



# FEMA

## REGION X FLOOD DAMAGE PREVENTION ORDINANCE WASHINGTON MODEL (REVISED 5/13/2004)

Close to 300 towns, cities, counties, and tribes within the State of Washington participate in the National Flood Insurance Program (NFIP). As a condition of participation in the NFIP, communities are required to adopt and enforce a flood hazard reduction ordinance that meets the minimum requirements of the NFIP; however, there are occasionally additional requirements identified by State law that are more restrictive. In these cases, FEMA will require that communities meet those standards as well.

Although there is no specific prescribed ordinance that can be adopted across the country that meets all requirements for floodplain development, this model identifies the basic requirements, and cross references them to appropriate Federal CFR or State WAC citations (RCW 86.16 WA Floodplain Management law). It also encourages Community Officials to consider the direct insurance implications of certain building standards that, if adopted, can reduce (or increase) annual flood insurance premiums for local citizens. This ordinance, as developed by FEMA and the WA Department of Ecology, supercedes previous versions and includes all the minimum standards required as a condition of participation in the NFIP. It will be used by FEMA and State staff as the basis for providing technical assistance and compliance reviews during the Community Assistance Contact (CAC) and Community Assistance Visit (CAV) process to ensure that federal and state law are met.

The model identifies the basic minimum federal regulation requirements that must be contained in a local flood ordinance as well as suggestions for stronger measures, but notes that these measures are *recommended*, not required. Additionally, it outlines several specific floodplain development practices and regulations that can reduce insurance premiums (highlighted). Adopting this model flood hazard reduction ordinance verbatim can ensure compliance with FEMA; however, *it should be emphasized that its adoption is not a mandatory requirement per NFIP regulation*. Some sections of this document are included for clarity and are not required by federal or state law. For instance, as indicated in SECTION 1: STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE AND OBJECTIVES, it is not mandatory to adopt this entire section, but by doing so, it will make your ordinance more legally enforceable.

This document can also serve as a foundation upon which communities can craft their own additional measures. The ordinance can be modified to accommodate local standards, provided they are not less restrictive than the minimum standards identified on this model. Areas on the model that exceed those minimum standards are clearly marked. The model ordinance is in a modular format. The basic model is available separately, and the following attachments can be provided if they fit a community's status, or if they are requested:

**APPENDIX A:** ORDINANCE STANDARDS FOR COMMUNITIES WITH SHALLOW FLOODING IDENTIFIED AS AN AO ZONES ON FLOOD INSURANCE RATE MAPS (FIRM)

**APPENDIX B:** ORDINANCE STANDARDS FOR COMMUNITIES WITH COASTAL FLOODING IDENTIFIED AS A V ZONE AND AN ORDINANCE COMPLIANT WITH 44 CFR 60.3(E)

**APPENDIX C:** FLOOD HAZARD PREVENTION AND FISH HABITAT PROTECTION ORDINANCE (*Not yet complete*)

**APPENDIX D:** OTHER HIGHER REGULATORY STANDARDS (*Not yet complete*)

If you have any questions concerning this ordinance or participation in the NFIP, please contact the Department of Homeland Security, Federal Emergency Management Agency (FEMA) at our Regional Office at (425) 487-4678.

**SECTION 1.0 - STATUTORY AUTHORIZATION, FINDINGS OF FACT,  
PURPOSE, AND OBJECTIVES** *(Not mandatory to adopt section 1.0)*

**1.1 STATUTORY AUTHORIZATION**

The Legislature of the State of Washington has delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the \_\_\_\_\_ of \_\_\_\_\_, does ordain as follows:

**1.2 FINDINGS OF FACT**

- 1) The flood hazard areas of \_\_\_\_\_ are subject to periodic inundation which results in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
- 2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to the flood loss.

**1.3 STATEMENT OF PURPOSE**

It is the purpose of this ordinance to promote the public health, safety, and general welfare; reduce the annual cost of flood insurance; and minimize public and private losses due to flood conditions in specific areas by provisions designed:

- 1) To protect human life and health;
- 2) To minimize expenditure of public money and costly flood control projects;
- 3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- 4) To minimize prolonged business interruptions;
- 5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;
- 6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- 7) To ensure that potential buyers are notified that property is in an area of special flood hazard;
- 8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

**1.4 METHODS OF REDUCING FLOOD LOSSES**

In order to accomplish its purposes, this ordinance includes methods and provisions for:

- 1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
- 2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- 3) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- 4) Controlling filling, grading, dredging, and other development which may increase flood

- damage; and
- 5) Preventing or regulating the construction of flood barriers that unnaturally divert floodwaters or may increase flood hazards in other areas.

