

November 2003



**A Homeowner's Guide
for Flood Prevention
and Response**



Weathering the Storm



Learn what you can do to:

- Prepare your family for a flood emergency
- Protect your property from flooding
- Control erosion in burned areas
- Protect your property from debris flows

A MESSAGE FROM

DISTRICT DIRECTOR

JEFF PRATT

Ventura County has seen many changes since the District was created on September 12, 1944. Once dominated by agriculture, Ventura County is now the 12th most populous county in California and home to more than 750,000 people.

As land has been transformed into cities, it has become increasingly important to control floodwaters. The District's primary mission is to protect life, property, watercourses, watersheds, and public infrastructure from the dangers and damages associated with flood and stormwaters. Individual homeowners can help to protect their homes by implementing the flood prevention strategies outlined in this booklet.

Please take a moment to familiarize yourself with the emergency response tips. We strongly recommend that you develop a family disaster plan and assemble a disaster supply kit because disasters can strike quickly and without warning. In addition, consider purchasing flood insurance as losses due to flooding are not covered under most homeowner policies.

We hope you find this guide useful. Your feedback is appreciated—please contact me directly at (805) 654-2040 or by email: jeff.pratt@mail.co.ventura.ca.us to offer suggestions.

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

*Protecting Public Health and Safety and
the Future of Our Watersheds*

Table of Contents

General Flood Information	4
Flood Prevention Strategies	5
Preparing Your Property for Debris Flows	11
Preparing Your Property for Water Flows	17
Flood Protection and Erosion Control in Newly Developed Areas	23
Erosion Control in Burned Areas	24
Flood Awareness	25
During the Flood: Emergency Response Tips	26
Important Contacts	31

General Flood Information

Flooding is a National Problem

Flooding causes more than \$2 billion in property damages each year, and losses due to flooding are not covered under most homeowner or business policies.

Are you at risk?

There is a 26% chance of experiencing a flood during the life of a 30-year mortgage—compared to a 4% chance of fire. Most communities in the United States can experience some kind of flooding. Find out if you are located in a floodplain or special flood hazard area.

Are you protected?

Consider purchasing flood insurance—available through the National Flood Insurance Program (NFIP). Generally, there is a 30-day waiting period for this policy to become effective, so don't wait until the last minute to apply. A flood insurance policy may also reimburse you for the actions you take to prevent flood damage.



For more information about the NFIP, contact your insurance company or call the NFIP at (800) 720-1090, TDD# 1-800-427-5593.

Flood Terminology

Flood watch means a flood is possible in your area

Flood warning means flooding is already occurring or will occur soon in your area

Flash flood is a sudden, violent flood

100-year flood means there is a 1% possibility that this particular area will be flooded in any one year. It is possible to have a 100-year flood more than once in the same year

Base flood elevation is the height that floodwaters in a particular area have a 1% possibility of reaching or exceeding in a given year at that particular location

Special flood hazard areas are areas on a FEMA flood map that are at high risk of flooding

FEMA is the Federal Emergency Management Agency

Flood Prevention Strategies

Checklist for Evaluating your Property

- The main electric panel board (electric fuses or circuit breakers) should be at least 12" above the projected flood elevation for your home. Panel board height is regulated by code.
- Consider elevating all electric outlets, switches, light sockets, baseboard heaters and wiring at least 12" above the projected flood elevation for your home. You may also want to elevate electric service lines and connect all receptacles in areas that could get wet to a ground fault interrupter (GFI) circuit.
- Elevate the washer and dryer on masonry or pressure-treated lumber at least 12" above the projected flood elevation.
- The furnace and water heater can be placed on masonry blocks or concrete at least 12" above the projected flood elevation.
- Know your property: identify changes in slope and grade that influence where water and debris flow and collect.
- Know the overland escape routes for water/debris, and plan diversions accordingly. Consider low spots and high flow areas when planning for structure and property protection.
- Consider escape routes for water and be sure that your efforts to protect your own property do not result in diverting water to a neighbor's property where it could cause damage there. See Figures 1 and 2 for drawings depicting protected and unprotected properties.

Property Flood Proofing: Drainage Improvements

There are two types of drainage to consider; surface and sub-surface. Surface drainage refers to channels, ditches, culverts, walls and other conveyance or diversion methods that move surface water or debris off your property. Sub-surface drainage includes pipes, French drains and sumps which move water under the surface of land. Sub-surface drainage can be more difficult and expensive to construct, but can also result in lower property damage due to surface flooding and soil erosion, or flooded structures.

Carefully evaluate which type of drainage is needed for your property. When designing a drainage system, especially if you are located in a flood prone area, consider consulting a professional such as a civil or geotechnical engineer or a landscape architect.

