

Uniaxial compression and tensile splitting tests on adobe with embedded steel wire reinforcement

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ABSTRACT

Adobe has recently gained further significance, and the associated interest of engineers and researchers, due to its environment friendliness. Several studies can be found in the literature that focus on various aspects of the material behaviour of adobe. This article focuses on the investigation of the effects of wire mesh reinforcement on the compressive strength, uniaxial compression behaviour over the entire loading regime, and the tensile splitting strength of adobe specimens. A total of 30 cylindrical specimens with 150 mm diameter and 300 mm length were tested, 15 for tensile splitting and 15 for uniaxial compression. For each type of test, 5 specimens did not have any reinforcement, whereas 10 were reinforced with a single layer of steel wire mesh. It has been concluded that the adobe specimens reinforced with wire mesh do not suddenly split because of tensile stresses. It has also been concluded that the wire mesh reinforcement significantly increases the compressive strength of adobe specimens. The stress-strain response of adobe, which is non-linear with post-peak strain softening in the absence of any reinforcement, becomes bilinear in form with continuous post-cracking hardening when wire mesh reinforcement is added. The use of wire mesh reinforcement in adobe construction has great potential to further promote adobe as a construction material.

Keywords: Adobe; Uniaxial compression; Modulus of elasticity; Tensile splitting; Wire mesh

