

## Sheeting joints along erosional slopes in the regions of Hiroshima Granite, and their formation process

# Toshifumi Hamaoki[1]; Shuichiro Yokota[2]

[1] Geoscience, Shimane Univ; [2] Geoscience, Shimane Univ.

Existence of sheeting joints dipping with same trend of mountainous slopes is one of geological causes for the occurrence of slope failures in the regions of granite rocks. Such joints have sometimes two and three trends slightly different one another. They tend to appear on steep slopes rapidly denuded along rivers. The author has attempted to obtain the configuration of joint planes and their distribution just below the surfaces of such erosional slopes by observing joint planes appeared on artificially excavated slopes in quarry sites and others.

Strikes of low angle joint planes were almost perpendicular to the dipping directions of mountain slopes in there. However, at least two types of joint planes are distinguished within such slopes. One is low angle lower than 20 degrees, and has well persistence of planes. On the contrary, the other dips 20 to 40 degrees, and it shows curved plane with downward convex and poor persistence. The latter is composed of two or three short planes showing an echelon structure one another. Stairs-like alignments of such planes overlapped one another, are regarded as one portion of Riedel shear. This means that shear direction is almost along the slopes. According to the results of observation on excavated slopes, the latter are recognized in the portions of a several meters from the surface of natural slopes. These types are also recognized in other areas of Hiroshima Granite. Consequently, at least two types of sheeting joints are developing on steep erosional slopes in the area.

In general, characteristic stress field with large differential stress appears just below surface of steep slopes under the gravity. Materials just below the surfaces may move outward by additional horizontal seismic vibration, because slope surface is free mechanically. Therefore, shear stress, which makes materials move downward along the slope, may occur under the influences of the gravity force or seismic vibrations.

Considering that both uplift and dissecting of the mountains has been rapid during the Quaternary Period in Japan, not only the forces of unloading or action of exfoliation, such local stress conditions may also cause slopes unstable condition. Therefore, we must evaluate such types of sheeting joints and their combinations in granite rock regions.