

**17.65.050 Geologically Hazardous Areas.**

- A. Purpose. The purpose of this section is to protect human health, safety, and property from the threats posed by geologically hazardous areas. Geologically hazardous areas include areas susceptible to erosion, sliding, earthquake, or other geological events.
  
- B. Designation. Maps referenced below are to be used as a guide for the city, project applicants and property owners, and may be continuously updated as new critical areas are identified. Maps are generally intended as a screen of potentially hazardous areas and are for reference only and do not provide a final critical area designation.
  - 1. Erosion Hazard Areas. Erosion hazard areas are at least those areas identified by the U.S. Department of Agriculture’s Natural Resources Conservation Service as having a “moderate to severe,” “severe,” or “very severe” rill and inter-rill erosion hazard. Erosion hazard areas are also those areas impacted by shoreline and/or stream bank erosion, wave erosion zones, and those areas within a stream or river channel migration zone.
  
  - 2. Landslide Hazard Areas. Landslide hazard areas are areas potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. They include areas susceptible because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors. Example of these may include, but are not limited to the following:
    - a. Areas of historic failure, such as:
      - i. Those areas delineated by the U.S. Department of Agriculture’s Natural Resources Conservation Service as having a “severe” limitation for building site development;
      - ii. Those areas mapped by Washington State Department of Natural Resources slope stability mapping as unstable, unstable old slides, or unstable recent slides; or
      - iii. Areas designated as quaternary slumps, earthflows, mudflows, lahars, or landslides on maps published as the U.S. Geological Survey or the Washington State Department of Natural Resources.
  
    - b. Areas with two or more of the following characteristics:
      - i. A slope steeper than 15 percent.

- ii. Hillsides intersecting geologic contacts with a relatively permeable sediment or fractured rock overlying a relatively impermeable sediment or bedrock.
      - iii. Springs or groundwater seepage.
    - c. Areas that have shown movement during the Holocene epoch (from 10,000 years ago to the present) or that are underlain or covered by mass wastage debris of that epoch.
    - d. Slopes that are parallel or subparallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials.
    - e. Slopes having gradients greater than 80 percent subject to rock fall during seismic shaking.
    - f. Areas potentially unstable because of rapid stream incision, stream bank erosion, or undercutting by wave action.
    - g. Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris flows or catastrophic flooding.
    - h. Any area with a slope of 25 percent or steeper and with a vertical relief of 10 or more feet except areas composed of consolidated rock. A slope is delineated by establishing its toe and top and measured by averaging the inclination over at least 10 feet of vertical relief.
  - 3. Seismic Hazard Areas. Seismic hazard areas are areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement, soil liquefaction, lateral spreading, or surface faulting. Such areas may be shown on seismic hazard maps produced by the Washington State Department of Natural Resources.
  - 4. Other Hazard Areas. Geologically hazardous areas shall also include other areas determined by the city to be susceptible to other geological events.
- C. Partial Exemptions. The following activities are allowed in geologically hazardous areas, provided they are otherwise allowed pursuant to this chapter and other applicable regulations, and do not require submission of a critical area report:
- 1. Erosion and Landslide Hazard Areas. Except as otherwise provided for in this chapter, only those activities approved and permitted consistent with an approved critical area report may be allowed.
  - 2. Seismic Hazard Areas. All activities consistent with this chapter and other city regulations may be allowed.

3. Other Hazard Areas. The city may allow the following activities within other geologically hazardous areas, if the activity will not increase the risk of the hazard:
  - a. Construction of new buildings with less than 2,500 square feet of floor area or roof area, whichever is greater, and which are not residential structures or used as places of employment or public assembly;
  - b. Additions of 250 square feet or less to existing residences; and
  - c. Installation of fences.

D. Critical Areas Report.

1. When Required. A critical area report for geologically hazardous areas shall be required when an erosion, landslide, or other hazard area is located within 200 feet of a project area or has the potential to be affected by the proposal, unless the proposal is a partial exemption specified in subsection C, above.
2. Additional Requirements. In addition to the general critical area report requirements of BMC 17.65.010.L.Critical Area Report, critical area reports for geologically hazardous areas must meet the following requirements:
  - a. Preparation by a Qualified Professional. A critical areas report for a geologically hazardous area shall be prepared by an engineer or geologist, licensed in the state of Washington, with experience analyzing geologic, hydrologic, and ground water flow systems, and who has experience preparing reports for the relevant type of hazard.
  - b. Areas Addressed. The following areas shall be addressed in a critical area report for geologically hazardous areas:
    - i. The project area of the proposed activity; and
    - ii. All erosion, landslide, or other hazard areas within 200 feet of the project area or that have the potential to be affected by the proposal.
  - c. Geological Hazards Assessment. A critical area report for a geologically hazardous area shall contain a geological hazards assessment, including, at a minimum, the following site- and proposal-related information:

- i. Site and Construction Plans. The report shall include plans for the proposal showing, as applicable:
  - (a) The type and extent of geologic hazard areas and other critical areas, including their buffers, within 200 feet of the project area, or farther than 200 feet from the project area if such areas might impact the proposal.
  - (b) 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.
  - (c) Topography, in two-foot contours.
  - (d) Clearing limits.
- ii. Assessment of Geological Characteristics. The report shall include an assessment of the geologic characteristics of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted classification systems. The assessment shall include, but not be limited to:
  - (a) A description of the surface and subsurface geology, hydrology, soils, and vegetation found in the project area and in all hazard areas addressed in the report.
  - (b) A detailed overview of field investigations; published data, and references; data and conclusions from past assessments of the site; and site-specific measurements, tests, investigations, or studies that support the identification of geologically hazardous areas.
  - (c) A description of the vulnerability of the site to seismic and other geologic events.
- iii. Analysis of Proposal. The report shall contain a hazards analysis including a detailed description of the project, its relationship to the geologic hazard(s), and its potential impact upon the hazard area, the subject property, and affected adjacent properties.