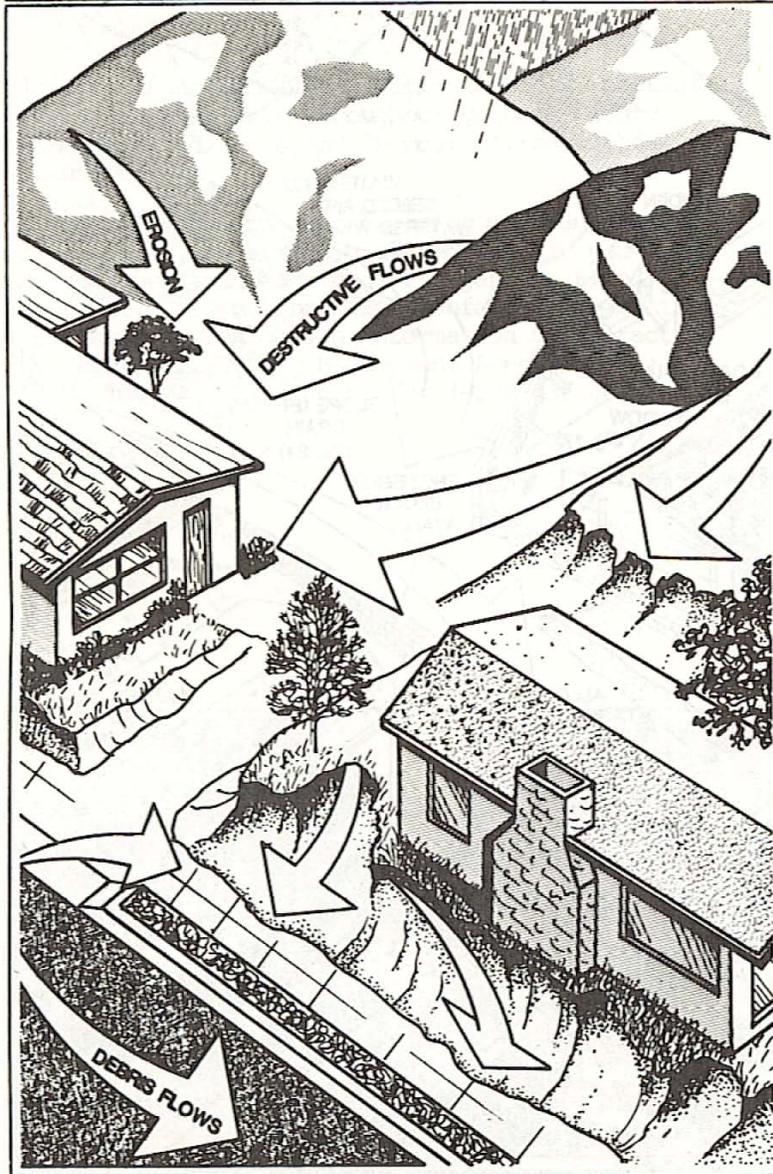


Figure 1: Unprotected Homes

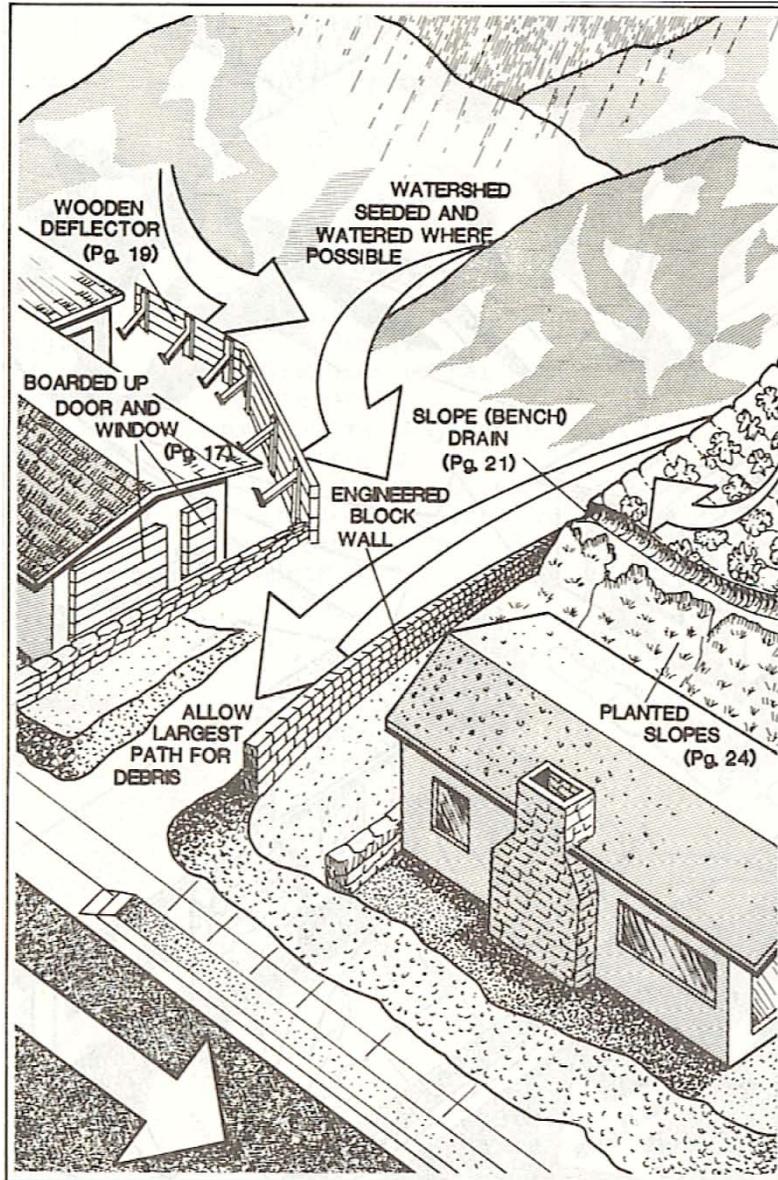


Figure 2: Protected Homes

Where water has flooded a low-lying area, a submersible sump pump is recommended. If flooding is a recurring problem, a permanent pump should be installed in a sump with a flotation device for automatic on/off operation. See Figure 3.

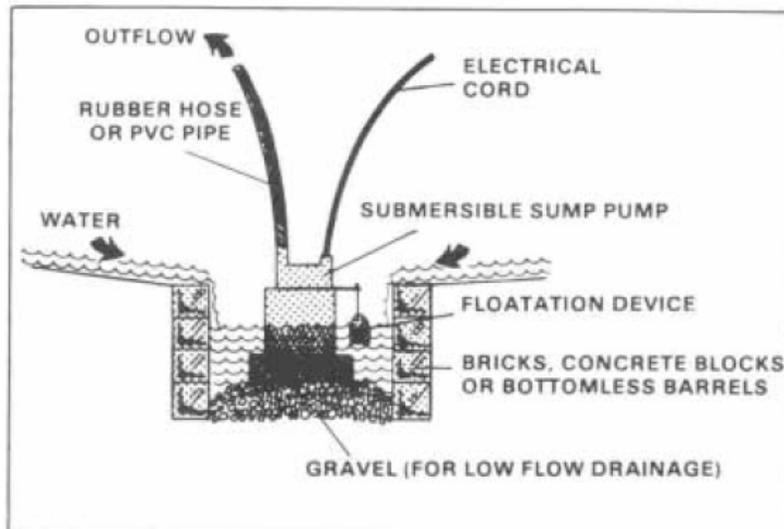


Figure 3: Submersible Sump Pump

In hillside areas, poorly maintained drainage devices (including slope or bench drains) are the source of many flooding problems. Maintenance of these drains are the responsibility of the homeowner with few exceptions. Keep these drains clear of debris and overgrowth. Blocking may cause undermining and structural failure of the drains or erosion of the hillside. See Figure 4.

A primary design consideration is the location of overland escape routes for water on your property leading to streets or gutters. It is important that your drainage system not overload those escape routes.

Once you have designed and installed a drainage system, be sure that you maintain it and check it periodically during the rainy season to identify and correct problem areas such as leaves clogging a drain or sump. See Figures 4 and 5 for drawings illustrating drainage improvements.