## **SECTION 2.0 – DEFINITIONS** (44 CFR 59.1, not mandatory to adopt all definitions as shown)

*Terms with 1 asterisk trigger a specific building requirement and must be adopted. Terms with 2 asterisks are directly related to insurance and are not mandatory to adopt. Unless specifically defined below, terms or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application.*

**APPEAL:** a request for a review of the interpretation of any provision of this ordinance or a request for a variance.

**AREA OF SHALLOW FLOODING:** designated as AO, or AH Zone on the Flood Insurance Rate Map (FIRM). AO zones have base flood depths that range from one to three feet above the natural ground; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow; AH indicates ponding, and is shown with standard base flood elevations.

**AREA OF SPECIAL FLOOD HAZARD:** is the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. Designation on maps always includes the letters A or V.

**BASE FLOOD:** the flood having a 1% chance of being equaled or exceeded in any given year (also referred to as the “100-year flood”). Designated on Flood Insurance Rate Maps by the letters A or V.

\* **BASEMENT:** means any area of the building having its floor sub-grade (below ground level) on all sides.

**BREAKAWAY WALL:** means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

**COASTAL HIGH HAZARD AREA:** means an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The area is designated on the FIRM as Zone V1-30, VE or V.

**CRITICAL FACILITY:** means a facility for which even a slight chance of flooding might be too great. Critical facilities include (but are not limited to) schools, nursing homes, hospitals, police, fire and emergency response installations, and installations which produce, use, or store hazardous materials or hazardous waste.

\* **DEVELOPMENT:** means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within the area of special flood hazard.

\*\* **ELEVATION CERTIFICATE:** means the official form (FEMA Form 81-31) used to track development, provide elevation information necessary to ensure compliance with community floodplain management ordinances, and determine the proper insurance premium rate with Section B completed by Community Officials.

**ELEVATED BUILDING:** means for insurance purposes, a non-basement building that has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

**EXISTING MANUFACTURED HOME PARK OR SUBDIVISION:** means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the adopted floodplain management regulations.

**EXPANSION TO AN EXISTING MANUFACTURED HOME PARK OR SUBDIVISION:** means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

**FLOOD or FLOODING:** means a general and temporary condition of partial or complete inundation of normally dry land areas from:

- 1) The overflow of inland or tidal waters and/or
- 2) The unusual and rapid accumulation of runoff of surface waters from any source.

**FLOOD INSURANCE RATE MAP (FIRM):** means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

**FLOOD INSURANCE STUDY (FIS):** means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Insurance Rate Maps, and the water surface elevation of the base flood.

**FLOODWAY:** means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

**\* LOWEST FLOOR:** means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance found at Section 5.2-1(2), (i.e. provided there are adequate flood ventilation openings).

**MANUFACTURED HOME:** means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

**MANUFACTURED HOME PARK OR SUBDIVISION:** means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

**NEW CONSTRUCTION:** means structures for which the "start of construction" commenced on or after the effective date of this ordinance.

**NEW MANUFACTURED HOME PARK OR SUBDIVISION:** means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of adopted floodplain management regulations.

**RECREATIONAL VEHICLE:** means a vehicle,

- 1) Built on a single chassis;
- 2) 400 square feet or less when measured at the largest horizontal projection;
- 3) Designed to be self-propelled or permanently towable by a light duty truck; and
- 4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

**START OF CONSTRUCTION:** includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent

construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

**STRUCTURE:** a walled and roofed building, including a gas or liquid storage tank that is principally above ground.

\* **SUBSTANTIAL DAMAGE:** means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

\* **SUBSTANTIAL IMPROVEMENT:** means any repair, 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 repair is started; or
- 2) If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition “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 can exclude:

- 1) Any project for improvement of a structure to correct pre-cited existing violations of state or local health, sanitary, or safety code specifications which have been previously identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or
- 2) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

**VARIANCE:** means a grant of relief from the requirements of this ordinance that permits construction in a manner that would otherwise be prohibited by this ordinance.

