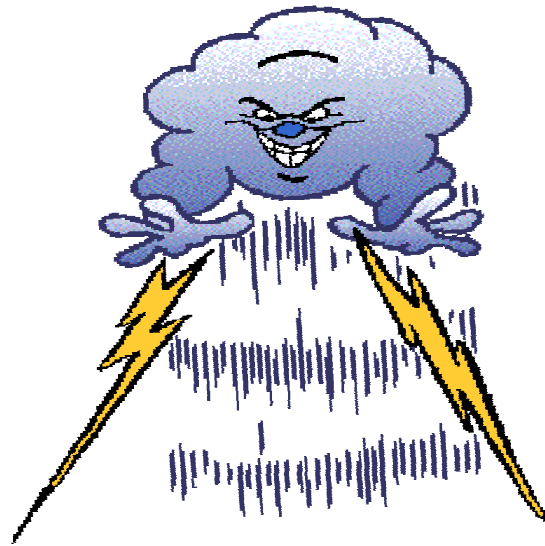


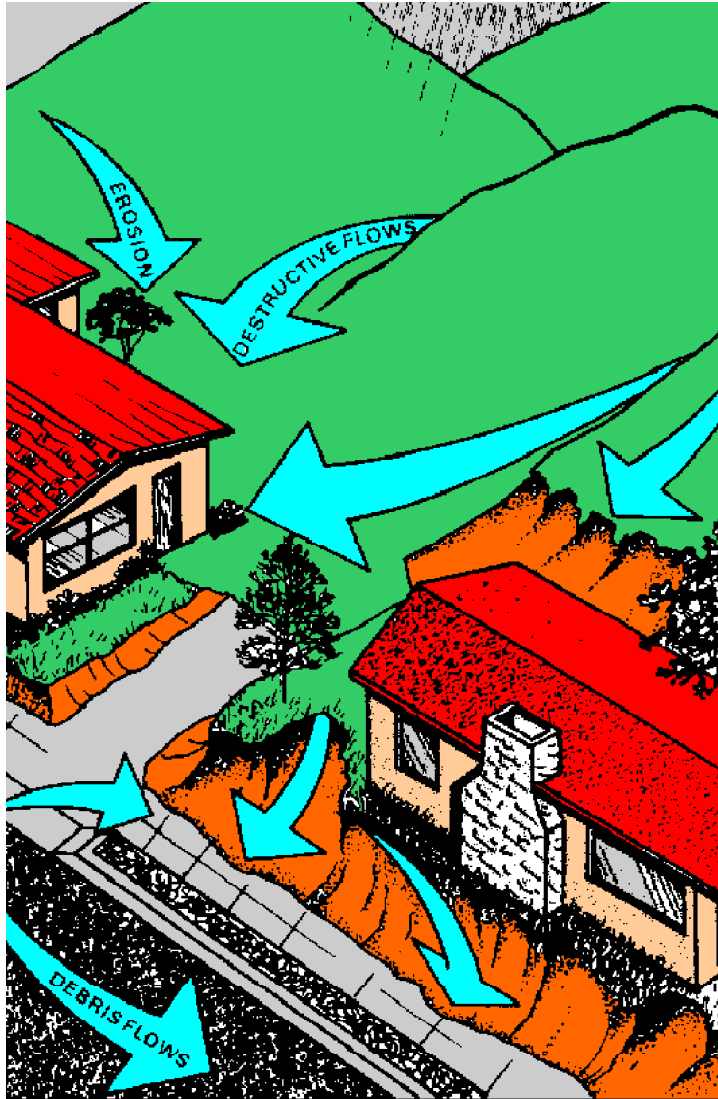
BE PREPARED

HOMEOWNERS GUIDE FOR FLOOD, STORM DEBRIS, AND EROSION CONTROL



**CITY OF LOS ANGELES
DEPARTMENT OF BUILDING & SAFETY**

HOW STORMS CAN EFFECT YOUR PROPERTY



UNPROTECTED HOMES

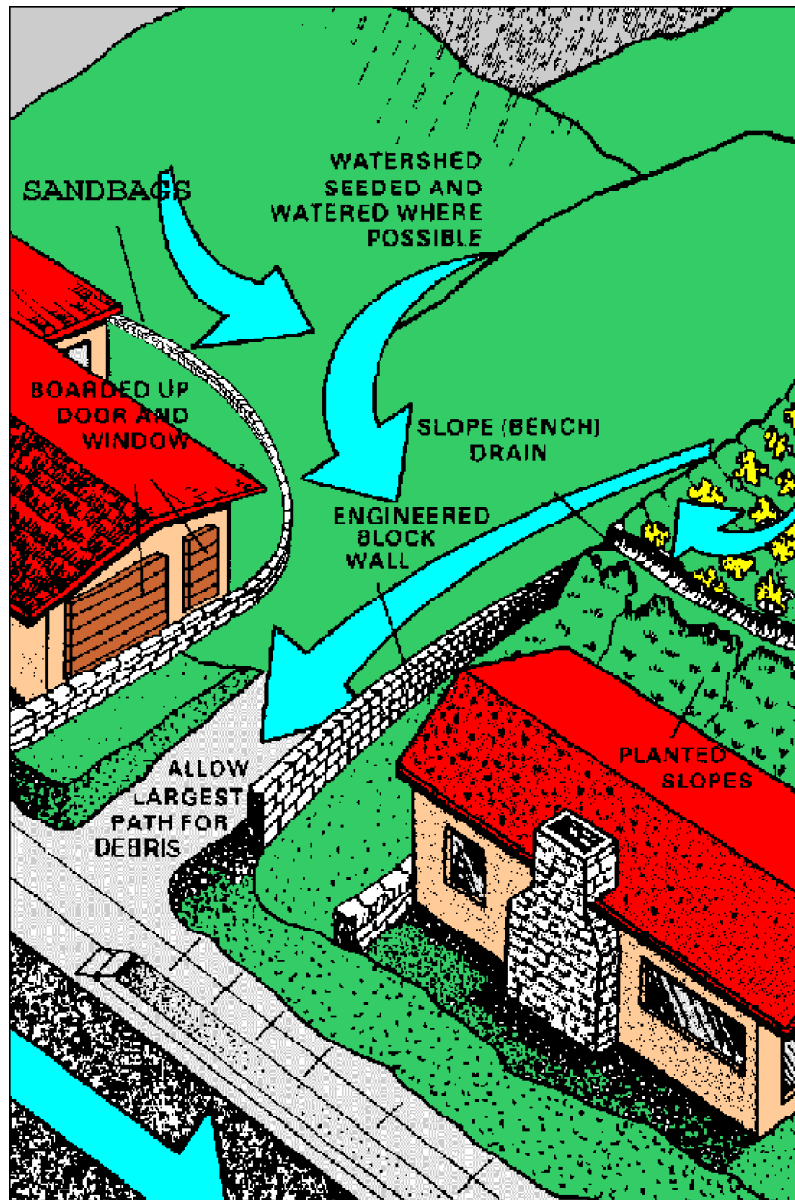
RAIN STORMS

Heavy and sustained rainfall from winter storms cause millions and, at times, billions of dollars in property damage annually. Planning and preparing against these disastrous effects, especially in hillside areas, can reduce or eliminate damage to homes and property.

This pamphlet provides homeowners and residents some useful methods for controlling the damage possible from such storms.

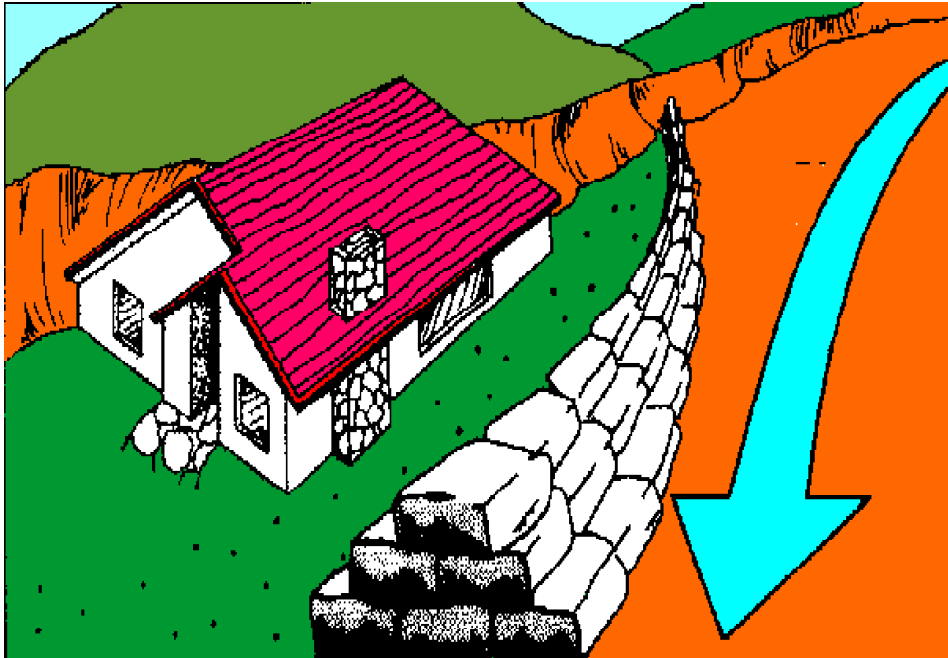
POTENTIAL FOR DESTRUCTION

Rain falling on barren or sparsely planted slopes has great destructive potential. When rain strikes a bare slope it washes and carries off the soil surface with the runoff. This erosive effect becomes destructive as the soil surface becomes saturated and the flow increases in volume and velocity. Generated mud and debris flows scour and gouge out the slope creating deep furrows in its surface. Under prolonged rainfall, the slope may even become saturated resulting in a slope failure or landslide.



HOMES PROTECTED FROM MAJOR DAMAGE

Mud and debris flows not only damage slopes, but also have sufficient momentum to damage structures in their path, at times resulting in severe injuries and fatalities to building occupants. Mud and debris flows consist of mud, brush, and trees that are moved by storm water. These flows may range in degree of severity from small mud slides to large landslides moving with destructive force down to the bottom of the slope. In either case this is of serious consequence to the property owner.

