

CHAPTER 15.12**GEOLOGICALLY HAZARDOUS AREAS****SECTIONS:**

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15.12.010 GEOLOGICALLY HAZARDOUS AREAS.

Geologically hazardous areas include areas susceptible to erosion, land sliding, bluff failures, or other geological events. Such areas pose a threat to the health and safety of citizens when incompatible development is sited in areas of significant hazard. Such incompatible development may not only place itself at risk, but also may increase the hazard to surrounding development and use.

[Ord. 609 (2018) § 45]

15.12.020 DESIGNATION OF SPECIFIC HAZARD AREAS.

Geologically hazardous areas are designated as those areas that are susceptible to one or more of the following types of hazards:

(a) Erosion Hazard Areas.

(1) Slopes between 15 percent and 39 percent;

(2) Slopes 40 percent or greater; or

(3) Slopes 15 percent or greater that contain soils or soils complexes identified by the U.S. Department of Agriculture's Natural Resource Conservation Service or the Soil Survey for Benton County as having, "severe" or "very severe" erosion hazard potential.

(b) Landslide Hazard Areas.

(1) Slopes 15 percent or greater that have a relatively permeable geologic unit overlying a relatively impermeable unit and have springs or ground water seeps;

(2) Slopes 40 percent or greater with a vertical relief of 10 or more feet except areas composed of competent rock and properly engineered slopes designed and approved by a geotechnical engineer licensed in the state of Washington and experienced with the site;

(3) Potentially unstable slopes resulting from rapid river or stream incision, river or stream bank erosion, or undercutting by wave action. These include slopes exceeding 10 feet in height adjacent to rivers, streams, lakes and shorelines with more than a 35 percent gradient;

(4) Areas that have shown evidence of historic failure or instability, including, but not limited to, back-rotated benches on slopes; areas with structures that exhibit structural damage such as settling and racking of building foundations; and areas that have toppling, leaning, or bowed trees caused by ground surface movement;

(5) Slopes having gradients steeper than 80 percent subject to rock fall during seismic shaking;

(6) Areas that are at risk of mass wasting due to seismic forces;

(7) Areas of historical landslide movement; or

(8) Areas mapped by the State of Washington Department of Natural Resources as landslides or landslide deposits.

(9) Areas identified as landslide runout areas or areas at the top and sides of landslide hazards likely to slide.

(c) Seismic hazard areas shall include areas subject to a severe risk of earthquake damage as a result of seismically induced ground shaking, differential settlement, slope failure, settlement, lateral spreading, mass wasting, surface faulting or soil liquefaction. They include areas identified by the State of Washington Department of Natural Resources as having liquefaction susceptibility of moderate, moderate to high, and/or high.

(d) Other Hazard Areas. Geologically hazard areas shall include those areas subject to severe risk of damage as a result of other geological events including mass wasting, debris flows, rock falls and differential settlement.

[Ord. 609 (2018) § 46]

15.12.030 MAPPING OF GEOLOGICALLY HAZARDOUS AREAS.

(a) The approximate location and extent of critical areas are displayed on various inventory maps available at the Planning Department. These maps will be updated as inventories are completed in compliance with the requirements of the Growth Management Act, and additional maps may be added as appropriate. Benton County's critical areas maps depict the approximate location and extent of known or suspected geologically hazardous areas, and are hereby adopted.

(1) These maps are to be used as a guide for the County, project applicants, and/or property owners, and may be continuously updated as new critical areas are identified. They are a reference and do not provide a final critical area designation.

[Ord. 609 (2018) § 47]

15.12.040 CRITICAL AREA REPORT-ADDITIONAL REQUIREMENTS FOR GEOLOGICALLY HAZARDOUS AREAS-GEOTECHNICAL ENGINEERING REPORT.

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for geologically hazardous areas shall meet the requirements of this section. This section shall apply to those hazards identified in BCC 15.12.020(a)(2), (b), (c), and (d).

(a) Preparation by a Qualified Professional. A critical area report for geologically hazardous areas shall be prepared by a qualified professional who has training and experience in preparing reports for the relevant type of hazard. A qualified professional shall meet the standard specified in BCC 15.02.070(57).

(b) Geotechnical Engineering Report. The technical information for a project which has the potential to be damaged by a geologically hazardous area shall include a geotechnical engineering report, prepared by a qualified professional as described in subsection (a). The qualified professional shall present and include the

following information:

(1) Site Plan. The report shall include a copy of the site plan for the proposal showing:

(i) The height of slope, slope gradient, and cross section of the project area;

(ii) The location and description of surface water runoff;

(iii) The location of springs, seeps, or other surface expressions of ground water on or within two hundred feet of the project area or that have potential to be affected by the proposal;

(iv) Proposed development, including the location of existing and proposed structures, fill, storage of materials, and drainage facilities, with dimensions indicating distances to the floodplain, if available;

(v) Clearing limits; and

(vi) The topography, in five-foot contours, or as deemed appropriate by the Planning Administrator, of the project area and all hazard areas addressed in the report.

