

BUILDING RESEARCH AND TRAINING CENTRE

بمختار  
البحوث

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CONCRETE MIXES  
CALCAREOUS GRAVEL

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المركز القومي لبحوث الإسكان والبناء  
Housing & Building Research Center  
1958  
Since 1954

BUILDING RESEARCH AND TRAINING CENTRE

مركز البحوث القومية  
للبناء والإسكان

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## INTRODUCTION

Concrete is one of the most important building materials in Egyptian constructions as confirmed by the results of statistics which show that concrete materials cost about 12% of the total estimation of the structure. The ingredients used in manufacturing concrete are mainly siliceous aggregates and Portland cement. The cost of concrete produced in this way at many places is somewhat higher due to transportation. In order to cut the concrete cost, the local aggregates at construction zones should be used if it fulfills the specified requirements.

In recent years many constructions were erected in places where calcareous aggregates are easily available, but the concrete aggregates used were the previously mentioned siliceous aggregates due to usual practice, and fear of inferior properties of calcareous aggregate in concrete. Therefore it is of importance to investigate such calcareous aggregates to show its suitability for concrete works.

The purpose of this investigation is to study this problem; the calcareous aggregates of EL-Tibbeen near Helwan was taken as an example since it lies near Helwan Zone where large progress in building is expected in the near future specially after the construction of many factories.

The work encountered in this paper covers the physical, mechanical and chemical properties of El-Tibbeen calcareous gravel, and the properties of concrete made with this gravel & the Pyramid sand, using different amounts of cement content and water/cement ratios.

The investigation reaches a conclusion that El-Tibbsen gravel fulfills satisfactorily the accepted requirements of concrete aggregates, besides the gain in economy in using it instead of siliceous gravel at Helwan zone. Also the concrete mixes made with this gravel gives some what higher strength than that of siliceous gravel. For cement content  $300 \text{ Kg/m}^3$  concrete, a value for compressive strength of about  $400 \text{ Kg/cm}^2$  was obtained after a period of 28 days.

This result strongly recommends its use in concrete works where such gravel is easily available. Also this investigation <sup>also</sup> encourages the study of calcareous gravel as concrete aggregates in various Egyptian localities with the aim of reducing the cost of concrete, consequently the Building Research & Training Center is preparing a program of large scale study of Egyptian calcareous gravel quarries and a study of concrete mixes with different proportioning of materials to get high quality concrete.