عنوان مقاله:

Properties of concrete treated by ChemConcrete-WPwaterproofing admixture

محل انتشار:

نهمین کنگره سالانه بین المللی عمران، معماری و توسعه شهری (سال: 1402)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Aref Sadeghi-Nik - Department of Civil Engineering, Laval University, Quebec City, Quebec, Canada

Farzad Zivari - Department of Building, Civil and Environmental Engineering, Concordia University,Montreal, Canada

Mohammad Afrazi - Department of Mechanical Engineering, New Mexico Institute of Mining and Technology,Socorro, New Mexico, USA

,Mohammadreza Rezaeian - Department of Civil, Environmental and Geomatic Engineering, University College London,London, UK

Masoud Ahmadi - Associate Professor, Department of Civil Engineering, AyatollahBoroujerdi University, Boroujerd, Lorestan, Iran

خلاصه مقاله:

Penetration of water and corrosive chemicals is the main reason for the major chemicaland physical deteriorations of concrete infrastructures and pavements, which shortens theservice-life of concrete and results in an annual cost of billions of dollars to the nationaleconomies. Extensive research has been carried out to extend the life span and improvethe durability of concrete using different integral waterproofing admixtures, membranes,and surface coatings. It has been believed that the use of an effective integralwaterproofing admixture has many advantages over surface protection methods becausean integrally waterproof concrete does not require ongoing maintenance, is not vulnerableto degradation, does not include labor work, saves the construction time, and can be usedwhere membranes or surface coatings are impossible or too complex to apply.ChemConcrete-WP is a commercially available, hybrid integral waterproofing admixtureused to develop a waterproof concrete and improve the durability of concrete structuresand pavements. This research evaluated the effects of this commercial admixture oncompressive strength, flexural strength, bulk water absorption, water contact angle, andchloride resistance of concrete treated by ChemConcrete-WP. The water absorption testsresults were also compared with the existing literature on similar waterproofingadmixtures. The findings of this research showed that ChemConcrete-WP waterproofingadmixture increased the water contact angle of concrete from ۰ º to ۹۳ º, respectively.Balk water absorption of ۲۸-day cured concrete specimens reduced from ۶.۳۸% to below۱% because of employing this admixture. Compressive and flexural strengths of concreteincreased from ۴۱ MPa to ۴۸ MPa and from ۵.۵۰ MPa to ۶.۳۰ MPa, respectively.Chloride resistance of concrete treated by ChemConcrete-WP was also significantlyincreased in comparison to the untreated control concrete. A comparison between theresults of this research and the existing literature showed that ChemConcrete-WPwaterproofing admixture is more effective than six other commercial counterparts that arepresented in this research in terms of reducing the water absorption rate and developingdurable/watertight concrete while .simultaneously improving the strength properties aswell

کلمات کلیدی:

.Concrete waterproofing admixtures; waterproof concrete; water absorption; durability;chloride resistance; ChemConcrete-WP

لینک ثابت مقاله در پایگاه سیویلیکا: