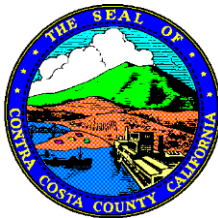


Contra Costa County Floodplain Management Program

Answers to Commonly Asked Questions and
A Guide for Residential Construction within
Special Flood Hazard Areas



Contra Costa County
Public Works
Department

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This brochure applies only to the unincorporated areas of Contra Costa County. Please contact your local agency if your property is within an incorporated city.

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Introduction

Ninety percent of all natural disasters in California are flood related. All rivers and creeks have floodplains. Floodplains are natural geological features that can provide environmental and flood reduction benefits. These floodplains are primarily level, fertile lands and have historically attracted development. As development has encroached within the floodplains, loss of life, property damage, and associated costs have greatly increased. Furthermore, as development occurs, the runoff of rainwater intensifies and the frequency of flooding events also increases.

In July 1987, after an extensive study of the County's floodplains, the Federal Emergency Management Agency (FEMA) produced our first Flood Insurance Study (FIS) and printed Flood Insurance Rate Maps (FIRMs). These watersheds are re-studied and re-mapped periodically and show areas with a one percent chance of flooding each year. These areas are commonly referred to 100-year floodplains, and are shown as Special Flood Hazard Areas (SFHAs) on the FIRM maps. Flood insurance is mandatory for most residential, commercial and industrial developments within SFHAs.

In compliance with the National Flood Insurance Program (NFIP), Contra Costa County adopted a Floodplain Management Ordinance. This ordinance requires that the elevation of the lowest floor, including basement, for all new residential structures or substantial improvements to existing structures within a SFHA must be elevated one to two feet above the Base Flood Elevation (BFE) for that area. Commercial and industrial developments can be elevated, flood proofed or made flood resistant. Lower insurance rates are available when the lowest floor is above the BFE.

Owners and developers of properties within the SFHA of the County are encouraged to review the current Floodplain Management Ordinance found in Chapter 82-25 of the County

Ordinance Code to learn about the requirements for development of their properties prior to submitting a formal application. This ordinance is available from the County's website at www.co.contra-costa.ca.us.

Flood Insurance Rate Maps (FIRMs)

FIRMs generally show flood zones, floodplain boundaries, and BFE. These FIRMs along with the FIS are used for floodplain management, flood insurance rating, and to determine flood insurance requirements. FIRMs are available online from **FEMA Map Service Center** at <https://msc.fema.gov/portal/>. Use FEMA Map Service Center to find official flood maps and other flood hazard products by entering a property address, a place, or longitude/latitude coordinates.

FIRMs are also available in the branch libraries of Contra Costa County, at the Application and Permit Center and at the Public Works Department for public use.

Flood Zones

High Risk Areas	
Zone A are the Special Flood Hazard Area (except coastal V Zones) shown on a community's Flood Insurance Rate Map. There are five types of A Zones. Mandatory flood insurance purchase requirements apply to these zones (if owner has federally backed mortgage).	
A (Unnumbered A Zone)	SFHA where no base flood elevation is provided.
A# (Numbered A Zone)	Numbered A Zones (A1-A30), SFHA where the FIRM shows a base flood elevation in relation to NGVD.
AE	SFHA where base flood elevations are provided. AE Zone delineations are now used on new FIRMs instead of A# Zones.
AO	SFHA with sheet flow, ponding, or shallow flooding. Base flood depths (feet above grade) are provided; average depth ranges from 1 to 3 feet.
AH	Shallow flooding SFHA. Base flood elevations in

	relation to NGVD are provided.
High Coastal Risk Areas	
The Special Flood Hazard Area subject to coastal high hazard flooding; i.e. with velocity hazard (wave action). There are three types of V Zones: V, V#, and VE, and they correspond to the A Zone designations. Mandatory flood insurance purchase requirements apply to these zones (if owner federally backed mortgage).	
V (Unnumbered V Zone)	SFHA where no base flood elevation is provided.
V# (Numbered V Zone)	Numbered V Zones (V1-V30), SFHA where the FIRM shows the based flood elevation in relation to the NGVD.
VE	SFHA where base flood elevations are provided.
Moderate to Low Risk Areas	
Flood insurance is available to all property owners and renters in the zones below.	
B / X (shaded)	Area of moderate flood hazard, usually depicted on Flood Insurance Rate Maps as between the limits of the base and 500-year floods. B Zones are also used to designate base floodplains of little hazard, such as those with average depths of less than 1 foot. The areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood
C / X (unshaded)	Area of minimal flood hazard, usually depicted on Flood Insurance Rate Maps as above the 500-year flood level. B and C Zones may have flooding that does not meet the criteria to be mapped as a Special Flood Hazard Area, especially ponding and local drainage problems. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance (or 500-year) flood
Undetermined Risk Areas	
D	Area of undetermined but possible flood hazard

