

SECTION 19

R E S I D E N T I A L C O N S T R U C T I O N I N F L O O D Z O N E S

The purpose of the following information and documents are to clarify procedures used by the Sonoma County Permit & Resource Management Department to enforce provisions of Sonoma County Code Chapter 7B, Flood Damage Prevention.

These procedures have been in place since January, 1982, when the department first received flood insurance rate maps, floodway maps and the attendant certification requirements. Procedures have remained primarily unchanged to present, however, policy and documents have evolved to reflect known legal interpretations and clarifications necessary to more effectively apply ordinance provisions.

The documents provided in this appendix are samples of current usage and are not intended to reflect the evolution of changes.

If you have questions, contact the PRMD at (707) 565-1900.

GLOSSARY OF TERMS USED IN THIS SECTION

Base Flood Elevation (BFE) - The flood elevation having a one-percent chance of being equaled or exceeded in any given year. The BFE is determined by statistical analysis for each local area and designated on the Flood Insurance Rate Maps.

Flood Insurance Rate Maps (FIRM) - The official map of a community issued by FEMA, that shows the Base Flood Elevation (BFE), along with the Special Flood Hazard Areas (SFHA) and the risk premium zones applicable to the community.

Flood Vents - A system designed to allow floodwaters to enter an enclosure, usually the foundation walls, so that the rising water does not create a dangerous differential in hydrostatic pressure.

Floodway - The central portion of the floodplain that carries the greatest portion of the waterflow in a flood. Obstructions in the floodway will result in increased flood levels upstream.

Lowest Floor - The lowest floor of the lowest enclosed area, including basements; however, an un-finished or flood-resistant enclosure used solely for parking, building access, or storage shall not be considered the lowest floor.

National Flood Insurance Program (NFIP) - The federal program created by an act of Congress in 1968 that makes flood insurance available in communities that enact satisfactory floodplain management regulations.

RESIDENTIAL CONSTRUCTION IN FLOODZONES

1. Adopted Flood Map & Floodplain Management Regulations

Floodplain management regulations are contained in Chapter 7B of the Sonoma County Code. These regulations were enacted when Sonoma County voluntarily elected to participate in the National Flood Insurance Program. This program allows reasonably priced flood insurance to be offered. The flood level referred to is the Base Flood Elevation (BFE), as published on the Flood Insurance Rate Maps (FIRM) by the Federal Emergency Management Agency (FEMA).

2. Application

The lowest floor for all new construction and substantial improvements of residential living areas, utility areas, or any enclosed area including basement must be at least one foot above the BFE. Only non-habitable spaces such as garages, carports and building access areas **that 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. Flood Resistant Materials

All building materials and assemblies located below the BFE must be resistant to flood damage. Materials that are approved for use below the base flood elevation include masonry, concrete, pressure treated heavy timber, pressure treated wood or some combination. Connectors and fasteners in contact with pressure treated wood products must be either hot-dipped galvanized or stainless steel. No enclosed stud spaces or cavities will be approved below the base flood elevation. All building components below the BFE must be designed to be rinsed clean of sediment after a flood. Similarly, joist spaces enclosed by plywood or sheetrock on top and bottom will not be approved. FEMA Technical Bulletins 1-93, 2-93, 5-93, 8-96 and 11-01 (available on the FEMA website) provide additional information on the acceptability of various materials and construction methods used below the BFE.

4. Assemblies

Assemblies, other than wood stud frame, such as pole buildings, may be brought to PRMD for preliminary plan check review prior to an application for a building permit being submitted. Conformance with flood regulations may be discussed before design time is expended on concepts that may not be approved. In general braced post and beam construction, with no enclosed stud space, is an acceptable type of construction.

New dwellings, located in the State Responsibility Area (SRA), must maintain the ignition-resistant integrity of the exterior walls, on the underside of the floors, or the entire underfloor area shall be enclosed to grade.

Where enclosed space occurs below the BFE, openings are required to allow for automatic entry and exit of floodwaters. These openings are also referred to as flood vents and shall meet the following minimum requirements:

- a. A minimum of two openings on different sides of each enclosed area. If a structure has more than one enclosed area below the BFE, each area shall have openings on exterior walls.
- b. The total net area of all openings shall be at least one square inch for each square foot of enclosed area.
- c. The bottom of each opening shall be no more than one foot above the adjacent ground level.

- d. Openings shall not be less than three inches in diameter.
- e. Louvers, screens, or other opening covers shall not block or impede the automatic flow of floodwaters into and out of the enclosed areas.
- f. Openings meeting the requirements of a through e above may be installed in doors and windows. Doors and windows by themselves do not meet the flood venting requirements.

5. Design Loads

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.

Structures located in Special Flood Hazard zones, where the water velocity exceeds 5 feet per second, must be designed to resist the hydrodynamic force of moving water. PRMD will use the FIRM to determine if moving water design is required for a building site.

Most people assume that the velocity in the fringe is lower than the velocity in the floodway; however, this may not always be correct. We recommend that you design for Floodway Velocity. Please refer to FEMA technical literature on "Design for Hydrodynamic Forces."

6. Fire-Resistance Construction Required by the California Building Code (CBC)

A common residential design for the Sonoma County flood zone is a garage or carport located below the BFE that supports living space located above the base flood elevation.

Fire-resistant construction is required by CBC between R-3 and U occupancies. Floor-ceiling construction must use 5/8" Type "X" sheetrock on the ceiling of the garage, if there's a living space above the garage. The *entire* assembly must be above the base flood elevation. The use of moisture resistant 5/8" Type "X" sheetrock for fire-resistant construction located below the BFE will *not* be approved.

