



GEOLOGICALLY HAZARDOUS AREAS CRITICAL AREA/GEOTECHNICAL ENGINEERING REPORTS

What is a geologically hazardous area? Geologically hazardous areas are places highly susceptible to erosion, landslides, earthquakes, or other geologic events. Their designations are dependent upon slope, soil type, geologic material and hydrogeologic conditions.

Does my property contain a geo-hazard? To assist you in determining if your property contains a geo-hazard, you may contact Benton County Planning Department. Approximate locations of some critical areas in Benton County are available in the Benton County Planning Department and may also be shown on Benton County's GIS website: <https://tinyurl.com/BentonCoPlanningMap>

It is important to note that GIS maps are intended to be used as a guide and do not provide a definitive designation. In most cases an exact location of a critical area is to be determined through a field investigation by a qualified professional.

Classification and Designation. In Benton County, four types of geologically hazardous areas exist:

1. **Erosion Hazard:** Areas with 15% or greater slope and/or areas with 15% or greater slopes that contain soils designated as having severe erosion hazard potential.
2. **Landslide Hazard:** Slopes resulting from stream bank erosion, areas with historical landslide movements, areas mapped by the State of Washington's Department of Natural Resources as a landslide area and areas with 15% or greater slopes that have a permeable geologic unit overlying an impermeable unit and have springs or groundwater seeps.
3. **Seismic Hazard:** Areas that are 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.
4. **Other Hazard:** Geologically hazardous 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.

Qualified Professional. In Benton County a qualified professional is a professional engineering geologist, geologist, or civil engineer licensed in the State of Washington. The person will have obtained the necessary experience and training in the field as described in the Critical Area Ordinance.

Critical Area Report. A critical area report shall be developed by a qualified professional and submitted to the Planning Department for review. The report evaluates a project or proposal and all probable impacts to critical areas/project using scientifically valid methods and studies. A critical area report consists of **two** components:

1. The minimum report contents as described in BCC 15.02.190; and
2. The standards described in BCC 15.12.040 (Geotechnical Report) *and/or* BCC 15.12.050 (Geotechnical Risk Assessment) whichever applies to the hazard.

Benton County Code (BCC). The Critical Area Ordinance can be found in the Benton County Code. You can either contact the Planning Department or go online and locate the regulations at: <https://tinyurl.com/BentonCoWACode>

**MINIMUM REQUIREMENTS FOR
CRITICAL AREA/GEOTECHNICAL ENGINEERING REPORTS
BCC 15.02.190(c)**

At a minimum, the report shall contain the following:

- (1) The name and contact information of the applicant, a description of the proposal, and identification of the permit requested;
- (2) A copy of the site plan for the development proposal including: A map to scale depicting critical areas, buffers, the development proposal, and any areas to be cleared;
- (3) The dates, names, and qualifications of the persons preparing the report and documentation of any fieldwork performed on the site;
- (4) Identification and characterization of all critical areas, wetlands, water bodies, and buffers adjacent to the proposed project area;
- (5) A statement specifying the accuracy of the report, and all assumptions made and relied upon;
- (6) An assessment of the probable cumulative impacts to critical areas resulting from development of the site and the proposed development;
- (7) An analysis of site development alternatives;
- (8) A description of reasonable efforts made to apply mitigation sequencing pursuant to mitigation sequencing (Section 15.08.220) to avoid, minimize, and mitigate impacts to critical areas;
- (9) Plans for adequate mitigation, as needed, to offset any impacts, in accordance with mitigation plan requirements (Section 15.08.230), including but not limited to:
 - (i) The impacts of any proposed development within or adjacent to a critical area or buffer on the critical area; and
 - (ii) The impacts of any proposed alteration of a critical area or buffer on the development proposal, other properties and the environment.
- (10) A discussion of the performance standards applicable to the critical area and proposed activity;
- (11) Financial guarantees to ensure compliance;
- (12) Critical area reports for two or more types of critical areas must meet the report requirements for each relevant type of critical area;
- (13) Unless otherwise provided, a critical area report may be supplemented by or composed, in whole or in part, of any reports or studies required by other laws and regulations or previously prepared for and applicable to the development proposal site, as approved by the Planning Administrator; and
- (14) Any additional information required for the critical area as specified in this chapter.

**ADDITIONAL REQUIREMENTS FOR
CRITICAL AREA/GEOTECHNICAL ENGINEERING REPORTS
IN GEOLOGICALLY HAZARDOUS AREAS
BCC 15.12.040**

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.