

# Storm Water Pollution & Erosion Control

The primary purpose of erosion control is to reduce the erosive effects of surface water runoff on exposed soil. As a reminder, reducing the source of the surface water runoff can provide a significant improvement to erosion problems and should be the first step taken.

Soil erosion, although a natural process, can be greatly accelerated by improper construction practices. Because of the climate in Wisconsin and the general nature of our topography, eroded soils can be quickly transported to a creek, river, stream or the bay.



Soil becomes vulnerable to erosion when construction activity removes or disturbs the vegetative cover. Vegetative cover and its root system play an extremely important role in preventing erosion by: (1) Shielding the soil surface from the impact of falling rain drops; (2) Reducing the velocity of runoff; (3) Maintaining the soil's capacity to absorb water, and (4) Holding soil particles in place.

Because of the vegetation's ability to minimize erosion, limiting and phasing its removal can significantly reduce soil erosion. In addition, decreasing the area and duration of exposure of disturbed soils is also effective in limiting soil erosion. **The designer must give special consideration to the phasing of a project so that only those areas actively under construction have exposed soils.** Other factors influencing soil erosion are: (1) Soil types, (2) Land slope, (3) Amount of water flowing onto the site from up-slope, and (4) Time of year of disturbance.

Besides phasing and sequencing the construction to limit the exposure of soils, there are many structural erosion control measures that can be used. The principal measures are:

- **Mulching.** This practice is the application of plant material such as hay and straw to the soil surface. This reduces erosion by shielding the soil from the force of raindrop impact and reducing the velocity of runoff flowing over the soil. Hay and straw mulch should be applied at the rate of one-and-one-half to two tons per acre, or until the soil surface is not visible through the mulch. Mulch can also aid in seed growth by conserving moisture and shielding the young plants from extremes of heat, cold, or dry conditions. Mulch may need to be held in place by sprayed on tackifiers or netting.



- **Matting.** This practice is similar to mulching except that a manufactured product is used. The matting may be made from jute, coconut fiber, or a combination of natural and synthetic fibers. Matting should be used in areas where mulch would wash off such as channels and long and/or steep slopes. Wire staples are used to hold the matting in place. This practice, like mulching, is an excellent erosion control measure.



- **Diversion.** In this practice the contractor constructs an earth channel and/or berm up-slope of the work area with a supporting ridge on the lower side across the slope. Diversions intercept and divert clean water before it flows onto the construction site. It is important to only expose the site to water falling directly onto it.

- **Vegetated Filter Strip.** This practice consists of a well-vegetated strip through which the runoff flows before leaving the work area. Vegetated filter strips remove sediment by filtering the water as it flows through the vegetation and slowing the velocity of flow allowing the sediment to settle. Strips should be a minimum of 50 to 75 feet wide. Vegetated filter strips on slopes more than 15 % are less effective.



- **Temporary Seeding.** This practice is the seeding of grass or small grains on the disturbed area for a limited period. The seeding will replace the vegetation removed and will provide similar erosion control benefits. Temporary seeding is not effective until the vegetation is well established.

Establishing vegetation usually takes a full growing season; therefore it is frequently combined with mulching.

- **Silt Fence/Hay Bale Barrier.** These are the most common types of erosion control measures and are often improperly applied, installed and/or maintained. These devices function by slowing the water velocity, thereby allowing the sediment to settle behind the device. They should only be used on small drainage areas. They should be installed along the contour so as not to concentrate runoff. The barriers should have their ends turned up the slope to prevent runoff from flowing around them.



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- **Temporary Grade Stabilization Structures.** These are hay bales or similar measures installed in ditches and swales. In this application they function by slowing the velocity of water in the ditch, making it non-erosive. These structures may also be constructed of rock or timber. The spacing between them should be such that the top of the

downstream structure is at the same elevation as the toe of the immediate upstream structure.

- **Sediment Trap.** This is a small temporarily ponded area with a stable outlet. The sediment trap intercepts sediment-laden runoff from small-disturbed areas and detains it long enough for most of the sediment to settle out. The sediment trap must have a minimum volume of 1,800 cubic feet for each acre of drainage area. The surface area of the sediment trap should be as large as possible to improve performance. A sediment trap should not be used for drainage areas of more than five acres.



Link to City of Green Bay Chapter 34 Construction Site Erosion Control Ordinance:  
<http://greenbaywi.gov/178/Municipal-Code>

Link to Wisconsin DNR Chapter 216:  
<https://dnr.wi.gov/>