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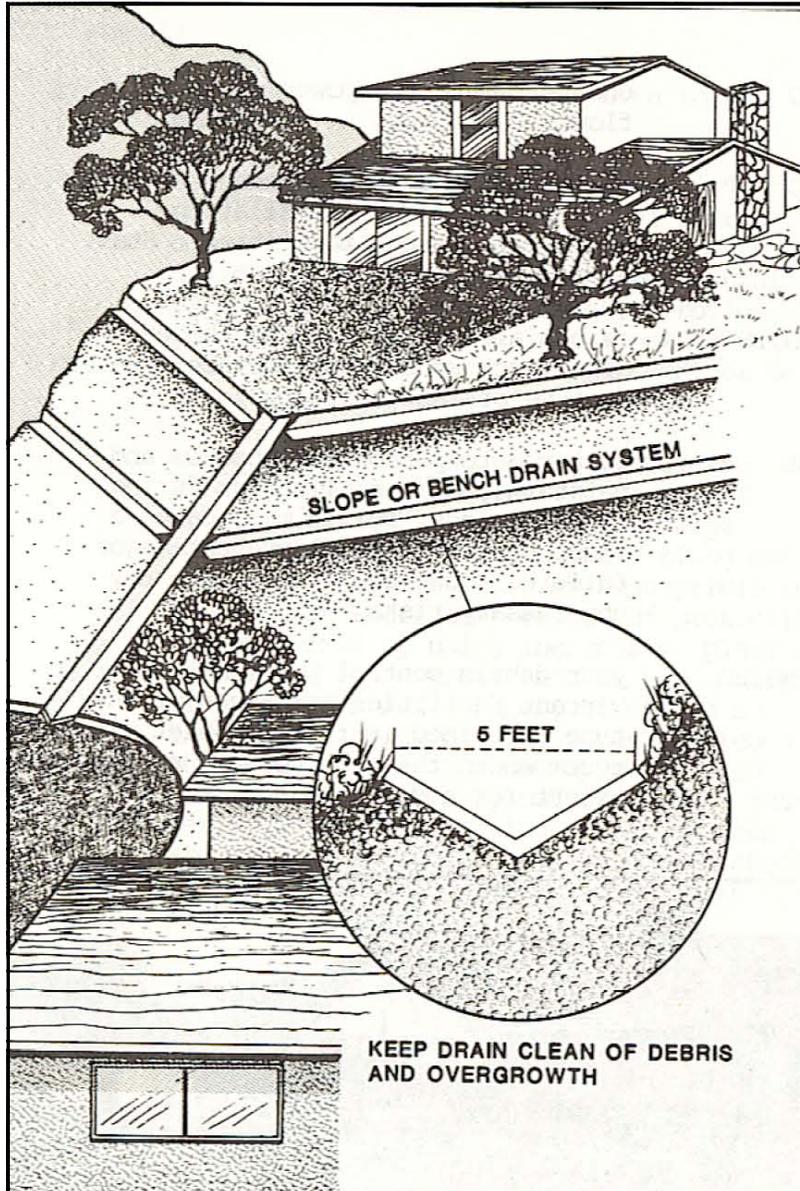
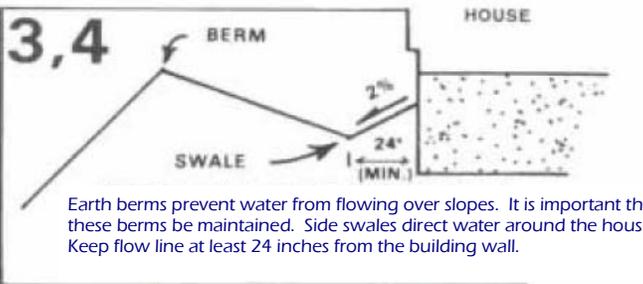
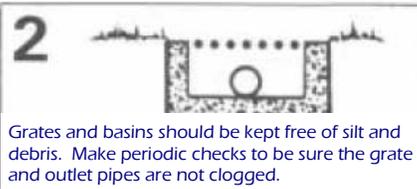
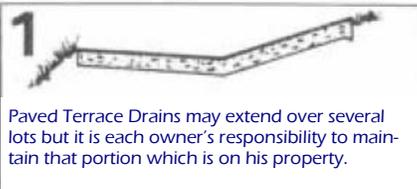
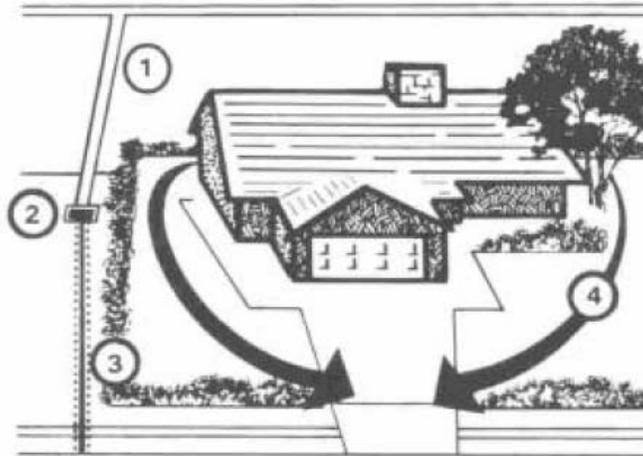


Figure 4: Slope (Bench) Drain



**Keep
drainage
devices
clean!**

Figure 5: Property Drainage

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Preparing Your Property for Debris Flows

During a flood, your property can be damaged by water, debris (mud, rocks, branches, etc.) or both. You need to be prepared for the possibility that both could occur. Many of the prevention strategies are the same. The following section emphasizes preparing for debris flows. The section on flood-proofing structures focuses on keeping water out of homes and other structures.

Debris

Don't underestimate the potential power of debris flows. Begin planning and installation of debris control facilities before the storm season. Start as soon as possible. Protection facilities are not always pleasing to the eye but appearance should not dictate location or type of installations.

Be prepared to personally observe and maintain your installations during storm periods. In many cases, a minor correction will prevent major failure. However, do not take any unnecessary risks.

Should your debris control problems appear to warrant facilities in excess of the type described in this booklet, we recommend that you consult a licensed expert such as a civil or geotechnical engineer or landscape architect for additional advice.

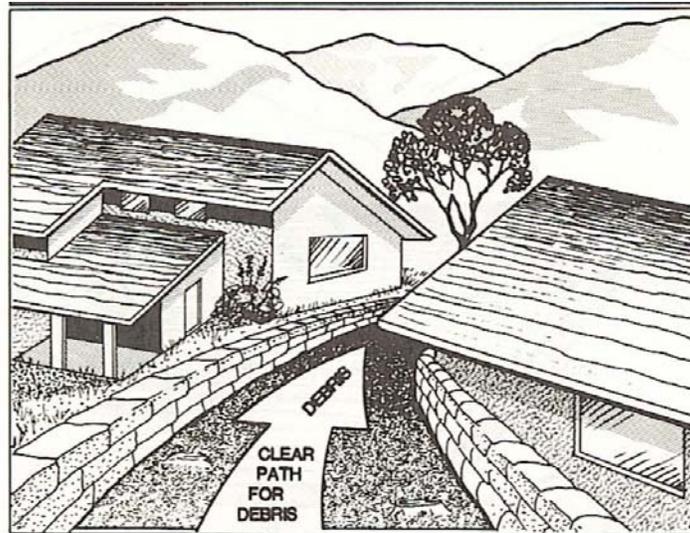


Figure 6: Directing Debris Flows Between Buildings

Do It Yourself Debris Control Aids

There are a variety of inexpensive ways to control debris flow on your property during a storm. See Figures 6, 7, and 8 for drawings depicting debris flow and control. When compared to the protection received, they are well worth the time and money to install them. Most can be installed with normal household tools and use materials readily available at your local lumber or home improvement store—things like lumber, sandbags, sand, and plywood.

