

Summary of Notable Landslide Hazard Regulations* in Other Jurisdictions

(*not an exhaustive list of triggers, exemptions, standards, etc.)

Salem, OR (Ch. 810): The City of Salem’s ordinance was highlighted in DLCD’s “Planning for Natural Hazards: Oregon Technical Resource Guide, 2000” as a “good example of regulating development in steep-slope and landslide prone areas”

Permit Triggers
Applies to all the following development in moderate and high landslide hazard risk areas: <ul style="list-style-type: none"> • Excavation or fill >2-feet in depth or 25cy volume • Structure >500sf • Land division • Tree removal on slopes >60% (tree removal is defined term)
Exemptions
Excavations and fill exceeding permit triggers within public ROW or public utility easement
Emergency work to prevent imminent threat to public
Standards
Geological assessment must be prepared and stamped by CEG
Geotechnical report must be prepared and stamped by CEG <u>and</u> Geotechnical engineer (GE)
Code establishes matrix point system tables to calculate landslide risk. Higher score requires move involved reporting (no report, geological assessment or geotechnical report)
No final approval will be provided without written statement by Geotechnical Engineer that project completed as recommended.

Marion County, OR (ch. 17.182): Geologically Hazardous Areas Overlay Zone

Permit Triggers
The following development: <ul style="list-style-type: none"> • Residential, commercial, industrial and farm buildings • Excavation • Filling • Subdivisions, partitions • Construction or alteration of any structure of public infrastructure • Construction, reconstruction and maintenance of on-site sewage disposal systems • Construction of any new public or private road or driveway • Construction or enlargement of ponds • Grading activities
Exemptions
The following are exempt: <ul style="list-style-type: none"> • Activities conducted pursuant to Oregon State Forest Practices Act • Agricultural activities

<ul style="list-style-type: none"> • Operation, maintenance and reconstruction of existing roads, streets, driveways and utility lines and associated structures. Installation of new infrastructure in improved ROW. • Test pits/borings, etc. • Emergency actions
Standards
Geological assessment must be prepared and stamped by CEG
Geotechnical report must be prepared and stamped by Geotechnical engineer (GE)
Code establishes matrix point system tables to calculate landslide risk. Higher score requires move involved reporting. Higher score requires move involved reporting (no report, geological assessment or engineering geology report)

Clackamas County, OR (Ch. 1002 & 1003): Protection of Natural Features (Hillsides) & Hazards to Safety

Permit Triggers
Clackamas Co permit review triggers are based on slope percent rather than landslide hazard maps. 20%, 25% and 35% are triggers.
Exemptions
Standards
Generally, residential development on slopes 20-25% must: <ul style="list-style-type: none"> • Cluster buildings, minimize building pad grading (no “mass pad grading”) • Limit grading to no more than 30% of slopes 20 percent or more on site. Variance option exists. Generally, residential development on slopes >25% must: <ul style="list-style-type: none"> • Supply engineering geologic study establishing site is suitable for the development • Supply a surface water management plan (ch. 1006.06) • Demonstrate not feasible to develop on lesser slopes Diversion of stormwater into areas of land movement (as identified on DOGAMI maps) prohibited

Washington County, OR (Ch. 410-4): Landslide Study Area Requirements

Permit Triggers
Grading lands on adopted Landslide Study Area Maps or within 250-feet of property that within High or Moderate susceptibility for shallow or deep landslide susceptibility
Exemptions
Replacement dwelling given prior dwelling’s lot coverage not exceeded
DEQ permitted disposal sites
Excavations or fills for public roads and transportation facilities substantially in the public ROW
Surface mining
Other exemptions found in 201.2-12: (excavations authorized by building permit, graves, wells, tunnels, utilities, county contracted projects, exploratory excavations by geologist or engineer, forest and agriculture access roads (with limitations such as 3-foot cut/fill threshold), farming, soil or water conservation projects approved by SWCD, excavations less than 2-feet depth and which does not create a cut slope greater than 5 feet in height and steeper than 1.5:1 (H:V), importing fill less than 150 cy, underground pipes and conduits.
Standards

Engineering geology report address any potential landslide hazards. Must be prepared and stamped by Oregon Certified Engineering Geologist
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Portland, OR

Permit Triggers
Land division where any portion of the site is within a potential landslide hazard area (33.632.020)
Removing 5 or more trees on a site with an average slope of at least 20% requires a geotechnical engineering report to assess stability of site (unclear whether this is different than LHS – 24.70.020)
Exemptions
Standards
Landslide Hazard Study (LHS) must be prepared by a Certified Engineering Geologist (CEG) <u>and</u> a Geotechnical Engineer (PE)
LHS must provide statement of the estimated effect of the development on stormwater and ground water runoff as it relates to slope stability. LHS must provide statement of proposed method of stormwater control.
LHS must determine “whether the proposed layout and design reasonably limits the risk of a landslide” ...to a “reasonably safe level” (33.632.100)

