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Fig. 3: Corrective measures devised according to danger degrees

1. Partial danger degree stated from the geometry
2. Partial danger degree stated from the engineering-geological parameters

Range O: no corrective measures required
Range A: little cleaning
Range B: removal of vegetation and extensive cleaning
Range C: constructional-engineering measures.

Discussion

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The use of small-diameter pipes, usually of steel, as horizontal drains for assisting with the control of landslides, receives appropriate attention in Professor Hutchinson's admirable and wide-ranging General Report. His appeal for records of the performance of installations of horizontal drains invites the comment that all too little has been published about long-term experiences with such installations. This probably reflects the general neglect of necessary regular inspections of landslide remedial works. It is so very easy to have a remedial programme efficiently completed with such satisfactory results that those involved, having seen the immediate problem solved, then go away and forget all about it.

Such solutions to landslide problems must naturally be permanent. Accordingly, it is desirable to ask if there is available any information

about the very long-term performance — to be measured in decades — of steel pipe when used for horizontal drains. Steel corrodes, and since the open-ended nature of horizontal drains permits the access of air all along each pipe, water also being present inevitably, the desirable environment for corrosion is automatically created.

If corrosion of pipe does occur, it is conceivable that perforations may become plugged up, the pipe losing its effectiveness as a drain. If this is not noticed in regular inspections, trouble could develop in the form of a recurrence of slope instability. This suggests that the use of corrosion-resistant pipe for all horizontal drain installations is probably economically desirable. Do Professor Hutchinson or any of the panelists know of any relevant information and do they agree with the foregoing suggestion?