岩石力学与工程学报 » 2012, Vol. 31 » Issue (3) :469-478 DOI:

基于灌浆前、后波速变化的岩体固结灌浆效果分析

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ANALYSIS OF CONSOLIDATION GROUTING EFFECT OF ROCK MASS BASED ON COMPARISON OF WAVE VELOCITY BEFORE AND AFTER GROUTING

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摘要 基于20多个大型水利水电工程固结灌浆检测资料，分别对断层破碎带、风化及开挖影响区等不同条件岩体固结灌浆前、后波速的变化进行分析，建立固结灌浆后岩体波速提高率与灌浆前岩体波速之间的关系。同时，对波速变化与变形参数之间的关系进行探讨，并与瀑布沟水电站进水塔基础固结灌浆试验结果进行比较。结果表明：待灌浆岩体自身的可灌性是固结效果的决定性因素；不同工程条件岩体具有相对应的波速提高率范围，置信水平为95%条件下，断层破碎带、风化岩体和开挖影响区岩体波速提高率范围分别为14%～38%，10%～25%和6%～16%；波速提高率与灌浆前岩体波速之间的关系可以用来对岩体固结灌浆效果进行预测。

关键词： 水利工程 坝基 固结灌浆 波速提高率 可灌性

Abstract： Based on the detection data of more than twenty large-scale hydropower projects，the wave velocity changes before and after consolidation grouting of rock masses under different conditions of fault fracture zone， weathered zone，and excavation effecting zone are analyzed；and the relationship between the increasing rate of wave velocity after grouting and the wave velocity before grouting is established. Moreover，the relationship between change of wave velocity and deformation parameters of rock mass is discussed. And the comparison between detection data and test results of consolidation grouting for foundation of intake tower in Pubugou hydropower station is carried out. The results show that：(1) The groutability of rock mass is the decisive factor of consolidation grouting effect.(2) Different rock masses have their corresponding fixed ranges of increasing rate of wave velocity. Under confidence interval of 95%，the ranges of increasing rate of wave velocity of fault fracture zone，weathered zone and excavation effecting zone are 14%－38%，10%－25% and 6%－16%，respectively. (3) The relationship between increasing rate of wave velocity and wave velocity before grouting can be used to predict the effect of consolidation grouting.

Keywords： hydraulic engineering dam foundation consolidation grouting increasing rate of wave velocity groutability

Received 2011-09-25;

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