



Structural and Physical Aspects of Construction Engineering
Assessment of Slope Stability on the Road

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Abstract

The paper deals with the assessment of slope stability on the road II / 595 near the village Zlatno before and after the landslide caused by floods in 2010. For proposal for a comprehensive assessment and possible remedial action is necessary to know the geological conditions and choose the appropriate method for to assess slope stability. The calculation of factor of safety was made using GEO 5 software. The critical factors of safety have been determined by Petterson and Sarma Methods. After finding the most unfavorable slip surface has been made a proposal of remediation measures. The paper presents various solutions to ensure slope stability of the road. The most appropriate remedial action is Variant III - reinforced slope, because he had a greater factor of safety.

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1. Introduction

Currently, frequent flood events are taking place in our area. In recent years the intensity and frequency of rainfall, which are capable of causing flooding have significantly increased in Slovakia. Floods are destructive and cause damage to human society. They are associated with high water levels and extreme water flow in the river beds [1]. Floods are also associated with rapid erosion processes, which involve the destruction of land resources and consequently may lead to landslides of drenched soil. In 2010, severe floods hit most of the territory of the Slovak Republic. It was the biggest flooding in last 50 years [2].

Climatic factors combined with the erosion activity water courses and groundwater are major causes of slope deformations. In 2010, a result of exceptional a hearty rainfall and flood situation increased the number of slope

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deformations on 577 new, active landslides, of which over one hundred and endangers the lives, health, property of citizens and the environment.

The main cause extremely large landslides were primarily long-term rainfall in the months of May and June, when daily rainfall was 25-50 mm throughout Slovakia, but in the north and east of Slovakia was up to 80 mm. Continuous rain caused significant elevations in almost all water courses and floods. Slopes ground mass saturated with water have become prone to landslide. Figure 1 shows a prognostic map of the landslide susceptibility zoning [3].

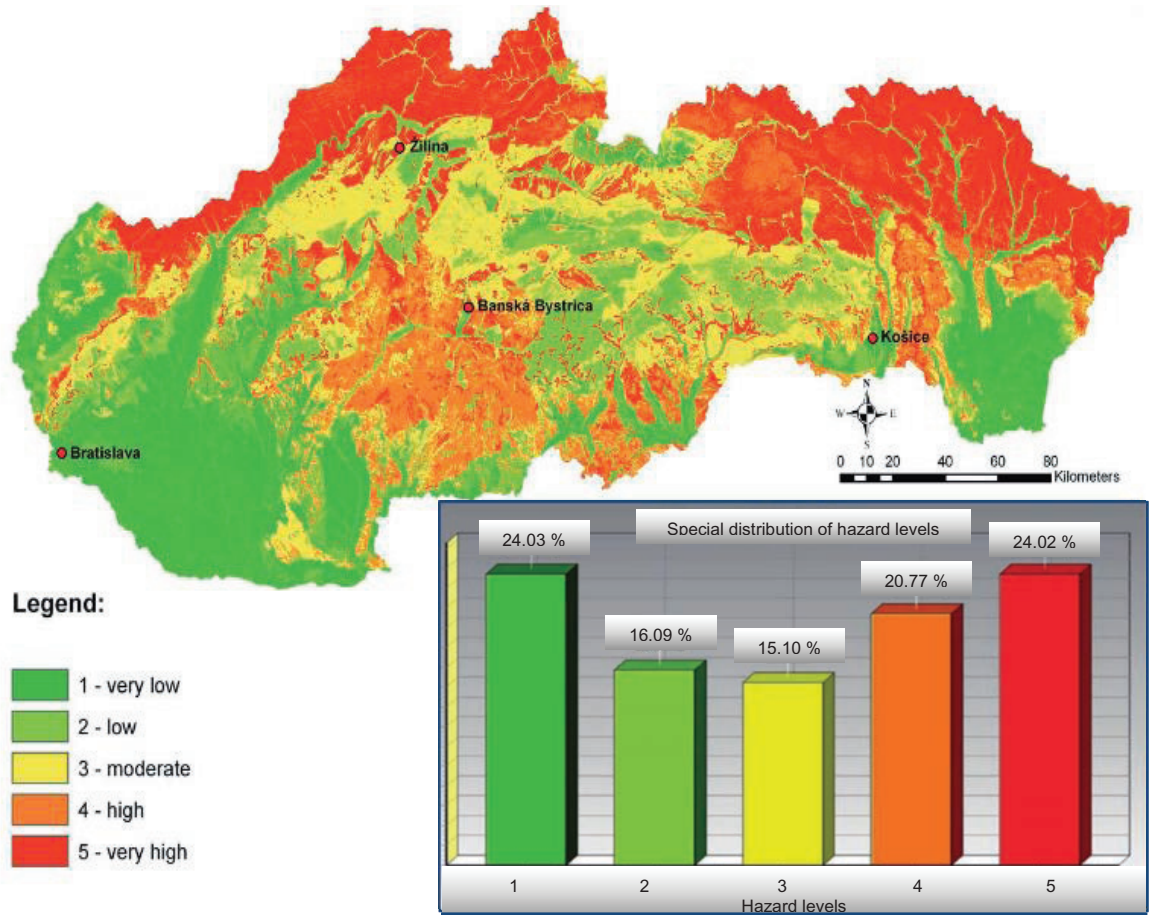


Fig. 1. Prognostic map of the landslide susceptibility zoning [3].

2. Landslide on the road II/595 near the village Zlatno

The consequence of penetration of rainwater on the right embankment slope of the road body there was a landslide and the road II / 595 near the village Zlatno. The area of interest is located in the village Zlatno, road section is guided in a slope in the unilateral notch. In this area occurred in 2010 a landslide from 24.886 to 24.932 kilometers. Asphalt layer of roads after the landslide of the slope are broken and slide down.

Landslide narrowed width of the carriageway, thereby reducing the security of vehicle passages in this section (Fig. 2 and 3) [4].

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