

Post-Print: Curtain Grouting Test in Moderately to Strongly Permeable Granite Strata at a Hydropower Station

Authors: Wang Honggang, Gan Yiqiang, Liu Xingguo

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Abstract

For hydropower projects exceeding 200 m in height, seepage prevention requirements are stringent and the consequences of leakage are severe, resulting in increasing attention to anti-seepage curtains by project developers. To ensure seepage control effectiveness, designs often adopt relatively high grouting pressures. Curtain grouting trials conducted in the right dam abutment of a 213 m high dam, within moderately to highly permeable formations exhibiting permeability greater than 10 Lu, have revealed several characteristics of the receiving strata: large grout absorption by open fractures, tendency for zero grout intake during re-grouting of hole sections awaiting setting, susceptibility to hydraulic fracturing during grouting, and inability of two curtain rows to meet the 1 Lu seepage prevention standard in zones of relatively high permeability. Subsequent design optimization should be undertaken in conjunction with production-scale testing of the main curtain grouting works.

Full Text

Preamble

Curtain Grouting Test in Medium-to-Strong Permeable Granite Formation at a Hydropower Station

Wang Honggang, Gan Yiqiang, Liu Xingguo

POWERCHINA Vibroflotation Construction Engineering Co., Ltd., Beijing 100102

Abstract

For hydropower projects exceeding 200 m in height, stringent seepage prevention requirements and significant leakage hazards have led to increasing emphasis on

impermeable curtains by developers. To ensure seepage control effectiveness, designs often employ high grouting pressures.

At a 213 m high dam, curtain grouting tests were conducted in medium-to-strong permeable granite formations (permeability >10 Lu) at the right abutment. The tests revealed several characteristics: open fractures exhibited large grout absorption, re-grouting of sections awaiting set was prone to no-absorption, grouting was susceptible to fracturing, and two curtain rows could not achieve the 1 Lu seepage standard in more permeable zones. Subsequent design optimization should be integrated with production tests of the main curtain grouting project.

Keywords: Grouting pressure; Highly permeable formation; Curtain grouting test; Optimization design

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv — Machine translation. Verify with original.