4.11.132Natural Hazards (Balance of County Policy 5.11)

Coos County has inventoried the following ***hazards*:**

- Flood Hazard
    - Riverine flooding
    - Coastal flooding
- Landslides and Earthquakes
    - Landslide Susceptiblitiy
    - Liquefaction potential
- Tsunamis
- Erosion
    - Riverine streambank erosion
    - Coastal
        - Shoreline and headlands
        - Wind
- Wildfire

Purpose Statements:
Coos County shall regulate development in known areas potentially subject to natural disasters and hazards, so as to minimize possible risks to life and property. Coos County considers natural disasters and hazards to include ***river and coastal flooding, landslides, liquefaction potential due to earthquakes, fault lines, tsunamis, river bank erosion, coastal erosion along shorelines and headlands, coastal erosion due to wind, and wildfires, including those areas affected by gorse.***

This strategy shall be implemented by enacting special protective measures through zoning and other implementing devices, designed to minimize risks to life and property associated with new development and substantial improvements. ***The determination of whether a property is located in one of the above referenced potentially hazardous areas shall be made by the reviewing body (Planning Director, Planning Commission, Board of Commissioners, or any designee based upon adopted inventory mapping). A specific site may not include the characteristics for which it is mapped. In these circumstances staff shall apply §*** 4.11.132.ii.2m.

b. Landslides and Earthquakes

Landslides: Coos County shall promote protection to life and property in areas potentially subject to landslides. New development or substantial improvements proposed in such areas shall be subject to geologic assessment review in accordance with section 4.11.150. Potential landslide areas subject to geologic assessment review shall include all lands partially or completely within "very high" landslide susceptibility areas as mapped in DOGAMI Open File Report O-16-02, "Landslide susceptibility map of Oregon."

Earthquakes: Coos County shall promote protection of life and property in areas potentially subject to earthquake hazards. New development or substantial improvements in mapped areas identified as potentially subject to earthquake induced liquefaction shall be subject to a geologic assessment review as set out in this section. Such areas shall include lands subject to "very high" and "high"

liquefaction identified in DOGAMI Open File Report O-13-06, "Ground motion, ground deformation, tsunami inundation, co-seismic subsidence, and damage potential maps for the 2012 Oregon Resilience Plan for Cascadia Subduction Zone Earthquakes."

Coos County shall continue to support Oregon State Building Codes to enforce any structural requirements related to landslide and earthquakes. Staff will notify Oregon State Building Codes by providing a copy of the geologic assessment report with the Zoning Compliance Letter.

4.11.150 Geological Hazards special development Review Standards

Applications for a geologic hazard review may be made concurrently with any other type of application required for the proposed use or activity. A review of the property must be conducted prior to any ground disturbance. All geologic hazard assessment reports shall include a description of the qualification of the licensed professional or professionals that prepared the assessment.

The applicant shall present a geologic hazard assessment report (geologic assessment) prepared by a qualified licensed professional competent in the practice of geosciences, at the applicant's expense, that identifies site specific geologic hazards, associated levels of risk, and the suitability of the site for the use and/or activity in view of such hazards. The geologic assessment shall include the required elements of this section and one of the following:

a. A statement that the use and/or activity can be accomplished without measures to mitigate or control the risk of geologic hazard to the subject property resulting from the proposed use and/or activity;
b. A statement that there is an elevated risk posed to the subject property by geologic hazards that requires mitigation measures in order for the use and/or activity to be undertaken safely sited on the property; or
c. A certification that there are no high or very high geological hazards present on site. If such is certified by a licensed profession then an application is not required. Coos County is not liable for any type of certification that a geological hazard is not present on site.

4.11.155 Geological Assessment review

Geologic Assessment Review: The applicant(s) shall complete the following review to determine compliance with this section. This type of review requires a conditional use application and shall follow the administrative procedures for conditional uses found in Article 5 of the CCZLDO.

