TOWN OF TIBURON
LANDSLIDE MITIGATION POLICY

GOAL

The Town of Tiburon shall require physical improvements to landslides and to potential landslide areas necessary to secure the public health, safety and/or welfare, in instances where avoidance of landslides is not feasible or appropriate. This policy sets forth the framework that the Town will use to determine the type and extent of necessary physical improvements to landslides and potential landslide areas. The intent of such physical improvements is to substantially improve slope stability or construct protective structures to mitigate the impacts of landslide movement.

APPLICABILITY

This policy shall apply to all applications for Precise Development Plan, Major Subdivision, and Minor Subdivision; and to Conditional Use Permit applications for the construction of any multiple family dwelling (three or more units). This policy also applies to applications for Site Plan & Architectural Review for a new dwelling on a vacant lot or parcel not created as part of a subdivision recorded after June 23, 1964, unless the Town Engineer determines that there is no potential for landslides on the property. This policy shall also apply to new single family residences and major remodels if, in the opinion of the Town Engineer, a potential landslide risk exists.

REQUIRED GEOLOGIC MAPPING INFORMATION

At a minimum, any project subject to this policy shall submit a geologic map, at a scale suitable for delineating existing landslides and/or potential landslide areas, prepared by a Registered Geologist, Certified Engineering Geologist or Registered Geotechnical Engineer. The mapping shall include a review of available published geologic maps and a site reconnaissance. For sites with more complex geology (i.e. Franciscan melange {KJ_{fm}}, serpentinite {KJ_{sp}}, colluvium {Qc} on steep, unstable slopes with landslides {Qls}, undocumented man-made fill, etc.), the geologic mapping shall also include a review of historic and recent aerial photographs, and be supplemented with preliminary subsurface exploration. The project geologic map shall identify, locate and define the extent of active landslides[1], dormant landslides[2] and potential landslide areas[3].

POLICY

The required level of repair, improvement, or mitigation for the mapped landslides will depend on the level of risk for damage to property and to existing or proposed improvements, as set forth below:

- Risk Level A Mitigation

  Risk Level A landslides include all active, dormant, or potential landslide areas having a high risk of causing damage to structures and improvements, and: (1) are within 100 feet of any designated building envelope; (2) have debris flow source areas where the flow path crosses

[1] Landslides with visible geomorphic features that indicate instability within the last fifty (50) years.

[2] Ancient landslides with poorly defined geomorphic features and no evidence of recent activity.

[3] Areas where the soil type, groundwater conditions and topography are typically associated with landslides and/or debris flows.

any building envelope or residential use area; (3) are active landslides that could affect adjacent public or private property.

All Risk Level A landslides shall be repaired or avoided. Landslide repairs shall improve the stability of a landslide to a level such that the calculated factor of safety[4] is at least 1.5 for static conditions and greater than 1.0 for pseudo-static[5] (seismic) conditions. The improved stability may be accomplished by various methods including: (1) excavation of unstable material, installation of subsurface drainage and construction of a compacted earth fill buttress; (2) design and construction of retaining structures; (3) de-watering; (4) removal of the entire unstable landslide mass; or (5) other methods for landslide stabilization acceptable to the Town.

Landslide avoidance requires that proposed structures and improvements are not located within a Risk Level A landslide, or that they are set back an adequate distance from a Risk Level A landslide as determined by a Registered Geologist, Certified Engineering Geologist or Registered Geotechnical Engineer. Avoidance also requires that existing structures, property, and off-site improvements will not be affected by future Risk Level A landslide movement.

- Risk Level B Mitigation

  Risk Level B landslides have a lower risk of causing significant damage to property or improvements within or outside the property than Risk Level A landslides. In most instances, Risk Level B landslides would be those located in proposed open space areas or in areas outside of any building envelope and any residential use area.

  All Risk Level B landslides shall be improved or avoided. Landslide improvement requires increasing the stability to a level such that the calculated factor of safety is at least 1.2 for static conditions. Improvement may also include the construction or installation of protective devices to protect structures, property, and improvements located downslope of Risk Level B landslides.

  Landslide avoidance requires placement of structures and improvements an adequate distance from the landslide, as determined by a Registered Geologist, Certified Engineering Geologist or Registered Geotechnical Engineer, such that any future slope movement is not likely to affect the structures or improvements.

All mapping, evaluation, analyses and design for repair, improvement or avoidance of landslides is subject to review and acceptance by the Town of Tiburon and/or the Town's Geotechnical Consultant. The Town Engineer shall have sole discretion to determine: (1) the Risk Level of any landslide or potential landslide; (2) whether a proposed project avoids an on-site landslide or landslides; and (3) whether proposed mitigation is adequate under this policy.

By adopting this policy, the Town Council does not intend to self-impose any liability for damages to persons or property arising from any landslide features, slope stability failures or other land movement.

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[4] The factor of safety is defined as the ratio of the resisting forces to the driving forces. Slopes with a factor of safety less than 1.0 are unstable and a landslide will commence. Slopes with a factor of 1.0 are marginally stable. The higher the factor of safety, the more stable the slope.

[5] The seismic acceleration used in the pseudo-static analyses shall be the maximum ground acceleration determined from deterministic methods, or the probabilistic ground acceleration that corresponds with a 10 percent chance of being exceeded in 50 years.