



County of San Diego

Flood Protection for Your Home or Business

Has your home or business been damaged by flooding? Is it in an area where flooding is likely to occur? There are temporary measures that can help to protect your property during a flood event. You can plan ahead about where and how you will move furniture out of harm's way; keep materials like sandbags, plywood, plastic sheeting and lumber handy for emergency waterproofing; and clear brush and debris away from storm drains and ditches so water can drain away from the structure.

There are also more permanent projects for protecting your property. Although these projects do not remove the flood insurance requirement on the property for federally backed mortgages, they can protect your property and bring you peace of mind. The technical limitations of the methods and cost will help you determine the best project for your home or business. Other considerations might include such things as the appearance of the structure after retrofitting and any inconvenience resulting from retrofitting.

Please keep in mind that all floodplain development requires a building permit.

WARNING

Wet floodproofing, dry floodproofing, levees, and floodwalls cannot be used to bring a home into compliance with the National Flood Insurance Program or the County's floodplain management ordinance.

Six Ways to Protect Your Home or Business from Flooding

WET FLOODPROOF is used to make uninhabited portions of your home or business resistant to flood damage and allow water to enter during flooding. The purpose of allowing water into uninhabited portions of the structure is to ensure that the interior and exterior hydrostatic pressures will be equal. Allowing these pressures to equalize greatly reduces the likelihood of wall failures and structural damage. No matter how small the effort, wet floodproofing can, in many instances, reduce flood damage to your property and its contents. In addition, wet floodproofing measures are often less costly than other types of retrofitting and do not require the additional land that may be needed for levees and floodwalls (discussed below). Keep in mind, wet floodproofing is not permitted in areas other than those used for parking, building access, or storage.

Pumping floodwaters out of a wet floodproofed basement too soon after a flood may lead to structural damage.

DRY FLOODPROOF, or seal, your business to prevent floodwaters from entering. Dry floodproofing is permitted only for non-residential structures. Making the building watertight requires sealing the walls with waterproof coatings, impermeable membranes, or supplemental layers of masonry or concrete. Also, doors, windows, and other openings below the expected flood level must be equipped with permanent or removable shields, and backflow valves must be installed in sewer lines and drains.

Most floodproofing is appropriate only where floodwaters are less than three feet deep, since walls and floors may collapse under higher water levels. A registered professional engineer or architect must prepare the building plans and certify the floodproofing measures, using a FEMA Floodproofing Certificate form, which can be downloaded from FEMA's website at the following link:

<http://www.fema.gov/library/viewRecord.do?id=1600>.

Dry floodproofing reduces the flood risk to the building and its contents and may be less costly than other retrofitting methods.



A home protected by a levee, which holds back the floodwaters shown in the lower half of the photograph. Note that the levee ties into high ground created by the road embankment.

BUILD A LEVEE around your property to hold back floodwaters. A possible technique in areas of shallow and moderate flooding depths with low velocity, this is a method of creating a barrier of compacted soil to keep the water away from a home or business. It can be one of the least expensive techniques, and it can be attractively landscaped. Its construction, however, requires great care, and there must be continued attention and maintenance to prevent its failure. Further, levees may require a large amount of space to install. Note that development in the floodplain is heavily regulated, therefore a levee might not be allowed if you live in the regulatory floodplain.

BUILD A FLOODWALL around your property to hold back floodwaters. This method is sometimes practical for areas with low to moderate flooding depths or velocities. As with levees, floodwalls are designed to keep the water away from the structure, but are constructed of materials such as of masonry block and reinforced concrete. They are more expensive than levees, but if property



A home protected by a floodwall designed as a landscape feature

designed, take up less space and do not require as much concern with continued inspection and maintenance. However, because some designs have openings for access to the house, they often require closures and human presence to make sure they are in place prior to flooding.

ELEVATE the structure so that the lowest floor is above the flood level. You can elevate the entire structure, including the floor, or leave the structure in its existing position and construct a new raised floor within the structure. The method used depends largely on construction type, foundation type, and flooding conditions. Although the cost of elevation may be high, there are many advantages, including:

- Elevation 1-foot above the Base (1-percent-annual-chance) Flood Elevation (BFE) allows a substantially improved or substantially damaged home or business (see below) to be brought into compliance with the National Flood Insurance Program (NFIP) and local floodplain management ordinances.
- Elevation reduces the flood risk to the home and its contents.
- Except where a lower enclosed area is used for storage, elevation eliminates the need to move vulnerable contents to areas above the water level during flooding.
- Elevation often reduces flood insurance premiums.
- Elevation techniques are well known, and qualified contractors are often readily available.
- Elevation does not require the additional land that may be needed for the construction of levees or floodwalls.
- **PROTECTION OF UTILITIES** – Damage to utility systems is one of the most common losses suffered by home and business owners during flooding. Fortunately, protection of utility systems is one of the easiest and least expensive retrofitting methods to accomplish.
- Cost effective measures that can be taken to retrofit existing systems include: elevating air-conditioning units on a brick pad, moving the main electrical switch box and main gas/water connections, and creating a shield to divert water away from utilities and appliances.

HOW HIGH?

