

CHAPTER 24.50 - FLOOD HAZARD AREAS

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24.50.010 Purpose.

The purpose of this Chapter is to promote the public health, safety, and general welfare and to minimize public and private losses due to flooding in flood hazard areas.

24.50.020 General.

- A.** All development and construction within flood hazard areas, as defined in Section 24.50.030, are subject to the terms of this Chapter and all other applicable regulations.
- B.** If an inconsistency or conflict exists between Chapter 24.50 and other provisions of this Code, including Title 33, the more restrictive uses or requirements will apply.
- C.** A structure or use that was lawful when it was established or approved by the City, but that does not conform with the current provisions of this Chapter may be continued subject to the provisions of the State Building Code pertaining to existing structures.
- D.** The flood protection elevations and the floodway and flood fringe areas specified by this Chapter, based on the 100-year flood elevations and the February 1996 Flood Inundation Area, as described in the Composite February 1996 Flood Inundation Area Mapping described in Subsection 24.50.040 E. below, are considered reasonable for regulatory purposes. Greater flood heights and more extensive flood fringe areas associated with climate change and larger floods may occur or the flood height and extent of flooding may be increased by human or natural causes, such as log jams, bridge openings or culverts restricted by debris, or changes in basin conditions. Areas within designated drainage districts and those areas not covered by adequate topographic maps may contain unmapped watercourses subject to flooding. The identification of designated flood hazard areas does not imply that lands outside of such areas will be free from flooding or flood damage.

The City of Portland, any officer or employee thereof, and the Federal Insurance Administration will not be liable for any flood damages that result from reliance on

the provisions or designations of this Chapter or any administrative decision lawfully made thereunder.

- E. The Bureau of Development Services administers and enforces the State of Oregon Specialty Codes, as adopted in Chapter 24.10, which contain certain provisions that apply to the design and construction of buildings and structures located in flood hazard areas, as defined in this Chapter. This Chapter will be administered and enforced in conjunction with such Specialty Codes.
- F. The Director of the Bureau of Development Services will appoint a Floodplain Administrator who will be responsible for administering, implementing, and enforcing this Chapter, including granting or denying development permits in accordance with its provisions. The Floodplain Administrator may delegate authority to implement these provisions.

24.50.030 Flood Related Definitions.

The definitions contained in this Section relate to flood hazard areas and considerations outlined in this Chapter.

- A. "Appeal" means a request for a review of the City of Portland's interpretation of any provision of this Chapter or a request for a variance.
- B. "Area of shallow flooding" means a designated AO or AH zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from 1 to 3 feet; 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 and AH indicates ponding.
- C. "Areas of Special Flood Hazard" mean the land in the floodplain subject to a one percent or greater chance of flooding in any given year. Designation on Flood Insurance Rate Maps always includes the letters A or V. "Special flood hazard area" is synonymous with the phrase "area of special flood hazard."
- D. "Base Flood (100-year flood)" means the flood having 1 percent chance of being equaled or exceeded in any given year.
- E. "Base flood elevation (BFE)" means the elevation to which floodwater is anticipated to rise during the base flood.
- F. "Basement" means any area of the building having its floor, including crawlspace, below ground level on all sides.
- G. "Building" – See Structure.
- H. "City Datum" means the reference datum for the City of Portland maps. The FIRM maps described in Section 24.50.050 are referenced to the North American Vertical Datum (NAVD) of 1988. To convert NAVD 1988 level to City datum, subtract 2.125 feet from the elevation referenced to NAVD 1988 level.

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- I. "Design Flood" means the greater of the base flood or the February 1996 Flood Inundation Area.
- J. "Design Flood Elevation" means the greater of the base flood elevation or the February 1996 Flood Inundation Area elevation.
- K. "Development" means any human-created change to improved or unimproved real estate, including but not limited to buildings, bridges, other structures, and mining, dredging, filling, grading, paving, excavation, fencing, landscaping, drainage facilities, drilling operations, or storage of equipment or material.
- L. "Existing manufactured home park or manufactured home subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale for which the construction of facilities for servicing the lot on which the manufactured home is to be affixed (including as a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) is completed before October 18, 1979.
- M. "Expansion to an existing manufactured home park or manufactured home 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, either final site grading or the pouring of concrete pads, and the construction of streets).
- N. "FIA" means the Federal Insurance Administration.
- O. "Flood Hazard Area" means any area that has been identified as subject to flooding.
- P. "Flood Insurance Study" means the official report provided by the Federal Insurance Administration that contains information regarding flooding, discusses the engineering methods used to develop the Flood Insurance Rate Maps (FIRMs), and includes flood profiles, and the water surface elevation of the base flood.
- Q. "Flood Insurance Rate Map (FIRM)" means the official map on which the Federal Insurance Administration has delineated the areas of special flood hazards.
- R. "Flood or flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters, or the unusual and rapid accumulation of runoff of surface waters from any source.
- S. "Flood protection elevation" means the design flood elevation plus a freeboard allowance.
- T. "Floodplain" means the channel of watercourse and adjacent land areas that are subject to inundation by the design flood.