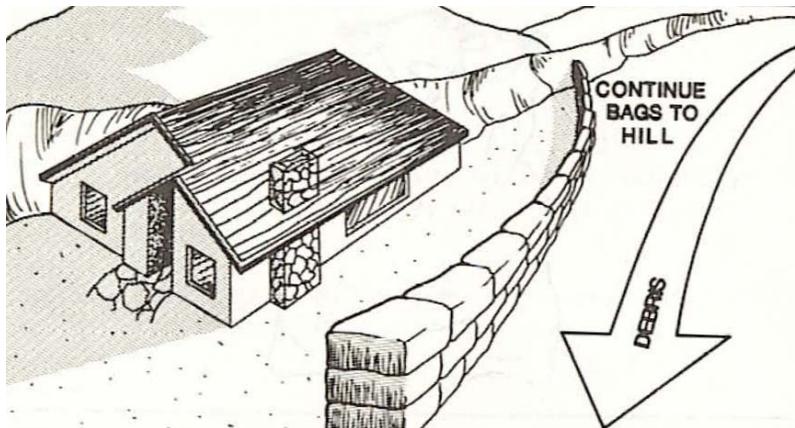


Figure 7: Directing Debris Flow

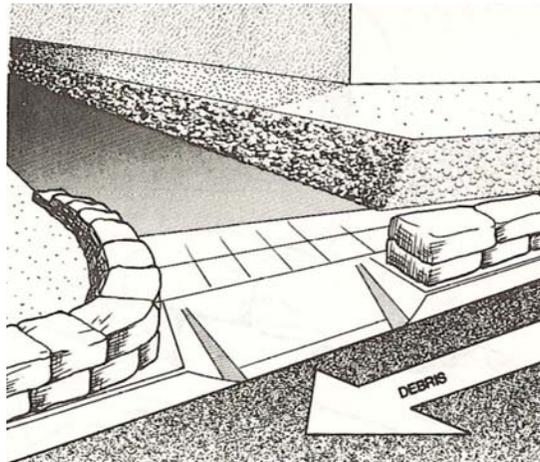


Figure 8: Controlling Debris

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General Tips for Debris Flow Control

Each situation differs, however these basic tips can help you effectively manage debris movement:

- **Never underestimate the power of any debris flow.**
- **Try to direct debris flows away from improvements.**
- **Clear a path for the debris.**
- **Always place protection to deflect debris, not to dam it.**
- **Use your house or building as a deflector if necessary. Avoid trying to confine the flows more than is absolutely required.**
- **Debris can enter a building through windows. Consider boarding up windows that might be in the path of debris, such as those on the side of a structure facing a steep slope.**
- **Remember to protect your most valuable property first—your home. Then consider what time and money are available to protect other less valuable objects, such as swimming pools or landscaping.**
- **Be prepared to sacrifice the use of portions of your property to achieve good protection.**
- **Try to work with adjacent affected property owners.**

Sandbags

Sandbags are available at home improvement stores. If there is an elevated risk of flooding or debris flows (such as after a wildfire), sandbags are often provided by your local fire department. When properly placed, sandbags will redirect water and debris flows away from property improvements. See Figures 9, 10, 11, and 12 for details.

Filling Sandbags

1. Fill sandbags half full. Sand is suggested if readily available, however any local soil may be used.
2. Fold top of sandbag down and rest bag on its folded top.

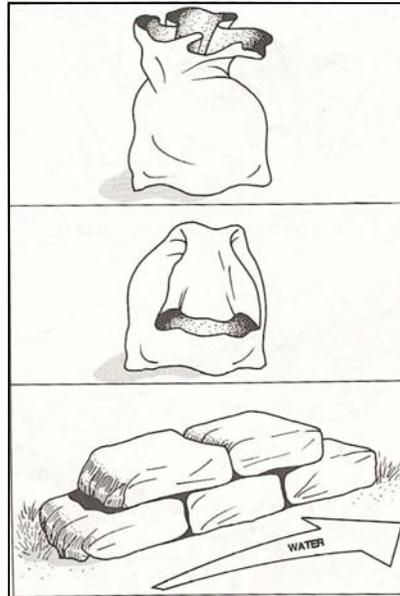


Figure 9: Filling and Placing Sandbags

Placing Sandbags

Stack sandbags according to the above diagram. Complete each layer before starting the next, and stagger the bags to provide support. Limit placement to three layers unless a bracing is used as a backing or sandbags are stacked in a pyramidal style as shown in Figure 10 or 11.

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Figure 10: Stacking Sandbags in a Pyramid

Things to Know about Sandbags

- Sandbags will not seal out water.
- Sandbags deteriorate when exposed for several months to continued wetting and drying. If bags are placed too early, they may not be effective when needed. If bags need to remain durable for longer time, adding cement can increase effective life.
- Sandbags are basically for low-flow protection (up to two feet). Protection from high flow requires a more permanent type of structure.
- Remember—sandbags should not be stacked directly against the outer walls of a building since wet bags may create added pressure on the foundation.