1. Except for activities identified in Subsection 2 of this section, as exempt, any new development or substantial improvement in an area subject to the provisions of this section shall require a Geologic Assessment Review.

2. The following development activities are exempt from the requirement for a Geologic Assessment Review:
    a. Maintenance, repair, or alterations to existing structures that do not alter the building footprint or foundation and do not constitute substantial improvement as defined in Chapter II.
    b. An excavation and/or fill which is less than two feet in depth, or which involves less than twenty-five cubic yards of volume;

c. Exploratory excavations under the direction of a certified engineering geologist or registered geotechnical engineer;
d. Construction of structures for which a building permit is not required;
e. Yard area vegetation maintenance and other vegetation removal on slopes less than 25%;
f. Forest operations subject to regulation under ORS 527 (the Oregon Forest Practices Act);
g. Maintenance and reconstruction of public and private roads, streets, parking lots, driveways, and utility lines, provided the work does not extend outside of the previously disturbed area;
h. Maintenance and repair of utility lines, and the installation of individual utility service connections;
i. Emergency response activities intended to reduce or eliminate an immediate danger to life, property, or flood or fire hazard;
j. Construction/erection of beachfront protective structures subject to regulation by the Oregon Parks and Recreation Department under OAR 736, Division 20; and
k. Any development or activity to be conducted on a site for which a certified engineering geologist has determined that there are no high or very high geologic hazards present. Coos County is not liable for any type of certification that a geologic hazard is not present on site.

3. Application, review and appeals for a Geologic Assessment Review shall be in accordance with the requirements for administrative conditional use review as set forth in Article 5.2. Applications for a Geologic Assessment Review may be made prior to or concurrently with any other type of application required for the proposed use or activity. Geologic Assessment Review shall be completed prior to any ground disturbance.

4. All applications for Geologic Assessment Review shall be accompanied by an engineering geologic report prepared by a certified engineering geologist at the applicant's expense.

A. ENGINEERING GEOLOGIC REPORTS

1. Engineering geologic reports required pursuant to this section shall be prepared by a certified engineering geologist licensed in the State of Oregon. Such reports shall be prepared consistent with standard geologic practices and employing generally accepted scientific and engineering principles. The content of such reports shall be generally consistent with the applicable provisions of "Guideline for Preparing Engineering Geologic Reports," 2nd Edition, 5/30/2014, published by the Oregon Board of Geologist Examiners.

2. Properties abutting the ocean shore that are located in a mapped regulated hazard area shall include the following additional information :
    a. Site description:
        i. The geological history and stabilization measures of the site including any previous riprap or dune grading, erosion events, or exposed trees on the beach.
        ii. Topography, including elevations and slopes on the property itself.
        iii. Vegetation cover.
        iv. Subsurface materials – the nature of the rocks and soils.
        v. Conditions of the seaward front of the property, particularly for sites having a sea cliff.
        vi. Description of streams or other drainage that might influence erosion or locally reduce the level of the beach.
        vii. If the site is located on or adjacent to a estuarine water body or Coastal Lake including the Coastal Shoreland Boundary the following additional information shall be included:

1. Presence of drift logs or other flotsam on or within the property.
2. Proximity of nearby headlands that might block the longshore movement of beach sediments, thereby affecting the level of the beach in front of the property.
3. Description of any shore protection structures that may exist on the property or on nearby properties.
4. Presence of pathways or stairs from the property to the beach.
5. Existing development including modification of soil or vegetation on the site, particularly any which might alter the resistance to wave attack.
6. Average widths of the beach during the summer and winter.
7. Median grain size of beach sediment.
8. Average beach slopes during the summer and winter.
9. Elevations above mean sea level of the beach at the seaward edge of the property during summer and winter.
10. Presence of rip currents and rip embayments that can locally reduce the elevation of the fronting beach.
11. Presence of rock outcrops and sea stacks, either offshore or within the beach zone.
12. Information regarding the depth of beach sand down to bedrock at the seaward edge of the property.