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- U. “Floodplain Administrator” means the City of Portland official designated by the Director of the Bureau of Development Services to administer and enforce this Chapter.
- V. "Floodproofing" means any combination of structural and nonstructural additions, changes, or adjustments to structures that reduce or eliminate the risk of flood damage to real estate or improved real property, sanitary, and water facilities, structures, and their contents. Floodproofed structures are those that have the structural integrity and design to be watertight with walls substantially impermeable to the passage of water.
- W. "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 a designated height. The actual floodway boundaries are computer generated and approximate. These boundaries are depicted on the FIRM. Boundaries for other watercourses may be subject to identification by the Sewage System Administrator. The width of the floodway for unidentified watercourses may not be less than 15 feet unless otherwise approved by the Sewage System Administrator.
- X. "Flood fringe area" means any area lying outside the floodway that is subject to flooding by a base flood and for which water surface elevations and floodway and flood fringe boundaries have been determined by a Flood Insurance Study and are shown on the FIRMs. Boundaries for unidentified watercourses may be subject to identification by the Sewage System Administrator.
- Y. "Freeboard" means an additional height above the design flood elevation to account for factors that may contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as filling in the flood fringe, wave action, effect of urbanization of the watershed, map inaccuracies, irregular watercourse cross sections, irregular constructions at bridges, and the uncertainties of flood discharge computations.
- Z. “Functionally-dependent use” means a use that cannot fulfill its intended purpose unless it is located or carried out in close proximity to water. For purposes of this Chapter, this definition applies only to docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship-building and ship-repair facilities, and does not include long-term storage or related manufacturing facilities.
- AA. “High Hazard Area” means the area comprised of and measured to the farthest landward extent of the floodway or the area inundated by a flood event having a 10 percent or greater chance of flooding in a given year as mapped or determined by FEMA.
- ZBB.** "Lowest Floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of

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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 Subsection 24.50.060 F.2.

AACC. "Manufactured home" means a structure transportable in one or more sections, that is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes, the term "manufactured home" does not include park trailers, travel trailers, and other similar vehicles.

BBDD. "New construction" means structures for which the start of construction commenced on or after October 18, 1979.

CCEE. "New manufactured home park or manufactured home subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale for which the construction of facilities for servicing the lots on which the manufactured home is to be affixed (including as a minimum, the installation of utilities, either final site grading or the pouring of concrete pads and the construction of streets) is completed on or after October 18, 1979.

DDFF. "Reasonably safe from flooding" means floodwaters and subsurface waters related to the design flood or other sources identified by the Sewage System Administrator will not damage proposed or existing structures.

EEGG. "Sewage System Administrator" means the person designated by the Bureau of Environmental Services who is responsible for regulating the public sanitary and stormwater facilities. The Sewage System Administrator may delegate their authority for the purpose of implementing these provisions.

FFHH. "Start of construction" means the date the building permit was issued, provided the actual construction, repair, reconstruction, substantial improvement, placement, or other improvement was commenced within 180 days of the permit issuance 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, or filling; the installation of streets, walkways, sanitary sewers, storm sewers, or drainage facilities; excavation for a basement, footings, piers, or a foundation or the erection of temporary forms; or 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.

GGII. "Structure or accessory structure" means a walled and roofed building, including a gas or liquid storage tank, as well as a manufactured home.

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HHJJ. “Substantial Damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

HKK. "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 start of construction of the improvement or repair, or
2. If the structure has been damaged, and is being restored, before the damage occurred. 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:

- a. Any project for improvement of a structure to comply with existing State or local health, sanitary, or safety code specifications that are solely necessary to assure safe living conditions; or
- b. Any alteration of a structure listed on the National Register of Historic Places or the State Inventory of Historic Places.