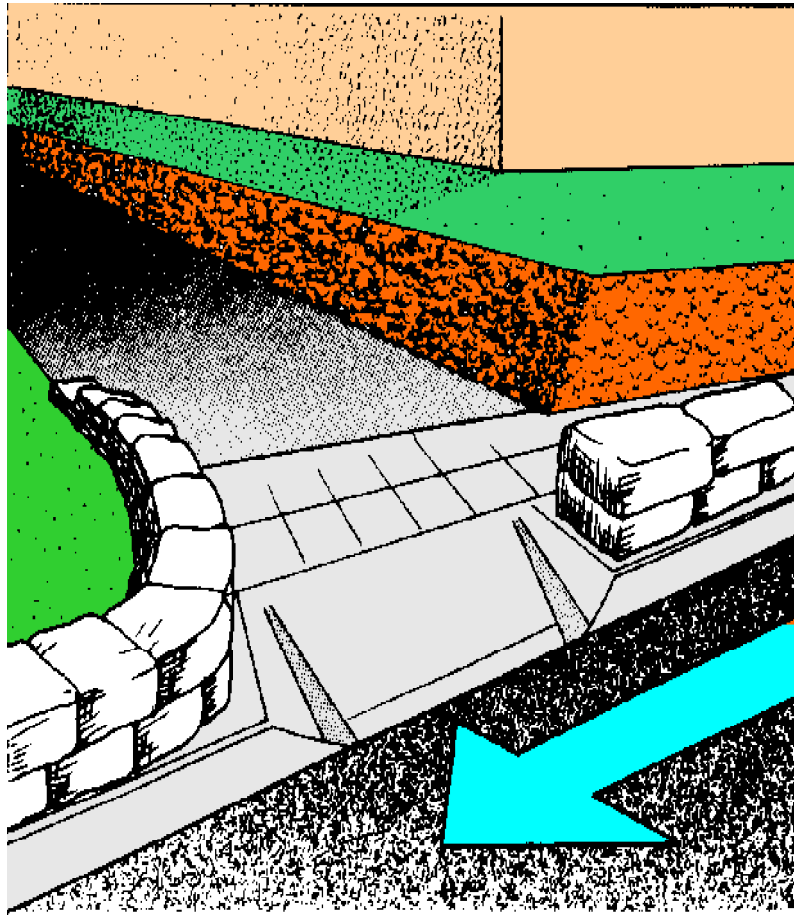


MUD AND DEBRIS FLOW DIVERTED BY SANDBAGS

HOW TO PREPARE

Early planning and continued maintenance reduce the damaging effects of storms. As the rainy season approaches, serious consideration should be given to determining what problems might arise and what procedures will be required to meet them. Once the mud and debris flows start it's too late to plan for protection; put your plans into action when weather reports predict storms.

Adequate tools such as shovels, picks, sledge hammers, and ordinary garden and carpentry tools should be handy to get to. Construction materials consisting of plastic sheeting, burlap bags (locations where sand and sandbags can be obtained are listed on pages 13 and 14), sand, lumber, plywood need to be stored, and flashlights, lanterns, work clothes and rain gear should be readily available. While preparation can be as simple as a few well placed sandbags and some plastic sheeting, having these supplies available now means less time in getting ready and more time for installing temporary protection devices.



USE SANDBAGS TO DIVERT FLOWS BUT DO NOT USE THEM TO ACT AS A DAM

Sandbags can effectively and inexpensively control mud-flow. They are made of materials readily available from your local building materials supply yard, and are easily installed using household or garden tools. Properly placed sandbags re-direct storm and debris flow away from improvements. Sandbagging is most effective in diverting flows and should not be used as a dam to contain mud-flows. Large slope areas are especially prone to failure during and after prolonged rainfalls. The use of plastic sheeting provides an excellent method of temporarily protecting these and other problem slopes from saturation during storms.

Both sandbags and plastic sheeting are, as they imply, temporary devices. These materials, inexpensive and easy to work with, are not durable and will quickly deteriorate over time. In areas where erosion or mud slides are a re-occurring problem, permanent structures or devices need to be considered. Consulting with a design professional and your local nursery can result in effective and attractive long term debris and erosion control. Be sure to check with your local Building and Safety office for any permit and code requirements, especially when earth retaining structures are planned.

WHEN THE STORM IS UPON YOU

The following recommendations can greatly help reduce the damaging effects of an imminent storm. Please review these carefully now, as you may not have time when the storm is approaching.

PLASTIC SHEETING

Spread plastic sheeting across the slope and use stakes at the corners to secure it to the slope. Drive stakes along the edge at 10 to 12 foot intervals (steeper slopes may require closer spacing). Tie ropes to the stakes across the slope face and attach sandbags or old tires to the ropes to hold the plastic in place (see figure 5). On very steep slopes the plastic should be anchored at the top and secured at the bottom by placing weights on the corners. Make sure the plastic is not punctured or torn.

Make sure that water running off the plastic sheeting is directed to the street or other non-erosive device such as a paved terrace drain, driveway, or walkway. Avoid any concentration of flow onto the slopes that would cause erosion.

