

COUNTY OF ORANGE
RDMD / FLOOD CONTROL DIVISION

When Water Is Your ENEMY



Huntington Beach, 1983

A Flood Protection Booklet

www.ocflood.com

THE PURPOSE OF THIS BOOKLET

Floods have made a significant impact throughout Orange County history. The heavy floods of 1938, 1969 and 1983 are grim reminders that should be taken seriously. Flood control facilities are being constructed or upgraded as rapidly as possible with available funds. However, there are many flood control facilities that are still deficient. In 2002, the Public Facilities and Resources Department, currently known as the Resources and Development Management Department (RDMD), prepared a Long Range Flood Control Program Report Update that estimated that \$1.058 billion will be needed to solve the regional flood control problems. This figure does not include the Santa Ana River Mainstem flood control project which is being funded by the federal government, Orange County, San Bernardino and Riverside Counties.

Each year, many low-lying areas in Orange County may face flooding. The water damage is costly to those unprepared. The prime responsibility of the local government during widespread flooding is to protect public highways, streets, bridges and buildings. The government cannot promise immediate assistance to property owners. Owners can protect their property by using the precautions in this booklet.

This booklet offers information from flood control engineers, public works officials, and others experienced in flood control. It will help you protect your house, business, and other valuables. The precautions described and illustrated in this booklet will prevent or minimize water entering a building under doors, through foundations, sill-seams and other openings. The protection for your house or business costs only a fraction of what it costs to repair structural damage from flooding. It takes little skill and time to do the job. When the flood waters rise, it is too late to defend yourself against flooding. It is critical that you prepare today, before the danger arrives.

STAY AWAY FROM ALL FLOOD CONTROL CHANNELS AND THE SANTA ANA RIVER DURING AND AFTER HEAVY RAINS.

HOME FLOOD PROTECTION

DO-IT-YOURSELF METHODS OF GUARDING YOUR PROPERTY FROM FLOOD DAMAGE

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HOW TO PROTECT YOUR PROPERTY FROM STREET-FLOW WATER

Flood waters from street gutters or drains, particularly on sloping streets, may flow into the property through driveway openings, through low places in the curb or over the street gutter. Water may be redirected by properly stacked sandbags or by 2" x 12" planks or railroad ties. These water barriers will control the direction of water away from your property thereby preventing water erosion to gardens and lawns. If the water is not too deep, the barriers may prevent water from reaching the house.

Sandbags or wood barriers, as shown in Figure 1, must be placed at an angle and must be long enough to direct the flowing water back into the street gutter. While some water may get around or flow through the barrier, the major destructive flow will be returned to the street.

Wherever flooding exists, two or more individual properties may be affected. The protection of one property might force additional amounts of water to enter a neighbor's property. Therefore, community effort is necessary. Home owners must work together to make sure that efforts to protect their property do not increase flood damage to neighboring property.

**SANDBAGS AND PLANK BARRIERS DO NOT
COMPLETELY SEAL OUT FLOOD WATERS FROM
PROPERTY OR BUILDINGS.**

**PROPER USE OF THESE BARRIERS RE-DIRECTS
WATER AWAY, PREVENTING OR MINIMIZING FLOOD
WATER FLOW THAT OTHERWISE WOULD DAMAGE
PROPERTY OR BUILDINGS.**

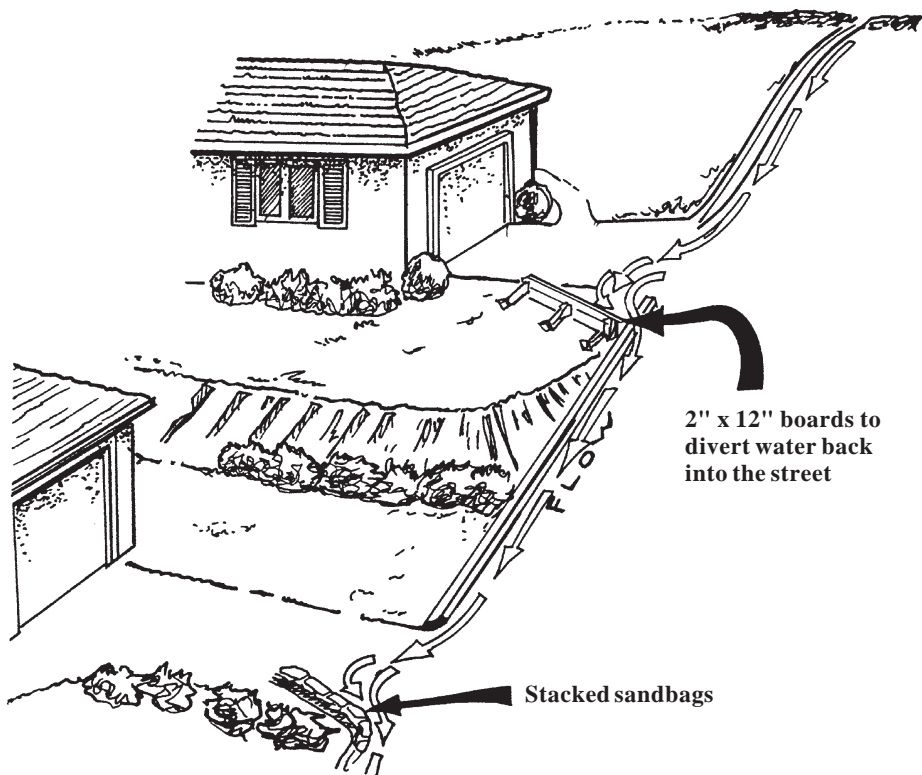


FIGURE 1

HOW TO USE SANDBAGS TO DIRECT FLOW OF FLOOD WATER FROM YOUR PROPERTY

Layers of sandbags (see Figure 2) properly placed will cause moving water to flow around instead of through property. However, standing water may seep through and between stacked sandbags. Sandbags cannot be filled ahead of time because burlap bags, when filled with sand or dirt, will rot. They must be filled immediately before or during the storm. Sandbags require a lot of hard work and time to fill properly and stack in place. Sandbags can weigh 40–60 pounds each. It takes more than one person to get the job done.