LL. “Top of Bank” means the largest decrease in slope that is 10 percent or greater between the ordinary high water mark of a water body and a point 50 feet landward from the ordinary high water mark. See Chapter 33.930, Measurements. If there is no decrease in slope that is 10 percent or greater within a distance of 50 feet from the ordinary high water mark, then the top of bank will be the default top of bank location described in Chapter 33.930.

JMM. “Variance” means a grant of relief from the requirements of this Chapter that permits construction in a manner that would otherwise not be allowed under this Chapter.

KKNN. “Water surface elevation” means the height of the water surface of the design flood for any point along the longitudinal course of a watercourse.

LOO. “Watercourse” means a channel in which a flow of water occurs, either continuously or intermittently, and if the latter, with some degree of regularity. Watercourses may be either natural or artificial.

PP. “Willamette River Central and South Reach” means that portion of the Willamette River Flood Zone south of the Fremont Bridge on the west bank and the Broadway Bridge on the east bank.

QQ. “Willamette River North Reach” means that portion of the Willamette River Flood Zone north of the Fremont Bridge on the west bank and the Broadway Bridge on the east bank.

24.50.040 Flood Insurance Administration Study and Flood Hazard Maps.

The following study and maps in this Section are hereby adopted and declared to be a part of this Chapter.

- A. Flood Insurance Study is the official scientific and engineering report entitled “Flood Insurance Study for City of Portland, Oregon: Multnomah, Clackamas and Washington Counties,” dated November 26, 2010, prepared by the Federal Insurance Administration (FIA) under agency agreement with the Portland District Corps of Engineers. The latest edition of the report, along with accompanying FIRMs, are on file with the Bureau of Development Services.
- B. Flood Insurance Rate Maps (FIRMs) are the official maps entitled “The Flood Insurance Rate Maps (FIRMs) for City of Portland, Oregon: Multnomah, Clackamas and Washington Counties,” dated either October 19, 2004, or November 26, 2010, whichever is more current, on which the Federal Insurance Administration has delineated the areas of flood hazards along with the 100-year (base flood) and 500-year flood boundaries, the floodway zone boundaries and the 100-year flood elevations.
- C. Other Flood Insurance Studies and Flood Insurance Rate Maps for areas within jurisdictions subject to Chapter 24.50 under separate intergovernmental agreements.
- D. When base flood elevation data has not been provided by the FIA study, the Sewage System Administrator may obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state, or other source. This data will be utilized only after technical review and approval by the Sewage System Administrator.
- E. The "Composite February 1996 Flood Inundation_Area Mapping" published by the City. The identified areas are subject to the regulations of this Title.

24.50.050 Flood Hazard Areas and Flood Protection Elevations.

Flood hazard areas contain all lands located within the floodway boundary, flood zones within the flood fringe areas, and other identified flood zones. Identified and unidentified flood hazard areas and flood protection elevations are described in this Section. When a structure is partially located in a flood hazard area, the entire structure is subject to the requirements for new construction, substantial improvements, and substantial damage. When a structure is located within multiple flood zones, the more restrictive flood zone elevations apply.

- A. Columbia River FIRM Flood Zone AE. These flood zones represent areas for which base flood elevations are determined. The flood protection elevation is the base flood elevation plus 1 foot of freeboard. The nominal 1-foot increase for

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freeboard reflects the relatively wide floodplain of the Columbia River. In the vicinity of the confluence of the Columbia and Willamette Rivers, the Columbia River floodplain is considered to be east of the westerly flood fringe boundary of the Columbia Slough.