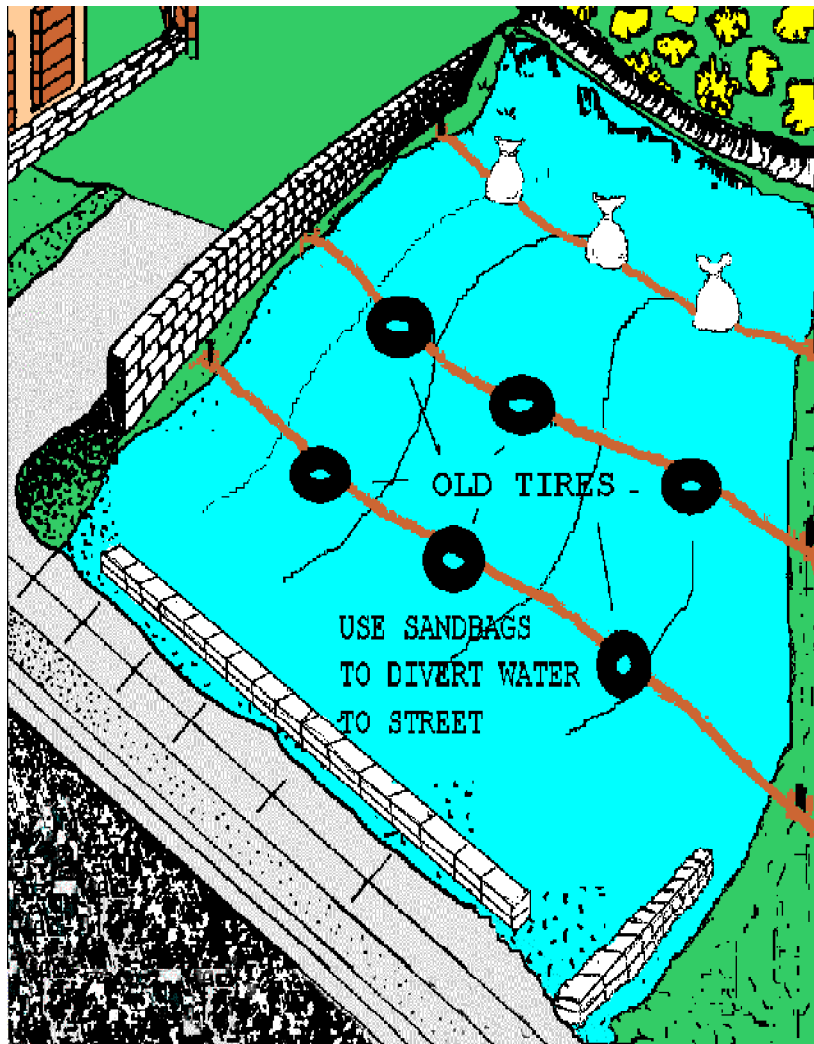


Figure 5

SAND BAGS

Sand bags should be used to divert flows away from improvements and onto the street or a natural watercourse by creating a channel or path for debris. Between storms be sure to remove any residual debris and/or silt from these channels to prevent dangerous build-up. Remember, the purpose of sandbagging is to divert debris flows, not to act as a dam. Improperly placed sand bags may cause more damage than if they had not been used at all.

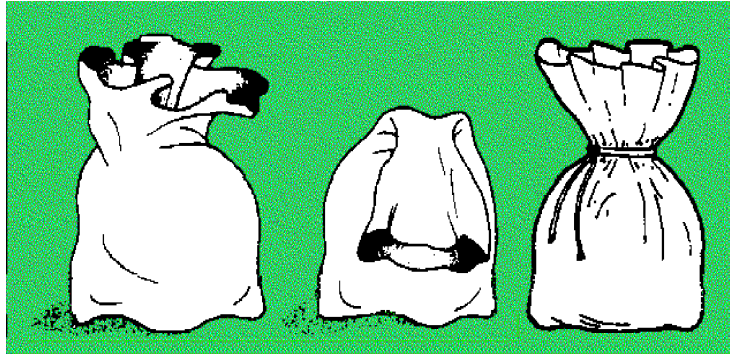


Figure 6

Fill sand bags with common construction or playground sand. If sand is not available, local soil may be used. Care should be taken that only loose topsoil is used. Do not dig into a hillside as this may cause more problems than it will prevent. Fill the sand bags half full, gather the top and tie with heavy string or cord (figure 6). If string is not available, carefully fold the top over (figure 6). In either case the opening in the flap should be in the direction of flow (figure 7).

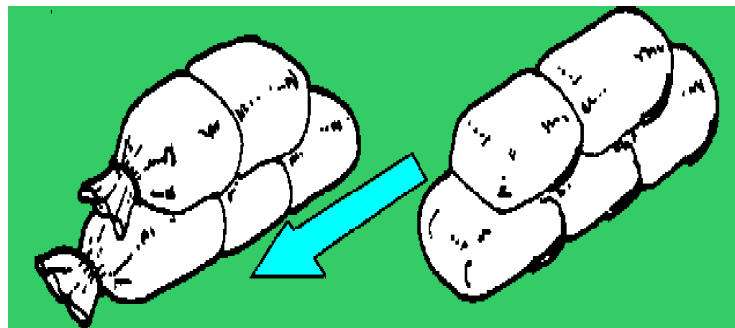


Figure 7

Lay the sand bags so that each course overlaps the previous one and stamp down firmly into place before laying the next course. Stack the sand bags no more than three courses high. You may stack higher if the base is at least as many bags wide as it is high (figure 8).