b. Analyses of Erosion and Flooding Potential on the site:
   i. Analysis of DOGAMI beach monitoring data for the site (if available,) all activities affecting shoreline erosion and possible mass wasting, including weathering processes, land sliding or slumping.
   ii. Calculation of wave run-up beyond mean water elevation that might result in erosion of the sea cliff or foredune (see Stockdon, 2006).[1]
   iii. Evaluation of frequency that erosion-inducing processes could occur, considering the most extreme potential conditions of unusually high water levels together with severe storm wave energy.
   iv. For areas subject to dune-backed shorelines, use an established geometric model to assess the potential distance of property erosion, and compare the results with direct evidence obtained during site visits, aerial photo analysis, or analysis of DOGAMI beach monitoring data.
   v. For bluff-backed shorelines, use a combination of published reports, such as DOGAMI bluff and dune hazard risk zone studies, aerial photo analysis, and fieldwork to assess the potential distance of property erosion.
   vi. Description of potential for sea level rise, estimated for local area by combining local tectonic subsidence or uplift with global rates of predicted sea level rise.

c. Determination of legal restrictions of shoreline protective structures (Goal 18 prohibition, local conditional use requirements, priority for non-structural erosion control methods).

d. Assessment of potential reactions to erosion events, addressing the need for future erosion control measures, building relocation, or building foundation and utility repairs.

e. The assessment should include recommendations:
   i. Use results from the above analyses to establish setbacks (beyond any minimums

[1]Stockdon, H. F., Holman, R. A., Howd, P. A. and Sallenger, A. H., 2006, Empirical parameterization of setup, swash, and runup: Coastal Engineering, 53, p 573-588.

set by this section or the underlying zone), building techniques, or other mitigation measures to ensure an acceptable level of safety and compliance with all local requirements.

ii. Recommend a foundation design, or designs, that render the proposed structures readily moveable.

iii. Recommend a plan for preservation of vegetation and existing grade within the setback area, if appropriate.

iv. Include consideration of a local variance process to reduce the building setback on the side of the property opposite the ocean, if this reduction helps to lessen the risk of erosion, bluff failure or other hazard.

v. Recommend methods to control and direct water drainage away from the ocean (e.g. to an approved storm water system); or, if not possible, to direct water in such a way so as to not cause erosion or visual impacts.

3. Engineering geologic reports required by this section shall include a statement from the preparer of the report that all of the applicable content requirements of this subsection have been addressed or are not applicable to the review.

4. Engineering geologic reports required by this section shall be valid for a period of five years from the date of preparation of such report. No extensions to this time line shall be granted.

B. DECISIONS ON GEOLOGICAL ASSESSMENT REVIEWS

A decision on a Geologic Assessment Review shall be based on the following standards:

1. The engineering geologic report shall meet the content standards set forth in within this Section.
2. In approving a Geologic Assessment Review, the decision maker may impose any conditions which are necessary to ensure compliance with the provisions of this section or with any other applicable provisions of the Coos County Zoning and Land Development Ordinance.
3. In the event the decision maker determines that additional review of the engineering geologic report by an appropriately licensed and/or certified professional is necessary to determine compliance with this section, Coos County may retain the services of such a professional for this purpose. The applicant shall be responsible for all costs associated with the additional review. The results of that evaluation shall be considered in making a decision on the Geologic Assessment Review.

