



If You Are a Victim of a Landslide

Immediately contact a Washington State licensed Geotechnical Engineer to ascertain the safety of your home. Also, contact the City's Development Services Group (DSG) at (206) 275-7605 to inform them of your situation. If your home is deemed unsafe to occupy, you will need to find alternate housing until your home is deemed safe. The City works closely with Red Cross to provide housing assistance if needed; the Red Cross phone number is (206) 323-2345. Additionally, the City has a cadre of Emergency Volunteers that can provide assistance if needed: contact MIPD Officer Jennifer Franklin at (206) 940-2962 or jennifer.franklin@mercergov.org. For questions regarding permit requirements, geologic hazard maps, or ordinances contact Don Cole, the City's Building Official at don.cole@mercergov.org.

Landslide History

In a typical year, Mercer Island will sustain between 6 and 15 landslides. Costs of landslides range from a few thousand dollars to upwards of several hundred thousand dollars. Most recently, the Oso landslide on March 22, 2014 in Snohomish County, destroyed part of the town, covered approximately 300 acres with debris dozens of feet deep, blocked a state highway and the Stillaguamish River, and left dozens of residents missing, injured, or deceased.

Why Do They Happen?

Slides are typically triggered by excess water and human factors such as: people discharging their roof drains onto slopes, removing vegetation from slopes, excavating into or placing fill onto slopes, and broken pipes. Understanding common contributory causes can effectively reduce your landslide risk.

When Do They Happen?

January is the peak month, but landslides occur from late winter to early spring. As the ground becomes saturated over the winter, freezing weather turns water to ice, which forces soil apart, increasing soil porosity and allowing more rain and melting snow to penetrate the surface. As soil saturation and slope stresses increase from the added water weight, so does the chance of a debris flow or mudslide.

Where Are They Likely?

Landslides usually occur on moderate slopes with soil types that are conducive to sliding, on slopes that have a history of sliding, and on steeper slopes regardless of soil type. A map assessing known or suspected potential landslide hazard areas can be viewed at City Hall or the City website at: <http://www.mercergov.org/Maps>.

Typically, development within a landslide hazard area is subject to special land use regulations as part of the *Critical Areas Ordinance*.

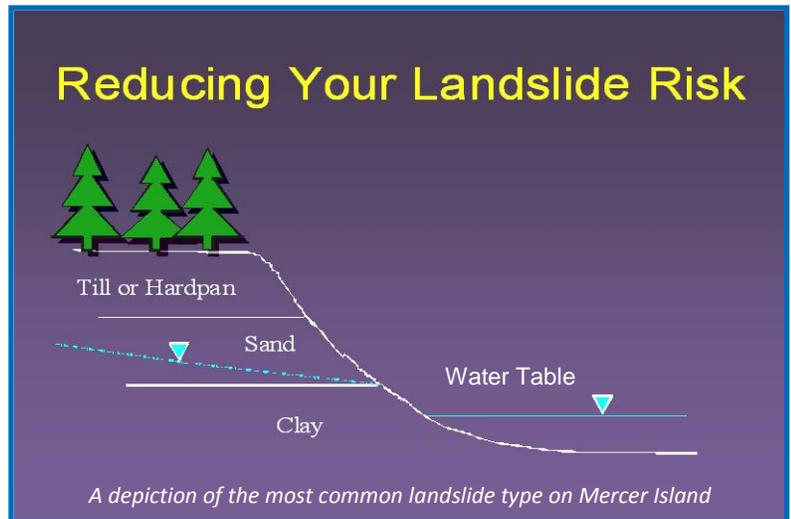
You can also monitor rainfall thresholds for forecasting landslide potential on the USGS website at: <http://landslides.usgs.gov/monitoring/seattle/rtd/plot.php>.

What Can You Do To Reduce Landslide Risk?

Become familiar with slopes on your property and talk with your neighbors if their slope affects your property. **Retain a qualified geotechnical engineer to assess your site and then take action to reduce the risk of a landslide.**

The typical cost of an assessment ranges from \$400 to \$800 and may include the following common practices and recommendations:

- **Control drainage features:** identify and direct storm water and surface drainage away from vulnerable areas, such as steep slopes, loose soils and non-vegetated surfaces. For example, collect and direct water from roof drains, patios, driveways and other impervious surfaces into catch basins or other approved locations. Maintain drainage systems, such as gutters, pipes and ditches in effective operation and keep nearby street drains free of leaves and debris.
- **Control surface water:** since debris flows can originate in swales or depressions on steep slopes, check for saturated soils, ponded water, watch the patterns of storm-water drainage and observe where runoff water converges; also check for surface water flowing onto your property from adjacent areas, investigate trickles of flowing mud or areas of deposited silt, sand or mud. Identify areas which show evidence of erosion and be aware of any sudden increase or decrease in water flow, or a change from clear to muddy water. Limit irrigation and never soak lawns or garden areas near a steep slope; inspect and shut down irrigation systems every fall.
- **Avoid disturbing any slope:** never cut into the toe of a slope or across a slope, and do not use slopes for play areas, bike trails, etc.
- **Preserve natural vegetation:** trim trees for view rather than completely removing them, and leave roots and stumps in the ground. Keep fill, yard waste and vegetative debris off of your slope. Plant native ground cover to improve slope stabilization.
- **Verify the integrity of site features:** such as retaining walls and rockeries and their drainage systems; also clear weep-hole openings, and inspect excavations on slopes (such as at road-cuts).
- **Perform periodic inspections:** of your property prior to the winter and then during storm events when safe to do - look for signs of land movement, such as tension cracks, progressively tilting trees, small landslides or debris flows.
- **Be informed:** standard homeowner insurance policies do not typically cover landslide damage. Consider extending your coverage to include damage caused by landslides/earth movement.



Keep Alert!

A dangerous debris flow can happen extremely fast. If you suspect a dangerous condition, immediately contact your geotechnical engineer and warn affected neighbors. Never ignore typical warning signs which might include tension cracks opening parallel to top of the slope, water-saturated ground or soft ground conditions, the appearance of bulging ground near the base of a slope, increased water output from springs, seeps or water breaking through the ground surface at new locations, movement or leaning of retaining walls or rockeries, utility line breakage, newly tilting trees or the apparent movement of walls, floors, patios, stairs, or decks.

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