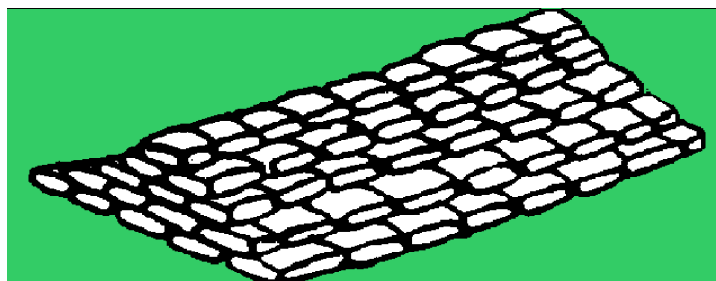


Figure 8

PLYWOOD

Plywood placed over doors and windows is an effective way of preventing mud and debris from entering through these openings (see figure 10). By placing plastic sheeting against the opening before covering with plywood, water intrusion can be further reduced. You may use an inexpensive plywood at least 3/8" thick and overlap the door or window several inches. Stack sandbags or use 2"x4" braces against the plywood to secure it.

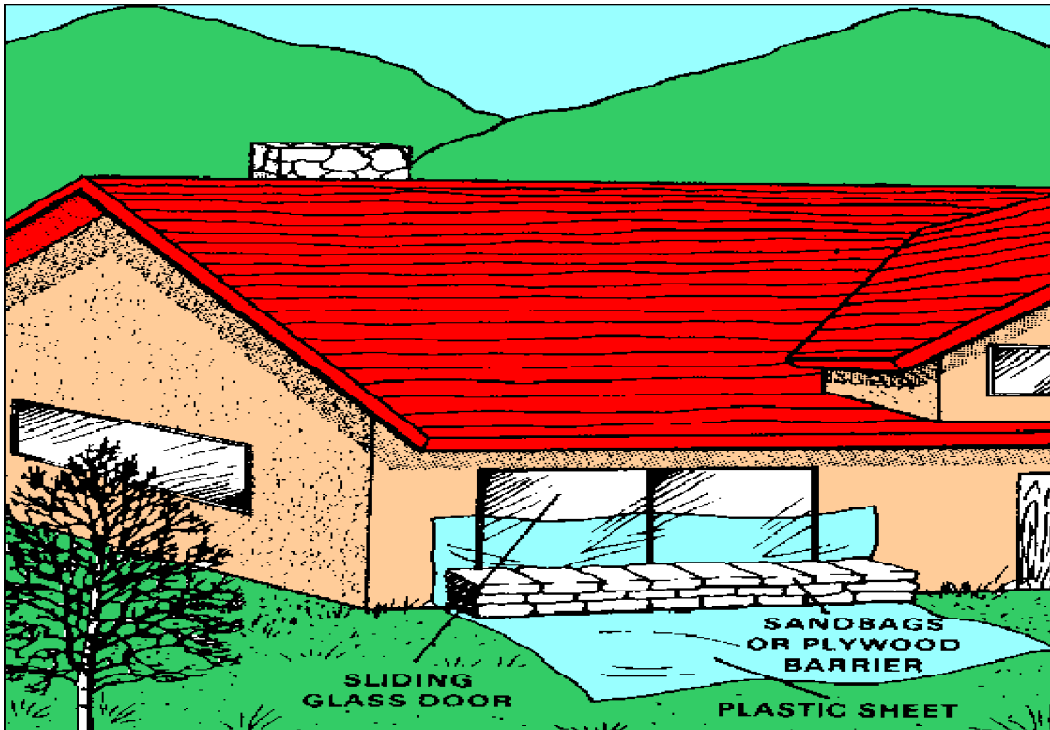


Figure 9

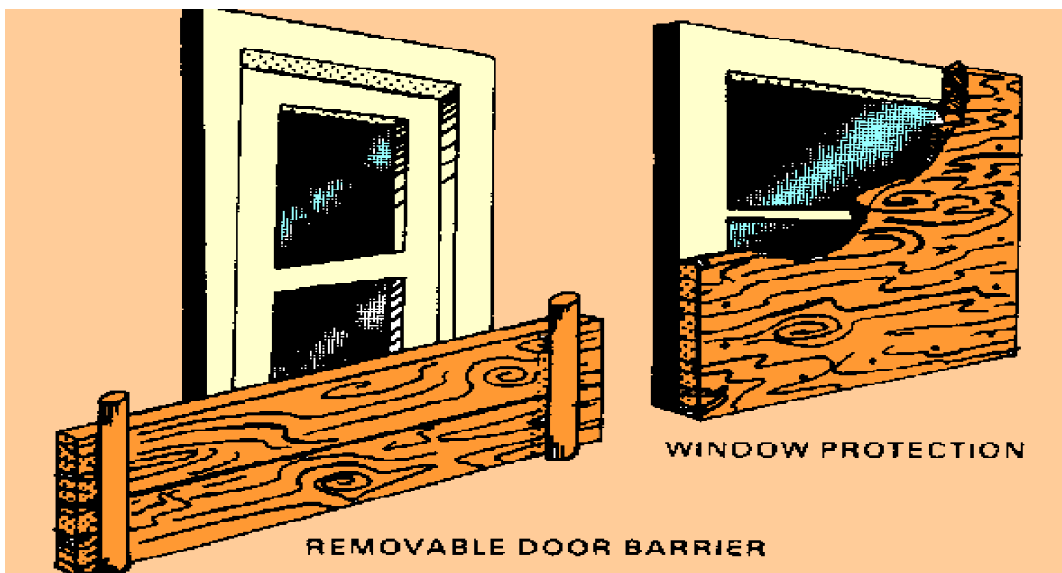


Figure 10

AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE.