Snohomish County, WA (Oso landslide location) - 30.62B, Geologically Hazardous Areas

Permit Triggers
Applies to development activities in geologically hazardous areas including clearing
Exemptions
Structural and property improvements that don’t disturb ground
Routine landscape maintenance of established, ornamental landscaping
Removal of noxious weeds
Maintenance and replacement of septic tanks, drainfields, wells, individual utilities, cemetery plots – if area not expanded.
Scientific data collection by non mechanical means, including surveying and monument placement. Includes soil testing.
Agricultural activities
Standards
Geotechnical report required for development in a landslide hazard area or within 200-feet of any faults. Report shall be prepared, stamped and signed by a licensed engineer or geologist.
County may require independent consultant review at applicant’s expense. Applicant pays deposit at application submittal for this second review which is returned if unused upon issuance of final decision.
Covenant between property owner and county is required to be recorded for approval in landslide hazard area (county projects exempt from this requirement). Covenant describes project and specific risks identified in the geotechnical report. Covenant clarifies owner accepts responsibility of risk and waives right to assert claim against county.
Finding of no alternative location outside of landslide zone must be made when a structure is proposed in landslide hazard areas.
Permit required for tree removal, except for hazardous trees based on review by arborist
Snohomish Co. code has very specific design guidelines for stormwater, utilities, etc.

DLCD Publication – Planning for Natural Resources: Oregon Technical Resources Guide (2000)

Recommended Permit Triggers
Recommended Exemptions
Recommended Standards
Require peer review of geotechnical studies: <ul style="list-style-type: none"> • Require CEG <u>and</u> PE stamp geotechnical reports, or... • Local governments can adopt allowance that owner pay for another engineer to review proposal and provide second opinion, or... • Conduct internal review of geotechnical study if only one professional preparing report
Require landslide study for subdivisions
Avoid construction of large impervious surfaces, don't concentrate flow, direct stormwater away from hazardous areas
Prohibit siting of critical facilities in extreme landslide hazard areas

Oregon Revised Statutes 195.260: Duties of local governments, state agencies and landowners in landslide hazard areas*

**Limited to rapidly moving landslides.*

Permit Triggers
Local government <u>may</u> require geotechnical report before issuing building permit. If report required, <u>shall</u> provide for coordinated review of report by DOGAMI or State Forestry Department. Applies to dwellings and other structures designed for human occupancy. Structures exempt from building code exempt from geotechnical report requirement
Exemptions
Standards
Landowner shall sign statement (must also be recorded) that acknowledges inability to bring future action against adjacent landowner for effects of rapidly moving landslides.
Local government cannot adopt ordinance that limits use of land in addition (beyond) lands mapped by DOGAMI or Forestry Department for rapidly moving landslides.

Oregon Structural Specialty Code (2014) – Chapter 18: Soils and Foundations

Permit Triggers
Seismic site hazards report (includes evaluation of earthquake-induced landslide risk) required for essential facilities, hazardous facilities, major structures and special occupancy structures as defined by ORS 455.447: <ul style="list-style-type: none"> (a) “Essential facility” means: <ul style="list-style-type: none"> (A) Hospitals and other medical facilities having surgery and emergency treatment areas; (B) Fire and police stations;

(C) Tanks or other structures containing, housing or supporting water or fire-suppression materials or equipment required for the protection of essential or hazardous facilities or special occupancy structures;

(D) Emergency vehicle shelters and garages;

(E) Structures and equipment in emergency-preparedness centers;

(F) Standby power generating equipment for essential facilities; and

(G) Structures and equipment in government communication centers and other facilities required for emergency response.

(b) **“Hazardous facility”** means structures housing, supporting or containing sufficient quantities of toxic or explosive substances to be of danger to the safety of the public if released.

(c) **“Major structure”** means a building over six stories in height with an aggregate floor area of 60,000 square feet or more, every building over 10 stories in height and parking structures as determined by Department of Consumer and Business Services rule.

(d) **“Seismic hazard”** means a geologic condition that is a potential danger to life and property that includes but is not limited to earthquake, landslide, liquefaction, tsunami inundation, fault displacement, and subsidence.

(e) **“Special occupancy structure”** means:

(A) Covered structures whose primary occupancy is public assembly with a capacity greater than 300 persons;

(B) Buildings with a capacity greater than 250 individuals for every public, private or parochial school through secondary level or child care centers;

(C) Buildings for colleges or adult education schools with a capacity greater than 500 persons;

(D) Medical facilities with 50 or more resident, incapacitated patients not included in subparagraphs (A) to (C) of this paragraph;

(E) Jails and detention facilities; and

(F) All structures and occupancies with a capacity greater than 5,000 persons.