Slope Stabilization Works by Green Lexar Method for the 2nd Sabo Dam at Shiritaka Valley,

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1. Outline of the Construction Work

This construction work is intended to build a slit sabo dam made of I-type steel pipes and an access road.

The road is 650m long but 350m out of 650m is constructed using reinforced soil fill walls and L-type steel walls. The contract period for the said construction work is 3 years.

The dimension of the road and walls is 4-meter wide and 4 meter to 10-meter high depending on topographic conditions, respectively.

The construction site is located on steep slopes covered with dense forest consisting of cypress and cedar. The working space is, therefore, quite limited.

Situation of slope after felling hindrance trees

2. Construction Method

The sequence of the construction works are as follows: Slope cutting---Footing preparation---Shield sheets (geo-textile) on the slopes---Filter sheets (grass seeds enclosed) over the shield---Ties installation---Footing net installation---Surface unit installation---Linking surface unit with shield sheets---Earth filling and compaction.

Construction works are repeated using the above-mentioned sequence with intervals.

Situation of the footing net

The material for the surface shield and tie is galvanized iron expanded net, of which zinc content is 500g/m, footing net of which the commodity name is geonet and is made of plastic.

The Green Lexar method stabilizes soil fillings by wrapping earth mass with surface shield, footing net and slope shield. The function of the Green Lexar is similar to that of gabion. The stability of the Green Lexar is assured by binding the slope shield with each other.(Figure 1)

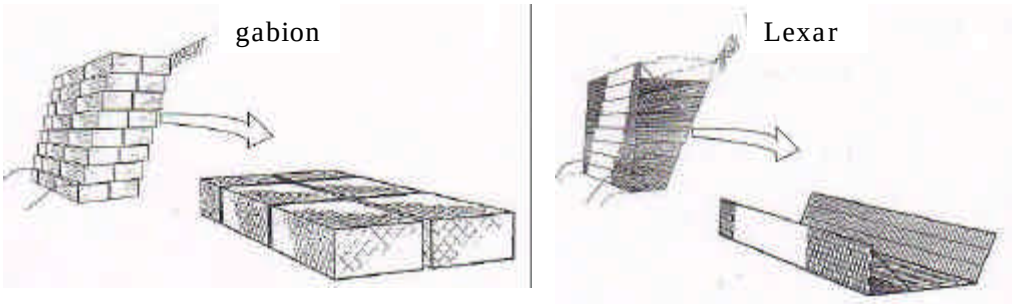

Fig.1 The outside restriction type

With regards to the quality control of the construction works, tests on the load bearing capacity at the footing level and the density of filling materials are being conducted at every span.

3. Medium-Term Evaluation of the Construction Works

3.1 Process Control

This work is characterized by pre-fabricated products and manual labor to ensure that no specific hardship or difficulty will occur throughout the working process.

Quality and conformance control are, therefore, fairly easy and are conducted with focus on the size of the particle and density of the filling earth materials.

3.2 Safety Management

With regards to safety in working processes and sites, since there is no need to hoist scaffoldings, monitoring practices on the stability of target slopes is necessary.

Workability is quite good because all of the materials, except filling earth, are pre-fabricated and the frameworks are flexible so that the wall can be built in conformity with, like tailor-made suits, in the shape of target slopes. The walls are quite similar to a gabion and/or wrapped structure.

3.3 Environmental Consciousness

Unfavorable environmental impacts are minimized since all the earth materials removed from the initial slopes are used for filling works and stabilized by packing and compaction. All the wall surfaces are covered with vegetation.

3.4 Cost Effectiveness

Because of architectural and dynamic features of the structure, unlike the walls employing intrinsic material stress absorption technology, the cost of the walls of this type is low. The width of the wall is small so that there is no need to cut slopes deeper. The cost of the wall surface made of expanded metal is cheaper than the ones made of concrete.

3.5 Unit Length of the Panel

Since the length of a single surface panel is designed to be 1.0 meter, there is no need to shorten the panel if the designed length of a wall is integer multiple. Neither loss nor waste is generated. In case the designed length is not precise integer multiple, the surface panel is not cut but overlapped.

3.6 Stowage of Surface Panels

Roads for which the Green Lexar Method is applied are characterized by a lot of curved lines of which the radius is as short as 15 meters. As illustrated in Figure 2, surface panels accumulated in alternative shift results in gaps between the top of the lower panel and the foot of the higher panel and, as a result, cannot produce the straight longitudinal surface.

In order to make the longitudinal surface line straight, surface panels are put forming straight

joints.

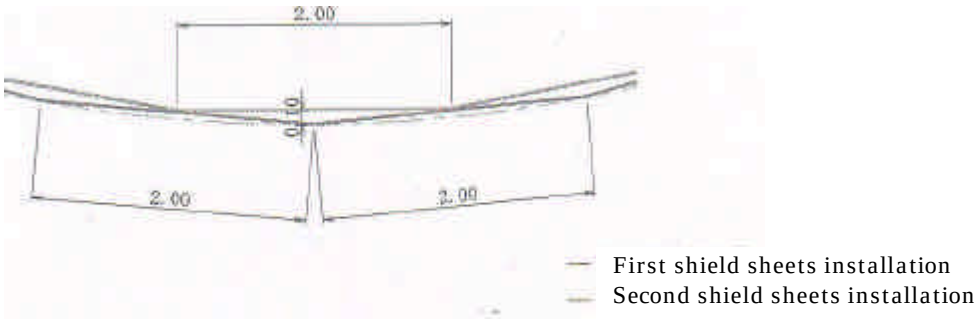

Fig.2 The connection part plane of the alternative shift

3.7 Longitudinal Joints

Longitudinal joints cannot be straight sometimes due to multiple effects such as spreading at the bottom and shrinkage at the top at the stretch of a sharp bend. This irregularity in joints has nothing to do with the stability of the wall and is not visible sooner or later because of vegatation cover.

4. Future Steps

We are still at the early stages of the Green Lexar Method and has found out that there are remaining problems to be solved, but we are certain that this method will ensure safe environment along roads in mountain regions with lower cost.

※Translated from Journal of Japan Sabo Association, Sabou to Chisui, Vol.168, pp.18-19, 2005