- B.** Multnomah Drainage District No. 1, Peninsula Drainage District No. 1, and Peninsula Drainage District No. 2 FIRM Flood Zones AH and A. FIRM Flood Zone AH represents isolated areas of shallow flooding (1 to 3 feet in depth, resulting from upslope runoff) for which base flood elevations are determined. FIRM Flood Zone A represents areas for which base flood elevations are not determined. In the case of unidentified watercourses occurring within the boundaries of the Drainage Districts, the base flood elevation will be estimated by procedures described in Subsection I. below. The flood protection elevation is the base flood elevations plus 1 foot of freeboard.
- C.** Columbia River FIRM Flood Zone A. These flood zones represent areas for which base flood elevations are not determined. The flood protection elevation is either the grade at the adjacent flood fringe boundary or the crown of the nearest street, whichever is higher, plus 1 foot of freeboard.
- D.** Willamette River FIRM Flood Zone AE. These flood zones represent areas for which the base flood elevations are determined. The flood protection elevation is the base flood elevation plus 2 feet of freeboard.
- E.** Johnson Creek, Fanno Creek and Crystal Springs Creek FIRM Flood Zone AE. This flood zone represents areas for which the base flood elevations are determined. The flood protection elevation is the base flood elevation plus 2 feet of freeboard.
- F.** Johnson Creek FIRM Flood Zone AH. This flood zone represents areas of shallow flooding depth (1 to 3 feet) for which base flood elevations are determined. The flood protection elevation is the base flood elevation plus 2 feet of freeboard.
- G.** Johnson Creek FIRM Flood Zone AO. This flood zone represents areas of shallow flooding depth (1 to 3 feet) for which the depths of flooding are determined. The flood protection elevation is the depth of flooding shown on the FIRM map plus 2 feet of freeboard above the highest adjacent grade.
- H.** Johnson Creek, Fanno Creek, Tryon Creek, and Crystal Springs Creek FIRM Flood Zone A. These flood zones represent areas for which base flood elevations are not determined. The flood protection elevation is the base flood elevation plus 2 feet of freeboard. Base flood elevations will be calculated in accordance with Subsection I. below.
- I.** Unidentified Watercourse Flood Zones. These watercourses, generally draining one acre or more, are not identified in a Federal Insurance Study. The flood protection elevation is the base flood elevation plus 2 feet of freeboard. The width of the floodway may not be less than 15 feet, unless otherwise approved by the Sewage System Administrator. The floodway boundary, flood fringe boundary,

and flood protection elevation data will be based upon watercourse geometry, slope, channel roughness, effect of obstructions, backwater and other factors that affect flood flow. The requisite flood hazard data, maps, and sections must be obtained and developed by procedures approved by the Sewage System Administrator. When appropriate and necessary data are available, the flood protection elevation and floodway and flood fringe boundary data may be provided by the Sewage System Administrator. If pertinent hydrologic data and topographic data are not available, inaccurate, or outdated, and where substantial alterations or relocations of a watercourse are involved, the Sewage System Administrator may require the permit applicant to secure a registered engineer and surveyor to develop and supply the requisite flood hazard data, maps, and sections.

- J. February 1996 Flood Inundation Areas must have a flood protection elevation that provides a minimum of 2 feet of freeboard above the February 1996 Flood Inundation Elevation. February 1996 Flood Inundation Areas adjacent to Columbia River FIRM Flood Zone AE, Multnomah Drainage District No. 1, Peninsula Drainage District No. 1, Peninsula Drainage District No. 2 Firm Zone AH, and Columbia River FIRM Flood Zone A must have a minimum freeboard of 1 foot. The February 1996 Flood Inundation Elevations must be determined using an approved method such as river gage data; high water marks recorded during the flood; data from state, local, or other authorities; inundation area elevation contour interpolation; or a technical analysis stamped by a professional engineer licensed in the State of Oregon and approved by the Sewage System Administrator.

24.50.060 Provisions for Flood Hazard Reduction.

In all flood hazard areas defined in Section 24.50.050, the following requirements apply:

- A. Permits. All permit applications will be reviewed to determine whether proposed development and building sites comply with the provisions of this Chapter and will be reasonably safe from flooding. A development or building permit must be obtained before construction or development begins within any flood hazard area. The development or building permit is required for all structures, including manufactured homes, and for all other development, as defined in this Chapter, including fill. Such applications for permits must include the following information:
 - 1. Boundary of flood hazard areas.
 - 2. Boundaries of the high hazard area, top of bank, and 50-foot setback as applicable.
 - ~~23.~~ The base flood elevation and design flood elevation.
 - ~~34.~~ Elevation of lowest floor, including basement, for all structures and floodproofed elevations for nonresidential structures.
 - ~~45.~~ When required by the Floodplain Administrator, documentation necessary to verify substantial improvement or substantial damage.

