ABSTRACT


Title: Engineering Geology and Relative Stability of the Southern Half of Newell Creek Canyon, Oregon City, Oregon.

This study investigates the engineering geology and relative slope stability of the southern half of Newell Creek Canyon, Oregon City, Oregon, located partially inside the urban growth boundary of Portland where there is increasing pressure for development in areas of geologically hazardous terrain.

Within the study area, features associated with landslides were mapped and categorized according to their relative age (active, inactive-young, and inactive-mature) and the depth to the failure plane (deep or shallow-seated). These features were then examined and 79 landslides were identified. Sixty-five of the slides were classified as shallow-seated or having a failure plane $\leq 4.5$ meters below the ground surface. Most of the 14 deep-seated landslides in the study area were classified as inactive-young and inactive-mature and generally had a much greater area ($1,600m^2$ to $256,000m^2$) than the shallow-seated slides ($40m^2$ to $6,100m^2$).
One deep-seated landslide, representative of most of the deep-seated slides, was examined in detail and a stability analysis confirmed the current, relatively stability and the potential for reactivation. The Spady Landslide, a typical shallow-seated landslide, was examined in detail by mapping the slide after its initial failure in 1996 and then again after it grew in size from 2,200 m$^3$ to 14,600 m$^3$ in order to examine how these types of slides grow and the resulting stability of the area immediately adjacent to these slides. Finally, a stability analysis was performed on all of the residual soils to evaluate potential shallow-seated landsliding.

From the record of landslide features and geologic conditions, the Engineering Geologic Map was constructed. This map, along with the stability analysis on existing landslides and areas with no existing features resulted in the construction of the interpretive Relative Stability Map. This Relative Stability Map was divided into three zones with the following percents of the study area: moving ground (5%), potentially unstable ground (56%), and stable ground (38%). The two maps resulting from this study along with the text serve as an engineering geologic report for use by engineers and planners in making educated decisions for future development.