The minimum NFIP requirement is to elevate or floodproof to the BFE. However, the County of San Diego has adopted an additional measure of safety into its floodplain management ordinance and requires buildings be elevated or floodproofed to ***one foot above the BFE.***



Retrofitted home elevated on extended continuous foundation walls.

- Where the flood protection level (BFE plus 1 foot) is not too high, a furnace, water heater or other heavy appliance can be raised on a platform inside the house to protect it from low-level flooding. The appliance can be placed on concrete blocks or a wooden platform supported by concrete blocks. Appliances such as washers and dryers must be secured such that they will not vibrate off the blocks or platform during use.
- Another option to protect the furnace, water heater, and washer and dryer from shallow flooding is to build a low floodwall around them. A concrete or wooden wall 1 or 2 feet high can stop low-level flooding. The wall should be waterproofed with plastic sheeting or waterproofing compounds that can be purchased at hardware stores.
- FEMA 348, *Protecting Building Utilities from Flood Damage* provides in depth information about protecting building utilities from flooding. It can be viewed and downloaded from FEMA's website at www.fema.gov/hazards/floods/lib06b.shtm.

OTHER MITIGATION OPTIONS include demolishing the structure entirely or relocating the structure to another property, or to a higher point on the same property. In general, these options are more costly than those presented above; however, both options are allowable under the NFIP. For more information on these two retrofit options, please see FEMA 312, *Homeowner's Guide to Retrofitting*, which can be downloaded at www.fema.gov/rebuild/mat/fema312.shtm.

Substantial Improvement and Substantial Damage Projects

Under the NFIP, an improvement of a building (such as reconstruction, rehabilitation, or an addition) is considered a **substantial improvement** if its cost equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. Similarly, damage to a building, regardless of the cause, is considered **substantial damage** if the cost of restoring the building to its before-damage condition would equal or exceed 50 percent of the structure before the damage occurred. Of the retrofitting methods discussed here, only elevation is permitted for substantial improvement or substantial damage projects (see matrix on next page). For more information about substantially damaged buildings, refer to FEMA 213, *Answers to Questions about Substantially Damaged Buildings*.

<http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1636>

Financial Assistance

FEMA and other Federal agencies have an array of financial assistance programs for States, communities, and individual property owners in mitigating the negative effects of flood hazards. You may be eligible to receive financial assistance through one or more of these programs that will help pay for some of these retrofitting projects. You can contact the California Department of Water Resources, Division of Flood Management, by telephone at 1-916-653-9902. The Department is located at 1416 9th Street, Room 1623, in Sacramento. You can also contact the FEMA Region Office IX by telephone at 510-627-7100. The Region IX office is located at 1111 Broadway, Suite 1200, in Oakland.

One of the benefits provided by the NFIP is Increased Cost of Compliance (ICC) coverage. If your home or business is covered by a Standard Flood Insurance Policy (SFIP), is in the floodplain, and has been declared by your community to be substantially damaged or repetitively damaged by flood, ICC will help pay for certain types of retrofitting, including demolition. ICC coverage is available on most SFIPs.

Keep In Mind

Homeowners or business owners planning to use any of the techniques outlined here must contact the San Diego County Department of Planning and Land Use for a building permit. The Department can be reached by calling 1-858-565-5981 or toll free at 1-888-267-8770.

Remember that it is important to purchase flood insurance for your home, even if you mitigate your home using one of these methods. Also, flooding occurs in areas designated at moderate or minimal flood risk. FEMA recommends flood insurance coverage, even if it is not required by law or a lender.

For More Information on Protecting Your Property

“Homeowner’s Guide to Retrofitting: Six Ways to Protect Your House from Flooding” (FEMA 312), includes information on protecting a structure from flooding and information about available financial assistance. This free guide can be obtained by calling 1-800-480-2520 or online at

www.fema.gov/rebuild/mat/fema312.shtm.

FEMA and the National Association of Home Builders have produced a 30-minute videotape titled *Best Build 3: Protecting a Flood-Prone Home*, which illustrates the retrofitting methods described in this guide. 9-0048, 1998.

The video can be viewed online at <http://www.archive.org/details/gov.fema.build>.

For additional questions about property protection projects, or for information on permitting, please contact the San Diego County Department of Planning and Land Use at 1-858-694-2960 or 1-800-411-0017.

FEMA 114 *Design Manual for Retrofitting Floodprone Residential Structures* presents floodproofing techniques that can be used for existing residential structures. This document can be viewed online or downloaded from FEMA’s website at <http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1414>

FEMA 347, *Above the Flood: Elevating Your Floodprone House* shows how floodprone houses in south Florida were elevated above the 100-year flood level following Hurricane Andrew. Alternative elevation techniques are also demonstrated. This document can be viewed online at <http://www.fema.gov/library/resultFemaNumber.do>.

All of the flood protection methods described in this guide are discussed in depth in FEMA 259, *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures*. This document can be viewed online at <http://www.fema.gov/library/resultFemaNumber.do>.

Other resources include: FEMA’s Building Science Helpline, a technical assistance hotline, at 1-866-927-2104 (phone) or FEMA-Buildingsciencehelp@dhs.gov (email).