

**EFFECT OF RECTIFICATION MEASURES IN  
KAHAGOLLA LANDSIDE –COMPARISON OF  
MONITORING AND ANALYTICAL DATA**

Pattiye Arachchillaye Dayana Thushari Thilakarathna

168988D

Degree of Master of Engineering

Department of Civil Engineering

University of Moratuwa

Sri Lanka

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# EFFECT OF RECTIFICATION MEASURES IN KAHAGOLLA LANDSIDE –COMPARISON OF MONITORING AND ANALYTICAL DATA

P.A.D.T. Thilakarathna

168988D

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**Prof. Kulathilake S.A.S.**

B.Sc. Eng. Hons (Moratuwa), Ph.D. (Monash), C.Eng. MIE (SL),

Department of Civil Engineering,

University of Moratuwa,

Sri Lanka

## ABSTRACT

This research paper focuses on creep movements of rainfall-induced landslides with their groundwater level fluctuation, to understand the pore water pressure development in saturated/ unsaturated soil layers in relation to the mechanism of failure. A case study was selected at Kahagolla Sri Lanka, which is a massive creep landslide initiated around 1957 and triggering by prolonged rainfall events. The stabilization of the Kahagolla landslide was carried out under the “Landslide Disaster Protection Project” implemented by the Government of Sri Lanka with the support of Japan.

Detailed geotechnical investigation along with real-time monitoring data showed mainly four slip surfaces along the landslide axis. The main reason for movement is discovered as the rising of groundwater table and subsequent loss in the slip surface strength.

Two-dimensional analyses were carried out with several back analyses and adjusted parameters according to real-time monitoring data. Limit equilibrium analysis coupled with a seepage model was performed to confirm the actual conditions of the landslide occurrence. Thereafter, effects of rectifications were also modeled to assess the stability status of the rectified landslide. The performance of the rectification measures was further examined with critical design rainfalls and a threshold for the rectified landslide. The results show an acceptable stabilization of terrain after the construction of counter measures. It can be concluded that the final combination of rectifications has been succeeded in the stabilization of this landslide and the above-mentioned approach is appropriate for use in the simulation of deep-seated landslides.

**Keywords:** Kahagolla Landslide, Deep seated failure, Drainage wells, Back analysis, Rectification measures

**DEDICATION**

This thesis is dedicated to my loving parents Mr. P.A. Thilakarathna and Mrs.B.V.R.  
Chandrakanthi  
For their endless love, support and encouragement



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## LIST OF ABBREVIATIONS

### Abbreviation Description

CH –Chainage

NBRO - National Building Research Organization

SM - Silty Sand

SWCC - Soil Water Characteristic Curve

LDPP – Landslide Disaster Protection Programme

**LIST OF APPENDICES**

Appendix 1: Site Plan View and Investigation Points

Appendix 2: Laboratory Test Results

Appendix 3: Plainview and Longitudinal View with Rectification Measures