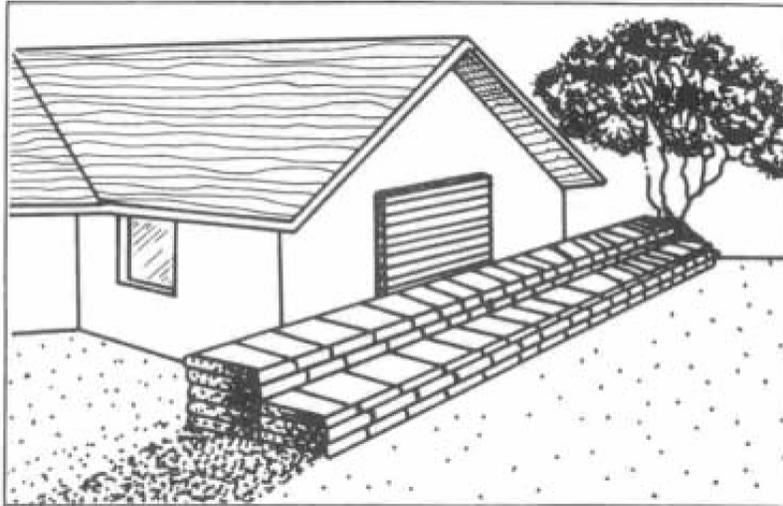


Figure 11: Building Protection

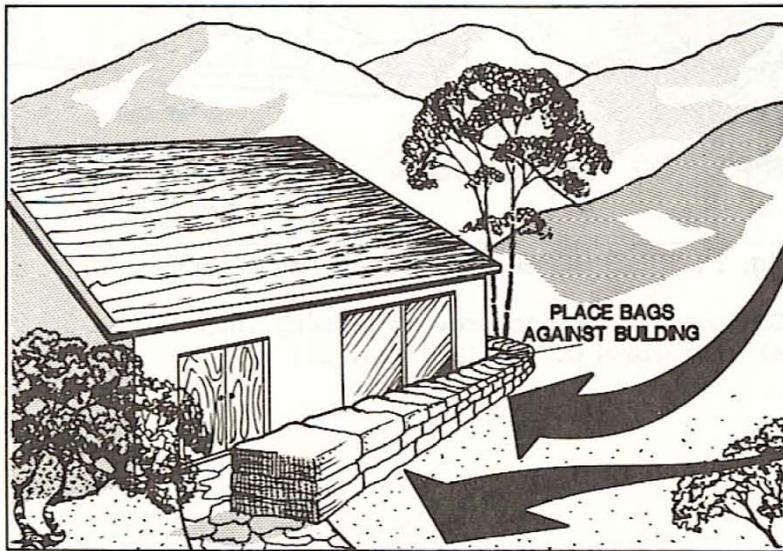


Figure 12: Stacking Sandbags

Preparing Your Property for Water Flows

Preventing water from entering a home or structure means ensuring that the primary access points (roof, windows, doors, walls and floor/foundation) are all protected as much as possible. The following information addresses each of these areas.

Roofs and Gutters

Be sure that your roof does not leak. A simple inspection by a roofing expert or observation of wet areas on the ceiling during a storm should be adequate. A problem point can be near the chimney, where cinder blocks or bricks can leak, leading to infiltration down into the fireplace. Water proof sealing materials are available at most hardware and building supply outlets.

Gutters should be checked every year before the rains to be sure they are clear of leaves and debris, and free of holes, rust or other structural defects. Gutters are the primary means to move excess water from the roof to safe overland escape points; non-functioning gutters can lead to problems. Downspouts should be designed to direct runoff to overland escape routes.

Window and Door Protection

It is important to provide protection against water intrusion at possible entry points of a structure, such as doors and windows. Prevent debris from entering doorways and windows with baffle boards. See Figures 13 and 14.

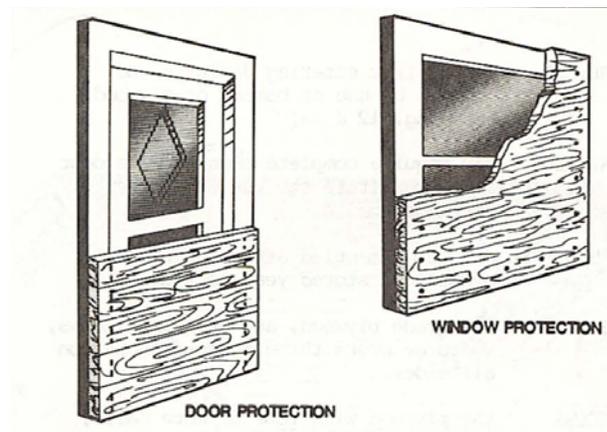


Figure 13: Typical Window and Door Protection

Ventura County Watershed Protection District

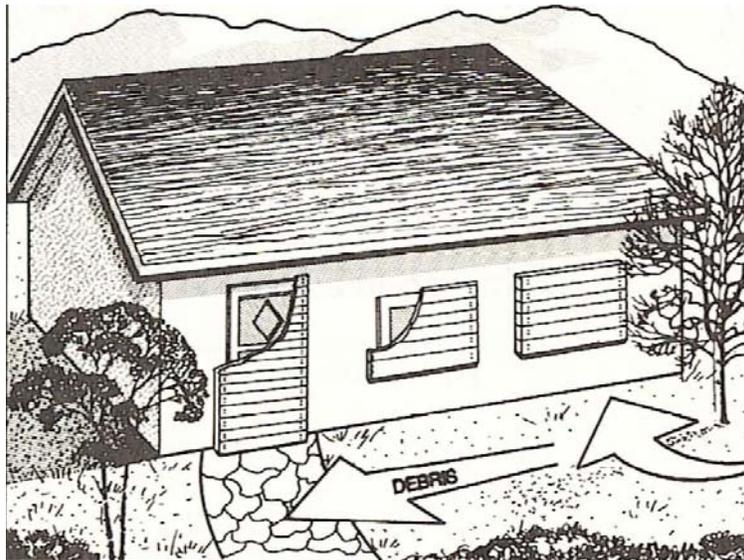


Figure 14: Use of Window and Door Protection

A hazard may require complete closure of a door and necessitate the use of another entrance. To prevent water from seeping through a door, a rubber seal (similar to weather stripping) should be affixed to the door frame. See Figure 15.

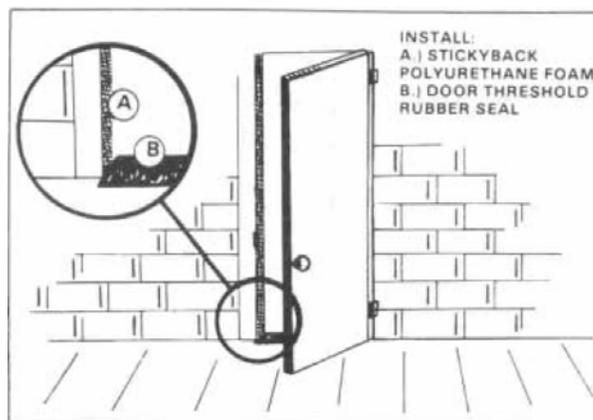


Figure 15: Door Seal

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To prevent water from seeping through a sliding glass door, a plastic sheet (2 to 3 mils thick) should be placed between the door and the sandbags or between the door and the plywood barrier. See Figure 16.

Important: The above is not recommended for water levels above two feet.

Materials can be dismantled after the storm season and stored from year to year. Use low-grade plywood and overlap windows, vents or doors three to four inches on all sides. Secure the plywood with four or more nails, screws or bolts. A stake and board may also be used to wedge boards in place.

