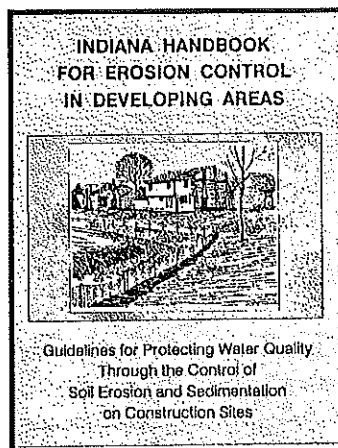
Every building site is unique and poses its own potential erosion hazards. In many instances, additional or alternative control methods are necessary if the lot is:

- Adjacent to a creek, 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 on five of the more commonly used building site erosion and sediment control practices. For information on other related practices, see the *"Indiana Handbook for Erosion Control in Developing Areas,"* available from Division of Soil Conservation, Indiana Department of Natural Resources, 402 West Washington Street, Rm. W265, Indianapolis, IN 46204-2748. For an order form, call the Division office at 317-233-3870.

Another valuable reference when building a home is your county's detailed soil survey report, which contains information about soil hazards and limitations (such as wetness) that may need to be addressed at the time of construction. Single copies of the soil survey are available at your local Soil and Water Conservation District (SWCD) office.

SWCDs also provide free technical assistance regarding the management of soil and water resources.



LOCAL EROSION CONTROL ORDINANCES

It is the responsibility of property owners and contractors to see that they are in compliance with state laws and local and county ordinances regarding construction site erosion and sediment control.

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Five Common Construction Site Erosion Control Practices

Exhibit #1 -- CURB INLET PROTECTION

1. Fill geotextile bags approximately half full with 2- to 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, causing possible injury.
7. Inspect and repair as needed, and remove any accumulated sediments after every storm.

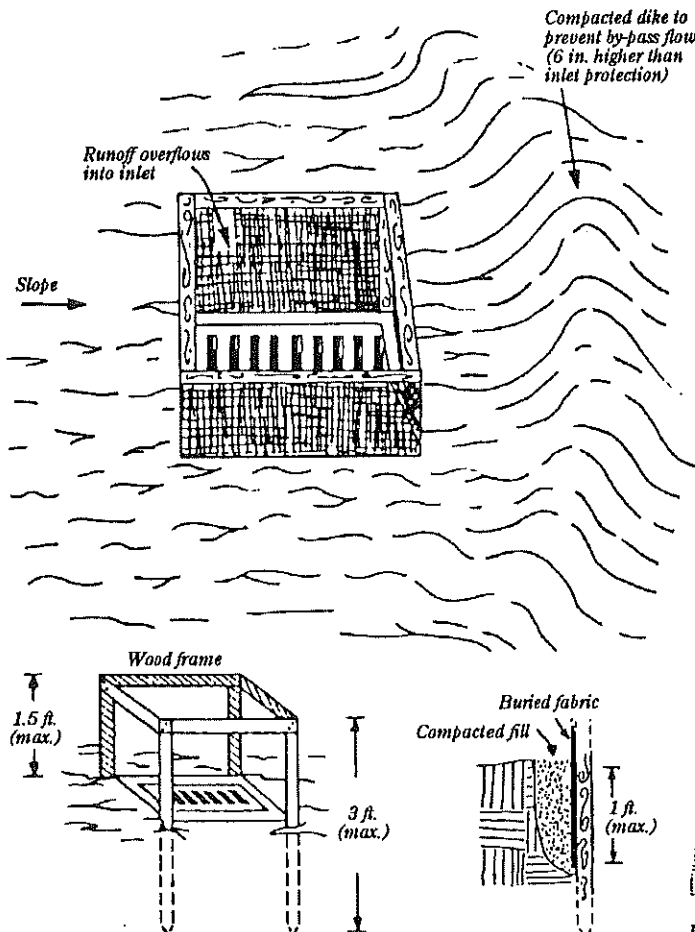
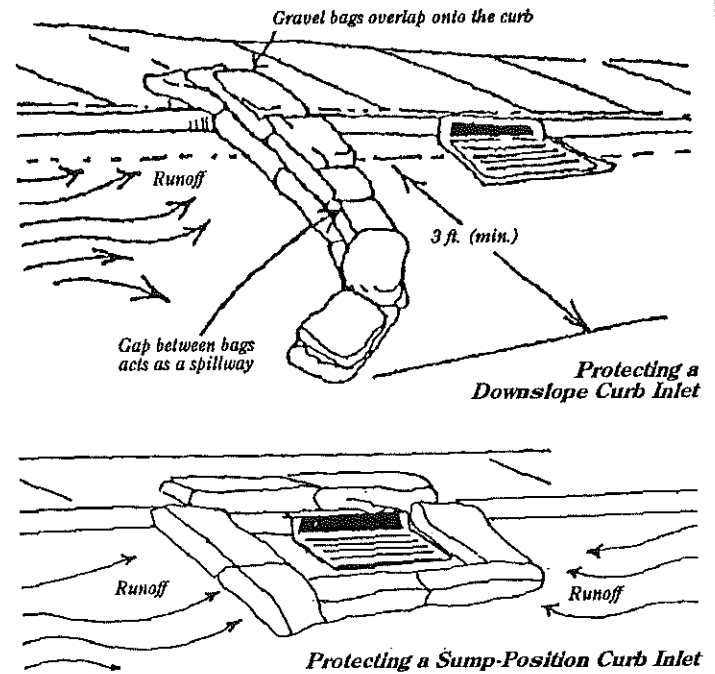