- 56.** Elevation of lowest point of bridge structures.
 - 67.** Existing and proposed topography of the site taken at a contour interval (normally 1 foot) sufficiently detailed to define the topography over the entire site and adjacent watercourses subject to flooding. Ninety percent of the contours must be plotted within 1 contour interval of the true location.
 - 78.** All necessary permits obtained from the federal and state governmental agencies from which prior approval is required.
 - 89.** Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (see Subsection 24.50.050 I.), applications for building permits will 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 any available hydrological data, drainage basin hydrology, historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate at least 2 feet above grade in these zones may result in higher insurance rates.
- B.** Elevation reference. The survey reference datum for finished lowest floor including basement, floodproofed elevations, and finished site grades must be either the North American Vertical Datum of 1988 or City of Portland datum, whichever is appropriate. When approved by the City Engineer, a local onsite survey reference datum may be adopted for FIRM Zones A and Unidentified Watercourse Flood Zones. The survey reference datum must be indicated on all relevant plan and section drawings, calculations, and the certified FEMA Elevation Certificate.
- C.** Certification of elevations and floodproofing.
1. All elevations specified below must be certified on a FEMA (FIA) Elevation Certificate by a licensed surveyor or engineer secured by the permittee and made part of the permit records.
 - a.** During construction elevations of the lowest floor, including basement, of all new or substantially improved structures upon placement of the lowest floor but prior to further vertical construction;
 - b.** As-built finished elevation of lowest floor including basement of all new or substantially improved structures;
 - c.** As-built finished floodproofed elevation of all new or substantially improved nonresidential structures;
 - d.** As-graded finished elevation of lowest grade within 25 feet of structures; and

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- e. As-graded finished elevation of lowest crawl space grade, as applicable.
 2. All floodproofing materials and methods for nonresidential structures must be certified by a licensed professional engineer or architect as meeting the criteria in Subsection 24.50.060 F.7.
- D. Floodway. Encroachments into the floodway by development and structures defined in Section 24.50.030 are prohibited unless it is demonstrated by technical analysis from a registered engineer that the development will result in no increase in the base flood elevation. In areas where a regulatory floodway has not been designated, no new construction, substantial improvement or other development (including fill) will be permitted within Zone AE, 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 1 foot at any point within the flood hazard areas regulated by the City. Technical analysis will be reviewed and approved by the Sewage System Administrator. However, the minimum width of the floodway shall not be less than 15 feet, unless otherwise approved by the Sewage System Administrator.
- E. New Technical Data and Notifications of Other Entities. The Bureau of Development Services will:
 1. City Boundary Alterations. Notify the Federal Insurance Administration in writing whenever the boundaries of the City have been modified by annexation or the City has otherwise assumed authority or no longer has authority to adopt and enforce floodplain management regulations for a particular area, to ensure that all Flood Hazard Boundary Maps (FHBM) and Flood Insurance Rate Maps (FIRM) accurately represent the City's boundaries. The Bureau will include within such notification a copy of a map of the City suitable for reproduction, clearly delineating the new corporate limits or new area for which the City has assumed or relinquished floodplain management regulatory authority.
 2. Watercourse Alterations. Notify adjacent communities, the Department of Land Conservation and Development, and other appropriate state and federal agencies, prior to any alteration or relocation of a watercourse as identified in the Flood Insurance Study and Flood Insurance Rate Map, and submit evidence of such notification to the Federal Insurance Administration. The applicant must provide this notification to the Federal Insurance Administration as a Conditional Letter of Map Revision (CLOMR) along with either:
 - a. A proposed maintenance plan to ensure the flood-carrying capacity within the altered or relocated portion of the watercourse will be maintained; or

enclosed area subject to flooding or be certified by a registered design professional;

- (3)** The bottom of all openings may be no higher than 1 foot above grade;
 - (4)** Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters; and
 - (5)** An agreement approved by the Floodplain Administrator not to convert the use of the enclosed area must be recorded against the property deed when required by the Floodplain Administrator.
- c.** Fill required to elevate the lowest floor to the flood protection level must comply with Chapter 24.70. Fill selection and placement must recognize the effects of inundation from floodwaters on slope stability, fill settlement, and scour. The minimum elevation at the top of the fill slope must be at or above the design flood elevation. Minimum distance from any point of the building perimeter to the top of the fill slope must be at least 25 feet or twice the depth of fill at that point, whichever is the greater distance.

3. Subdivision proposals.

- a.** All subdivision proposals must be consistent with the need to minimize flood damage;
- b.** All subdivision proposals must have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
- c.** All subdivision proposals must have adequate drainage provided to reduce exposure to flood damage; and,
- d.** Where base flood elevation data have not been provided or are not available from another authoritative source, it must be generated for subdivision proposals and other proposed developments that contain at least 50 lots or 5 acres.