This old adage certainly applies here. Practicing the following recommendations can save you considerable expense and grief.

PLANTING FOR SLOPE PROTECTION

After the rainy season, fire resistive plants should be planted. The purpose of this re-planting is to protect slopes and watershed areas to prevent or minimize damage from erosion. In areas where controlled planting exists, the damage from erosion tends to be relatively small.

Fire resistive plants that are hardy and drought resistant, with a good root structure are the best choice for ground cover plants to limit erosion. These include grasses or other ground cover, evergreen shrubs, and trees.



After a fire the remaining ash can contribute to the regrowth of plants as long as its not too thick. Rake the ash and soil together 2-3 inches in depth and water it thoroughly before replanting. Water lightly twice or three times daily until the ground cover is established.

Your local Fire Department will sometimes use a chemical called Borate to extinguish fires. This chemical is usually dropped from the air by helicopter or airplane onto the fire below. If borate was used to extinguish the fire, the soil may be sterile and unable to support plant growth for up to 3 years. All visible borate should be removed. Consult with a landscaper or nursery on how to treat the soil to revitalize it.

Plant growth for erosion resistance takes time to stabilize the soil. Some degree of surface stability can be achieved before and during plant growth by any of the following methods:

STRAW MULCH - Straw applied thickly to the soil surface after seed planting, can be punched in or covered with chicken wire to prevent its being blown away. This will hold the soil surface and moisture for the germinating seeds.

JUTE MATTING - Heavy woven jute mesh can be rolled over the slope face and staked or stapled to the ground. When properly installed, after planting, the jute will not be blown or washed away and will not interfere with plant growth as it slowly decomposes, gradually being replaced by grasses and plants.

HYDRO-MULCH - This mixture of fibrous material, fertilizer, bonding agent and seed is blown on under pressure onto slopes to create an erosion resistant surface that both plants and stabilizes. The application of hydro-mulch is available only through commercial outlets.

IRRIGATION OF SLOPES

Slope irrigation is as important to slope stability as planting. Sustained moisture is absolutely necessary in order for seeds to germinate and to maintain healthy plants. An effective method of irrigation should be provided. Watering can be as simple and portable as a hose connected from the garden faucet to a board with sprinkler heads mounted to it, or as complex as a buried pipe irrigation system. No satisfactory ground cover can be grown without watering and the weather cannot be depended on for irrigation.

Do not over water the ground cover before it has been fully established. This could cause the soil to erode and carry away the germinating seeds. If automatic or timer activated irrigation is used, it should be monitored closely during the rainy season (October 1-April 15). The combination of normal irrigation and heavy storms can erode a slope to the point that no amount of planting can resist.

MAINTENANCE

The owner of a hillside property is responsible for maintaining all yard and slope areas. Maintenance is of greatest importance during the period between a destructive summer fire and the rainy season. Every effort should be made to restore damaged hillside ground cover in order to stabilize the property through the rainy season.

The owner or person responsible for maintaining the yard areas, should periodically inspect the slopes for potential failures. While this is especially true just prior to the rainy season, checking earlier in the year will allow time for improvements or repairs. The following recommendations may prevent slope failure during heavy rains:

1. Make sure all drainage is directed to the street or other water course by approved devices, such as drainage channels, ground gutters, paved swales, or yard or area drains.
2. Check all drainage devices and remove any accumulated dirt and debris. In some areas, drainage devices may cross property lines or be in what is considered common areas. Don't let conditions on your property create a problem for those next to you. Cooperate with your neighbors and work together to prevent problems for both of you.
3. Catch basins, grates and underground drainage piping are frequently blocked by silt, weeds and debris. Inspect and clean them regularly to make sure they are free flowing.
4. Roof gutters and down spouts may become damaged or clogged with leaves, twigs and silt. Inspect and clean them to ensure that they are free flowing. If your roof shows signs of wear, have it checked by a licensed roofing contractor. Do not allow the down spouts to discharge directly onto the soil, use splash stones, driveways or walkways to divert runoff to the street or other watercourse.
5. Concrete swales around the perimeter of a structure, are designed to direct water away from it. Make sure that they are not cracked or broken to the point that they lose their effectiveness. Keep them clean and repair any fractures that may allow water to penetrate them.
6. Building sites that were developed since the mid-fifties have berms of densely compacted earth at the top of slopes to prevent water from running over the slope. Make sure that these are maintained in good condition.
7. Check slopes for large amounts of loose soil, rocks, brush, or debris and remove any that may become dislodged during storms. Loose brush can act as a dam for silt. During storms it can wash down slopes causing damage or blocking drainage devices. If the brush is firmly rooted, it should be allowed to remain until after the rainy season which will help support the soil.
8. Large rocks and boulders may become loose during storms. Consult with a licensed Geologist or Soils Engineer in order to determine the best method for correcting this condition.