Exhibit #2 -- DROP INLET PROTECTION

1. Construct a 6-inch dike on the downslope side to prevent by-pass 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 1½ 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.

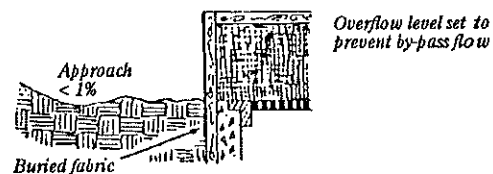


Exhibit #3 -- SILT FENCE

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 4 inches wide and 8 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 trench with soil material, and compact.
7. Join silt fence sections by overlapping sections and nailing with lath to the nearest post.
8. Inspect twice a week and 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, whereas straw bale barriers have a limited life of 3 months or less.)

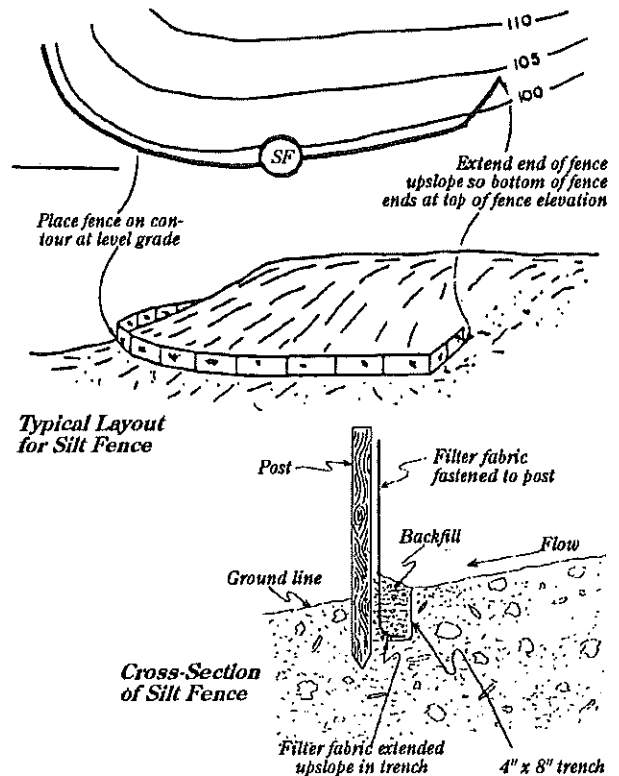


Exhibit #4 -- GRAVEL ENTRANCE

1. Place 6 inches of coarse aggregate (IN-DOT CA No. 2) over a stable subgrade.
2. Construct the drive at least 12 feet wide and 50 feet long or the distance to the foundation.
3. Add stone as needed to maintain 6 inches of clean depth.
4. To improve stability or if wet conditions are anticipated, place geotextile fabric on the graded foundation.

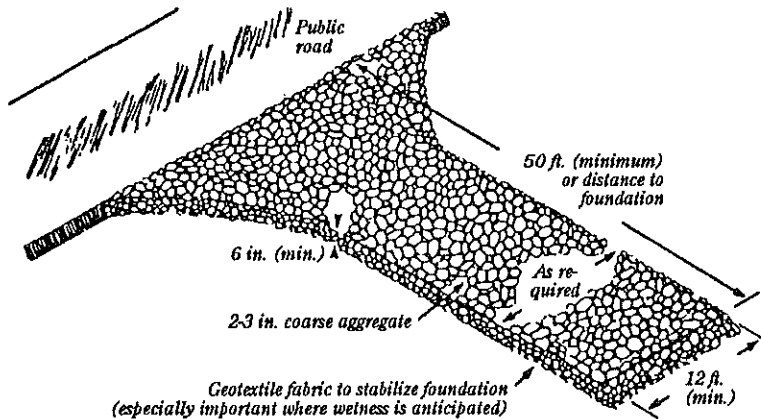


Exhibit #5 -- TEMPORARY DOWNSPOUT EXTENDERS

1. Install extenders as soon as gutters and downspouts are installed to prevent erosion from roof runoff.
2. Use non-perforated (unslotted) drainage tile.
3. Route water to a stable grassed or paved area or to the storm sewer.
4. Remove after vegetation is established.