INSTRUCTIONS

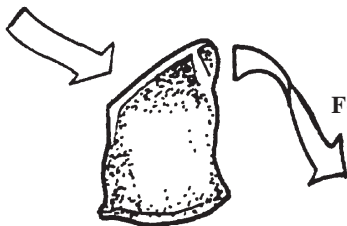
1. Fill bags only half full.
2. Fold over the empty top of the bag to prevent sand from leaking out.
3. Place each bag over the folded top of the preceding bag and stamp each bag into place before placing the next bag.
4. Always finish one complete layer of sandbags before starting the next layer.
5. Stagger the second layer of bags, stamping each bag into place before placing on the next bag.

**REMEMBER SANDBAGS WILL
NOT COMPLETELY SEAL OUT WATER.**

NOTE: Sandbags are available from the RDMD's Operations Division during storms. Sandbags are also available from your local fire department.



Fill bag 1/2 full
with sand



Fold end over flap

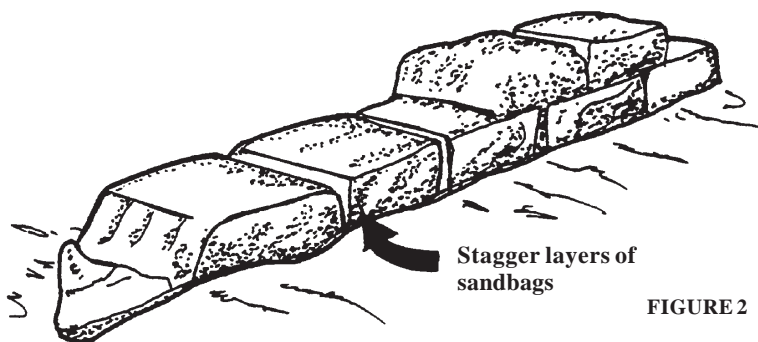


FIGURE 2

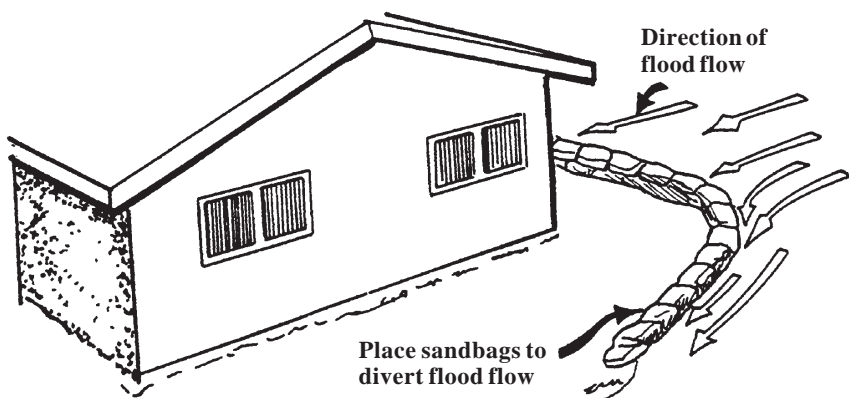


FIGURE 3

HOW TO USE WOOD PLANKS OR TIES TO DIRECT FLOOD WATER FLOW

Planks or railroad ties when properly placed will change the direction of water more effectively than sandbags. These can be prepared in advance and stored as long as needed. Wood planks are easily and quickly installed and dismantled by one person.

INSTRUCTIONS

1. Get 2" x 12" planks or railroad ties, 2" x 4" wood pieces to use as stakes and/or braces, and nails.
2. Using planks: nail 2" x 12" planks to 2" x 4" wood stake. Angle brace as shown in Figure 4 and secure with small 2" x 4" piece above brace and nail to stake. Angle an additional stake to brace and nail to provide adequate support (Figure 4).
3. Using railroad ties: nail railroad ties to two or more 2" x 4" stakes (Figure 5).
4. Set stakes in solid soil, as in Figure 6, to guide water around home.

When setting the stakes, be sure they are firmly driven into the ground.
NAIL THE PLANKS AND RAILROAD TIES TO THE STAKES.

