STATE OF CALIFORNIA / THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

FLOOD FIGHTING METHODS

Division of Flood Management
Flood Operations Branch

Revised August 2003

Filling Sandbags

When filling sandbags you should work in pairs, with one person holding the bag while the other shovels in the fill material. The first shovel of fill should be placed on the lip of the bag to help hold the bag open. The bag holder should find the most comfortable position while holding the bag open.

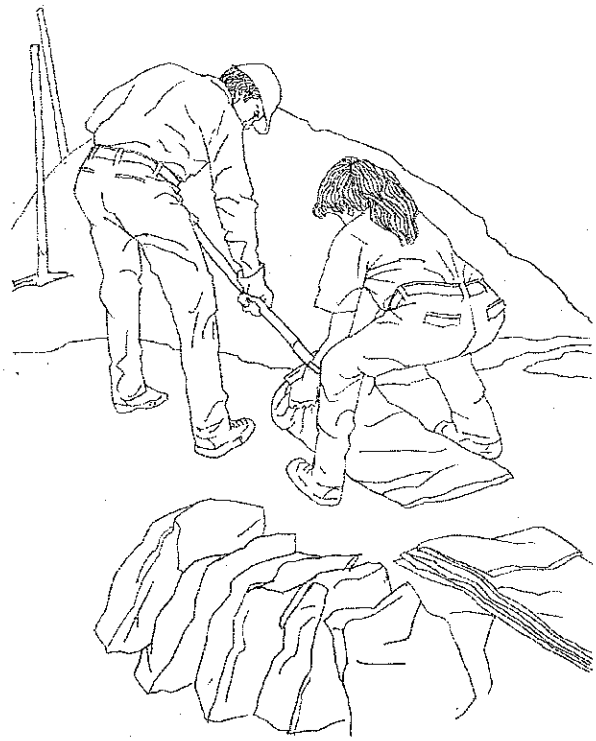


Figure 1

•The most common mistake made is overfilling bags. The shoveler should use rounded scoops of fill until the bag is approximately 1/3 full. While shoveling or holding, avoid extra movements (turning or twisting of the back) to prevent injury.

Sandbag Construction

The use of sandbags is a simple but effective method of preventing or reducing damage from floodwater and debris. (see Figure 2) Suggestions for constructing sandbag structures are:

1. Close weave burlap bags are recommended for all sandbag construction when available.

2. Fold the empty top of the bag at a 45-degree angle to keep sand from leaching out.

3. Place each bag over the folded top of the preceding bag and stomp into place.

4. Stagger the second layer of bags over the preceding layer seams.

5. Stomp all bags to form a tight seal.

6. The last sandbag in a line is referred to as a Key Sack. This bag is folded under and stomped into place.

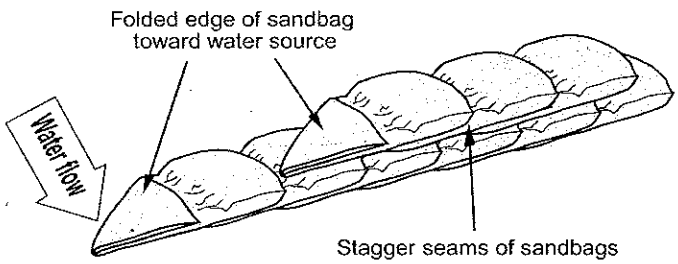


Figure 2
Fill sandbags 1/3 full, folded edge of sandbag toward water source, stagger seams of sandbags.

METHODS OF FLOOD FIGHTING AROUND STRUCTURES

The main causes of damage to structures, homes and property during heavy rains or flood flows are:

1. Flood water from overwhelmed storm drains and urban diversions, particularly on sloping streets.

2. Flood flows onto property through driveway openings, and low spots in curbs.

3. Debris flow from hillsides that have been cleared of vegetation by fire or real estate development.

The flood fighting methods described in the following paragraphs have proved effective in combating floodwaters and flood flows.