- iv. Minimum Buffer and Building Setback. The report shall make a recommendation for the minimum no-disturbance buffer and minimum building setback from any geologic hazard.
- v. Mitigation of Long-Term Impacts. If a hazard is identified, a mitigation plan must be included that specifically addresses how the activity maintains or reduces the pre-existing level of risk to the site and adjacent properties on a long-term basis (equal to or exceeding the projected lifespan of the activity or occupation). Proposed mitigation techniques shall be considered to provide long-term hazard reduction only if they do not require regular maintenance or other actions to maintain their function. Mitigation may also be required to avoid any increase in risk above the pre-existing conditions following abandonment of the activity.
- d. Incorporation of Previous Study. Where a valid critical areas report has been prepared within the last five years for a specific site, and where the proposed land use activity and surrounding site conditions are unchanged, said report may be incorporated into the required critical area report. The applicant shall submit a critical areas report addendum detailing any changed environmental conditions associated with the site.

E. Performance Standards.

1. General Standards.

- a. Alterations of geologically hazardous areas or associated buffers may only occur for activities that:
  - i. Will not increase the threat of the geological hazard to adjacent properties beyond pre-development conditions;
  - ii. Will not adversely impact other critical areas;
  - iii. Are designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than pre-development conditions; and
  - iv. Are certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington.

- b. Critical facilities shall not be sited within or below geologically hazardous areas unless there is no other practical alternative.
2. Erosion and Landslide Hazard Area Standards. Activities on sites containing erosion or landslide hazards shall meet the standards in BMC 17.65.050.E.1, General Standards, and the following requirements.
- a. Landslide Hazard Area Buffers. A buffer shall be established from all edges of landslide hazard areas. The size of the buffer shall eliminate or minimize the risk of property damage, death, or injury resulting from landslides caused in whole or part by the development, based upon a critical area report.
    - i. The minimum buffer shall be equal to the height of the slope or 50 feet, whichever is greater.
    - ii. The buffer may be reduced to a minimum of 10 feet when a qualified professional demonstrates that the reduction will adequately protect the proposed development, adjacent developments, and uses and the subject critical area.
    - iii. The buffer may be increased where a larger buffer is necessary to prevent risk of damage to proposed and existing development.
  - b. Alterations. Alterations of an erosion or landslide hazard area and/or buffer may only occur for activities for which a geologic hazard assessment is submitted and certifies that:
    - i. The development will not increase surface water discharge or sedimentation to adjacent properties beyond pre-development conditions;
    - ii. The development will not decrease slope stability on adjacent properties; and
    - iii. Such alterations will not adversely impact other critical areas.
  - c. Design Standards. Development within an erosion or landslide hazard area and/or buffer shall be designed to meet the following basic requirements unless it can be demonstrated that an alternative design that deviates from one or more of these standards provides greater long-term slope stability while meeting all other provisions of this chapter. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to

maintain their level of function. The basic development design standards are:

- i. Structures and improvements shall be clustered to avoid geologically hazardous areas and other critical areas.
  - ii. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography.
  - iii. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation.
  - iv. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties.
  - v. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes.
  - vi. Development shall be designed to minimize impervious lot coverage.
- d. **Vegetation Retention.** Unless otherwise provided or as part of an approved alteration, removal of vegetation from a landslide hazard area or related buffer shall be prohibited without a geological evaluation and report.
- e. **Seasonal Restriction.** Clearing shall be allowed only from May 1 to October 1 of each year provided that the city may extend or shorten the dry season on a case-by-case basis depending on actual weather conditions, except that timber harvest, not including brush clearing or stump removal, may be allowed pursuant to an approved forest practice permit issued by the city or the Washington State Department of Natural Resources.
- f. **Utility Lines and Pipes.** Utility lines and pipes shall be permitted in erosion and landslide hazard areas only when the applicant demonstrates that no other practical alternative is available. The line or pipe shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of an underlying slide. Stormwater conveyance shall be allowed only through a high-density polyethylene pipe with fuse-welded joints, or similar product that is technically equal or superior.

- g. Point Discharges. Point discharges from surface water facilities and roof drains onto or upstream from an erosion or landslide hazard area are prohibited, except if:
  - i. Conveyed via continuous storm pipe downslope to a point where there are no erosion hazards areas downstream from the discharge;
  - ii. Discharged at flow durations matching predeveloped conditions, with adequate energy dissipation, into existing channels that previously conveyed stormwater runoff in the predeveloped state; or
  - iii. Dispersed discharge upslope of the steep slope onto a low-gradient undisturbed buffer is demonstrated to be adequate to infiltrate all surface and stormwater runoff, and where it can be demonstrated that such discharge will not increase the saturation of the slope.
  
- h. Subdivisions. All land divisions in landslide hazard areas and associated buffers are subject to the following:
  - i. Land that is located wholly within a landslide hazard area or its buffer may not be subdivided. Land that is located partially within a landslide hazard area or its buffer may be divided provided that each resulting lot has sufficient buildable area outside of, and will not affect, the landslide hazard or its buffer.
  - ii. Access roads and utilities may be permitted within the landslide hazard area and associated buffers if the city determines that no other feasible alternative exists and any hazards can be adequately mitigated.