NIPPON STEEL METAL PRODUCTS CO.,LTD.

Landslide / Slope Failure Prevention Method

Landslide / Slope Failure Prevention Method which enables to preserve or recover vegetation

Hazard

Earthquake Land Slide

Solution Purpose

Prevention & Mitigation Recovery

Solution Theme

Infrastructure Technology Building Technology Eco Infrastructure

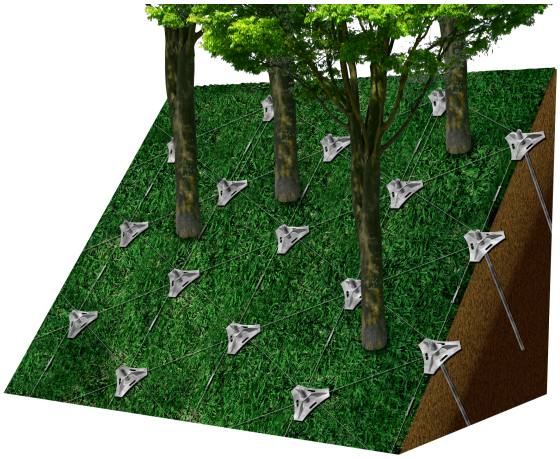
Technology Subject

Dam & Reservoir Sabo Road Facility for Disaster Prevention Ecosystem-based Infrastructure

Advantages

By taking advantage of these features of the measure (environment friendly), it preserves the natural environment much better than the conventional method, on top of its original purpose of disaster preventive function. It can contribute directly as “hard” interface to local disaster prevention by introducing the slope especially adjacent to residential houses and public facilities where landslides frequently happen. In addition, with collaboration with government and local design consultants, it also contributes to implementing slope disaster prevention criteria suitable to local geological features.

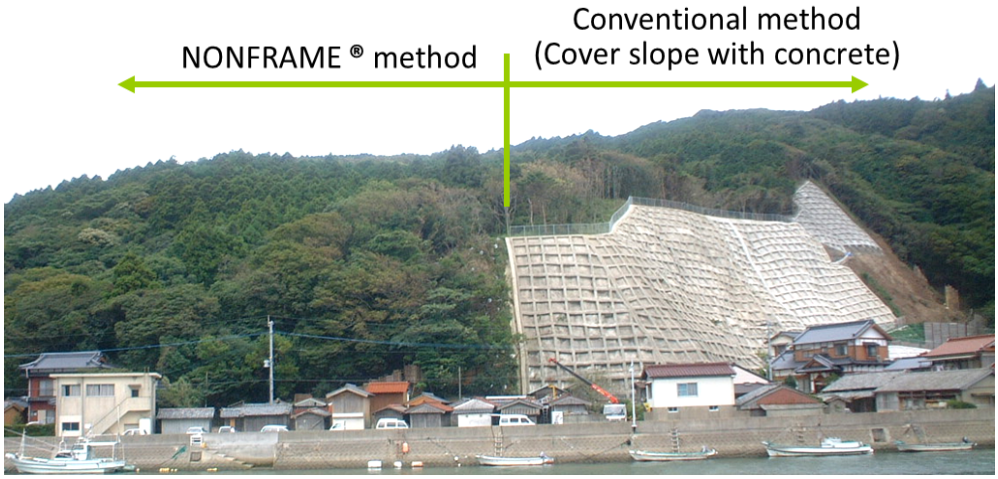
Solution Illustrated



Stabilize slope while preserving or recovering vegetation

NONFRAME® method is a kind of soil nailing which can stabilize slope while preserving or recovering vegetation.
In case of stabilizing natural slope, this method can construct without cutting trees.
This method can of course be applied as well as cutting or corrupsed slope. In this case, the slope is fully covered with vegetation after construction, since this method does not cover slope with concrete.

Background



As an alternate solution to the concrete spray "conventional" slope-disaster prevention method, this "NONFRAME® Method" had been developed in 1996 in response to the growing needs of landscape conservation and eco consciousness from the market. This method enables to preserve the trees without any trees felling, grading works or covering with a concrete structure, yet to realize stabilization of slope with its simplified structure.

Exposition of the Solution

This method, which was inspired by "trees root", consists of three major elements 1) Rock Bolt (driven into the firm layer underground approx. 2-3m depth), 2) Base Plate (installed on its heads to stabilize the soft and less-solid clod, weight approx. 14kg), and 3) Wire Rope (joining the base plates together as network with 2m pitch each other).
With its excellent feature,
①no need to cut the trees that are native to the slopes
②possible to drastically reduce construction period and cost
③construction workable even under severe condition
This method becomes very popular in Japan with steady growth rate of construction results, contributing keeping construction site in harmony with the beautifully landscape, which has also induced a great deal of attention from abroad.

Achievements of Examples

Right after slope failure

Right after construction of NONFRAME® method

4 months after construction, the slope had been fully covered with vegetation

Other References

Construction example in Bhutan

This is the project with regard to Hydroelectric Project dam site in Trongsa, Bhutan. In 2015, the slope failed due to torrential rainfall and five workers were killed, even though it was originally covered with shotcrete. Then, NONFRAME® method was installed on the corrupsed slope to stabilize the slope. The construction area was total 5,400 sqm, however the construction finished only three months even

severe condition, because NONFRAME® method is easy to construction even unskilled worker.
After construction, the slope has been stabilized by this method and has been covered with vegetation.

Corporate Profile

NIPPON STEEL METAL PRODUCTS CO.,LTD.

Akihabara UDX 13F, Sotokanda 4-14-1, Chiyoda-ku, Tokyo, Japan　101-0021

Tel. : +81-3-6625-6260

E-mail : skaji@ns-kenzai.co.jp

Website : https://www.ns-kenzai.co.jp/english/index.html