DEVELOPMENT OF A TOOL FOR ROADSIDE SLOPE RISK ASSESSMENT IN SRI LANKA

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Degree of Master of Science in Geotechnical Engineering

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DECLARATION

I declare that this is my own work, and this thesis does not incorporate without acknowledgment any material previously submitted for a degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgment is made in the text.

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……... Date: 14.04.2024

V.G.D. Gangani

The above candidate has carried out research for the master's thesis under my supervision.

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Prof. S.A.S. Kulathilaka

ABSTRACT

Sri Lanka has experienced a huge number of slope failures, cutting failures and landslides along the road network throughout the island. Usually, roadside slope risk assessments are carried out after such failure or with the appearance of early signs of failure. Consequent risk mitigation design and construction are carried out considering the area subjected to failure or susceptible to failure.

Although, a considerable region along a particular road may have the same geological and geomorphological conditions, in this approach the risk is assessed only at a single point after any incident is reported. There is no proper methodology to assess the overall risk along the road.

As such, there is a necessity to streamline the process of risk assessment, to minimize the probability of further failures along a mitigated road. A national level program should be implemented to assess the level of risk along the road network and develop a timeline for mitigation based on the identified risk level. As the first step of the process, a proper method shall be developed to streamline the risk assessment procedure. The most preferred method for a proper assessment is to maintain a checklist as a tool that can be used by a professional with some knowledge and experience regarding road slope failures. As the second step, a database should be prepared with road slopes categorized according to identified risk levels and mitigation plans, which include mitigation design, estimated budget, and a timeline for mitigation work.

The objective of this study is to develop a checklist for roadside slope risk assessment. The objective is to be achieved through field observations, data collection and analysis, geotechnical & geological investigations, and slope stability analysis.

Key words: roadside slope failures, risk assessment, mitigation

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