

小湾拱坝三级配混凝土动态弯拉力学特性试验研究

Experimental study on dynamic flexural tensile mechanical behavior of three graded concrete in Xiaowan Arch Dam

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中文摘要:

对小湾拱坝工程三级配混凝土动态弯拉力学特性进行了试验研究。试验采用液压伺服加载系统和简支梁三分点加荷法,共进行了21个试件试验,尺寸是300mm×300mm×1100mm。静载试验时,加载速率为250N/s。动载试验时,考虑了不同初始静载(0%、40%、80%)和不同动态加载方式(冲击和变幅三角波)。试验结果表明,初始静载对混凝土动态极限弯拉强度影响很大;合适比例的初始静载,对混凝土动态极限弯拉强度有利;同静载相比,冲击加载时混凝土动态极限弯拉强度提高,弯拉极限拉伸值变小,纯弯区正截面中和轴位置基本不变;

英文摘要:

The experimental study on dynamic flexural tensile mechanical behavior of the three graded concrete in the arch dam of Xiaowan Hydro Project by using third point loading method for simply supported beam was carried out. Twenty one specimens with dimensions 300mm×300mm×1100 mm were adopted. In the static loading tests, the loading rate was 250N/s. In the dynamic loading tests, different initial static load and different dynamic load patterns, including the impact wave and triangular wave with variable amplitude, were considered. The results show that the initial static load significantly affects the ultimate dynamic flexural tensile strength of concrete. A proper magnitude of initial static loading is benefit to the dynamic strength. Comparing with the static loading tests, the ultimate dynamic flexural tensile strength increases, but the strain decreases, and the Young's modulus increases only a little, if the concrete is subjected to impact loading. Cyclic loading has disadvantageous effect of low cycle fatigue.

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