

## Stabilization of Idikki Arch Dam Foundations\*

by

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### Author's Reply

Author is thankful to Shri R.M. Patel for his interest in the paper. The reply to his comments is as follows.

1. The problem of stabilization of arch dam foundation in my paper is entirely different than the problem of grouting of alluvial by black cotton soil and foundation treatment of earth dams, as discussed in reference quoted by Shri R.M. Patel.

2. Pre construction rock investigations at Idikki revealed the necessity of rock treatment for accepting the intended load and also stabilizing the loose rock adjacent to the abutment.

3. Fine fractures present in the Idikki massif were considered as the most dangerous due to possibility of the development of maximum pore pressure in them. For this reason high uplift pressures were expected below the arch and down stream of it even after grouting. Therefore, a drain curtain in down stream was considered as absolute necessity. Even if the effect of uplift directly below the arch are considered secondary, the danger of water pressure blowing out the downstream mass of rock immediately adjacent to the toe was considered as of primary concern and hence drainage holes were proposed to intersect the three main water routes that may develop after impounding of water.

4. Thorough foundation explorations were conducted and grout in doubt principle was not adopted. The grouting was adopted to create an effective barrier against seepage, to seal joints, voids and blasting cracks, to glue the dam to its foundation rock, to consolidate the supporting foundation skin etc. For checking effectiveness of rock treatment precise instrumentation is adopted at dam.

5. The prestigious Idikki project was a challenge and hence high order compactence was given first preference over cost. The well established procedure of cement grouting was adopted over bentonite and black cotton soil taking into consideration different technical aspects of the project.

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\*Published in Indian Geotechnical Journal, Vol 8, No. 2, April 1978.