

论文

氯氧镁水泥钢筋混凝土轴压构件力学性能

乔宏霞, 刘尧, 周茗如, 余红发, 董金美, 冯坚

兰州理工大学 土木工程学院, 甘肃 兰州 730050

摘要:

基于近年来氯氧镁水泥基材改性研究的进展, 在当前已解决镁水泥吸潮返卤、腐蚀钢筋等问题的前提下, 制作氯氧镁水泥钢筋混凝土轴心受压构件并实验测定承载力及力学曲线。依据实验数据, 采用现有混凝土结构规范方法推定混凝土各项力学指标(如弹性模量、抗压强度标准值等), 进一步得出构件承载力理论值, 并与实测构件承载力对比。同时, 依据测得的基本力学指标, 采用有限元软件ADINA, 选用规范给出的应力-应变关系建立有限元模型, 模拟构件加载-破坏全过程。结果表明, 采用规范公式计算的构件承载力与实验数据吻合, 且有限元模拟的构件力学行为与实验结果拟合良好, 模拟极限承载力数据亦与实验数据吻合。这些事实充分证明, 运用现有规范预测氯氧镁水泥钢筋混凝土构件力学性能是可行的。

关键词: 氯氧镁水泥; 钢筋混凝土; 结构构件; 承载力; 有限元法

Mechanical performance of axially loaded structural components made of magnesium oxychloride cement concrete

Abstract:

Based on the modification research of Magnesium Oxychloride Cement(MOC) in recent years, and the fact of successfully overcoming the problems of durability, scumming and corrosion on rebar recently, this study made the reinforced MOC structural component and conducted testing on its mechanical performance under axially loading.The experiments were designed to test the bearing capacity and mechanical behavior.According to the test results, the parameters(Young' s modulus, axial compressive strength, etc.) of MOC concrete were estimated using the method described in the Code for Design of Concrete Structures, and also the bearing capacity was calculated and compared with the experimental results.In addition, based on the parameters obtained and the constitution relation given in the Code, a finite element modeling was performed using ADINA software.The comparison of all the results demonstrates a high consistency, which verifies the feasibility of predicting the mechanical properties of MOC structural components with the current Code.

Keywords: Finite element analysis

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通讯作者: 乔宏霞

作者简介: 乔宏霞(1977—), 女, 山西应县人, 副教授, 博士后

作者Email: qiaohx7706@163.com

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