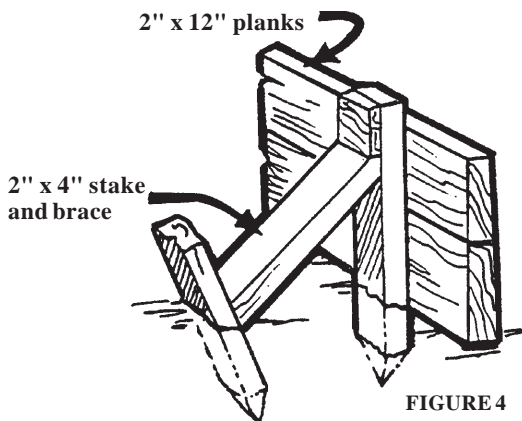


FIGURE 4

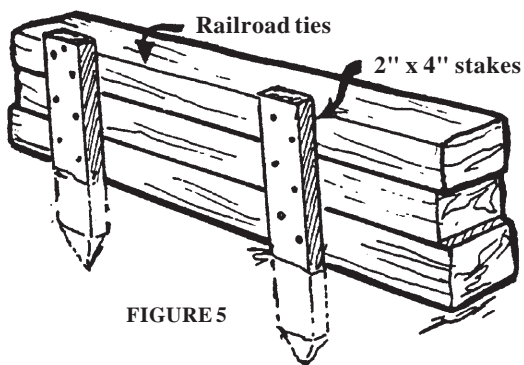


FIGURE 5

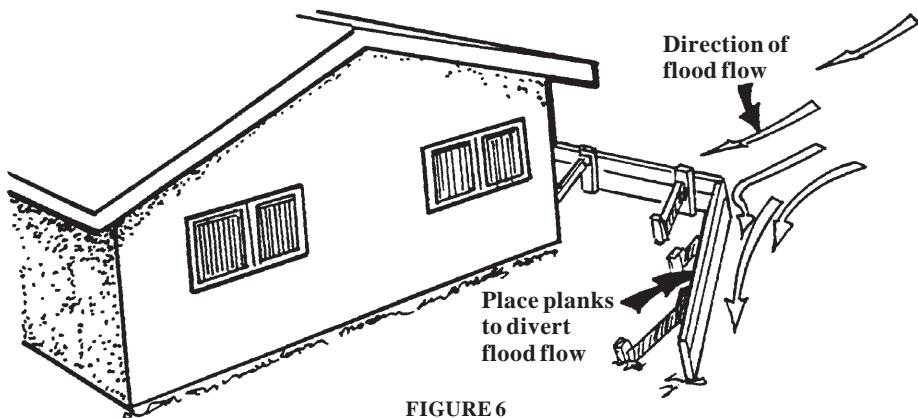


FIGURE 6

HOW TO PROTECT HOMES AND BUILDINGS HAVING SLAB (CONCRETE) FLOORS

Water can be kept from penetrating stucco or brick walls with special paints. Most of the water in this type of building, however, comes up between the foundation and the outside wall, then flows over or under the sill and through and under the inside wall or plaster board as shown in Figure 7.

Note: Most water enters through wall cracks and at points where outside wall and foundation sill meet.

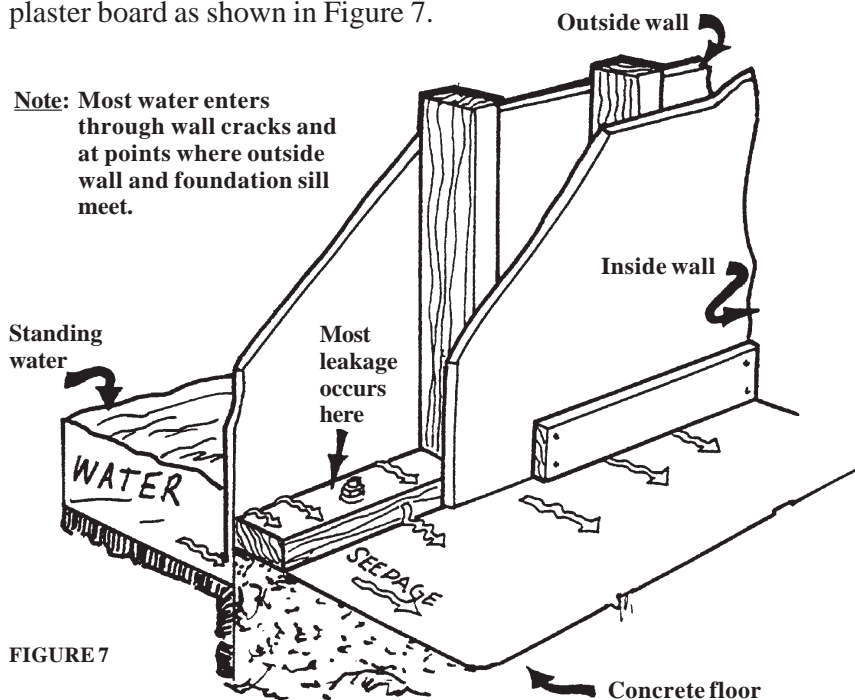


FIGURE 7

TO OBTAIN THE GREATEST PROTECTION FROM SUCH WATERS:

1. Patch up all cracks in the outside stucco and concrete foundation with regular patching mixes available at hardware stores (see Figure 8).
2. Clear the dirt away from the stucco apron and caulk the lower exposed edge with commercial caulking compound. This seal will last for several years with minor maintenance. The dirt may be pushed back into place without affecting the seal.

PREPARATION OF STUCCO SIDING

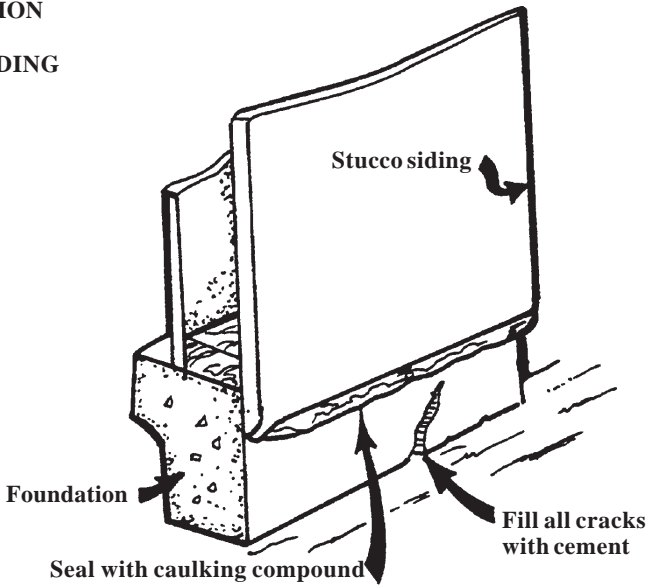


FIGURE 8

3. For temporary protection of stucco or wood-siding, fasten plastic sheeting, waterproof building paper or similar material to the side of the house with lathing or sticks and then cover the lower edge of the material with dirt (see Figure 9). Remove the sheeting or paper after the water has receded to avoid rot and mildew in the house frame.

