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Erosion Control For The Home Builder

Soil erosion and the resulting sedimentation are a leading cause of water quality problems in Ohio. *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.

Why The Concern About Erosion and Sediment Control?

◆ **Water quality** - Sediment is the number one pollutant, by volume, of surface waters in the state of Ohio. 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** - Cleaning up sediment in streets, sewers and ditches increase costs to local government budgets and subsequently to taxpayers.

◆ **Flooding** - Sediment accumulation in ditches, 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 Lot 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 principles to be followed when developing a building site.

◆ **Evaluate 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 practices** - Determine the specific practices

needed, and install them *before* clearing the site. Among the more commonly used practices are vegetative filter strips, silt fence, gravel drives, and storm water inlet protection.

◆ **Develop a maintenance program** - Maintenance of all practices is essential for them to function properly. They should be inspected once 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 into the stormsewer system.*

◆ **Revegetate the site** - Do so as soon as possible. Any area to be left bare for more than 21 days should be seeded immediately to a temporary cover of annual ryegrass.

Construction Sequence

Lot Erosion & Sediment Control

Step 1. Evaluate the Site

Before construction begins, 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).

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 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.

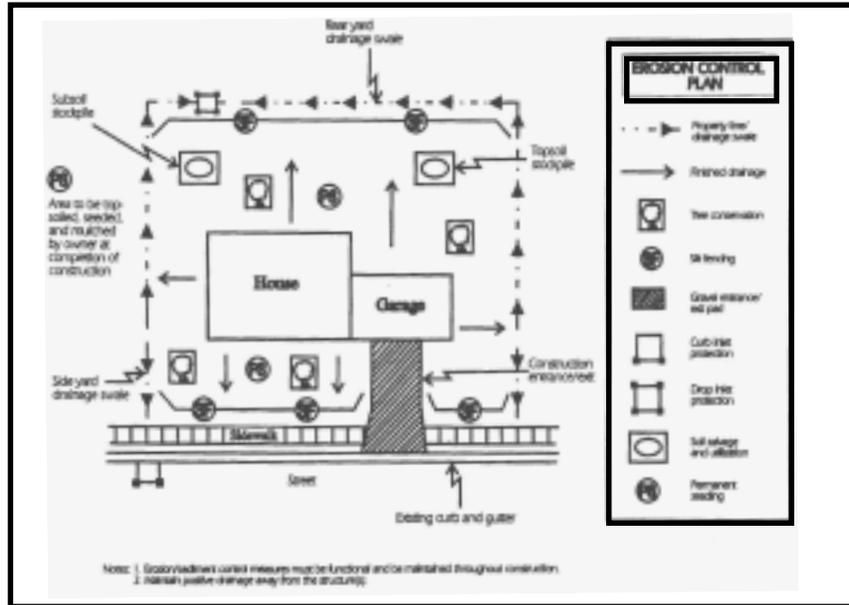
Protect Down-Slope Areas

With Vegetative Filter Strips

- ◆ On slopes of less than 6 per cent, 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

Example of Erosion & Sediment Control on a Building Lot



- ◆ Use silt fencing along the perimeter of the lot’s downslope side(s) to trap sediment.

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.

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 Structures & 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

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.

STEP 5. Maintenance

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

STEP 5. Maintenance (cont'd)

- ◆ Inspect the control practices a minimum of once 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.

STEP 6. Revegetate The Site

Immediately after all outside construction activities are completed, stabilize the lot with sod, seed, and 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; soak to 2 inches. Less watering is needed once grass is 2 inches tall.

Mulch Newly Seeded Areas

- ◆ Spread straw mulch on newly seeded areas, using 2 to 3 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.

STEP 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.

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.

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Reference Materials

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

- ◆ Adjacent to a creek, river, 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 four of the more commonly used building site erosion and sediment control practices. For information on other related practices, refer to the ODNR, Division of Soil and Water Conservation handbook, *Rain Water and Land Development - Ohio's Standards for Stormwater Management, Land Development and Urban Stream Protection*. Copies are available at the Summit Soil and Water Conservation District, 2787 Front Street, Suite B, Cuyahoga Falls, Ohio 44221; Phone (330) 929-2871; Fax (330) 929-2872 or from the ODNR Division Office at 1939 Fountain Square Court Building E-2, Columbus, Ohio 43224-1336, telephone (614) 264-6610. For more information about the NPDES Permit Program contact the Ohio EPA Northeast Division office at (330) 963-1145.

Another valuable reference when building a home, is the Summit County 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 the Summit Soil and Water Conservation District (SWCD) office (address above).

Summit SWCD also provides free technical assistance regarding the management of soil and water resources.