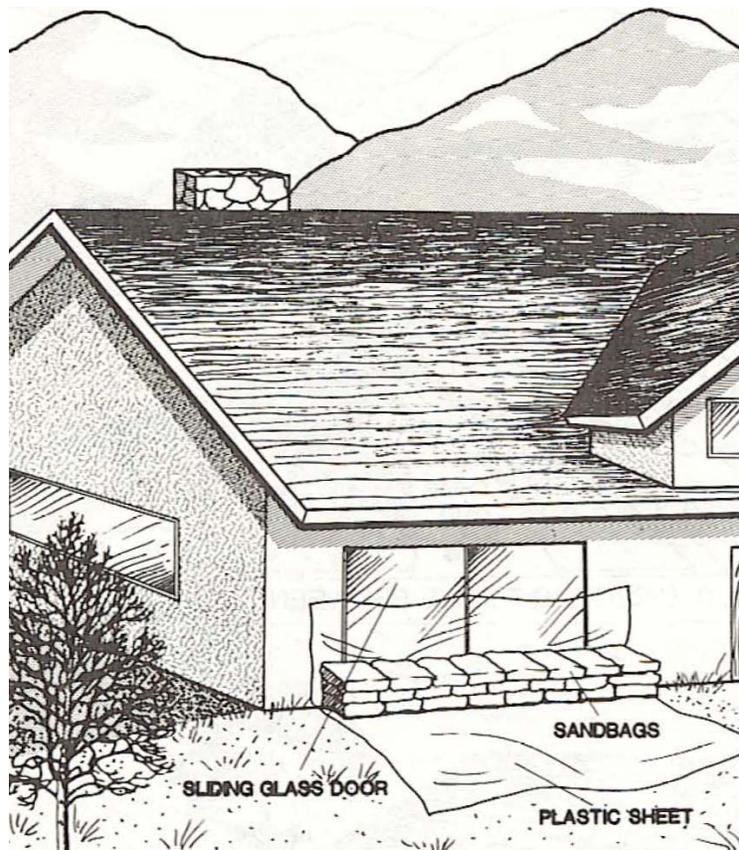


Figure 16: Sealing a Sliding Glass Door

Wooden Deflectors

A wooden deflector is used outside a structure to deflect debris or water to the best overland escape. See Figures 17 and 18 for detail. Use low-grade lumber and overlap sections with protruding face downstream. Drive stakes to at least one half their length to ensure proper anchorage. Place deflectors on solid level soil to reduce the hazard of undercutting.

Important: Do not attempt to use the lumber as a dam.

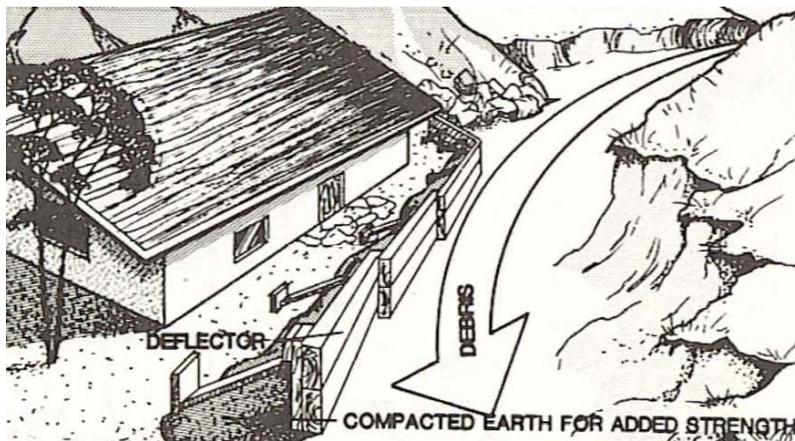


Figure 17: Timber Deflector

Earth packed behind the deflector will provide needed additional strength. If the deflector required is more than three feet in height, the house or structure will have to be protected with sandbags and used as a deflector.

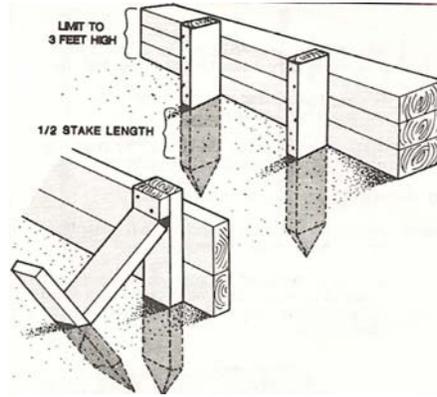


Figure 18: Close-up of Timber Installation

Engineered Walls

Concrete block and heavy-duty wood walls that are designed and built to withstand loads caused by water and debris are excellent for protection and durability. See Figures 19 and 20. In many cases, such walls can be adapted to become part of the landscaping. Because these walls can be expensive, they should generally be considered permanent installations.

Important: Do not rely on walls that have not been specifically engineered for protection.

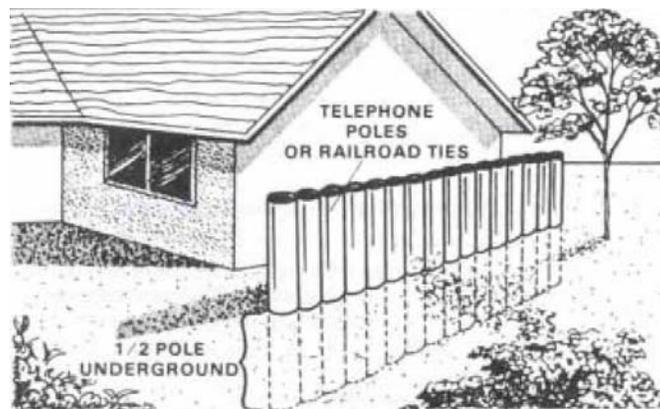


Figure 19: Barrier made of Telephone Poles or Railroad Ties

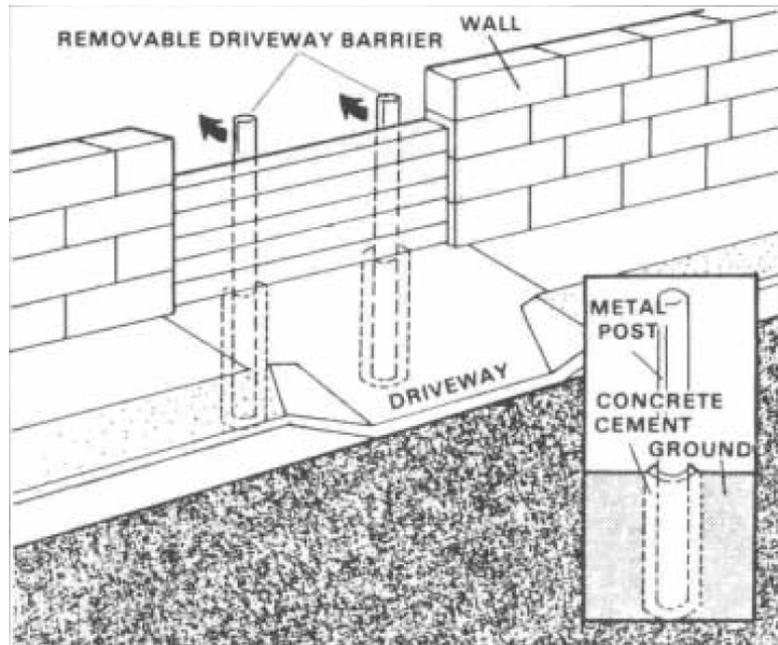


Figure 20: Removable Driveway Barrier

General Prevention Strategies

- Seal wood with water seal products
- Install weather stripping
- Be sure chimney and vent flashing is adequate
- Clean out culverts and drains near structures to assure clear water path

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Flood Protection and Erosion Control in Newly Developed Areas

Most newly-developed areas lack good coverage from landscaping and ground covers and are more susceptible to erosion. The following tips will help prepare those areas for flooding/erosion.