PREPARATION OF WOOD SIDING

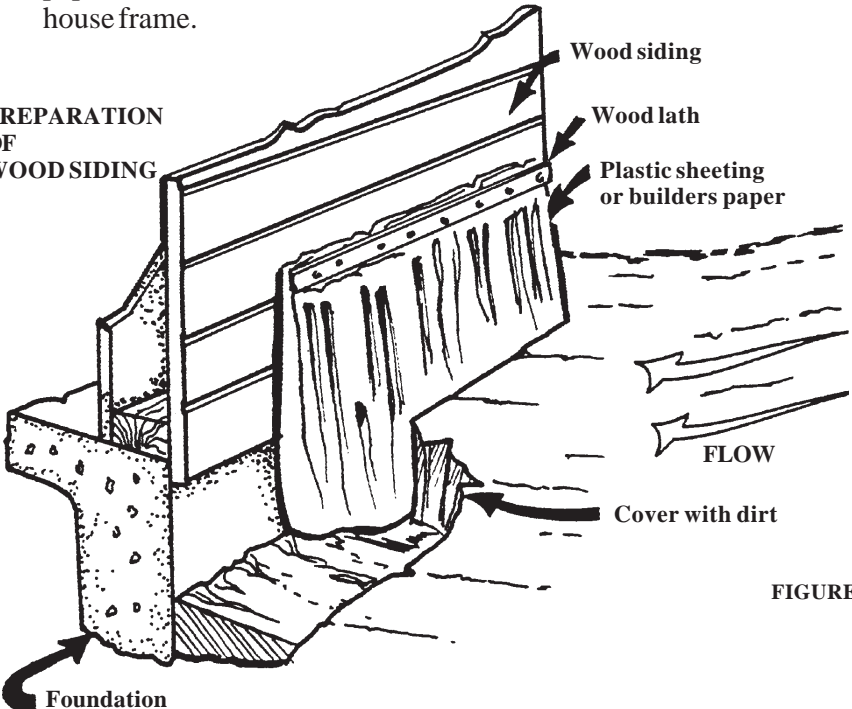


FIGURE 9

HOW TO PROTECT HOMES AND BUILDINGS HAVING STANDARD WOOD FLOORS

Water can leak into and fill the crawl space or basement through foundation cracks, pipe holes, vents and windows, as shown in Figure 10. It can also seep between the house siding and foundation sills. Once the crawl space or basement is filled, the water will rise into the building through floors and wall joints until it reaches the height of the outside waters.

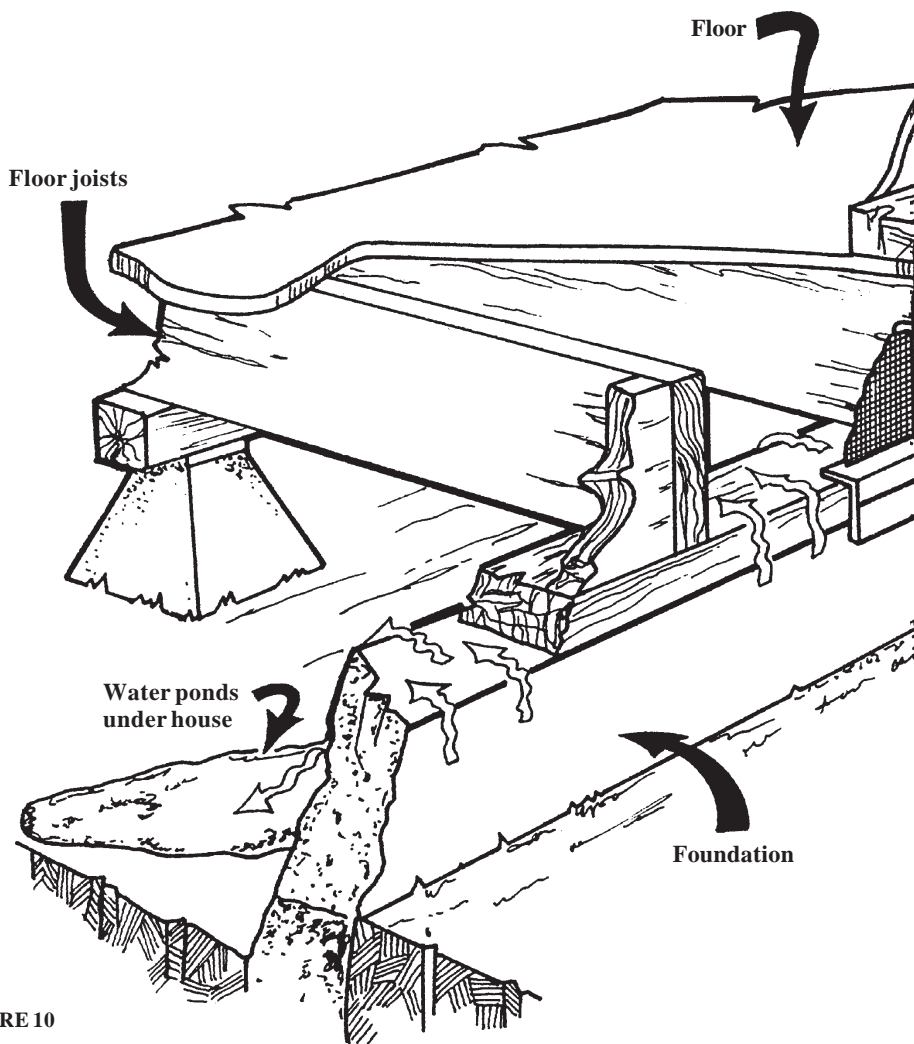
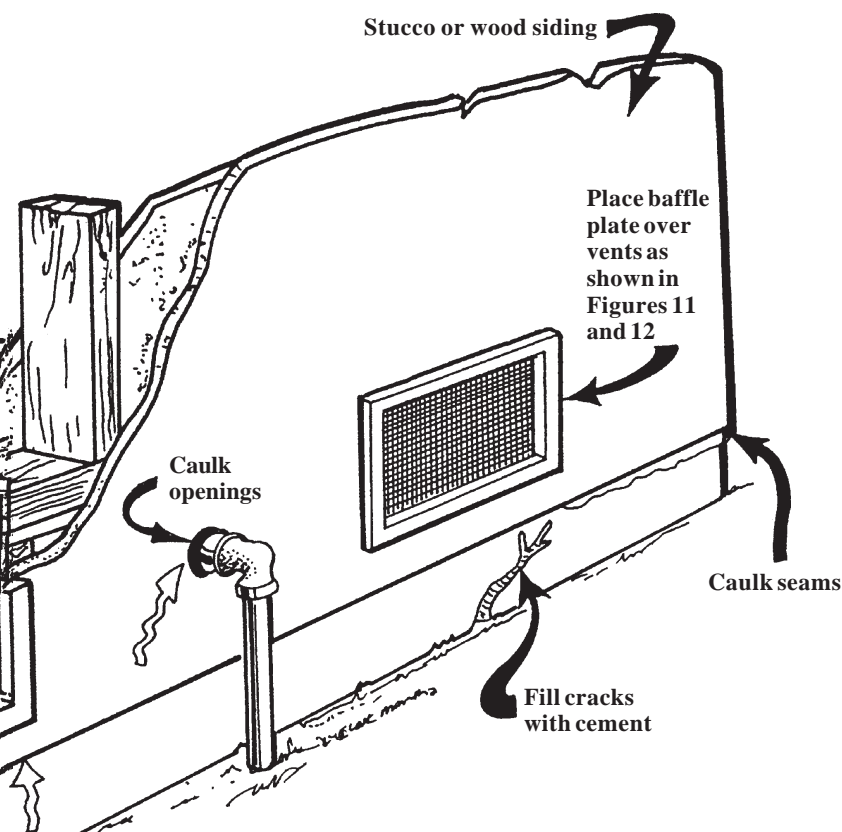