4. Nonresidential construction. New construction and substantial improvement of any commercial, industrial, or other nonresidential structure must either have the lowest floor, including basement, elevated to the level of the flood protection elevation, or, together with attendant utility and sanitary facilities, must:

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- a. Be floodproofed so that below the flood protection elevation the structure is watertight with walls substantially impermeable to the passage of water;
 - b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
 - c. 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 the professional engineer's or architect's development or review of the structural design, specifications and plans. Such certifications must be provided to the Bureau of Development Services.
 - d. Nonresidential structures that are elevated, but not floodproofed, must meet the same standards for space below the lowest floor as described for residential structures.
 - e. Applicants floodproofing nonresidential buildings will be notified that flood insurance premiums will be based on rates as if the building is 1 foot below the floodproofed level (i.e., a building constructed to the base flood level will be rated as 1 foot below that level).
5. **Manufactured homes.** All manufactured homes to be placed or substantially improved within the flood hazard area must be elevated on a permanent foundation such that the lowest floor of the manufactured home is at or above the flood protection elevation; securely anchored to prevent flotation, collapse or lateral movement; and installed using methods and practices that minimize flood damage. The construction must conform to the requirements of Subsection 24.50.060 F.2. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Refer to FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).
6. **Utilities.** All new and replacement water supply and sanitary sewage systems must be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the sanitary sewage systems into floodwaters. On-site waste disposal systems must be located to avoid impairment to them or contamination from them during flooding.
7. **Construction materials and methods.** All new construction and substantial improvements must be constructed with materials and utility equipment resistant to flood damage, using methods and practices that minimize flood damage. Electrical, heating, ventilation, plumbing and air-conditioning

equipment and other service facilities must be protected to or above the flood protection elevation.

~~8. Balanced Cut and Fill Required. In all flood hazard areas of the City not addressed by Subsection 24.50.060 G., balanced cut and fill shall be required. All fill placed at or below the base flood elevation shall be balanced with at least an equal amount of soil material removal. Soil material removal shall be within the same flood hazard area identified in Subsections 24.50.050 A. through I.~~

~~a. Excavation shall not be counted as compensating for fill if such areas will be filled with water in non-storm winter conditions.~~

~~b. Temporary fills permitted during construction shall be removed.~~

98. Tanks.

a. Underground tanks must be anchored to prevent flotation, collapse, and lateral movement under conditions of the design flood.

b. Above-ground tanks must be installed at or above the flood protection elevation or be anchored to prevent flotation, collapse, and lateral movement under conditions of the design flood.

109. Uncontained hazardous materials as referred to in Section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S. Section 9601 et seq.) (CERCLA), Section 502 (13) of the Clean Water Act and any other substances so designated by the Director of the Bureau of Development Services are prohibited in flood hazard areas.

~~11. AH/AO Zone Drainage. Adequate drainage paths shall be provided around structures on slopes to guide floodwaters around and away from proposed structures.~~

G. 10. Johnson Creek Flood ~~Zones~~Risk Areas - Special Provisions. In addition to other requirements of this Chapter, the following requirements ~~apply within designated portions of the Johnson Creek Flood Zones:~~

~~1. All Johnson Creek Flood Zones~~

~~a. Balanced cut and fill. Within all areas of the Johnson Creek Flood Zones, all new fills below the base flood elevation must be accompanied by an equal amount of excavation on the same site so that the storage capacity of the floodway and flood fringe is retained.~~

~~b. Mitigation payment allowed in lieu of balanced cut and fill. After September 1, 1998 residential properties within the area of the 100 year floodplain, but outside of the floodway and Flood Risk Area,~~

~~and bounded by I-205 on the west, SE 142nd Avenue on the east, and the Springwater Corridor Trail on the south, may elect to pay into the Johnson Creek Fill Mitigation Bank in lieu of creating a balanced cut and fill. The amount of the payment will be determined by the Bureau of Environmental Services.~~

~~2. Johnson Creek Flood Risk Area. The following provisions apply within the Johnson Creek Flood Risk Area, as established in Chapter 33.537:~~

~~a. Balanced cut and fill. The requirements of Subsection G.1. above, apply within the Johnson Creek Flood Risk Area.~~

ba. Reduction in flooding capacity prohibited. Structures, fill or other development are only allowed in the Johnson Creek Flood Risk Area when they are designed so that there will be no significant reduction in the storage capacity of the floodway and flood fringe and there will be no significant impediment to the passage of floodwaters.

eb. Exceptions to the applicability of Subsection 24.50.060 ~~G.2F.10.a.:~~

(1) One-story, detached accessory buildings used as tool and storage sheds, playhouses or similar uses, provided the floor area does not exceed 120 square feet.

(2) Parking garages accessory to one- and two-family structures, provided the floor area does not exceed 300 square feet.

