

**MOST SUITABLE GROUT CURTAIN DESIGN FOR PROPOSED
HASALAKA OYA DAM PROJECT, SRI LANKA**

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With the rapid increase in population, high-rise dams are constructed to meet the demands of hydropower and irrigation. Most of the dam failures are due to leakages/seepages from the dam foundation and embankments. Hence, the importance of sealing the dam foundation cannot be underestimated and attended to based on the geological condition of the foundation. This study mainly focused on designing a suitable grout curtain for the *Hasalaka Oya* dam based on detailed geological investigations. The geomorphology of the considered area shows that the most suitable dam is a Roller Compacted Concrete due to the existing narrow gauge. The study includes geological mapping, a seismic refraction survey, and borehole drilling, along with water pressure tests (Lugeon method). The Stereographic projection and geological map of the dam foundation provided the best-suited grout hole orientation, which is 20° to the left-bank side since the best-suited grout hole should cut all the rock beddings. Seismic refraction survey work clarified the weak geological conditions of the left-bank side. Low Core Recovery and Rock Quality Designation (RQD) values and the high percentage of core losses indicated weaker geological conditions on the left-abutment side up to deep depths. High Lugeon values indicated turbulent water flows on the left-bank side, and they confirmed linked and open discontinuity conditions of the foundation. The final grout hole depth was decided using the Lugeon map drawn from all the Lugeon test results along the dam axis. The final grout curtain was designed with 24 primary and 25 secondary holes. The depth of grouting is determined by extending the Lugeon map until the rock mass has a Lugeon value of less than 5, and a single-line grout curtain was designed with overall geological conditions.

Keywords: Geomorphology, Grout curtain, Lugeon method, Rock beddings, Stereographic projection