

Case study of using complex reinforced structure to repair mountain road landslide in Taiwan

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1. Introduction

Taiwan is located in subtropical monsoon climate zone and on the circum-Pacific seismic belt. Its geographic position is unique. Natural disasters occur frequently. Due to its young, complex and fragile geology, bad cementation of the rock formation and steep slope terrain, the disasters such as landslides, debris etc. happen easily. In addition, the improper exploitation in the mountain areas these years has resulted in serious damage to mountain roads because of the heavy rain during the typhoon season. The collapses and traffic disruption affect people's lives and property safety. Prompt repair after disasters and the prevention from the failure reoccurrence are what all the engineers continuously work toward. Security is the main concern for repairing slope failure. However, there are several types of repair methods in accordance with the destruction.

Reinforced retaining structure is one of the methods. Generally known as reinforced retaining structure in accordance with its surface can be divided into types of wrapped reinforced retaining wall, landscaped soil retaining wall, pre-cast panel reinforced retaining wall and steel mesh reinforced retaining wall. In certain special geological conditions, reinforced retaining structure requires to use different methods to repair the slope such as the concrete walls, piles, anchors, soil nails, etc. It is the so-called complex reinforced structures, that is, using different methods to combine the advantages and processed the rehabilitation works. By analyzing the design, compared to the traditional method, it can provide better stability and consistent with ecological work to the structure. This paper is to present the damage cases of some Taiwan mountain roads and the restoration work, and to provide relevant case analysis, design information for reference.

2. Conclusions

Most disasters of Taiwan mountain road damage are similar to the above cases. In recent years, more and more reinforced retaining structures were used to repair the road damages. In this paper, the road reinforced slopes of comprehensive collapse after natural disasters are the examples. Using them in combination with other relevant geosynthetic material such as pile, RC wall, anchor and so on, becomes complex reinforced retaining structures and increases the security.

Every time after the typhoon or rainstorm, the mountain roads collapsed or damaged and repair projects after disasters abound. Yet how to propose appropriate planning under well considering various factors is the real wisdom test to the engineers. The repair work either design or installation, time is extremely tight. Therefore, complex reinforced retaining structure is the option for resolving the mountain road repair. Besides, these cases are successfully experienced several natural disasters. In addition to a well thought-out of engineering design in advance, it requires more attention to the construction quality and thus to ensure the safety of reinforced retaining structures. To sum up, complex retaining structures are more economical, easy to construct, higher flexibility and seismic energy absorption capacity. Compared to traditional retaining structures, complex retaining structures applied in repairing the damaged mountain roads after disasters are, after all, a safe, economical, ecological landscape method.