加载速率对大直径GFRP筋足尺试件抗拉性能的影响

李国维1，2，葛万明2，倪 春2，戴 剑2，牟春林3*

(1. 河海大学 土力学与堤坝工程教育部重点实验室，江苏 南京 210098；2. 河海大学 岩土工程科学研究所，江苏 南京 210098；
3. 中山市浦美复合材料有限公司，广东 中山 528400)

EFFECT OF LOADING RATE ON TENSILE PROPERTIES OF FULL-SCALE SPECIMEN OF LARGE-DIAMETER GLASS FIBER REINFORCED POLYMER(GFRP) BAR

LI Guowei1，2，GE Wanming2，NI Chun2，DAI Jian2，MU Chunlin3*

(1. Key Laboratory of Ministry of Education for Geotechnique and Embankment Engineering，Hohai University，Nanjing，Jiangsu 210098，China；2. Geotechnical Research Institute，Hohai University，Nanjing，Jiangsu 210098，China；3. Zhongshan Pulwell Composites Company Ltd.，Zhongshan，Guangdong 528400，China)

摘要 参考文献 相关文章

Download: PDF (341KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 玻璃纤维增强聚合物(GFRP)筋是一种由玻璃纤维与树脂复合而成的新型加固材料，具有良好的应用前景。GFRP筋为非均质各向异性材料，横向抗压强度远小于轴向抗拉强度，具有显著的尺寸效应，因此，GFRP筋强度指标的测试比钢筋材料更复杂。本文试验解决大直径GFRP筋足尺试件的端部锚固问题。通过在拉力试验机上进行大直径GFRP筋足尺试件的抗拉破坏性试验，研究不同加载速率下大直径GFRP筋的抗拉强度、拉伸弹性模量、延伸率等基本力学指标的变化规律，并对比分析GFRP筋与钢筋的受力破坏机制。试验结果表明，随着加载速率的增大，大直径GFRP筋的抗拉强度、延伸率明显增大，拉伸模量的变化幅度较小，基本保持恒定；并分析得出，材料的组成结构决定材料的力学特征和破坏形式。

关键词： 建筑材料 玻璃纤维增强聚合物 加载速率 抗拉性能 破坏机制

Abstract： The glass fiber reinforced polymer(GFRP) bar is a new reinforcement material composed of glass fiber and resin，and has good application prospects. The GFRP bar has the properties of anisotropy. Its horizontal compressive strength far less than axial tensile strength；and it has remarkable size effect. Therefore，the strength index testing of GFRP is more complex than that of steel. The end anchorage problem of large-diameter full-scale GFRP test specimen is solved by laboratory test. Through the tensile test of full-scale specimen of large-diameter GFRP in the tensile testing machine，the variation laws of the basic mechanical properties of large-diameter glass fiber bar，such as tensile strength，tensile elastic modulus and elongation ratio，are studied under different loading rates. In addition，the failure mechanisms between the GFRP bar and steel bar are compared. The experimental results demonstrate that，with increase of loading rate，the tensile strength and elongation ratio of GFRP bar increase significantly，while the elastic modulus remains roughly constant；the mechanical characteristics and failure modes are determined by the materials? composition and structure.

Keywords： building materials glass fiber reinforced polymer loading rate tensile properties failure mechanism

Service
把本文推荐给朋友
加入我的书架
加入引用管理器
Email Alert
RSS
作者相关文章

引用本文:
李国维1，2，葛万明2，倪 春2，戴 剑2，牟春林3.加载速率对大直径GFRP筋足尺试件抗拉性能的影响[J] 岩石力学与工程学报, 2012,V31(7): 1469-1477

LI Guowei1，2，GE Wanming2，NI Chun2，DAI Jian2，MU Chunlin3.EFFECT OF LOADING RATE ON TENSILE PROPERTIES OF FULL-SCALE SPECIMEN OF LARGE-DIAMETER GLASS FIBER REINFORCED POLYMER(GFRP) BAR[J] , 2012,V31(7): 1469-1477