FEMA Flood Zone Determination

A map determination service is available from County staff. This service is based on a review of currently available Assessor's Parcel Maps and FEMA information, and only interprets the data. We determine if any portion of the parcel is in a flood zone. We can also review owner supplied materials to determine whether or not a structure is located in a SFHA. The County has no authority to change the flood zones as shown on the FIRM. Please contact Public Works Department or Permit Technician to inquire as to the suitability for your needs. There is a fee for a written office determination, and an additional fee for field visits.

You can also visit **FEMA Map Service Center** at <https://msc.fema.gov/portal/> to determine the flood zone designation of a property by entering a property address, a place, or longitude/latitude coordinates in the search box.



The Floodplain Permit and Certification Process

To satisfy the requirements of Chapter 82-28, Floodplain Management Ordinance, projects planned for construction within a SFHA must meet development and construction standards specifically designed to prevent or limit flood damage.

Tentative Maps must show floodplain boundaries and base flood elevation information when submitted.

Application submittals for subdivisions, development plans, land use permits and other entitlement changes within a floodplain must include the flood zone designation, base flood elevation and ground elevation on the maps or plans submitted. The Public Works Department staff will check the maps or plans for certification of flood zone and elevation by a registered civil engineer or licensed land surveyor. An architect may also certify flood zones and elevations, but the data used

must come from a survey done by a licensed surveyor or a registered civil engineer qualified to provide such services.

The Community Development Division staff at the Department of Conservation and Development will review building permit applications. If a property is determined to be in a SFHA, the applicant will be required to obtain a floodplain permit from the Public Works Department before Building Inspection can issue a building permit. If appropriate, the applicant will be required to complete the NFIP Elevation Certificate, which is a standard form available from FEMA; a link to this is available online on the County's Permit Portal page. This form must be completed by a licensed surveyor or a registered civil engineer qualified to provide such services and submitted to the Public Works Department to be accepted and approved before the builder may schedule a framing inspection from the Building Inspection.



Frequently Asked Questions

1. What is the National Flood Insurance Program (NFIP)?

The National Flood Insurance Program provides insurance and Federal assistance in the event of floods within the County.

The program is administered by the Federal Emergency Management Agency (FEMA). Such flood insurance coverage was generally unavailable from private sector insurance companies. In the absence of this program, the County's vulnerability to flood damage and loss could be substantial and a threat to the public health, safety and welfare.

Federal flood insurance is made available to residents when their local government agrees to implement and enforce measures to reduce flood risks to new or substantially improved construction in Special Flood Hazard Area (SFHA). When Contra Costa County joined the program, the County agreed to require floodplain permits for all development and substantial improvements to existing structures within SFHA of the unincorporated County, and to ensure that construction materials and methods will minimize flood damage. As a result, building permits must contain documentation to substantiate how buildings are actually constructed.

2. How does the National Flood Insurance Program benefit the community?

Through the National Flood Insurance Program (NFIP), property owners in Contra Costa County are able to insure against flood losses. Careful management of development in the floodplains results in construction practices that can reduce public and private flood losses. A major purpose of the program is to alert communities to the danger of flooding and to assist the community in reducing potential property losses.

3. How is flood risk determined?

Flood risk is determined by the use of all available information for each community. Historical flood data, rainfall and river-flow data, topography, wind velocity, tidal surge, flood control measures, development (existing and planned), community maps, and other data are all elements used in determining flood risk.

4. How does the County participate in the National Flood Insurance Program?

When the County joined the National Flood Insurance Program, it adopted and began to enforce minimum floodplain management standards. FEMA worked closely with the State and the County to identify flood hazard areas, flooding risks and to establish minimum floodplain management standards. The floodplain management standards are designed to prevent new development from increasing the flood threat and to protect new and existing buildings from anticipated flood events.

5. What is a Flood Insurance Rate Map (FIRM)?

Flood Insurance Rate Map is a map on which FEMA has delineated both the areas of special flood hazards and the risk premium zones applicable within the County.

6. How can a property owner determine if a property is in a Special Flood Hazard Area (SFHA)?

FEMA publishes maps known as the Flood Insurance Rate Maps (FIRMs) indicating the County's flood hazard areas and the degree of risk in those areas. FIRMs are available from **FEMA Map Service Center** at <https://msc.fema.gov/portal/>. Use FEMA Map Service Center to find official flood maps and other flood hazard products by entering a property address, a place, or longitude/latitude coordinates.