Please also review the discussion of the reference level on the attached "Elevation Certificate Procedure".

7. Electrical Limitations

PG&E must approve the location of all electrical meter locations. Both electrical meter sockets and load centers must have 30 inch wide and 36 inch deep working clearances. If located on an exterior platform, this platform must be safe and conform to the current version of the California Building Code. If the load center is located inside the building it may not be located in a closet used to store combustible materials and must conform to the current version of the National Electrical Code in every respect.

All electrical equipment must be located above the BFE. "Electrical equipment" includes electrical load centers, subpanels, circuit breakers, ground fault interrupting devices, motors, etc. Therefore, load centers with circuit breakers must be located above the BFE.

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

An electrical meter socket may be located below the BFE. 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 BFE may not be a circuit breaker. The remaining components of the service equipment must be located above the BFE.

8. Plumbing & Mechanical Limitations

All plumbing and mechanical equipment must be located above the BFE. "Plumbing and mechanical equipment" includes all heaters, furnaces, air conditioners, compressors, fans, water heaters, laundry facilities, plumbing fixtures, etc. Toilets and therefore toilet rooms are also prohibited below the BFE.

9. Limitations on Storage

In general the lowest floor of all enclosed storage rooms and areas must be located one foot above the BFE. The enclosed storage or parking space that may be permitted below the BFE is only that which is incidental and accessory to the principal use of the structure and used only to store damage resistant items that can not be stored above the base flood elevation. For instance, if the structure is a residence, storage in the enclosure 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. The term "low damage items" is a good test of acceptability. 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 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 & 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 can not be stored above the base flood elevation.

10. Floodways

Located within the SFHA are areas designated as floodways. Since the floodways are extremely hazardous due to the velocity of flood waters that carry debris, potential projectiles, and erosion potential, building and grading permits are extremely restricted. New construction is not allowed within a floodway, however elevation of existing structures is allowed when design provisions for moving water are provided. Please contact PRMD for additional information.

11. Other Information

Information on flood insurance is available from the NFIP by phone or on their Internet site. (<http://www.fema.gov/business/nfip/>). Elevation Certificates (FEMA form 81-31) can be obtained online at <http://www.fema.gov/pdf/nfip/elvcert.pdf>

Technical questions about flood regulations may be answered by FEMA, Region IX.

A library of books on flood hazard and flood regulation is available at the Guerneville Public Library and at the Sonoma County Permit and Resource Management Department.

ELEVATION CERTIFICATE PROCEDURE

1. Site Review & Notice to Applicant:

When an application for the construction of a building or a manufactured home (mobile home) installation is received by PRMD, a site evaluation is made to identify any known hazard. If the building site is within the SFHA as shown on the FIRM, an Elevation Certificate (FEMA Form 81-31) will be required. After the site evaluation, the applicant will be notified of this requirement.

2. Site Plan & Survey Information:

The applicant must retain a registered civil engineer or licensed surveyor to determine the actual reference elevation of the site where the building is proposed. A benchmark indicating the elevation above the North American Vertical Datum 1988 (NAVD) must be placed at the site for use during construction. The elevation of the benchmark and the building pad must be determined by running a survey line using a closed loop level circuit from an established and approved benchmark.

Before the building plans can be approved and a permit issued, the site plan submitted must include the following information:

- a. The location and elevation of the benchmark.
- b. The elevation of the building pad.
- c. The proposed elevation of the "lowest floor" or the reference level.
- d. The wet signature, date, and license or registration number of the surveyor or civil engineer.

Sections must also be submitted before the plans can be approved. These sections must indicate:

- e. The location of the BFE as read from the most recently adopted FIRM.
- f. The reference level elevation. This is the top of the lowest floor of a building that is not flood resistant. In most cases this is the lowest finish floor of the building. (A common design includes a garage floor below the BFE, garage walls made of flood resistant materials such as heavy timber or concrete or masonry, a one-hour rated sheetrock ceiling in the garage, and the habitable space located above the garage.) The reference level may have to be defined with notes as well as indicated graphically on the sections. **In all cases the reference level must be at least one foot above the base flood elevation.**
- g. All plumbing, electrical, and mechanical equipment must be shown on the plans and installed above the BFE.

3. Verification of Floor or Reference Level Elevation:

After the building permit is issued, the builder uses the benchmark on site to construct the building floor or reference level to the correct elevation. When the floor framing is complete, the surveyor or engineer must survey the floor or reference level and complete their sections of the FEMA Elevation Certificate. Section B will already have been completed by PRMD staff. If the reference level is not the lowest floor, this should be noted or explained on the plans or Elevation Certificate or both. The partially completed Elevation Certificate shall be available on-site for the Inspector's review at the time of the close-in inspection. The fully completed Elevation Certificate shall be provided to the Inspector at the time of the final inspection. This **must** be done before occupancy of the building.

IMPROVEMENTS/REPAIRS TO BUILDINGS IN FLOOD HAZARD AREAS

Sonoma County Code Chapter 7B sets forth flood protection regulations applicable to development in flood areas. These regulations were adopted pursuant to the NFIP. Consequently, flood insurance is available to property owners throughout the County.

This section is intended to acquaint property owners with the specific code regulations that relate to additions, remodeling and repairs to existing buildings located in flood hazard areas.

The complete text of the Sonoma County Code is available at:

<http://library.municode.com/HTML/16331/book.html>

PRMD policy 1-4-4 (available on the PRMD website) contains a summary of requirements and the procedure for computing percentage of improvements. An example of the form used by PRMD to check calculations (CNI-003) is available on the PRMD website.