Rammed earth construction materials incorporating waste plastic and stabilised with cement

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PROF.DR. J. M. KHATIB[1], ASSOC.PROF.DR. SUNNY O. NWAUBANI[2]

[1] *University of Wolverhampton, Faculty of Science and Engineering, Wolverhampton, UK*

j.m.khatib@wlv.ac.uk

[2] *Anglia Ruskin University, Faculty of Science and Engineering, Cambridge&Chelmsford, UK*

sunny.nwaubani@anglia.ac.uk

Abstract

This work reports some results of an experimental investigation on rammed earth construction materials. The rammed earth is stabilised with 6% of cement (by weight) and contains shredded waste plastic. Specimens in the form of cubes of 50mm in size were prepared and left to cure in air until the time of testing. Testing included the determination of density, compressive strength, UPV and capillary water absorption. For the determination of density, compressive strength and ultrasonic pulse velocity (UPV), the specimens were cured for 56 days whereas for the absorption by capillary action specimens were cured for 28 days. Increasing the content of shredded waste plastic in the mix causes a decrease in compressive strength and UPV. The capillary water absorption tends to be higher when waste plastic is incorporated but the effect of varying the waste plastic content on water absorption is not clear.

Key words: rammed earth construction, waste plastic.

Povzetek

V članku so prikazani rezultati raziskave armiranih zemeljskih materialov. Armirane zemljine so utrjene s 6 ut.% cementa in vsebujejo razrezano odpadno plastiko. Izdelani so bili vzorci v obliki kock dimenzije 50 mm in do preiskave starani na zraku. Preiskave vključujejo določitev gostote, enoosne tlačne trdnosti, ultrazvočne pulzne hitrosti in absorbcije kapilarne vlage. Za določitev gostote, tlačne trdnosti in ultrazvočne pulzne hitrosti morajo biti vzorci starani do 56 dni, za določitev absorbcije kapilarne vlage pa do 28 dni. Povečanje vsebnosti razrezane odpadne plastike v mešanici povzroči zmanjšanje tlačne trdnosti in ultrazvočne pulzne hitrosti. Absorbcija kapilarne vlage se z dodatkom odpadne plastike povečuje vendar vpliv različnega deleža odpadne plastike na absorbcijo vlage še ni znan.

Ključne besede: armirane zemeljske konstrukcije, odpadna plastika.