C. DEVELOPMENT STANDARDS FOR USES SUBJECT TO GEOLOGIC ASSESSMENT REVIEW

In addition to the conditions, requirements and limitations imposed by a required engineering geologic report, all uses subject to a geologic assessment review shall conform to the following requirements:

1. Historical, Cultural, and Archaeological Resources: All activities and uses subject to Geologic Assessment Reviews proposed for areas of historical, cultural, or archaeologically sensitive areas, as identified on the Coos County Comprehensive Plan Map, shall require consultation with the appropriate local Tribe prior to the commencement of any and all ground disturbing activity. Proof of this consultation shall be provided as a part of application submission.
2. Hazard Disclosure Statement: All applications for new development or substantial improvements subject to Geologic Assessment Review shall provide a Hazard Disclosure Statement signed by the property owner that acknowledges:
    a. The property is subject to potential natural hazards and that development thereon is subject to risk of damage from such hazards;
    b. The property owner has commissioned an engineering geologic report for the subject property, a copy of which is on file with Coos County Planning Department, and that the property owner has reviewed the engineering geologic report and has thus been informed and is aware of the type and extent of hazards present and the risks associated with

development on the subject property;

c. The property owner accepts and assumes all risks of damage from natural hazards associated with the development of the subject property.

3. Mitigation measures: If on-site structural mitigation measures are required as a condition of approval, the applicant shall, prior to the issuance of a zoning compliance letter, record on the title to the subject property a notification that includes a description of the measures or improvements and that also specifies the obligation of the property owners to refrain from interfering with such measures or improvements and to maintain them.
4. Safest site requirement: All new structures shall be located within the area most suitable for development based on the least exposure to risk from hazards as determined by an engineering geologist as part of an engineering geologic report prepared in accordance with Section 4.11.150 through 4.11.155. Notwithstanding the provisions of the underlying zone, as necessary to comply with this requirement, any required yard or setback may be reduced by up to 50% without a variance.
5. Certification of compliance: Permitted development shall comply with the recommendations in the required engineering geologic report. Certification of compliance shall be provided to the director by the applicant as follows:
    a. Plan Review Compliance: Building, construction or other development plans shall be accompanied by a written statement from a certified engineering geologist stating that the plans comply with the recommendations contained in the engineering geologic report for the approved Geological Assessment Review.
    b. Inspection Compliance: Upon the completion of any development activity for which the engineering geologic report recommends an inspection or observation by a certified engineering geologist, the applicant shall provide to the director a written statement from the certified engineering geologist indicating that the development activity has been completed in accordance with the applicable engineering geologic report recommendations.
    c. Final Compliance: Upon completion of development requiring an engineering geologic report, the applicant shall submit to the director:
        i. A written statement by a certified engineering geologist indicating that all performance, mitigation, and monitoring measures specified in the report have been satisfied; and,
        ii. If mitigation measures incorporate engineering solutions designed by a licensed professional engineer, a written statement of compliance by the design engineer.

Section 5.11.100 geologic assessment Requirements

1. Applications for a geologic hazard review may be made concurrently with any other type of application required for the proposed use or activity. A review of the property must be conducted prior to any ground disturbance. All geologic hazard assessment reports shall include a description of the qualification of the licensed professional or professionals that prepared the assessment.

2. The applicant shall present a geologic hazard assessment report (geologic assessment) prepared by a qualified licensed professional competent in the practice of geosciences, at the applicant's expense, that identifies site specific geologic hazards, associated levels of risk, and the suitability of the site for the use and/or activity in view of such hazards. The geologic assessment shall include an analysis of the risk of geologic hazards on the subject property including the upslope and downslope properties that may be at risk from, or pose a risk to, the use and/or activity. The geologic hazard assessment shall also address the erosion impacts, any increase in storm water runoff, and any diversion or alteration of natural storm water runoff patterns resulting from the use and/or activity. The geologic hazard assessment shall include one of the following:
    a. A statement that the use and/or activity can be accomplished without measures to mitigate or control the risk of geologic hazard to the subject property resulting from the proposed use and/or activity;
    b. A statement that there is an elevated risk posed to the subject property by geologic hazards that requires mitigation measures in order for the use and/or activity to be undertaken safely sited on the property; or
    c. A certification that there are no geological hazards present on site. If such is certified by a licensed profession then an application is not required. Coos County is not liable for any type of certification that a geological hazard is not present on site.
3. If the assessment identifies any past or present risk then an administrative conditional use is required to evaluate such risk and if mitigation measures are necessary to ensure that proposed development can be safely sited. The assessment shall describe and recommend how the proposed use and/or activity will be adequately protected from geologic hazards, including land sliding and sloughing, soil erosion or deposition, and earthquakes.

