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(Landslide)

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Ø = / °

C = / t/m³

C' = / t/m³

y_t = / t/m³

h' =

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$S_a =$ () ()
 OF'ZNAF (Ø)
 A-B (Sa) ()

Q-E :
 (P₁) /
) Z-N
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$$Y_g = / \text{ t/m}^3$$

$$h = \text{ m}$$

$$a = \text{ }^\circ$$

$$B = \text{ }^\circ + \text{ }^\circ = \text{ }^\circ$$

$$P = / \text{ t/m}^3$$

$$\Sigma =$$

$$M_s$$

$$W = (7 + 0.5)(2.5 + 1)1.7 = 44.63 \text{ t/m}$$

$$M_s = W \left(\frac{3.5}{2} + 0.5 \right) \cos 6^\circ + \frac{7.5}{2} \sin 6^\circ$$

$$M_s = 44.63 * 2.629 = 117.33$$

$$B = \text{ }^\circ$$

$$b = / \text{ m}$$

$$W =$$

$$()$$

$$b' = / \text{ m}$$

$$.b' = \text{ m}$$

$$K_a = 0.2535$$

$$H = AE = AN \cos 6^\circ + QN \sin 6^\circ = 7.274$$

S_{av}

S_{ah}

S_a

/

M_{if}

M_iS_{ah}

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$$S_a = \frac{1}{2} K_a Y_t H^2 + K_a P H$$

(Fs)

(CB)

(FN)

(Sr)

(SP)

$$F_s = fN + cB + sP \cos g + Sr$$

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/ (m* m)

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$$= 0.253 * \frac{1}{2} * 1.7 * 7.27^2 + 0.253 * 0.5 * 7.27 = 12.29 \text{ t/m}$$

$$S_{ah} = S_a \cos W = 12.29 * \cos 24^\circ = 11.23 \text{ t/m}$$

$$S_{av} = S_a \sin W = 12.29 * \sin 24^\circ = 4.99$$

$$M_{isah} = \left(\frac{1}{3} H + \frac{H + 3p/y_t}{H = 2P/y_t} - B \sin a - S_{ar} \left(B \cos a + \frac{HH + 3P_t}{3H + 2P_{pyt}} \right) \right) ga$$

$$M_i = 11.23 \left(\frac{7.277 * 7.27 + 1.5 * 1.7}{3 * 7.27 + 11.7} - 4.5 \sin 6^\circ \right) 44.9 (45 \cos 6^\circ +$$

$$\frac{7.27 * 7.27 + 1.5 * 1.7}{3 * 7.27 + 11.7} \text{tg} 6^\circ = 9.94 \text{ tm/m}$$

S_{ph}

W_f

:

$$W_f = \frac{1}{2} y_t B \cos 60^\circ B \sin 6^\circ = 1.89 \text{ t/m}$$

$$S_{ph} = \frac{1}{2} y_t OR^2 \text{tg}^2 \left(4.5 + \frac{\phi}{2} \right) = 4.36 \text{ t/m}$$

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$$(S.F.)_s = E_s = (\omega + \omega_f + S_{av}) + g\phi + S_{ph} + CBC \cos a + S_{ah}$$

$$= \frac{44.63 + 1.89 + 4.99}{11.23} \text{tg} 23.4 + 4.36 + 4.5 \cos 6^\circ = 2.77$$

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$$(S.F.)_r = \Sigma_r = \frac{M_s}{M_i} = \frac{117.33}{0.94} = 124.82$$

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Possibilities of Stabilizing Landslide and Mass Movement in Forest Roads (Case Study: Kheiroud-Kenar Forest as a Scientific Model)

N. Sarikhani¹

M. Gorji Mojri²

Abstract

The importance of landslide and massmovements, their complexity and heavy costs to forest roads, was the main reason for the continuation of the studies done in 1994 as an M.Sc. research project, which was conducted in Kheiroud-Kenar Research Forest. The previous studies made clear some of the massmovement characters, such as its classification, mechanical behaviors, moisture, Gradient-curves, unrestrainery slope. Then, it became necessary to study the sample area with regard to ground water level, shear resistance, rainfall frequency and intensity, base material, topography in order to be able to calculate and design the drainage and structures for the stabilization of landslide and massmovements and finally to be able to calculate the costs involved.

Thus, the objectives of this research were: 1. To have the basic knowledge of impact on shears strength and slope stability analysis, 2. To have directions for calculation and design of structures and drainage networks to stabilize massmovements and landslides, and 3. To be able to estimate and compare the cost of repairing and rebuilding of the moving part of the road, as well as the costs of constructing a new connecting part of the road.

The results of this study showed that due to the repetitive high costs, repairing and eventually changing the route were not a good decision. Instead, constructing a new connecting road-piece could have been a better solution for the same area.

Keywords: Landslide, Mass movement, Drainage, Shear resistance, Forest road network.

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