9. Don't let water run wild. During heavy rains and storms, inspect the slope for erosion and correct any problems immediately. If unusual cracks, settling, or earth slippage start, don't wait, act immediately.

10. Inspect any retaining walls that may effect your property. If there is any listing, leaning, overturning , or cracking, contact a licensed engineer immediately.

When landscaping, avoid disrupting the flow patterns established when your property was originally developed. When in doubt, consult a licensed Geologist or Soils Engineer.

For further questions regarding these or other related matters, please feel free to call the Department of Building and Safety at:

Toll Free in Los Angeles County	(888) 524-2845
Outside Los Angeles County	(213) 482-0000

FIRE STATION LOCATIONS WITH SAND BAGS

The Los Angeles City Fire Stations have sandbags available in the event of pending major storms and storm emergencies. For a list of L.A. City Fire Stations distributing sandbags, check the Emergency Preparedness Department's website at www.lacity.org/epd or Update LA at www.updatela.com. A limit of up to 25 burlap bags are available to each household. Property owners and residents should not solely rely on these sources as high demand may rapidly strap resources and create spot shortages.

You may also check the City of Los Angeles' 311 website at <http://publiccsd.lacity.org/CSD> for additional information on fire station sandbag distribution. For further questions regarding this matter, please call:

Inside the City of Los Angeles
Outside the City of Los Angeles

311
(866) 452-2489

BUREAU OF STREET SERVICES

During the storm season, the Bureau of Street Services also offers free sand and sandbags. Individuals may pick up sand and sandbags at the Bureau of Street Services locations listed below. Please note that residents must fill the sandbags themselves. Shovels will be available at the yard. The maximum number of bags per resident is 25 bags at the yards.

LIST OF AREAS/YARDS WHERE SAND AND SANDBAGS ARE AVAILABLE

AREAS/YARDS	SAND & SANDBAGS SERVICE HOURS	AREAS/YARDS	SAND & SANDBAGS SERVICE HOURS
<u>Bay Harbor Area</u>		<u>North Central Area</u>	
Venice Yard 2000 Abbott Kinney Bl. (310) 575-8830	8:00 a.m.-2:00 p.m.	Hollywood Yard 6640 Romaine St. (213) 485-4501	8:00 a.m.-2:00 p.m.
San Pedro Yard 1400 N. Gaffey St. (310) 548-7661	8:00 a.m.-2:00 p.m.	East Yard 452 San Fernando Rd. (213) 485-5667	8:00 a.m.-2:00 p.m.
Central City South Yard 4206 S. Central Ave. (213) 485-3717	8:00 a.m.-2:00 p.m.	<u>West Valley Area</u>	
<u>East Valley Area</u>		Reseda/Woodland Hills Yard 6015 Baird Ave. (818) 756-8809	8:00 a.m.-2:00 p.m.
Bel-Air Yard 11165 Missouri Ave. (310) 575-8478	8:00 a.m.-2:00 p.m.	Granada Hills Yard 10210 Etiwanda Ave. (818) 756-8449	8:00 a.m.-2:00 p.m.
North Hollywood/Studio City 10811 Chandler Blvd. (818) 756-8807	8:00 a.m.-2:00 p.m.	Canoga Park Yard 7453 Canoga Ave. (818) 756-8728	8:00 a.m.-2:00 p.m.
Sunland Yard 9401 Wentworth St. (818) 756-9612	8:00 a.m.-2:00 p.m.	Palisades Yard 1479 Stoner Ave. (310) 575-8479	8:00 a.m.-2:00 p.m.

To report storm-related emergencies such as trees down, landslides, potholes, and road erosion, please call **(213) 473-8410** or **(800) 996-2489 (CITY)** or the **3-1-1 operator**.

You may also visit their website at www.lacity.org/boss/Resurfacing/storm.htm for up to date information.

REDUCE THE CHANCE OF FLOODING IN YOUR NEIGHBORHOOD

Even in the best of weather, **urban runoff pollution** is a major threat to the health of our local bays. But in stormy weather, the threat increases over a millionfold.

Urban runoff pollution is all the materials that flow from our yards and streets into the catch basins at the end of the block, and from there directly to local bays through the 3000 miles of local channels and underground drains designed to carry stormwater quickly and safely out of our neighborhoods.

Urban runoff pollution can include: all litter and trash; pet droppings; chemicals dripped and spilled from our vehicles; chemicals like fertilizers and pesticides washed from our lawns; chemicals (like motor oil) deliberately dumped in storm drains—in short, anything on the street.

In dry weather, as much as *100 million gallons* of water runs through the storm drains and into the bay—water from lawn overwatering, from washing cars, from construction sites, from industrial discharges, etc.—carrying with it urban runoff pollution. These pollutants can linger in the storm drains, attracting vermin and smelling up the neighborhood. When flushed through, they cover our beaches, can make human beachgoers sick, and can harm or kill the creatures that live in our bays.

Wet weather compounds the situation, because *billions of gallons* can run through the storm drains in a single storm. Heavy rains sweep everything before them, sometimes clogging storm drains with debris, causing neighborhood flooding, or carrying pollution to the Santa Monica and San Pedro Bays.

