Geological Report Guidelines for New Development on Oceanfront Properties

Produced by the Coastal Processes and Hazards Working Group and Oregon Coastal Management Program staff (including DLCD, DOGAMI, and OPRD), this is a list of geologic factors, analyses and recommendations which should be included in geologic reports for new development on oceanfront property, as well as property close enough to the ocean to be influenced by coastal geomorphology and ocean-caused erosion.

These guidelines can be used as a supplement to the "Appendix B" Guidelines for Preparing Engineering Geologic Reports in Oregon. They are meant to be a resource for local government review and ordinance updates, geologic and engineering consultants, and those interested in coastal property.

A. Site Description

1. 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.

2. Topography, including elevations and slopes on the property itself.

3. Vegetation cover.

4. Subsurface materials – the nature of the rocks and soils.

5. Conditions of the seaward front of the property, particularly for sites having a sea cliff.

6. Presence of drift logs or other flotsam on or within the property.

7. Description of streams or other drainage that might influence erosion or locally reduce the level of the beach.

8. Proximity of nearby headlands which might block the longshore movement of beach sediments, thereby affecting the level of the beach in front of the property.

9. Description of any shore protection structures that may exist on the property or on nearby properties.

10. Presence of pathways or stairs from the property to the beach.

11. Existing human impacts on the site, particularly that might alter the resistance to wave attack.

B. Description of the Fronting Beach

1. Average widths of the beach during the summer and winter.

2. Median grain size of beach sediment.

3. Average beach slopes during the summer and winter.

4. Elevations above mean sea level of the beach at the seaward edge of the property during summer and winter.

5. Presence of rip currents and rip embayments that can locally reduce the elevation of the fronting beach.

6. Presence of rock outcrops and sea stacks, both offshore or within the beach zone.

7. Information regarding the depth of beach sand down to bedrock at the seaward edge of the property.

C. Analyses of Erosion and Flooding Potential

1. Analysis of DOGAMI beach monitoring data available for the site.

2. Analysis of human activities affecting shoreline erosion.

3. Analysis of possible mass wasting, including weathering processes, landsliding or slumping.

4. Calculation of wave run-up beyond mean water elevation that might result in erosion of the sea cliff or foredune (see Stockdon, 1996).

5. 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.

6. 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 site visit, aerial photo analysis, *or analysis of DOGAMI beach monitoring data*.

7. For bluff backed shorelines, 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.

8. 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.

D. Assessment of Potential Reactions to Erosion Episodes

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

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

E. Recommendations

1. Use results from the above analyses to establish setbacks, building techniques, or other mitigation to ensure an acceptable level of safety and compliance with all local requirements.

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

3. Include a 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.

4. 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.

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