(2) Geotechnical Analysis. The geotechnical analysis shall specifically include:

(i) A description of the extent and type of vegetative cover;

(ii) A description of subsurface conditions based on data from site-specific explorations;

(iii) An estimate of load capacity including surface and ground water conditions, public and private sewage disposal systems, fills and excavations and all structural development;

(iv) An estimate of slope stability and the effect construction and placement of structures will have on the slope over the estimated life of the structure;

(v) An estimate of the bluff retreat rate that recognizes and reflects potential catastrophic events such as seismic activity or a one hundred year storm event;

(vi) Consideration of the run-out hazard of landslide debris and/or the impacts of landslide run-out on down slope properties;

(vii) A study of slope stability including an analysis of proposed angles of cut and fill and site grading;

(viii) Recommendations for building limitations, structural foundations, and an estimate of foundation settlement; and

(ix) An analysis of proposed surface and subsurface drainage, and the vulnerability of the site to erosion.

(3) Geotechnical Engineering Report. The qualified professional shall provide engineering recommendations for the following:

(i) Parameters for design of site improvements including appropriate foundations and retaining structures. These should include allowable load and resistance capacities for bearing and lateral loads, installation considerations, and estimates of settlement performance;

(ii) Recommendations for drainage and subdrainage improvements;

(iii) Earthwork recommendations including clearing and site preparation criteria, fill placement and compaction criteria, temporary and permanent slope inclinations and protection, and temporary excavation support, if necessary;

(iv) Mitigation of adverse site conditions including slope stabilization measures and seismically unstable soils, if appropriate; and

(v) The report shall make a recommendation for the minimum building setback from any geologic hazard based upon the geotechnical analysis.

(4) Seismic Hazard Areas. A critical area report for a seismic hazard area shall also meet the following requirements:

(i) The site map shall show all known and mapped faults within two hundred feet of the project area or that have potential to be affected by the proposal;

(ii) The analysis shall include a complete discussion of the potential impacts of seismic activity on the site (for example, forces generated, fault displacement and liquefaction potential); and

(iii) Where liquefaction risks of high, moderate to high or moderate exist, the report shall address soil and structural mitigation measures.

[Ord. 609 (2018) § 48]

15.12.050 CRITICAL AREA REPORT-ADDITIONAL REQUIREMENTS FOR GEOLOGICALLY HAZARDOUS AREAS-GEOTECHNICAL ENGINEERING RISK ASSESSMENT.

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for those hazards in BCC 15.12.020(a)(1), must meet the requirements of this section.

(a) Preparation by a Qualified Professional. A critical area report for geologically hazardous areas shall be prepared by a qualified professional who has training and experience in preparing reports for the relevant type of hazard. A qualified professional shall meet the standard specified in BCC 15.02.070(57).

(b) Geotechnical Engineering Risk Assessment: The technical information for a project shall include a geotechnical engineering risk assessment, prepared by a qualified professional as described in Subsection (a). The qualified professional shall present and include the following information:

(1) Site Plan. The assessment shall include a copy of the site plan for the proposal showing:

(i) The height of slope and slope gradient of the project area;

(ii) The location of springs, seeps, or other surface

expressions of ground water on or within two hundred feet of the project area or that have potential to be affected by the proposal;

(iii) The location and description of surface water runoff;

(iv) The top and toe of all unstable slopes and locations of erosion hazard areas;

(vi) Proposed development, including the location of existing and proposed structures, fill, storage of materials, and drainage facilities, with dimensions indicating distances to the floodplain, if available; and

(vii) Clearing limits.

(2) A description of the geology of the site and the proposed development;

(3) An assessment of the potential impact the project may have on the hazard area;

(4) An assessment of what potential impact the hazard area may have on the project;

(5) Appropriate mitigation measures, if any;

(6) A determination by the qualified professional as to whether further analysis is necessary. If further analysis is necessary, a geotechnical engineering report, pursuant to BCC 15.12.040 is required; and

(7) The assessment must be signed by and bear the seal of the engineer or geologist that prepared it.

(c) If additional hazards are identified at the activity site, a geotechnical engineering report, pursuant to BCC 15.12.040 is required.

[Ord. 609 (2018) § 49]

15.12.060 PERFORMANCE STANDARDS-GENERAL REQUIREMENTS.

(a) If it is determined by the geotechnical engineering report that either the proposed development or adjacent properties will be at risk of damage from the geologic hazard, or that the project

will increase the risk of occurrence of the hazard, and there are no adequate mitigation measures to alleviate the risks, the proposed development cannot be approved by the Planning Administrator.

(b) Development and grading plans shall comply with Benton County Building Department and Benton-Franklin Health District requirements. Additional permits may apply.

(c) Development activities within seismic hazard areas shall comply with the following:

(1) All new development shall conform to the applicable provisions of the International Building Code (Benton County Building Code, BCC 3.04), as existing and hereafter amended by Benton County, which contains structural standards and safeguards to reduce risks from seismic activity.

(2) Construction of commercial, industrial, public assembly, or any publicly owned building shall comply with the requirements of BCC 15.12.040 which includes the submittal of a geotechnical report. The results or conclusions of the evaluation shall be considered a condition of development approval.

[Ord. 609 (2018) § 50]

15.12.070 SEVERABILITY. If any provision of this Chapter is declared unconstitutional, or the applicability thereof to any person or circumstance is held invalid, the constitutionality of the remainder of the Chapter and the applicability thereof to other persons and circumstances shall not be affected thereby.

[Ord. 609 (2018) § 64]

15.12.080 EFFECTIVE DATE This Chapter shall take effect and be in full force upon its passage and adoption.

[Ord. 609 (2018) § 65]