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GENLEŞTİRİLMİŞ KİL AGREGALI HAFİF BETONUN YAPI DAVRANIŞI VE KABA YAPI MALİYETİNE ETKİSİ

ÖZET

Bu çalışmada, genleştiril kil agregası kullanılarak elde edilen hafif betonun yapı davranışı ve kaba yapı maliyetine etkisi araştırılmıştır. Analiz sonucunda betonarme eleman kesitleri, yapı zati ağırlığı, yapı deprem davranışı ile donatı, beton ve kalıp miktarları ile kaba yapı maliyetleri normal beton ve GKB için ayrı ayrı hesaplanmış ve sonuçlar karşılaştırmalı olarak değerlendirilmiştir. Sonuç olarak, yapıda normal beton yerine GKB kullanılması durumunda; yapının zati ağırlığının %42 oranında azaldığı, böylece zemine gelen yükün yaklaşık 1,9 ton/m^2, yapı eleman kesitlerinin %15, yapı temel kalınlığının %33, yapıya etkiyen deprem kuvvetlerinin %15 oranında azaldığı, kaba yapı maliyetlerinin de normal betona göre %0,3 oranında azaldığı görülmüştür.

Anahtar Kelimeler: Genleştirilmiş Kil Agregalı Beton, Yapı Davranışı, Kaba Yapı, Maliyet, Beton

THE EFFECTS OF EXPANDED CLAY AGGREGATE CONCRETE ON STRUCTURAL BEHAVIOUR AND BASIC STRUCTURE COST

ABSTRACT

In this study, the effect of lightweight concrete obtained with expanded clay aggregate on structural behavior and basic structure costs of the structure have been investigated. In the present study, a building having four-storey was designed, and then mechanical properties of expanded clay aggregate concrete (ECAC) and traditional concrete were respectively used for analyzing reinforced concrete design. Cross section of reinforced concrete member, dead weight of structure, structure earthquake response and reinforcing bar and the amount of the total concrete and formwork were investigated after the results of the research analysis. Basic structure costs of the designed structure used both ECAC and traditional concrete were calculated. As a result; it is seen that, compared with the traditional concrete, the dead weight of the structure made with ECAC was reduced by %42, so that the total structure loads were decreased approximately 1,9 ton per square meter and also cross section of reinforced concrete members, foundation thickness and the earthquake loads on the structure were decreased. Consequently, basic structure costs of structure made with ECAC was reduced compared with the structure made with traditional concrete.

Keywords: Expanded Clay Aggregate Concrete, Structural Behavior, Basic Structure, costs, Concrete