**WATER DEPENDENT:** means a structure for commerce or industry that cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

## **SECTION 3.0 – GENERAL PROVISIONS** *(Mandatory adoption requirements are listed per sub-section)*

### **3.1 LANDS TO WHICH THIS ORDINANCE APPLIES** *(44 CFR 59.22(a))*

This ordinance shall apply to all areas of special flood hazards within the jurisdiction of \_\_\_\_\_.

### **3.2 BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD** *(44 FR60.3(c)(1)(d)(2))*

The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled “The Flood Insurance Study for (\_\_\_\_community name\_\_\_\_) “ dated (\_\_\_\_), (20\_\_\_\_), and any revisions thereto\*, with an accompanying Flood Insurance Rate Map (FIRM), and any revisions thereto\*, are hereby adopted by reference and declared to be a part of this ordinance. The Flood Insurance Study and the FIRM are on file at (\_\_\_\_community address\_\_\_\_). The best available information for flood hazard area identification as outlined in Section 4.3-2 shall be the basis for regulation until a new FIRM is issued that incorporates data utilized under Section 4.3-2.

\* *In some communities, the phrase “and any revisions thereto” is not considered legally binding and should not be adopted.*

**3.3 PENALTIES FOR NONCOMPLIANCE** *(Not mandatory)*

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this ordinance and other applicable regulations. Violations of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions), shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall upon conviction thereof be fined not more than \_\_\_\_\_ or imprisoned for not more than \_\_ days, or both, for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the \_\_\_\_\_ from taking such other lawful action as is necessary to prevent or remedy any violation.

**3.4 ABROGATION AND GREATER RESTRICTIONS** *(Not mandatory)*

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

**3.5 INTERPRETATION** *(Not mandatory)*

In the interpretation and application of this ordinance, all provisions shall be:

- 1) Considered as minimum requirements;
- 2) Liberally construed in favor of the governing body; and,
- 3) Deemed neither to limit nor repeal any other powers granted under State statutes.

**3.6 WARNING AND DISCLAIMER OF LIABILITY** *(Not mandatory)*

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of \_\_\_\_\_, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

**SECTION 4.0 – ADMINISTRATION**

**4.1 ESTABLISHMENT OF DEVELOPMENT PERMIT**

**4.1-1 DEVELOPMENT PERMIT REQUIRED** *(44 CFR 60.3(b)(1))*

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 3.2. The permit shall be for all structures including manufactured homes, as set forth in the “Definitions,” and for all development including fill and other activities, also as set forth in the “Definitions.”

**4.1-2 APPLICATION FOR DEVELOPMENT PERMIT** *(Not Mandatory; however example permits are available from FEMA/DOE for review or use)*

Application for a development permit shall be made on forms furnished by the \_\_\_\_\_ and may include, but not be limited to, plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following

information is required:

- 1) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures recorded on a current elevation certificate (FF 81-31) with Section B completed by the local official.
- 2) Elevation in relation to mean sea level to which any structure has been floodproofed;
- 3) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet floodproofing criteria in Section 5.2-2;
- 4) Description of the extent to which a watercourse will be altered or relocated as a result of proposed development.

#### **4.2 DESIGNATION OF THE LOCAL ADMINISTRATOR** (44 CFR 59.22(b)(1))

(Local Administrator) is hereby appointed to administer and implement this ordinance by granting or denying development permit applications in accordance with its provisions.

#### **4.3 DUTIES & RESPONSIBILITIES OF THE LOCAL ADMINISTRATOR** (Not mandatory)

Duties of the (Local Administrator) shall include, but not be limited to:

##### **4.3-1 PERMIT REVIEW**

- 1) Review all development permits to determine that the permit requirements of this ordinance have been satisfied. (Not mandatory)
- 2) Review all development permits to determine that all necessary permits have been obtained from those Federal, State, or local governmental agencies from which prior approval is required. (44 CFR 60.3(a)(2))
- 3) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of Section 5.4(1) are met. (Not mandatory, but essential to enforce Washington's floodway law.)

##### **4.3-2 USE OF OTHER BASE FLOOD DATA (IN A AND V ZONES)** (44 CFR 60.3(b)(4))

When base flood elevation data has not been provided (in A or V Zones) in accordance with Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD, the (Local Administrator) shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, in order to administer Sections 5.2, SPECIFIC STANDARDS, and 5.4 FLOODWAYS.

