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A Research on Technology Development in response to Slope Reinforcing Facility (Anchor) Aging

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Recently, various drawbacks have been pointed out on the aspects of design, construction, and maintenance of anchor-reinforced slopes, and in some research the causes of increases and decreases of the tension force of the anchor are analyzed. However, research on the development of technology to cope with increases and decreases of the tension force in terms of maintenance is rare. In case that slipping occurs on an anchor-reinforced slope, shear and bending stress will occur in the shear section along the slip surface, and the anchor force may increase when slipping persists due to the deformation of the anchor body. Additionally, if shear deformation occurs in the anchor, cracks will occur in the grout at a relatively low deformation rate, and when deformation continues, the tension force may be further reduced due to the destruction of the grout. We tried to define investigation methodologies and safety plans through the analysis of case studies on functional loss sections, such as fractures of strands due to the excessive load placed on the anchors. From the results of the anchor lift-off test of 466 holes, the number of anchors that could not be retensioned was 177 holes, and the number of anchors with an increased tension force was 49 holes. From the results of ground exploration, it was found that soiled weathering zones or weathering zones with fractured bedrock were distributed at depths of 30m or more. It is analyzed that most anchor settlement with insufficient anchor forces were located in the slip surface and lacked anchor length. It is found that the safety of the slope can be secured if additional reinforcing anchors are installed around anchors with poor strand strength or anchors that cannot be retensioned.(Project Number: 20SCIP-C151408-02).