FIRMs are also available to view at the Application and Permit Center, 30 Muir Road, Martinez, California, 94553, and at the County Public Works Department, 255 Glacier Drive, Martinez, California, 94553.

Property owners may consult these maps to determine if their properties are located in SFHA. If a property owner wants the County to determine if a property is in a SFHA, the owner may contact the County at (925) 646-1623 or

Public Works Department, Engineering Services Division at (925) 313-2000. The important thing is whether or not an *insured structure* is in the SFHA -- not just the parcel of land. Staff will determine the structure's location in this written determination if a plot plan is provided. There is per parcel fee for a written floodplain determination based on County fee ordinance.

7. How is a Flood Insurance Rate Map changed?

Three procedures have been established for changing or correcting a flood map. The three are the following:

- A. LETTER OF MAP AMENDMENT (LOMA) is the result of an administrative procedure in which FEMA reviews scientific or technical data submitted by the owner or lessee of a property who believes the property has been incorrectly included in a designated Special Flood Hazard Area. A letter of map amendment amends the FIRM map and establishes that a property is not located in a Special Flood Hazard Area.

Although FEMA may issue a letter of map amendment, it is a lending institution's prerogative to require flood insurance as a condition of its own, beyond the provisions of the Flood Disaster Protection Act of 1973, before granting a loan or mortgage.

Those seeking a letter of map amendment should first talk with their lending institution to determine whether the institution will waive the requirement for flood insurance if a letter of map amendment is issued.

LOMAs will not be shown on updated FIRMs.

- B. LETTER OF MAP REVISION (LOMR) is a revision to the FIRM map. It is used to change flood zones, floodplain and floodway delineation, flood elevations, and planimetric features. Unlike map amendments, map revisions are the result of some physical improvement

affecting the floodplain (i.e. grading, flood control facilities, etc.) and will be shown on any new or updated FIRMs.

All requests for letters of map revision must be made to FEMA through the Floodplain Manager in the County's Public Works Department since it is the County that must adopt any changes and revisions to the map. An initial deposit is required when submitting to the County for review and requesting signature of the community acknowledgement section.

- C. PHYSICAL MAP REVISION is an official republication of a map to reflect changes to flood insurance zones, floodplain delineation, flood elevations, floodways, and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additions or deletions of flood hazard areas, or corrections of base flood elevations or flood insurance risk zones. The Floodplain Administrator submits data to FEMA to support the request for a map revision. The data is analyzed, and the map may be revised, if warranted. When base flood elevations are changed, a 90-day appeal period is provided, followed by a period for formal approval.

8. How long does it take to obtain a letter of map amendment, letter of map revision, or physical map revision?

For single building or single lot determinations that do not involve changes to base flood elevations or floodways, a letter of map amendment or letter of map revision can usually be issued by FEMA within four weeks. Letters of map amendment and letters of map revision involving multiple lots or multiple buildings usually require about

eight weeks for FEMA to process. Letters of map revision involving decreases in base flood elevations or floodways take approximately twelve weeks for FEMA processing. If changes in flooding conditions are extensive or if base flood elevations increase, a physical map revision will be required, which may take 12 months or longer.

9. What is a conditional map revision?

Communities, developers and property owners who undertake improvement projects intended to reduce the flood hazard in their communities usually want FEMA maps to reflect the effects of these projects. Similarly, property owners and developers who intend to place structures in the SFHA, 100-year floodplain, usually must demonstrate to lending institutions and local officials that these structures will be above the base flood elevation.

Those who are planning such actions are encouraged to submit design plans and other engineering data to FEMA for evaluation. The response to the requests will describe the change that may eventually be made to the flood map and is called a "conditional letter of map revision".

10. Why is the burden of proof on the person requesting the map change?

Government agencies and private engineering firms are contracted to perform analysis of flood risks and prepare flood maps for the County. The analysis and flood insurance study findings are then reviewed by FEMA and local agencies. FEMA will not change a study determination without sufficient evidence that such a change is appropriate.

11. How is elevation measured?

All elevations refer to Mean Sea Level (MSL). Historically,

the National Geodetic Vertical Datum of 1929 (NGVD29) was used. The current datum adopted by the Federal Government is the North American Vertical Datum of 1988 (NAVD88). FEMA is using NAVD88 on recently published FIRMs. Elevations shown on the drawings and on Elevation Certificates must be certified by a licensed surveyor, a registered Civil Engineer in California or a licensed architect. The basis of datum must be noted of the Elevation Certificate form.