FIGURE 10



INSTRUCTIONS

1. Seal vents and windows with baffle boards as described on page 14. Vents are required by building codes to prevent mildew and rot. Therefore, all baffle boards must be removed as soon as the flood danger passes.
2. Fill cracks in the foundation or stucco wall with concrete patch or other effective crack-filler material.
3. Seal small openings around pipes with concrete patch, crack-filler or caulking compound.
4. Seal the joint between the siding and foundation with caulking compound. See Figure 8.

HOW TO MAKE BAFFLE BOARDS TO SEAL FOUNDATION VENTS AND WINDOWS

INSTRUCTIONS

1. Use 3/4" plywood for baffle boards. Cut plywood to overlap the window or vent by 3 or 4 inches on all sides, as shown in Figure 11.
2. Attach strips of felt, foam rubber or other soft material, at least 2 inches wide, with waterproof glue to the overlap surface of the board to form a gasket. There are many suitable waterproof glues available from hardware stores.
3. Hold the baffle boards securely in place with nails, screws, or bolts.
4. Nail the boards to wooden frames, but if screws are used, protect the screw holes with lead anchors or expansion sleeves. For stucco, concrete or brick walls, special screws or expansion bolts will be required. These anchors or expansion bolts are not expensive and can be purchased in hardware stores.
5. Further secure baffle board by nailing a small board 2" x 4" or 2" x 2" to baffle board. Hold or wedge baffle boards into place by placing 2" x 4" under board and staking it as shown in Figure 12.

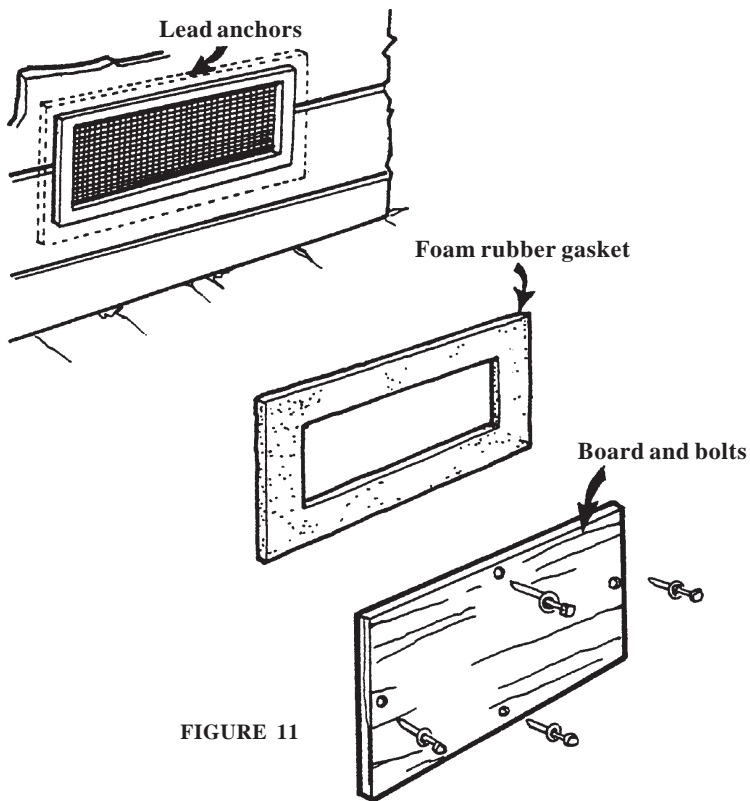


FIGURE 11

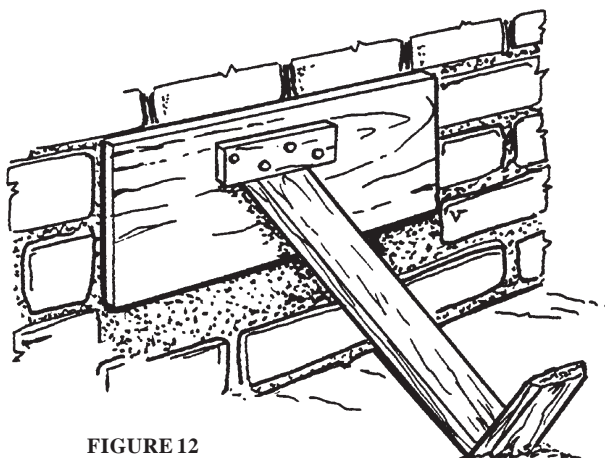


FIGURE 12

HOW TO INSTALL EMERGENCY SEALS FOR DOORWAY ENTRANCES

METHOD 1: Use putty, modeling clay, floral clay, or other such materials to fill and seal cracks and joints around the door, the sill and frames. These materials are easily removed when flood waters subside (see Figure 13).

METHOD 2: Use plastic sheeting or waterproof building paper (see Figure 14).

REMEMBER

- ✓ With method 1 or 2 above, caution must be taken to lock the door from the inside to prevent an accidental opening which would break the waterproof seal.
- ✓ Although such materials as putty and modeling clay are effective short-time seals, the cracks around the door sill and frame should be filled with a good caulking compound for a longer lasting seal.