   If structural requirements are part of the recommendation, then as a condition of approval, an engineering geologic report consistent with standard geologic practices and generally accepted scientific and engineering principles is required and shall, at a minimum, be consistent with the Oregon State Board of Geologist Examiners "Guidelines for Preparing Engineering Geologic Reports in Oregon". This shall be supplied to the planning department to be attached to a zoning compliance before a building permit may be obtained.

Section 5.11.200 Geotechnical application Reviews

An application for a geotechnical review shall be reviewed under an administrative conditional use procedure unless Section 5.11.100.2 applies.

1. A geologic hazard assessment shall be deemed complete if the geologic report meets the content standards listed in Section 5.11.300.
2. Specific recommendations contained in the geologic report shall be incorporated into the approval as conditions. Based on content, recommendations and conclusions of the geotechnical report, the decision maker may apply other reasonable conditions.
3. The specific recommendations contained in the geotechnical report, and conditions applied to the geologic hazard permit shall be incorporated into the plans and specifications of the development which is the subject of the development permit.
4. The review requires an administrative application and all components shall be submitted with the Coos County Zoning and Land Development Ordinance (CCZLDO) §5.0.150 and Section 5.11.300. This review will be processed in accordance with Article 5.2.
5. At the discretion of the decision maker and at the applicant's expense, it may be required to have an evaluation of a geologic assessment by another expert as part of the review of a land use application located in an area subject to this section. The results of that evaluation shall be used in making the final decision on the effected land use application.
6. If § 5.11.100.2.b applies then prior to approval of the use and/or activity, the applicant shall provide a mitigation plan specific to the use and/or activity, including land divisions, and the approved geologic hazard mitigation report shall address the following:
    a. The mitigation plan must adequately address all issues identified in the geologic hazard mitigation report and must identify any potential appropriate protection methods for the subject property;
    b. The mitigation plan shall specify which, if any, measures and improvements must be installed or constructed under the direction of a supervising engineer;
    c. The applicant shall, prior to the issuance of any development permits, record on the title to the subject property a notification that includes a description of the measures or improvements and that also specifies the obligation of the property owners to refrain from interfering with such measures or improvements and to maintain them; and
    d. A schedule of inspections to be completed by the geologist or engineer to assure compliance with recommendations.

Section 5.11.300 application and development Standards for geotechnical applications:

The review and approval of a conditional use in a Geologic Hazard Special Development Consideration area shall be based on the conformance of the proposed development plans with the following standards. Conditions of approval may be imposed on the development permit to assure that the development plan meets the standards of this section and to prevent the creation of a hazard to public or private property.

1. All Geologic Assessments are valid as prima facie evidence of the information therein contained for a period of five (5) years. Coos County assumes no responsibility for the quality or accuracy of such reports.
2. The geologic assessment shall include the following:

a. A topographic plot plan that shall include to scale:
    i. All adjacent, contiguous and related property identified in the geologic hazard assessment as being at risk from, or posing a risk to, the use and/or activity;
    ii. The degree of slope on the subject and adjacent properties;
    iii. All features on the subject and adjacent properties that may cause or contribute to mass movement. Such features shall specifically include any landslide, bluff failure or shoreline erosion that could migrate upslope into the subject or adjacent properties;
    iv. The location of all identified geomorphic features and micro-topographic features related to the identified geologic hazards;
    v. All on site or adjacent features or conditions, which contribute to the hazard or risk from the hazard(s); and
    vi. A map that depicts features and conditions associated with any building site or construction site associated with the development activity.
b. A technical analysis and narrative describing the following:
    i. The geologic features or conditions of the property as well as those features or conditions which gave rise to the hazard from the use and/or activity;
    ii. All features related to earth movement or geologic instability on adjacent touching parcels or lots to the site;
    iii. The results of all geologic and/or engineering tests performed on soils, material, and rock type subsurface data from drill holes, or other data obtained from the site investigation with data points clearly identified on a map;
    iv. Whether the proposed development activity can be sited in a manner to mitigate the substantial risk to the subject property in view of the geological hazards and risks that have been identified in the geologic assessment;
    v. All features related to earth movement or geologic instability on, adjacent to, upslope or downslope from the subject property;
    vi. A clear statement of all requirements or conditions on the use and/or activity that the geologist has determined are necessary to mitigate the geologic hazards that require mitigation; and
    vii. A schedule of inspections to be completed by the geologist or engineer to assure compliance with recommendations.