12. What constitutes “substantial improvement” or “substantial damage” of a structure?

“Substantial improvement” means any reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either (1) Before the improvement or reconstruction is started; or (2), If the structure has been damaged, and is being restored, before the damage occurred. This term includes structures that have incurred “substantial damage” regardless of the actual repair work performed. “Substantial Improvement” is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either of the following:

- A. Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are the minimum necessary to assure safe living conditions; or
- B. Any alteration of a “Historic Structure.” (Ords. 90-118, 88-50, 87-45)

If staff and the permit applicant differ in opinion of the market value, the applicant may provide an appraisal by a licensed real estate appraiser.

Improvements are tracked and accumulated over 10-year period to determine if the substantial improvement level has been reached.

13. What are the floodplain requirements for mobile homes and manufactured homes?

Within an existing mobile home park, mobile homes must be anchored to prevent floatation. The lowest floor level must be a least 3 feet above the ground or pad level.

Outside the mobile home park or within a new mobile home park, mobile homes must be elevated and anchored above the 100-year flood level to satisfy freeboard requirements of the County's Floodplain Management Ordinance.

For example, all mobile homes (as well as new construction and substantial improvements) on Bethel Island must conform to the requirement of 9 feet elevation (above MSL) for the lowest floor. Therefore, temporary mobile homes (mobile homes that are not on a permanent foundation) are not allowed on Bethel Island.

14. When is an Elevation Certificate required?

If a development is in a SFHA, a completed Elevation Certificate (FEMA Form 086-0-33) signed by a licensed surveyor or an engineer licensed to perform surveying must be submitted to the Public Works Department Permit Technician before a building permit will be accepted as **final**.

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect authorized by state law to certify elevation information of the following:

- A. To verify that the lowest floor has been property constructed relative to the BFE;
- B. To insure compliance with the County's Floodplain

- Management Ordinance;
- C. To determine the proper flood insurance premium rate; and
 - D. To support a request for a map amendment or a map revision.

If a non-residential building is being flood proofed, then a Flood Proofing Certificate must be completed in addition to the Elevation Certificate.

15. What is the Community Rating System?

The Community Rating System (CRS) is a program that rewards residents that live in communities that have a Floodplain Management Program that exceeds the minimum FEMA standards. When the floodplain standards in a community exceed the minimum FEMA standards, the residents can receive a reduction in their Flood Insurance Premiums. Because of our floodplain management program, the Contra Costa County has a CRS Class 5 community rating. With a CRS Class 5 community rating residents receive a 25% reduction in their premiums.



Design Guide for Residential Construction in SFHAs

1. The flood level referred to is the base flood elevation (BEF or 100 year) as published on the Flood Insurance Rate Maps by the Federal emergency management Agency.
2. All new construction and substantial improvements to residential living areas, utility areas, storage areas or any enclosed area, including a basement, must be above the base flood elevation. Only garages, carports, approved storage areas and building access areas which are not subject to flood damage may be allowed below the base

flood elevation and must be clearly labeled as such on the drawings submitted for building permits.

3. Only construction materials (structural and non-structural) that are classified as a "flood-resistant material" may be used below the base flood elevation (BFE). Acceptable materials are specified in "Technical Bulletins" and/or as approved by the Floodplain Administrator. In general, wood products such as studs, posts, plywood, siding, doors, and trim must be pressure-treated, redwood, or cedar. Gypsum board and plaster products (such as stucco) are not flood-resistant and are not allowed below the BFE except in certain instances (see item VI below.)

Enclosed stud spaces or cavities in which flood water could collect are not allowed below the BFE (except as used in Item VI below), and all building components must be designed to be rinsed clean of sediment after a flood."

4. Assemblies other than wood stud frame, such as pole buildings, may be submitted for preliminary review prior to application for plan check. Conformance with flood regulations may be discussed before design review time is expended.
5. All construction must be designed for all vertical and lateral loads. When a building site is subject to flowing water, the structure must be designed to resist those forces. The Floodplain Administrator will determine if moving water design or still water design is applicable to each building at each site.
6. Fire protection of a building (or a portion of a building) is required by the Building Code (currently the 1997 Uniform Building Code, or UBC) under two conditions. The first is an "occupancy separation" which provides for protection between differing occupancy uses within a building, and is covered in UBC Section 302.4. The second is when a

building or structure is constructed in close proximity to a property line, and is covered under Section 503.2.1.

A. Floor-Ceiling Construction:

When an occupancy separation is required, such as between a garage or carport and the residential living space above, the floor-ceiling assembly between must have a one- hour fire rating, as designated by UBC Chapter 7, and be constructed with flood-resistant elements below the base flood elevation.