(3) Fences that do not prevent the flow of water.

dc. Buildings designed to meet all of the following criteria will be presumed to comply with Subsection 24.50.060 ~~G.2F.10.:~~

(1) At least 50 percent of perimeter walls located at, or below, the base flood elevation will remain open and unenclosed;

(2) At least 25 percent of each perimeter wall located at, or below, the base flood elevation will remain open and unenclosed; and

(3) The footprint of all portions of the building located at, or below, the base flood elevation may not exceed 15 percent of the footprint of the building located above the base flood elevation.

11. AH/AO Zone Drainage. Adequate drainage paths must be provided around structures on slopes to guide floodwaters around and away from proposed structures.

G. Compensatory excavation or removal required.

1. The following compensatory excavation or removal regulations apply at the time of a building or development permit application.

The provisions of this Subsection apply exclusively to the compensatory excavation and removal requirements of Subsection 24.50.060 G.

a. Applications for building or development permits will be processed based on the compensatory excavation or removal regulations in effect on the date a complete permit application is filed with the City. For the purposes of this Section, a complete building or development permit application contains the information necessary to determine whether the proposal conforms with all applicable regulations and development standards.

b. Exceptions to the application of Subsection 24.50.060 G.1.a.:

(1) Applications for building or development permits for development approved by an Environmental Review, Greenway Review, South Waterfront Greenway Review, Land Division, Conditional Use Master Plan, Planned Development Review, or River Review land use decision that has not expired may be processed based on the compensatory excavation or removal regulations in effect on the date the land use application was filed with the City, as specified in Chapter 33.700, provided a building or development permit is issued before expiration of the final land use decision.

(2) Applications for building or development permits for development approved by a Central City Master Plan land use decision may be processed based on the compensatory excavation or removal regulations in effect on the date the complete land use application was filed with the City, as specified in Chapter 33.700, provided the building or development permits are issued no later than 10 years after the date of the final land use decision.

c. Revisions to building or development permit applications will be processed based on the compensatory excavation or removal regulations in effect when the original complete permit application was filed.

2. In all flood hazard areas regulated by the City: The application must provide for a compensatory volume, consisting of either the excavation of soil or rock or the removal of permanent structures that displace floodwater, or both, to compensate for the loss of flood storage volume as described in

the subsections below. The compensatory volume must be located within the same flood hazard area, identified in Subsections 24.50.050 A. through J., as the fill or structure causing the loss of flood storage, except for the Johnson Creek flood zones, where the compensatory volume must be on the same site.

a. Columbia River Flood Zones, Willamette River Central and South Reach Flood Zones, and Fanno Creek Flood Zones: The volume of floodwater displaced by fill and structures placed within the special flood hazard area at or below the base flood elevation requires a compensatory volume below the base flood elevation as follows:

(1) Within the high hazard area, the compensatory volume must be equal to or greater than twice the displaced volume (a ratio of 2 to 1) and must be located within the high hazard area.

(2) Within a 50-foot setback measured landward from top of bank, the compensatory volume must be equal to or greater than one and a half times the displaced volume (a ratio of 1.5 to 1) and must be located within the same setback, the high hazard area, or both.

(3) Landward of the 50-foot setback from top of bank, the compensatory volume must be equal to or greater than the displaced volume (a ratio of 1 to 1).

(4) Exceptions to the application of Subsections 24.50.060 G.2.a.(1) – (3):

(a) Subsections 24.50.060 G.2.a.(1) – (3) do not apply to areas with Heavy Industrial (IH), General Industrial 2 (IG2), or General Employment 2 (EG2) zoning.

(b) Subsections 24.50.060 G.2.a.(1) – (3) do not apply to the portion of the South Waterfront Subdistrict of the Central City Plan District north of Willamette River mile 14.6 as described in the Flood Insurance Study.

(c) Subsections 24.50.060 G.2.a.(1) – (3) do not apply to the portion of the University District/South Downtown Subdistrict of the Central City Plan District south of Willamette River mile 13.4 as described in the Flood Insurance Study.

b. Crystal Springs Creek Flood Zones, Johnson Creek Flood Zones, Tryon Creek Flood Zones, Willamette River North Reach Flood Zones, Multnomah Drainage District No. 1, Peninsula Drainage

District No. 1 and Peninsula Drainage District No. 2 Flood Zones, areas with Heavy Industrial (IH), General Industrial 2 (IG2) or General Employment 2 (EG2) zoning, and Unidentified Watercourse Flood Zones: The volume of floodwater displaced by fill placed within the special flood hazard area at or below the base flood elevation requires a compensatory volume below the base flood elevation equal to or greater than the displaced volume (a ratio of 1 to 1).

c. February 1996 Flood Inundation Areas: The volume of floodwater displaced by fill placed within the February 1996 Flood Inundation Area requires a compensatory volume below the February 1996 Flood Inundation Elevation as follows:

(1) In areas outside of the special flood hazard area, the compensatory volume must be equal to or greater than the displaced volume (a ratio of 1 to 1).

