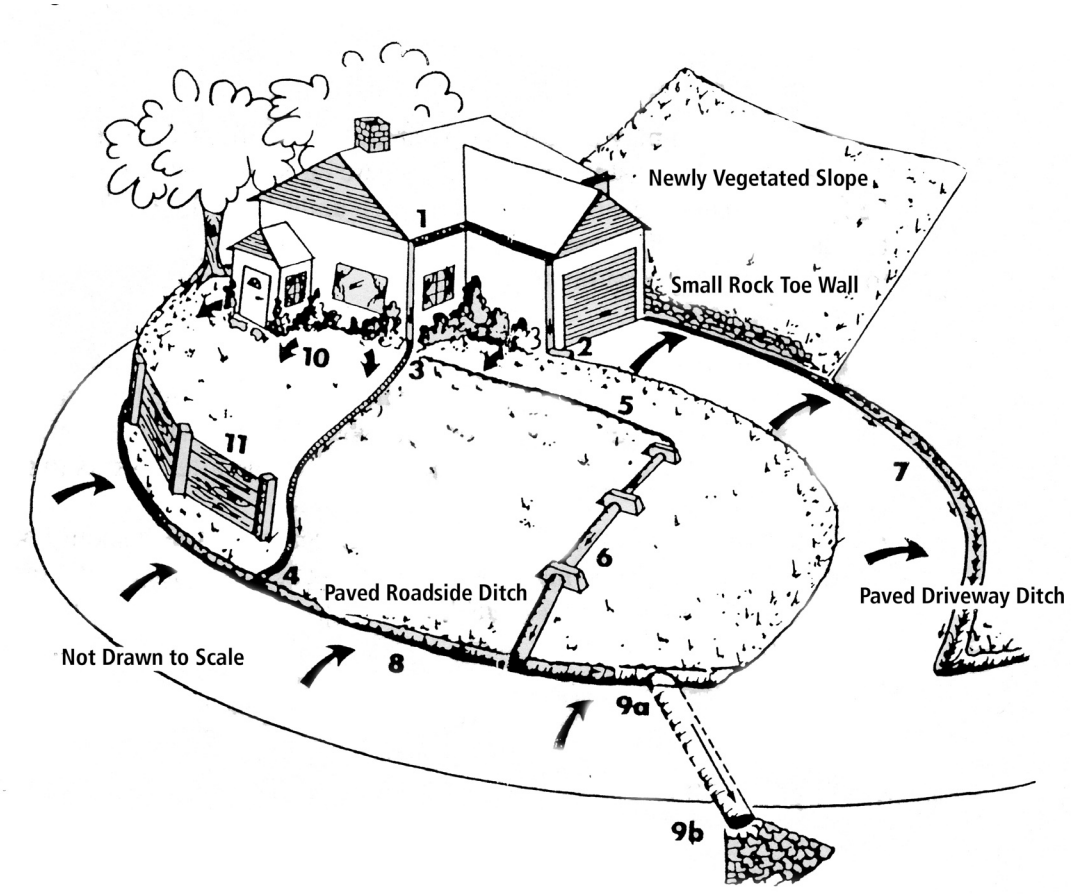
NRCS Natural Resources Conservation Service

FACT SHEET

DRAINAGE TIPS FOR HILLSIDE HOME OWNERS

Most hillside lots which have been damaged by fire or are located in an unstable watershed are very susceptible to water drainage problems. Torrential or prolonged rains and excessive landscape watering cause most of the damage. Therefore, drainage and erosion control are important aspects of homesite stability.

In order to treat surface drainage problems, you will first need to identify the source of surface water (runoff) flowing over your property. A good place to start your investigation is with roofs, patios and driveways since these surfaces can shed tremendous amounts of water during even a single storm.



GUTTERS AND DOWNSPOUTS TO DIRECT ROOF RUNOFF

Be sure that your roof is fitted with gutters and downspouts (1), taking care to release water from these onto a non-erodible surface such as a paved driveway (2) or connect downspouts firmly to solid plastic pipe (3) that will carry water downslope away from your home to a place where it will be released safely such as a paved roadside ditch (4). Because twigs and leaves can clog gutters and downspouts, gutter guards of 1/4 and 1/2- inch hardware cloth screen are highly recommended.

BERMS TO PROTECT SENSITIVE SLOPES

An asphalt or compacted earth berm on the outside edge of a driveway or building pad (5) can direct runoff away from sensitive slopes to an area where it can be released safely. Recommended height of the berm is a minimum of 12-18 inches. (A sandbag berm may be used as a temporary measure.) A pipe drop (6) may be used to carry runoff downslope to a place where it can be released safely, such as the paved roadside ditch.

LINED DITCHES TO HANDLE ROAD AND DRIVEWAY RUNOFF

Roads and driveways can be graded toward a lined ditch designated to handle water sheeting from paved surfaces and uphill slopes (7 & 8). As shown in the diagram, water from the driveway ditch is released safely into the drainage ditch of the main road. At specific intervals along the main road, water is transported under the road through a culvert (9a) and released safely onto a non-erodible surface. An energy dissipater (9b) can serve this purpose where slope is minimal. Roads and driveways generally require a number of drainage measures. You may need to consult additional sources when designing your own system.

GRADING YOUR PROPERTY

Correct grading of your land helps prevent water from pooling around foundations, flooding basements and adding unwanted weight to slopes. In general, all soil should be graded away from foundations at a minimum grade of 1-2 feet for every 100 feet (10). Soil must be graded evenly since rainwater can collect in depressions.

DRAINAGE FOR RETAINING WALLS

Good drainage must be provided for retaining walls (11). Weepholes and perforated pipe with a gravel backfill behind the wall work well. Small openings between boards of redwood retaining walls are also used for this purpose.

DIVERSION DITCHES

A diversion ditch may be needed to handle surface runoff flowing onto your property from upslope. For slopes steeper than 5%, where large amounts of water are expected, the ditch should be lined with concrete or hand - placed rock underlain with filter fabric. Water should be directed to a safe, non-erodible surface - never onto the slope itself. Always consult a qualified engineer to design water diversion measures.

MAINTENANCE

- Regular maintenance will certainly help, but one of the best measures you can take is to observe your system during the rain when you can watch runoff patterns on your property.
- Check gutters, downspouts and pipes during and after storms to remove debris that might cause clogging.
- Clean and repair berms and ditches as necessary. These should be checked regularly. Signs of over-topping may mean that redesign is necessary to handle larger quantities of water. Be sure to plug gopher holes since these provide easy avenues and may lead to collapse of structure walls.
- Plant and/or mulch all bare areas, especially on slopes.
- Regular maintenance also saves time and money in the long run.

SAFETY MEASURES

- Do not start any work until the location of both above-ground and underground utilities lines have been determined. Information on the location of underground utility lines can be obtained by calling 1-800-642- 2444.
- Do not release runoff onto septic leach fields, slopes or at the base of foundations.