FIGURE 13

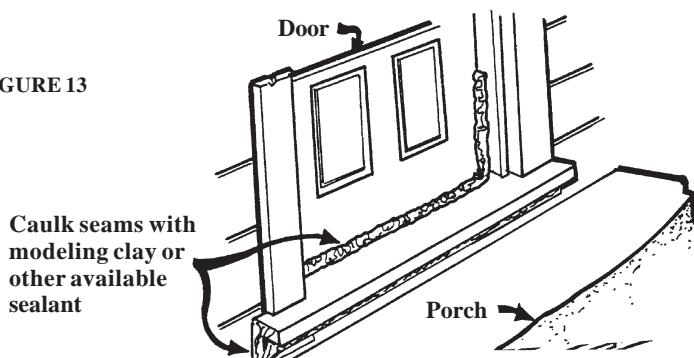
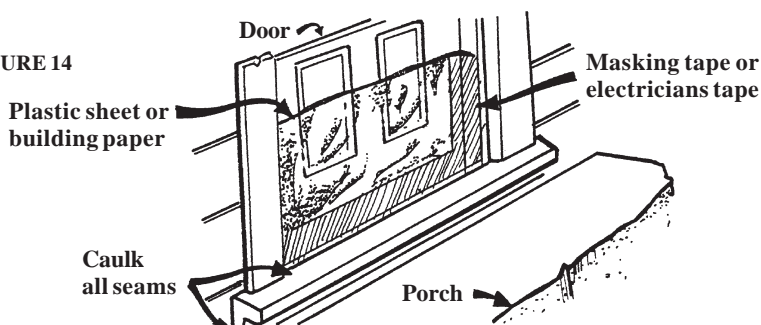


FIGURE 14



HOW TO USE BAFFLE BOARDS TO PROTECT DOORWAY ENTRANCES

Water can be prevented from entering doorways by the use of properly installed baffle boards as shown in Figures 15, 16, and 17. Just by stepping over the barrier occupants can enter or leave.

**ENTERING OR
LEAVING HOME
OR BUSINESS IS
POSSIBLE WHEN
BAFFLE BOARDS
ARE INSTALLED
AS SHOWN.**

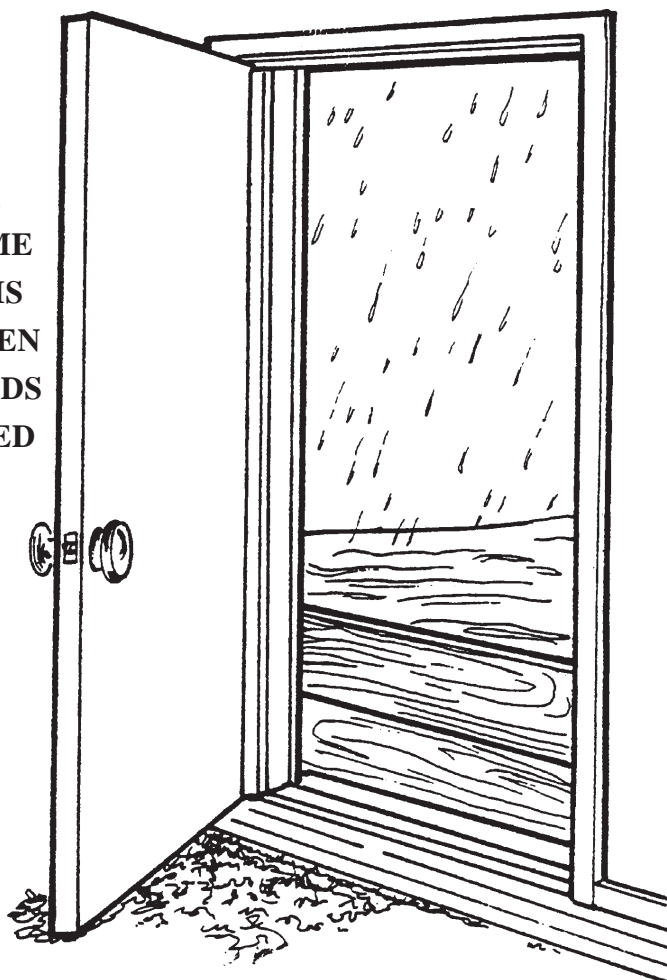


FIGURE 15

HOW TO PREPARE READY-TO-INSTALL DOORWAY Baffle BOARDS

Doorway baffle boards are constructed similarly to the window or vent baffles described on page 14, except that the gasket material must also be folded around the bottom edge of the board to make a watertight seal.

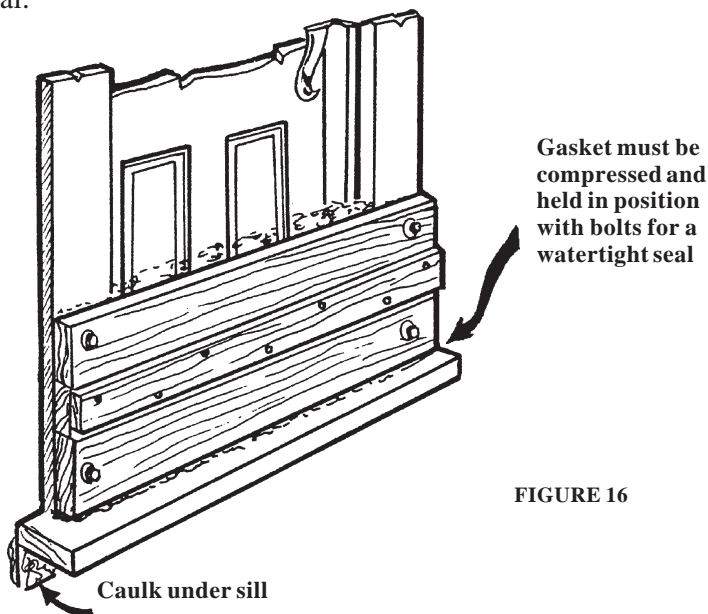


FIGURE 16

INSTRUCTIONS

- 1 Use boards and battens, or plywood to construct buffer board as shown on opposite page.
2. Cut out 3 inch wide strip of rubber or felt to overlap surface of board to form a gasket leaving enough to fold under bottom of board. Glue to baffle board with waterproof glue.
3. Caulk under sill. Unless the cracks and joints under and around door sills and frames are caulked and sealed, the baffle boards will be insufficient. Use a good caulking compound for a sealer which will last several years with little or no maintenance.
4. Remove screen door if necessary. Using bolts or screws with washers and lead anchors, bolt planks to door jamb.