1. Keep water away from the protected area

For water flowing onto the property: Dig a small ditch with a hoe or shovel fairly close to the upper edge of the property. The pitch of the ditch should be nearly level to ensure slow water movement. Provide for the ditch to drain into a natural watercourse or onto street pavement or to a well-vegetated area.

For water falling on the property (rain): Dig the same type of small ditch at the top of each steep slope. Do not allow large amounts of water to concentrate along one route. On soils especially susceptible to erosion, an additional degree of protection can be gained by using inexpensive plastic sheeting. These sheets should be overlapped like shingles and securely tied or staked down so that the majority of water does not reach the soil at all. Shrubs may be planted through the plastic by cutting a hole just large enough for planting. Where ditches are used in unstable soil, the ditch should be planted with ice plant or sowed with perennial grasses.

2. Strengthen the soil to resist erosion

Straw or wood chips are effective in holding the soil in place. They have the further value of increasing the organic content of the soil. Either material should be working into the top few inches of the soil. Use a one-inch covering of chips, or less as slope and soil conditions indicate. Nitrogen fertilizer should be added.

Woven burlap or jute netting can be laid on the slope and tied down properly with stakes to prevent lifting by wind or water. Regular planting procedures can be followed before laying the burlap, since it will not interfere with establishing growth on the slope. The burlap decomposes eventually, but will remain long enough for grasses or plantings to become well established.

Erosion Control in Burned Areas

It is especially important to provide adequate protection against flooding and erosion for structures in recently burned areas. Planting in burned areas is similar to planting in newly developed areas. Consult a landscape professional for appropriate groundcovers and erosion control techniques. Plant throughout the burned area. It may be necessary to irrigate in order to assure early growth.

Since rains can normally be expected to start in October, plant in the early fall to take advantage of this extra watering.

For more information about soil erosion and prevention, contact the Natural Resources Conservation Service at (805) 386-4489 or call a landscape architect or contractor with erosion control experience.

See Figure 21 demonstrating techniques to protect areas damaged by fires or other erosion problems.

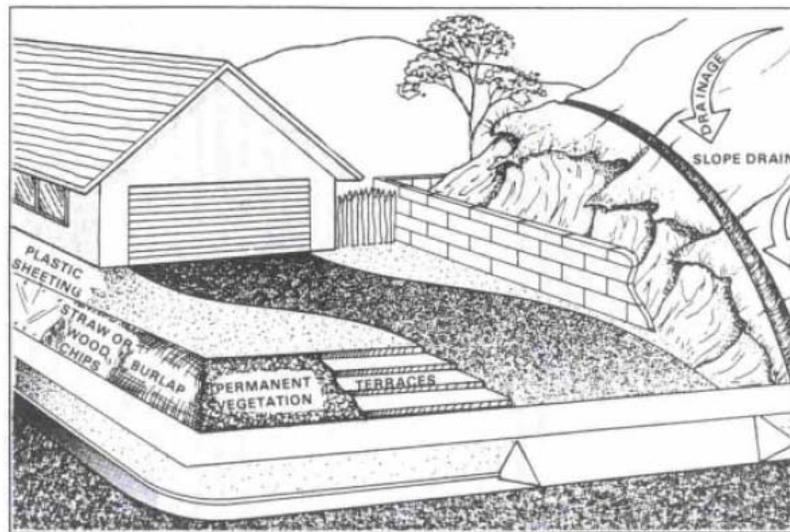


Figure 21: Erosion Control in Burned Areas

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Flood Awareness

Several factors contribute to flooding. Two key elements are rainfall intensity and duration. Intensity is the rate of rainfall, and duration is how long the rain lasts. Topography, soil conditions, and ground cover also play important roles.

Floods can roll boulders, tear out trees, destroy buildings and bridges, and scour out new channels. Flood waters can reach heights of 10 to 20 feet and often carry a deadly cargo of debris. Flood-producing rains can also trigger catastrophic debris slides.

Regardless of how a flood occurs, the rule for being safe is simple: head for higher ground and stay away from flood waters. Even a shallow depth of fast-moving flood water produces more force than most people imagine. The most dangerous thing you can do is to try walking, swimming, or driving through flood waters. Two feet of water is enough to carry away most automobiles.

Plan for a Flood

- **Talk to your insurance agent about the National Flood Insurance Program.**
- **Assemble a disaster supply kit. Keep a portable radio, emergency cooking equipment, and flashlights in working order.**
- **Develop an evacuation plan—everyone in your family should know where to go if they have to leave.**
- **Discuss floods with your family—everyone should know what to do in case all family members are not together.**
- **If you live in frequently flooded areas, keep materials such as sandbags, plywood, plastic sheeting and lumber on hand for use in protecting property.**

During the Flood: Emergency Response Tips



Information Sources

There are a number of places to turn for information during a major storm or flood event. These include:

- **Ventura County Watershed Protection District**—for local flood updates—log on to www.vcwatershed.org
- **Weather Radios** (available at electronics stores) - for detailed weather updates
- **Television and radio news**—for flood updates, weather conditions, and evacuation information
- **California Highway Patrol**—for road conditions
- **Ventura County Fire Department**
- **National Weather Service and the Weather Channel**—for detailed weather reports and flood information by region. Consult television listings or call your cable company for the channel number.
- **Ventura County Office of Emergency Services**—for any questions related to a disaster in Ventura County.



See page 31 for list of important contacts.

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What to Do

Personal safety is the most important consideration during a flood. Since floodwaters can rise very rapidly, you should be prepared to evacuate before the water level reaches your property.