Diverting Water Away from Homes

To prevent or reduce property damage, the following methods can be effective.

Homes and structures can be protected from floodwater by redirecting the water flow as shown in Figure 18. Sandbag or wooden barriers must be placed at an angle and must be long enough to divert the flowing water away from all structures.

Barriers constructed of sandbags or lumber can also be used to channel mud and debris away from property improvements.

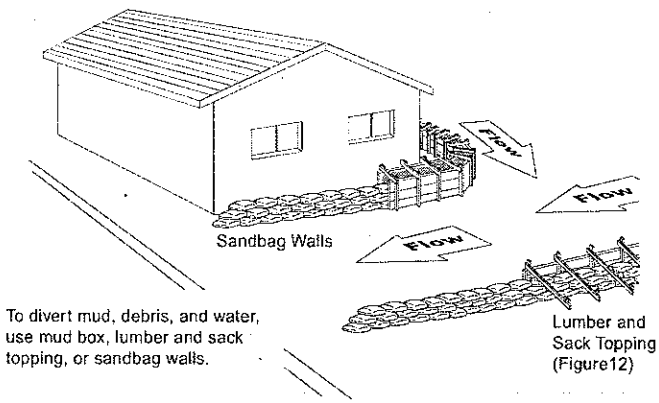


Figure 18

Home / Structure Protection

The following method is used for protection of buildings and other structures along lake shores and in similar situations where water is rising with little or no current.

Lay plastic sheeting on the ground and up the building walls to a point at least 1 foot above the predicted water elevation, and far enough out on the ground to form a half pyramid of sandbags (see Figure 19). Secure plywood over doors and vents. Overlap visquine and sandbags at corners of buildings.

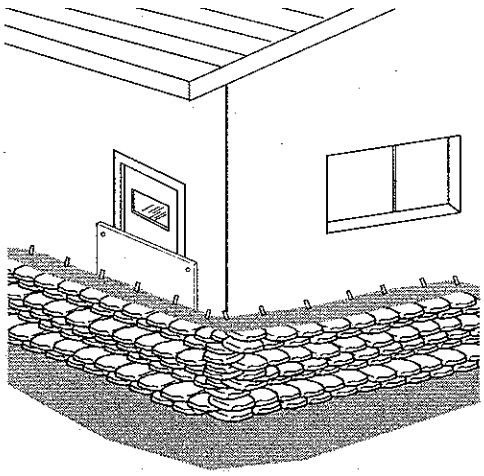
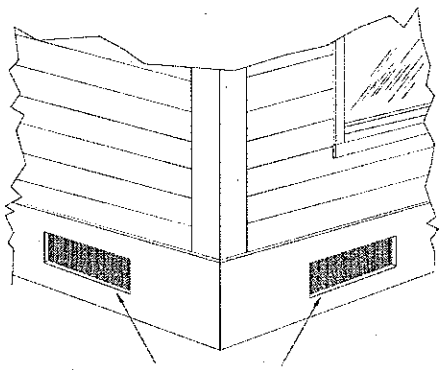


Figure 19

Wet Flood Proofing Requirements for Structures Located Within Special Flood Hazard Areas

National Flood Insurance Program regulations require that buildings on extended wall foundations or that have enclosures below the base flood elevation must have foundation or enclosure wall openings. These openings prevent the foundation or enclosure walls from weakening or collapsing under pressure from hydrostatic forces during a 100 year flood event. The openings allow flood waters to reach equal levels on both sides of the foundation or enclosure wall and minimize the potential for damage from hydrostatic pressure.



Foundation or wall openings must be kept open within special flood hazard areas

Figure 20

These Openings Must Not Be Blocked If The Building Is Located Within A Special Flood Hazard Area.
For details refer to FEMA Technical Bulletins TB1-93 and TB-7.
These bulletins may be obtained from the FEMA web site at:
http://www.fema.gov
For additional information contact DWR Floodplain Management at (916) 653-9902.