**REMOVE SCREEN
DOOR IF NECESSARY**

POINTS TO REMEMBER

TO CONSTRUCT
BAFFLE BOARDS follow
steps 1 through 3 and keep
in mind the following
points as illustrated in
Figures 16 and 17.

1. When installed, the bottom gasket must be compressed and firmly held down to make the bottom seal.
2. The baffle can be held in place with nails, screws or bolts. For frequent re-use, it is advisable to use a type of bolt for which lead anchors can be permanently installed on the door frame, because re-use of nails or screws may split or weaken the door frame.
3. The baffle boards can be stored from year to year and are thus always ready for an emergency.

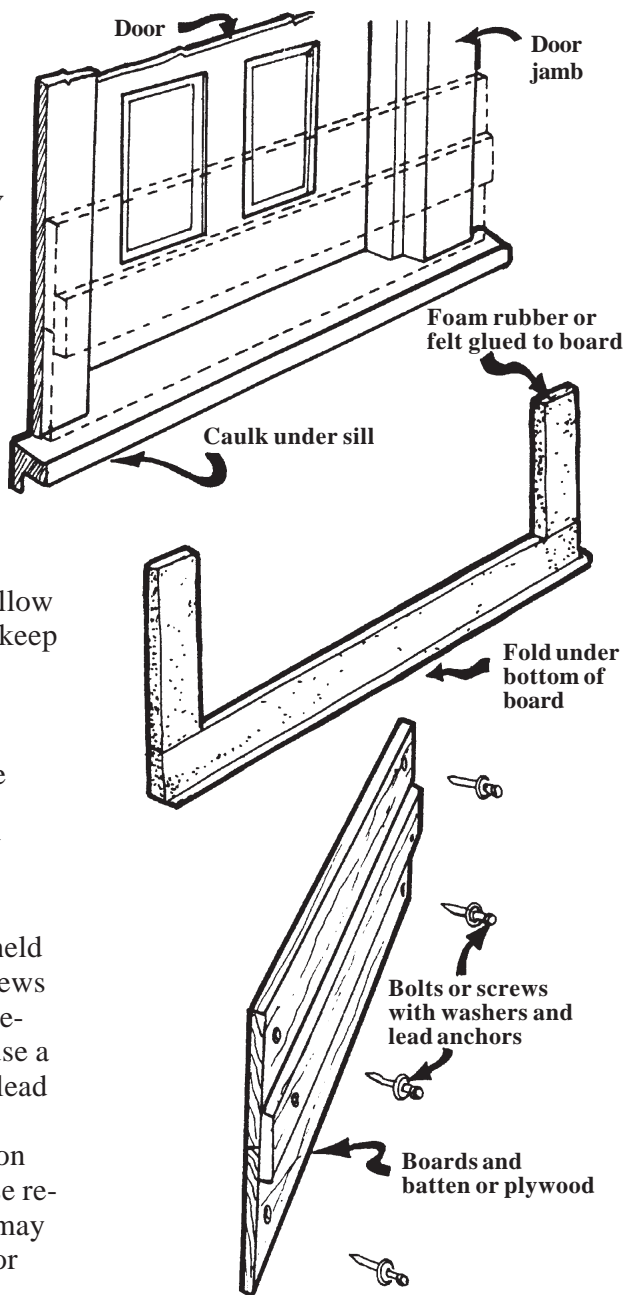


FIGURE 17

HOW TO PREPARE WATERTIGHT SEALS FOR GARAGE DOORWAYS

Garage doors can be sealed by baffle boards which are made much in the same manner as described for vents and doors.

INSTRUCTIONS

1. Use a suitable 1" thick board instead of plywood for the door seals.
2. Shape bottom edge of baffle board to fit the driveway surface so that there will be a watertight seal on the bottom.

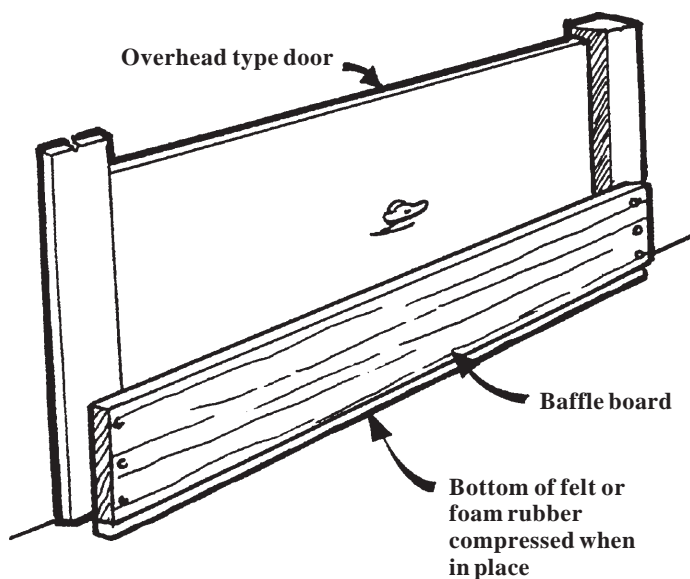


FIGURE 18

3. For hinged doors, consider using separate baffles to seal the sides and center opening of the door cracks vertical to and higher than the bottom seal.
4. Seal the openings around the hinges or hasps with such materials as putty or modeling clay to assure no leakage.
5. Further, protect garages with overhead doors from higher water by stacking additional baffle boards to the desired height.

