1 New Protection Measures of Urban Slope

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Abstract: Urban plant protection plays both positive and negative roles on the slope protection. With describing economic analysis of vegetation slope protection and mechanical mechanism on both advantages and obvious disadvantages, the limitations of plant protection are pointed out, and new prevention and treatment which is a combination of root piles and plant protection measures are proposed.

Key words: urban; plant protection; root piles

2 Experimental Study of Shear Strength of Soil Rooted with Vetiver Roots

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Abstract: Vetiver due to its powerful and fast growing root system, is highly suitable for slope stabilization. However, rare research work has been carried out for quantifying the stabilizing effect of vetiver roots on slopes. In this study, in-situ investigation of vetiver root system was conducted; undisturbed samples of soil and rooted soil were taken from the field; the shear strengths of the soil and rooted soil were determined in the laboratory by means of a standard shearbox tests; and the tensile strengths of the roots were measured using a universal testing machine, hence the root reinforcement model of vetiver was verified by the overall trend of the experiment results; this model can be used to assess the stabilizing effect of vetiver root system on soil slope.

Key words: vetiver; root investigation; shear test; tensile test; root reinforcement model

3 Research on in-situ Measurement for Soil Fixing Capability of Vetiver Roots

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Abstract: The field experiment of in-situ measuring soil fixing capability by vetiver (Vetiveria zizanoides) in 10 cm and 20 cm depth with the anchor-shank tensiometer and self-designed shear box were conducted. The results showed that vetiver roots at tillering stage elastically deformed with small load, and the displacement increased with the increasing of load, and showed a liner relationship. When the load exceeded the maximum tensile strength of roots, the plastic deformation would occur. Load and displacement gradually deviated...
from linear relationship which showed the nonlinear elastic characteristics and sampling soil square breakdown from bulk soil finally. Compared with bare soil, the displacement of soil with vetiver was shorter under the same load, as showed the soil fixing capability of vetiver grass. Soil fixing capability of vetiver increased with root penetrating from 10 to 20 cm.

**Key words:** vetiver; soil fixing capability; in-situ measurement

### 4 Application of Vetiveria Zizanioides in Eco-hydrology Engineering

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**Abstract:** On the basis of the introduction of characteristics and properties of vetiveria zizanioides and according to the concept and application of eco-hydrology engineering currently, this paper puts forward a method of composite treatment and slope-fixing. The method combines the routine engineering measures with eco-plant vetiveria zizanioides, keeps the merits of routine engineering methods and absorbs the merits of eco-plant. This method provides a new way for the development of eco-hydrology.

**Key words:** vetiveria zizanioides; eco-hydrology engineering; hedge; dyke

### 5 Finite Element Analysis of Slope Reinforcement Impact Factors of Vetiver Plant Roots

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**Abstract:** With the vetiver as the research object, the article researched the effect mechanism of plant roots slope reinforcement and the impact factors of roots slope-reinforcement, and through using the Ansys finite element software for simulation, it analyzed the effect of plant roots slope-reinforcement under the function of various factors, and obtained the influence rules of relevant factors on roots slope-reinforcement effect.

**Key Words:** Vetiver: Plant roots: Slope reinforcement factors: Finite element analysis