

边坡岩体力学参数对Hoek-Brown准则参数敏感性的综合性分析

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ORTHOGONAL ANALYSIS OF SENSITIVITY OF MECHANICAL PARAMETERS OF SLOPE ROCK MASS TO PARAMETERS IN HOEK-BROWN CRITERION

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摘要 针对广义Hoek-Brown准则参数敏感性分析单因素法的局限性,提出利用正交试验法来研究准则参数对岩体力学参数的影响,该方法可以对各因素的影响进行综合性分析,避免单因素法的片面性。以龙桥特大桥5[#]拱座所在边坡为工程背景进行了基于正交试验的准则参数敏感性分析。结果表明:地质强度指标 GSI 对岩体的变形参数 E_m 的影响最显著;岩石抗压强度 σ_{ci} 和岩体扰动系数 D 对岩体的强度参数 C 、 ϕ 的影响最显著;总体来说,岩体力学参数对地质强度指标 GSI 与岩石抗压强度 σ_{ci} 最敏感,对岩体扰动系数 D 次之,最后为岩石的Hoek-Brown参数 m_i ;并且准则参数之间无交互作用,相对独立。

关键词: 广义Hoek-Brown准则 边坡岩体 力学参数 正交试验 综合性分析

Abstract: This paper examines the effects of parameters in the generalized Hoek-Brown failure criterion on the mechanical parameters of slope rock mass using orthogonal test method. It gives a comprehensive analysis of various factors and effectively explains the limitation of single-factor method. Sensibility analysis of the criterion parameters based on the orthogonal test is done within the slope of 5[#] abutment in Longqiao Extra-large Bridge. It is found that the Geological Strength Index (GSI) influences the rock mass deformation parameter E_m significantly, and the compressive strength σ_{ci} and disturbance factor of rock mass D have greater impact on the rock mass strength parameters C 、 ϕ . In summary, the index GSI and σ_{ci} are more sensitive to the mechanical parameters of rock mass comparing to disturbance factor of rock mass D , and then m_i ; There is no interaction between the criterion parameters, and they are relatively independent.

Key words: Generalized Hoek-Brown criterion Slope rock mass Mechanical parameters Orthogonal test Comprehensive analysis

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