##### **4.3-3 INFORMATION TO BE OBTAINED AND MAINTAINED** (The following language is required and should be adopted verbatim per 44 CFR)

- 1) Where base flood elevation data is provided through the Flood Insurance Study, FIRM, or required as in Section 4.3-2, obtain and record the actual (as-built) elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement. (44 CFR 60.3(b)(5)(i)) Recorded on a current elevation certificate (FF 81-31) with Section B completed by the local official.
- 2) For all new or substantially improved floodproofed nonresidential structures where base flood elevation data is provided through the FIS, FIRM, or as required in Section 4.3-2:
  - i) Obtain and record the elevation (in relation to mean sea level) to which the structure was floodproofed (44 CFR 60.3(b)(5)(ii))
  - ii) Maintain the floodproofing certifications required in Section 4.1-2(3) (44 CFR

60.3(b)(5)(iii))

- 3) Maintain for public inspection all records pertaining to the provisions of this ordinance. (44 CFR 60.3(b)(5)(iii))

**4.3-4 ALTERATION OF WATERCOURSES** (44 CFR 60.3(b)(6))

- 1) Notify adjacent communities and the Department of Ecology prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.
- 2) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

**4.3-5 INTERPRETATION OF FIRM BOUNDARIES** (This section is not required, but if the Local Administrators are performing this task on a regular basis, it should be adopted.)

Make interpretations where needed, as to exact location of the boundaries of the areas of special flood hazards (e.g. where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation. Such appeals shall be granted consistent with the standards of Section 60.6 of the Rules and Regulations of the National Flood Insurance Program (44 CFR 59-76).

**4.4 CONDITIONS FOR VARIANCES** (Excerpts summarized from 44 CFR 60.6(a)(1-7)

Communities are encouraged to adopt standards equal to or more restrictive than 44 CFR 60.6(a)(1-7) or use existing codes that meet or exceed these standards. FEMA may review a community's findings justifying the granting of variances, and if that review indicates a pattern inconsistent with the objectives of sound floodplain management, FEMA may take appropriate action under 44 CFR 59.24(b).

- 1) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a small or irregularly shaped lot contiguous to and surrounded by lots with existing structures constructed below the base flood level. As the lot size increases the technical justification required for issuing the variance increases.
- 2) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.
- 3) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- 4) Variances shall only be issued upon:
  - i) A showing of good and sufficient cause;
  - ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
  - iii) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
- 5) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from flood elevations should be quite rare.



- 6) Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except 4.4(1), and otherwise complies with Sections 5.1-1, 5.1-3, and 5.1-4 of the GENERAL STANDARDS.
- 7) Any applicant to whom a variance is granted shall be given written notice that the permitted structure will be built with its lowest floor below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk.

## **SECTION 5.0 – PROVISIONS FOR FLOOD HAZARD REDUCTION**

### **5.1 GENERAL STANDARDS** *(Section 5.0 is required)*

In all areas of special flood hazards, the following standards are required:

#### **5.1-1 ANCHORING** *(44 CFR 60.3(a)(b))*

- 1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure. *(44 CFR 60.3(a)(3)(i))*
- 2) All manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors. *(44 CFR 60.3(b)(8)). For more detailed information, refer to guidebook, FEMA-85, "Manufactured Home Installation in Flood Hazard Areas."*

#### **5.1-2 CONSTRUCTION MATERIALS AND METHODS** *(44 CFR 60.3(a)(3)(ii-iv))*

- 1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
- 2) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
- 3) Electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

#### **5.1-3 UTILITIES** *(44 CFR 60.3(a)(5)(6))*

- 1) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems;
- 2) Water wells shall be located on high ground that is not in the floodway\*
- 3) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters;
- 4) Onsite waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

*\* FEMA endorses the more restrictive WA floodway standard identified in WAC 173-160-171*

#### **5.1-4 SUBDIVISION PROPOSALS** *(44 CFR 60.3(a)(4)(b)(3))*

- 1) All subdivision proposals shall be consistent with the need to minimize flood damage;
- 2) All subdivision proposals shall have public utilities and facilities, such as sewer, gas,

- electrical, and water systems located and constructed to minimize or eliminate flood damage;
- 3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage;
  - 4) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or 5 acres (whichever is less).

