

بجث رقم (٢)

عنوان البجث (باللغة التى نشر بها) :

Experimental Investigation on the Behaviour of Crumb Rubber Concrete Columns Exposed to Chloride–Sulphate Attack

مكان النشر (بلغة مكان النشر): **Structures - Elsevier B.V.**

Impact factor 4.01

تاريخ الإرسال للنشر : ٢٠٢١/١٢/٣٠ ، تاريخ القبول للنشر : ٢٠٢٢/١٠/١٨ ، تاريخ النشر : ٢٠٢٢/١٠/٢٥

This research presents an experimental study to investigate the structural behaviour of crumb rubber concrete (CRC) short columns subjected to different exposure conditions. Thus, three different concrete mixtures were designed with varying replacement ratios of crumb rubber (CR) (0 %, 10 %, and 20 %) to the total volume of fine aggregate. The experimental program of this study includes the testing of 27 short columns characterised by three different environmental conditions, that is, laboratory, chloride, and sulphate. Nine columns were kept in a neutral laboratory environment condition. Nine columns were immersed in a sodium chloride solution, and the remaining nine columns were immersed in a magnesium sulphate solution for 90, 180 or 365 days. Experimental results illustrate that the addition of CR to concrete adversely affects the mechanical properties and durability of the CRC. The column strength, stiffness, and toughness continuously degrade with the increase in the CR content and immersion time. The column's strength, stiffness, and toughness decrease as the level of corrosion damage increases. Specifically, the reduction levels in the strength of the columns immersed in 10 % magnesium sulphate solution are more noticeable than those immersed in 10 % sodium chloride solution.