Here are the best ways to keep urban runoff pollution from clogging our storm drains and flooding our neighborhoods. In the hours before a storm arrives:

1. Pick up all litter and loose objects in your yard and on your property. Anything loose can be washed away. This includes yard clippings, branches, etc., that can clog storm drains. Dispose of yard clippings in your City-issued green container.
2. Check your own yard drains to make sure they aren't clogged. If they are, clean them and properly dispose of the debris. Also, look at the catch basin at the end of your street. If it's clogged, report it to the City at 1-800-974-9794.
3. Sweep all dirt from driveways and walkways and throw it in the City-issued black trash containers. Even dirt is a pollutant when carried into the bay. Never hose down sidewalks or walkways.
4. Don't fertilize or use pesticides on your lawn and garden before a storm. These chemicals are washed off the lawn into the street and storm drains.
5. Don't store paints or any other toxic chemicals outdoors. Only store them in containers with tight-fitting lids.
6. Always clean up pet waste and flush it down the toilet, or throw it, wrapped, in the black container.

PETS AND DISASTERS

People cannot prevent a disaster from occurring but they can reduce the impact of a disaster on their pets. Pet owners are responsible for their pets before, during and after a disaster. Pets are completely dependent on their owners for their survival and well being. To assure that their needs are met pet owners should have an emergency response plan. Readily accessible kits with provisions for family members and pets are a must. The following information has been compiled to help pet owners prepare:

- * Keep current identification on you dog or cat. If your pet can't wear an I.D. then label their containers and cages.
- * Take current color photos of your pet(s) showing any special markings and keep them with your emergency supplies.
- * If you are certain a disaster is going to occur, control your animal with a leash or carrier.
- * Ask a neighbor to care for your pet in your absence.
- * If you need to evacuate, take your pet with you if possible
- * Predetermine a safe place for your animal to stay during a crisis. Most evacuation shelters will not accept animals.
- * Contact your local Los Angeles City Animal Care and Control Center to find out their available services during a disaster. They can provide temporary sheltering for pets and they have plans for livestock evacuation.

You should have adequate supplies for your pet readily available such as:

- | | |
|-------------------------------|---|
| * portable carrier | * food/water bowls |
| * pet food in plastic bottles | * litter and litter box for cats |
| * medications | * first aid kit with manual for animal care |
| * health records | * special instructions for diet or feeding |
| * leashes | |

All Los Angeles Animal Shelters can be reached by calling **(888) 452-7381**, or you may visit their website at www.lacity.org/ani.

North Central	3201 Lacey Street Los Angeles 90031	South Los Angeles	3612 11th Ave. Los Angeles 90018
East Valley	13131 Sherman Way No. Hollywood 91605	West Los Angeles	11950 Missouri Ave. West L.A. 90025
West Valley	20655 Plummer St. Chatsworth 91311	Harbor	735 Battery St. San Pedro 90731

FLOOD HAZARD AND FLOOD PROTECTION INFORMATION

Free Flood Information: The City of Los Angeles provides free flood zone information. Copies of the Federal Emergency Management Agency Flood Insurance Rate Maps are available for review in all Engineering offices. Flood information is also available by calling the numbers:

(213) 847-5220 or (800) 974-9794
Call back time is 24 hours and 48 hours during peak hours.

This information is also available to you directly through the Internet at: <http://navigatela.lacity.org/floodgis>. If requested, the City's Floodplain Manager will visit your property to review its flood problem and explain ways to stop flooding or prevent flood damage. Call the City's Floodplain Manager at (213) 847-5210. These services are free.

Investigation of Drainage Deficiencies: Request a drainage investigation when the water in the streets overtops the curb by calling your local Bureau of Engineering District office:

Harbor District - (310) 732-4690 West L.A. District - (310) 575-8534
Valley District - (818) 756-8431 Central District - (213) 847-9509
Espanol - (213) 847-6305

Clogged Catch Basins: Report clogged catch basins to the City Hot Line (800) 974-9794 between 8 a.m. and 4 p.m. Monday through Friday or (213) 485-7575 after 4 p.m. and on weekends.

Before You Build in the Floodplain: All new development and construction in the floodplain is regulated and requires a special review before a building permit is issued. Contact the Floodplain Manager at (213) 847-5210 during the planning stages to inquire about the regulations applicable to your project. Suspected illegal floodplain development can be reported at the same number.

Flood Protection Library: Additional information regarding flood protection, floodplain management and the National Flood Insurance Program (NFIP) can be found through the FEMA web site at www://fema.gov or at the City's Central Library (Science, Technology, and Patents Department) at <http://www.lapl.org/central/science.html>.

NFIP Phone Numbers: General Information - (800) 427-4661
 Looking for a Flood Insurance Agent? - (800) 720-1093

If You Decide to Purchase Flood Insurance, You Need to Know That: The City is a participant of the Community Rating System (CRS) with a CRS rating of 8, which qualifies residents in Special Flood Hazard Areas for a 10% discount. All other residents (outside Special Flood Hazard Areas) continue to qualify for a 5% discount. Please be aware that there is a 30-day waiting period from the time a flood insurance policy is purchased before coverage comes into effect. Exceptions: First time purchase for a new mortgage, or in connection with updating or revising a map.

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The City of Los Angeles
Department of Building & Safety
Training & Emergency Management Division
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