(2) In areas within both the special flood hazard area and the February 1996 Flood Inundation Area, where the February 1996 Flood Inundation Elevation is greater than the base flood elevation, the compensatory volume must be equal to or greater than the displaced volume between the February 1996 Flood Inundation Elevation and the base flood elevation (a ratio of 1 to 1). Compensatory excavation requirements at and below the base flood elevation are described in Subsections 24.50.060 G.2.a. and b.

3. Excavation of soil or rock or the removal of permanent structures from an area may not be counted as compensatory volume if the area will be filled with water in non-storm winter or spring conditions.

4. Compensatory excavation areas must be designed to freely drain to the source of flooding to the extent practicable to avoid stranding fish.

5. Temporary fills permitted during construction must be removed prior to final inspection approval of the permit.

6. Mitigation bank credits may be substituted for compensatory excavation or removal of permanent structures, provided the mitigation bank has been approved by the City and the mitigation bank is located within the same flood hazard area as the development and satisfies the requirements of Subsections 24.50.060 G.2.a. through c.

24.50.065 Recreational Vehicles located in Areas of Special Flood Hazard or Base Flood Zones.

Exhibit B

- A. Any recreational vehicle placed on a site located in either an area of special flood hazard or in the base flood zone must:
 - 1. Meet the elevation and anchoring requirements for manufactured homes;
 - 2. Be on the site for fewer than 180 consecutive days; or
 - 3. Be fully licensed and ready for highway use. As used in this Section, “ready for highway use” means that the vehicle is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and has no permanently attached additions.

- B. For the purpose of this Section, “recreational vehicle” means any vehicle which is:
 - 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.

24.50.070 Appeals and Variances.

- A. Appeals. Any person aggrieved by a requirement, decision, or determination made pursuant to the administration of this Chapter may appeal such requirement, decision, or determination to the BDS Administrative Appeal Board in accord with Chapter 24.10.

- B. Variances. If variances from requirements of this Chapter are requested, all relevant factors and standards specified in this Chapter will be considered, as well as the following:
 - 1. The danger that materials may be swept into other lands to the injury of others;
 - 2. The danger to life and property due to flooding or erosion damage;
 - 3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
 - 4. The importance of the services provided by the proposed facility to the City;
 - 5. The necessity to the facility of a waterfront location, where applicable;
 - 6. The availability of alternative locations, not subject to flooding or erosion damage;

Exhibit B

7. The compatibility of the proposed use with existing anticipated development;
8. The relationship of the proposed use to the Comprehensive Plan and Floodplain Management Program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;
11. The costs of providing governmental services during and after flood conditions including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges; and
12. The potential impact on federally protected species.

C. Conditions for variances. Upon consideration of the factors listed above and the purposes of this Chapter, such conditions may be attached to the granting of variances as are deemed necessary.

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 lot of 1/2 acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, provided the items in Subsection 24.50.070 B. have been fully considered. As the lot size increases, the technical justification required for issuing the variance increases.
2. Variances will not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.
3. Variances will only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
4. Variances will only be issued upon:
 - a. A showing of good and sufficient cause;
 - b. A determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 - c. A determination that the granting of a variance would not result in increased flood heights, additional threats to public safety, extraordinary public expense, creating a nuisance, causing fraud on

or victimization of the public, or creating a conflict with existing local laws or ordinances.

5. Variances may be issued for new construction, substantial improvements, or other development necessary for the conduct of a functionally-dependent use, provided that the criteria of Subsection 24.50.070 C.2. through C.4. are satisfied.
56. Any applicant to whom a variance is granted will be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation as applicable.
67. Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle in that they pertain to a physical piece of property. Variances are not personal in nature and do not pertain to the structure, its inhabitants, or economic or financial circumstances. As such, variances from the flood elevations should be quite rare.
78. 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 Subsection 24.50.070 C.1. and otherwise complies with Subsections 24.50.060 F.1. and 24.50.060 F.7.