Stormwater Erosion and Sediment Control For Large Parcel Construction

The Problem

In urban environments, construction sites are the primary cause of exposed soil. Sediment washes off areas of exposed soil, enters the local drainage ways and streams, contributes to localized flooding problems, and damages water quality. This report summarizes erosion and sediment control requirements for *large parcel* projects - defined as land disturbing activities of 1 acre or more. Note that owners/developers of individual, detached, single family residences and duplexes must comply with *small parcel* minimum requirements. Another report in this series summarizes requirements for small parcels.

Ecology's Stormwater Technical Manual defines large parcels as those that involve land disturbing activities of one acre of more.

Responses in the Puget Sound Basin

In an effort to improve water quality in the region, the Puget Sound Water Quality Management Plan (Puget Sound Plan) was adopted in 1987. One goal of the Puget Sound Plan, in conjunction with local and federal programs, is to reduce pollutant discharges from stormwater caused by development and construction activities.

In response to the stormwater element of the Puget Sound Plan, the Washington State Department of Ecology (Ecology) developed minimum requirements for stormwater management. The minimum requirements, and methods for meeting them, are presented in the *Stormwater Management Manual for the Puget Sound Basin* (Technical Manual).

In November 1990, in accordance with the 1987 amendments to the Clean Water Act, the Environmental Protection Agency developed the National Pollutant Discharge Elimination System (NPDES) program, which has been implemented by Ecology. This program requires permits for any construc-tion that disturbs five or more acres of land. Currently, coverage under Ecology's general baseline permit is required for projects meeting this criteria. Requirements of the permit are generally based on Ecology's Technical Manual, so most of the infor-mation in this report will be helpful in preparing a construction NPDES permit. However, you will need to refer to the permit for specific requirements.

What Are the Requirements for Erosion and Sediment Control?

The first of eleven minimum requirements laid out in Ecology's Technical Manual addresses large parcel projects. Aimed at controlling erosion, sediment, and pollutants on construction sites, there are several items that must be considered, including methods and limits of construction, when, where, and what kind of erosion and sediment controls are used, and who bears the financial responsibility.

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Erosion and sediment can be controlled by implementing best management practices (BMPs). BMPs are physical, structural and managerial practices that prevent erosion and trap sediment. Generally, several types of BMPs are needed on a site for effective erosion and sediment control. Full descriptions of available BMPs are included in the Technical Manual.

Cover Soil

Cover practice BMPs prevent erosion by protecting the soil surface from rainfall and runoff. Prevention of erosion is the preferable approach, since it is the most effective and least costly. Cover practice BMPs include protection of existing vegetation, as well as the temporary covering of exposed soil. If soils are disturbed during construction, they must be stabilized by seeding, mulching, plastic covering, or other means. In order to prevent erosion from occurring on exposed soil, specific time tables for stabilizing disturbed areas have been developed. From October 1 to April 30, soils must be stabilized within two days of being exposed. From May 1 to September 30, soils must be stabilized within seven days. Once construction is completed, the site must be permanently stabilized with seeding, sodding, or topsoiling if needed.

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Steep Slopes Need Special Attention

Special consideration should be given to existing steep slopes or cut and fill slopes constructed as a part of grading operations. These slopes are more susceptible to erosion than flat land.

Plastic covering tied down with sandbags and ropes is effective for cut and fill slopes. When possible, runoff from above the slope should be routed away. This can be accomplished by constructing interceptor ditches or berms at the top of the slope. Discharge from these structures should flow into a pipe slope drain or stabilized channel to safely direct the runoff down the slope. Special structural erosion control BMPs and variations of these measures have been developed for long slopes and other field conditions.

Trap Sediment Onsite

In order to prevent eroded sediment from exiting the site in runoff, use structural sediment control BMPs. Filter fences or straw bale barriers are commonly used to filter sheet flow runoff, and should be placed along the ground contour at the toe of the disturbed slope. For filtering more concentrated flows, sediment traps or ponds should be used. If there are working storm drains on site, you'll need to prevent sediment from getting into the storm drain inlet and clogging the catchbasin. To minimize tracking of sediment off-site, access routes that intersect paved roads must be stabilized with gravel.

Protect Adjacent Properties

Areas adjacent to the construction site must be protected from increased flows from the project site. Protect adjacent properties from sediment deposition by providing a grass buffer around the site perimeter. If an existing detention facility currently detains runoff from the site, keep it working during construction. Stabilize outlets from temporary or existing conveyance systems to prevent erosion downstream.

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Control Other Pollutants

Other pollutants such as pesticides, petrochemicals, concrete products, paints, and fertilizer that exist on the construction site should be handled and disposed of in a manner that does not cause contamination of stormwater. Pollutant Control BMPs have been developed to prevent stormwater contamination by such pollutants. For a listing of these BMPs, consult the Technical Manual.

Manage Construction Activities

"Management measures" are construction management methods that prevent or reduce erosion potential and ensure the proper functioning of BMPs. Well considered construction management can dramatically reduce the cost of erosion and sediment problems.

- Be sure that the structural sediment control BMPs are in place before land disturbing activities begin.
- Conduct construction in phases so that the least possible area is disturbed at any time.
- Avoid grading activities during the rainy season (November through March) as much as possible.
- Mark clearing limits to restrict the area disturbed.
- Install BMPs properly and maintain them regularly.
- Remove all temporary erosion and sediment control BMPs within 30 days after final site stabilization is achieved, or after the temporary BMPs are no longer needed.

Develop a Large Parcel Erosion and Sediment Control Plan

A large parcel erosion and sediment control plan is required for all large parcel projects. The owner/developer is responsible for developing, implementing, and funding the plan. An erosion and sediment control plan for large parcel development should consist of a narrative report and a site plan or set of plans (see back page).

Before:

Taken at the same site, these photos show one view before stabilizing the construction site entrance, and one after an alternate entrance was stabilized with gravel. This is an example of an effective erosion and sediment control best management practice.

After:

What's in a Large Parcel Erosion and Sediment Control Plan?

The narrative report should:

- Describe the project, existing site conditions, and adjacent areas in relation to potential erosion and sediment problems.
- Discuss how each of the items in the erosion and sediment control requirement are specifically met by the plan. Discuss why or why not each is applicable to the project. List the specific BMPs you selected.
- List the temporary and permanent erosion and sediment control BMPs and show the schedule for implementation of selected pollutant control BMPs.
- Describe maintenance procedures for BMPs.

The site plan(s) should include:

- Vicinity map clearly locating property. Accurate location map of the existing and proposed site structures and access.
- Existing site features including topography, vegetation, soils, critical areas, and drainage systems.
- Limits of clearing and grading, cut and fill slopes, and final contours.
- Location of all applicable erosion and sediment control BMPs, and details of structural measures.
- Locations and details of a temporary conveyance system for use during construction.

For more information on municipal stormwater requirements, or if you have special accommodation needs, please call the Urban Nonpoint Management Unit of Ecology's Water Quality Program at 206/438-7058. The agency's telecommunications device for the deaf (TDD) number is 206/438-8721. Ecology is an Equal Opportunity and Affirmative Action Employer.

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