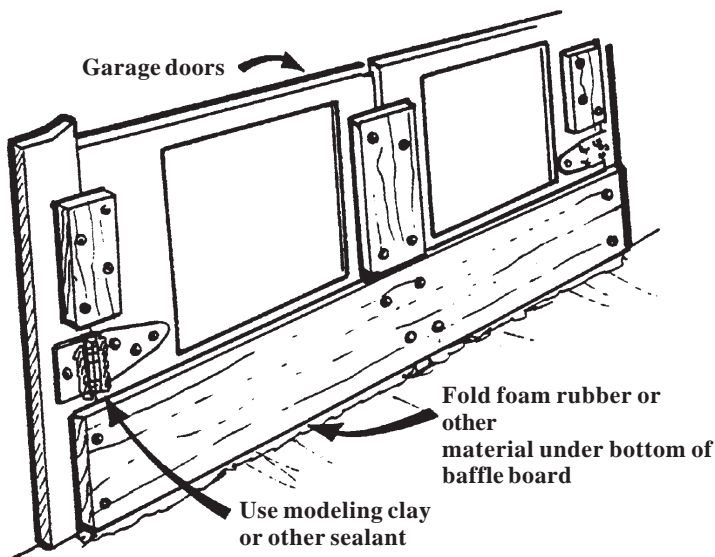


FIGURE 19

HOW TO CONTROL EROSION ON UNPLANTED SLOPES AND BANKS

1. KEEP THE WATER AWAY FROM THE SOIL

Water flowing into the property—dig a small ditch with a hoe or shovel fairly close to the upper edge of the property. Wait until the soil is moist so that it can be easily worked. Build the ditch nearly on the horizontal to produce slow water movement. Have the ditch empty into a creek or onto pavement or to a well vegetated area.

Rain falling on the property—dig the same type of small ditch at the top of each slope. On slopes, 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 can be overlapped like shingles so that the great majority of water does not reach the soil. Shrubs may be planted through the plastic by cutting a hole just large enough for planting.

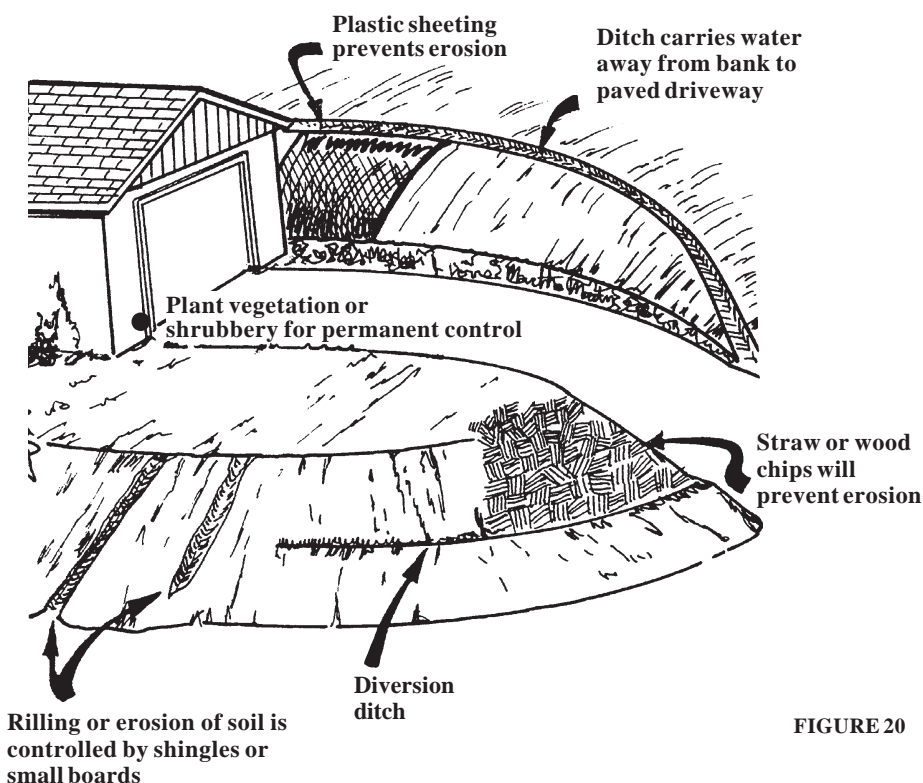


FIGURE 20

2. SLOW WATER DOWN

When the soil is washing away, control is achieved through the use of shingles or other small pieces of wood as dams. Simply push the shingles or boards solidly into the ground across the patch of the rill or small gully so that it acts as a dam. Make sure that the ends of the dam are buried deep in each side. On long slopes it is advisable to use ditches, such as those previously mentioned, at intervals down the slope. Keep them close to the contour and build to empty onto pavement or into dense vegetation.

3. 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 worked into the top few inches of the soil. Use a one-inch covering of chips or three inches of straw as a guide. Apply more or less as slope and soil conditions indicate. Nitrogen fertilizer should be added to straw or wood chips.

4. SEED COVER CROP

In conjunction with the steps above, a ground cover should be established prior to the winter rains. Seed a drought-tolerant grass at the rate of one pound per 1,000 square feet, or plant other drought-tolerant ground cover plants as recommended by your local nurseryman.

You may wish to use several of the suggestions in this bulletin or perhaps just one or two. The important thing is to be prepared when the heavy rains come. A small amount of effort applied at the right time and place can prevent a lot of trouble later.

POINTS TO REMEMBER

- ☐ Sandbags do not completely seal out water.
- ☐ Review and follow your Flood Fight Bulletin recommendations each year.
- ☐ Check and test baffle boards at the start of each rainy season.
- ☐ Check caulking around all foundations, seams and doorways each year.
- ☐ Remove baffle boards from vents and windows after the water recedes so that the foundation can dry and you are in compliance with building codes.
- ☐ Stay away from all channels and the Santa Ana River during and after heavy rainfall.

HELPFUL TELEPHONE NUMBERS AND ADDRESSES

Resources and Development Management Department
Flood Control Division
300 N. Flower, P.O. Box 4048
Santa Ana, CA 92702-4048

For information:
www.ocflood.com

National Flood Insurance Program
www.fema.gov/nfip

Weather
www.noaa.gov

Orange County Storm Center
Operations Division
(Emergency Sandbags)
(714) 567-6300
(714) 567-6340 (Fax)

Orange County
Flood Control District



Orange County
Board of Supervisors

Resources and Development Management Department
Flood Control Division
P.O. Box 4048
Santa Ana, CA 92702-4048