COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION

MITIGATING LANDSLIDES BY USE OF DEBRIS BASINS

Purpose

The purpose of this memorandum is to provide guidelines for the design of debris basins that are affected by landslides/slope instabilities. When a debris basin is impacted by the proximity of a landslide, as an alternative to stabilizing the landslide in accordance with minimum County standards, the developer may be allowed to enlarge the basin capacity to accommodate the total amount of anticipated material from the landslide in addition to the design volume for debris control.

The projected geometry of the slide must be such that it will not adversely impact the ability of the basin to perform its primary function. In addition, the geotechnical consultants must include in their report a “111 statement” that indicates the design is safe and that there will be no adverse impact on offsite properties.

General Criteria

Review criteria and guidelines for the preparation of geotechnical reports for debris basins, landslide analyses, remediation, etc., are provided below. Nevertheless, judgment will be necessary as each site and project will be different. In addition to debris volumes determined for the hydrology sediment study, debris generated by the movement of landslides and debris flows directly into the basins or impound area must be considered in the sizing of the basin. Debris generated by the movement of landslides and debris flows into canyons contributory to a debris basin may need to be considered in the sizing of the basin, depending on the proximity to the basin.

The consulting engineering geologist, geotechnical (soils) engineer, and hydrologist must work together and provide input when calculating the volume of slide debris that could enter the basin and demonstrate that failure of the slope will not adversely impact the ability of the basin to perform its primary function. Landslide debris volumes must be accompanied by supporting data, complete analyses, and discussion. Once these additional volumes are adequately determined, the Land Development Division Hydrology and Drainage Section must be provided with the calculated landslide debris volume.

The consulting engineering geologist, geotechnical (soils) engineer, and hydrologist must work together and provide input when considering the amount of debris which could directly impact the basin.

Specific Criteria

1. The projected geometry of the slide must be such that it will not adversely impact the ability of the basin to perform its primary function. Generally, this applies to landslides and debris flows that would fail directly into the basin. Failure of the landslide cannot negatively impact the debris basin improvements. Landslides that do not meet these criteria must be mitigated to a factor of safety (F.S.) $\geq$ 1.5.

2. Existing landslides and natural slopes need not be considered if the F.S. is $\geq$ 1.5 unless the ponding of water by the debris basin adversely impacts stability of the existing landslide and natural slopes. Analyses shall be based on proposed grades and may require additional analyses to address temporary conditions.

3. Landslides that are negatively impacted by the presence of the proposed basin/impounded water and which could impact offsite/adjacent properties must be mitigated.

4. Upstream active or potentially active landslides and unstable slopes (F.S. $\leq$ 1.5) are to be considered, but *may* not require an increase in debris capacity of the basin when one or more of the following conditions are met:

   - The post failure geometry of the toe is not subject to erosional processes and mobilization of debris into the basin.

   - Where reactivation of a landslide or debris flow failure is at a significant distance from the basin and sediment transportation from runoff is unlikely.

   - A statement, in accordance with County of Los Angeles Building Code Section 111, indicating that there will be no adverse impacts to proposed debris basins or their calculated impound/catchment areas.

5. When a debris basin and impound area may be directly impacted by landslide debris or potentially unstable slopes (F.S. $\leq$ 1.5), the developer may be allowed to enlarge the basin capacity to accommodate the <u>total</u> amount of anticipated debris. The consulting engineering geologist, geotechnical (soils) engineer, and hydrologist must include/consider the following in their report/findings:

   - Evaluation of whether or not standard basin cleanout procedures can be used without destabilizing the subject landslide or potentially unstable slopes.

   - Instability (F.S. $\leq$ 1.5) that may be triggered by rapid drawdown of impounded water.

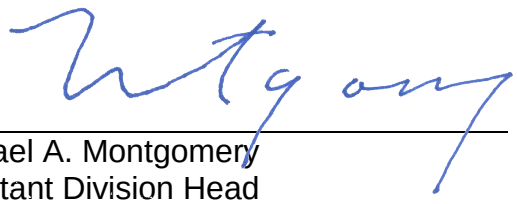
- The effects of high water level created by the presence of the basin.

- The elimination of potential adverse effects or changed conditions created by the presence of the debris basin relative to offsite property. If the proposed basin impacts the stability of a slope common to more than one property the slope must be stabilized to a F.S. $\geq$ 1.5. The adverse or changed conditions must be considered in the slope stability analyses.

- A statement in accordance with Section 111 stating that there will be no adverse impacts on, or caused by the proposed debris basin.

6. Hydrology studies incorporating debris loads based upon this directive must be reviewed and approved by the Land Development Division.

Approved By:



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