



TOWNSHIP OF CHATHAM

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STEEP SLOPES IN CHATHAM TOWNSHIP

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The following section on Steep Slopes was reviewed by the Chatham Township Environmental Commission and adopted by the Commission as an addendum to the Chatham Township Natural Resources Inventory, 1999 edition, at the Commission's regularly scheduled meeting on September 7, 2004.

STEEP SLOPES IN CHATHAM TOWNSHIP – Insert in Geology Chapter after page eleven (11).

Slopes are important parts of the landscape from both an aesthetic and practical point of view. Practically, during development planning, attention must be given to slope stability. Stability of slopes is determined by:

- steepness
- length
- subsurface geology
- soil characteristics (erodibility, percolation rate)
- amount and type of vegetative cover
- climate (precipitation, wind, freezing and thawing)

The U.S. Natural Resources Conservation Service and the State Development and Redevelopment Plan (SDRP) provide the following characterizations of steep slopes:

Minor Slopes – Less than 10 percent

- minor slopes are best suited for development and less costly to develop;
- ponding, runoff, and erosion may be a problem on nearly level slopes from 0-2 percent, unless the soils are well drained;
- erosion can occur on slopes as slight as 2-3 percent, depending on soils. Soils that percolate readily tend to be less erodible than less pervious soils, such as clays;
- slopes of 5-10 percent present moderate septic problems because of possible seepage.

Steeper Slopes – Greater than 10 percent

- steeper slopes are more erodible, need special stormwater management and roadway specifications, and raise costs for utilities, sewers, and other infrastructure;
- slopes greater than 15 percent have soils that tend to be thin and less fertile;
- slopes from 10-25 percent should be left in a natural condition, carefully maintained in grass or tree cover, or used as pastureland; construction on such areas can increase the sediment load of streams 100-fold;
- slopes greater than 25 percent should be left alone but can provide good sites for passive recreation or wildlife.

The Results of Disturbing Slopes

Disturbing the plant life, drainage patterns, topography or soils of slopes often increases the amount and speed of runoff and can cause erosion, soil creep, slumping (sections of soil shifting down and outward on the slope), and landslides. When a hillside is cleared, the usual result is more and faster runoff, especially when grading has smoothed a slope's natural roughness. Leaves and branches no longer shield the soil from wind and rain; roots no longer hold the soil in place; and the smoother slope allows the runoff to travel faster, increasing erosion and decreasing groundwater recharge. These problems become progressively worse as slopes get steeper.

Steep sloped lands are also often times characterized by other environmentally sensitive conditions including increased erosion, soil instability, and shallow depths to bedrock. The combination of these conditions contributes to the fact that

highly sloping ground has the potential of being inherently unstable, thus increasing the potential problems associated with the development of such land (Legget and Karrow 1983). Specifically, development of steep slopes can also affect the ability of the prevailing soils to infiltrate precipitation. This occurs as a result of soil compaction, the disturbance of thin soils, the removal of vegetation or the exposure of bedrock. This promotes an increase in runoff and can lead to additional instability of the down gradient soil and rock.

Steep slopes in Chatham Township

In Chatham Township, steep slopes can be found in many areas. Most noticeable are those above the Passaic River along the third Watchung Ridge. Steep slopes exist also:

- west of the Hickory Tree shopping center and north of Shunpike Road
- west of Loantaka Way, north of Shunpike Road terminus
- along Spring Valley Road.

Slopes of the Third Watchung Ridge in Chatham Township range from 10 to over 25 percent. The ridge west of River Road and the Passaic River measures approximately 4 miles. This area has remained largely undeveloped due to the development constraints posed by the slopes.

The soils along this ridge reflect severe development constraints for town and country planning according to the Morris County Soil District Soil Survey. The dominant soil groups include:

- Boonton gravelly loam on 8-15 percent slopes and are characterized as having severe limitations for local roads, streets, and parking lots.
- Ellington fine sandy loam on 8-25 percent slopes and are characterized as having severe limitations of foundations lawns, landscaping, septic tank fields, local roads, streets and parking lots, picnic and play areas.
- Holyoke-Rock outcrop complex on 15-35% slopes with severe constraints for all categories of town and country planning because of the hard, steep bedrock at a depth of less than 1½ feet and rock outcrop.
- Klinesville shaley silt loam, on 25-35 percent slopes with severe constraints for all categories of town and country planning because of bedrock at a depth of less than 1½ feet.

Slopes north of Shunpike Road and west of Loantaka Way are characterized by highly permeable sandy soil and are included in a recharge zone identified by the NJ Geological Survey. They are dominated by Riverhead soils which have moderate development constraints with erosion and ground-water pollution potential.

Slopes along Spring Valley Road are characterized by wet soils. The slopes are dotted with spring and seeps and are fairly shallow. The soil groups include:

- Preakness, characterized by high water table soils and severe limitations for all categories of development
- Pompton, characterized by frequent flooding, seasonal high water table and severe limitations for all categories of development.

Sources: Acting Locally: Municipal Tools for Environmental Protection, ANJEC, 2002. Natural Resource Inventory, Union Township (New Jersey), 2003. Soil Survey, Morris County (New Jersey) Soil Conservation District.