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Study on the Effects of Grassroots Characteristics on Reinforced Soil Performance by Direct Shear Test

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Abstract : Vegetation slope protection technique is economic, aesthetic and practical. Herbs are widely used in practice because of rapid growth, strong erosion resistance, obvious slope protection and simple method, in which the root system of grass plays a very important role. In this paper, through changing the variables value of grassroots quantity, grassroots diameter, grassroots length and grassroots reinforce layers, the direct shear tests were carried out to discuss the change of shear strength indexes of grassroots reinforced soil under different reinforce situations, and analyse the effects of grassroots characteristics on reinforced soil performance. The laboratory test results show that: (1) in the certain number of grassroots diameter, grassroots length and grassroots reinforce layers, the value of shear strength, and cohesion first increase and then reduce with the increasing of grassroots quantity; (2) in the certain number of grassroots quantity, grassroots length and grassroots reinforce layers, the value of shear strength and cohesion rise with the increasing of grassroots diameter; (3) in the certain number of grassroots diameter, and grassroots reinforce layers, the value of shear strength and cohesion raise with the increasing of grassroots length in a certain range of grassroots quantity, while the value of shear strength and cohesion first rise and then decline with the increasing of grassroots length when the grassroots quantity reaches a certain value; (4) in the certain number of grassroots quantity, grassroots diameter, and grassroots length, the value of shear strength and cohesion first climb and then decline with the increasing of grassroots reinforced layers; (5) the change of internal friction angle is small in different parameters of grassroots. The research results are of importance for understanding the mechanism of vegetation protection for slopes and determining the parameters of grass planting.

Keywords : direct shear test, reinforced soil, grassroots characteristics, shear strength indexes
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