Before a Flood

- Find out if you live in a flood-prone area from your local floodplain manager. Ask if your property is within a special flood-hazard area.
- Learn flood warning signs and your community alerts signals.
- If you live in a frequently flooded area, stockpile emergency building materials such as plywood, plastic sheeting, lumber, nails, hammer and saw, shovels and sandbags.
- Have check valves installed in sewer traps in your home and/or business to prevent floodwaters from backing up in sewer drains. As a last resort, have large corks or stoppers to use to plug showers, tubs and basins.
- Plan and practice an evacuation route. Contact the Ventura County Office of Emergency Services for a copy of the community flood evacuation plan. If you live in a flash flood area, have several alternative evacuation routes.
- Have a disaster supply kit on hand:
 - Flashlights and extra batteries
 - Portable, battery-operated (or hand-crank) radio and extra batteries
 - First aid kit and manual
 - Emergency food and water
 - Non-electric can opener
 - Essential medicines
 - Cash and credit cards
 - Sturdy shoes
- Develop an emergency communication plan in case family members are separated from one another during floods. Ask an out-of-town relative or friend to serve as the family contact. After a disaster it's often easier to call long distance than locally. Make sure everyone in the family knows the name, address and phone number of the contact person.

- Teach all family members how to turn off gas, electricity and water. Teach children how to call for emergency help and which radio station to turn to for emergency information.
- Keep your insurance policies in a safe place. Ask your insurance agent about flood insurance or call 1-800-720-1090 for information. Remember that there is a 30-day waiting period before a policy is in effect.

During a Flood Watch

- Listen to a battery-operated radio for the latest storm information.
- Fill bathtubs, sink and jugs with clean water, in case the local water supply becomes contaminated. You can sanitize these storage containers by first rinsing with bleach.
- Bring outdoor belongings, such as lawn furniture, indoors or tie them down securely.
- Move valuable papers and household possessions to upper floors or to safe ground, if time permits.
- If you are instructed to do so by local authorities, turn off all utilities at the main switch and close the main gas valve.
- Be prepared to evacuate.

During a Flood

If Indoors

- Turn on battery-operated radio or television to get the latest information.
- Get your disaster supply kit.
- If you're caught in the house by suddenly rising waters, move to the second floor and, if necessary, to the roof. Take warm clothing, a flashlight, and portable radio with you. Then wait for help...don't try to swim to safety. Rescue teams will be looking for you in/at the house.
- Turn off all utilities at the main power switch and close the main gas valve if evacuation appears necessary. Do not touch any electrical equipment unless it is in a dry area and you are standing on a piece of dry wood while wearing rubber gloves and rubber-soled boots or shoes.

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- ☑ If advised to evacuate, do so immediately. Evacuation is easier and safer before floodwaters become too deep. Take your pet and their food and medicines.
- ☑ Follow recommended evacuation routes. Shortcuts may be blocked.

If Outdoors

- ☑ Climb to high ground and stay there.
- ☑ Avoid walking through any floodwaters. Even six inches of swiftly moving water can sweep you off your feet.

If Evacuated

- ☑ Stock your car with nonperishable foods (like canned goods), a plastic container of water, blankets, first aid kit, flashlights, dry clothing and any special medication needed by your family.
- ☑ Do not drive where water is over the road— turn around and go another way.
- ☑ If your car stalls in a flooded area, abandon it immediately and climb to higher ground. Floodwaters can rise rapidly and sweep a car and its occupants away. Many deaths have resulted from attempts to move stalled vehicles.

After a Flood

Flood dangers do not end when the water begins to recede. Listen to radio or television and do not return home until authorities indicate it is safe to do so.

Entering a Building after a Flood

- ☑ Before entering the building, inspect the foundation for cracks or other damage. When entering the building, use extreme caution.
- ☑ Wear sturdy shoes and take battery-powered lanterns or flashlights to examine the damage. Do not use matches or other open flames because gas may be trapped inside.
- ☑ Examine walls, floors, doors and windows to make sure the building is not in danger of collapsing. Watch for loose plaster and ceilings that could fall.

- ☑ Take pictures of the damage—both to the house and its contents—for insurance claims. If possible, take photos that show the high-water marks left on walls and other damage.
- ☑ Watch out for animals, especially poisonous snakes that may have come into your home with the floodwaters. Use a stick to poke through debris.
- ☑ Look for fire hazards, such as broken or leaking gas lines, flooded electrical circuits, submerged furnaces or electrical appliances and flammable or explosive materials that may have come from upstream.
- ☑ Cover broken windows and holes in the roof or walls to prevent further weather damage. The expense of these temporary repairs is usually covered under your flood insurance policy, so save your receipts.
- ☑ Throw away food, including canned goods, that has come in contact with floodwaters.
- ☑ Water for drinking and food preparation should be boiled vigorously for ten minutes, until such time as the public water system has been declared safe. Another method of disinfection is to mix 1/2 teaspoon of liquid commercial laundry bleach with 2 1/2 gallons of water; let stand for five minutes before using. The flat taste can be removed by pouring the water from one container to another or adding a pinch of salt. In an emergency, water may be obtained by draining a hot water tank or melting ice cubes.
- ☑ Service damaged septic tanks, cesspools, pits and leaching systems as soon as possible. Damaged sewage systems are health hazards.

Inspecting Utilities in a Damaged Home

- ☑ Check for gas leaks. If you smell gas or hear a blowing or hissing noise, quickly leave the building. Turn off the gas at the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned on by a professional.
- ☑ Keep power off until the electrical system is inspected. If you see sparks or broken and rayed wires, or if you smell hot insulation, call an electrician for advice before doing anything.
- ☑ Check for sewage and water-line damage. If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap.

▶ **Visit us on the web at www.vcwatershed.org**

Important Contacts

Local

Ventura County Sheriff's Office of Emergency Services (805) 654-2551

Ventura County Watershed Protection District (805) 654-2001

◆ www.vcwatershed.org

Ventura County Fire Department Dispatch (805) 384-1500

State

Governor's Office of Emergency Services Warning Center (24 hrs)

◆ www.oes.ca.gov (916) 845-8911

California State Highway Patrol Office (M-F/8-5) - (805) 654-4571

◆ www.chp.ca.gov Dispatch (24 hours) - (805) 477-4174

Federal

Federal Emergency Management Agency—Region IX (510) 627-7100

◆ www.fema.gov

National Flood Insurance Program (800) 720-1090

TDD# 1-800-427-5593

Flood Map Information (877) FEMA-MAP

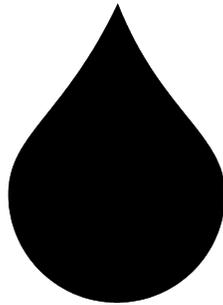
National Weather Service (805) 988-6610

◆ www.nwsla.noaa.gov/

Natural Resources Conservation Services (805) 386-4489

◆ www.ca.nrcs.usda.gov/

Ventura County Watershed Protection District



Ventura County Watershed Protection District



800 South Victoria Avenue #1610
Ventura, California 93009

Phone: 805-654-2001
Fax: 805-654-3350

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