عنوان مقاله:

Utilization of EAF Slag in Concrete Containing Recycled Aggregate

محل انتشار:

چهارمین کنگره بین المللی عمران ، معماری و توسعه شهری (سال: 1395)

تعداد صفحات اصل مقاله: 14

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خلاصه مقاله:

An experimental program was carried out in order to investigate mechanical properties of concrete containing Electric Arc Furnace slag produced in Mobarakeh Steel co. and recycled concrete aggregate in fine and coarse sizes. 12 different mixtures in 4 groups were studied. Because the aim of study was investigate effect of these alternative aggregates on properties of concrete we had to minimize impacts of gradation on altering mechanical properties, so combined gradation curves were checked by 8-18 chart, coarseness factor chart and 0.45 power gradation chart so they all have almost the same gradation parameters. Slump test was performed on fresh concrete and compressive strength, split tensile strength tests were conducted on hardened concrete. Results showed that on one hand EAF slag aggregates increased compressive and tensile strength of the concrete and reduced slump, on the other hand recycled concrete aggregates in high amount substitution reduced compressive strength but tensile strength more significantly. Reduction in slump was also observed by increasing substitution of recycled concrete aggregates. As the final result of the experiment we can claim that if combined gradation of concrete mixture satisfies criteria which were checked in this experiment EAF slag and recycled concrete aggregates can be combined to produce an environmental friendly concrete. Combination of 20% of recycled aggregate, 40% of EAF slag and 40% of natural aggregate showed really good compressive and tensile strength in comparison with control concrete. Concrete which has an acceptable range of mechanical properties and high value of alternative resources used and minimized application of raw materials.

کلمات کلیدی:

Recycled Concrete, EAF Slag, Compressive Strength, Combined Gradation, Crushed Concrete, Green Concrete