World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:11, No:12, 2017

Study of the Hydraulic Concrete Physical-Mechanical Properties by Using Admixtures

Authors : Natia Tabatadze

Abstract : The research aim is to study the physical - mechanical characteristics of structural materials, in particular, hydraulic concrete in the surface active environment and receiving of high strength concrete, low-deformable, resistant to aggressive environment concrete due application of nano technologies. The obtained concrete with additives will by possible to apply in hydraulic structures. We used cement (compressive strength R28=39,42 mPa), sand (0- 5 mm), gravel (5-10 mm, 10-20 mm), admixture CHRYSO® Fuge B 1,5% dosage of cement. CHRYSO® Fuge B renders mortar and concrete highly resistant to capillary action and reduces, or even eliminates infiltration of water under pressure. The fine particles that CHRYSO® Fuge B contains combine with the lime in the cement to form water repellent particles. These obstruct the capillary action within concrete. CHRYSO® Fuge B does not significantly modify the characteristics of the fresh concrete and mortar, nor the compressive strength. As result of research, the alkali-silica reaction was improved (relative elongation 0,122 % of admixture instead of 0,126 % of basic concrete after 14 days). The aggressive environment impact on the strength of heavy concrete, fabricated on the basis of the hydraulic admixture with the penetrating waterproof additives also was improved (strength on compression R28=47,5 mPa of admixture instead of R28=35,8 mPa), as well as the mass water absorption (W=3,37 % of admixture instead of W=1,41 %), volume water absorption (W=1,41 % of admixture instead of W=0,59 %), water tightness (R14=37,9 mPa instead R14=28,7 mPa) and water-resistance (B=18 instead B=12). The basic parameters of concrete with admixture was improved in comparison with basic concrete.

Keywords : structural materials, hydraulic concrete, low-deformable, water absorption for mass, water absorption for volume
Conference Title : ICCBE 2017 : International Conference on Civil and Building Engineering
Conference Location : Rome, Italy
Conference Dates : December 11-12, 2017