3. Additional Standards for Oceanfront Development. In addition to the requirements set forth in this subsection, geotechnical assessments for lots or parcels abutting the ocean shore shall include the following information, analyses, and recommendations:
    a. Site description:
        i. The history of the site and surrounding areas, such as previous riprap or dune grading permits, erosion events, exposed trees on the beach, or other relevant local knowledge of the site;
        ii. Topography, including elevations and slopes on the property itself;
        iii. Vegetation cover;

iv. Subsurface materials – the nature of the rocks and soils;
v. Conditions of the seaward front of the property, particularly for sites having a sea cliff;
vi. Description of streams or other drainage that might influence erosion;
vii. Description of any shore protection structures that may exist on the property; and
viii. Presence of pathways or stairs from the property to the beach.

b. Analyses of erosion and flooding potential:
   i. Analysis of DOGAMI beach monitoring data for the site, if available;
   ii. Analysis of possible mass wasting, including weathering process, land sliding, or slumping;
   iii. Calculation of wave run-up beyond mean water elevation that might result in erosion of the sea cliff or foredune (see Stockdon, 2006[2]);
   iv. Evaluation of frequency that erosion-inducing processes could occur, considering the most extreme potential conditions of unusually high water levels together with severe storm wave energy;
   v. For dune-backed shoreline, use established geometric model to assess the potential distance of property erosion, and compare the results with direct evidence obtained during a site visit, aerial photo analysis, and/or analysis of DOGAMI beach monitoring data;
   vi. For bluff-backed shoreline, use a combination of published reports, such as DOGAMI bluff and dune hazard risk zone studies, aerial photo analysis, and field work, to assess the potential distance of property erosion; and
   vii. Description of potential for sea level rise, estimated for local area by combining local tectonic subsidence or uplift with global rates of predicted sea level rise.

c. Assessment of potential reactions to erosion episodes:
   i. Determination of legal restrictions of shoreline protective structures (Goal 18 prohibition, local conditional use requirements, priority for non-structural erosion control methods); and
   ii. Assessment of potential reactions to erosion events, addressing the need for future erosion control measures, building relocation, or building foundation and utility repairs.

d. Recommendations:
   i. Use results from the above analyses to establish setbacks (beyond any minimums set by this section), building techniques, or other mitigation to

[2]Stockdon, Hilary F., Rob A. Holman, Peter A. Howd, and Asbury H. Sallenger."Empirical Parameterization of Setup, Swash, and Runup."Coastal Engineering, 2006, 573-88.Accessed January 14, 2016. https://www.researchgate.net/publication/223784721_Empirical_parameterization_of_setup_swash_and_runup_Coast_Eng.

ensure an acceptable level of safety and compliance with all local requirements;

ii. Recommend a plan for preservation of vegetation and existing grade within the setback area, if appropriate;

iii. The applicant may apply for a variance if the recommendations show that a reduction to a property setback on the side of the property opposite the ocean, if this reduction helps to lessen the risk of erosion, bluff failure or other hazard; and

iv. Recommend methods to control and direct water drainage away from the ocean (e.g. to an approved storm water system), or if not possible, to direct water in such a way so as to not cause erosion.