Contact the Ohio Utilities Protection Service (OUPS) 48 hours before you dig, 1-800-362-2764.

LOCAL 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.

The information, drawings and materials in this pamphlet were taken in part from the Pickaway SWCD pamphlet *Erosion Control for the Home Builder* revised 1/96.

Installation Specifications

Exhibit #1 — CURB INLET PROTECTION

1. Construct wooden frame using 2-by-4-in. lumber. The end spacers shall be at least 1 foot beyond both ends of the opening. The anchors shall be nailed to 2-by-4-in. stakes driven on opposite side of curb.
2. Install wire mesh in one continuous piece with minimum width of 30 in. and 4 ft. longer than the length of inlet, 2 ft. on each side.
3. Geotextile EOS of 20-40 sieve shall be the same size as wire mesh and be resistant to sunlight.

4. Wire mesh and geotextile should be formed to the concrete gutter and against the face of the curb on both sides of the inlet and securely fastened to the frame
5. Place 2 in. stone over wire mesh and geotextile to prevent water from entering the inlet under or around the geotextile.
6. Inspect and repair as needed, and remove any accumulated sediments after every storm.

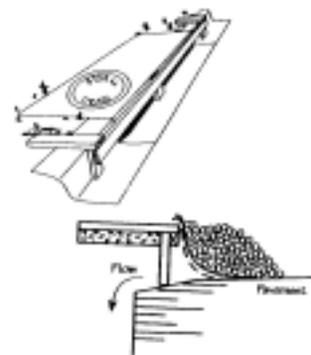


Exhibit #2 Storm Drain Inlet Protection

1. Construct an earth dike on the downslope side to prevent by-pass flow. The top of earth dike shall be at least 6 inches higher than the top of the frame.
2. Dig a trench 18 inches deep and 4 inches wide around the inlet.
3. Space support posts evenly against the inlet perimeter a maximum of 3 feet apart, and drive them about 1 1/2 feet into the ground. The top of the frame shall be at least 6 inches below adjacent roads if ponded water would pose a safety hazard to traffic.
4. Cut enough filter fabric from a single roll to eliminate joints. Stretch tightly around the frame over wire mesh. Fasten securely.
5. Bury the bottom of the fabric at least 1 foot deep; then backfill and compact the backfill.
6. Cross brace the corners to prevent collapse.
7. Inspect and repair as needed, and remove accumulated sediments after every storm.

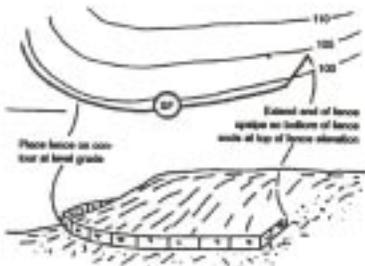
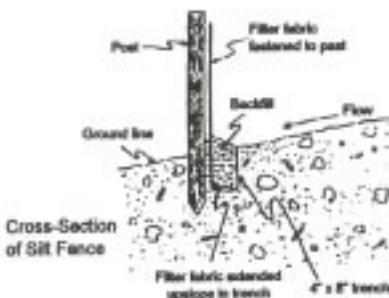


Exhibit #3 — SILT FENCE

1. Install silt fence before upslope land disturbance begins.
 2. Install parallel to the contour of the land.
 3. Extend ends upslope enough to allow water to pond behind the fence.
 4. The length of the fence posts shall be 32 inches long; a minimum of 16 inches shall be above the original ground.
 5. Cut a trench a minimum of 6 inches deep; bury 8 inches of fabric in the trench.
 6. Install fence with stakes on the downslope side.
 7. Backfill trench with soil material, and compact.
 8. Seams between section of silt fence shall be overlapped with the end stakes of each section wrapped together before driving into the ground.
 9. Inspect once 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.)



Typical layout for Silt Fence

Exhibit #4-Gravel Entrance

1. Construct the drive at least 10 feet wide and at least 50 feet long or the distance to the foundation.
2. Place 2-3 inch stone over a stable subgrade.
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.
5. A pipe or culvert shall be constructed under the entrance if needed to prevent surface water flowing across the entrance.

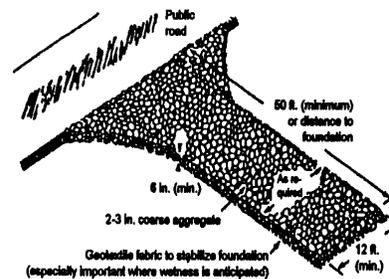


Exhibit #5 — TEMPORARY DOWN-SPOUT EXTENDERS

1. Install extenders as soon as gutters and down-spouts 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 only after adequate vegetative cover is established.