#### **5.1-5 REVIEW OF BUILDING PERMITS** (44 CFR 60.3(a)(3))

Where elevation data is not available either through the Flood Insurance Study, FIRM, or from another authoritative source (Section 4.3-2), applications for building permits shall be reviewed to assure that proposed construction will be *reasonably safe from flooding*. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. **Failure to elevate at least two feet above the highest adjacent grade in these zones may result in higher insurance rates.**

#### **5.2 SPECIFIC STANDARDS** (44 CFR 60.3(c)(1))

In all areas of special flood hazards where base flood elevation data has been provided as set forth in Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD, or Section 4.3-2, USE OF OTHER BASE FLOOD DATA. **Additional standards were clarified in FEMA Technical Bulletin 11-01 to allow below-grade crawlspace construction for buildings located in the special flood hazard areas. However, the standards in 11-01 must be specifically adopted, and adopting them can result in a 20% increase in flood insurance premiums.** The following provisions are required:

#### **5.2-1 RESIDENTIAL CONSTRUCTION** (44 CFR 60.3(c)(2)(5))

- 1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot or more\* above the base flood elevation (BFE).

**\* Minimum FEMA standards require the lowest floor to be elevated "to or above" the BFE; however, adding an additional foot of freeboard increases safety and can reduce insurance premiums by as much as 30%. Adopting additional freeboard is strongly encouraged by FEMA. This note applies throughout the model ordinance.**

- 2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
  - i) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
  - ii) The bottom of all openings shall be no higher than one foot above grade.
  - iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

**Foundation vent standards required by the IBC/IRC outside the floodplain do not meet this standard and are often inadvertently permitted. Insurance rates reflect an "all or nothing" standard, meaning, partially ventilated crawlspaces may be subject to an additional loading fee of 20-25% attached to the annual insurance premium.**

#### **5.2-2 NONRESIDENTIAL CONSTRUCTION** (44 CFR 60.3(c)(3)(4))

New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated one foot or more\* above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

- 1) Be floodproofed so that below one foot or more above the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
- 2) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
- 3) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in Section 4.3-3(2);
- 4) Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 5.2-1(2);

\* *Applicants who are floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to the base flood level will be rated as one foot below). Floodproofing the building an additional foot will reduce insurance premiums significantly.*

### **5.2-3 MANUFACTURED HOMES** (44 CFR 60.3(c)(6)(12))

- 1) All manufactured homes in the floodplain to be placed or substantially improved on sites shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated one foot or more above\* the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.

### **5.2-4 RECREATIONAL VEHICLES** (44 CFR 60.3(c)(14))

Recreational vehicles placed on sites are required to either:

- 1) Be on the site for fewer than 180 consecutive days, (*or*)
- 2) Be fully licensed and ready for highway use, on wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or
- 3) Meet the requirements of 5.2-3 above and the elevation and anchoring requirements for manufactured homes.

### **5.3 AE AND A1-30 ZONES WITH BASE FLOOD ELEVATIONS BUT NO FLOODWAYS**

(44 CFR 60.3(c)(10))

In areas with base flood elevations (but a regulatory floodway has not been designated), no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

### **5.4 FLOODWAYS** (Note the more restrictive language for floodway development per RCW 86.16)

Located within areas of special flood hazard established in Section 3.2 are areas designated as

floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters that can carry debris, and increase erosion potential, the following provisions apply:

- 1) Prohibit encroachments, including fill, new construction, substantial improvements, and other development unless certification by a registered professional engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels during the occurrence of the base flood discharge. (44 CFR 60.3(d)(3))
- 2) Construction or reconstruction of residential structures is prohibited within designated floodways\*, except for (i) repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (ii) repairs, reconstruction or improvements to a structure, the cost of which does not exceed 50 percent of the market value of the structure either, (A) before the repair, or reconstruction is started, or (B) if the structure has been damaged, and is being restored, before the damage occurred. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or to structures identified as historic places, may be excluded in the 50 percent.  
*\* FEMA endorses the more restrictive WA floodway standard adopted in WAC 173-158-070.*
- 3) If Section 5.4(1) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Section 5.0, PROVISIONS FOR FLOOD HAZARD REDUCTION.

## **5.7 CRITICAL FACILITY** *(Not mandatory)*

Construction of new critical facilities shall be, to the extent possible, located outside the limits of the Special Flood Hazard Area (SFHA) (100-year floodplain). Construction of new critical facilities shall be permissible within the SFHA if no feasible alternative site is available. Critical facilities constructed within the SFHA shall have the lowest floor elevated three feet above BFE or to the height of the 500-year flood, whichever is higher. Access to and from the critical facility should also be protected to the height utilized above. Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base flood elevation shall be provided to all critical facilities to the extent possible.