Seattle Department of Construction and Inspections
sdci
Tip 324
Seattle Permits
— part of a multi-departmental City of Seattle series on getting a permit

Reducing Landslide and Stormwater Erosion Damage: What You Can Do

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Each year landslides, erosion and sedimentation cause many thousands of dollars in damage to private and public property. Because of the Puget Sound region's rainy season and periodic intense storms, many hills and steep slopes are subject to costly slides and erosion. Improper construction and development increase the risks and multiply the damages that storms may cause.

This Tip identifies potential and actual signs of landslide and erosion damage and provides solutions you can act on today.

SYMPTOMS TO LOOK FOR

- After or during a prolonged period of rain or an intense storm, inspect your property to locate points and areas which show evidence of surface water erosion or deposition of silt, sand or mud.
- Check the flow from downspouts, roof drains and drainage ditches on your property and the road or street which serves your property; remove obstructive debris.
- Check for concentrated, or heavy surface flows coming on to your property from adjacent areas.
- Check the ground at the bottom and top of steep slopes for saturated soils or ponded water indicating poor drainage and a potential for earth movement.

SOLUTIONS

Take Preventive Action

- The potential for landslides and destructive erosion can be greatly reduced or prevented with proper development, sound construction techniques, seasonal inspections and regular maintenance of drainage facilities.

SDCI staff inspected nearly 400 private properties in Seattle for landslide damage after the 1997 New Year's Day storm.

Protect Vulnerable Areas

- Keep surface drainage water away from vulnerable areas, such as steep slopes, loose soils and non-vegetated surfaces.

Collect Runoff

- Collect and direct water from patios, driveways, non-vegetated surfaces, and other impervious surfaces into catch basins; and confine water flow in drainpipe or conduct to an approved discharge point, such as a drainage ditch, drywell, gutter, natural drainage or holding pond. Roof water may go directly to the drainpipe. Obtain the approval for the discharge point from SDCI.

Intercept Surface Water

- When surface water flows onto your property, and where a discharge point is available, dig a shallow, gently sloping ditch to intercept the water and con-

duct it into a natural water course, vegetated drainage area, street pavement, or road drainage ditch. Your intercepting ditch should be nearly horizontal, with a minimum slope, sufficient to allow water to flow slowly. Smooth the sides of the ditch and plant with rye or lawn grass; keep all ditches free of debris. Obtain the approval for the discharge point from SDCI.

Stabilize Slopes

- Improve your soil's ability to resist erosion by stabilizing slopes with mulching and any of a number of plantings, including grass, ground covers, and trees. However, stable native vegetated slopes should not be disturbed and a grading/building permit may be required if any filling or excavation is performed.
- Straw, woodchips, or bark applied to a depth of at least one inch are effective in holding soil in place on slopes of less than one vertical to two horizontal. On steeper slopes, burlap fabric, coir and other manufactured fabrics can be installed with wood stakes as a means of temporary soil stabilization, until new plantings of shrubbery are established. The fabric permits water to reach and stimulate the growth of plant roots to stabilize the soil.

Maintain Ditches and Report Major Problems

- All drainage ditches require maintenance, including annual debris removal and vegetation trimming.
- Report erosion problems not easily corrected to the Seattle Department of Transportation (SDOT) and/or SDCI.

Reduce Landslide Potential

- Preserve natural vegetation, especially on hillsides, steep slopes and stream sides.
- On steep slopes, do not remove vegetation; for view enhancement, trim trees rather than completely remove; obtain permit when required. Direct water away from steep slopes.
- Water or irrigate with care; do not soak lawn or garden areas located on or near steep slopes. Select plants which do not require deep or intensive watering.
- Do not deposit garbage or vegetative debris on steep slopes.
- Maintain single, low-slope trails down or across steep slopes; discourage play areas, caves and excavations on steep slopes.
- If scars develop as a result of earth movement or water run off, immediate remedial action is needed or the condition will worsen. Direct surface water away from the scarred area by ditching or piping. Subsurface water may also be present in the scarred area and should be directed away from the damaged area. Application of plastic sheeting, or manufactured fabric, adequately anchored, will prevent additional erosion from rainfall. Disturbed areas should be restored and planted during the next growing season. **If the disturbed area is large or is located near a building, immediately notify SDCI.**

Consider Flood Insurance

- See your local insurance agent: Damage from mudflows or stormwater is often covered under a separate insurance policy through the National Flood Insurance Program.

HELPFUL RESOURCES

- For information on environmentally critical areas (ECAs), contact SDCI at (206) 684-8600.
- For general information, existing site drainage, and discharge point approval, call or visit the Drainage & Sewer Review Desk at the SDCI Applicant Services Center, located on the 20th floor of Seattle Municipal Tower, 700 Fifth Ave., (206) 684-5362.
- For online access to the ECA and Seattle Grading and Drainage Control codes, visit **www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)**.
- The Washington State Department of Ecology's landslide website at **www.ecy.wa.gov/programs/sea/landslides** provides helpful tips on reducing landslide risk, checking drainage, investigating slope stability, and getting help in the event of a landslide.
- The Washington State Department of Ecology's landslide website also provides the following helpful online documents (scroll down to the "Online Resources" section at **www.ecy.wa.gov/programs/sea/landslides/help/help.html**):
  - *Managing Drainage on Coastal Bluffs*
  - *Managing Vegetation on Coastal Slopes*
  - *Controlling Erosion Using Vegetation*
  - *Puget Sound Shorelines*