B. Wall Construction:

The walls, beams, and posts which support a one- hour fire rated floor-ceiling assembly must also be one- hour fire rated, as required by UBC Section 302.2, or may be of heavy-timber construction as defined in UBC Section 605.6. Heavy-timber construction consists of 8 x 8 posts and/or 6 x 10 beams (minimum sizes.)

When the exterior walls of a building are located near the property line (less than 3 feet no inches for residential construction), it is also required that they be of one-hour fire resistant construction from UBC Section 503.2.1.

In either case, it is preferred that the vertical members be constructed of masonry or concrete which are both fire-resistant and flood-resistant materials. The Floodplain Ordinance, however, does allow these members to be of pressure treated wood or steel framing with fire protection elements of these assemblies (gypsum board, stucco, etc.) of non-flood-resistant materials, when specifically allowed and/or required by the Building Inspection Department.

Otherwise, all construction materials located below the BFE must be flood-resistant as defined in FEMA

Technical Bulletin (2-93) and/or as approved by the Floodplain Administrator.

7. Electrical Limitations:

PG&E must approve the location of all electrical meters. Both electrical meter sockets and load centers must have 30-inch wide, 36-inch deep working clearances. If located on an exterior platform, the platform must conform to the Uniform Building Code. If the load center is located inside the building it may not be located in a closet used to store combustible materials.

All electrical equipment must be located above the base flood elevation. "Electrical equipment" includes electrical load centers, sub-panels, circuit breakers, and ground fault interrupting devices, motors, etc.

Electrical branch circuits may extend below the base flood elevation only if protected by a ground fault interrupting device located above the base flood elevation. Since no enclosed stud spaces may be approved below the flood elevation, protection of electrical conductors must usually be done with approved conduit.

An electrical meter socket may be located below the base flood elevation. If this option is chosen, PG&E will require a main disconnect located within four feet of the meter. A main disconnect located below the base flood elevation may not be a circuit breaker. The remaining components must be located above the base flood elevation.

8. Storage Limitations:

In general, all enclosed storage rooms and areas must be located above the base flood elevation. Enclosed storage or gar- ages which may be permitted below the base flood elevation are those that are incidental and accessory to the principal use of the structure and used only to store

damage resistant items that cannot be stored above the base flood elevation. For instance, if the structure is a residence, the storage in the enclosure below should be limited to items such as lawn and garden equipment, snow tires, canoes, and other low damage items that cannot be stored in the elevated portion of the structure. If an item may be stored outdoors during bad weather or immersed under water without damage, it might be acceptable to store it in an enclosed area below the base flood elevation. The occupant should note that no flood insurance coverage is available for these items under most circumstances.

Plans submitted to the County for plan check must include the following statement limiting the use of storage space or garages located below the base flood elevation:

Use of enclosed storage areas or garages below the Base Flood Elevation must meet all the following limitations:

- A. Use of this storage area must be incidental and accessory to the principal use of the structure, and
- B. Storage is limited to damage resistant items only, and
- C. Storage is limited to items that cannot be stored above the base flood elevation."

9. Plumbing and Mechanical Limitations:

All heating, ventilation, plumbing and air conditioning equipment must be designed and located so as to prevent water from entering or accumulating within the components during conditions of flooding. Without a special design authorized by the Building Inspection Department, mechanical equipment and plumbing fixtures shall be located above the BFE.

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For questions about the Floodplain Management Program, contact Public Works Engineering Services Division, Land Development Section.

For information on applying for a Floodplain Permit, contact the Public Works Department Permit Technician or Engineering Services Division.

Contra Costa County Public Works Department
255 Glacier Drive
Martinez, CA 94553
(925) 313-2000

Contra Costa County Application and Permit Center
Contra Costa County Public Works Department
30 Muir Road
Martinez, CA 94553
(925) 674-7200

Jocelyn A. Bolibol LaRocque, Senior Civil Engineer (Floodplain Manager)	(925) 313-2315
Randolf Sanders, Associate Civil Engineer	(925) 313-2111
Robert B. Hendry III, Permit Technician	(925) 674-7744
Floodplain Determination Program	(925) 646-1623
Engineering Services Division	(925) 313-2170

For information regarding flood insurance, please call the National Flood Insurance Program Help Center at (800) 427-4661 or visit their website at www.floodsmart.gov.

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Below are some frequently used acronyms that is used in this document.

BFE	Base Flood Elevation
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
NFIP	National Flood Insurance Program
SFHA	Special Flood Hazard Area (A Zones and V Zones)